

# Section 5: Implementation Plan and Cost Evaluation

## 5.1 Recommended Steps and Cost

The final step in the process of developing recommendations for the Task Force is the identification of the steps necessary to implement the recommendations and a planning-level estimate of the cost of implementation. Each of the following sections includes a table of the implementation steps and associated costs. The costs have been categorized into “one-time” costs and recurring/annual costs. At the conclusion of this section, a summary table of all proposed costs is included along with a proposed implementation schedule.

### 5.1.1 Implementation of H&H Modeling

The first step for implementation of this recommendation will be a pilot study of Poplar Creek or a watershed with similar development conditions. The modeling study will include the collection of existing and future land use information, a field survey of the stream corridor and crossings, delineation of the watersheds, modeling, and mapping of the floodplain. Once completed, County staff will convene the County’s Water Quality Committee to review the findings of the pilot study and make recommendations on solutions for the predicted flood impacts and to determine future use and application of such models.

Table 5-1 summarizes the proposed steps for implementing the recommendation. The table also includes the cost of implementation. It has been estimated that facilitation of the Water Quality Committee will have a one-time cost of \$25,000 while the modeling will cost an estimated \$250,000. In future years, it has been proposed that the County and its partners continue to appropriate approximately \$250,000 annually to prioritize and model the remainder of HUC units that have not yet been modeled by the County or other local jurisdictions.

### 5.1.2 Implementation of Post-Construction Runoff Controls

As a first step, the Task Force recommended that the County convene a set of coordination meetings involving any Towns who have an interest in participating in the county-wide post-construction stormwater runoff control program. Participating members will develop a uniform draft ordinance that achieves both the regulatory minimum control for water quality and additional control of the 10-year, 24-hour storm to reduce incidents of flooding.

Table 5-1  
Implementation Plan for H&H Modeling Recommendation

No.	Implementation Steps	Estimated Resources
1	Perform Pilot Study/Model of Poplar Creek	<p><b>One-Time Cost</b> \$25K for facilitation meetings to review findings</p> <p><b>Recurring Cost</b> \$250K annually for modeling of HUCs (\$250K in Year 1 for pilot study)</p> <p><b>Funding/Revenues</b> Wake County</p>
	a. collect all land-use and development plan information for watershed	
	b. augment current City of Raleigh survey data with new data	
	c. delineate watershed into 100-acre sub-basins	
	d. perform hydrologic and hydraulic modeling	
	e. generate future conditions floodplain map	
2	Convene Water Quality Committee to review findings of pilot study	
3	Facilitate discussion with Water Quality Committee to determine alternative solutions for predicted impacts	
4	Determine future use and application of watershed models (using committee)	
5	Use Water Quality Committee to prepare policy decisions on modeling	

Table 5-2  
Implementation Plan for Post-Construction Stormwater Runoff Controls

No.	Implementation Steps	Estimated Resources
1	Convene coordination meetings with Towns to participate in joint program	<p><b>One-Time Cost</b> \$25K for facilitation meetings</p> <p><b>Recurring Cost</b> \$225K annually for review and inspection of required controls</p> <p><b>Funding/Revenues</b> Wake County &amp; User Fees</p>
2	Develop uniform draft ordinance with NPDES Phase II minimum water quality control and with additional requirement for control of 10-year storm (flood protection)	
3	Provide staff to review and enforce design and maintenance	
4	Review existing ordinances county-wide to determine compatibility with LID practices	
5	Convene committee (Water Quality committee) to develop incentives for non-structural controls and LID practices and to suggest ordinance changes related to impervious surfaces	

Once the ordinance is adopted, appropriate staff will be hired to administer the program. As is County policy, the cost to review plans and provide enforcement would be paid through development fees, which would be uniform throughout the incorporated and unincorporated areas. In addition to implementation of the post construction rules, existing staff will perform a review of all current ordinances to determine their compatibility with low impact development (LID) practices. Where conflicts are identified, changes to the ordinances will be proposed. The County’s Water Quality Committee will be convened to assist with any proposed ordinance changes.

