

Program Document for the Pitt County Stormwater Program for Nutrient Control



Effective Date: October 11, 2004
Revised Date: May 15, 2006

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1. Introduction

In accordance with stormwater rule 15A NCAC 2B .0258 *Tar-Pamlico River Basin-Nutrient Sensitive Waters Management Strategy: Basinwide Stormwater Requirements*, hereinafter referred to as the “Rule”, Pitt County is required to develop a local stormwater program to comply with the substantive requirements of the Rule. This Program document includes all technical requirements to satisfy the Rule.

The Pitt County Stormwater Program will be implemented and enforced through the cooperation of several County Departments, including:

Pitt Co. Planning Department (lead role).....(252) 902-3250
Pitt Co Engineering Department.....(252) 902-3175
Pitt Co Legal Department.....(252) 902-3100

1-A. Purpose of the Tar-Pamlico Stormwater Rule

The Tar-Pamlico River Basin begins in Piedmont North Carolina and extends approximately 180 miles through the Coastal Plain to Pamlico Sound. Together, Pamlico Sound and neighboring Albemarle Sound constitute one of the most productive estuarine systems in the country. The 5,400 square mile Tar-Pamlico basin is comprised primarily of agricultural and forest land, and many smaller municipalities. Despite the rural character of the basin, in the mid-1970’s the Pamlico River estuary began to see increasing frequencies of harmful algal blooms, fish kills, and other nutrient-related problems.

By the mid-1980’s, the state began to consider actions to control nutrient inputs to the estuary. Those actions have included the following:

Phase I: In 1989, the North Carolina Environmental Management Commission (hereinafter referred to as the “EMC” or the “Commission”) designated the entire basin “Nutrient Sensitive Waters”. The first phase of management through 1994 focused primarily on point sources, establishing an annually decreasing nutrient loading cap for an association of dischargers, and an innovative “trading” program that allowed dischargers to achieve reductions in nutrient loading more cost-effectively.

PCS Recycling: In 1992, a phosphate mining company then known as Texas Gulf, which is located on the Pamlico River estuary, instituted a wastewater recycling system that reduced its phosphorus discharges to the estuary by 93%.

Phase II: Modeling of estuary conditions showed that despite the gains made to that point, significant reductions in nitrogen and phosphorus loading were still needed to restore water quality standards and minimize the recurrence of harmful algal blooms. The second phase of the nutrient strategy, which runs through 2004, established a biologically based goal of 30

percent reduction in nitrogen loading from 1991 levels and holding phosphorus loading at 1991 levels. Load reductions were apportioned among point sources and the major nonpoint sources. The point sources were given steady annual nitrogen and phosphorus loading caps. A program was designed with the nonpoint sources to achieve the goals through voluntary measures. After two years of voluntary implementation, the Commission found insufficient progress and called for rules for nonpoint sources.

Rules: Beginning in 1998, Division of Water Quality (hereinafter referred to as the “Division” or “DWQ”) staff conducted a lengthy public input process to evaluate source categories and develop rules where needed. Over the course of 2000, the Commission adopted rules for agriculture, fertilizer application across all land uses, urban stormwater, and rules to protect the nutrient removal functions of existing riparian buffers. These rules were modeled after a similar set of rules recently adopted in the adjacent Neuse River Basin. The Neuse rules were given extensive public review and modification, and the Tar-Pamlico rules similarly received extensive scrutiny. The resulting rules provide increased flexibility for the regulated community while maintaining the focus of the nutrient reduction goals.

1-B. Requirements of the Tar-Pamlico Stormwater Rule

The Tar-Pamlico stormwater rule applies to the local governments with the greatest likelihood of contributing significant nutrient loads to the Pamlico estuary. The EMC may designate additional local governments in the future through rule amendment based on criteria given in the rule.

The affected local governments are:

<u>Municipalities</u>	<u>Counties</u>
Greenville	Beaufort
Henderson	Edgecombe
Oxford	Franklin
Rocky Mount	Nash
Tarboro	Pitt
Washington	

For these local governments, only their geographic areas that fall within the Tar-Pamlico River Basin are subject to the rule. In subject counties, applicable areas are those under the direct jurisdiction of the counties, which would not include incorporated cities, towns, or villages within county jurisdictional limits. Cities and counties are encouraged to coordinate to establish implementation responsibilities within municipal extraterritorial jurisdictions. Counties administering development regulations by interlocal agreement on behalf of municipalities would implement the rule within only those municipalities that are subject to the rule. The activities of state entities within subject local governments would be subject to the rule.

Within Pitt County, all areas within the County's planning jurisdiction will be subject to the Pitt County Stormwater Management Ordinance for Nutrient Control, except that the area within the Neuse basin need not comply with the phosphorus loading limits.

The rule establishes a broad set of objectives for limiting nutrient runoff from urban areas. It then lays out a set of specific elements, described below, that local governments shall include in their programs. Timeframes for implementation of the rule are as follows:

- April 1, 2001: Effective date of the rule.
- February 13, 2003: Target date for approval of the Model Stormwater Program by the Environmental Management Commission (modified through EMC approval from the date of April 1, 2002 established in the rule).
- February 13, 2004: Deadline for submittal of local Stormwater Programs (including ordinances) to the EMC (modified as above).
- September, 2004: Deadline for local governments to begin implementing local Stormwater Programs (modified as above). The effective day in September will vary by local government and depends on the date of program and ordinance adoption by the local board. Pitt County's effective date shall be September 28, 2004.

Following implementation in September 2004, local governments are required to make annual progress reports to the EMC that will include nitrogen and phosphorus loading reduction estimates.

The elements that must be included in local stormwater management programs are:

1. New Development Review/Approval

New development is required to meet the 30% reduction goal through site planning and best management practices. The rule imposes a 4.0 pounds per acre per year (lb/ac/yr) nitrogen loading limit and a 0.4 lb/ac/yr phosphorus loading limit on new development. Proposals that exceed these performance standards may partially offset their load increases by treating existing developed areas offsite that drain to the same stream.

New development must also avoid causing erosion of surface water conveyances. At minimum, post-development peak flows leaving the site may not exceed pre-development for the 1-year, 24-hour storm event. The rule also provides Pitt County with the option of using regional stormwater facilities to help meet nutrient loading and attenuation requirements under certain circumstances.

2. Illegal Discharges

Illegal discharges are substances deposited in storm sewers (that lead to streams) that should instead be handled as wastewater discharges. Illegal discharges may contain nitrogen. Pitt County must identify and remove illegal discharges.

3. Retrofit Locations

There are a number of funding sources available for water quality retrofit projects, such as the Clean Water Management Trust Fund and the Wetland Restoration Program that the NC General Assembly has recently established. To assist technical experts, Pitt County is required to identify sites and opportunities for retrofitting existing development to reduce total nitrogen and phosphorus loads.

4. Public Education

Citizens can reduce the nitrogen pollution coming from their lawns and septic systems if they understand the impacts of their actions and respond with appropriate management measures. Pitt County will develop and implement public and developer education programs for the Tar-Pamlico basin.

