

**A RESOLUTION ADOPTING A STATEMENT
EXPLAINING THE BOARD OF ALDERMEN'S REASONS FOR ADOPTING AN
AMENDMENT TO THE TEXT OF THE CARRBORO LAND USE ORDINANCE
Resolution No. 85/2008-09**

WHEREAS, an amendment to the text of the Carrboro Land Use Ordinance has been proposed, which amendment is described or identified as follows: An Ordinance Amending Article XVI of the Carrboro Land Use Ordinance Dealing with Flood Damage Prevention, Storm water Management, and Watershed Protection.

NOW THEREFORE, the Board of Aldermen of the Town of Carrboro concludes that the above described amendment is necessary in order to support the policies embodied in Carrboro Vision2020, particularly:

Policy 5.22 and 5.23 and the

Facilitated Small Area Plan for Carrboro's Northern Study Area (Goal 3, Objectives 3.2).

BE IT FURTHER RESOLVED that the Board concludes that its adoption of the above described amendment is reasonable and in the public interest because it makes local regulations and procedures consistent with adopted policies.

This resolution becomes effective upon adoption.

**A RESOLUTION ADOPTING A STATEMENT
EXPLAINING THE BOARD OF ALDERMEN'S REASONS FOR REJECTING AN
AMENDMENT TO THE TEXT OF THE CARRBORO LAND USE ORDINANCE**

Resolution No. 86/2008-09

WHEREAS, an amendment to the text of the Carrboro Land Use Ordinance has been proposed, which amendment is described or identified as follows: An Ordinance Amending Article XVI of the Carrboro Land Use Ordinance Dealing with Flood Damage Prevention, Storm water Management, and Watershed Protection.

NOW THEREFORE, the Board of Aldermen of the Town of Carrboro concludes that the above described amendment is not consistent with adopted policies.

BE IT FURTHER RESOLVED that the Board concludes that rejection of the above described amendment is reasonable and in the public interest because existing regulations are sufficiently consistent with adopted policies.

This resolution becomes effective upon adoption.

**AN ORDINANCE REVISING ARTICLE XVI OF THE CARRBORO LAND USE
ORDINANCE DEALING WITH FLOOD DAMAGE PREVENTION,
STORMWATER MANAGEMENT, AND WATERSHED PROTECTION**

THE BOARD OF ALDERMEN OF THE TOWN OF CARRBORO ORDAINS:

Section 1. All references in this ordinance are to Chapter 15 of the Carrboro Town Code, the Carrboro Land Use Ordinance.

Section 2. Sections 15-265, 15-268, and 15-269 of Part II of Article XVI of the Carrboro Land Use Ordinance are repealed and the following provisions are adopted in lieu thereof:

ARTICLE XVI

**FLOOD DAMAGE PREVENTION, STORMWATER MANAGEMENT, AND
WATERSHED PROTECTION**

PART III. WATER QUALITY BUFFERS

Section 15-270 Findings and Purpose

(a) The Board finds that:

- (1) Soil and pollutants carried overland from upstream land uses can be effectively trapped by leaving a relatively undisturbed strip of vegetation parallel and adjacent to a drainage feature.
- (2) Properly managed overland water flow can be directed into this water quality buffer area in a manner that will minimize the concentration of flow and promote diffuse flow and infiltration of the water.
- (3) Sediments and other pollutants carried by water will be reduced as a result of the dispersion and infiltration of flow and associated filtering, absorption, and uptake of pollutants.

(b) The purpose of this part is to protect, preserve, and enhance water quality buffers in order to maintain their pollutant removal functions and protect the quality of surface waters and water supplies.

Section 15-270.1 Definitions

For purposes of this part, the following terms shall have the meaning as indicated:

- (a) 'Access Trails' means pedestrian trails constructed of pervious or impervious surfaces, and related structures to access a surface water including boardwalks, steps, rails, signage.
- (b) 'Archaeological Activities' means activities conducted by a Registered Professional Archaeologist (RPA).
- (c) 'Buffer' means a water quality buffer, or an undeveloped area parallel and adjacent to a drainage feature to protect and enhance water quality.
- (d) 'Diffuse flow' means flow that generally moves down slope via sheet flow rather than concentrating in rills, gullies, and ditches and in doing so is able to infiltrate into the soil and plant root zone.
- (e) 'Ditch' means a man-made channel other than a modified natural stream as defined by the North Carolina Environmental Management Commission.
- (f) 'Ephemeral stream' means a drainage feature that only carries surface runoff in direct response to precipitation. An ephemeral stream may or may not have a well-defined channel and the stream bed is always above the water table. An ephemeral stream lacks the biological, hydrological, and physical characteristics commonly associated with perennial or intermittent streams.
- (g) 'Greenway / Hiking Trails' means pedestrian and bicycle trails constructed of pervious or impervious surfaces and related structures including but not limited to boardwalks, steps, rails, and signage.
- (h) 'Intermittent stream' means a well-defined channel that contains water for only part of the year, typically during winter and spring when the aquatic bed is below the water table. The flow may be heavily supplemented by stormwater runoff. An intermittent stream often lacks the biological and hydrological characteristics commonly associated with the conveyance of water.
- (i) 'Perennial stream' means a well-defined channel that contains water year round during a year of normal rainfall with the aquatic bed located below the water table for most of the year. Groundwater is the primary source of water for a perennial stream, but it also carries stormwater runoff. A perennial stream exhibits the typical biological, hydrological, and physical characteristics commonly associated with the continuous conveyance of water.
- (j) 'Riparian buffer enhancement' is defined as the process of converting a non-forested riparian area, where woody vegetation density is greater than or equal to 100 trees per acre but less than 200 trees per acre, to a forested riparian buffer area. The enhanced, forested riparian buffer area shall include at least two native hardwood tree species planted at a density sufficient to

provide 320 trees per acres at maturity, and diffuse flow through the riparian buffer shall be maintained.

- (k) 'Riparian buffer restoration' is defined as the process of converting a non-forested riparian area, where woody vegetation density is less than 100 trees per acre, to a forested riparian buffer area. The restored, forested riparian buffer area shall include predominately native hardwood tree species planted at a density sufficient to provide 320 trees per acres at maturity, and diffuse flow through the riparian buffer shall be maintained.
- (l) "Stream" means a body of concentrated flowing water in a natural low area or natural channel on the land surface.
- (m) 'Stream restoration' is defined as the process of converting an unstable, altered or degraded stream corridor, including adjacent riparian zone and flood-prone areas to its natural or referenced, stable conditions considering recent and future watershed conditions. This process also includes restoring the geomorphic dimension, pattern, and profile as well as biological and chemical integrity, including transport of water and sediment produced by the stream's watershed in order to achieve dynamic equilibrium. 'Referenced' or 'referenced reach' means a stable stream that is in dynamic equilibrium with its valley and contributing watershed. A reference reach can be used to develop natural channel design criteria for stream restoration projects. 'Stump diameter' means the diameter of a tree measured at six inches above the ground surface level.
- (n) 'Surface waters' means any ephemeral, intermittent, or perennial stream, lake, pond, or reservoir.
- (o) 'Temporary road' means a road constructed temporarily for equipment access to build or replace hydraulic conveyance structures or water dependent structures, or to maintain public traffic during construction.
- (p) Water dependent structures are those structures for which the use requires access or proximity to or siting within surface waters to fulfill its basic purpose, such as boat ramps, boat houses, docks and bulkheads.

Section 15-270.2 Required Buffers

(a) Subject to the remaining provisions of this part, the water quality buffer areas described in this section are hereby designated as described below. The width of these buffers shall be as prescribed in Section 15-270.3. Disturbance of the area within these buffers is restricted or prohibited as provided in Section 15-270.5

- (b) Buffers shall be established adjacent to all surface waters designated as such on either the most recent version of the soil survey map prepared by the Natural Resources Conservation Service of the United States Department of Agriculture, the most recent version of the 1:24,000 scale (7.5 minute)

quadrangle topographic maps prepared by the United States Geologic Survey (USGS), or other more accurate mapping approved by the N.C. Environmental Management Commission.

- (1) If surface water is not designated as such on any of the foregoing maps, then the buffer requirements of this article applicable to perennial streams, intermittent streams, lakes, or ponds that are shown on such maps shall not apply, but buffers applicable to ephemeral streams may apply.
 - (2) Where the specific initiation point of an intermittent stream is in question, a publication of the N.C. Division of Water Quality entitled *Identification Methods for the Origins of Intermittent and Perennial Streams* shall be used to establish that point.
 - (3) When a landowner or other affected party believes that surface waters shown on the above described maps have or have not been appropriately designated as perennial streams, intermittent stream, lakes or ponds, then such landowner or other affected party may have an on-site evaluation completed by a party who has successfully completed the NC Division of Water Quality *Surface Water Identification Training Certification* course, its successor, or other equivalent training curriculum approved by the Division, and submit the results of that evaluation to the town. The decision as to the type of surface water, if any, present on the site shall be made by the permit issuing authority when it makes a final decision on the issuance of the permit.
- (c) Buffers shall also be established adjacent to all ephemeral streams and ponds not shown on the above described maps that have a contributing drainage area that is at least five acres in size, as depicted in the Town's GIS database.
- (1) When a landowner or other affected party believes that the designation of an area by the town as an ephemeral stream or pond with a contributing drainage area of at least five acres is in error, such landowner or other affected party may request that Town staff perform an onsite visit and/or submit to the Town data sufficient to make this case. Upon request, Town staff shall make a site visit and consider the information submitted by the landowner or other affected party as well as other relevant information.
 - (2) The decision as to the existence of an ephemeral stream or pond with a contributing drainage area of at least five acres shall be made by the permit issuing authority when it makes a final decision on the issuance of the permit.

- (d) The administrator may require that the precise location of any surface water be surveyed and accurately shown on development plans whenever necessary to ensure that a proposed development complies with the provisions of this article.

Section 15-270.3 Width of Buffers

- (a) **ZONES OF THE RIPARIAN BUFFER.** The protected riparian buffer shall have two zones as follows:
- (1) A streamside zone ("Zone 1") shall consist of an undisturbed area except as provided for in Section 15-270.5. The function of the streamside zone is to protect the physical and ecological integrity of the stream ecosystem, and filter runoff received from Zone 2. The desired vegetation for Zone 1 is mature forest. The location of Zone 1 shall be as follows:
 - a. Zone 1 shall begin at the most landward limit of the top of the bank. Zone 1 shall extend landward on either side of the stream as indicated in Table 1, measured horizontally on a line perpendicular to a vertical line marking the origin of the buffer as defined above.
 - b. For ponds, lakes and reservoirs, Zone 1 shall begin at the most landward limit of the normal water level and extend landward as indicated in Table 1, measured horizontally on a line perpendicular to a vertical line marking the edge of the surface water.
 - (2) Zone 2 shall consist of an undisturbed area except as provided for in Section 15-270.5. The functions of this zone are to: protect the streamside zone, to filter runoff from upland development, and deliver runoff to Zone 1 in a dispersed fashion. Grading and revegetating Zone 2 is allowed provided that the health of the vegetation in Zone 1 is not compromised. Zone 2 shall begin at the outer edge of Zone 1 and extend landward as indicated in Table 1 as measured horizontally on a line perpendicular to the surface water. The desired vegetation for this zone is mature native vegetation; forest cover is encouraged.
 - (3) The total buffer width shall be the sum of the widths of the two zones, as indicated in Table 1, and shall extend on all sides of the waterbody.

Table 1: Required Minimum Buffer Width (*)

Waterbody type	Zone 1 width		Zone 2 width		Total width	
	Watershed	Outside of Watershed	Watershed	Outside of Watershed	Watershed	Outside of Watershed
Perennial Streams, Ponds, Lakes, Reservoirs	100'	50'	--	50'	100'	100'
Intermittent Streams	60'	30'	--	30'	60'	60'
Ephemeral Streams	--	--	30'	15'	30'	15'

* "Watershed" means within the University Lake Watershed, and "Outside of watershed" means the remainder of the Town's planning jurisdiction. For streams, the width indicated is in one direction from the stream channel; the total width is therefore twice the width indicated.

(4) Notwithstanding the other provisions of this section, in no case shall the width of any buffer be less extensive than the special flood hazard area for the same stream, pond, or lake drainage feature designated in accordance with the provisions of Part I of this article.