Table 5-2 lists the proposed implementation steps and estimated costs. A one-time, estimated cost of \$25,000 has been assumed for assistance with the Water Quality Committee meetings associated with this proposal. In order to estimate annual cost for administration of the program, it has been assumed that cities and towns currently administering a post-construction stormwater control program would not collaborate on this task. For the remaining jurisdictions, annual costs to review plans and inspect post construction stormwater devices has been estimated to be approximately \$225,000, or approximately three full time equivalent staff persons (FTEs). Funding for the program would be generated through user fees.

### 5.1.3 Implementation of S&E Enhancements

Following approval of this plan, the first step that should be implemented is the ordinance changes for silt fence on single-family lots. Since some jurisdictions have already made this change, it is suggested that others use these existing ordinances as a model for the changes.

Next, the local stormwater managers group should be reconvened to consider the risk criteria and appropriate enforcement for the “high-risk” sites.

Once the risk criteria and enforcement strategies have been established, the County should perform a workload management study to determine the appropriate staffing levels for the risk-based program. Lastly, the County and participating jurisdictions should develop a training program to educate field staff on potential S&E violations.

Table 5-3 lists the proposed implementation steps and associated program costs. Items #1 and #2 can be completed with existing staff at no extra cost to the jurisdictions. The workload projection study for Item #3 would likely be performed by an outside professional at an estimated cost of \$35,000. In order to estimate future costs for enforcement of the S&E program, CDM and County staff have assumed a target workload of 80 permits per inspector (currently 800 permits for County and existing S&E partners). As such, 10 inspectors would be required to meet the target workload (County currently employs seven inspectors). The cost of an additional three inspectors (3 FTEs) on an annual basis is approximately \$255,000. Similar to the post construction stormwater control program and per County policy, the sedimentation and erosion control recommendations would also be funded through user fees.

### 5.1.4 Implementation of the Call Center

Step 1 for implementation of the call center recommendation would be to estimate the current call load for the County and all of the local jurisdictions. Next, an outside

Table 5-3 Implementation Plan for S&E Program Enhancement		
No.	Implementation Steps	Estimated Resources
1	Modify ordinance to include requirement for silt fence on all residential lots	<p><b>One-Time Cost</b> \$35K for workload projection study</p> <p><b>Recurring Cost</b> \$255K for annual enforcement of S&amp;E rules</p> <p><b>Funding/Revenues</b> Wake County &amp; User Fees</p>
2	Develop risk criteria for disturbed sites and enforcement criteria for "high-risk" sites	
3	Perform workload projection study to determine necessary FTEs to provide S&E services	
4	Provide additional staff to enforce high-risk approach	
5	Develop cross-training program to educate field staff to report S&E violations	

professional would develop a policy and procedures manual for the call center. Once these steps are completed, the call center can be initiated.

Table 5-4 lists the steps and estimated costs for implementation of the call center recommendation. Item #1 can be performed by existing staff at the Towns and at a cost of \$5,000 to the County for compiling and mapping the stormwater calls. An additional, one-time cost of \$15,000 has been estimated for the policies and procedures manual.

Based on current data for calls logged in the jurisdictions, CDM has estimated an annual call volume of 4,600 for the entire county (all jurisdictions participating in the call center). Research on the cost of a relatively low-volume call center shows an estimated cost of \$20 per call (includes salary time, overhead, and equipment). Therefore, the annual cost for operation of the call center has been

estimated to be approximately \$100,000 (includes approximately 2 FTEs).

Assuming all jurisdictions participate in the Call Center, it is anticipated that each partner will share in the cost of the program and that the cost share would be allocated on a population-basis.

