

Existing Stormwater Ordinances and Recommendations for the Town of Trent Woods, NC



Developed by:


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I. INTRODUCTION

Stormwater runoff is produced from storm events when rainwater flows over the surface of the ground or impervious surfaces (e.g., paved streets, parking lots, rooftops, and driveways) instead of soaking into the ground. When stormwater or excess irrigation water moves over the ground or impervious surfaces, it washes and carries away natural and man-made pollutants. These pollutants can be eventually discharged untreated into waterways and cause adverse impacts on water quality.

Harmful pollutants which are often carried with stormwater runoff include nutrients, bacteria, sediment, and hazardous substances. Nutrients, like phosphates and nitrates, come from fertilizers, pet waste, faulty septic systems, and soil erosion. Excess nutrients in waterways are a problem because they stimulate algal blooms and aquatic weed growth. As these algal blooms and aquatic weeds die, bacteria uses oxygen to decompose these plants, leaving limited dissolved oxygen for fish to survive. Bacteria comes from pet waste, faulty septic systems, and boat discharges and can result in contaminated drinking water, an unsafe environment for swimming and fishing, and low dissolved oxygen levels which can lead to fish kills. Sediment or soil comes from construction sites, ditches, bare yards, garden beds, etc. Excessive sediment in waterways can prevent light from reaching aquatic vegetation, reduce plant growth, alter food supplies for aquatic organisms, decrease spawning habitat and cover for fish, and increase flooding. Hazardous substances are man-made pollutants which come from pesticides/herbicides, spilled auto fluids, motor oil and grease from roads or driveways, household cleaners, etc. These substances contain toxins, heavy metals, and nutrients which can create an unsafe and unhealthy environment for aquatic organisms and humans.

Because of the adverse impacts pollutants in stormwater runoff can have on waterways, it is important to regulate and control sources of stormwater runoff. This report will first evaluate the Town of Trent Woods' existing ordinances for if, and how, they address stormwater runoff and water quality. This report will then provide recommendations for additions to these existing ordinances as well as recommendations for other stormwater management practices so that an enhanced level of protection is provided for the waterways within and surrounding Trent Woods.

II. EXISTING STORMWATER ORDINANCES

The Town of Trent Woods does not currently have a stormwater ordinance. However, stormwater runoff and water quality are somewhat addressed and thus regulated through the Town's existing subdivision, street right of way, litter, junked motor vehicle, flood damage prevention and burning ordinances.

Subdivision

Trent Woods' Subdivision Ordinance ensures that stormwater runoff from the development and subdivision of land is able to be appropriately discharged through a drainage system. Preliminary subdivision plats must include plans for stormwater control and drainage "sufficient to insure appropriate control of stormwater on and drainage of the tract to be subdivided" (page 20). Examples of stormwater control and drainage features listed in the Ordinance include holding basins, settling ponds, swales, ditches, porous pavement, etc. Additionally, easements are allowed for the installation of drainage swails and/or a tiled drainage system if necessary for the sufficient disposal of stormwater runoff.

The Subdivision Ordinance also requires an inventory of features related to stormwater to be included in subdivision preliminary and final plats. These features include existing water features (e.g., marshes, ponds, and streams), the floodplain, and existing stormwater structures (e.g., culverts and storm drains).

Street Right of Way

Trent Woods' Street Right of Way Ordinance is relevant to stormwater runoff because stormwater structures like ditches, swails and culverts are often located in the street right of way. According to this Ordinance, a construction permit and encroachment agreement must be obtained prior to any work, including the placement of any drain, drain tile, or pipe, conducted in the street right of way. The permit application must show that the work will not adversely affect the drainage of surface waters. Every reasonable precaution must also be taken to prevent soil erosion, or the silting or pollution of waterways and ground water during the work in the street right of way. Furthermore, this Ordinance requires that from when and after the work in the street right of way is completed, the permittee is responsible for the maintenance of the work. Therefore, the permittee is responsible for the cleaning out of installed culverts, pipes, etc. and any other maintenance tasks associated with these installations.