2. New Development Review/Approval

2-A. Requirements in the Rule

The Tar-Pamlico Stormwater Rule (15A NCAC 2B .0258) has the following requirements (see the rule in Appendix A for complete language) for new development located within the planning and zoning jurisdictions of the 11 local governments subject to these rules:

- The nitrogen load contributed by new development activities is held at 4.0 pounds per acre per year. This is equivalent to 70 percent of the estimated average nitrogen load contributed by non-urban areas in the Tar-Pamlico River basin (as defined using 1995 LANDSAT data). Similarly, the phosphorus load contributed by new development activities is held at 0.4 pounds per acre per year, which is equivalent to the estimated average phosphorus load contributed by non-urban areas in the basin. The Environmental Management Commission may periodically update these performance standards based on the availability of new scientific information.
- Property owners shall have the option of partially offsetting projected nitrogen loads by providing treatment of existing developed areas off-site that drain to the same stream. 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.
- There is no net increase in peak flow leaving the developed site from the predevelopment conditions for the 1-year, 24-hour storm.
- Pitt County must review new development plans to assure compliance with requirements for protecting and maintaining riparian areas as specified in 15A NCAC 2B .0259.

Pitt County may include regional stormwater facilities in their programs to provide for partial nutrient and flow control. Such facilities may not degrade surface waters.

2-B. Protecting Riparian Areas on New Development

The Tar-Pamlico Riparian Buffer Protection Rule, 15A NCAC 2B .0259, requires Pitt County to ensure that riparian areas on new developments are protected in accordance with the buffer rule's provisions. The buffer rule requires that 50-foot riparian buffers be maintained on all sides of intermittent and perennial streams, ponds, lakes and estuarine waters in the basin. The buffer rule provides for certain "allowable" uses within the buffer with DWQ approval, such as road and utility crossings.

Within the first year of the stormwater program implementation, Pitt County intends to obtain delegated authority to implement a local riparian buffer protection program pursuant to the buffer delegation rule, 15A NCAC 2B .0261, and implement all applicable provisions of the buffer rule within its jurisdiction. Until local delegation authority is obtained, Pitt County will disapprove any new development activity proposed within the first 50 feet adjacent to a waterbody that is shown on either the USGS 7.5 minute topographic map or the NRCS Soil Survey map unless the owner can show that the activity has been approved by DWQ. DWQ approval may consist of the following:

- ❑ An on-site determination that surface waters are not present.
- ❑ An Authorization Certificate from DWQ for an “allowable” use such as a road crossing or utility line, or for a use that is “allowable with mitigation” along with a Division-approved mitigation plan. A table delineating such uses is included in the buffer rule.
- ❑ 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.

2-C. Calculating N and P Export from New Development

New Development Described: For the purposes of the Tar-Pamlico Stormwater Program, new development shall be described to include the following:

- ❑ Any activity that disturbs greater than one acre of land to establish, expand, or replace a single family or duplex residential development or recreational facility. For individual single family residential lots of record that are not part of a larger common plan of development or sale, the activity must also result in greater than ten percent built-upon area.
- ❑ Any activity that disturbs greater than one-half an acre of land to establish, expand, or replace a multifamily residential development or a commercial, industrial or institutional facility.
- ❑ Projects meeting the above criteria that replace or expand existing structures or improvements and that do *not* result in a net increase in built-upon area shall not be required to meet the basinwide average non-urban loading levels.

- Projects meeting the above criteria that replace or expand existing structures or improvements and that result in a net increase in built-upon area shall achieve a 30 percent reduction in nitrogen loading and no increase in phosphorus loading relative to the previous development. Such projects may achieve these loads through onsite or offsite measures or some combination thereof.
 - Multi-family residential, commercial, industrial, and institutional projects may choose to achieve all of this reduction by providing treatment of off-site developed areas, or by permanently conserving land from future development in conformance with the local government's approved land conservation plan, as described in Section 2-G.
- Built-upon area means that portion of a development project that is covered by impervious or partially impervious cover including buildings, pavement, and gravel area. Slatted wooden decks and the water surface area of pools shall be considered pervious.
- Land disturbance is defined as grubbing, stump removal, grading, or removal of structures.

New development shall not include agriculture (including intensive livestock operations), mining, or forestry activities.

Vesting: All new development projects that have received approval from Pitt County for a site-specific or phased development plan by September 28, 2004 and that have implemented that development in accordance with local vesting provisions shall be exempt from the requirements of the Tar-Pamlico stormwater rule. Any plats associated with such development must be recorded within a maximum of five years from the date of development approval. All new development projects that have not received such approval by September 28, 2004, or recorded any plats associated with such development within five years of the development's approval shall be subject to the requirements of the rule.

Projects that require a state permit, such as landfills, NPDES wastewater discharges, land application of residuals and road construction activities shall be considered exempt if a state permit was issued prior to the effective date of the local stormwater program.

Calculating N and P Export: The nitrogen and phosphorus export from each new development must be calculated. The developer shall submit calculations signed and sealed by a qualified professional. This export will be calculated in pounds per acre per year (lbs/ac/yr). A methodology that may be used to make this calculation is described here. Worksheets to carry out this method are provided in Appendix D, along with a description of their development. For background information concerning nitrogen see Appendices B and C.

It is expected that some values provided in the methodology will be refined over time. The Division plans to provide those refinements to Pitt County on a periodic basis as they are established. For example, additional research may lead to refined export values for the various urban land covers, particularly rooftop and transportation impervious surface. Also, stormwater management practices are typically in various stages of refinement around the country. Several nutrient reducing BMPs are being applied and studied around North Carolina toward better designs and more accurate knowledge of long-term nutrient removal efficiencies. The Division will ask all affected jurisdictions to incorporate these refinements into their programs from time to time as they are substantiated.

For a given project, the methodology calculates a weighted annual load export for both nitrogen and phosphorus based on event mean concentrations of runoff from different urban land covers and user-supplied acreages for those land covers. The user chooses BMPs that reduce the export to rule-mandated levels. The Coastal Plain version of the export calculation spreadsheet created by DWQ shall be used to generate export calculations for Pitt County. A residential worksheet is also provided in Appendix D to calculate acreages dedicated to different land covers in residential developments where impervious footprints are not shown. One situation not addressed by the methodology is a non-residential subdivision where the impervious surfaces are not shown on the plans at the time of submittal. In this case, the property owner shall determine a worst-case scenario for the areas of impervious surface and managed open space for the type of development specified given zoning and other land use restrictions and then apply the methodology.

2-D. BMPs for Reducing Nitrogen and Phosphorus

The rule requires that all new developments achieve a nitrogen export of less than or equal to 4.0 (and a phosphorus export of less than or equal to 0.4) pounds per acre per year. If the development contributes greater than 4.0 pounds nitrogen (or 0.4 pounds phosphorus), then the following options exist.

For residential (or commercial or industrial) development:

- If the computed nitrogen export is greater than 6.0 (or 10.0) lb N/ac/yr, then the owner must either use on-site BMPs or take part in an approved regional or jurisdiction-wide stormwater strategy or some combination of these to lower the nitrogen export to at least 6.0 (or 10.0) lb N/ac/yr. The owner may then use one of the following three options to reduce nitrogen from 6.0 (or 10.0) to 4.0 lb N/ac/yr.
- If the computed nitrogen export is greater than 4.0 lb/ac/yr but less than 6.0 (or 10.0) lb N/ac/yr, then the owner may either:
 - Install BMPs onsite or take part in an approved regional or jurisdiction-wide stormwater strategy or some combination of these to remove nitrogen down to 4.0 lb N/ac/yr.

