

SEDIMENTS

Newsletter of the North Carolina Sedimentation Control Commission

Henderson County and City of Asheville Win Awards for Excellence in Erosion and Sediment Control

By Evangelyn Lowery-Jacobs, Land Quality Section, Raleigh, NC

The annual Local Programs Workshop and Awards Banquet was held at the Brownstone Hotel and Conference Center in Raleigh on January 26 and 27, 2011. This annual workshop brings together delegates from each of the 52 local programs throughout the state and specializes in training and discussion of erosion and sediment control issues in North Carolina.

Local erosion and sediment control programs have the ability to exercise greater control over erosion and sediment control in their respective jurisdictions and may often inspect sites more frequently than

the state erosion and sediment control program. Furthermore, local erosion and sediment control program ordinances may be more restrictive than state law, giving additional control over the development occurring within their respective jurisdictions. The North Carolina Sedimentation Control Commission recognizes the importance and the value of local erosion and sediment control programs in controlling pollution by sedimentation to the waters of North Carolina. In addition to training, the workshop seeks to recognize outstanding local

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Pictured from left to right: Robin Smith (NC SCC), Tim Fox (Henderson Co.), Natalie Berry (Henderson Co.), Michael P. Voiland (NC SCC), and Gray Hauser (NCDENR-LQS)

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SEDIMENTS is a newsletter published quarterly by the N.C. Sedimentation Control Commission to provide information and assistance to the regulated community and to facilitate communication among personnel of state and local erosion and sedimentation control programs. SEDIMENTS is available in electronic form at: <http://www.dlr.enr.state.nc.us/pages/sedimentationnewsletters.html>.

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State of North Carolina,
Department of Environment & Natural Resources
Dee Freeman, Secretary

Land Quality Section, Division of Land Resources
James D. Simons, Director and State Geologist

Awards for Excellence

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programs. Each year, awards of excellence are presented to programs in two categories:

Small program – program providing 0-3 man-years or full-time equivalents supporting erosion and sediment control

Large program – program providing 3+ man-years or full-time equivalents supporting erosion and sediment control

This year, Henderson County received the Local Program Award of Excellence for a small program. This new program is located within the Henderson County Engineering Department. Natalie Berry, PE, the Assistant County Engineer, has direct oversight over the program. Tim R. Fox, CPESC, is the Erosion and Sediment Control Technician.

Henderson County received 54 projects from Land Quality, in addition to 30 active projects of their own. They seek to educate homeowners and other environmental groups. Inspection of sites is conducted twice per month by a small staff. According to Gowon Goode, “Henderson County does a good job administering their Local Program.”

The Henderson County Erosion Control Local Program is responsible for the following: soil erosion and sedimentation control for all unincorporated areas of Henderson County, the City of Hendersonville, Village of Flat

Rock, Town of Laurel Park and Town of Fletcher.

More information on the Henderson County’s Erosion and Sediment Control program can be found on their website at:

<http://ww2.hendersoncountync.org/engineering/erosion/>

The Erosion & Sedimentation Control Program for the City of Asheville received the Local Program Award of Excellence for a large program. The Stormwater Services Division of the Transportation and Engineering Department reviews and approves grading and erosion control plans within the City of Asheville’s corporate limits. The City of Asheville is able to offer one stop shop permitting for projects throughout the city. The staff seeks to inspect sites twice per month, as circumstances require. The large staff is able to cater to projects from start through completion.

The division reviews sketches and plans when a development is required to apply for a grading permit. If the disturbed area is 10,000 square feet or larger, a design professional is required to complete the grading and erosion control plans and calculations by using the guidelines in the City’s Soil Erosion and Sedimentation Control section of their Standard Details and Specifications manual, NCDENR’s Stormwater Best Management Practices manual and the City’s Unified Development Ordinance (UDO).

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From left to right: Robin Smith (NC SCC), Monte Clampett (City of Asheville), McCray Coates (City of Asheville), Michael P. Voiland (NC SCC), and Gray Hauser (NCDENR-LQS). (Not in photo: Cathy Ball, Stephanie O’Conner, Ray Tracy, Chuck Watson, Ric Ledford, Arthur Hensley, Danny Gibson, John Fly, Woody Ledford, and Toby Shelton)



SEDIMENTS is published by the NC Sedimentation Control Commission to provide information and assistance to the regulated community and to facilitate communication among personnel of state and local erosion and sedimentation control programs. Past issues are on the [Land Quality Section web site](#).

