

# NC STATE UNIVERSITY

Annual Report  
August 2009

## **Stormwater Management**

Environmental Health and Public Safety Center  
North Carolina State University  
Campus Box 8007  
2620 Wolf Village Way ♦ Raleigh, North Carolina ♦ 27695

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## I. Program Summary and Assessment

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North Carolina State University (University, NC State) currently holds a Permit to Discharge Stormwater under the National Pollutant Discharge Elimination System (NPDES). Permit Number NCS000376 was issued on April 18, 2005 with an effective date of May 1, 2005. This report is intended to meet the permit condition found at Part II, Section A, Item 1. The report summarizes the University's activities under the permit for the previous 12-month period.

### **Program Summary**

The Program lost the full-time position of Stormwater Program Manager in August 2008. The role of Stormwater Program Manager was absorbed by the Environmental Affairs Manager and a support staff person.

The Program was evaluated as part of a detailed multi-media compliance audit, conducted during the summer of 2008. The audit identified several program deficiencies which have been the subject of considerable attention during the year, just ending.

The Stormwater Program was reorganized, and now operates under a streamlined Stormwater Committee.

## **May 2008 – July 2009 Highlights**

Below is a summary of accomplishments by activity category.

<b>Activity Category</b>	<b>Comments</b>
Education, Outreach and Public Involvement	Activities: <ul style="list-style-type: none"><li>• Developing Plan to provide targeted computer-based training modules designed to reach the staff and contractors directly affecting stormwater runoff</li><li>• Participated in special events such as Earth Day</li><li>• Active participant in the University's Sustainability Programs</li></ul>
Illicit Discharge Detection and Elimination	Activities: <ul style="list-style-type: none"><li>• Continue implementing procedure for investigating and correcting reported illicit connections, discharges, spills and illegal dumping</li><li>• Corrected reported problems and currently working to resolve two other issues</li></ul>
Sediment & Erosion Control	Activities: <ul style="list-style-type: none"><li>• Site evaluations of all active construction sites</li><li>• Continued implementation of the Sediment and Erosion Control Program</li></ul>
Pre- & Post-Construction Stormwater Management	Activities: <ul style="list-style-type: none"><li>• Continue to implement the Stormwater Management Plan Guidelines</li></ul>
Pollution Prevention and Good Housekeeping	Activities: <ul style="list-style-type: none"><li>• Continued to implement, expand and improve upon the existing programs</li><li>• Developed and "environmental concerns" report form available on the website for anyone to submit concerns, questions or suggestions.</li></ul>
Permanent BMPs Inspection & Maintenance	Activities: <ul style="list-style-type: none"><li>• Engaged in a study to identify, categorize and prioritize permanent BMPs on the campuses of NCSU</li><li>• Implementing maintenance activities to ensure functionality of devices</li></ul>
Monitoring	Activities: <ul style="list-style-type: none"><li>• Continued to implement the Stormwater Discharges and Water Quality Monitoring Plan</li><li>• Contracted with an independent consultant to implement Plan and provide written report</li><li>• Completed two sampling events</li></ul>
Retrofits	Activities: <ul style="list-style-type: none"><li>• Provided financial support for three retrofit projects</li></ul>

## II. Component Discussions

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### A. Education and Outreach Program

North Carolina State University believes that an integral part of stormwater management involves the education of the campus community about our local water resources, how we affect water quality, and what we can do to minimize pollution and damage and lessen our impact on the environment. In this context, the University has developed an Education and Outreach Program that provides information to those staff persons and contractors which have a direct impact on stormwater quality.

#### **Awareness Training & Educational Workshops**

NC State Stormwater Management training specifically targets University Project Managers from Design and Construction Services, as well as members of the development community such as engineers, architects, contractors, surveyors, and planners who propose to work on the campuses of NC State. Training is designed to educate those involved with the design, construction and maintenance of University projects. Table 3 outlines the type of training available on an annual basis.

<b>Table 2: Training and Educational Workshops</b>	
<b>University Project Managers</b>	<b>Development Community</b>
Permitting Requirements <ul style="list-style-type: none"><li>• Environmental Assessments/FONSI</li><li>• Stormwater Management Plans</li><li>• Sediment &amp; Erosion Control</li><li>• 401/404 Permits &amp; Approvals</li><li>• Air Permits</li></ul>	Contractor's Meetings <ul style="list-style-type: none"><li>• Review of Permit Conditions and Requirements</li><li>• Review of Sediment and Erosion Control Guidelines</li><li>• Review of Inspection Procedures</li></ul>
Plan Submittal & Approval Protocol	Pre-Construction Meetings
Required Permits &/or Approvals	
Other Applicable Environmental Documentation	

#### **Special Events Participation**

NC State Stormwater Management participates in workshops and other appropriate venues with an education booth designed to inform the public about the stormwater program at NC State University. Along with the display, many brochures, pamphlets, and other handouts discussing pollution prevention and water quality issues are available.