- Provide treatment of an offsite developed area that drains to the same stream to achieve the same nitrogen mass loading reduction that would have occurred onsite.
- Pay a one-time offset payment to the North Carolina Ecosystem Enhancement Program's Riparian Buffer Restoration Fund using the applicable nitrogen and phosphorous offset payment calculations specified in the Nutrient Offset Payments Rule (15A NCAC 02B.0240).
 - a) The formula to calculate nutrient offset payments will be adjusted by NC EEP on an annual basis (January of each year) based upon the construction cost index factor published every December in the Engineering News Record.
 - b) In cases where reductions are needed for both nitrogen and phosphorous and the offset option is sought, only the greater value of the two offset payments calculated is required to satisfy the offset reductions for both limits.
 - c) The project engineer shall submit the documentation of the offset payment calculations. The County shall verify the correct offset payment amount required and shall issue an approval letter to NC EEP and the developer. The approval letter shall include the project name and location including river basin, the offset payment calculations, and the amount of the offset payment.
 - d) Prior to the County issuing a permit, the developer shall provide receipt from NC EEP.
- The owner must install BMPs that also achieve a phosphorus export of less than or equal to 0.4 lb P/ac/yr, but may do so through any combination of on-site and offsite measures or by making a mitigation payment to the North Carolina Ecosystem Enhancement Program's Riparian Buffer Restoration Fund. Any and all BMPs must be designed and installed under the supervision of a qualified professional.
- County review of applications that require BMPs, and review of the design of BMPs, will be overseen by a qualified professional capable of designing the stormwater systems and BMPs that will be reviewed.

A sound site planning process is vital in achieving the nutrient loading requirements. The process should first consider the ability to achieve the needed reductions using site design measures that avoid or minimize runoff to begin with. The accounting method in Section 2-C provides credit for site planning practices that reduce nutrient loadings in this manner. These planning measures include reducing, disconnecting, and rerouting impervious surfaces, maximizing time of concentration for stormwater, and protecting open spaces for infiltration and evapotranspiration. More detail on planning measures that reduce hydrologic and nutrient loading is given in Appendix H.

Often, structural management practices cannot be avoided. BMP selection is an important and challenging craft. Available data indicate that most BMPs remove only 20 to 40 percent of total nitrogen or phosphorus on a consistent basis. There are a number of issues to consider to ensure this sustained performance. It is crucial to consider the issues of aesthetics, long-term maintenance, safety and reliability in BMP design. All BMPs require regular maintenance and some have varying performance depending on soil type and season. The efficiencies provided below and in the load calculation worksheets in Appendices F and G assume correct sizing and other design per the referenced manuals, and optimum performance based on regular, effective maintenance as well as proper siting of the practices.

The BMPs available for nutrient reduction and their removal rates based on current literature studies are provided in Table 2C below. These median values are based on a literature review conducted by a contractor that updated Neuse nitrogen efficiencies and established phosphorus values. A summary of these literature studies is given in Appendix E. Also provided in the table are the design standards to be adhered to in permitting BMP design.

The North Carolina Department of Environment and Natural Resources, Division of Water Quality, Water Quality Section, Stormwater Best Management Practices Manual, 1999, hereafter referred to as the “NC Design Manual” or “NC BMP Design Manual” shall be used to guide stormwater facility planning, design and maintenance in Pitt County. A copy of this manual shall be available for public review in the office of the Stormwater Administrator.

The design of best management practices that remove nitrogen and phosphorus from stormwater is a developing field. Researchers throughout the country, particularly in the Southeast, are conducting studies to identify and refine effective means of controlling nitrogen and phosphorus. As stated in Section 2-C, the Division plans to provide refinements in the stated BMP removal efficiencies to the jurisdictions on a periodic basis as they are substantiated.

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

BMP Type	TN Removal Rate per Literature Review	TP Removal Rate per Literature Review	Appropriate Design Standards
Wet detention ponds	25%	40%	NC Design Manual
Constructed wetlands	40%	35%	NC Design Manual
Restored riparian buffers	30%	30%	Tar-Pamlico Riparian Buffer Rule (15A NCAC 2B .0259)
Vegetated filter strips with level spreader	30%	30%	NC Manual and other literature information
Bioretention (rain gardens)	40%	35%	NC Design Manual
Sand Filters	35%	45%	NC Design Manual
Proprietary BMPs	Varies	Varies	Per manufacturer subject to DWQ approval
Other BMPs	Varies	Varies	Subject to DWQ approval

The North Carolina BMP Design Manual can be accessed and downloaded from the DWQ Stormwater Unit's web page at <http://h2o.enr.state.nc.us/su/stormwater.html> or obtained by contacting the Stormwater Unit at 919-733-5083 ext. 545.

Multiple BMPs: The worksheet provides calculation space for the case where more than one BMP is installed in series on a development. It determines the removal rate through serial rather than additive calculations. This is important to understand in projects where the automated worksheet is not used to estimate the effect of multiple BMPs.

As an example, if a wet detention pond discharges through a restored riparian buffer, then the removal rate shall be estimated to be 47.5 percent, determined as follows. The pond removes 25 percent of the influent nitrogen mass and discharges 75 percent to the buffer. The buffer then removes 30 percent of the remaining 75 percent of the original nitrogen amount that discharged from the pond, or 22.5 percent of the original influent amount. The sum of 25 and 22.5 is 47.5. The removal rate is NOT 25 percent plus 30 percent.

Assigning Values to Pervious Cover: Large-lot residential development may involve substantial open space that, at least initially, may remain in an undisturbed wooded or reforestation condition. While it may seem logical to enter this acreage as wooded pervious, without conservation easements or some other mechanism for ensuring protection of these areas, the local government has no control over their eventual condition. Thus, unless specific protection instruments, such as conservation easements, are established and provided in the development application or by Pitt County, lot areas shall be assigned the lawn/landscape managed pervious export rate. The worksheet will do this automatically.

Riparian buffers protected under the Tar-Pamlico Riparian Buffer Protection rule, 15A NCAC 2B .0259, are divided into two zones, moving landward from the surface water, that are afforded different levels of protection. Zone 1, the first 30 feet, is to remain essentially undisturbed, while zone 2, the outer 20 feet, must be vegetated but may be managed in certain ways. The user shall enter the acreage in zone 1 into the worksheet as wooded pervious, while zone 2 acreage shall be entered as managed pervious (lawn/landscape).

2-E. Calculating Peak Runoff Volume

The Tar-Pamlico Stormwater Rule requires that new development not cause erosion of surface water conveyances. At a minimum, new development shall not result in a net increase in peak flow leaving the site from pre-development conditions for the 1-year, 24-hour storm event. A number of Neuse local governments sought to use the 2-year rather than the 1-year storm as the design storm for peak flow control given that the 2-year storm is more consistent with current hydrologic modeling methodologies.

The main reason that the rule requires a 1-year design storm for peak flow control is to protect stream channels from erosion. Development on land causes many changes in stormwater

hydrology. One of the major causes of streambank erosion in urban streams is the increase in the frequency of the bankfull-flooding event. The bankfull-flooding event generally occurs at approximately a 1.5-year frequency. The Tar-Pamlico Stormwater Rule requires control of the 1-year storm to predevelopment levels to insure that the rate of release will be below bankfull and therefore less erosive to the stream channel. Releasing the 2-year storm at predevelopment levels would likely have the effect of increasing the frequency of a storm that is just a bit larger than the most erosive storm.