### 5.1.5 Implementation of Risk-Based Stormwater System Maintenance Program

Table 5.5 shows the steps for implementation of the risk-based maintenance program. As an early step in the program, County staff will convene a meeting with local stormwater managers to determine the list of NCDOT-related maintenance items. This list will be compiled and presented to NCDOT for response. In addition to the NCDOT issues, the stormwater managers should also be used to develop the risk-based protocol for all other maintenance items. Existing staff will then draft a main-

Table 5-4 Implementation Plan for the Call Center		
No.	Implementation Steps	Estimated Resources
1	Develop common tracking procedures for current customer calls/complaints	<p><b>One-Time Cost</b> \$20K for Items #1 through #3</p> <p><b>Recurring Cost</b> \$100K annually for operation of the call center</p> <p><b>Funding/Revenues</b> Wake County &amp; Local Governments</p>
2	Compile information on all stormwater-related calls county-wide to estimate anticipated call volume	
3	Develop policies and procedures manual for call center activities	
4	Implement call center	
5	Provide staffing for required service level	

Table 5-5 Implementation Plan for Risk-Based Stormwater System Maintenance		
No.	Implementation Steps	Estimated Resources
1	Develop work plan of NCDOT-related maintenance issues and present to NCDOT	It has been anticipated that all activities will be accomplished with existing staff.
2	Develop risk-based protocol for maintenance priorities using local Stormwater Managers	
3	Develop computerized database of high-risk locations in each jurisdiction using modeling results, call logs, and field experience	
4	Develop maintenance plan for addressing high-risk sites	
5	Implement and perform maintenance procedures	

tenance plan for the high-risk sites. Since it has been assumed that all tasks associated with this recommendation will be performed by existing staff, no cost estimate has been identified.

### 5.1.6 Implementation of the Collaborative NPDES Phase II Program

As a first step for this recommendation, a meeting with all interested jurisdictions should be convened to discuss appropriate levels of service and to draft interlocal agreements. In addition, a uniform ordinance should be developed based on a standard model ordinance, such as the available NPDES Phase II model ordinance. Next, staff at participating jurisdictions should agree upon a five-year work plan for services to be provided by the County. Lastly, the County and participating jurisdictions should approach the State about acquiring a joint NPDES permit.

Table 5-6 outlines the proposed steps for implementation of this recommendation. Costs for implementation of the Phase II programs were estimated based on a literature search. The document titled "NPDES Phase II Cost Estimates" (Reese, 2000) provides per capita cost metrics for

each of the six minimum measures. Since the post construction, S&E, and public education/ involvement recommendations are addressed separately by the Task Force, these program costs were removed from the estimated NPDES program cost. Also, consideration of Raleigh as a participating jurisdiction was eliminated since Raleigh has an NPDES Phase I program.

Based on the cost per capita metrics provided in the "NPDES Phase II Cost Estimates" study, a cost of \$220,000 annually (includes an estimated 2.5 FTEs) has been estimated to provide two of the six NPDES Phase II minimum measures (illicit discharge detection and elimination and good housekeeping) to the County and all jurisdictions other than Raleigh. As stated in Section 4, this program would be modeled after the City of Charlotte/Mecklenburg County program, where the County provides services to the local jurisdictions for a fee with the intent of achieving full cost recovery for services rendered.

Table 5-6 Implementation Plan for Collaboration on NPDES Phase II Programs		
No.	Implementation Steps	Estimated Resources
1	Convene meeting with interested jurisdictions and develop interlocal agreements	<p><b>Recurring Cost</b> \$220K annually for implementation of the five-year work plan</p> <p><b>Funding/Revenues</b> Wake County &amp; Local Government partners</p>
2	Develop uniform ordinance for all jurisdictions	
3	Develop five-year work plan for program activities with associated staffing plan	
4	Develop joint permit for State approval	
5	Provide enforcement and reporting activities	

### 5.1.7 Implementation of the Environmental Monitoring Program

The first step for implementation of the monitoring program is to convene a meeting with all agencies and jurisdictions that currently perform monitoring in the County. It has been assumed that an outside professional would assist with this assignment. The outcome of these coordination meetings will be the development of a county-wide monitoring plan. Once completed, interlocal agreements will be developed and the plan will be implemented.

Table 5-7 lists the implementation steps and provides estimated program costs. A 2003 report by CDM to the County identified a list of monitoring projects and associated costs. The projects include the retrofitting of eight existing USGS sites at a cost of \$40,000. Also, the plan proposes the installation of an additional eight monitoring sites at a total cost of \$160,000. Operating costs for these 16 sites is estimated at \$160,000 annually (\$15K per new; \$5K per retrofit site). Lastly, the plan includes a monitoring project for the Little River Reservoir at a cost of \$25,000 per year.