Section 15-270.4 Diffuse Flow Requirement

To the maximum extent practicable and in consideration especially of topography and existing uses, diffuse flow of runoff at non-erosive velocities shall be established before the runoff enters the buffer, and maintained in the buffer by dispersing runoff that has concentrated into rills, gullies, and ditches, and reestablishing vegetation where concentrated flow has displaced vegetation. Corrective action to restore diffuse flow shall be taken if necessary to impede the formation or expansion of erosion rills or gullies. Where site conditions constrain the ability to ensure diffuse flow through both Zones 1 and 2, emphasis will be placed on ensuring diffuse flow through Zone 1, as provided for in 15-270.3. No new engineered stormwater devices or conveyances are allowed in the buffers except as provided for in Section 15-270.5.

Section 15-270.5 Exempt and Allowable Activities

(a) The table set forth in subsection (c) below sets out the activities and their designation under this part as exempt, allowable, or allowable with mitigation, except as provided for in 15-270.2. All activities not designated as exempt, allowable, or allowable with mitigation are prohibited within the buffer unless a variance is granted pursuant to Section 15-270.8.

(b) Activities designated in the table below as exempt, allowable, and allowable with mitigation shall be subject to the following requirements. All activities shall be designed, constructed and maintained to minimize soil and vegetation disturbance and to provide the maximum water quality treatment capacity of the buffer.

(1) Exempt. Activities designated as exempt are allowed within the buffer. In addition, exempt uses shall meet the requirements listed in the table and the accompanying notes for the specific use

(2) Allowable. Activities designated as allowable are permissible within the buffer provided that there are no practical alternatives to the requested use as determined in accordance with Section 15-270.6.

(3) Allowable With Mitigation. Activities designated as allowable with mitigation are permissible within the buffer provided that there are no practical alternatives to the requested use as determined in accordance with Section 15-270.6, and an appropriate mitigation strategy has been approved pursuant to Section 15-270.7.

(c) For public utilities as referenced in section 15-15(143), the activities and their designation as set forth in the table in subsection (c) apply to expansions and extensions. The requirements do not apply to routine or emergency maintenance and repairs.

(c) Table of Exempt and Allowable Activities in Water Quality Buffers

Activity	Exempt	Allowable	Allowable with Mitigation
Drainage, Stormwater, Erosion Control, and other Water-based activities			
Dam maintenance activities:			
• Dam maintenance activities that do not cause additional buffer disturbance beyond the footprint of the existing dam or those covered under the U.S. Army Corps of Engineers Nationwide Permit No. 3	X		
• Dam maintenance activities that do cause additional buffer disturbance beyond the footprint of the existing dam or those not covered under the U.S. Army Corps of Engineers Nationwide Permit No. 3		X	

Activity	Exempt	Allowable	Allowable with Mitigation
Drainage of a pond in a natural drainage way provided that a new buffer that meets the requirements of this Section is established adjacent to the new channel			X
Drainage ditches, roadside ditches and stormwater conveyances through buffers: <ul style="list-style-type: none"> • New stormwater flows to existing drainage ditches, roadside ditches, and stormwater conveyances provided that flows do not alter or result in the need to alter the conveyance and are managed to minimize the sediment, nutrients and other pollution that conveyed. • Realignment of roadside drainage ditches retaining the design dimensions provided that no additional travel lanes are added and the minimum required roadway typical section is used based on traffic and safety considerations. • New or altered drainage ditches, roadside ditches and stormwater outfalls provided that a stormwater management facility is installed to manage water quality and quantity before the conveyance discharges through the buffer. • New drainage ditches, roadside ditches and stormwater conveyances that do not provide a stormwater management facility due to topography constraints provided that other practicable BMPs have been employed. 	X	X	X
Ponds created by impounding streams and not used as stormwater BMPs: <ul style="list-style-type: none"> • New ponds in Zone 2 only provided that the diffuse flow requirements in 15-270.4 are established • All other new ponds 		X	X
Scientific studies and stream gauging	X		

Activity	Exempt	Allowable	Allowable with Mitigation
Stormwater BMPs: <ul style="list-style-type: none"> • Constructed wetlands in Zone 1, if not closer than 30' to surface waters • Wet detention, bioretention, and constructed wetlands in Zone 2 if diffuse flow of discharge is provided into Zone 1 • In stream management measures for impaired streams that require DWQ approval of a 401 Water Quality Certification. 	X	X	
Stream relocation The alteration of location of the channel, including daylighting, of a stream so long as the newly created buffer area provides equal or better runoff treatment capabilities than the buffer in its original location, subject to State and Federal requirements		X	
Stream restoration	X		
Stream bank stabilization using natural channel design practices presented in the document Stream Restoration: A Natural Channel Design Handbook. NC Stream Restoration Institute, 2003.	X		
Stream bank stabilization using other practices, including armoring of stream banks with rip rap or retaining walls		X	
Temporary sediment and erosion control devices: <ul style="list-style-type: none"> • In Zone 2, provided that the vegetation in Zone 1 is not compromised and that discharge is released as diffuse flow in accordance with Section 15-270.5 and erosion control for upland areas is addressed to the maximum extent practical. • In-stream temporary erosion and sediment control measures for work within a stream channel 		X	
Water dependent structures		X	

Activity	Exempt	Allowable	Allowable with Mitigation
Water wells <ul style="list-style-type: none"> • Single family residential water wells • All other water wells 	X	X	
Wetland, stream and buffer restoration that results in impacts to the riparian buffers: <ul style="list-style-type: none"> • Wetland, stream and buffer restoration that requires DWQ approval for the use of a 401 Water Quality Certification • Wetland, stream and buffer restoration that does not require DWQ approval for the use of a 401 Water Quality Certification 	X	X	
Miscellaneous			
Archaeological activities	X		
Fences: <ul style="list-style-type: none"> • Fences provided that disturbance is minimized and installation does not result in removal of trees as defined in Section 15-316 • Fences provided that disturbance is minimized and installation results in removal of trees as defined in Section 15-316 	X	X	
Grading and revegetation in Zone 2 only provided that diffuse flow and the health of existing vegetation in Zone 1 is not compromised and disturbed areas are stabilized until they are revegetated		X	

Activity	Exempt	Allowable	Allowable with Mitigation
<p>Mining activities:</p> <ul style="list-style-type: none"> • Mining activities that are covered by the Mining Act provided that new buffers that meet the requirements of this section are established adjacent to the relocated channels • Mining activities that are not covered by the Mining Act OR where new buffers that meet the requirements of this section are not established adjacent to the relocated channels • Wastewater or mining dewatering wells with approved NPDES permit 	X	X	X
Preservation or maintenance of historic or cultural sites	X		
Protection of existing structures, facilities and stream banks when this requires additional disturbance of the riparian buffer or the stream channel		X	
Removal of previous fill or debris provided that diffuse flow is maintained, a stabilizing ground cover sufficient to restrain erosion is established, and any woody vegetation removed is restored		X	
Recreation			
<p>Access trails: Pedestrian access trails leading to the surface water, docks, fishing piers, boat ramps and other water dependent activities:</p> <ul style="list-style-type: none"> • Pedestrian access trails that are restricted to the minimum width practicable and do not exceed 4 feet in width of buffer disturbance, and provided that installation and use does not result in removal of trees as defined in Section 15-316 and no impervious surface is added to the buffer • Pedestrian access trails that exceed 4 feet in width of buffer disturbance, the installation or use results in removal of trees as defined in this Section or impervious surface is added to the buffer 	X	X	

Activity	Exempt	Allowable	Allowable with Mitigation
Canoe Access provided that installation and use does not result in removal of trees as defined in Section 15-316 and no impervious surface is added to the buffer.	X		
Greenway / hiking trails ¹ designed, constructed and maintained to maximize nutrient removal and erosion protection, minimize adverse effects on aquatic life and habitat, and protect water quality to the maximum extent practical		X	
Playground equipment: • Playground equipment on single family lots • Playground equipment installed on lands other than single-family lots	X	X	
Transportation			
Bridges		X	
Driveway crossings of streams and other surface waters subject to this Section: • Individual driveway crossings that disturb equal to or less than 25 linear feet or 2,500 square feet of buffer • Individual driveway crossings that disturb greater than 25 linear feet or 2,500 square feet of buffer • Multiple driveway crossings in any development that cumulatively disturbs equal to or less than 150 linear feet or one-third of an acre of buffer • Multiple driveway crossings in any development that cumulatively disturbs greater than 150 linear feet or one-third of an acre of buffer • Driveway impacts other than crossing of a stream or other surface waters subject to this Section	X	X X	X X

¹ To the extent practicable, greenway easements shall be located a minimum of 10 feet from the top of bank; surfaces shall be a minimum of 15 feet from the top of bank

Activity	Exempt	Allowable	Allowable with Mitigation
Railroad impacts other than crossings of streams and other surface waters subject to this Section.		X	
Railroad crossings of streams and other surface water drainage features subject to this Part: <ul style="list-style-type: none"> • Railroad crossings that impact equal to or less than 40 linear feet of riparian buffer • Railroad crossings that impact greater than 40 linear feet but equal to or less than 150 linear feet or one-third of an acre of riparian buffer • Railroad crossings that impact greater than 150 linear feet or one-third of an acre of riparian buffer 	X	X	X
Road relocation: Relocation of existing private access roads associated with public road projects where necessary for public safety: <ul style="list-style-type: none"> • Less than or equal to 2,500 square feet of buffer impact • Greater than 2,500 square feet of buffer impact 		X	X
Temporary roads, provided that restoration activities, such as soil stabilization and revegetation, occur immediately after construction: <ul style="list-style-type: none"> • Less than or equal to 2,500 square feet of buffer disturbance • Greater than 2,500 square feet of buffer 	X	X	

Activity	Exempt	Allowable	Allowable with Mitigation
Transportation (vehicular, pedestrian, bike) crossings of streams and other surface waters subject to this Section: <ul style="list-style-type: none"> • Transportation crossings that impact equal to or less than 40 linear feet of riparian buffer • Transportation crossings that impact greater than 40 linear feet but equal to or less than 150 linear feet or one-third of an acre of riparian buffer • Transportation crossings that impact greater than 150 linear feet or one-third of an acre of riparian buffer 	X	X	X
Transportation impacts other than crossings of streams and other surface waters subject to this Section			X
Vehicle access roads and boat ramps leading to the surface water, docks, fishing piers, and other water dependent activities: <ul style="list-style-type: none"> • Vehicular access roads and boat ramps to the surface water but not crossing the surface water that are restricted to the minimum width practicable not to exceed 10 feet in width • Vehicular access roads and boat ramps to the surface water but not crossing the surface water that are restricted to the minimum width practicable and exceed 10 feet in width 		X	X
Utilities			
Electric utility, aerial, perpendicular crossings ^{2,3,4} : <ul style="list-style-type: none"> • Disturb equal to or less than 100 linear feet of buffer • Disturb greater than 100 linear feet of buffer 	X	X	

² Provided that within 30 feet of surface waters, all of the following BMPs for overhead utility lines are used. If all of these BMPs are not used, then the overhead utility lines shall require a no practical alternative evaluation by the Administrator as defined in Section 15-270.6.

Activity	Exempt	Allowable	Allowable with Mitigation
Electric utility, aerial, other than perpendicular crossings ³ : <ul style="list-style-type: none"> • Impacts greater than 50 feet from surface waters • Impacts within 30-50 feet of surface waters • Impacts within 30 feet of surface waters^{2,4} 	X	X	X
Electric utility, underground, perpendicular crossings ^{3,4,5} : <ul style="list-style-type: none"> • Disturb less than or equal to 40 linear feet of buffer • Disturb greater than 40 linear feet of buffer 	X	X	

• A minimum zone of 10 feet wide immediately adjacent to the water body shall be managed such that only vegetation that poses a hazard or has the potential to grow tall enough to interfere with the line is removed.

- Woody vegetation shall be cleared by hand. No land grubbing or grading is allowed.
- Vegetative root systems shall be left intact to maintain the integrity of the soil. Stumps shall remain where trees are cut.
- Riprap shall not be used unless it is necessary to stabilize a tower.
- No fertilizer shall be used other than a one-time application to re-establish vegetation.
- Construction activities shall minimize the removal of woody vegetation, the extent of the disturbed area, and the time in which areas remain in a disturbed state.
- Active measures shall be taken after construction and during routine maintenance to ensure diffuse flow of stormwater through the buffer.
- In wetlands, mats shall be utilized to minimize soil disturbance.