Protecting streambanks from erosion is a crucial part of the overall Tar-Pamlico Nutrient Sensitive Waters Management Strategy. Riparian buffers are protected under this program because in most situations they are effective at removing nitrogen resulting from nonpoint source pollution. The use of nitrogen reducing BMPs on new development does not prevent the need to maintain valuable riparian buffers.

In the Neuse process, DWQ staff devised a strategy, which is incorporated here, to allow use of the 2-year design storm while also providing a similar level of protection for streambanks as the use of the 1-year design storm. The strategy is to give Pitt County the option of using the 2-year storm as the design storm for peak flow control; however, requiring that it be controlled to the pre-development levels of the 1-year storm. This can be done by computing the peak flow associated with the 2-year storm for pre-development conditions and then reducing it by an appropriate percentage to reflect the difference between the 1-year and 2-year storm peak flows. The County will allow either of the following two options below to calculate the peak runoff, however only one option shall be utilized per development site.

Option 1: Use the 1-year Design Storm

The rainfall depth for Pitt County for the 1-year, 24-hour storm is 3.4 inches according to the US Weather Bureau (Technical Paper 40).

The Rational Method is an acceptable method for estimating peak discharge in the design of stormwater facilities for relatively small watersheds (up to 50 acres). The basic equation is:

$$Q = CIA$$

Where: Q is the peak flow for the design storm in cubic feet per second
C is the coefficient of runoff based on land cover (dimensionless)
I is the storm intensity in inches per hour
A is the drainage area in acres

The rational equation is based upon the assumption that rainfall is uniformly distributed over the entire drainage area at a steady rate, causing the flow to reach a maximum at the outlet of the watershed at a time to peak, T_p . The Rational Method typically gives a conservative estimate of runoff.

In order to use the Rational Method to determine peak flows, it is necessary to compute the storm intensity in inches per hour for the 1-year storm. The intensity is computed by the formula:

$$I = g/(h+T)$$

Where: I is the storm intensity in inches per hour
g and h are empirically derived constants
T is the duration in minutes (or $(L^3/H)^{0.385}/128$)

The appropriate values for g and h were estimated by graphing the 2, 5, 10, 25, 50 and 100-year values of g and h for Wilson County as a function of return period on a log-normal scale and determining the y-intercept of the best-fit line (see Appendices F and G). The resulting values of g and h for use in Pitt County for the 1-year storm are 112 and 20, respectively.

Option 2: Use the 2-year Design Storm, but Control it to 1-year Predevelopment Levels

This option involves the following three steps:

- First, compute the peak flows (both pre- and post-development) from the drainage area based on the 2-year design storm using one of the methodologies listed below.
- Second, estimate the 1-year predevelopment peak flow by multiplying the 2-year predevelopment peak flow by 80%. Details on how the 80% was computed can be found in Appendix I.
- Third, design a BMP that will control the 2-year post-development peak flow to 1-year pre-development peak flow levels (estimated by the second step).

Exceptions to the Peak Flow Requirement

Peak flow control is not required for developments that meet one or more of the following requirements:

- 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.
- The development occurs in a part of a drainage basin where stormwater detention can aggravate local flooding problems as determined by Pitt County. Such problems may include but are not limited to creation of tailwater problems on upstream reaches, development of concurrent peaks, and creation of unusually erosive conditions.

Acceptable Methodologies for Computing Peak Flow

The following methodologies are acceptable in Pitt County for computing the pre- and post-development conditions for the design storm:

- The Rational Method.
- Dr. Rooney Malcom, P.E., Small Watershed Method
- NRCS Methodologies applied through the Corps of Engineers HEC-1 Program

- ❑ The Peak Discharge Method as described in USDA Soil Conservation Service's Technical Release Number 55 (TR-55).
- ❑ The Putnam Method.
- ❑ Other methods proposed by local governments and approved by the Environmental Management Commission.

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

2-F. Offsite Partial Offset Option

The Tar-Pamlico stormwater rule provides the option to partially offset nitrogen load increases from new development by providing treatment of offsite developed areas. The offsite area must drain to the same classified surface water as the new development. The developer must provide appropriate legal measures to ensure that the offsite area achieves and maintains the credited nutrient reduction for as long as the new development exists, including through changes of ownership on either property.

Typical features of such an offsite offset project that distinguish it from regional systems (described in section 2-G) include the following:

- ❑ The new development site does not typically drain into the offsite treatment facility.
- ❑ The offsite facility is retrofitted to treat an existing developed property.
- ❑ The offsite facility may address only the nutrient requirements, unless a development proposal demonstrates that meeting some or all attenuation requirements offsite will not result in degradation of surface waters to which the new development site discharges.
- ❑ The new development site must reduce nitrogen export to at least 6 lb N/ac-yr for residential and 10 lb N/ac-yr for other types of development.

Offsite offset projects may be similar to regional system projects in certain ways:

- ❑ The offsite facility may be public or private.
- ❑ The offsite facility may serve multiple projects provided the local government tracks its use and the new development owner performs maintenance.

In order to take advantage of the partial offset option, the stormwater development plan must meet the following conditions:

- ❑ The offsite facility must drain to the same classified surface water as the new development.
- ❑ The new development must first reduce nitrogen export from the site to at least 6 lb N/ac-yr for residential and 10 lb N/ac-yr for other types of development. The balance of the nitrogen removal must be made by the offsite facility.
- ❑ The net phosphorus loading for the project must be reduced to 0.4 lb/ac/yr. Some or all of the reduction may be obtained through the offsite BMPs

- ❑ The offsite facility may only be used to address the nutrient requirements, unless the development proposal demonstrates that meeting some or all attenuation requirements offsite will not result in degradation of surface waters to which the new development site discharges.
- ❑ The off site BMP may serve multiple projects provided the facility is appropriately sized and a tracking system to allocate nutrient removal is in place and the off-site facility has been approved as a regional BMP.
- ❑ Both the development owner and the owner of the offsite facility must agree in a documented, enforceable manner that offsite facilities are dedicated to achieving the specified nutrient and flow reductions for the life of the new development. The responsibility for maintaining these reductions as well as the provisions of any required conservation easements and operation and maintenance agreements shall run with the land and be binding upon subsequent owners of both the development project and the off-site BMP.
- ❑ The operation and maintenance plan shall require an annual inspection by a licensed professional and shall ensure that Edgecombe County has the authority to inspect the stormwater facilities and make any necessary corrections if the owner fails to complete the required inspection or complete any required improvements. Any costs associated with this work, including administrative costs and fines, will be charge to the owner or party legally responsible for maintenance of the facility.