Litter

Litter is a stormwater and water quality concern because it can cause flooding through clogging storm drains, ditches and pipes, choke, suffocate or disable aquatic wildlife, be mistaken by wildlife as food, and introduce harmful pollutants into waterways. Trent Woods' Litter Ordinance addresses these potential threats from litter through prohibiting the temporary or permanent placement of trash, refuse, garbage, scrapped automobile, or scrapped truck on a variety of locations (e.g., street right of way, park, and public place) when the placement is not in a trash receptacle.

Junked Motor Vehicle

Motor vehicles are a water quality concern because of the potential for auto fluids like gasoline, oil, and anti-freeze to leak from vehicles onto the ground and be washed away with stormwater runoff into waterways. “Nuisance” and “junked” motor vehicles may pose an even greater threat to waterways because of their increased potential for leaks. Trent Woods’ Junked Motor Vehicle Ordinance does address the potential water quality threat from nuisance and junked motor vehicles through requiring their removal from a property when ordered.

A nuisance vehicle under this Ordinance is defined as a point of concentration of gasoline, oil, animal waste, or garbage. Animal waste can contain fecal bacteria, parasites, viruses, and nutrients which can lead to poor water quality. Garbage or litter is a concern because it can cause flooding, endanger wildlife, and introduce harmful pollutants into waterways as discussed earlier. Therefore, it is important that nuisance vehicles are removed when ordered.

Flood Damage Prevention

Trent Woods’ Flood Damage Prevention Ordinance is currently designed, among other items, to minimize flood hazards and regulate development which may increase erosion or flood damage. This Ordinance applies to all areas within Trent Woods which are located in the Special Flood Hazard Area (SFHA) (i.e., the 100-yr floodplain or the area subject to a 1% or greater chance of being flooded in any given year). Under this Ordinance, a floodplain development permit is required prior to the start of any development activities in the SFHA.

An inventory of features related to stormwater is required in the application for this permit. These features include the SFHA boundaries, the old and new location of any waterways that will be altered/relocated, proposed drainage facilities, details concerning the proposed development which may affect stormwater runoff volume and velocity (e.g., grading/pavement areas and fill materials), the proposed development elevation in relation to the mean sea level, etc. This Ordinance also requires that if a waterway is proposed to be altered and/or relocated, then the permit application must include an engineering report on the effects of the proposed project on the flood-carrying capacity of the waterway and the effects to properties located upstream and downstream.

Burning

Trent Woods’ Burning Ordinance prohibits the burning of anything within the street right of way. As mentioned earlier, this is relevant to stormwater runoff because stormwater structures like ditches, swails and culverts are often located in the street right of way. The placement of items to be burned in the street right of way could prevent the proper drainage of stormwater through clogging these stormwater structures and potentially lead to flooding.

This Ordinance also limits burning to pine straw, grass cuttings, underbrush, yard debris, and bush, hedge, and tree branches, limbs, and prunings. It is important that these items are prohibited from

being burned in the street right of way because pesticide, herbicide and fertilizer residues and sediment may be attached to these items. As discussed earlier, pesticides, herbicides, fertilizers and sediment can all lead to poor water quality and a degraded aquatic habitat. These pollutants may be more likely to be washed and carried away with stormwater into stormwater structures located in the street right of way if the burning of grass cuttings, yard debris, etc. were permitted in the street right of way.

III. RECOMMENDED STORMWATER ORDINANCES

The Town of Trent Woods's existing ordinances do address stormwater runoff and water quality. However, it is recommended that the Town makes a few additions to these ordinances to prevent additional harmful pollutants in stormwater runoff from entering waterways within and surrounding the Town.

Pet Waste

Although Trent Woods currently has an Animal Control Ordinance and Litter Ordinance, these ordinances do not address pet waste and proper pet waste disposal procedures. When pet waste is not removed from the ground, it is washed and carried with stormwater runoff into waterways. As discussed in the Introduction, pollutants in pet waste can result in algal blooms, low dissolved oxygen levels, an impaired aquatic habitat, and an unsafe environment for human contact like fishing, swimming, and drinking. Therefore, it is important that pet owners bag their pet's waste and dispose of it in an appropriate receptacle.

