



SEDIMENTS

Newsletter of the North Carolina Sedimentation Control Commission

US EPA Issues Effluent Limit Guideline Rule for Construction Site Runoff

US EPA issued the final rule for regulating construction site runoff on December 1, 2009 in the Federal Register. The final rule is a considerable departure from the proposed rule, released for comment a year ago. The key feature is that there is a turbidity maximum and that attaining it is expected to be accomplished through passive treatment systems (PTS), which were not part of the proposed rule. The turbidity standard is less stringent than the proposed rule, but applies to sites 10 acres and more. EPA is phasing in the numeric effluent limitation over four years. This final rule is effective on February 1, 2010, 60 days after publication in the Federal Register. EPA staff have publicly admitted that some implementation details are yet to be worked out. Here is a summary of the new requirements:

1. All construction sites will be required to meet the series of **non-numeric** effluent limitations (e.g., site stabilization and basins with surface outlets, other items specified by the State's Construction Permits).
2. Surface outlets are required for all basins.
3. For all construction sites, areas not being actively graded need to be stabilized in 14 days or less.
4. For sites 10 acres or more, when they come under the Rule, they will need to meet the **numeric** effluent limitation: The average turbidity of any discharge for any day must not exceed 280 nephelometric turbidity units (NTU), for storms of 2 year recurrence or less. For greater storms, treatment is still

required but the turbidity limit does not apply. The frequency and type of sampling is still vague, but currently suggested to be grab samples.

5. Construction sites that disturb 20 or more acres at one time will be required to conduct monitoring of discharges from the site and comply with the **numeric** effluent limitation (280 NTU) beginning 18 months after the effective date of the final rule or August 1, 2011.
6. Construction sites that disturb 10 or more acres at one time will be required to conduct monitoring of discharges from the site and comply with the **numeric** effluent limitation (280 NTU) beginning four (4) years after the effective date of the final rule or February 2, 2014.
7. The acreage is calculated based on all disturbed acres for a given project, so if two areas of 5 acres are being disturbed, the rule will be in effect in 4 years.
8. Sampling of discharges is required for sites 10 acre or more, but NC may be able to determine what this entails.

The selection of passive treatment systems (PTS) necessary to achieve the numeric effluent limitation is up to the developer, but EPA cited systems that included chemical treatment as well as infiltration systems such as sand filters and berms. They determined that there is enough evidence that these can be successful in different parts of the country that the turbidity limit of 280 NTU should be achievable. Around

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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

NC Sedimentation Control Commission: November Actions

At its meeting on November 12, 2009, the NC Sedimentation Control Commission (SCC) took the following actions:

Delegated Local Programs:

- City of Greenville: Approved the continuation of Local Delegation of erosion and sediment control (ES&C) programs.
- City of Henderson: Approved the continuation of Local Delegation with the recommendation that the Local Program work closely with the Raleigh Regional Office to obtain consistency in their plan reviews regarding construction sequencing and required plan details.
- City of Burlington: Placed the City of Burlington's Local Program on probation until the next scheduled SCC meeting. Suggested improvements included preparing written inspection reports for sites with violations, prepare monthly inspection reports, and writing Notice of Violation in a timely manner for a large site.
- City of Wilson: Approved the continuation of Local Delegation.
- City of Archdale: Approved the continuation of Local Delegation.
- Chatham County: Approved the continuation of Local Delegation.
- City of Rocky Mount: Approved the continuation of Local Delegation.

Qualifications of Inspectors:

- Per the recommendation of the SCC Subcommittee on Qualified Personnel, the SCC passed a resolution supporting the amendment of the Sedimentation Pollution Control Act (SPCA) to define qualified personnel for inspections (see separate article for Resolution, p.3).
- A draft bill to amend the SPCA to allow the SCC to set minimum guidelines for any license, certification or certificate of training education or experience to qualify an individual as qualified (inspection personnel) was considered. The final suggested

wording can be refined by the Qualified Inspector subcommittee and legal counsel (The subcommittee met on December 29 to complete a draft bill).