The developer shall submit the following information:

- ❑ The type and design of the proposed stormwater facility.
- ❑ The location, extent, type of use, and built-upon areas on the existing development site that will be treated by the stormwater facility.
- ❑ A maintenance agreement and plan for the offsite facility that meets all of the requirements of this plan.
- ❑ A binding legal instrument to be recorded at the Edgecombe County Register of Deeds prior to the release of a certificate of occupancy for the new development site that:
 - ❑ Permits the applicant to construct and maintain the offsite facility on the property of the existing development;
 - ❑ Clearly describes the responsibilities and limitations of all parties;
 - ❑ Holds all owners and parties in interest in the existing development and the proposed new development corporately and separately liable to the county for the ongoing maintenance of the facility;
 - ❑ Clearly states that the offsite facility is dedicated to achieving the specified nutrient and flow reductions for the life of the new development;
 - ❑ Attaches to both properties and is automatically transferable to any and all new owners, parties in interest, future successors and assigns;
 - ❑ Will remain in full force and effect unless and until the county shall approve the closure of the offsite facility;
 - ❑ Clearly indicates by numerical standard(s) the nutrient reduction and, if applicable, stormwater attenuation ability of the facility(ies);

- ❑ Acknowledges that as long as the agreement is in effect, future change of use or land disturbing activity of either site shall be reviewed for its impact on the ability of the offsite facility to meet the nutrient and, if applicable, attenuation requirements of this plan and shall not be approved if the requirements cannot be maintained; and
- ❑ Acknowledges the intent of the county to insure through any and all inspection and enforcement authorities it has that the offsite facility is maintained in perpetuity.

An as-built survey of the existing development site along with the location and extent of the proposed offsite facility and clear indication of the area the facility is treating shall be required to be submitted, approved, and recorded prior to the release of a certificate of occupancy for the new development site. Such survey shall show on its face the following note signed by all owners:

NOTE: The stormwater facility(ies) shown on this site are provided as an offsite offset facility for the property known as <Subdivision / development name> located at <physical address / location> with Tax Identification Number(s) <#####-##-#####>. This (these) facility(ies) and such property(ies) are legally bound by a <name of binding legal instrument> recorded at the Pitt County Register of Deeds <reference number>.

This note shall also be shown on the face of the recorded site plan and/or subdivision plat of the new development site, signed by all owners of that property, and shall appear along with the owner's signature on all future subdivision maps and/or documents of both properties as long as the agreement is in effect.

Prior to approval of any subsequent change of use or land development activity on either site, the applicant shall demonstrate that offsite property nutrient loading reductions and, if applicable, attenuation as required by this plan shall be maintained.

Pitt County shall also establish appropriate tracking processes, mechanisms, legal instruments, etc for the following purposes:

- To ensure, after development approval, that the new development and offsite property are linked for operation and maintenance purposes.
- To ensure that the local government will maintain stormwater facilities if the owner fails.
- To ensure, when a change of use is proposed on either site, that Pitt County will maintain the offsite property nutrient loading reductions through the change of use.

2-G. Regional or Jurisdiction-Wide Approaches

The Tar-Pamlico stormwater rule provides the option for Pitt County to develop regional or jurisdiction-wide stormwater facilities in their programs as an alternative means for developers to address nutrient or flow control requirements. Pitt County is required to demonstrate that such measures will not contribute to degradation of surface waters. The rule also requires Pitt County to quantify nutrient and flow reductions and provide for tracking and administration of the use of such facilities.

Regional Facilities: Within the context of the rule, the Group interprets the concept of a regional facility to mean generally a stormwater facility that serves more than one development project, each of which drains to the facility for treatment or attenuation. Inflows to regional facilities may already be partially treated or attenuated. Examples of regional facilities may include wet detention ponds or constructed wetlands.

The regional system option is intended to provide greater flexibility to development in affected communities than would strict onsite controls by giving Pitt County the opportunity to include stormwater management on a larger scale. Two basic types of regional facilities may be described as offstream and instream. While Pitt County may pursue instream regional facilities, instream facilities involve a more complicated set of issues associated with protection of surface waters, they are potentially suitable to a relatively small set of circumstances, and federal approval must be sought on a case-by-case basis and may be difficult to obtain.

Many individual developments include stormwater designs that could be interpreted as “regional” under the broadest of definitions, but which are not intended for the type of review and approval process described here. Projects such as phased developments or commercial projects with outparcels may propose using shared stormwater facilities that receive runoff from more than one lot and that would be accessed by lots under different ownership at different points in time. However, shared facilities that are permitted under single projects are intended for permitting by Pitt County.

Regional facilities provided for in the rule would serve more than one development project. They could be publicly or privately owned, but would be proposed to DWQ by Pitt County. Basic elements of regional system proposals, to be permitted by DWQ, and other “shared-facility” individual projects permitted by Pitt County would be the same, and are described below.

The rule mandates certain limitations on regional facilities. A regional facility would have to be implemented in conjunction with on-site controls to locally protect against water quality degradation and flooding. The Tar-Pamlico buffer requirements may impact the feasibility of using certain regional stormwater approaches.

Jurisdiction-Wide Approach: Within the context of the rule, the Group interprets the concept of a jurisdiction-wide approach to mean generally a nutrient-reducing management measure implemented under the authority of Pitt County to offset one or more increases that may take place in the same or a separate watershed within the jurisdiction. An offsite offset project (see Section 2-F) that is implemented under the authority of Pitt County would be a specific type of jurisdiction-wide approach. Examples of nutrient reducing measures may include but are not limited to conventional stormwater facilities, constructed wetlands, or land conservation.

Pitt County will consider the following criteria in developing a land conservation proposal for DWQ review:

- Conserved land would need to achieve the net nutrient reductions not achieved by new development that conservation is credited with offsetting. Proposals would need to quantify those reductions, including a measure of uncertainty. Land conservation would need to occur as part of some activity that would allow the conservation to achieve nutrient reductions. Examples include:
 - Conservation of a portion of a new development site to receive and treat the runoff from the development.
 - Conservation of a portion of some other, concurrent new development site to receive and treat runoff from that other site.
 - Restoration of the buffering functions of undeveloped land adjacent to existing or new development, e.g. converting pipe or ditch flow to dispersed sheetflow through forested land.
 - Obtaining and retiring agricultural land to forest land.
- The conserved land should be no further from the estuary than the new development and within the same jurisdiction. Proposals to establish interlocal agreements that would provide for development and offsetting conservation in different jurisdictions shall provide adequate assurance of enforceability between jurisdictions, as well as cross-jurisdictional tracking and monitoring procedures, in addition to the proposal information called for below.
- Adjacent new development could not claim credit for conserved lands that are being credited to other new development (no double counting).
- Lands whose nutrient removal functions are established and protected through other regulatory programs, such as wetlands and riparian buffers, would not be eligible for conservation credit.
- Conserved land could be used to offset flow attenuation requirements if adequate measures are provided to ensure diffuse flow and no hydrologic degradation of the conserved features or surface waters.
- The conserved land would be established within the context of a long-term regulating plan for development in the local government's comprehensive plan.
- It should be secured in a permanent conservation easement or equivalent legal mechanism whose provisions prohibit both farming and unapproved logging practices. This conservation land should be tracked on a GIS system and recorded on the plat or deed. An example conservation easement is provided in Appendix J.

Proposal Information: Regional or jurisdiction-wide approaches may be incorporated into Pitt County's model program if there is appropriate supporting information to show how they will achieve the nitrogen and phosphorus loading reduction requirements applicable to new development. Whether a regional or jurisdiction-wide approach is designed, implemented, and maintained by a developer or Pitt County, the County will need to provide in its program submittal or amendment to DWQ the following information for any proposed regional facility. Pitt County should also refer to the offsite offset criteria for guidance on administrative elements to consider in a regional or jurisdiction-wide approach.