It is recommended that Trent Woods develop, adopt, and enforce a new pet waste ordinance, or cover pet waste in their existing animal control or litter ordinances. Examples of pet waste ordinance language may be found at the following websites:

- NC Department of Environment and Natural Resources' (DENR) Division of Energy, Mineral and Land Resources: <http://portal.ncdenr.org/web/lr/universal-sw-program> → Rule & Model Ordinance Tab → USMP Model Ordinance → page 32
- City of Wilmington, NC: <http://library.municode.com/index.aspx?clientId=14101> → Part II. General Ordinances → Chapter 12. Utilities → Article III. Stormwater Utility and Illicit Discharges → Division 2. Illicit Discharge and Other Prohibited Waste → Part 2. Other Prohibited Waste → Section 12-28. Domestic animal waste
- Town of River Bend, NC: http://www.riverbendnc.org/animal_control.html → Animal Control Regulations in the Town Code → Section 9.01.003 Animal Feces → page 5

Additionally, Trent Woods does not currently have “pet waste stations” placed around town. These stations consist of a supply of waste collection bags and waste receptacles and could be placed in parks and other pet-frequent areas. Sign postings in parks and other pet-frequent areas would also serve as a helpful reminder to owners about picking up after their pets and the impacts of pet waste on water quality.



Pet waste station in New Bern, NC

For more information on pet waste management, please visit the US Environmental Protection Agency’s (EPA) website

http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=4.

Illicit Discharges

The improper disposal of illicit discharges into stormwater systems and waterways can result in elevated levels of pollutants, heavy metals, toxics, nutrients and bacteria in waterways. A discharge to a stormwater system is considered illicit when the discharge is not composed entirely of stormwater. Examples of illicit discharges include car wash wastewaters, motor oil and grease, auto fluids, and household hazardous waste such as paint and cleaners. It is recommended that Trent Woods develop, adopt, and enforce an ordinance which prohibits non-stormwater discharges into storm drains, catch basins, and waterways. Examples of illicit discharge ordinance language may be found at the following websites:

- US EPA: <http://water.epa.gov/polwaste/nps/mol5.cfm>
- US EPA: <http://water.epa.gov/polwaste/nps/discharges.cfm>

- NC DENR Division of Energy, Mineral and Land Resources:
<http://portal.ncdenr.org/web/lr/universal-sw-program> → USMP Model Ordinance → page 49
- City of Wilmington, NC: <http://library.municode.com/index.aspx?clientId=14101> → Part II. General Ordinances → Chapter 12. Utilities → Article III. Stormwater Utility and Illicit Discharges → Division 2. Illicit Discharge and Other Prohibited Waste → Part 1. Illicit Discharge → Section 12-22. Illicit discharges prohibited

Additional Ordinances

For examples of other ordinances which can be used to regulate stormwater, please visit the US EPA's website on model ordinances to prevent and control nonpoint source pollution:

http://water.epa.gov/polwaste/nps/ordinance_index.cfm.

IV. OTHER RECOMMENDED STORMWATER MANAGEMENT PRACTICES

In addition to the recommended ordinances, there are several other practices which Trent Woods could implement to ensure that the Town is a good steward of stormwater management and water quality protection. Examples of such practices can be taken from the requirements of federal and statewide stormwater management programs. The following sections will discuss the requirements of two of these programs: 1) the National Pollutant Discharge Elimination System Stormwater Program, and 2) North Carolina's Universal Stormwater Management Program. Please note that the following sections are general in nature and are not intended to provide a comprehensive account of each program's requirements. For more information on these programs, please reference the website links provided in this report.

It is important to also note here that North Carolina has a State Stormwater Permitting Program which regulates site development and post-construction stormwater runoff. Because all coastal counties are subject to the State Stormwater Permitting Program and the Town of Trent Woods is located in a coastal county, specific types of development activities in the Town of Trent Woods fall under the State Stormwater Permitting Program. Since this Program is already mandated in Trent Woods, the Program's requirements will not be discussed in this report.