### 5.1.8 Implementation of the Public Education Program

Since the County has announced plans to form an Environmental Stewardship Division that will be responsible for stormwater public education, the recommendation from this group should be coordinated with this new division. The County should also convene a meeting with local stormwater managers to determine the current stormwater public education practices county-wide

to provide the most comprehensive program. Next, a citizen survey should be conducted to determine the current state of citizen knowledge. Lastly, the Water Quality Committee should be used to support analysis of the survey data and to suggest alternative directions for the program.

Table 5-8 lists the proposed implementation steps and associated implementation costs. Current activities and resources dedicated to public education are sufficient to meet the minimum regulatory requirements of the NPDES Phase II permit. However, the Task Force recommended a more robust program that would strive to achieve behavioral change in the County. The County has proposed to re-allocate and re-dedicate existing resources and personnel to achieve the goals of the Task Force related to public education. Also, it is anticipated that the County will collaborate with local governments to develop and/or implement any new programs where appropriate. However, a one-time cost of \$50,000 would be necessary to conduct a citizen survey that would assess the current knowledge level of County citizens.

### 5.1.9 Implementation of the On-Site Wastewater System Maintenance Program

Through the support of this Task Force, the County has initiated an implementation plan for the on-site wastewater system maintenance program evaluation. The County has identified potential alternatives and is currently presenting them to a stakeholder committee. At the conclusion of the stakeholder process and upon recommendations by the group, a maintenance plan will be developed to achieve the goals of that committee. To support the inspection process, the County will also need to develop

Table 5-7  
Implementation Plan for Environmental Monitoring

No.	Implementation Steps	Estimated Resources
1	Convene a series of meetings with all agencies supplying monitoring within Wake County to assess data gaps and identify program enhancements	<p><b>One-Time Cost</b> \$45K for Items #1 through #3</p> <p>\$200K for new and retrofit sites</p> <p><b>Recurring Cost</b> \$185K for yearly operations and testing</p> <p><b>Funding/Revenues</b> Wake County</p>
2	Develop monitoring work plan that will include station locations, monitoring activities, and frequencies	
3	Develop interlocal agreements and cost share guidelines for participating jurisdictions	
4	Implement program enhancements per recommendations in the monitoring work plan	
5	Develop and implement procedures for a common reporting mechanism	

Table 5-8 Implementation Plan for Collaboration on Public Education Programs		
No.	Implementation Steps	Estimated Resources
1	Coordinate Task Force recommendations/suggestions with newly-formed County Environmental Stewardship Division	<p><b>One-Time Cost</b> \$50K for Items #1 through #3</p> <p><b>Funding/Revenues</b> Wake County re-allocation; shared resources w/ local governments</p>
2	Convene a meeting with local jurisdictions and agencies to determine all local education programs for stormwater	
3	Develop and conduct a citizen survey to determine current knowledge level and deficiencies	
4	Convene a meeting of the Water Quality Committee to review survey data and other programs to determine the focus areas for the new education program	
5	Develop materials and workshops to support desired education initiatives	

a Master Account Database to track maintenance and inspection activities. The associated inspections will require additional staffing for the department.

Table 5-9 lists the implementation steps for this recommendation. The County has already secured funding for the review of maintenance practices, facilitation of the stakeholders group, and the development of the recommended maintenance plan. Additional funding will be required to develop the Master Account Database at one-time cost of \$200,000 (this cost will be phased over the first four years of the program). Wake County staff has performed a preliminary cost estimate for implementation of a risk-based maintenance program for on-site wastewater systems. Annual program cost is estimated at \$846,000, which includes nine FTEs. Imple-

mentation of this program and the hiring of new staff would be phased in over a five-year period. It is anticipated that 100 percent of this expenditure is recoverable through user fees.