- System location and design information, including:
 - land uses in the contributing area
 - type of facility – treatment, attenuation, both, treatment method, expected nitrogen and phosphorus removal efficiency
 - worst-case percent impervious of the contributing area at buildout
 - assumptions for on-lot treatment and attenuation
 - calculations on nitrogen and phosphorus reduction needed, demonstration that facility meets needs
 - demonstration that any proposed measures will not contribute to degradation of surface water quality, degradation of aquatic or wetland habitat or biota, or destabilization of conveyance structure of involved surface waters

- Process for tracking expenditure of treatment and attenuation capacity.

- Facility protection provisions - an easement, restricted to storm water management and containing adequate access, dedicated to the public or public entity through a platted and recorded map. An example conservation easement is provided in Appendix J for projects where such an instrument would be appropriate.

- Operation and maintenance provisions:
 - An agreement that demonstrates that (a) the developer, (b) a local government, or (c) a private for-profit or non-profit company will operate and maintain the facilities. Example maintenance agreements are provided in Appendix I.
 - Financial guarantees for maintenance of continued performance in the event that the Pitt County must assume maintenance.
 - An adopted ordinance providing for fines and penalties to ensure maintenance of the stormwater facilities.

2-H. BMP Maintenance

If BMPs are implemented to achieve the nitrogen and phosphorus loading and flow attenuation requirements for a development, then Pitt County will require an operations and maintenance plan for each BMP.

- For residential development, the developer is responsible for maintenance of BMP's for the first two years after installation. A homeowner's association, created by the developer, is responsible for maintenance thereafter.

- For non-residential development, each individual property owner is responsible for maintenance of the BMP's located on their property.
- An Operations and Maintenance Plan is required for all BMP's installed, as specified in the NC BMP Design Manual and annual inspection reports must be submitted to the stormwater administrator by the responsible party.
- Pitt County will conduct an annual inspection of all BMP's and will notify the owner upon finding that maintenance is needed on a BMP. If the owner does not complete the maintenance himself in a timely manner, then Pitt County shall contract out the maintenance itself and recover costs in the manner it determines most appropriate.
- Pitt County shall require a legal maintenance agreement for the BMP with the owner.

2-1. Land Use Planning Provisions

This model program is intended to provide the flexibility and incentives for Pitt County to improve their growth management practices and for developers to use impact-reducing site design techniques that will reduce nitrogen and phosphorus loading from their developments. As discussed previously, one such measure, reducing impervious surfaces, reduces the need for BMPs to control nitrogen and peak stormwater flows and also reduces associated BMP maintenance concerns.

Under the model stormwater program, Pitt County will review their local ordinances with regard to the following topics and show that they have provided adequate flexibility for developers to utilize planning measures to reduce impervious surfaces. This review is intended to look for opportunities where these measures could be allowed, or where obstacles to their use could be removed.

Pitt County will show that they have reviewed and considered the following planning techniques and the general advantages and disadvantages of incorporating these approaches at the local level.

- Reducing road widths
- Reducing minimum parking requirements
- Minimizing use of curb and gutter
- Cluster or open-space developments
- Traditional neighborhood developments
- Mixed-use developments
- Low Impact Development principles
- Other impact-reducing approaches

Descriptions of these techniques are provided in Appendix H.

2-J. References

Arendt, R. Open Space Design Guidebook: Albermarle-Pamlico Estuarine Region. 1993. Prepared for the NC Association of County Commissioners. National Lands Trust. Media, PA. 259 pp.

Environmental Protection Agency. Office of Water. November 1994. Section 319 Success Stories.

Environmental Protection Agency. Office of Water. Jan. 1993. Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters. Washington, DC.

Land of Sky Regional Council. 1995. Stormwater Fact Sheet Number 8: Plan Early for Stormwater in Your New Development. Asheville, NC. 4 pp.

Schueler, T. S. Dec. 1995. Site Planning for Urban Stream Protection. Metropolitan Washington Council of Governments. Silver Spring, MD 231 pp.

Stimmel Associates. 1993. Traditional Neighborhood Development Design Guidelines. Chapel Hill, NC.

3. *Illegal Discharges*

3-A. *Requirements in the Rule*

The Tar-Pamlico Stormwater Rule requires that Pitt County establish a program to prevent, identify and remove illegal discharges. Illegal discharges are flows in the stormwater collection system that are not associated with stormwater runoff or an allowable discharge.

3-B. *What is an Illegal Discharge?*

Stormwater collection systems are vulnerable to receiving illegal discharges (even though the person responsible for the discharge may be unaware that it is illegal). Depending on their source, illegal discharges may convey pollutants such as nutrients, phenols, and metals to receiving waters. Table 3a identifies some potential flows to the stormwater collection system that may be allowable. Table 3b identifies some discharges that are not allowed.

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		
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3-C. Establishing Legal Authority

One of the first steps that Pitt County is required to take is establishing the legal authority to control illegal discharges. According to the policies of Pitt County, this legal authority will be carried out through the Pitt County Stormwater Ordinance for Nutrient Control that does the following:

- Controls the contribution of illegal pollutants identified in Table 3b to the stormwater collection system.
- Prohibits illegal discharges to the stormwater collection system.
- Prohibits discharge of spills and disposal of materials other than stormwater to the stormwater collection system.
- Establishes criteria that allow determination of compliance and non-compliance.
- Requires compliance and undertakes enforcement measures in cases of non-compliance.

3-D. Collecting Jurisdiction-Wide Information

Pitt County is required to collect geographic information at three increasing levels of detail:

- The first, most cursory level is information that shall be collected for the entire jurisdiction. The associated requirements are discussed in this section.
- The second level is a more detailed screening for high priority areas within the jurisdiction. The associated requirements are discussed in Section 3-E.
- The third level is a very detailed investigation that shall be done upon the discovery of an illegal discharge. The associated requirements are discussed in Section 3-F.

The purpose of collecting jurisdiction-wide information are to assist with identifying potential illegal discharge sources and characterizing illegal discharges after they are discovered.

Pitt County shall compile maps that show the following information. All of this information may not be shown on a single map and no map shall be at a scale that is greater than 1:24,000.

- 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 – Natural Resources Conservation Service Soil Survey Maps and the U.S. Geological Survey 1:24,000 scale topographic maps.
- Land uses. Categories, at a minimum, should include undeveloped, residential, commercial, agriculture, industrial, institutional, publicly owned open space and others.

- 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 (this list can be obtained from the Division of Water Quality).

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 includes 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.

Pitt County shall complete this collection of jurisdiction-wide information by the time the second annual report is due (October 2006).

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

Beginning in the third year after implementation of the local stormwater program, Pitt County shall identify a high priority area of its jurisdiction for more detailed mapping and field screening. This high priority area shall comprise at least ten percent of the jurisdiction's area. This requirement will begin in the third year after implementation. Each subsequent year, Pitt County is responsible for selecting and screening another high priority area that comprises at least ten percent of its jurisdiction.