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

⁴ Provided that poles or aerial infrastructure shall not be installed within 10 feet of a water body unless the Administrator completes a no practical alternative evaluation as defined in Section 15-270.6

⁵ Provided that, in Zone One, all of the following BMPs for underground utility lines are used. If all of these BMPs are not used, then the underground utility line shall require a no practical alternative evaluation by the Administrator, as defined in Section 15-270.6.

- Woody vegetation shall be cleared by hand. No land grubbing or grading is allowed.
- Vegetative root systems shall be left intact to maintain the integrity of the soil. Stumps shall remain, except in the trench created for the line installation.
- Underground cables shall be installed by vibratory plow or trenching.
- The trench shall be backfilled with the excavated soil material immediately following cable installation.
- No fertilizer shall be used other than a one-time application to re-establish vegetation.
- Construction activities shall minimize the removal of woody vegetation, the extent of the disturbed area, and the time in which areas remain in a disturbed state.

Activity	Exempt	Allowable	Allowable with Mitigation
Electric utility, underground, other than perpendicular crossings ^{3,5} : <ul style="list-style-type: none"> • Impacts greater than 50 feet from surface waters • Impacts within 30-50 feet of surface waters • Impacts within 30 feet of surface waters 	X	X	X
Non-electric utility, perpendicular crossings ^{3,5} : <ul style="list-style-type: none"> • Disturb equal to or less than 40 linear feet of buffer with a maintenance corridor equal to or less than 10 feet in width • Disturb equal to or less than 40 linear feet of buffer with a maintenance corridor greater than 10 feet in width • Disturb greater than 40 linear feet but equal to or less than 150 linear feet of buffer with a maintenance corridor equal to or less than 10 feet in width • Disturb greater than 40 linear feet but equal to or less than 150 linear feet of buffer with a maintenance corridor greater than 10 feet in width • Disturb greater than 150 linear feet of buffer 	X	X X X	X X X
Non-electric utility, other than perpendicular crossings ^{3,5} : <ul style="list-style-type: none"> • Impacts greater than 50 feet from surface waters • Impacts within 30-50 feet of surface waters • Impacts within 30 feet of surface waters 	X	X	X
Vegetation Management			
Forest harvesting – See Section 15-319.1			
Fertilizer application: <ul style="list-style-type: none"> • One-time fertilizer application to establish vegetation 	X		

Activity	Exempt	Allowable	Allowable with Mitigation
Vegetation management:			
• Emergency fire control measures provided that topography is restored	X		
• Mowing and harvesting of plant products in Zone 2 only	X		
• Planting vegetation to enhance the riparian buffer	X		
• Pruning forest vegetation provided that the health and function of the forest vegetation is not compromised	X		
• Removal of individual trees which are in danger of causing damage to dwellings, other structures or human life	X		
• Removal of poison ivy	X		
• Removal of invasive exotic vegetation as defined by the North Carolina Botanical Gardens	X		

(d) Additional Setback Requirements for Specific Water Pollution Hazards

The following activities are designated as potential water pollution hazards, and must be set back from any stream or waterbody by the required buffer width provided in 15-270.3 or the distance indicated below, whichever is greater:

Activity	Setback
Above or below ground storage of hazardous substances, petroleum or biofuels	150 feet
Animal feedlot operations	250 feet
Land application of biosolids	100 feet
Solid waste landfills or junkyards	300 feet

(e) Because it is not the intent of this part to render undevelopable lots of record on the effective date of this part, intrusions into the protective buffer are permitted in the event that a lot of record would otherwise be made undevelopable by the provisions of this part, to the extent necessary for the lot in question to be developed as permitted by the underlying zoning designation and in such a manner as to minimize the disruption of the protective buffer.

(f) No new lot may be created through a major or minor subdivision process that would be undevelopable under the provisions of this part because of the amount or dimensions of protective buffer land included in it, unless such lot has already been developed, or it

plainly appears that such lot is intended to be devoted to permanent open space use.

(g) Areas set aside as protective stream buffers as required by this part may be counted towards required open space as set out in Sections 15-198, so long as they meet all the provisions of that section.

(h) Nothing in this part shall prevent a single family residence (including a mobile home) from being located within the required protective stream buffer areas if such home: 1) replaces a home that had been located within such buffer prior to the effective date of this part and is located on the same location as the previous home; or 2) is located on a mobile home pad or foundation that was in existence on the effective date of this part.

(i) Nothing in this part shall prevent the expansion of an existing single family detached residence (including an attached garage) into any buffer area that adjoins an ephemeral stream, if and to the extent that such area was not a regulated stream buffer under the provisions of this chapter in effect prior to the effective date of this section.

Section 15-270.6 Determination of "No Practical Alternatives"

(a) Persons who wish to undertake uses designated as allowable or allowable with mitigation under Section 15-270.5 shall submit a written request to the permit issuing authority for a "no practical alternatives" determination. The applicant shall certify that the criteria identified in subsection (b) are met and may submit any information deemed relevant to the permit issuing authority determination, in addition to the plans and other information submitted as part of the application for a permit under Article IV of this chapter. A "no practical alternatives" determination shall only be made for proposed developments with respect to which permit applications under Article IV are pending.

(b) The permit issuing authority shall make a "no practical alternatives" determination if s/he concludes, after reviewing the project plans and any other applicable information, that:

(1) The basic project purpose cannot be practically accomplished in a manner that would better minimize disturbance, preserve aquatic life and habitat, and protect water quality, and;

(2) Best management practices shall be used if necessary to minimize disturbance, preserve aquatic life and habitat, and protect water quality.

(c) Requests for a "no practical alternatives" determination shall be reviewed and either approved or denied. The permit issuing authority shall issue his/her decision in writing.

Section 15-270.7 Mitigation for Water Quality Buffers

(a) **PURPOSE.** The purpose of this section is to set forth the mitigation requirements for water quality buffer protection

(b) **THE AREA OF MITIGATION.** Staff shall determine the required area of mitigation, which shall apply to all mitigation options identified in this section, according to the following:

(1) The impacts in square feet to each zone of the buffer shall be determined by adding the area of the footprint of the activity causing the impact to the riparian buffer, including any clearing and grading within the buffer necessary to accommodate other activities, and the area of any ongoing maintenance corridors within the buffer associated with the activity.

(2) The required area of mitigation shall be determined by applying the following multipliers to the impacts determined in subsection (b)(1) to each zone of the riparian buffer:

a. Impacts to Zone one of the riparian buffer shall be multiplied by three;

b. Impacts to Zone two of the riparian buffer shall be multiplied by one and one-half.

(c) **THE LOCATION OF MITIGATION.** The mitigation effort shall be located within the Town's planning jurisdiction, and as close to the location of the impact as feasible.

(d) **OPTIONS FOR MEETING THE MITIGATION DETERMINATION.** The mitigation determination may be met through one of the following options:

(1) Payment of a compensatory mitigation fee to the Town's Water Quality Enhancement Fund;

(2) Donation of real property or of an interest in real property pursuant to subsection (e) of this Section;

(3) Riparian buffer enhancement, or riparian buffer restoration. This shall be accomplished by the applicant after submittal and approval of a restoration plan pursuant to Item (f) of this Section.

(e) **PAYMENT TO THE WATER QUALITY ENHANCEMENT FUND.** Persons who choose to satisfy their mitigation determination by paying a compensatory mitigation fee to the Water Quality Enhancement Fund as allowed here shall use the following procedure:

(1) The Town shall establish annually, and include on the Miscellaneous Fees and Charges Schedule, a per square foot buffer mitigation fee. The fee shall be based upon a reasonable estimate of the per square foot cost of accomplishing riparian buffer restoration.

(2) The amount of the compensatory mitigation fee due shall be determined by multiplying the area in square feet of mitigation calculated in accordance with subsection (b) by the per square foot buffer mitigation fee.

(3) The required fee shall be submitted to the Town prior to construction plan approval.

(f) **DONATION OF PROPERTY.** Persons who choose to satisfy their mitigation determination by donating real property or an interest in real property to the Town shall meet the following requirements:

(1) The donation of real property interests may be used to either partially or fully satisfy the payment of a compensatory mitigation fee to the Water Quality Enhancement Fund. The value of the property interest shall be determined by an appraisal performed in accordance with subsection (f)(4)d of this Section. The donation shall satisfy the mitigation determination if the appraised value of the donated property interest is equal to or greater than the required fee. If the appraised value of the donated property interest is less than the required fee, the applicant shall pay the remaining balance due.

(2) The donation of conservation easements to satisfy compensatory mitigation requirements shall be accepted only if the conservation easement is granted in perpetuity.

(3) Donation of real property interests to satisfy the mitigation determination shall be accepted only if such property meets all of the following requirements:

- a. The property shall contain riparian buffers that are in need of restoration.
- b. The restorable riparian buffer on the property shall have a minimum length of 100 linear feet along a surface water and a minimum width of 15 feet as measured horizontally on a line perpendicular to the surface water.
- c. The size of the restorable riparian buffer on the property to be donated shall equal or exceed the acreage of riparian buffer required to be mitigated under the mitigation responsibility determined pursuant to Item (b) of this Section.
- d. The property shall not require excessive measures for successful restoration, such as removal of structures or infrastructure. Restoration of the property shall be capable of fully offsetting the adverse impacts of the requested use.
- e. The property shall be suitable to be successfully restored, based on existing hydrology, soils, and vegetation.
- f. The estimated cost of restoring and maintaining the property shall not exceed the value of the property minus site identification and land acquisition costs.
- g. The property shall not contain any building, structure, object, site, or district that is listed in the National Register of Historic Places established pursuant to Public Law 89-665, 16 U.S.C. 470 as amended.
- h. The property shall not contain any hazardous substance or solid waste.
- i. The property shall not contain structures or materials that present health or safety problems to the general public. If wells, septic, water or sewer connections exist, they shall be filled, remediated or closed at owner's expense in accordance with state and local health and safety regulations.
- j. The property and adjacent properties shall not have prior, current, and known future land use that would inhibit the function of the restoration effort.
- k. The property shall not have any encumbrances or conditions on the transfer of the property interests.

(4) At the expense of the applicant or donor, the following information shall be submitted to the Town with any proposal for donations or dedications of interest in real property:

- a. Documentation that the property meets the requirements laid out in subsection (f)(3) of this Section;
- b. Documentation showing the location of the property to be donated along with information on existing site conditions, vegetation types, presence of existing structures and easements;
- c. A current property survey performed in accordance with the procedures of the North Carolina Department of Administration, State Property Office as identified by the State Board of Registration for Professional Engineers and Land Surveyors in "Standards of Practice for Land Surveying in North Carolina." Copies may be obtained from the North Carolina State Board of Registration for Professional Engineers and Land Surveyors, 3620 Six Forks Road, Suite 300, Raleigh, North Carolina 27609;
- d. A current appraisal of the value of the property performed in accordance with the procedures of the North Carolina Department of Administration, State Property Office as identified by the Appraisal Board in the "Uniform Standards of Professional North Carolina Appraisal Practice." Copies may be obtained from the Appraisal Foundation, Publications Department, P.O. Box 96734, Washington, D.C. 20090-6734; and
- e. A title certificate from a licensed NC attorney.