### 5.2 Implementation Schedule

In Section 4, the Task Force and Stormwater Managers identified priority programs for implementation. Based on this list, CDM and County staff have identified tasks that should be completed in the first few years of the program. Specifically, the County should begin implementation of the following items beginning in January 2008:

- Convene meetings with jurisdictions interested in collaboration
- Develop NPDES Phase II ordinance

Table 5-9 Implementation Plan for Maintenance of On-Site Wastewater Systems		
No.	Implementation Steps	Estimated Resources
1	Perform a review of local and peer community maintenance practices	<p><b>One-Time Cost</b> Already Incurred for Steps 1 through 3</p> <p>\$200K for Master Account Database Development</p> <p><b>Recurring Cost</b> \$846K annually for risk-based maintenance</p> <p><b>Funding/Revenues</b> User Fees</p>
2	Convene stakeholders group to review practices and select alternatives	
3	Develop maintenance plan for on-site wastewater systems	
4	Develop a Master Account Database to track maintenance/inspections	
5	Implement maintenance and inspection program with appropriate staff	

- Develop Post Construction ordinance
- Initiate Poplar Creek Pilot Study
- Determine Risk-Based Criteria for S&E
- Compile Maintenance “Hot-Spots”
- Establish Environmental Stewardship Initiative

### 5.3 Summary of Implementation Costs

A summary of the implementation costs and estimated FTEs is shown in Table 5-10 at the end of this section. The costs have been distributed over a five-year planning period beginning in fiscal year 2007-2008, assuming that some activities will begin in January 1, 2008. One-time program costs are highlighted in red. The middle portion of the table summarizes the one-time costs and the recurring (annual) program costs as well as the total cost of all programs for the five-year planning window. To the right of the “Program Costs” section, funding/revenue sources are summarized. Funding required by Wake County for the first five years of implementation is shaded in blue. Required contributions by local government partners and revenues from user fees are also shown.

The total Wake County cost for the 5-year plan is \$2.6 million, which is an average of approximately \$520,000 per year.

### 5.4 Proposed Resolution to Initiate Recommendations

As a final element of this report and as a first step forward for the implementation process, the Task Force wished to put forth a resolution pledging that each local government will work in concert to consider implementing the recommendations proposed in this document. A draft resolution is located at the end of this section and will be presented to the governing boards at each of the local governments. The Task Force wishes to receive full support for this resolution.

SAMPLE RESOLUTION FOR LOCAL GOVERNMENTS

**RESOLUTION PLEDGING THAT EACH LOCAL GOVERNMENT WILL WORK IN CONCERT TO EARNESTLY CONSIDER IMPLEMENTING RECOMMENDATIONS OF THE WAKE COUNTY STORMWATER MANAGEMENT TASK FORCE**

WHEREAS Wake County is one of the fastest growing and most desirable places in the nation to live, work, and play; and,

WHEREAS growth brings economic opportunities and growth-management challenges; and,

WHEREAS a critical challenge is managing stormwater to reduce flooding and stream degradation and otherwise ensure environmentally sound use of natural resources; and,

WHEREAS, the County and its municipalities recognized this challenge and designated representatives to serve on a county-wide stormwater task force; and,

WHEREAS, the task force over 20 months has explored stormwater issues and prepared a report containing recommendations for each governing board's consideration; and,

WHEREAS, those recommendations have been presented to each governing board; and,

WHEREAS, it is in the interest of the community that the governing boards work together across jurisdictional boundaries to address stormwater management;

THEREFORE IT IS HEREBY RESOLVED that the undersigned governing boards agree to work in concert to earnestly consider implementing recommendations of the Wake County Stormwater Task Force.

Signed:

The County of Wake County  
The City of Raleigh  
The Town of Apex  
The Town of Cary  
The Town of Fuquay-Varina  
The Town of Garner  
The Town of Holly Springs  
The Town of Knightdale  
The Town of Morrisville  
The Town of Rolesville  
The Town of Wake Forest  
The Town of Wendell  
The Town of Zebulon

**Table 5-10**  
**Wake County, North Carolina**  
**Stormwater Management Task Force**  
**Cost and Implementation Schedule for Task Force Recommendations**