National Pollutant Discharge Elimination System Stormwater Program

Overview

The National Pollutant Discharge Elimination System (NPDES) is a program established under the federal Clean Water Act which regulates stormwater discharges from Municipal Separate Storm Sewer Systems (MS4s), among other entities and operations. MS4s are regulated to reduce the quantity of pollutants which are carried with stormwater into stormwater systems during storm events. Under Phase II of the NPDES program, smaller communities (<100,000 population) and public entities that own and operate a MS4 are required to obtain an NPDES permit for stormwater discharges and implement a stormwater

management program. This stormwater management program is required to be designed to reduce the presence of harmful pollutants in stormwater discharge to the “maximum extent practicable” and includes six “control measures”:

1. Public Education and Outreach
2. Public Participation and Involvement
3. Illicit Discharge Detection and Elimination
4. Pollution Prevention/Good Housekeeping for Municipal Operations
5. Construction Site Stormwater Runoff Control
6. Post-Construction Stormwater Management

The Town of Trent Woods could consider the adoption of a stormwater management program and the six control measures to demonstrate the Town’s commitment to good stormwater stewardship. The adoption of these control measures by Trent Woods would give the Town a head start to their compliance with Phase II if Trent Woods were designated as a Phase II entity in the future. The following sections will discuss actions under each of the six control measures that the Town of Trent Woods could implement.

Stormwater Control Measures

1. Public Education and Outreach

Trent Woods could distribute educational materials and conduct public outreach so that the Town’s citizens and visitors are informed about 1) adverse impacts on water quality from polluted stormwater discharge and 2) methods that can be taken to reduce stormwater pollution. Examples of public education and outreach include:

- Brochures or fact sheets designed for the general public and specific audiences
- Recreational guides to educate groups such as golfers, paddlers, and fisherman
- Educational web sites, bumper stickers, and refrigerator magnets
- Library of educational materials for community and school groups
- Stenciling of storm drains and catch basins with messages such as “Do Not Dump – Drains Directly to River”
- Educational displays at community events and festivals
- Educational programs for school-aged children
- Tributary signage to increase public awareness of local water resources



Stainless steel storm drain marker in Wilmington, NC¹



Storm drain stencil²

Educational materials like brochures or fact sheets and pollution prevention resources/website links could also be posted to the Town's website. Currently, an educational brochure on how homeowners can prevent runoff pollution is available on the Town's website. As part of the project for which this report was produced, this brochure was created and distributed to the Town's residents. Approximately 150 copies of this brochure were also delivered to Trent Woods' town hall for future distribution. A website link to NC DENR's "Improving Water Quality in Your Own Backyard" document is also currently posted on the Town's website as a resource for Trent Woods' residents. A website link to the Coastal Environmental Partnership (<http://www.coastalenvironmentalpartnership.com/>) could also be posted on the Town's website. The Coastal Environmental Partnership website provides information on where hazardous materials like latex and oil paints, paint thinners, used motor oil, anti-freeze, lawn and garden fertilizers and pesticides, etc. may be dropped off for appropriate disposal.

For more information, ideas and resources on public education and outreach, please visit the US EPA website

http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=1 and the North Carolina State University (NCSU) website <http://www.bae.ncsu.edu/topic/phase2/measure1.htm>.

2. Public Participation and Involvement

Trent Woods could also provide opportunities for and encourage its citizens to participate in the development and implementation of a stormwater management program. Examples of how citizens could participate include:

- Public meetings
- Citizen representation on a stormwater management panel

¹ Image Source:

http://www.wilmingtonnc.gov/public_services/stormwater/education_outreach/storm_drain_marking

² Image Source: <http://clark.wsu.edu/volunteer/ws/>

- Volunteer water quality monitoring - Would give citizens first-hand knowledge of the quality of local waterways and provide a cost-effective means of collecting water quality data
- Volunteer educators/speakers - Conduct workshops
- Storm drain and catch basin stenciling
- Community clean-ups along local streams, rivers, and around culverts and storm drains
- “Adopt-A-Storm-Drain” program – Would keep culverts and storm drains free of debris and monitor what is entering local waterways through storm drains

For examples of stormwater volunteer programs (e.g., Adopt-A-Stream, volunteer storm monitoring, and storm drain marking programs) in North Carolina, please visit the following websites:

- Neuse RiverKeeper Foundation, RiverWatch program: <http://www.neuseriver.org/riverwatch.html>
- City of Greensboro, NC: <http://www.greensboro-nc.gov/index.aspx?page=2254>
- City of Raleigh, NC: <http://www.raleighnc.gov/neighbors/content/PWksStormwater/Articles/AdoptAStreamProgram.html>,
<http://www.raleighnc.gov/neighbors/content/PWksStormwater/Articles/StormDrainMarkingProgram.html>,
<http://www.raleighnc.gov/neighbors/content/PWksStormwater/Articles/VolunteerStreamMonitoring.html>

For more information, ideas and resources on public participation and involvement, please visit the US EPA website

http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=2 and the NCSU website <http://www.bae.ncsu.edu/topic/phase2/measure2.htm>.

3. Illicit Discharge Detection and Elimination

Trent Woods could develop and adopt an ordinance which prohibits non-stormwater discharges into storm drains, catch basins, and waterways. The importance of having an illicit discharge ordinance and examples of ordinance language may be found in the section Recommended Stormwater Ordinances. Public employees, businesses, and the general public could also be educated about the adverse impacts associated with illicit discharges and appropriate methods for the disposal of illicit discharges.

Another requirement for fulfilling this control measure under the Phase II program is producing a stormwater system map which shows the location of all outfalls, and the name and location of all waters that receive discharges from those outfalls. As part of the project for which this report was produced, this type of map was created for the Town of Trent Woods. Both printed and electronic copies of this map were given to the Town.

For more information, ideas and resources on illicit discharge detection and elimination, please visit the US EPA website

http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=3 and the NCSU website <http://www.bae.ncsu.edu/topic/phase2/measure3.htm>.

4. Pollution Prevention/Good Housekeeping for Municipal Operations

Trent Woods' municipal operations could also alter their own actions to prevent pollutants from entering the stormwater system and waterways. Municipal employees could be trained on how to incorporate pollution prevention/good housekeeping techniques into their municipal operations.

Examples of these techniques include:

- Street and paved surface cleaning – Use dry methods of cleaning such as sweeping and vacuuming instead of hosing or pressure washing. If wet cleaning is absolutely necessary, sweep and remove debris before flushing the paved surface. Always dispose of swept or vacuumed debris in the garbage.
- Use of native vegetation to reduce the need for herbicides
- Not using herbicides if rain is expected
- Minimal use of chemical fertilizers
- Frequent inspection and cleaning of stormwater system drains and culverts
- Storing hazardous materials and wastes where they are protected from rain

For more information, ideas and resources on pollution prevention and good housekeeping techniques, please visit the US EPA website

http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=6 and the NCSU website <http://www.bae.ncsu.edu/topic/phase2/measure6.htm>.

5. Construction Site Stormwater Runoff Control

Active construction sites are a stormwater concern because stormwater runoff from these sites can carry and deposit large amounts of sediment in stormwater systems and waterways. In North Carolina, all development projects that disturb one acre or more of land require a local- or state-approved Erosion and Sedimentation Control plan. These development projects are also automatically covered by an NPDES Stormwater General Permit. Therefore, many local governments in North Carolina already meet a majority of the construction site stormwater runoff control measure requirements.

Each local government in North Carolina currently has a state or state-delegated erosion and sedimentation program implemented in its jurisdiction. Because the Town of Trent Woods and Craven County do not currently have state-delegated erosion and sedimentation programs, Trent Woods currently relies on the Land Quality Section of NC DENR's Division of Energy, Mineral and Land Resources to implement the state erosion and sedimentation program in its jurisdiction.

If Trent Woods were to become a Phase II designated entity, then the Town would only need to provide and promote a way for the Town's citizens to report observed erosion and sedimentation problems. This requirement could be met through the Town promoting the Land Quality Section's toll-free "Stop Mud" telephone hotline number 1-866-STOPMUD.

More information on construction site stormwater runoff control may be found at the US EPA websites http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=4 and <http://cfpub.epa.gov/npdes/stormwater/const.cfm>, and the NCSU website <http://www.bae.ncsu.edu/topic/phase2/measure4.htm>.