The method for determining the high priority area will vary from jurisdiction to jurisdiction. "High priority" means the areas within a jurisdiction where it is most likely to locate illegal discharges. Based on the experiences of Raleigh and Durham, the most likely locations for identifying illegal discharges are areas with older development. Each year, Pitt County should explain their basis for selection of the high priority areas.

The first part of the screening process for the selected high priority area is mapping the stormwater system. At a minimum, the map that is produced should include the following:

- Locations of the outfalls, or the points of discharge, 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 the outfalls of drainage ditches that drain more than 50 acres of non-industrial lands.
- Locations of the outfalls 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 shall not be conducted during or within 72 hours following a rain event of 0.1 inches or greater. In residential areas, Pitt County will attempt to conduct the field screening either before 9:00 am or after 5:00 pm, since these are the hours that citizens are most likely to be home and thus any illegal discharges are more likely to be evident.

Figure 3a illustrates a suggested process 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 should be checked for intermittent flow at a later date.

If the field screening shows that an outfall has a dry weather flow, then the Pitt County is required to complete a screening report for the outfall. The information that should be contained in the screening report is outlined in Table 3c. Screening reports shall be kept on file for a minimum of five years. Example screening report forms are provided in Appendix K.

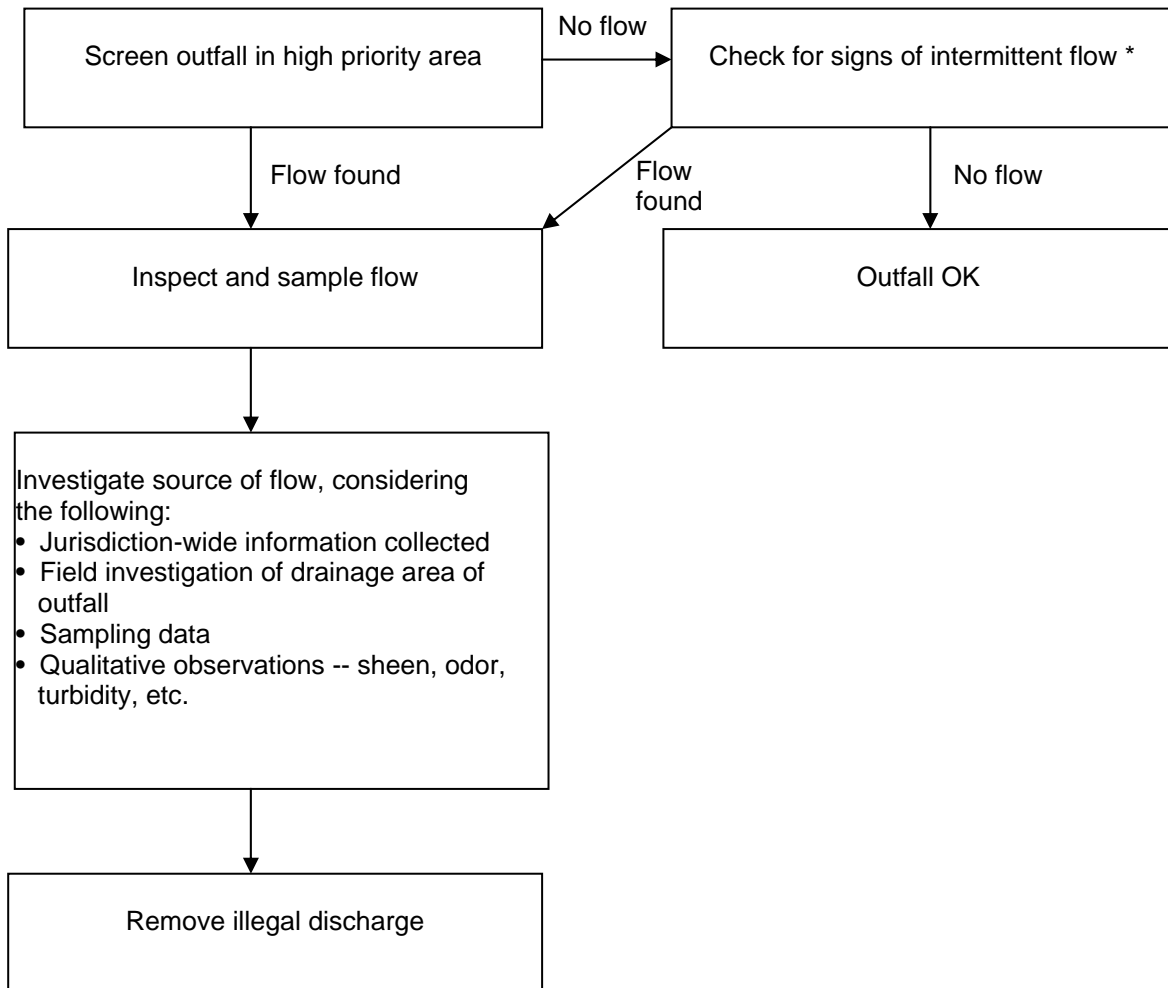
Table 3c: Field Screening Report Information

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 Total Phosphorus Ortho-Phosphate

* 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. The tests for ammonia and nitrate/nitrate that are used shall be sensitive for 0.1 to 10 mg/L.

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 should 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-F. Identifying and Removing Illegal Discharges

After the field screening is complete, Pitt County is required to take measures to identify and remove illegal discharges. Identifying illegal discharges may require a combination of office and field work. After the field screening, Pitt County staff should consult the jurisdiction-wide information they have compiled (see Section 3-D) to obtain information about the land uses, infrastructure, industries, potential sources and types of pollution that exist in the drainage area of the outfall.

After potential sources have been identified in the office, a systematic field investigation should be planned that minimizes the amount of resources required to identify the source. Several field methods may be used to identify illegal discharges. Pitt County will use a simple approach if that will suffice. Listed below are several approaches that may be used, starting with simple approaches and moving to more complex ones:

- 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)
- Smoke Testing
- Television Inspection

One tip on identifying illegal discharges is that outfalls that do not have flow during wet weather are likely to originate from floor drains.

Documentation of the results of the office and field investigations should be kept on file for five years with the screening report.

After Pitt County identifies the source of an illegal discharge, it will take enforcement action to have the source removed. Enforcement shall include requiring the person responsible for the discharge to remove or redirect it to the sanitary sewer. The County will also deal with

cases of non-compliance as outlined in the Pitt County Stormwater Management Ordinance for Nutrient Control. Records of all compliance actions shall be kept on file for five years along with the screening report.

In addition to keeping all screening reports on file, Pitt County shall maintain a map that includes the following:

- 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-G. Preventing Discharges and Establishing a Hotline

Pitt County is required to contact persons who are responsible for establishments that are likely sources of illegal discharges. Some of these sources include automotive sales, rental, repair and detailing establishments, lawn care companies, cleaners and certain types of contractors. Previous experience has shown that many illegal discharges are actually unintentional. A sample letter to inform owners and operators about the requirements of the illegal discharge program is included in Appendix L.

The experiences of Raleigh and Durham have shown that an illegal discharge hotline is a cost-effective way to identify illegal discharges. Part of the public education program (discussed in Chapter 5) will be to educate citizens about what types of discharges should not go to the stormwater collection system and make them aware of the hotline.

Pitt County is responsible for establishing a hotline. The hotline will require them to either designate a new phone number or use an existing service. The hotline should include a recording advising citizens what to do if they call during non-business hours. There should be another number given in cases where the illegal discharge is perceived to be an emergency.

