ATTACHMENT A – Meeting #9 Summary

To: *Stormwater Management Task Force*

From: *CDM*

Date: *December 19, 2006*

Subject: *Wake County Stormwater Task Force Meeting #9 Summary – Tools & Strategies Module*

On December 14 2006, CDM and Wake County staff facilitated the ninth meeting for the Wake County Stormwater Management Task Force. Attendees were provided with meeting materials, including a copy of the agenda, a revised list of priority tools, materials for a voting exercise, and a PowerPoint presentation. All meeting materials can be found on the Task Force website at http://www.wakegov.com/environment/stormwater/.

The meeting began with a welcome by Commissioner Kenn Gardner, Chairman of the Wake County Stormwater Task Force. CDM staff then provided a brief update on the work plan status. Meeting #9 was the third meeting of the "Tools and Strategies" module. In this meeting, the Task Force continued reviewing detailed evaluations of toolsets that scored well when compared to the evaluation criteria. The "Assessment and Forecasting" and "Sediment & Erosion Control" toolsets were evaluated in this meeting.

Revised List of Priority Tools

Based on comments from the task force members at Meeting #8, CDM staff revised the list of priority tools. The tools related to impervious surface controls were consolidated into one tool. Also, several tools were added to the list of priority list to bring the total list of tools to 15. The revised list of tools is attached.

Assessment and Forecasting Tools Discussion

Brenan Buckley of CDM facilitated the discussion about priority tools in the Assessment and Forecasting category. Assessment and forecasting tools represent tools used to assess current demands on the stormwater system and to predict future ones based on new development. Within this category, the priority tools identified by the Task Force included water quantity and water quality modeling.

Water Quantity Modeling

The primary modeling efforts related to water quantity tools are drainage basin studies and floodplain mapping. Drainage basin studies (or master plans) typically identify structural flooding impacts, maximum water surface elevations, streambank erosion potential and capacity issues within the drainage system. Floodplain mapping identifies vertical and horizontal extent of the 100- and 500-year floodplain and is typically applied only to existing conditions (although, recent map updates have begun to include future conditions).

Mr. Buckley continued with a detailed discussion of the contents and applicability of drainage basin studies. The presentation included a description of its basic components, the importance of model scale, and the typical results from such a model. The presentation also included a summary of the current drainage basin studies that have been performed by the local governments. At present, only 15% of the total area in Wake County has been modeled to some extent.

Mr. Buckley next explained the purpose and status of floodplain mapping in the County. In FEMA's most recent map updates/revisions, future conditions floodplain mapping was performed in much of the county. In addition, the City of Raleigh is also performing its own future floodplain mapping for FEMA streams in its jurisdiction. While the coverage is extensive, Mr. Buckley presented some examples of areas remaining outside of the FEMA coverage that may still be important to model. This modeling can be performed by the local governments or policies can be put in place to require the developers to share in the burden of predicting future flood impacts.

Water Quality Modeling

Water quality modeling applications are used to estimate the impact of pollutant loadings on water quality in streams and lakes. Models can be applied at varying levels of sophistication, including daily pollutant loading predictions and even "subdaily" loading. Ultimately, the models can be used to compare management strategies to address pollutant impacts.

Mr. Buckley presented detailed information and examples related to the range of application for water quality models. Seasonal/annual loading models can estimate total annual pollutant loads and are useful for relative comparisons of management strategies. These models are less costly and complex to develop. Daily or "subdaily" models can predict daily streamflow and runoff loading and can be used to predict exceedance of local water quality standards. However, these models are very complex and costly to implement, and require extensive/long-term sampling data.

Sediment and Erosion (S&E) Control Tools Discussion

David Mason with CDM facilitated the discussion on sediment and erosion control tools. S&E tools are used to size, locate, install, and maintain sedimentation and erosion control

practices during land disturbance activities and agricultural operations. The priority tools identified by the Task Force for this category included the design, maintenance, inspection and enforcement standards for S&E devices. When assessing these tools, the items considered by the Task Force included sources of sediment in streams, methods/activities used to control sediment, and operations/inspections to control sediment.

