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Post-Construction Stakeholders' Process

Scenario #1

07/22/2004

Background:

Land development activities and associated increases in impervious cover alter the hydrologic response of local watersheds and increase storm water runoff rates and volumes as well as increase discharges of non-point source pollutants, incidents of flooding, stream channel erosion, and sediment transport and deposition. It has been effectively demonstrated that these impacts can be controlled and minimized through the regulation of storm water runoff from development sites. These regulations can vary significantly depending on local goals. The specific goals identified for the Charlotte-Mecklenburg post-construction ordinance process are listed below. A water quality model has been developed to assist in the development of an ordinance to effectively fulfill these goals. This model will be used to assess current water quality and quantity conditions and predict impacts from proposed future changes in land use as watersheds develop. These assessments will be performed using four (4) criteria, which if effectively controlled would result in the fulfillment of all ordinance goals. The model will also serve as a tool to assess the effectiveness of various ordinance scenarios at fulfilling the goals of the ordinance. A minimum of three (3) scenarios will be modeled. The first scenario is described below. To ensure an effective evaluation of these scenarios, thresholds have been established for the assessment criteria using the estimated pollutant loads generated from the upper 25th percentile (most healthy) of watersheds in Mecklenburg County, which are currently unimpaired and thus meet all their designated uses. The watersheds are Caldwell, Clarke, Clear, Gar, Rocky River, Upper Mountain Island, Beaver Dam, Goose and Lake Wylie. The established criteria and their thresholds are as follows:

- Total Suspended Solids: 0.3 tons/acre/year
- Total Nitrogen: 4 lbs./acre/year
- Total Phosphorus: 0.65 lbs./acre/year

Goals of the Post-Construction Ordinance Process:

The four (4) stated goals of the post-construction ordinance are as follows (see Section 2, pages 1 through 9):

1. Achieve compliance with the Phase I and Phase II NPDES Storm Water Permit requirements for post-construction pollution control, as applied to the respective jurisdictions.
2. Satisfactorily address the guidelines to mitigate the cumulative and secondary impacts to aquatic and terrestrial wildlife resources and water quality specified by the N.C. Wildlife Resources Commission (NCWRC) and the U.S. Fish and Wildlife Service (USFWS) for Goose Creek and the Yadkin River Watershed.

DRAFT

3. Satisfactorily address the causes of impairment identified in the N.C. 2002 Integrated 305(b) and 303(d) Report for surface waters in Mecklenburg County in assessment categories 4a, 4b, 5 and 6 when the potential sources of water quality impairment are identified as “urban runoff/storm sewers.” These categories are defined as follows:
 - Category 4a: TMDL has been completed.
 - Category 4b: Other pollution control requirements are reasonably expected to result in attainment of the water quality standard in the near future.
 - Category 5: Impaired for one or more designated uses by a pollutant(s), and requires a TMDL.
 - Category 6: Impaired due to biological data
4. Satisfactorily address detention measures for the control of storm water volumes and peaks associated with new construction.

Scenario #1:

Scenario #1 involves the variation of performance criteria between two (2) distinct Watershed Districts (see Figure 1) for the purpose of fulfilling the four (4) ordinance goals and meeting the established criteria thresholds. A description of the two (2) Watershed Districts and their specific pollution control criteria is provided below.

Watershed District #1 Yadkin: Includes those watersheds draining into the Yadkin River Basin, the area of concern for the protection of the Carolina heelsplitter. Goal #2 above is specific to this Watershed District. In fulfilling Goal #2, Goals #1, #3 and #4 are also met. The performance criteria selected for this area were derived from the proposed Mint Hill post-construction ordinance, which was specifically developed to fulfill the mitigation measures for protection of the Carolina heelsplitter from the cumulative and secondary impacts of land development activities developed by NCWRC and USFWS.

Watershed District #2 Catawba: Includes those watersheds draining into the Catawba River Basin. This is the area that drains to drinking water supply watersheds and is also the area that contains the majority of the impaired stream miles in Mecklenburg County. This is an area that is also of concern due to elevated nutrient levels discharges to Lake Wateree in S.C. The performance standards selected for this area were derived from an assessment of the modeling data from healthy, unimpaired watersheds. These criteria are specifically targeted toward preventing increases in nutrient loads and channel degradation from future development activities.