Send comments to Evangelyn Lowery-Jacobs, NCDENR-Land Quality, 1612 Mail Service Center, Raleigh, NC 27699-1612. Email: evangelyn.lowery-jacobs@ncdenr.gov.

To receive *Sediments* electronically, please see page 1 for list service instructions or contact bonnie_kurth@ncsu.edu or (919) 515-3723.

Personnel of the Land Quality Section of the NC Department of Environment and Natural Resources provide information and assistance for implementation of the NC Erosion and Sedimentation Control Program. For assistance, please contact the Regional Engineer or the Raleigh headquarters listed below:

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The North Carolina Sedimentation Control Commission

The Sedimentation Control Commission (SCC) was created to administer the Sedimentation Control Program pursuant to the NC Sedimentation Pollution Control Act of 1973 (SPCA). It is charged with adopting rules, setting standards, and providing guidance for implementation of the Act. The composition of the Commission is set by statute to encompass a broad range of perspectives and expertise in areas related to construction, industry, government, and natural resource conservation and quality. All members are appointed by the Governor and serve three-year terms, except for the Director of the Water Resources Research Institute of the University of North Carolina, who serves as long as he remains Director. The chairman of the SCC is named by the Governor. The following is a list of current members with the organizations they represent:

Chair:

Robin Smith
Burnsville

Non-governmental Conservation

Commissioners:

Elaine C. Chiosso
Brynum

Non-governmental Conservation

Tommy Esqueda
Wake County

NC Association of County Commissioners

Joseph E. Glass
Fayetteville

Professional Engineers of NC

Kevin Martin
Franklinton

NC Environmental Management Commission

Rich McLaughlin
Raleigh

NC State University, Dept. of Soil Science

John William Miller, Jr.
Burnsville

NC Mining Commission

Randy Veltri
Charlotte

NC Public Utilities

Richard Vick
Wilson

Carolinas Associated General Contractors

Michael P. Voiland
Raleigh

Water Resources Research Institute of
The University of North Carolina

Rob Weintraub
Wake Forest

NC Home Builders Association

Manly West
Moyock

NC Soil and Water Conservation Commission

Awards for Excellence

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The City of Asheville provides checklists for the required plan elements for the proposed grading and erosion controls to make sure the plans contain all the required items. Once the submittal is received by the City of Asheville, city staff thoroughly review it to ensure the design meets the city's criteria.

After the grading and erosion control review has been completed and the plans are approved, a permit package is issued so that erosion control measures can be installed and then the grading can begin. During the grading and construction process, there are periodic grading & erosion control inspections by the City of Asheville's staff to check that the erosion and sediment control measures are being maintained.

The City of Asheville's staff receiving the award are: Cathy Ball, PE and Director of Public Works; Monte Clampett, Construction Coordinator; McCray Coates, Stormwater Services Manager; Stephanie O'Conner, Senior Secretary; Ray Tracy, Plan Reviewer; Chuck Watson, Plan Reviewer; Ric Ledford, Plan Reviewer Technician; Arthur Hensley, Senior Inspector; Danny Gibson, Senior Inspector; John Fly, Inspector; Woody Ledford, Inspector; and Toby Shelton, Inspector.

More information on the City of Asheville's Erosion and Sediment Control program may be found on their website at:

http://www.ashevollenc.gov/business/development_services/plan_review/default.aspx?id=1938

Congratulations to these two well-deserving programs in recognition of their excellence in erosion and sediment control. ❖

Construction Sites: Effluent Numeric Limit for Turbidity

Effective January 4, 2011, EPA has stayed the numeric limitation of 280 NTU. EPA will propose a revised limit in a future rule-making. Other requirements still remain in place and are summarized in Sediments Vol 16(4) and includes stabilization within 14 days on all construction sites and sampling of discharges for all sites 10 acres or more..

For factsheets on this issue, please go to: <http://water.epa.gov/scitech/wastetech/guide/construction/>

NC Sedimentation Control Commission: February Actions

At its meeting on February 17, 2011 the NC Sedimentation Control Commission (SCC) took the following actions:

Delegated Local programs:

- Town of Apex: Approved the continuation of Local Delegation of erosion and sediment control (ES&C) programs. The Commission recommended Apex fill the vacant full time E & SC position.
- Town of Southern Pines: Approved the continuation of Local Delegation.

Request from Idaho DOT:

- Request was made by the Idaho DOT for the use of an unpublished draft Risk Assessment Methodology developed by the LQ during the years of 1997-2002. A courtesy approval given.

