

## 8.25 S.W.I.M. (Surface Water Improvement and Management) Stream Buffers

.1 Purpose. The purpose of a stream buffer network is to filter pollutants, store floodwaters, provide habitat, and contribute to the “green infrastructure”. Stream systems are comprised of each stream and its respective drainage basin.

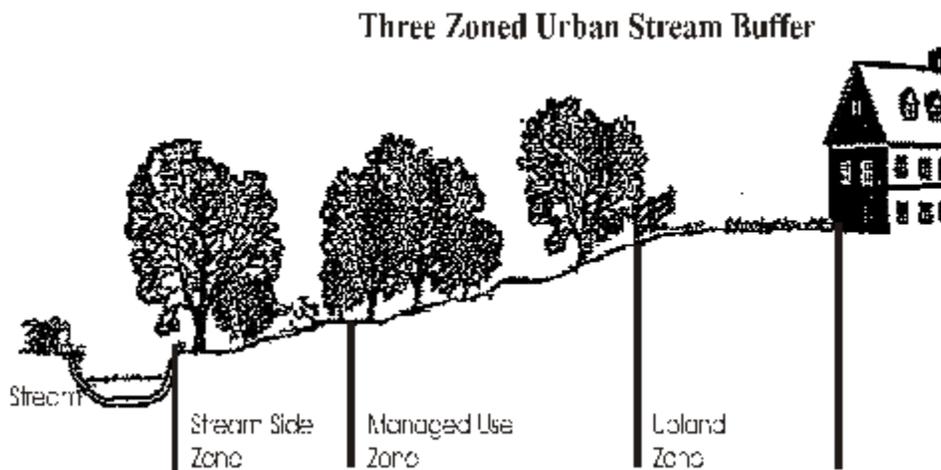
- Streams have the primary natural functions of conveying storm and ground water, storing floodwater, and supporting aquatic life.
- Vegetated lands adjacent to the stream channel in the drainage basin serve as “buffers” to protect the stream’s ability to fulfill its natural functions. Buffers have the primary natural functions of protecting water quality by filtering pollutants, providing intermittent storage for floodwaters, allowing channels to meander naturally, and providing suitable habitat for wildlife.

.2 Definitions. For the purposes of this section, the following words and phrases shall be defined as specified below:

Best Management Practices (BMP's). A structural or nonstructural management based practice used singularly or in combination to reduce non-point source input to receiving waters in order to achieve water quality protection goals.

Buffer. A vegetated area through which storm water runoff flows in a diffuse manner so that the runoff does not become channelized and which provides for infiltration of the runoff and filtering of pollutants.

Buffer Zones. Buffer widths are measured in three (3) zones as shown below. The buffer width is measured horizontally and must be surveyed by a licensed land surveyor on a line parallel to the surface water, landward from the top of the bank on each side of the stream.



Drainage Basin. The area of land that drains to a given point on a body of water.

Floodway. The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface

elevation more than the allowable surcharge (currently one foot).

Flood Fringe. The land area located between the limits of the floodway and the maximum elevation subject to inundation by the base (1% chance) flood.

Floodplain. The low, periodically flooded lands adjacent to rivers and lakes. For land use planning purposes, the regulatory floodplain is usually viewed as all land alongside a watercourse that would be inundated by the base (1% chance) flood; the floodway plus the flood fringe.

Mitigation. Actions taken on-site and/or off-site to offset the effects of temporary or permanent loss of a buffer.

Top of Bank. The landward edge of the stream channel during high water, bankfull conditions at the point where water begins to overflow onto the floodplain.

### .3 Applicability.

a) All properties shall comply with the buffer requirements of this Section except those which, as of the effective date of October 19, 1999, have previously secured a right to proceed by one of the following methods, and have received written authorization to disturb the buffer from the Town's Planning Staff:

- Having been issued a Certificate of Building Code Compliance;
- Being subject to an approved major subdivision preliminary plan and/or recorded final plat;
- Being subject to a minor subdivision plat, exempt plat listed under the definition of subdivision in the Subdivision Ordinance, or described by metes and bounds in a recorded deed which:
  - If to be used for residential purposes, are one (1) acre or less in size.
  - If to be used for nonresidential purposes or mixed use purposes, are four (4) acres or less in size if located on a non-FEMA regulated floodway, or are seven (7) acres or less in size if located on a FEMA regulated floodway.
- Being subject to a site specific development plan defined under [Section 2.2.2](#) of these zoning regulations; or
- Having otherwise secured a vested property right under state law.

b) Redevelopment or expansion of uses and structures included in a), above, shall comply with the buffer requirements of this Section, however uses and structures previously approved and constructed in a buffer may remain.

c) A site specific development plan amended by action of the Board of Commissioners subsequent to adoption of this Section shall comply, in its amended form, with the S.W.I.M. buffer requirements, however uses and structures previously approved for construction in a buffer may remain.

d) Where stream buffers are also required as part of the Lake Norman or Mountain Island Lake Watershed Overlay Districts, the more stringent of the stream buffer requirements shall apply.