Table 1 provides a description of the performance criteria recommended for the two (2) watershed districts.

DRAFT

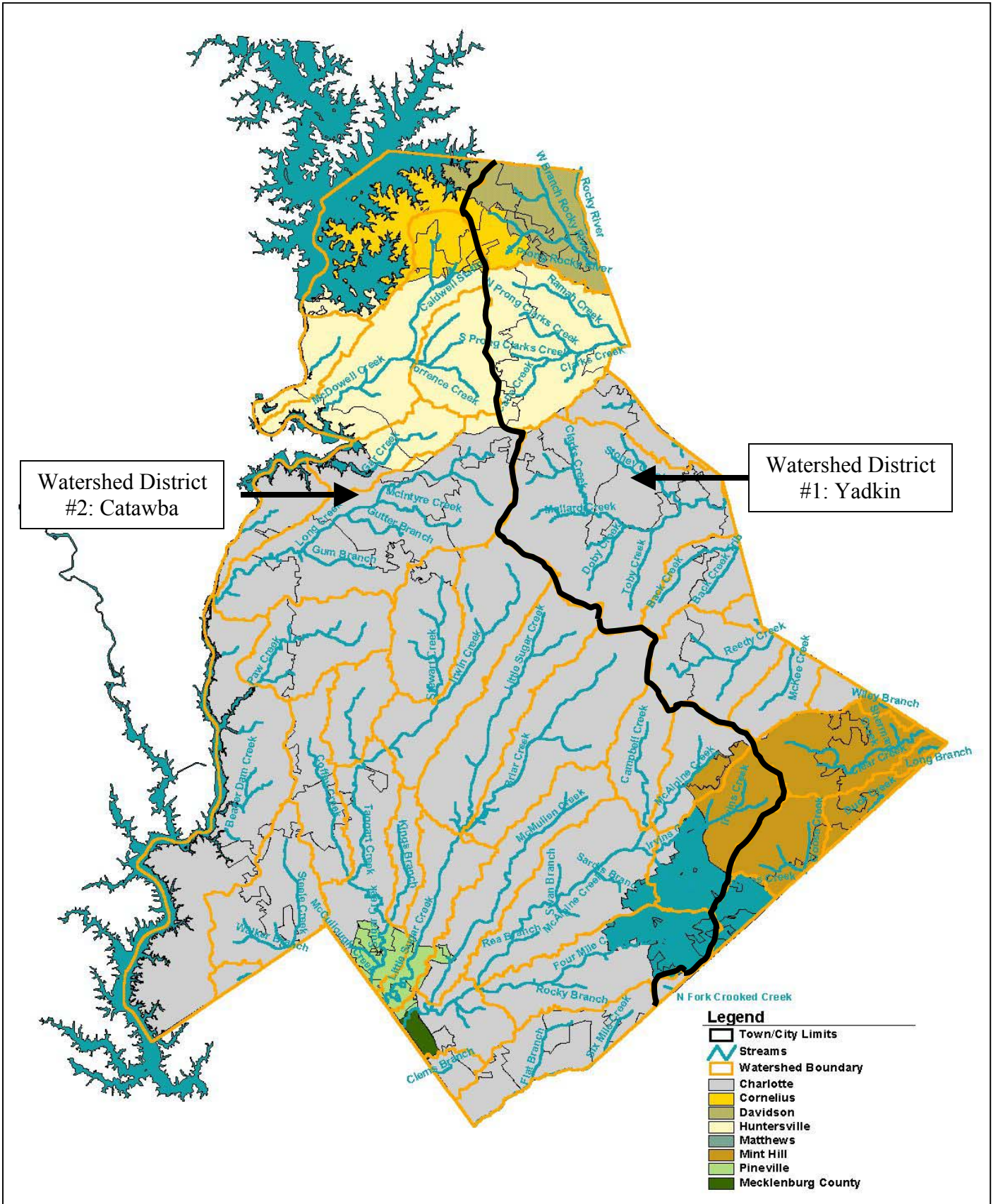


Figure 1: Watershed District Designations for Post-Construction Ordinance Implementation.