Sedimentation Education Funds:

- Approved LQ staff to use unspent sedimentation education funds for operations.

SCC 2011 Meeting Dates:

- Thursday, February 17
- Tuesday, May 17
- Thursday, August 18
- Tuesday, November 29

Sedimentation Pollution Control Act of 1973

The link to the N.C. General Statutes is:

http://www.ncga.state.nc.us/enactedlegislation/statutes/html/byarticle/chapter_113a/article_4.html

LQS Personnel Changes

Andrew Schneider returned to the Land Quality Section on February 9, 2011 as an Assistant State Dam Safety Engineer in the Raleigh Central Office.

Gowon Goode, Assistant State Sediment Specialist, left the Land Quality Section's Raleigh Central Office on February 25, 2011 for a position with the Natural Resources Conservation Service.

Turbidity Control: Principles of Making Flocculants Work for You

Richard A. McLaughlin, Ph.D., Professor/ Extension Specialist, Department of Soil Science, NC State University

In the last issue, I discussed approaches to meeting the new requirement from the US Environmental Protection Agency for controlling turbidity in stormwater discharges from construction sites (see *Turbidity Control: Basic Concepts, Sediments 17(2)*). These include filtration, infiltration, and flocculation. There is probably a song in that phrase, but I pointed out that the first two are difficult and/or expensive in most cases, so we are left with flocculation. Flocculation is the process of small suspended particles sticking to each other to form assemblages called flocs. This occurs naturally in many aquatic environments, often facilitated by organic molecules produced during decomposition of organisms. We can also add synthetic organic chemicals to get the same effect, only faster and more reliably. This is the most common approach to reducing turbidity in drinking water and for removing suspended solids in wastewater and industrial process water. How can we get this to work for construction site runoff?

It takes about a day and a half to answer that question in our workshops, but I can boil it down to essential aspects that illustrate the principles. The flocculation process involves having the chemical flocculant coming into contact with two or more suspended solids, usually clays, and pulling them together. The process is repeated until many of the formerly individual particles are held together in a floc. The flocs can settle faster

than the particles because they have less exposed surface area. While a clay particle might take days or weeks to settle to the bottom of a basin, a floc might settle in less than a minute. The key to forming flocs is to maximize the opportunity for the flocculant molecules to intercept the suspended solids as frequently as possible. Simply put: the more mixing energy and time the better.

There are many chemicals which are used for flocculation in water treatment and industrial processes, but the construction site water treatment market consists primarily of polyacrylamides (PAM) and chitosan. Polyacrylamide is a class of organic polymers which has common basic chemistry but which can be synthesized to have a wide variety of properties. In this market, however, PAMs are linear, long-chain molecules with a negative, or anionic, charge, and they are not toxic to aquatic organisms. Within this group, properties of each PAM are somewhat different and need to be matched to the specific soil or sediment on your site. Chitosan is synthesized from chitin that is harvested from crab and shrimp shells, and it has a net positive charge. Chitosan can be toxic to fish in pure form, but this is largely eliminated in the presence of the turbidity found in construction site runoff. Both PAM and chitosan have been widely used for turbidity control on construction sites.

There are two broadly-defined ways to get the flocculation process to work on a construction site: passive and active treatment. Passive treatment uses only gravity to dose runoff, primarily by placing the flocculant in areas where runoff concentrates (ditches, pipes) so some of the chemical dissolves into the turbid water as it flows by. In order to maximize the mixing and contact time previously mentioned as key to successful



Example of passive treatment as runoff from the disturbed area passes through a stable ditch with wattles treated with PAM

flocculation, the flocculant needs to be placed in many locations uphill from basins or other sediment collection devices. Runoff should always be treated on the construction site and pooled to collect sediment and flocs before discharge off the site. Active treatment involves pumping the turbid water and dosing it with a flocculant in the process, followed by pooling or filtration systems prior to discharge. It is considerably more expensive than passive treatment but

it is also much more reliable because your flows are known and controllable, compared to unpredictable storm flows used in passive treatment.

We don't know what the final turbidity number will be for the new EPA Effluent Limit Guideline, but it is almost certain that some level of flocculation will be necessary to achieve it. The basic principles outlined in these articles were intended as an introduction to controlling turbidity on construction sites. In practice, these principles can be applied in many different ways, but they are necessary in order to meet turbidity limits.