(g) **RIPARIAN BUFFER RESTORATION OR ENHANCEMENT.** Persons who choose to meet their mitigation requirement through riparian buffer restoration or enhancement shall meet the following requirements:

- (1) The applicant may restore or enhance a non-forested riparian buffer if either of the following applies:
 - a. The area of riparian buffer restoration is equal to the required area of mitigation determined pursuant to subsection (b) of this Section; or
 - b. The area of riparian buffer enhancement is three times larger than the required area of mitigation determined pursuant to subsection (b) of this Section.
- (2) The location of the riparian buffer restoration or enhancement shall comply with the requirements in subsection (c) of this Section.
- (3) The width of the riparian buffer restoration or enhancement site shall comply with Section 15-270.3.
- (4) The applicant shall submit a restoration or enhancement plan for approval. The restoration or enhancement plan shall contain the following:
 - a. A map of the proposed restoration or enhancement site;
 - b. A vegetation plan. The vegetation plan shall include a minimum of at least two native hardwood tree species planted at a density sufficient to provide 320 trees per acre at maturity;
 - c. A grading plan. The site shall be graded in a manner to ensure diffuse flow through the riparian buffer;
 - d. A fertilization plan; and

- e. A schedule for implementation.
- (5) Within one year after the permit issuing authority has approved the restoration or enhancement plan, the applicant shall present proof that the riparian buffer has been restored or enhanced. If proof is not presented within this timeframe, then the person shall be in violation of the riparian buffer protection program.
- (6) The mitigation area shall be placed under a perpetual conservation easement that will provide for protection of the property's water quality enhancement functions.
- (7) The applicant shall submit annual reports for a period of five years after the restoration or enhancement showing that the trees planted have survived and that diffuse flow through the riparian buffer has been maintained. The applicant shall replace trees that do not survive and restore diffuse flow if needed during that five-year period.
- (h) The Town may determine that the option described in 15-270.7(e) does not apply to a public utility as referenced in section 15-15(143) if the mitigation options specified above in 15-270.7(f) and (g) are found to not be feasible.

Section 270.8 Permits and Enforcement of Buffer Requirements.

Like the other requirements of this chapter, the provisions of Part III of Article XVI (water quality buffers) shall ordinarily be enforced by requiring compliance as development permits (i.e., zoning, special use, or conditional use permits) are issued. Accordingly, a determination as to whether a proposed disturbance of a buffer is exempt, allowable, or allowable with mitigation will ordinarily be made in the context of the review process for such a development permit. To the extent that the activities identified in the Table of Exempt and Allowable Activities (set forth in Subsection 15-270.5(c) above) are proposed to be conducted or undertaken under circumstances where no such development permit is likely to be required (e.g., archeological activities or the installation of playground equipment), such activities may not be conducted or undertaken until a buffer disturbance permit has been issued by the zoning administrator. Such permit shall be issued if the administrator concludes, based upon the information submitted with the application for such permit, that the proposed disturbance will be consistent with the requirements of this article.

Section 3. Subsections 15-92(i) and (j) are repealed and in lieu thereof the following new subsections 15-92(i), (j), and (k) are adopted:

- (i) If the board votes to grant a major variance from any of the provisions of Section 15-266, dealing with requirements peculiar to areas within the University Lake Watershed or Jordan Lake Watershed Protection District, the administrator shall forthwith prepare and send to the Environmental Management Commission a record of the proceedings before the board. The variance shall not be issued until it is approved by the EMC. For purposes of this subsection, a major variance is one that authorizes a relaxation of greater than 10% of any requirement set forth in Section 15-266.

(j) If the board votes to grant a major variance from any of the provisions of Part III (Water Quality Buffers) of Article XVI, the administrator shall forthwith prepare and send to the Environmental Management Commission a record of the proceedings before the board. The variance shall not be issued until it is approved by the EMC. For purposes of this subsection, a major variance is one that pertains to activities that will impact any portion of Zone One of the riparian buffer.

(k) The administrator shall keep a record of all variances granted during any calendar year from the provisions of Sections 15-266 or Part III of Article XVI and shall submit the record of such variances on or before January 1 of the following year to the Division of Water Quality. The record shall contain a description of each project receiving a variance and the reason for granting the variance.

Section 4. Subsection 15-198 (b) (4) of the Carrboro Land Use Ordinance is amended by rewording subdivisions (b) and (e) to read as follows:

- (b) Hardwood areas as designated in the Geographic Information System (GIS) of the Town of Carrboro.
- (e) Water quality buffers on perennial and intermittent streams designated in the GIS of the Town of Carrboro.

Section 5. Subsection 15-198 (b) (5) of the Carrboro Land Use Ordinance is amended by rewording subdivision (f) to read as follows:

- f. Other environmentally, historically, or archaeologically significant or unique areas, including water quality buffers on ephemeral streams designated in the GIS of the Town of Carrboro.

Section 6. Subsections 15-184(g) and (h) are hereby repealed.

Section 7. This ordinance shall become effective when it has been both approved by the North Carolina Environmental Management Commission and adopted by the Carrboro Board of Aldermen. However, the provisions of ordinance shall not be applicable to proposed developments for which completed applications have been received and fees paid prior to the effective date of this ordinance, so long as a permit for the proposed development is issued within two years following the effective date of this ordinance. As to such developments, the provisions of Sections 15-265, 15-268, and 15-269 of the Carrboro Land Use Ordinance shall remain applicable; provided that, the applicant and the permit issuing authority may agree to allow the provisions of this ordinance to apply to such projects.

Section 8. The definition of water dependent structure found in subsection 15-15(149) is deleted and the remaining definitions in this section renumbered accordingly.

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PART II. STORM WATER MANAGEMENT

Section 15-261 Natural Drainage System Utilized to Extent Feasible (REWRITTEN 6/27/07).

(a) To the extent practicable, all development shall conform to the natural contours of the land and natural drainage ways shall remain undisturbed.

(b) To the extent practicable, lot boundaries shall be made to coincide with natural drainage ways within subdivisions to avoid the creation of lots that can be built upon only by altering such natural drainage ways.

Section 15-262 Development Must Drain Properly. (REWRITTEN 6/27/07)

(a) All development shall be provided with a stormwater management system containing drainage facilities that are adequately designed and constructed to prevent the undue retention of surface water on the development site. Surface water shall not be regarded as unduly retained if:

- (1) The retention results from a technique, practice or device deliberately installed as part of an approved sedimentation or stormwater management plan, or
- (2) The retention is not substantially different in location or degree than that experienced by the development site in its pre-development stage, unless such retention presents a danger to health or safety.

(b) No surface water may be channeled or directed into the OWASA sanitary sewer system.

(c) Whenever practicable, the drainage system of a development shall coordinate with the drainage system or drainage ways on surrounding properties or streets.

(d) Use of drainage swales rather than curb and gutter and storm sewers in subdivisions is provided for in Section 15-216. Private roads and access ways within unsubdivided developments shall utilize curb and gutter and storm drains to provide adequate drainage if the grade of such roads or access ways is too steep to provide drainage in another manner or if other sufficient reasons exist to require such construction.

(e) The minimum design storm frequency for all drainage systems shall be the 10 year storm, except that those facilities crossing streets shall be designed for the 25 year storm.

(f) Drainage culverts and associated facilities shall be suitably sized to accommodate designated storm frequencies and shall be suitably constructed and installed to insure that the

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facilities will function adequately and will not deteriorate within an unreasonably short period of time. (AMENDED 04/03/90)

Section 15-263 Management of Stormwater (REWRITTEN 6/26/07; AMENDED 6/24/08)

(a) The requirements of this section shall apply to all development that involves the disturbance of at least 5,000 square feet of land area, subject to the following:

- (1) For purposes of this section, the term "disturbance" means that the land surface is altered in some substantial way. By way of illustration without limitation, land disturbance occurs whenever the ground surface is altered by grading, clearing, adding or enlarging a structure to cover an area not previously covered, or otherwise altering it to make it less pervious. Adding new pavement to a previously unpaved surface, or the reconstruction of a previously paved area shall be considered disturbance, but repairing or resurfacing a previously paved surface shall not.
- (2) Single-family and two-family residential development activities that involve the disturbance of less than 7,500 square feet of land area shall be exempt from the provisions of this section.
- (3) When land is subdivided, then the amount of land disturbance attributable to such subdivision (for purposes of determining whether the requirements of this section apply) shall include not only the disturbance of land authorized by the permit or plat approval that authorizes the creation of the subdivision, but also the disturbance of land resulting from the reasonably expected development of any lot that is less than five acres in size within such subdivision.

(b) When land is subdivided, then the stormwater management system that is installed to comply with the provisions of this section shall be required to take into account not only the stormwater runoff from the subdivision if the lots so created remained undeveloped, but also the reasonably expected (according to generally accepted engineering standards) stormwater runoff from the development of all lots that are less than five acres in size within such subdivisions. When such lots are subsequently developed, they shall be exempt from further review under the provisions of this section. However, lots within such subdivisions that are five acres or more in size and that were not included in the stormwater calculations for purposes of designing a stormwater management system that satisfies the requirements of this section shall be required to comply with the requirements of this section when such lots are developed.

(c) Developments must install and maintain stormwater management systems that will control and treat runoff from the first one inch of rain as follows:

- (1) Draw down the treatment volume no faster than 48 hours, but no slower than 120 hours.

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- (2) Achieve an eighty-five percent (85%) average annual removal rate for Total Suspended Solids.

(cl) To the extent reasonably practicable, the stormwater management systems designed and constructed to satisfy the requirements of this section shall utilize best management practices that reduce nutrient loadings. **(AMENDED 6/24/08)**

(d) Developments shall be constructed and maintained so that their stormwater management systems meet the following minimum standards:

- (1) The post-development discharge rates shall be less than or equal to the pre-development discharge rates for the 1-, 2-, 5-, 10-, and 25-year 24-hour design storms.
- (2) For upstream properties, the 1% chance flood elevation may not be increased.

(e) The presumption established by this section is that, to satisfy the standards set forth herein, the applicant shall design and construct all stormwater management systems required by this section in accordance with the guidelines set forth in the Town of Carrboro Storm Drainage Design Manual (Appendix I to this chapter). However, the permit issuing authority may establish different requirements when it concludes, based upon (i) the information it receives in the consideration of the specific development proposal, and (ii) the recommendations of the public works director or the town engineer, that such deviations from the presumptive guidelines are necessary to satisfy the standards set forth in this section, or that the standards can still be met with such deviations and the deviations are otherwise warranted.

(f) Approval by the town of an applicant's stormwater management plans, and construction by the applicant of the stormwater management systems as shown in such plans, shall not relieve the applicant of the responsibility of complying with the standards set forth in this section. If at any time prior to two years following the issuance of a certificate of occupancy, for an unsubdivided development, or the approval of a final plat, for a subdivision, the town determines that the stormwater management systems planned to be installed or actually installed to meet the requirements of this section do not achieve that objective, the town may require the submission of revised plans and the installation of new, altered, or additional facilities to bring the development into compliance. Prior to issuance of a certificate of occupancy or approval of a final plat, the town may require the applicant to post a performance bond or other sufficient surety to guarantee compliance with this section.

(g) Upon completion of construction of the stormwater management facilities, the permit recipient shall submit to the town "as built" plans for all such facilities in the form required by the town. Compliance with this requirement must occur prior to issuance of a certificate of occupancy, or prior to final plat approval (if applicable), unless adequate security is otherwise provided in accordance with the provisions of Sections 15-53 or 15-60.

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Section 15-263.1 Maintenance of Structural BMPs.

(a) For purposes of this section, a “structural BMP” is a device constructed or installed to trap, settle out, or filter pollutants from stormwater runoff or to reduce stormwater discharge volume or velocity in order to satisfy one or more of the requirements of Section 15-263.

(b) The owner of each structural BMP installed pursuant to this ordinance shall maintain and operate it so as to preserve and continue its function in controlling stormwater quality and quantity at the degree or amount of function for which the structural BMP was designed. Such operation and maintenance shall be in accordance with the Operation and Maintenance Agreement specified in subsection (e) of this section.

(c) The owner of each structural BMP shall ensure that each such facility is inspected in accordance with the Operation and Maintenance Agreement specified in subsection (e) of this section by a qualified registered North Carolina professional or other individual specially qualified by an appropriate training, testing, and certification program. The person performing the inspections shall submit annually to the administrator a report certifying the results of such inspections. The report shall be in a format and shall contain the information prescribed by the administrator. The first report shall be due one year from the date of the as built certification required by Subsection 15-263(i), and subsequent reports shall be due on or before that anniversary date.

(d) The owner of each structural BMP shall ensure that, in accordance with the Operation and Maintenance Agreement, funds are set aside in an escrow account, sinking fund, or other arrangement, sufficient to pay major, non-routine costs associated with keeping such BMPs in proper operational condition, such as the cost of sediment removal, structural, biological, or vegetative replacement, major repair, or reconstruction. The owner shall submit annually to the administrator a report certifying that such funds have been set aside. The report shall be in a format and shall contain the information prescribed by the administrator. The first report shall be due one year from the date of the as-built certification required by Subsection 15-263(i), and subsequent reports shall be due on or before that anniversary date.