### 4 Buffer Delineation.

S.W.I.M. Stream Buffers, throughout the jurisdiction of the Town of Huntersville shall be delineated by Mecklenburg County through its geographic information system (GIS) using the most current digital elevation model (DEM) of no greater than 10-foot cells. This stream buffer delineation

including buffer widths shall be periodically updated as new data becomes available. The most recent delineation shall be provided for public use through Mecklenburg County’s website.

**.5 Minimum Buffer Widths.**

All perennial and intermittent streams draining less than 50 acres shall have a minimum 30-foot vegetated buffer including a 10-foot zone adjacent to the bank. Disturbance of the buffer is allowed; however, any disturbed area must be re-vegetated and disturbance of the 10-foot zone adjacent to the bank shall require stream bank stabilization using bioengineering techniques as specified in the Design Manual. All perennial and intermittent streams draining greater than or equal to 50 acres and less than 300 acres shall have a 35-foot buffer with two (2) zones, including a 20-foot stream side and 15-foot upland zone. Streams draining greater than or equal to 300 acres and less than 640 acres shall have a 50-foot buffer with three (3) zones, including a 20-foot stream side, 20-foot managed use and 10-foot upland zone. Buffers for streams draining greater than or equal to 640 acres shall be 100 feet in width or include the entire floodplain, whichever is greater. This buffer shall consist of a 30-foot stream side, 45-foot managed use and 25-foot upland zone or the entire FEMA floodplain, whichever is greater. All buffers shall be measured from the top of the bank on both sides of the stream. A summary of minimum buffer widths is provided in the table below.

Table of Minimum Buffer Widths by Basin Size and Buffer Zone

Area Designation	Stream Side Zone	Managed Use Zone	Upland Zone	Total Buffer Width each side of Stream	Notes
<50 acres	N/A	N/A	30 feet	30 feet	[1,2]
>50 acres	20 feet	None	15 feet	35 feet	[2]
>300 acres	20 feet	20 feet	10 feet	50 feet	[2]
>640 acres	30 feet	45 feet	25 feet or balance of floodplain, whichever is greater	100 feet or entire floodplain, whichever is greater	[2,3]

Notes:

[1] All perennial and intermittent streams draining less than 50 acres shall have a minimum 30-foot vegetated buffer including a 10-foot zone adjacent to the bank. Disturbance of the buffer is allowed; however, any disturbed area must be re-vegetated and disturbance of the 10-foot zone adjacent to the bank shall require stream bank stabilization using bioengineering techniques as specified in the Design Manual.

[2] Buffer widths are surveyed horizontally on a line parallel to the surface water, landward from the top of the bank on each side of the stream.

[3] Floodplain and buffer calculations will be based upon the FEMA flood fringe and floodway encroachment lines, as locally adopted and as may be amended from time to time.

**.6 Buffer Description.**

Buffer function, vegetation and use vary according to the different buffer zones and are described in the following table.

**Table of Buffer Treatment by Buffer Zone**

	<b>Stream Side Zone</b>	<b>Managed Use Zone</b>	<b>Upland Zone</b>	<b>Notes</b>
<b>Function</b>	Protect the integrity of the ecosystems	Provide natural filter; provide distance between upland development and the stream side zone	Prevent encroachment and filter runoff	
<b>Vegetative Requirements</b>	<b>Undisturbed (no cutting, clearing or grading).</b> If existing tree density is inadequate, reforestation is required.	<b>Limited clearing (no grading).</b> Existing tree density must be retained to a minimum of 8 healthy trees of a minimum 6 inch caliper per 1000 square feet. If existing tree density is inadequate, reforestation is encouraged.	<b>Herbaceous ground cover,</b> including grass, is allowed; maintenance of existing forest or reforestation is encouraged.	(1)
<b>Uses</b>	<b>Very restricted.</b> Permitted uses limited to flood control structures and bank stabilization (where permitted) as well as installation of parallel or near perpendicular (greater than or equal to 75 degrees) water and sewer utilities and near perpendicular road crossings (greater than or equal to 75	<b>Restricted.</b> Permitted uses limited to those allowed in the Stream Side Zone, as well as bike paths and greenway trails up to 10 feet in width.	<b>Restricted.</b> Permitted uses limited to those allowed in Stream Side and Managed Use Zones, as well as gasebos, non-commercial storage buildings less than 150 square feet, limited grading that does not change the functionality or extent of the floodplain, and storm water structural best management practices	(2), (3), (4)