Rec. No.	Title	Distributed Cost (\$)					Program Costs			Funding by Revenue Source (5-yr totals)			Associated FTEs	Notes Related to Cost Assumptions
		FY 07-08	FY 08-09	FY 09-10	FY 10-11	FY 11-12	One-Time Program Cost (\$)	Recurring Program Cost (\$)	Total 5-yr Program Cost (\$)	Wake County (\$)	Municipal Governments (\$)	User Fees (\$)		
1	H&H Modeling of the Stormwater System	\$275,000	\$250,000	\$250,000	\$250,000	\$250,000	\$25,000	\$250,000	\$1,275,000	\$1,275,000	---	---	n/a	One-time cost and one-year of modeling is included for FY 07-08
2	Implement Post Construction Runoff Controls**	\$25,000	\$255,000	\$255,000	\$255,000	\$255,000	\$25,000	\$255,000	\$1,045,000	\$25,000	---	\$1,020,000	3	One-time cost is included in FY07-08
3	Enhance S&E Program**	\$35,000	\$85,000	\$170,000	\$255,000	\$255,000	\$35,000	\$255,000	\$800,000	\$35,000	---	\$765,000	3	One-time cost is included in FY07-08; staggered hiring of new inspectors
4	Implement a County-wide Call Center**	\$0	\$20,000	\$100,000	\$100,000	\$100,000	\$20,000	\$100,000	\$320,000	\$92,000	\$228,000	---	2	One-time cost is included in FY08-09
5	Implement a Risk-Based Stormwater System Maintenance Program	\$0	\$0	\$0	\$0	\$0	n/a	n/a	\$0	---	---	---	n/a	Assumed no cost; utilize existing staff to target priority areas
6	Collaboration with County on NPDES Phase II Programs**	\$0	\$220,000	\$220,000	\$220,000	\$220,000	n/a	\$220,000	\$880,000	\$378,000	\$502,000	---	2.5	Used literature cost factors for annual costs
7	Environmental Monitoring	\$0	\$150,000	\$225,000	\$185,000	\$185,000	\$245,000	\$145,000	\$745,000	\$745,000	---	---	n/a	FY 08-09 cost includes one-time cost for workplan & site retrofits and recurring cost for operations and Little River sampling; remainder of program implemented in FY09-10
8	Collaboration on Public Education	\$0	\$50,000	\$0	\$0	\$0	\$50,000	\$0	\$50,000	\$50,000	---	---	n/a	One-time cost is included in FY08-09
9	Maintenance of On-Site Wastewater Systems**	\$0	\$518,000	\$644,000	\$708,000	\$846,000	\$200,000	\$846,000	\$2,716,000	---	---	\$2,716,000	9	Staggered hiring of maintenance/inspection staff; one-time cost for Master Account development (\$200,000) is spread out over 4 years
<b>Recommendation Totals =</b>		<b>\$335,000</b>	<b>\$1,548,000</b>	<b>\$1,864,000</b>	<b>\$1,973,000</b>	<b>\$2,111,000</b>	<b>\$600,000</b>	<b>\$2,071,000</b>	<b>\$7,831,000</b>	<b>\$2,600,000</b>	<b>\$730,000</b>	<b>\$4,501,000</b>	<b>19.5</b>	
<b>Anticipated Revenues =</b>		<b>\$0</b>	<b>\$983,000</b>	<b>\$1,270,000</b>	<b>\$1,419,000</b>	<b>\$1,557,000</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	<b>---</b>	
<b>Estimated Annual Cost to Wake County Budget =</b>		<b>\$335,000</b>	<b>\$565,000</b>	<b>\$594,000</b>	<b>\$554,000</b>	<b>\$554,000</b>								

**NOTES:**

- 1) Dollars in red include one-time costs (note: may also include some recurring cost for that year)
- 2) Some recurring costs have been phased in (i.e. add one FTE per year, etc)
- 3) Items noted with a (\*\*) symbol have revenues associated with them
- 4) For NPDES Phase II cost, assume county is responsible for 43% of total budget; 57% is recoverable
- 5) For Call Center, assume county is responsible for 24% of total budget
- 6) Full cost recovery is anticipated for Post Construction Runoff Control, S&E Control programs, and Maintenance of On-Site Wastewater Systems