(e) Prior to final plat approval, in the case of a subdivision, or prior to the issuance of a certificate of occupancy, in the case of an unsubdivided development, the owner of a development that contains a structural BMP shall enter into an Operation and Maintenance Agreement with the town (and shall record such agreement in the Orange County Registry) that specifies that the owner, and his or her successor and assigns:

- (1) Agrees to comply with the obligations set forth in subsections (b), (c), and (d) of this section;
- (2) Authorizes the town and its employees or agents to enter the property where the structural BMPs are located at reasonable times to inspect the same for

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compliance with the requirements of this section, the permit issued pursuant thereto, and the provisions of the Operation and Maintenance Agreement;

- (3) Agrees that, if the owner fails to operate and maintain such structural BMPs in accordance with the requirements of this section, the permit issued pursuant thereto, and the provisions of the Operation and Maintenance Agreement, the town is authorized (but not obligated) to enter the property to perform such work as is necessary to bring such BMPs into compliance and to charge the owner with the costs of such work.

(f) If structural BMPs are to be owned by a property owners or homeowners association or similar entity, then the covenants applicable to such association shall clearly reference the obligations of the association, as owner of such BMPs, to fulfill the obligations of the owner relating to such BMPs as required by the provisions of this section, the permit issued pursuant thereto, and the provisions of the Operation and Maintenance Agreement.

Section 15-264 Sedimentation and Erosion Control.

(a) No zoning, special use, or conditional use permit may be issued and final plat approval for subdivisions may not be given with respect to any development that would cause land disturbing activity subject to the jurisdiction of the Orange County Erosion Control Officer or the North Carolina Sedimentation Control Commission unless such officer or agency has certified to the town; either that:

- (1) Any permit required by such officer or agency has been issued or any erosion control plan required by such officer or agency has been approved; or
- (2) Such officer or agency has examined the preliminary plans for the development and it reasonably appears that any required permit or erosion control plan can be approved upon submission by the developer of more detailed construction or design drawings. However, in this case, construction of the development may not begin (and no building permits may be issued) until such officer or agency issues any required permit or approves any required erosion control plan.

(b) For purposes of this section, "land disturbing activity" means any use of the land by any person in residential, industrial, educational, institutional or commercial development, highway and road construction and maintenance that results in a change in the natural cover or topography and that may cause or contribute to sedimentation. Sedimentation occurs whenever solid particulate matter, mineral or organic, is transported by water, air, gravity, or ice from the site of its origin.

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(c) The Orange County Erosion Control Officer is authorized by resolution of the Carrboro Board of Aldermen to enforce within the town the Orange County Soil Erosion and Sedimentation Control Ordinance. (AMENDED 12/7/83)

(d) (REPEALED 12/7/83)

Section 15-265 Designated Buffer Areas in Watershed (AMENDED 12/7/83)

(a) The Board finds that:

- (1) Soil and pollutants carried overland, primarily from roads, trails, and land disturbing activities, can be effectively trapped by leaving a relatively undisturbed strip of vegetation parallel and adjacent to the watercourse.
- (2) Properly managed overland water flow can be directed into this buffer area in a manner that will reduce velocity and cause dispersion of the water.
- (3) Sediments and associated pollutants carried by the water will settle out as a result of this slowing and dispersion process.

(b) Developments on lots within the C, WR, B-5, or WM-3 zoning districts shall, if any of the watercourses identified in this subsection are located in whole or in part within the lots so developed, contain a designated buffer area adjacent to such watercourse. The buffer area boundaries shall be demarcated by a line connecting the points on either side of a watercourse located as follows: (AMENDED 05/15/90)

- (1) **Creeks and tributaries** (i.e., permanent streams flowing directly into University Lake and permanent streams flowing into such streams). Measure along a line running perpendicular to the edge of the floodplain (or if no floodplain has been demarcated, the center of the stream) fifty feet from the edge of the floodplain (or if no flood plain has been demarcated, from the edge of the water) plus an additional distance equal to:

$$4 \times \text{slope} \times 100$$

where "slope" is expressed as a percentage derived by dividing by 100 the rise of elevation between the floodplain boundary line (or if no floodplain has been demarcated, the edge of the water) and a point one hundred feet from that point along the above-described perpendicular line.

- (2) **Intermittent streams flowing into creeks and tributaries.** Measure along a line running perpendicular to the centerline of the intermittent stream fifty feet from such stream centerline.

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- (3) **Intermittent streams flowing directly into University Lake.** Measure along a line running perpendicular to the centerline of the intermittent stream one hundred feet from such stream centerline.
- (4) **Intermittent streams flowing into streams which flow directly into University Lake.** Measure along a line running perpendicular to the centerline of the intermittent stream fifty feet from such stream centerline.
- (5) **University Lake.** Measure along a line running perpendicular to the high water mark or floodplain boundary (whichever is farther from the Lake) one hundred feet from such high water mark or floodplain boundary (whichever is farther from the Lake) plus an additional distance equal to:

$$4 \times \text{slope} \times 100$$

where "slope" is expressed as a percentage derived by dividing by 100 the rise in elevation between the high water line of the Lake and a point one hundred feet from that point along the above described perpendicular line.

(c) Subject to subsection (e), the existing natural vegetation in a designated buffer area shall not be disturbed in any way that would reduce the buffer area's effectiveness in achieving the objectives set forth in subsection (a). In addition, buffer areas from which the vegetative cover has been removed shall be planted or otherwise provided with ground cover, devices, or structures sufficient to allow the buffer area to accomplish the objectives set forth in subsection (a). (AMENDED 11/11/86)

(d) Notwithstanding the remaining provisions of this article, whenever a floodplain lies between a watercourse and a designated buffer area or within a designated buffer area, the floodplain shall be considered a part of the buffer area for purposes of the development restrictions set forth in subsection (c).

(e) Notwithstanding the foregoing provisions, the permit issuing authority may authorize the crossing of a designated buffer area by a street, bikeway, sidewalk, water or sewer line or pump station, or water dependent structure under the circumstances specified in Subsection 15-184(g) or (h). (AMENDED 12/14/93)

Section 15-266 Impervious Surface Limitations (AMENDED 12/7/83; 05/15/90)

(a) Within a B-5 or WM-3 zoning district (the total area of which comprises less than one percent of the are of the University Lake Watershed and all of which is located more than one-half mile from the normal pool elevation of University Lake), not more than twenty-four percent (24%) of the land on any lot may be covered by an impervious surface such as a street, drive, sidewalk, parking lot, building, or other roofed structure, etc. In the event that the area of impervious surface is greater than six percent (6%) of the total lot, stormwater management techniques must be employed that would retain the first one inch of rainfall running off of all impervious surfaces on a lot. A registered engineer must certify that the stormwater techniques

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used will accomplish this objective before a permit is issued, and it shall be a continuing condition of the permit that the owner provide necessary maintenance so that the stormwater retention techniques continue to function effectively. Such stormwater retention techniques shall be subject to inspection by the Town at least annually. In granting the conditional use permit authorizing such facilities, the Board shall require the developer to post a cash bond or other sufficient security to guarantee that the developer or his successor shall adequately maintain such stormwater retention facilities so that such facilities will continue to operate as intended. (AMENDED 07/06/93; 10/15/96)

(b) Subject to subsections (c) and (d), within a C or WR zoning district the maximum impervious surface coverage permissible on any lot shall be as shown in the following Table of Impervious Surface Calculations, which establishes a sliding scale of permissible impervious surface coverage based on lot size. For purposes of applying the table, lot sizes shall be rounded to the nearest tenth of an acre. Lot sizes of less than 0.5 acres may not exceed 4200 square feet of impervious surface, and lot sizes in excess of five acres may not exceed an impervious surface area equal to 4% of the lot size. For purposes of this subsection, impervious surface includes but is not limited to areas such as a street, driveway, sidewalk, parking lot, building, or other roofed or paved structure.

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LOT SIZE		IMPERVIOUS SURFACE	
ACRES	SQUARE FOOTAGE	SQUARE FOOTAGE	PERCENTAGE
0.5	21,780	4,200	19.28
0.6	26,136	4,300	16.45
0.7	30,492	4,400	14.43
0.8	34,848	4,500	12.91
0.9	39,204	4,600	11.73
1.0	43,560	4,700	10.79
1.1	47,916	4,800	10.02
1.2	52,272	4,900	9.37
1.3	56,628	5,000	8.83
1.4	60,984	5,100	8.36
1.5	65,340	5,200	7.96
1.6	69,696	5,300	7.60
1.7	74,052	5,400	7.29
1.8	78,408	5,500	7.04
1.9	82,764	5,600	6.77
2.0	87,120	5,700	6.54
2.1	91,476	5,800	6.34
2.2	95,832	5,900	6.16
2.3	100,188	6,000	5.99
2.4	104,544	6,100	5.83
2.5	108,900	6,200	5.69
2.6	113,256	6,300	5.56
2.7	117,612	6,400	5.44
2.8	121,968	6,500	5.33
2.9	126,324	6,600	5.22
3.0	130,680	6,700	5.13
3.1	135,036	6,800	5.04
3.2	139,392	6,900	4.95
3.3	143,748	7,000	4.87
3.4	148,104	7,100	4.79
3.5	152,460	7,200	4.72
3.6	156,816	7,300	4.66
3.7	161,172	7,400	4.59
3.8	165,528	7,500	4.53
3.9	169,884	7,600	4.47
4.0	174,240	7,700	4.42
4.1	178,596	7,800	4.37
4.2	182,954	7,900	4.32
4.3	187,308	8,000	4.27
4.4	191,664	8,100	4.23
4.5	196,020	8,200	4.18
4.6	200,376	8,300	4.14
4.7	204,732	8,400	4.10
4.8	209,088	8,500	4.07
4.9	213,244	8,600	4.03
5.0	217,800	8,712	4.00

Art. XVI. FLOOD DAMAGE PREVENTION, STORMWATER MANAGEMENT, AND WATERSHED PROTECTION

(c) If a tract is subdivided, then impervious surface shall be calculated as follows:

- (1) The area of each lot shown on a proposed final plat shall be calculated. For purposes of this calculation, all street right-of-way created as part of the subdivision shall be allocated to the adjoining lots by extending lot lines. If lots are created on either side of a proposed street, lot lines shall be extended to the centerline of the right-of-way.
- (2) Maximum impervious surface area for each lot shall be determined in accordance with subsections (a) or (b).
- (3) The sum total of impervious surface area permissible on the entire tract shall be determined by adding together the impervious surface area available to each lot as determined under subsections (a) or (b).
- (4) The impervious surface area within streets and other areas, (such as common areas) outside of individual lot boundaries shall be subtracted from the total area calculated pursuant to subsection (3).
- (5) Following the calculation set forth in subsection (4), the remaining permissible impervious surface area shall be allocated by the subdivide to each lot, subject to the applicable limitations set forth in this section, and subject to the further limitation that, with respect to a cluster subdivision, in no case may the overall impervious surface area allocation for the subdivided tract exceed 4% of the area of that tract. For purposes of this calculation, the area of each lot shall exclude street right-of-way. The allocation assigned to each lot shall be indicated on the face of the subdivision final plat, and purchasers of each lot shall be bound by such allocation.

(d) If a development is completed in phases or stages, the percentage restrictions set forth in this section shall apply to each separate phase or stage.

(e) All development within the JLWP that requires a sedimentation and erosion control plan under 15A NCAC 4 or the Orange County Sedimentation and Erosion Control Ordinance shall be subject to the following requirements:

- (1) Density and built-upon area shall be limited as follows:
 - a. For single family residential subdivisions, minimum lot sizes of 20,000 square feet or maximum of two dwelling units per acre; or
 - b. Twenty-four percent built-upon area for all other residential and non-residential development; or

Art. XVI. FLOOD DAMAGE PREVENTION, STORMWATER MANAGEMENT, AND WATERSHED PROTECTION

c. Three dwelling units per acre or thirty-six percent built-upon area for properties without curb and gutter systems.