Sources of Sediment

Mr. Mason presented information on the various sources of sediment and the relative contribution of these sources. The discussion focused primarily on a comparison between the contribution of sediment from land disturbance practices and sediment from streambank erosion. Data and research on sediment loading/generation rates were provided. The analysis concluded that there is strong evidence that sediment from streambank erosion is a larger contributor to overall sediment load in Wake County streams. Please review the slides for more detailed information.

Standards, Practices and Effectiveness

Next, Mr. Mason discussed the current S&E standards that apply within Wake County. The minimum state standard for S&E control applies to all sites that disturb one or more acres. The controls are required to protect from the 10-year peak runoff and to capture 75% of the total sediment load. In many cases, however, local standards are more stringent than the State. Most communities in Wake County require a permit for smaller areas of disturbance (1/2 and 1/4 –acres) and also require silt fences on all single-family residential sites (regardless of size).

In terms of maintenance for these devices, contractors are required to inspect devices at least once weekly and after every rain event of one-half inch or greater. Upon inspection, sediment should be removed from the device if the device is half full. During each inspection, the contractor shall check the condition of the embankment, spillway and outlet for damage and repair immediately if necessary. The contractor should also maintain a log of all maintenance activities.

In order to evaluate the current programs, data was presented on the effectiveness of the devices to determine of current devices and practices are performing as intended. Data collected by NC State researches suggests that current sediment traps are only capturing 60% of the total sediment (target is 75%). In response, the State has updated the design manual to improve the effectiveness of current devices. In 2007, the updates will included larger sediment traps, a baffle requirement, and improved silt fence design.

Enforcement

Mr. Mason presented some data on local enforcement levels, including number of inspectors, number of permits per inspector, inspection frequency and the number of violations issued.

When violations are found, the methods of enforcement include withholding building permits, stop work orders, and fines. These levels of enforcement were compared to other programs in the State, including City of Charlotte, Mecklenburg County, and Gaston County. Local programs were on par or better in some areas. Lastly, some information was presented from a study on a comparison between tough enforcement vs. tough standards. The study concluded that higher levels of enforcement were more effective in controlling sediment loading.

In addition to the materials presented by CDM, a member of the task force suggested that the group consider risk-based permitting for sediment and erosion control, which provides an incentive for developers to "do the right thing." This option will be considered at a future meeting.

Voting Exercise

The Task Force was asked by CDM staff to fill out three ballots included with their handouts. There were ballots listing various levels of service for water quantity modeling, water quality modeling and sediment/erosion controls. The results of this voting exercise are attached. The results will be used to define costs for desired programs and to begin to formulate draft recommendations. The recommendations and costs will be discussed at a future meeting.

Wrap-Up and Path Forward

The next Task Force meeting will be held on January 18, 2007. This next meeting will continue the "Tools & Strategies" module. The Task Force will continue to review detailed evaluations of a toolsets that scored well when compared to the evaluation criteria.

Assessment and Forecasting Tools - Hydrologic and Hydraulic Modeling

Activity (Choose One)		Votes	Coverage (Choose One) No Model	FEMA limits (1 sq. mi.)	100-acre limit	Uses Votes:	Uses (Choose all that apply)
1	**Drainage Basin Planning**						
1A.	No model required					4	Develop Capital Improvement Plan (CIP) of infrastructure capacity needs.
1B.	Existing Conditions Assessment	4			4	10	Develop Capital Improvement Plan (CIP) of infrastructure capacity needs.
1C.	Existing and Future Conditions Assessment	11		3	8	10	Identify areas prime to streambank erosion.
						12	Use to review and approve proposed development projects.
						6	Require model be developed to determine structural flooding impacts of proposed development at downstream point where project site is 10% of the contributing watershed.
						9	Require model be developed to determine structural flooding and infrastructure impacts of proposed development at downstream point where project site is 10% of the contributing watershed.

Comments and Notes:
Dependent on impervious area (Line 5).
I think further conditions modeling still leaves too many variables out (aggregation, degradation, lateral hygration) and is not yet proven itself as far as effectiveness.