	degrees) with stabilization of disturbed areas as specified in Section 8.25.10.		(BMPs) if approved in accordance with Section 8.25.11 b), as a condition of a buffer width variance.	
--	---	--	--	--

**Note:**

(1) When reforestation of disturbed buffers is required, tree planting shall be as specified in the Charlotte Mecklenburg SWIM Stream Buffer Implementation Guidelines.

(2) Fill material cannot be brought into any required buffer. In the Upland Zone only, limited grading that does not change the extent or functional characteristics of the floodplain is permitted. Uses permitted in the buffer zones should be coordinated to ensure minimal disturbance of the buffer system. For example, if it is necessary to install utilities within the buffer, then if Greenway Trails are built they should follow these cleared areas instead of necessitating additional clearing.

(3) Notwithstanding the uses and structures permitted in the "Upland Zone", the stricter standards of floodway regulations, if applicable, shall apply.

(4) Greenway Trails referenced in this table refer exclusively to those approved by and dedicated to the Town of Huntersville or Mecklenburg County Parks and Recreation Departments. Other paths or trails in the buffer shall be in accordance with the Charlotte-Mecklenburg SWIM Stream Buffer Implementation Guidelines.

.7 Diffuse Flow Requirement. Diffuse flow of runoff shall be maintained in the buffer by dispersing concentrated flow through the use of level spreaders or other such devices to create sheet flow and by reestablishing vegetation. Techniques for providing diffuse flow are specified in the Charlotte-Mecklenburg BMP Design Manual.

- Maximum drainage area size shall be no greater than 10 acres for all outfalls discharging directly into a stream buffer.
- When practical, a drop structure should be installed prior to the last section of outfall pipe discharging to a buffer. A short length of outfall pipe should be laid flat (0% Slope Energy Dissipater), prior to the riprap apron or other energy dissipater.
- Concentrated runoff from ditches or other manmade conveyances shall be diverted to diffuse flow before the runoff enters the buffer.
- Periodic corrective action to restore diffuse flow shall be taken by the property owner as necessary to impede the formation of erosion gullies.

.8 Ponds that intersect the stream channel shall have the same buffers as the original stream. Buffer requirements do not apply to wet ponds used as structural BMP's.

.9 Buffer Delineation. The following buffer delineations are required:

a) Buffer boundaries including all buffer zones must be clearly delineated on all site-specific plans for Board of Commissioner approval, on all construction plans, including grading and clearing plans,

erosion and sediment control plans, and site plans.

b) The surveyed outside buffer boundary, including all buffer zones, must be clearly marked on-site with orange “tree-protection” or “high-hazard” fence prior to any land disturbing activities. Tree protection is required by [Section 7.4\(3\)](#) of this Ordinance. Where existing trees are to be preserved in a buffer zone, the limits of grading shall equal the drip line of those trees plus an additional five (5) feet on the upland side of the buffer. All Specimen and Heritage trees require a tree survey prior to land-disturbing activity and shall be saved in all buffer zones.

c) The surveyed outside boundary of the buffer must be permanently marked with an iron pin at the intersection of the watershed buffer and each property line on each parcel following the completion of land disturbing activities and prior to occupancy. Properties greater than 200’ in width shall be marked at a maximum of 100’ intervals.

d) Separate buffer zones must be permanently marked at highway stream crossings.

e) Buffer boundaries including all buffer zones as well as all buffer requirements must be specified on the record plat, on individual deeds, and in property association documents for lands held in common.

.10 Buffer Impacts Permitted under [Section 8.25](#), S.W.I.M. The following buffer impacts are permitted, but design and construction shall comply with the specifications provided in the Charlotte-Mecklenburg Buffer Implementation Guidelines for stabilization of disturbed areas to minimize negative effects on the quality of surface waters.