(2) Stormwater runoff from such developments shall be transported by vegetated conveyances to the maximum extent practicable. (AMENDED 10/15/96)

(f) For purposes of this section, the term "built-upon area" means that portion of a development project that is covered by impervious or partially impervious cover, including buildings, pavement, gravel areas (e.g. roads, parking lots, paths), recreation facilities (e.g. tennis courts), etc. Wooden slatted decks and the water area of a swimming pool are considered pervious. (AMENDED 10/15/96)

Section 15-267 Additional Development Standards Within C and WR District.
(AMENDED 11/11/86; 05/15/90)

(a) Buildings and other impervious surfaces within the C and WR zoning districts shall be located, to the extent reasonably possible, so as to (i) take full advantage of the assimilative capacity of the land and (ii) avoid areas described in subsection 15-198(e) and (f). (AMENDED 09/05/95).

(b) To avoid the creation of lots that will be difficult to build upon in a manner that complies with the standard set forth in subsection (a) and the impervious surface limitations set forth in Section 15-266, preliminary and final plats for the subdivision of land within the C and WR zoning districts shall show buildable area and approximate driveway locations for all lots within such subdivision. Thereafter, no zoning permit may be issued for construction of buildings or driveways outside the buildable areas so designated on the final plat unless the zoning administrator makes a written finding that the proposed location complies with the provisions of subsection (a) of this section as well as section 15-266.

Section 15-268 Protective Buffers Along Streams Outside of the Water Supply Watershed (AMENDED 12/06/88)

(a) All streams located outside of the University Lake Watershed and designated in paragraphs (b) and (c) of this section shall have a naturally vegetated, undisturbed protective buffer maintained along them. The purpose of these protective stream buffers is to minimize the likelihood for nuisance flooding by encouraging the location of structures outside of areas likely to experience flooding during large storms, as well as to promote the infiltration of stormwater into the ground and help maintain local streams' capacity for carrying off storm water.

(b) Streams located outside of the University Lake Watershed, with drainage areas smaller than one square mile (640 acres) in area, and where there are no mapped regulatory floodplains, but larger than 50 acres in area shall have a natural protective buffer width of fifty (50) feet or five times the average width of the stream as it flows through the property in question, whichever is larger, maintained on each side of the stream perpendicular to the stream channel, and

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measured perpendicular to the stream channel from the edge of the stream bank. With the exception of uses permitted by the provisions of subsections (f) and (g) of this section, this protective buffer shall be kept in its natural, undisturbed state, and is not permitted to be cleared.

(c) Streams located outside of the University Lake Watershed, with drainage areas smaller than 50 acres in size shall have a natural protective buffer width of fifteen (15) feet or five times the average width of the stream as it flows through the property in question, whichever is larger, maintained on each side of the stream perpendicular to the stream channel, and measured perpendicular to the stream channel from the edge of the stream bank. With the exception of uses permitted by the provisions of subsections (f) and (g) of this section, this protective buffer shall be kept in its natural, undisturbed state, and is not permitted to be cleared.

(d) Where a property owner is not satisfied that the presumptive standard stream buffer width described in subsections (b) or (c) of this section is a reasonably accurate description of the average 100-year floodplain width along the stream through such person's property, such person may initiate a Flood Modeling Study to better determine the location of the 100-year floodplain boundaries. Such a study shall demonstrate through modeling of the drainage basin in which the subject property is located, a more precise location of the floodplain. Such a study shall:

- (1) Be prepared by or under the direct supervision of a professional engineer registered in the state of North Carolina, operating within his or her area of competence, and contain the engineer's professional seal and signature; and
- (2) Utilize the computer model known as HEC-II, which is used by the Army Corps of Engineers in its floodplain modeling, to define the 100-year flood elevations and the width of the floodplain; and
- (3) Be based on future land use and impervious surfaces at build out conditions as predicted by the zoning in place in the drainage basins in question, and utilize as additional inputs to the model any additional information that the Land Use Administrator and Town Engineer may require; and
- (4) Reflect current town requirements for drainage and stormwater management; and
- (5) Provide 100-year flood elevations at each point where the stream crosses the boundary of the subject property, at points where the stream is directed into culverts or under bridges, and at intervals of 200 feet along the course of the stream within the property between these points.

When a determination is made by the town that the Floodplain Modeling Study is complete, accurate, and in an acceptable form, the 100-year floodplain area so modeled shall stand as the required protective buffer area, and development shall be limited pursuant to the provisions of this section only within those areas described by the Study as within the 100-year floodplain. Notwithstanding the foregoing, structures erected in conformity with the buffer requirements set forth in subsections (b) and (c) shall not be regarded as nonconforming if the buffer established

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pursuant to a modeling effort is more extensive than the buffer otherwise established by subsection (b) and (c).

(e) Within the required protective buffer area described in subsections (a), (b), and (c) above, no clearing or grading shall be permitted other than that associated with ordinary maintenance of existing vegetation, the development of uses as described in subsections (f) and (g) below, or the addition of new vegetation consistent with the purposes described in subsection (a).

(f) The following uses are permissible in required protective buffer areas along streams outside of the University Lake Watershed, pursuant to a permit issued for a use permissible in the underlying zone as described in Section 15-146 of this Ordinance, to the extent that they are designed in a manner which minimizes intrusion into the required protective buffer area: streets, driveways, bridges, culverts, utility lines and supporting facilities, railway lines, storm drainage improvements and facilities, stream obstruction removal, sewer and water supply facilities, recreation and other similar public, community, or utility uses.

(g) Because it is not the intent of this section to render undevelopable lots of record on the effective date of this section, intrusions into the protective buffer are permitted in the event that a lot of record would otherwise be made undevelopable by the provisions of this section, to the extent necessary for the lot in question to be developed as permitted by the underlying zoning designation and in such a manner as to minimize the disruption of the protective buffer.

(h) Subsequent to December 06, 1988, no new lot may be created through a major or minor subdivision process that would be undevelopable under the provisions of this section because of the amount or dimensions of protective buffer land included in it, unless such lot has already been developed, or it plainly appears that such lot is intended to be devoted to permanent open space use.

(i) Where the natural vegetation in the protective buffer area has been disturbed by the development of any of the uses permitted in (f) and (g) above, or is otherwise disturbed accidentally during development activities, it shall be replanted with appropriate vegetation in order to re-stabilize the area in question.

(j) Areas set aside as protective stream buffers as required by this subsection may be counted towards required open space as set out in Sections 15-186, 15-187, and 15-198, so long as they are left in their natural and undisturbed state, are unencumbered with any of the permitted uses outlined in (f) and (g), above, and meet all of the other criteria required of "usable" open space as set out in the above-referenced sections.

(k) Nothing in this section shall prevent a single family residence (including a mobile home) from being located within the required protective stream buffer areas if such home (i) replaces a home that had been located within such buffer within six months prior to the effective date of this section and is located on the same location as the previous home, or (ii) is located on a mobile home pad or foundation that was in existence on the effective date of this section.

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Section 15-269 Buffers in Northern Transition Area (AMENDED 05/25/99; 11/19/02)

- (a) The Board finds that:
1. Soil and pollutants carried overland, primarily from roads, trails and land disturbing activities, can be effectively trapped by leaving a relatively undisturbed strip of vegetation parallel and adjacent to the watercourse.
 2. Properly managed overland water flow can be directed into this buffer in a manner that will reduce velocity and cause dispersion of the water.
 3. Sediments and associated pollutants carried by the water will settle out as a result of this slowing and dispersion process.
- (b) For purposes of this section, the term "Northern Transition Area" shall mean not only the Transition Area portion of the Carrboro Joint Development Area as identified in the Joint Planning Agreement, but also any properties that were within this Transition Area as of September 1, 2002 but that are effectively removed from the Transition Area Classification by being annexed into the Town of Carrboro on or after September 1, 2002.
- (c) Notwithstanding the foregoing, these requirements shall not apply to projects with active land use permits issued prior to the effective date of this section.
- (d) Development on lots within the Northern Transition Area shall, if any of the watercourses identified below are located in whole or in part within the lots so developed, contain a designated buffer area adjacent to such watercourses. The buffer area boundaries shall be demarcated by a line connecting the points on either side of the watercourse located as follows:
1. Bolin Creek and Tributaries (permanent streams flowing into Bolin Creek) measure along a line running perpendicular to the edges of the floodplain (or if no floodplain has been demarcated, the center of the stream) one hundred (100) feet from the edge of the floodplain (or if no floodplain has been demarcated, from the edge of the water) plus an additional distance equal to
$$4 \times \text{slope} \times 100$$
where slope is expressed as a percentage derived from dividing by 100 the rise of elevation between the floodplain boundary line (or if no floodplain has been demarcated, the edge of the water) and a point one hundred (100) feet from that point along the perpendicular line described above. (AMENDED 1/16/07).
 2. Intermittent streams flowing into Bolin Creek and its tributaries measure along a line running perpendicular to and sixty (60) feet from the center of the intermittent stream. (AMENDED 1/16/07).

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3. Minor intermittent stream measure along a line running perpendicular to and thirty (30) feet from the center of the minor intermittent stream. (AMENDED 1/16/07).
- (e) Subject to subsection (e), the existing natural vegetation in a buffer area designated in accordance with this section shall not be disturbed in any way that would reduce the buffer area's effectiveness in achieving the objectives set forth in subsection (a). In addition, buffer areas from which the vegetative cover does not exist, has been removed, or is inadequate shall be planted or otherwise provided with vegetative cover or devices, sufficient to allow the buffer area to accomplish the objectives set forth in subsection.
 - (f) Notwithstanding the foregoing provisions, the permit issuing authority may authorize the crossing of a designated buffer area by a street, bikeway, sidewalk, water or sewer line or pump station under the circumstances specified in Subsection 15-184(g). In addition, the permit issuing authority may authorize sewer lines to be constructed within buffer areas designated under this section under circumstances where such location is practicably unavoidable if the subject property is to be served under the provisions of Section 15-238(c) and an alternate design would result in greater damage to the environment, so long as such sewer line is located to the extent practicable at least twenty-five feet from the edge of any stream bank.



TOWN OF CARRBORO

NORTH CAROLINA

TRANSMITTAL

PLANNING DEPARTMENT

DELIVERED VIA: ☒ HAND ☐ MAIL ☐ FAX ☐ EMAIL

To: Steven Stewart, Town Manager
Mayor and Board of Aldermen

Via: Roy Williford, Planning Director
Patricia McGuire, Planning Administrator

From: Randy Dodd, Environmental Planner

Date: November 14, 2008

Subject: Water Quality Buffer Conformity Analysis

The purpose of this memo is to present results of a conformity analysis as part of the Town's review of proposed water quality buffers. In specific, the total areas in current and proposed buffers in both the Northern Transition Area (NTA), University Lake Watershed, and the remainder of the Town's planning jurisdiction are presented, along with a simple overlay of buffers onto buildings as one indicator of conformity considerations for the built environment.

A number of different factors (e.g., stream and floodplain mapping, slope-based buffer width extension, zonation) are simultaneously affecting the relative footprint of current and proposed buffers. While recognizing these complexities, the intent of the analysis presented herein is to holistically look at the proposed buffers and present some simple summary statistics. The mapping of existing and proposed stream buffers and this conformity analysis have been carried out using the Town's GIS resources and best available data. Inherent in these processes are some limitations; a full understanding of the particular impacts of proposed changes and implementation of the buffer regulations will rely on field verification of data, and are difficult to generalize for site level impacts.

In light of the complexities in comparing current and proposed buffer geography, the analysis presented requires considerable qualification to aid in the interpretation and to avoid biased representation. The following are particularly important points to consider:

1. The mapping of buffers is obviously constrained and influenced by the data used at the time of mapping. The Town has in particular overhauled both hydrography data and stream definitions since mapping the current buffers; therefore any comparison of current and proposed buffers needs to recognize the reliance on different data sources.
2. The proposed buffers are wider in places and narrower in others in consideration of differences in base widths and points of reference (streambanks, center lines, or floodplains) from which widths are measured.
3. It is not possible to directly compare the previously mapped NTA buffers and the proposed ones. In 1999, two-foot contours were extrapolated and slope adjustments manually included in order to create a static map that was adopted as part of the LUO. It has not been possible to recreate the data used to create the 1999 map. In addition, floodplain mapping has been updated since the original buffer mapping, thereby affecting the buffer geometry.
4. The proposed buffers and new stream mapping explicitly defines regulated ephemeral streams as draining 5 acres or more. Previously defined buffers did not identify a minimum drainage threshold in order for drainage features to be classified as streams. While not necessarily a conformity issue, it is expected that some very difficult to develop sites with identified small stream features will become developable; small drainage features will be regulated using storm water/site planning provisions rather than water quality buffers.
5. Finally, the proposed buffer provisions do not present a simple “can or cannot develop” for nonconforming situations. The usability of any lot that contains a nonconforming structure will be determined based on the table of exempt and restricted activities, and the LUO provisions related to nonconforming situations and, if necessary, variances. It may be noted that a provision exempting certain additions to detached, single-family residences within ephemeral stream buffers has also been included in the draft ordinance (Section 15-270.5(i)).