6. Post-Construction Stormwater Management

Impervious surfaces are a stormwater concern because they are associated with pollutants such as sediment, nutrients, heavy metals, bacteria, and petroleum hydrocarbons. Since new development and redevelopment often result in the addition of impervious surfaces, it is important that stormwater runoff from post-construction sites is limited in order to reduce or prevent pollutants from being discharged into the stormwater system or waterways.

Trent Woods could develop, adopt, and enforce a post-construction stormwater ordinance which regulates stormwater on sites where new development and redevelopment activities disturb one acre or more of land, including development activities less than one acre that are part of a larger common plan of development (i.e., the NPDES Phase II standard). This ordinance could require these sites to use non-structural and/or structural best management practices (BMPs) which treat, store and infiltrate stormwater runoff on-site. Non-structural BMPs include buffer strips and riparian zone preservation, minimization of disturbance and impervious surfaces, and the maximization of open space. Structural BMPs include stormwater retention/detention BMPs (e.g., wet ponds and dry basins), infiltration BMPs (e.g., dry ponds, porous pavement), and vegetative BMPs (e.g., grassy swales, rain gardens and artificial wetlands). It is important to remember that all BMPs may not be appropriate for all sites. Also, once BMPs have been put into place, it is important that the long-term operation and maintenance of these BMPs are ensured. More information on BMPs may be found at the following websites:

- NC DENR Division of Water Quality Stormwater BMP Manual:
<http://portal.ncdenr.org/web/lr/bmp-manual>
- US EPA:
http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=5 and http://water.epa.gov/infrastructure/greeninfrastructure/gi_what.cfm

If the Town of Trent Woods were to adopt a post-construction stormwater ordinance, then a model ordinance developed by the University of North Carolina's (UNC) School of Government, in cooperation with the League of Municipalities and the Association of County Commissioners, may be used to develop

their ordinance. This model ordinance may be found at the UNC website:

http://www.efc.unc.edu/projects/stormwater_ordinance.htm.

Trent Woods could also proactively manage stormwater runoff from future development through its planning procedures. New or amended master plans, comprehensive plans, and zoning ordinances could guide new growth away from sensitive areas where water quality or the aquatic habitat is already degraded, flooding occurs, or unique environmental features exist.

More information on post-construction stormwater management may be found at the US EPA websites

http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=5 and the NCSU website <http://www.bae.ncsu.edu/topic/phase2/measure5.htm>.

Resources

NPDES Permit Program Basics:

- http://cfpub.epa.gov/npdes/home.cfm?program_id=6
- <http://portal.ncdenr.org/web/lr/npdes-stormwater>
- http://cfpub.epa.gov/npdes/faqs.cfm?program_id=45

NPDES Stormwater Rules & Laws: <http://portal.ncdenr.org/web/lr/npdes-laws>

Stormwater Discharges from Municipal MS4s: <http://cfpub.epa.gov/npdes/stormwater/munic.cfm>

Guidance on Phase II's Six Control Measures:

- <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>
- <http://www.bae.ncsu.edu/topic/phase2/>

Universal Stormwater Management Program

Overview

The Universal Stormwater Management Program (USMP) is a voluntary program in North Carolina which allows local governments to adopt and administer a model stormwater program within their jurisdictions that is simple to understand and administer. The USMP is intended to replace a number of existing stormwater management programs, all of which have differing and sometimes, confusing requirements, with a single, simplified set of stormwater control measures.

The Town of Trent Woods could consider the adoption of the USMP to meet the mandates for various stormwater programs and to provide an enhanced level of protection to its natural environment. Among a wide variety of stormwater programs, the adoption of the USMP satisfies the post-construction requirements for the NPDES Phase II program and the North Carolina State Stormwater Permitting Program for coastal counties. The following sections will discuss the USMP requirements and provide an example of model ordinance language which Trent Woods could use.

USMP Requirements

The USMP requirements consist of two major components: 1) a design standard for stormwater control and 2) a setback requirement. There are different requirements for each component depending upon whether a development activity is located in one of the 20 coastal counties. Because the Town of Trent Woods is located in a coastal county, the requirements for only coastal counties will be discussed below.