Environmental Connection 2011

Melanie McCaleb, MS, CPESC, Department of Soil Science, NC State University

Environmental Connection 2011 was held in Orlando, Florida. The conference was filled with excellent presentations ranging from sediment and erosion control to vegetation establishment to wind erosion. Below are summations of two presentations based on the papers of the publications.

Based on a paper entitled "*Effects of Selected Soil Conditions on Soil Erosion, Runoff, and Vegetation Growth*" by Hass et al, this presentation explored the results from past studies looking at the effects of polyacrylamide (PAM), Ammonium Laureate Sulfate (ALS), Fluidized Bed Combustion residue (FBC), and coal-fired power plant gypsum byproduct (GYP) in mitigating erosion and runoff from an acidic weathered Appalachian soil. All of the aforementioned materials were applied yearly for 4 years on an abandoned field on a hillside in southern West Virginia. Sediment totals, runoff volume and composition, and plant biomass were monitored.

No effect was observed with ALS. Yearly additions of 5 Mg ha⁻¹ FBC to the soil surface increased soil pH and Ca status. Addition of 5 Mg ha⁻¹ GYP increased runoff solution Ca, sulphur, and electrical conductivity more than FBC, but the effect decreased exponentially over a period of months. Rye growth was markedly improved in treatments receiving FBC, probably due to amelioration of Al and Mn toxicity in the acidic soil, and there was a tendency toward increased growth in the GYP treatment, which contained some calcium carbonate.

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When the plots were seeded and treatments applied in year 1, mean runoff in the FBC-containing treatments was reduced to 56% of that in control. Thus, the use of fluidized bed combustion residue (FBC) greatly improved plant nutrition status, increased vegetation biomass yield, and reduced overall runoff volume and sediment yield. The FBC-containing treatments were found to be superior to all other amendments tested. Its integrated effect on raising soil pH, reducing Al and Mn toxicity (which resulted in significantly higher biomass yield), increasing solution electrolyte levels, elevating Ca⁺⁺ concentration, and improving plant nutritional status all likely contributed to the decrease in runoff and sediment yield. PAM addition to FBC tended to further reduce sediment load.

“Staged Stabilization of Linear Projects: Minimizing Your Exposure to ELGs” by Ted Sherrod, formerly of NCDOT, and R. Brim, presented a compilation of statistics based on one study to determine the effectiveness of stage seeding on linear construction projects:

A comparison of ground cover types using RUSLE2 modeling (a modeling software that calculates the amount of soil that is lost by erosion based upon several variables) found seeding and mulching was the most effective followed by temporary mulch at a recommended rate of two tons per acre, temporary seed with no mulch, and no ground cover being the least effective. A further comparison of ground cover types both with and without polyacrylamide (PAM) found a bonded fiber matrix treatment was generally the most effective and bare soil was the least effective. Initial testing was conducted in Charlotte, NC by NC State University researchers. The runoff from different ground cover types including hydromulch, excelsior blanket, straw, and bare soil both with and without PAM were tested. Runoff was collected during three storm events. PAM was not reapplied after each storm. The results showed the use of PAM with ground cover types usually increased their effectiveness in reducing turbidity and erosion. However, it appears that PAM effectiveness decreases with subsequent rain events as one would expect. In temperate climates, germination of the seed mix would begin to establish as the flocculants effectiveness diminishes. Data presented is from one research site. Additional replications on other sites have been done and continue to be tested. ❖

IECA's Environmental Connection The World's Largest Soil & Water Event!

February 26-29, 2012

Las Vegas, Nevada, USA

The premier educational event for the erosion and sediment control industry. Environmental Connection has more erosion, sediment control, and stormwater focused training, technology and networking events than any other event. Over 4 days, Environmental Connection provides peer-reviewed education, products and technology which address eight technology sections:

- Slope Stabilization
- Stream Restoration
- Vegetative Establishment
- Stormwater Management
- Wetlands Technology
- Erosion and Sediment Control
- Beach and Shoreline Stabilization
- Wind Erosion Technology

Information: <http://www.ieca.org/conference/annual/ec.asp>



Feb. 26-29, 2012

call for presentations»

EPA's Stormwater Discharge Permit from Construction Sites: Public Comment

Stormwater discharges from construction activities (such as clearing, grading, excavating, and stockpiling) that disturb one or more acres, or smaller sites that are part of a larger common plan of development or sale, are regulated under the National Pollutant Discharge Elimination System (NPDES) stormwater program. Prior to discharging stormwater, construction operators must obtain coverage under an NPDES permit, which is administered by either the State (as is the case in NC) or EPA, (including Idaho, Massachusetts, New Hampshire and New Mexico, Washington DC, most territories, and most Indian country lands.)