Within these constraints and considerations, the summary statistics of the analysis are presented in Table 1.

Table 1: Area in Current and Proposed Buffers

	Area in Current Buffers (% of total area)	Area in Proposed Buffers (% of total area)
Northern Transition Area (NTA)	534 acres (20.4%)	477 acres (18.2%)
Area Outside of NTA	393 acres (12.3%)	572 acres (17.8%)
<u>Watershed</u>	<u>669 acres (34.5%)</u>	<u>616 acres (31.8%)</u>
Entire Jurisdiction	1596 acres (20.1 %)	1665 acres (21.0%)

In considering the total buffered area, the proposed buffers are about 2% smaller (relative to the total area) in the NTA, 3% smaller in the watershed, and about 5% larger in the area outside of the NTA and watershed. Currently, 8% more land relative to the total hydrojurisdictional area is buffered in the NTA than outside of the NTA; with the proposed buffer geometry, the two hydrojurisdictional areas achieve parity at 18% of the total area. A higher proportion of land (about one third) is buffered in the watershed relative to the rest of the Town’s jurisdiction due to

the larger buffer width and the larger area of surface waters. On balance for the entire jurisdiction, the buffered area would increase by 69 acres, or about 1% of the total area.

Given the complexity of the proposed buffer rules, a variety of potential approaches exist to study conformity. For this analysis, a simple approach of overlaying GIS-based buffer geometry onto existing buildings has been employed to provide one of many possible metrics (Table 2). The analysis has not been completed for the watershed because of the relatively small number of buildings affected based on visual inspection.

Table 2: Projected Effect of Draft Ordinance in Creating New Nonconforming Buildings *

	(1) Buildings in Proposed Buffers Not in Current Buffers (% of total)	(2) Buildings in Current Buffers Not in Proposed Buffers (% of total)	Net Number of Affected Buildings (1-2)
Northern Transition Area (NTA) (1169 total buildings)	19 (1.6%)	88 (7.5%)	-69 (-5.9%)
Area Outside of NTA** (5401 total buildings)	242 (4.4%)	75 (1.4%)	+167 (+3.1%)
Total (sum) (6570 total buildings)	261 (4.0%)	163 (2.5%)	+98 (+1.5%)

*Visual inspection of aerial imagery and attributes in GIS building data (type of building, square footage) were used to eliminate very small and accessory structures from the analysis. In addition, single family residences in proposed ephemeral buffers that are not in current buffers were excluded based on proposed exemption for the expansion of existing detached, single-family residences (including attached garages).

This analysis indicates a decrease in buildings affected in the NTA and an increase in buildings affected outside of the NTA (based on absolute numbers rather than proportions).

Of the 261 estimated new nonconforming buildings, 85% are single family residences, 9% are multifamily residences, and the remaining 6% are in other uses. The new buffer geometry would have an impact of increasing the number of nonconforming buildings by about 98 buildings, or 1.5% of all buildings. Virtually all of the new nonconformities would be in Zone 2 of the buffers, where greater flexibility exists for allowable activities than in Zone 1.

As part of the information package for public review, maps of current and existing buffers and buildings affected are available at <http://www.townofcarrboro.org/msg.htm#5>.

Recommendations

Staff recommends that these results be considered as part of the information package related to consideration of the draft ordinance revising water quality buffers.

ORANGE COUNTY PLANNING & INSPECTIONS DEPARTMENT

Craig N. Benedict, AICP, Director

Administration
(919) 245-2575
(919) 644-3002 (FAX)
www.co.orange.nc.us



306F Revere Road
P. O. Box 8181
Hillsborough, NC 27278



TRANSMITTAL DELIVERED VIA EMAIL

November 17, 2008

Patricia J. McGuire, AICP
Planning Administrator
Town of Carrboro
301 W. Main St.
Carrboro, NC 27510

Dear Trish:

Thank you for the opportunity to review the following ordinance amendments received by us on October 24, 2008 and proposed for town public hearing on November 25, 2008:

▪ **Water Quality Buffers.**

In addition to the verbal comments I made to you over the phone regarding some formatting issues, I also forwarded this proposal to our Erosion Control Officer. We offer the following comments for your consideration:

1. Table of Uses, "Drainage, Stormwater, Erosion Control and other Water-based activities" where it reads, "New or altered drainage ditches..." it appears that a second bullet was deleted at some point and that it should be re-inserted.
2. Table of Uses, "Drainage, Stormwater, Erosion Control and other Water-based activities" where it reads, "Stormwater BMPs:"; It seems contradictory to "exempt" stormwater wetlands in Zone 1. This would mean a developer could impact Zone 1 without providing a statement of no practical alternatives. Further, the point of stream buffers is to have a well-developed forested riparian area. We suggest not allowing any stormwater BMPs in Zone 1 without mitigation.
3. Under Section 15-270.8 Requirements Specific to Forest Harvesting, item #8 allows for planting of trees, shrubs, or ground cover plants to enhance the buffer...provided plantings consist "primarily of native species". Suggest

removing the word "primarily"; buffers should contain native, non-invasive species only.

4. Regarding forest harvesting (Section 15-270.8)...we presume the Town has researched this thoroughly. However, it is our understanding that there can be NO local government regulation of forestry (GS 160A-458.5 & 153A-451) if forestland is assessed at present-use value or if the forestry is conducted according to a forestry management plan developed by a registered forester. The exception is if the regulation is required to comply with federal and/or state law. Certainly if the Jordan Lake rules pass, there will be state required stream buffers and these rules would then apply, but Carrboro's proposed rules are more restrictive. We suggest that if this hasn't been discussed with the Town's attorney, you may desire to do so to ensure this provision is allowed.
5. Did Carrboro consider an "add-in" rule? In the County's rules we can require a stream buffer on an intermittent or perennial stream even if it was NOT mapped, provided an on-site determination is conducted and the stream meets the state standards to be classified as such. Perhaps there would be few instances this occurs since Carrboro's rules do buffer ephemeral channels under certain circumstances.
6. We presume that Enforcement and Penalties would be handled in the same manner as other enforcement actions occurring under the Town's Land Use Ordinance. If not, how does Carrboro intend to handle buffer violations?

If you have any questions regarding our comments, please address them to me or to our Erosion Control Officer, Terry Hackett, at 245-2575.

Sincerely,



Perdita Holtz, AICP
Planning Systems Coordinator

cc: Laura Blackmon, ICMA-CM, Orange County Manager
Craig Benedict, AICP, Orange County Planning Director

E A B R E C O M M E N D A T I O N

THURSDAY, NOVEMBER 20, 2008

Land Use Ordinance Text Amendment related to water quality buffers

Motion was made by Jennifer Winston and seconded by Dana Stidham that the EAB wholeheartedly recommends that the Board of Aldermen adopt AN ORDINANCE REVISING ARTICLE XVI OF THE CARRBORO LAND USE ORDINANCE DEALING WITH FLOOD DAMAGE PREVENTION, STORMWATER MANAGEMENT, AND WATERSHED PROTECTION. The EAB further recommends the following recommended minor modification. In Section 15-270.5(c) under Transportation, Temporary roads, provided that restoration activities, such as soil stabilization and revegetation, occur immediately after construction:

- Less than or equal to 2,500 square feet of buffer disturbance

Be changed from Exempt to Allowable

and

- Greater than 2,500 square feet of buffer

be changed from Allowable to Allowable with mitigation

The EAB commends staff for a job very well done.

VOTE: AYES: (4) Taylor, Winston, Hay, Stidham ABSENT/EXCUSED: (2) Mullen, Weller NOES (0)
ABSTENTIONS (0)

Associated Findings

By a unanimous show of hands, the EAB membership also indicated that no members have any financial interests that would pose a conflict of interest to the adoption of this amendment.

November 20, 2008

_____, *Chair*

Bob Taylor

Comments from DWQ Staff

15-270.3 Width of Buffers: The buffer is always measured from the top of bank. Measurement from the center of the stream is not permitted.

15-270.4 Diffuse Flow Requirement: We suggest using the phrase 'maximum extent practicable' instead of 'extent practicable'. This is the phrase used in other sets of rules and by the EPA. It's still a little hard to define, but I think it would make this diffuse flow requirement a little tougher for a developer to brush off. You may have to change the wording if the Jordan rules are adopted to drop 'maximum extent practicable' all together.

15-270.5 Exempt and Allowable Activities: There are many areas that need improvement in your draft table of uses. It seems like some activities that should be listed as exempt are listed as allowable and there are some uses listed as allowable that could be exempt. For example, Stream Bank Stabilization should be listed as 'allowable'. All water dependent structures should be listed as 'allowable'. All stormwater BMPs should be listed as 'allowable'. (I didn't understand the first item under Stormwater BMPs -- if the constructed wetland is more than 30 feet away from the water, then it couldn't still be in zone

1.) Preservation of historic sites can be listed as 'exempt'. There are more, but it may be easiest for you to go back and make changes to your table while looking at the draft Jordan rules.

There are some uses which aren't addressed in our current rules, and which I'm not sure should be included in your table. Stream relocation should not be 'exempt' and probably should not be in the table at all.

I do not understand 'Water dependent structures where installation does not result in disturbance to riparian buffers' -- I'm not sure it is possible not to disturb the buffer when installing a water dependent structure. If you keep this item, you should at least list it as 'allowable'. I do not think that 'Fences provided that disturbance is minimized and installation results in removal of trees' should be listed in the table. Under Recreation, I'd suggest eliminating 'Pedestrian access trails that exceed 4 feet'. A trail this wide would be hard to justify.

Also, I don't see a column in the table for prohibited uses, such as excavation of a streambed to bring it to the same elevation as the invert of a ditch, ongoing fertilizer application, and on site sanitary sewage systems. I think these should be included in your table.

Under the definitions of 'allowable' and 'allowable with mitigation, you should state that these uses require written authorization from the Division or delegated local authority prior to the applicant performing the impacts.

15-270.7 Mitigation for Water Quality Buffers (e): The town's water quality enhancement fund must be approved by DWQ before it can accept payments. I've been told that Carrboro has not submitted an application for approval of their fund.

15-92.2 Variances: Under the water supply rules, you need to have definitions for minor and major variances. Minor variances get approved by the local government; major through the EMC. See the

Water Supply Model Ordinance for this language:

<http://h2o.enr.state.nc.us/wswp/documents/ModelOrd2.doc>

To conform with existing riparian buffer rules and the proposed Jordan buffer rules, you'd need to change the variance section to include definitions of major and minor variances and the criteria to qualify for a variance. See the proposed Jordan rules for this language.

From: Carolyn Buckner [mailto:mojobuckner@hotmail.com]

Sent: Monday, November 24, 2008 10:23 PM

To: mark_chilton@hotmail.com; Jacquelyn Gist; brounsj@mindspring.com; lydia@lydialavelle.com; John Herrera (Forward to External); Randee Haven-O'Donnell; dan-coleman@nc.rr.com

Cc: zzDept. Mail - Town Clerk

Subject: Please Enact Proposed Buffer Rule Ammendments

Dear Aldermen Broun, Chilton, Coleman, Gist, Haven-O'Donnell, Herrera and Lavelle,

I am writing in **STRONG** support of the proposed amendments to the land use ordinance relating to water quality buffers with the following minor changes:

1. In the table listing activities as exempt, allowable and allowable with mitigation, under temporary sediment and erosion control devices, please delete "Zone 1" from the second bullet.
2. In the same table, under temporary roads, please change the two bulleted activities from "exempt" and "allowable" to "allowable with mitigation".