Design Standard for Coastal Counties

All development activities located in one of the 20 coastal counties that disturb 1) 10,000 square feet or more of land or 2) less than 10,000 square feet of land, but are part of a larger common plan of development will require the control and treatment of the stormwater run-off generated by a 1.5 inch rain event. These stormwater control and treatment features must be capable of removing 85% of the average annual amount of Total Suspended Solids and must have a volume drawdown of at least 48 hours, but not more than 120 hours. In addition, the storage volume of the stormwater control feature must be discharged at a rate equal or less than the pre-development discharge rate for the 1-year, 24-hour storm. Furthermore, new development within 575 feet of shell fishing waters is limited to an impervious surface density of no more than 36%.

Setback Requirements for Coastal Counties

For all development activities located in one of the 20 coastal counties, a 30 foot setback is mandated for impervious surfaces from all surface waters of the State, except for roads, paths and water dependent structures.

Ordinance

In order to implement the USMP, an ordinance which complies with the USMP Rule and receives approval from the NC Environmental Management Commission must be adopted. If the Town of Trent Woods desires to implement the USMP, the USMP Model Ordinance developed by UNC's School of Government may be used to develop their ordinance. The USMP Model Ordinance may be found at the NC DENR Division of Energy, Mineral and Land Resources website <http://portal.ncdenr.org/web/lr/universal-sw-program> → Rule & Model Ordinance Tab → USMP Model Ordinance.

Reviewing Stormwater Plans

Once the USMP ordinance is in place, a procedure needs to be developed for the review of stormwater plans that will be submitted with site plans for new developments. An individual which has the technical expertise and training required to carry out the USMP policies and procedures will also need to be identified as the Stormwater Administrator. This position's responsibilities may be contracted out to another local government or consulting firm. Alternatively, local governments in the 20 coastal counties

may elect to have the NC DENR Division of Water Quality administer and implement the USMP, either whole or in part.

Resources

Additional information about the USMP, the text of the USMP Rule (15A NCAC 2H .1020), and contacts for questions or assistance in implementing the USMP can be found at the NC DENR Division of Water Quality website <http://portal.ncdenr.org/web/wq/ws/su/usmp>.

V. REFERENCES

Eastern Carolina Council of Governments

- Universal Stormwater Management Program Guidebook (December 2007):
www.eccog.org/common/ewe/documents/USMPguidebook2008.doc

NC Department of Environment and Natural Resources

- Division of Energy, Mineral and Land Resources
 - Construction NPDES Stormwater: <http://portal.ncdenr.org/web/lr/construction-stormwater>
 - DWQ Stormwater BMP Manual & BMP Forms: <http://portal.ncdenr.org/web/lr/bmp-manual>
 - Local Erosion and Sediment Control Ordinances: <http://portal.ncdenr.org/web/lr/local-programs>
 - Stormwater Permitting Program: <http://portal.ncdenr.org/web/lr/stormwater>
- Division of Water Quality
 - Stormwater: <http://portal.ncdenr.org/web/stormwater/home>

NC State University & NC Cooperative Extension

- How to Do Phase II: Guidance for Local Governments:
<http://www.bae.ncsu.edu/topic/phase2/index.htm>

Texas A&M AgriLife Extension Service

- Texas Watershed Steward Handbook (Updated March 2012):
http://tw.s.tamu.edu/media/8691/Handbook_Revised_3-21-12_Bleed.pdf

Town of Trent Woods, NC

- Personal e-mail correspondence with Town Clerk
- Local Regulations: http://www.trentwoodsnc.org/index.asp?SEC=5E7B70C8-E15C-4D77-BC65-E004174D66BD&Type=B_BASIC

US Environmental Protection Agency

- NPDES National Menu of Stormwater Best Management Practices:
<http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>
- NPDES Stormwater Basic Information: <http://cfpub.epa.gov/npdes/stormwater/swbasicinfo.cfm>
- NPDES Stormwater Program: http://cfpub.epa.gov/npdes/home.cfm?program_id=6
- What is Nonpoint Source Pollution?: <http://water.epa.gov/polwaste/nps/whatis.cfm>