- Near perpendicular (75° or greater) road crossings for connectivity or transportation links where the Town of Huntersville has granted site plan approval.
- Near perpendicular (75° or greater) utility crossings as approved by Charlotte-Mecklenburg Utilities.
- Parallel water and sewer utility installation as approved by Charlotte-Mecklenburg Utilities, where a logical and appropriate basis for the impact is demonstrated, where disturbance of the Stream Side Zone is minimized to the maximum extent practicable, and where guidelines for restoring vegetation within buffers disturbed as a result of parallel utility installation are met. These guidelines are specified in the Charlotte-Mecklenburg Buffer Implementation Guidelines.
- Public paths and trails parallel to the creek outside the Stream side Zone and near perpendicular stream crossings in any zone. Pathways must use existing and proposed utility alignments or previously cleared areas and minimize tree cutting to the maximum extent practicable. To the extent possible, pathways shall preserve existing drainage patterns and avoid drainage structures that concentrate storm water.
- Incidental drainage improvements/repairs for maintenance.
- Individual pedestrian paths connecting homeowners to the stream in the form of narrow, pervious footpaths with minimal tree disturbance.
- New domesticated animal trails (farming) where existing trails are lost as a result of action beyond the farmer’s control. Stream crossings should be constructed to minimize impacts to the Stream Side Zone and be maintained with fencing perpendicular to and through the buffer to direct animal movement.
- Mitigation approved by a state or federal agency acting pursuant to Sections 401 or 404 of the federal Clean Water Act.

.11 Appeals and Variances.

a) An appeal to reverse or modify the order, decision, determination, or interpretation of the Zoning Administrator shall comply with the procedures and standards of Section 11.3 of these ordinances.

b) Special Variance Provisions/Mitigation Techniques.

- When “unnecessary hardships”, as defined in Section 11.3.2 f, would result from strict adherence to the buffer width requirements and/or buffer treatment standards, a petition for variance may be filed with the Huntersville Board of Adjustment in compliance with the procedures and standards of Section 11.3.
- Site specific mitigation plans using the mitigation techniques set out below and approved by the designated agency shall be construed by the Board of Adjustment to be evidence responsive to Section 11.3.2 e), subparagraph 4 – consistency with adopted plans and protection of public safety and welfare. Specifications for these mitigation techniques are provided in the Charlotte-Mecklenburg Buffer Implementation Guidelines (for Structural BMPs). The techniques below are not construed to offset the requirement of Section 8.25.6 for diffuse flow.

(1) Installation of Structural BMPs. The installation of an on-site structural BMP designed to achieve specified pollutant removal targets will allow for all proposed stream buffer impact on the specific site. The BMP must remain outside of the Stream Side Zone and Manage Use Zone. A detailed BMP design plan must be submitted to the Mecklenburg County Land Use and Environmental Services Agency for approval based on specifications contained in the Charlotte-Mecklenburg BMP Design Manual. This plan must also include a long-term maintenance strategy for the BMP, complete with the establishment of adequate financing to support the proposed maintenance practices.

(2) Stream Restoration. The owner may restore and preserve the buffer area on any stream of equivalent or greater drainage area the condition of which is determined to be qualified for restoration by the Mecklenburg County Land Use and Environmental Services Agency on a 1:1 basis in linear feet of stream. This restoration shall include stream bank improvements and Stream Side and Managed Use Zone re-vegetation, in accordance with the Charlotte-Mecklenburg Buffer Implementation Guidelines, and receive approval from the Mecklenburg County Land Use and Environmental Services Agency.

(3) Stream Preservation. The owner may purchase, fee simple, other stream segments at equivalent or greater drainage area on a 1:1 linear foot basis and convey fee simple and absolute title to the land to the Town of Huntersville, Mecklenburg County, or conservation trust, with a plan approved by the Mecklenburg County Land Use and Environmental Services.

(4) Wetlands Restoration. On a 2:1 acreage basis for disturbed stream and buffer area (2 acres of wetland for each acre of disturbed area), the owner may provide a combination of the preservation and/or restoration of wetlands with protective easements and the implementation of structural or non-structural BMPs to achieve specific pollutant removal targets within the impacted area. Restoration plan must be approved by the Mecklenburg County Land Use and Environmental Services.