## B. Public Involvement

The requirement in the University's Stormwater Permit addressing public involvement reflects the origins of the municipal stormwater regulatory framework. This is a standard requirement for federally-mandated environmental regulatory programs designed for implementation at the city government level. However, application of the stormwater permit to the University has been, and will continue to be, more driven by facility management principles, than by the processes applied to municipal governance. The Program is based upon agreed-upon plans and procedures, which are implemented by affected University component organizations.

In the context of the campus environment, the students are considered the public. Our student body is an important member of the University community, its involvement in the workings of the Stormwater Program is valued and encouraged.

## C. Illicit Discharge Detection and Elimination Program

The University continues to implement an Illicit Discharge Detection and Elimination Program. The program provides a standardized way to identify report, resolve and document illicit discharges.

The table provided below summarizes actions under this program for the subject reporting period.

<b>Illicit Discharge Reports</b>				
<b>Period of coverage July 2008 through July 2009</b>				
<b>Incident</b>	<b>Responsible Party</b>	<b>Cause</b>	<b>Corrective Actions</b>	<b>Notification Source</b>
Fish kill	Greek Village Construction Project	Broken water line	Water line was repaired.	Tim Schuller McKim & Creed
Sediment in Rocky Branch	Meredith College Construction Project	Breech in a sediment trap	Repaired trap	Robert Bradley NCSU Grounds
Oil leaked onto rocks in stormwater detention area	Kubota utility vehicle	The vehicle lost control and rolled onto rip rap area.	Rocks where wiped off.	Alan Daeke NCSU Facilities
Sewage in Rocky Branch	City of Raleigh	Sanitary Sewer overflow.	Sewage was removed from surface waters and storm sewer lines where flushed.	Alan Daeke NCSU Facilities
Sewage in stormwater system	undetermined	undetermined	Stormwater Sampling determined limits were below surface water standards at entrance to North Creek.	Pete Fraccaroli NCSU Housing
Sediment in North Creek	Greek Village Construction	Flushing of fire hydrant	Eroded area was repaired and sediment trap was cleaned out.	Ellen Buckner NCSU Environmental Affairs
Soapy/grey water in Rocky branch	undetermined	undetermined	A sample is being analyzed to help target the source	Barbara Doll Sea Grant Program
Yarborough Steam Plant oil spill	NCSU	Failed gasket	Complete cleanup and repair of failed equipment	NCSU – self reported

## D. Stormwater System Inventory and Mapping

Databases and maps describing the stormwater system, including collection devices, conveyances, structural controls, and outfalls, are being validated and consolidated into a single stormwater system inventory. The stormwater system inventory will be managed through the University's Architectural, Engineering, and Real Estate (AERES) System. AERES provides real-time access to facility building, room space, and infrastructure information for the University (Raleigh Campus). Access to AERES is restricted to University employees.

AERES 2.1 with GIS is scheduled to go to production in September. Stormwater data is being prepared in parallel with AERES system development.

Approximately 80% of structural BMP devices have been identified and mapped in GIS. The remaining 20% have been identified, but have not been mapped. We are currently compiling, converting, and verifying survey data for the underground piping network, which will then be assigned unique identification numbers and tracked in the system. Previously identified outfall locations will to be mapped next.

Impervious surface data for the campus, current as of 2007, has been obtained from Wake County GIS. Other current, publicly available GIS data has been gathered and entered into the system, including surface water features and topography. The University is researching the availability of current watershed GIS data.

## E. Sediment and Erosion Control Program

NC State Stormwater Management has been implementing a Sediment and Erosion Control Program since 2004. The program is composed of two procedures:

Sediment and Erosion Control Guidelines and Technical Specifications

Sediment and Erosion Control Evaluation Procedure

As stated in the Permit, the NC DENR Division of Land Resources, Land Quality Section provides Plan review and approval, and also periodic inspections. However, also under the Permit, the University performs monthly inspections of all active construction sites and provides the results of those inspections to Land Quality.

## F. Post-Construction Stormwater Management Program

The post-construction stormwater controls necessary to meet Program requirements actually begins well in advance of project construction. Any project which is subject to the Program must provide a stormwater plan for review and approval prior to initiating construction.

NC State Stormwater Management has developed and implemented a Pre- and Post-Construction Stormwater Management Program in accordance with the Neuse River Basin Nutrient Sensitive Waters Management Strategy: Basinwide Stormwater Requirements (15A NCAC 2B .0235).

All projects are required to develop a plan based on the Stormwater Management Plan Guidelines.

Currently, the University is conducting a survey of all permanent BMPs (as part of the system inventory and mapping activities). The survey will be used to identify and prioritize maintenance requirements. All permanent structural BMPs are inspected and maintained in accordance with the University's BMP Inspection and Maintenance Program.

## G. Pollution Prevention and Good Housekeeping

NC State Stormwater Management and various affected departments will continue to implement the non-structural best management practices, preventative measures and innovative programs currently in place.

A facility-wide stormwater exposure assessment has been completed, which is being used as input to develop necessary pollution prevention plans. The Stormwater Program is working with the following organizations on pollution prevention plan development.

- Dining
- Grounds Maintenance
- Transportation
- Athletics
- Housing
- Various Academic Departments

Pollution prevention efforts will be extended to other campus organizations, based upon the results of the exposure assessment.