Where EPA is the permitting authority, construction stormwater discharges are almost all permitted under the Construction General Permit (CGP). The CGP requires compliance with effluent limits and other permit requirements.

The proposed Construction General Permit (CGP) includes a number of enhanced protections, including enhanced provisions to protect impaired and sensitive waters. Some of the significant proposed permit modifications include new requirements for: eligibility for emergency-related construction; required use of the electronic notice of intent process; sediment and erosion controls; natural buffers or alternative controls; soil stabilization; pollution preven-

tion; site inspections; stormwater pollution prevention plans; and permit termination.

The public comment period on EPA's proposed new CGP ends June 24, 2011. More information on the proposed construction general permit is available at:

<http://cfpub.epa.gov/npdes/stormwater/cgp.cfm>

Contact Information: Enesta Jones,
Jones.enesta@epa.gov,
202-564-7873, 202-564-4355.

Installation of Construction Site Erosion & Sediment Control Devices

Credit: 3.5 Hours
(Soil Scientists, Landscape Architects, Engineers, CPESCs)

May 4 and July 13, 2011, Raleigh, NC

<http://www.soil.ncsu.edu/training/training.php>

Training on the development of erosion and sediment control plans is widely available, but proper installation of these devices is just as critical as a good plan. Attendees will learn what properly installed devices should look like and the common failures in their installation; how to install the most common devices by actually installing them; how to install alternatives to common rock systems and how to save some money using them.



Newsletter of the North Carolina
Sedimentation Control Commission
c/o NCSU Water Quality Group
Campus Box 7637
Raleigh, NC 27695-7619

Calendar of Events

5/4/2011	Installation of Construction Site Erosion & Sediment Control Devices, Raleigh, NC http://www.soil.ncsu.edu/training/training.php	7/14/2011	Advanced Construction Site Turbidity Control, Raleigh, NC http://www.soil.ncsu.edu/training/training.php
5/10/2011	Level I & II Recertification: Erosion & Sediment Control/Stormwater, Mills River, NC http://www.bae.ncsu.edu/workshops/dot/	8/23/2011	Level I & II Recertification: Erosion & Sediment Control/Stormwater, New Bern, NC http://www.bae.ncsu.edu/workshops/dot/
5/11/2011	Level II: Erosion & Sediment Control/Stormwater Site Management, Asheville, NC http://www.bae.ncsu.edu/workshops/dot/	8/24/2011	Level II: Erosion & Sediment Control/Stormwater Site Management, New Bern, NC http://www.bae.ncsu.edu/workshops/dot/
5/12/2011	Level I: Erosion & Sediment Control/Stormwater Inspector/Installer, Asheville, NC http://www.bae.ncsu.edu/workshops/dot/	8/25/2011	Level I: Erosion & Sediment Control/Stormwater Inspector/Installer, New Bern, NC http://www.bae.ncsu.edu/workshops/dot/
5/23-25, 2011	American Ecological Engineering Society Meeting, Asheville, NC http://www.bae.ncsu.edu/workshops/aees/	9/25-28, 2011	Low Impact Development Symposium and National Nonpoint Source Monitoring Workshop, Philadelphia, PA http://www.bae.ncsu.edu/stormwater/2011lid/
5/24/2011	Level II: Erosion & Sediment Control/Stormwater Site Management, Raleigh, NC http://www.bae.ncsu.edu/workshops/dot/	12/7/2011	Level III-A: Design of Erosion & Sediment Control Plans, Raleigh, NC http://www.bae.ncsu.edu/workshops/dot/
6/17-20/2011	2011 Soil and Water Conservation Society (SWCS) International Annual Conference, Washington, DC. Abstracts Due Dec. 17. http://www.swcs.org/en/conferences/2011_annual_conference/	12/8/2011	Level III-B: Design of Erosion & Sediment Control for Reclamation Plans, Raleigh, NC http://www.bae.ncsu.edu/workshops/dot/
7/13/2011	Installation of Construction Site Erosion & Sediment Control Devices, Raleigh, NC http://www.soil.ncsu.edu/training/training.php	12/9/2011	Level III-A & B Recertification: Design of Erosion & Sediment Control Plans, Raleigh, NC http://www.bae.ncsu.edu/workshops/dot/