DRAFT

Table 1 below summarizes the criteria for the two (2) Watershed Districts.

Table 1. Recommended Performance Criteria.

Watershed District	Structural Water Quality BMPs	Buffers	Detention	Goal
#1 Yadkin	LID BMPs to treat runoff from first inch of rainfall. Meet 85% TSS removal. BMPs to treat no more than 5 acres. See Table 2.	>300 ac. = 100 ft streamside + remainder of floodplain upland 50 to 300 acres = 50 ft. stream side < 50 acres = 30 ft. streamside + 20 ft. upland	Match pre-development volume for 2 yr, 24 hr. storm. Within 0.5 mile radius of identified transit station match pre development volume for 1 yr 24 hr storm. Match pre-development peak for 2 & 25 yr, 24 hr. storms. Safely pass 50 yr. storm. See Table 3.	Address NCWRC & USFWS guidelines for cumulative and secondary impacts to wildlife and water quality (Carolina heelsplitter).
#2 Catawba	>12% BUA require LID, conventional or a combination of BMPs to meet 85% TSS removal, 0.65 lbs/ac/year TP and 4 lbs/ac/year TN maximum loading rate	<640 ac. Intermittent 30 ft streamside Perennial 30 ft streamside and 20 ft upland >640 ac. 50 ft streamside and 50 foot upland + 85% of remaining flood fringe	Match pre-development volume for 2 yr, 24 hr. storm. Within 0.5 mile radius of identified transit station or within central business district (uptown) match pre development volume for 1 yr 24 hr storm. Match pre-development peak for 2 & 25 yr, 24 hr. storms. Safely pass 50 yr. storm. See Table 3.	Phase II Temporary Rule, biological integrity and water supply protection.

Tables 2 and 3 below identify those BMPs that could be used to meet the water quality and detention criteria (including volume and peak controls) in the two (2) Watershed Districts as described in Table 1 above. Watershed District #1 is required to use LID BMPs (see Table 2) for meeting the performance criteria. Development in Watershed District #2 has the option of using LID (see Table 2), conventional (see Table 3) or a combination of both types of BMPs for meeting the performance criteria. The conventional BMPs from Table 3 can be used in combination with the LID BMPs in Table 2 to meet the detention requirements.

DRAFT

Table 2. Example LID BMPs for Watershed District #1 Yadkin.

BMP	Applicable Zoning Districts(1)	Function(2) (WQ, VC, PC)
Strategic Clearing & Grading	All	WQ, VC, PC
Reduce Impervious Surfaces	All	WQ, VC, PC
Bioretention (Rain Garden)	All	WQ, VC, PC
Infiltration Trench	All	WQ, VC, PC
Infiltration Swale	All	WQ, VC, PC
Swales	All	WQ, VC
Swales with Outlet Control	R	WQ, VC, PC
Vegetative Filter Strips & Buffers	All	WQ, PC
Dry Well, Cistern & Rainbarrel	All	WQ, VC, PC
Porous Paving	All	WQ, VC
Curb & Gutter Elimination	R	WQ, PC

- (1) Applicable Zoning Districts: These are the Zoning Districts where the BMP can be used including C = Commercial; I = Industrial; R = Residential.
- (2) Functions: These are the dominate functions that the BMPs perform including WQ = Water Quality; VC = Volume Control; PC = Peak Control.

Table 3. Example Conventional BMPs for Watershed Districts #2 Catawba.

BMP	Applicable Zoning Districts(1)	Function(2) (WQ, VC, PC)
Wet Pond	All	WQ, VC, PC
Extended Dry Pond	All	VC, PC
Storm Water Wetlands	All	WQ, VC, PC
Sand Filter	C, I	WQ, VC, PC

- (1) Applicable Zoning Districts: These are the Zoning Districts where the BMP can be used including C = Commercial; I = Industrial; R = Residential.
- (2) Functions: These are the dominate functions that the BMPs perform including WQ = Water Quality; VC = Volume Control; PC = Peak Control.