Other than these two changes, I wholeheartedly endorse these amendments AS WRITTEN. I commend Randy Dodd for all the work that obviously went into drafting them.

Sincerely,

Carolyn Buckner,
Carrboro Resident and
Environmental Engineer w/ P.E. License in Civil Engineering and
a working history in Watershed Management and Stream Restoration and
past member of the Environmental Advisory Board.

MOTION OF THE NORTHERN TRANSITION AREA ADVISORY COMMITTEE
REGARDING PROPOSED REVISIONS TO ARTICLE XVI OF THE CARRBORO LAND
USE ORDINANCE DEALING WITH FLOOD DAMAGE PREVENTION,
STORMWATER MANAGEMENT AND WATERSHED PROTECTION

The Northern Transition Area Advisory Committee (NTAAC) recognizes and generally supports the **Town's having to make amendments to comply with State requirements for Jordan Lake** and striving to protect its surface and groundwater resources through adequate regulations. Water protection is, and should continue to be, a vital goal and value of the Town's.

The proposed revisions to the Land Use Ordinance Article (LUO) XVI endeavor to improve the protection of water within the Town's corporate limits and planning jurisdiction. The revisions attempt to make regulations regarding water regulations consistent across the Town **and to comply with State requirements.**

Separate from its support of the goal as stated below, the NTAAC has several concerns with the proposed revisions to the existing regulations:

- * The revisions are extremely complex and not easy to follow. The average citizen and homeowner will be hard pressed to be able to determine for themselves how to accurately apply, in an manner independent of Town staff, these regulations to their own property.

- * In the effort to focus purely on water protection, the revisions and changes to such aspects of water protection as size of buffers, impact of steep slopes, and changes of uses, do not appear to take into consideration what the current ordinance does in terms of protection of wildlife corridors, open space, and protection of forest land, native plants, walking trails, etc. The NTAAC is concerned that there is not adequate justification to remove the use of a slope base calculation in determining the location and width of stream buffers in the Northern Transition Area **and wants to make sure that Bolin Creek and its many tributaries and associated buffers are well-protected.**

In addition, significant reductions have been made to the buffers that currently exist in the Northern Transition Area in name of conformity. These reductions, which total sixty (60) acres of land, single out the Northern Transition Area without any further justification and without apparently establishing other protective regulations that address other values and reasons for maintaining the existing buffer sizes.

- *The provisions do not appear to address the issue of what uses may or may be made non-conforming if they are put into effect. There are uses in the Northern Transition Area that include the development or possible development of agriculture, silva-culture and the caring and use of animals. The NTAAC believes that these uses should continue to be allowed in the NTAAC and not subject to the revisions nor should they be made non-conforming.

* Section 15-269 of the LUO was created to augment the existing protections under the LUO in 1999 based on the recommendations of the Zoning Task Force that was formed to create zoning for the Northern Transition Area based on the adopted plan. These provisions were specific to assist in the protection of Bolin Creek and its tributaries. The NTAAC would not want to diminish these specific protections for Bolin Creek in any manner.

*Section 15-270.7 raises concerns that payment of a mitigation fee might become the norm rather than the exception, thereby resulting in loss of important buffer area.

*The NTAAC expresses a question about the ability of staff, from a time management point of view, to effectively monitor riparian and stream mitigation and restoration projects. **Who would be in charge of evaluating the different options for development uses?**

Based on the concerns recited above, the NTAAC recommends that the Board of Aldermen do the following:

1. Instruct staff to find ways to make the language and structure of the changes to the ordinance more user-understandable and more user-friendly. Different word choices, an index, illustrations where formulas may be used, and step by step examples are possible approaches.
2. Instruct the staff to develop other ordinances which justify maintaining the size of the existing buffers in the Northern Transition Area to protect other values such as wildlife, steep slopes and open space, which are valued by Carrboro citizens, so as not to lose the sixty (60) acres that would be lost if the current revisions are enacted.
3. Instruct staff to show approximately where buffers are being reduced in the Northern Transition Area and the distances from the stream of such lost buffer area. A chart should be made available which shows existing stream buffers in each area of the Town.

An approach that NTACC suggests is to use the town's GIS system to create overlay maps that show the:

- a. land not protected by buffers
 - b. land with primary constraints plus buffer
 - c. land with primary constraints plus proposed buffer
4. Make sure that any and all property owners that are to be effected by such proposed revisions are given individual notice for any future public hearing on the issues of such revisions.
 5. Instruct staff to create a matrix that shows to the Board and the general public which sections and language in the current ordinance are being changed and how and which are completely new.

6. Preservation or maintenance of historic or cultural sites under recommended 15-270.5© should be an “exempt activity” because it is illogical to require such sites to be moved or discontinued.

(Previous No. 6 from the last version was removed.)

7. **Make sure that Section 15-270.5 includes a statement in its opening paragraph that reads as follows:**

All uses that exist in or for any buffer or stream subject to Carrboro’s Land Use Ordinance at the time any amendments to Sections 15-265, 15-268 and 15-269 of Part II of Article XVI of the Carrboro Town Code, the Carrboro Land Use Ordinance, are approved as of _____, 2009, are exempt from said amended regulations.

8. Instruct staff to address other concerns of the NTAAC not specifically mentioned in nos. 1 through 7 above.

Ayes in favor of the motion:

Nays:

Date of meeting: February 16, 2009

NTA Comment	Staff Response
<p>The revisions are extremely complex and not easy to follow.</p> <ul style="list-style-type: none"> • Instruct staff to find ways to make the language and structure of the changes to the ordinance more user-understandable and more user-friendly. Different word choices, an index, illustrations where formulas may be used, and step by step examples are possible approaches. • Instruct staff to create a matrix that shows to the Board and the general public which sections and language in the current ordinance are being changed and how and which are completely new. • The average citizen and homeowner will be hard pressed to be able to determine for themselves how to accurately apply, in an manner independent of Town staff these regulations to their own property. 	<p>Staff appreciates the complexity of the draft ordinance. Response to specific requests are noted below:</p> <ul style="list-style-type: none"> • More user-understandable and more user-friendly: the draft provisions are much improved in terms of the use of universal language to facilitate compliance with draft Jordan Lake rules and current norms for water quality buffer regulations. • Staff recommends developing educational materials for the ordinance posted on the Town website and made available to interested parties as requested. • Illustrations/formulas: there are no formulas in the draft provisions • Step-by-step examples: Staff are planning to prepare a site level step-by-step example illustrating the ordinance for educational purposes. Staff recognizes that there will be a learning curve as part of implementation. • Staff will prepare a matrix showing ordinance changes as part of educational materials
<p>Instruct staff to show approximately where buffers are being reduced in the Northern Transition Area and the distances from the stream of such lost buffer area. A chart should be made available which shows existing stream buffers in each area of the Town.</p> <p>An approach that NTACC suggests is to use the town's GIS system to create overlay maps that show the:</p> <ol style="list-style-type: none"> land not protected by buffers land with primary constraints plus buffer land with primary constraints plus proposed buffer 	<ul style="list-style-type: none"> • Staff will finalize GIS data and post on the Town website prior to the ordinance effective date. Staff reminds all parties, as presented in staff memos and in staff presentations, that the GIS data, while providing a reasonable general portrait of buffers, has several important constraints and that site/survey level data will be required for regulatory purposes. • Staff included in the agenda packet for the 11/25 public hearing maps that depict current and proposed buffers are posted on the Town's website at http://www.townofcarrboro.org/msg.htm#5.

<p>In the effort to focus purely on water protection, the revisions and changes to such aspects of water protection as size of buffers, impact of steep slopes, and changes of uses, do not appear to take into consideration what the current ordinance does in terms of protection of wildlife corridors, open space, and protection of forest land, native plants, walking trails, etc. The NTAAC is concerned that there is not adequate justification to remove the use of a slope base calculation in determining the location and width of stream buffers in the Northern Transition Area and wants to make sure that Bolin Creek and its many tributaries and associated buffers are well-protected.</p> <p>In addition, significant reductions have been made to the buffers that currently exist in the Northern Transition Area in name of conformity. These reductions, which total sixty (60) acres of land, single out the Northern Transition Area without any further justification and without apparently establishing other protective regulations that address other values and reasons for maintaining the existing buffer sizes. * Section 15-269 of the LUO was created to augment the existing protections under the LUO in 1999 based on the recommendations of the Zoning Task Force that was formed to create zoning for the Northern Transition Area based on the adopted plan. These provisions were specific to assist in the protection of Bolin Creek and its tributaries. The NTAAC would not want to diminish these specific protections for Bolin Creek in any manner.</p> <p>Instruct the staff to develop other ordinances which justify maintaining the size of the existing buffers in the Northern Transition Area to protect other values such as wildlife, steep slopes and open space, which are valued by Carrboro citizens, so as not to lose the sixty (60) acres that would be lost if the current revisions are enacted.</p>	<ul style="list-style-type: none"> • Staff believes that this ordinance as drafted provides a significant enhancement for water quality protection. • With regard to protection of wildlife corridors, open space, forest land, and native plants, these changes are neutral because of the provisions in Section 15-198(b)(4) of the ordinance. • With regard to the use of a slope based calculation for determining the buffer width, staff recommend that the ordinance discontinue the use of this method because the additional width encourages the discharge of runoff into a buffer down a steeper grade with more likelihood of erosion, and provides a longer flow path for diffuse flow to concentrate as it passes through the buffer, also increases the probability of erosion. • A GIS analysis was conducted that resulted in the estimate of a 60 acre reduction. Staff reminds all parties, as presented in staff memos and in staff presentations, that the GIS data, while providing a reasonable general portrait of buffers, has several important constraints. Using GIS, it is not possible to precisely quantify the actual changes. GIS data approximating the changes have been provided.
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Make sure that any and all property owners that are to be affected by such proposed revisions are given individual notice for any future public hearing on the issues of such revisions.	Public notice as required by the LUO and the BOA has been provided.
<p>The provisions do not appear to address the issue of what uses may or may be made non-conforming.</p> <p>Make sure that Section 15-270.5 includes a statement in its opening paragraph that reads as follows:</p> <p>All uses that exist in or for any buffer or stream subject to Carrboro's Land Use Ordinance at the time any amendments to Sections 15-265, 15-268 and 15-269 of Part II of Article XVI of the Carrboro Town Code, the Carrboro Land Use Ordinance, are approved as of _____, 2009, are exempt from said amended regulations. forming if they are put into effect.</p>	Staff has completed a town wide conformity screening as presented in the staff memo. The ordinance includes provisions allowing existing uses to continue, an extensive list to clarify exempt, allowable, allowable with mitigation; prohibited uses are implicit. The ordinance provisions do not require retrospective changes in existing uses. Staff have included language in 15-270.5(e)-(i) to protect the ability to develop lots of record.
There are uses in the Northern Transition Area that include the development or possible development of agriculture, silviculture and the caring and use of animals. The NTAAC believes that these uses should continue to be allowed in the NTAAC and not subject to the revisions nor should they be made non-conforming.	The draft Jordan rules do not exempt agriculture, silviculture, or caring and use of animals. Therefore, any special allowance for these uses for buffers adjacent to intermittent or perennial streams will be subject to State oversight, and could require future of the LUO. It is also important to note that the Town has limited legal authority for regulation of silvicultural activities.
Section 15-270.7 raises concerns that payment of a mitigation fee might become the norm rather than the exception, thereby resulting in loss of important buffer area.	Mitigation would insure no loss rather than result in loss.
The NTAAC expresses a question about the ability of staff, from a time management point of view, to effectively monitor riparian and stream mitigation and restoration projects. Who would be in charge of evaluating the different options for development uses?	The changes are designed to streamline review of potential uses and activities in buffers and clarify to all staff reviewers, developers, property owners, and the public the details of exempt, allowable, and prohibited activities, and mitigation options. No proposed change in development review process is proposed.
Preservation or maintenance of historic or cultural sites under recommended 15-270.5© should be an "exempt activity" because it is illogical to require such sites to be moved or discontinued	Change has been included in latest update.
Instruct staff to address other concerns of the	Staff are available to respond to specific

NTAAC not specifically mentioned in nos. 1 through 7 above.	concerns
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