## H. Structural Stormwater Controls Inspection and Maintenance

All structural stormwater controls at the Raleigh Campus are subject to the NC State Stormwater Structural Controls Inspection and Maintenance Procedure. The procedure implements the NCDENR DWQ 2007 BMP Manual. Also, all inspection and maintenance activities are performed by University staff that holds an active BMP Inspection and Maintenance Certification.

## I. Retrofits

North Carolina State University was granted authority by NC DENR to collect internal offset payments and utilize the money for retrofit BMPs that would improve nitrogen reduction elsewhere on campus. Offset payment fees are collected from projects that do not exceed the export limits for new development projects that exceed the 3.6 lbs/acre /yr requirement.

NC State Stormwater Management has contributed funds to various retrofit projects around campus. The table below summarizes the most recent contributions.

<b>Table 6: Use of Offset Payment Funds</b>		
<b>Project Name</b>	<b>Location</b>	<b>Contribution</b>
Rocky Branch Phase III	Central Campus between Dan Allen Dr. and Morrill Dr.	\$75,000
Lake Wheeler Road Field Labs Buffer Restoration	Lake Wheeler Road Field Lab near the Fish Barns	\$6,050
Math & Statistics West-Accessible Path	Central Campus at front entrance to the Yarborough Steam Plant	\$0.00
Williams Hall-Sediment and Erosion Control Project	Central Campus on the east side of Williams Hall	\$15,000

## J. Research and Program Assessment

The Stormwater Program did not perform any research during the subject period.

The Program was subject to a comprehensive independent compliance audit, which was part of a large (multi-media) University-wide audit.

## K. Land Use Planning

At the University, land use planning is conducted under the term, "Master Planning," which is typical for a University setting. The master planning process integrates a number of planning variables, including stormwater management.

The University Master Plan was last updated in 2007. The Master Plan is a living document, subject to continual review and revision as new projects are being designed and constructed.

## L. Monitoring

NC State Stormwater Management has contracted with Piedmont Geologic to conduct stormwater discharge and water quality monitoring. The stormwater sampling plan was implemented twice during the subject period; during August 2008 and February 2009. Results of those sampling actions are summarized in Table 1.

### III. Proposed Program Changes and Schedule

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The current permit expires on April 1, 2010. In compliance with the permit, the University will submit a permit renewal application before October 31, 2009.

The permit renewal application will be based upon the requirements for a Phase II community [GS 143-215.1 and the Memorandum of Agreement between North Carolina and the U.S. Environmental Protection Agency dated May 19, 1994 (or as subsequently amended)].

The University will access DWQ Stormwater Section guidance in the development of this permit renewal application.

#### IV. Illicit Connections and Illegal Dumping Reports and Inspections

See Illicit Discharge Detection and Elimination discussion (Section II C).

## V. Report of Water Quality Improvement or Degradation

<b>Table 6: Reports of Water Quality Degradation</b>				
<b>Period of coverage: July 2008 through July 2009</b>				
<b>Incident</b>	<b>Responsible Party</b>	<b>Cause</b>	<b>Corrective Actions</b>	<b>Notification Source</b>
Fish kill	Greek Village Construction Project	Broken water line	Water line was repaired	Tim Schuller McKim & Creed
Sediment in Rocky Branch	Meredith College Construction Project	Breach in a sediment trap	Repaired trap	Robert Bradley NCSU Grounds
Oil leaked onto rocks in stormwater detention area	Kubota utility vehicle	The vehicle lost control and rolled onto rip rap area	Rocks were whipped off	Alan Daeke NCSU Facilities
Sewage in Rocky Branch	City of Raleigh	Sanitary Sewer overflow	Sewage was removed from surface waters and storm sewer lines where flushed	Alan Daeke NCSU Facilities
Sewage in stormwater system	undetermined	undetermined	Stormwater Sampling determined limits were below surface water standards at entrance to North Creek	Pete Fraccaroli NCSU Housing
Sediment in North Creek	Greek Village Construction Project	Flushing of fire hydrant	Eroded area was repaired and sediment trap was cleaned out	Ellen Buckner NCSU Environmental Affairs
Soapy/grey water in Rocky Branch	undetermined	undetermined		Barbara Doll Sea Grant Program
Sediment in Wetland	Terry Center Construction Project	Inadequate sediment and erosion control measures	Erosion Control measures are being maintained, a new Sediment and Erosion Control Plan has been approved for the site, and a project to clean out the wetland is in the planning phase.	Jean Spooner NCSU Water Quality Group
Oil spill in Rocky Branch	Yarborough Steam Plant	Broken pipe	Stormwater system and affected waters were cleaned	Alan Daeke NCSU Facilities

## VI. Successes, Failures, and Milestones

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The permit renewal application, which will be provided by November 1, 2009, is a milestone of note.

## Certification

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"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations."

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Printed

Name: Charles D. Leffler

Title: Vice Chancellor for Finance and Business

Table 1 STORMWATER MONITORING DATA SUMMARY REPORTS  
(Continued)