3-H. Implementation Schedule

In keeping with their goal of having an efficient and cost-effective program, the Tar-Pamlico Stormwater Model Group has created a phased implementation schedule for illegal discharges (Table 3d). The schedule allows for collecting jurisdiction-wide information during the first year of implementation and then screening the high priority areas during future years. This phased schedule is also intended to allow communities to evaluate and make improvements to their programs as they progress through high priority areas.

Table 3d: Implementation Schedule and Annual Reporting Requirements

Year	Implementation Requirements	Annual Report Requirements
By August 2005	<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 2006	<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 2006	<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.

3-I. References

Debo, Thomas N. and Reese, Andrew J., *Municipal Stormwater Management*, CRC Press, Inc. 1995

U.S. Environmental Protection Agency (EPA). 1992. *Manual of Practice – Identification of Illicit Connections*. EPA 833/R-90-100

U.S. Environmental Protection Agency (EPA). 1993. *Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems – A User’s Guide*. EPA 600/R-92-238.

U.S. Environmental Protection Agency (EPA). 1991. *Guidance Manual for the Preparation of Part 1 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems*. EPA 505/8-91-003A.

4. Retrofit Locations

4-A. Requirements in the Rule

The rule requires that Pitt County establish a program to identify and prioritize places within existing developed areas that are suitable for retrofits.

4-B. Approach for Meeting the Requirements

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 or phosphorus loading to the receiving water.
- The watershed is clearly contributing nitrogen or phosphorus loading above background levels.
- The landowner where the retrofit is proposed is willing to have the retrofit installed on his property. Securing the landowner's cooperation is one of the most important tasks for the local government, as this is often the most difficult aspect of implementing a retrofit.
- There is adequate space and access for the retrofit.
- It is technically practical to install a retrofit at that location.

The minimum number of retrofit opportunities that each local government is required to identify is based on a sliding scale according to the population of the government. For those communities that are not completely located within the Tar-Pamlico River Basin, the number of retrofits can be based on the estimated population within the Tar-Pamlico River Basin. Pitt County will have to provide the data to support this population. Table 4a shows the minimum requirements for identifying retrofit opportunities for each affected jurisdiction. Sites may be carried over to meet the minimum requirements for up to two subsequent years provided that BMPs/retrofits have not been implemented and the site continues to meet the criteria above on an annual basis.

Table 4a: Minimum Number of Retrofit Opportunities that Each Local Government Must Identify on an Annual Basis

Population Category	Local Government	Estimated 2001 Basin Population	Minimum Number of Retrofit Sites to be Identified
Less than 15,000	Tarboro	11,200	1
	Oxford	8,500	
	Washington	9,700	
Between 15,000 and 30,000	Edgecombe County	22,400	2
	Henderson	16,300*	
	Nash County	29,000	
Between 30,000 and 60,000	Beaufort County	30,600	3
	Franklin County	38,500	
	Greenville	41,700	
	Pitt County	31,800	
	Rocky Mount	56,000	
Over 60,000			4

* Represents total municipal population; portion within Basin not determined.

4-C. Data Collection and Notification

Each retrofit opportunity that is identified shall 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. Table 4b shows a suggested format for presenting this information for each retrofit opportunity.

The tables shall be submitted to the Division of Water Quality on October 30 of each year beginning in the year 2005 as part of the annual report.

DWQ will post these retrofit opportunities on its Web Page and also notify, 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
- Kerr-Tar Regional Council of Governments
- Upper Coastal Plain Council of Governments
- Mid-East Commission
- Environmental programs at NCSU, Duke University, UNC, ECU and others
- N.C. Sea Grant
- USDA – Natural Resources Conservation Service

- ❑ Tar-Pamlico Basin Association
- ❑ N.C. Wetlands Restoration Program

4-D. Mapping Requirements

Pitt County is required to provide maps that show the locations of retrofit opportunities. Mapping may be accomplished by using computers or with existing hard copy maps. The scale of the map should be large enough to adequately identify the following required parameters:

- 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 – where available).
- Publicly owned parks, recreational areas, and other open lands.

Table 4b: 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 and phosphorus loading from drainage area (lbs/acre/year) *	
Potential nitrogen reduction (lbs/ac/yr)*	
Potential phosphorus 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 the methodology provided in Appendix D to compute nitrogen export from the drainage area based on the amount of impervious surface, landscaped area and forested area in the watershed.

5. Public Education

5-A. Requirements in the Rule

The Tar-Pamlico Stormwater Rule requires Pitt County to develop a locally administered environmental education program to address nitrogen & phosphorous loading issues with the public and developers, and to address peak stormwater flow issues with developers.

5-B. Public Education Action Report and Plan

The ultimate goal of the public education program is to educate the general public, affected county and municipal staff, the development community, and elected officials. Pitt County is required to develop a Public Education Action Report and Plan. The purpose of the Action Report and Plan is to provide Pitt County a platform to design their own locally unique public education effort and to maintain it on an ongoing basis. The Action Report and Plan will outline the proposed education activities for the upcoming year, identifying target audiences and anticipated and actual costs of the program. Pitt County shall submit an annual Action Report and Plan to DWQ for approval in its October annual report each year. An example Action Report and Plan format can be found in Appendix L.

The Action Report and Plan shall consist of various types of activities. Innovative public education activities not included in this list are encouraged, and will be considered for approval on a case-by-case basis. All activities must 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.

The Action Plan template in Appendix L identifies point values for each type of education activity that may be contemplated by a community. Pitt County is required to conduct activities that sum to at least 15 points each year. Ongoing activities, such as continuing programs for pet waste or storm drain marking, receive credit for each year that they are continued.

During the first year of program implementation, Pitt County 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. These two workshops will receive point credit toward the annual total. During subsequent years, technical workshops are considered an optional activity. Communities are encouraged to work jointly to develop and conduct the workshops, if feasible. A Sample workshop agenda, including recommended resources, is located in Appendix M.

6. Reporting Requirements

Annual Tar-Pamlico River Basin stormwater program reports must be submitted to the Division of Water Quality by October 30 of each year beginning in 2005. All reports shall contain the following information.

6-A. New Development Review/Approval

Under the model program for new development review/approval, Pitt County is responsible for submitting the following information as part of the annual reporting requirement:

- Acres of new development and impervious surface based on plan approvals.
- Acres of new development and impervious surface based on certificates of occupancy.
- Summary of BMPs implemented and use of offsite options.
- Computed baseline and net change in nitrogen and phosphorus export from new development that year.
- Summary of maintenance activities conducted on BMPs.
- Summary of any BMP failures and how they were handled.
- Summary of results from any applicable jurisdictional review of planning issues
- Status of compliance with implementation timeline.
- Program administrative changes, updates.
- Summary of development approvals granted, construction compliance, O&M inspections, and enforcement actions.

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 August 2004	<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 2006	<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 2006	<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 4b or other equivalent format),
- Maps of potential retrofit sites as specified in Section 4-D, and
- The status of any retrofit efforts that have been undertaken within the jurisdiction.

6-D. Public Education

The Report will summarize the next year’s Action Plan and evaluate the implementation of the previous year’s 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 locality will address shortfalls.