(5) Bottom Land Hardwood Preservation. On a 2:1 acreage basis for impacted stream and buffer area (2 acres of bottomland hardwood for each acre of disturbed area), the owner may provide a combination of the preservation of existing bottom land hardwood forest or other specifically approved natural heritage area by conservation easement or other legal instrument, and the implementation of structural or non-structural BMPs to achieve specific pollutant removal targets within the impacted area. Plan to be approved by Mecklenburg County Land Use and Environmental Services Agency.

(6) Controlled Impervious Cover for Disturbance Landward of Stream Side Zone. The owner may commit to, and provide, a specific site development plan for the parcel with requested buffer disturbance. The plan shall limit overall site impervious cover to less than or equal to 24%. Preservation of the Stream Side Zone is still required. Plan to be approved by Mecklenburg County Land Use and Environmental Services Agency.

(7) Open Space Development. The submission of a site-specific development plan that preserves 50% of the total land area as undisturbed open space. Plan to be approved by Mecklenburg County Land Use and Environmental Services Agency.

(8) Mitigation Credits: The purchase of mitigation credits through the Stream Restoration Program on a 1:1 basis, utilizing linear feet of stream impacted and the prevailing rate of purchase as established by the Charlotte-Mecklenburg Buffer Implementation Guidelines. Mitigation credits purchased under any other program (i.e., U.S. Army Corp of Engineers) shall not cover this requirement unless the issuing agency agrees to relinquish the funds to the appropriate local government agency.

(9) Alternative mitigation. The list of mitigation techniques shall not prevent the creative development of alternative mitigation plans that achieve the purposes of this section.

.12 Posting of financial security required. When structural BMPs (wet detention ponds and other BMPs) are approved for mitigation of a buffer disturbance, the approval will be subject to the owner filing a surety bond or letter of credit or making other financial arrangements which are acceptable to the Mecklenburg County Land Use and Environmental Services Agency, in a form which is satisfactory to the County Attorney, guaranteeing the installation and maintenance of the required structural BMPs until the issuance of certificates of occupancy for seventy-five percent (75%) of all construction which might reasonably be anticipated to be built within the area which drains into the BMPs, allowing credit for improvements completed prior to the submission of the final plat. At such time that this level of occupancy is achieved, written notice thereof must be submitted by the owner to the Mecklenburg County Land Use and Environmental Services Agency. The owner must also verify the adequacy of the maintenance plan for the BMPs including the necessary financing to support the proposed maintenance practices. The Mecklenburg County Land Use and Environmental Services Agency will inspect the structural BMPs and verify the effectiveness of the maintenance plan; if both are found to be satisfactory, the department will notify the owner in writing within 30 days of the date of notice.

.13 Maintenance responsibilities for structural BMP's – Civil Penalties.

Maintenance of all structural BMP's will be the responsibility of the property owner or his designee. Any person who fails to maintain the required BMP's in accordance with the approved maintenance plan will be subject to a civil penalty of not more than \$5,000. Each day that the violation continues shall constitute a separate violation. No penalties shall be assessed until the person alleged to be in violation has been notified in writing of the violation by registered or certified mail, return receipt requested, or by other means which are reasonably calculated to give actual notice. The notice shall describe the nature of the violation with reasonable particularity, specify a reasonable time period within which the violation must be corrected, and warn that failure to correct the violation within the time period will result in assessment of a civil penalty or other enforcement action.

#### .14 Request for Determination of Buffer Requirements

When a landowner or other affected party believes that the S.W.I.M stream buffer delineation maps described in [Section 8.25.4](#) inaccurately depict buffer requirements, he or she shall request a determination from the Storm Water Administrator. Such determinations shall be made by the Storm Water Administrator based on an on-site evaluation using the U.S. Army Corps of Engineers and N.C. Division of Water Quality methodology for stream delineation as well as information from databases maintained for stream delineation by Mecklenburg County. Such determinations can also be made at the discretion of the Storm Water Administrator in the absence of a request from a landowner or other concerned party. The buffer requirements of this ordinance shall apply based on determinations made by the Storm Water Administrator. Surface waters that appear on the maps shall not be subject to this ordinance if an on-site determination by the Storm Water Administrator shows that they fall into one of the following categories.

- (1) Ditches and manmade conveyances other than modified natural streams.
- (2) Manmade ponds and lakes that are not intersected by a buffered stream segment and that are located outside natural drainage ways.
- (3) Ephemeral (storm water) streams.