Assessment and Forecasting Tools - Hydrologic and Hydraulic Modeling

Activity			Coverage			Uses	
(Choose One)		Votes	(Choose One) No Model	FEMA limits (1 sq. mi.)	100-acre limit	Votes:	(Choose all that apply)
2.	**Floodplain Modeling**						
2A.	No model required					8	Use to determine the extent of the floodplain for notification/disclosure purposes.
2B.	Existing Conditions Floodplain	3			3	13	Use to determine the extent of the floodplain for assessment of impacts of proposed development.
2C.	Future Conditions Floodplain	11		4	6		

Comments and Notes:
The future conditions (build-out) floodplain is the floodplain because homes aren't built with the idea that they won't last. We want a home to be there for generations.

Wake County, North Carolina
Stormwater Management Task Force

Meeting # 9
Tools and Strategies

Sediment and Erosion Control Tools

Activity		Options				Feedback
1. Design Standards	***Vote***	***(Choose one)***				***Comments***
A. Threshold for Permit Requirement	19	**1-acre disturbed**: 2	**1/2 acre disturbed**: 4	**1/4 acre disturbed**: 8	**All land disturbance**: 5	Should be somewhat dependent on soil type/location. Not sure if this matters…but I think it should be at least 1/4 acre.
B. Sediment Control Device Design	19	**Adopt new State Stds**: 7	**Apply most restrictive local standards**: 6	**Study more effective measures**: 6		What if local standards are less than state? Control w/vegetative cover. They've put a lot of research into this and have pretty good data. Fine, but I'd rather see requirements that prohibit mass grading.
2. Maintenance & Reporting	***Vote***	***(Choose one)***				***Comments***
A. Contractor Inspection Frequency	18	**2 X/ month + after rain**: 4	**1 X/ week + after rain**: 9	**2 X/ week + after rain**: 4	**Daily**: 1	One per week and before rain. Designer needs to inspect. After storms. Varies, ones with actual level disturbance requirement inspection in Wake Co. Should provide some flexibility based on staff experience and risk-based strategies (slope, location) near water bodies, etc.
B. Device Maintenance/Cleanout Frequency	16	**When device is half-full**: 6	**1 X/ month**: 1	**1 X/ week**: 1	**After every 0.5" rain**: 8	Or some rainfall event. Prefer standard 11/hr. Contractors tend to really mess things up when they check it out. As needed. Every run-off producing rain. I have no idea, but think frequency is easier to enforce, less frequent with/larger basins.
C. Maintenance Log/Reporting	18	**No report req'd**:	**Maintain log on-site**: 7	**Submit quarterly report to Town/County**: 3	**Submit monthly report to Town/County**: 8	Check what Phase II requires. Keep on-site and can be requested at anytime. Should do both (maintain log onsite and submit quarterly report to town/county. Signed by designing engineer.
3. Enforcement	***Vote***	***(Choose one)***				***Comments***
A. Staff Inspection Frequency	18	**2 X/ month**: 6	**1 X/ week**: 11	**2 X/ week**: 1	**Daily**:	Finding $$ for staff difficult. Plus after storm events.
B. Method of Enforcement	22	**Flexibility to work with Contractor**: 5	**Stop work order for any offense**: 9	**Heavy fines as deterrent**: 5	**Heavy fines only for repeat offenders**: 3	Have to employ all tools, not just one. Stop work and fine. All → carrots and sticks.

Extra Notes:
Need an erosion control tool!!!
Where do I vote to work on streambank erosion as a higher priority?

Assessment and Forecasting Tools - Water Quality Modeling

Activity (Choose One)		Votes	Coverage (Choose One) No Model	Water Supply Water-Sheds	All 303(d) Listed Streams	All Streams	Votes:	Uses (Choose all that apply)
3.	**Water Quality Modeling**							
3A.	No model required	1				1	9	Use to identify existing water quality conditions.
3B.	Existing Conditions Annual Loading Model	7	1	3	2	1	11	Use to identify possible impacts to water quality from new development.
3C.	Existing and Future Conditions Annual Loading Model	6		1	2	3	12	Use to assess possible management strategies to address existing water quality impacts
3D.	Existing Conditions Daily Loading Model (Continuous Simulation)	1		1	1		9	Use to assess possible management strategies to address predicted water quality impacts due to new development.
3E.	Existing and Future Conditions Daily Loading Model (Continuous Simulation)	3			1	2	8	Use to review and approve proposed development projects.

Comments and Notes:
Prefer to choose 303(d) and H2O Supply H2O Sheds.
Update modeling every 5 years?
3E. No!