Technical Advisory Committee:

- Approved members for the SCC Technical Advisory Committee to include: Greg Jennings (PE, PhD, NCSU, Biological and Ag Engineering), Kenny Waldroup (City of Raleigh Public Utilities), Curtis J. Richardson (PhD, Duke, Resource Ecology), Rich McLaughlin (PhD, NCSU, Soil Science), Kevin Martin (LSS, Soil Science consultant), Berry Jenkins (PE, Association of General Contractors), David Harris (PE, NCDOT Roadside Erosion Control and Vegetation Management), Mark Senior (PE, City of Raleigh Stormwater), Mark A. Taylor (PE, Engineering consultant), Mack Little (RLA, Landscape Architecture consultant), Dennis M. Glazener (RLA, Landscape Architecture consultant). Additional members can be continued be added in the future with SCC approval. Editors note: at the February 18, 2010 meeting, additional members approved were: Fred Roger Watson (PE, Metropolitan Sewerage District of Buncombe County), Chris Roberts (PE, Durham County, Division Manager Sedimentation & Erosion Control Division), Wyatt L. Brown (LSS, NC Ecosystem Enhancement Program, and Jimmy Kizer (PE, Engineering consultant).

The Technical Advisory Committee's roles will include being a technical advisory for the development of draft rules for upcoming rule-making regarding the Falls Reservoir and Upper Neuse River (these also may apply to other basins) water supply and evaluating potential revisions to the Sediment and Erosion Control Manual.

Adoption of 2010 SCC Meeting Dates:

- Thursday, February 18
- Thursday, May 20
- Thursday, August 19
- Tuesday, November 30

Support documents for SCC actions may be found online at <http://dlr.enr.state.nc.us/scc.html> ❖



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Send comments to Janalyn Vo, NCDENR-Land Quality, 1612 Mail Service Center, Raleigh, NC 27699-1612. Email: Janalyn.Vo@ncdenr.gov. To receive *Sediments* electronically, please subscribe at: <http://www.dlr.enr.state.nc.us/pages/sedimentationnewsletters.html> 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:

Chairman:

Donnie W. Brewer
Greenville

NC Environmental Management Commission

Commissioners:

W.T. "Buzz" Bryson
Raleigh

NC Public Utilities

Elaine C. Chiosso
Bynum

Non-governmental Conservation

Tommy Esqueda
Wake County

NC Association of County Commissioners

Joseph H. Kleiss
Raleigh

NC State University, Dept. of Soil Science

Grover McPherson
Winston-Salem

NC Soil and Water Conservation Commission

John William Miller, Jr.
Burnsville

NC Mining Commission

Michael P. Voiland
Raleigh

Water Resources Research Institute of
The University of North Carolina

Robin Smith
Burnsville

Non-governmental Conservation

Joseph E. Glass
Fayetteville

Professional Engineers of NC

Richard Vick
Wilson

Carolinas Associated General Contractors

Rob Weintraub
Wake Forest

NC Home Builders Association

LQS Personnel Changes

Rick Aragon, Dam Safety Program Administrator, responsible for permit tracking and file management started January 2010. This is a FEMA grant-funded position.

Floyd Williams, State Mining Specialist, retired February, 2010 after 33 years of State service (all with the Land Quality Section).

News from Land Quality Section

Floyd Williams, Retired

After 33 years of valuable service with the Land Quality Section, Floyd Williams retired on February 1, 2010. On December 20, 1976 Floyd was hired as an Environmental Engineering Tech II. His original assignment was with the Division of Earth Resources, South Central Field Office. He was promoted to Regional Engineer at the Washington Regional Office on January 1, 1978. Then, on August 18, 2003 he was promoted to State Mining Specialist in the Raleigh Central Office. His last day in the office was January 29, 2010.

Design Professional Workshops

Each year, the Sedimentation Control Commission, in conjunction with the Land Quality Section and the Water Resources Research Institute, sponsors a series of workshops for design professionals. These workshops provide updates to the Sedimentation Pollution Control Act (SPCA), current design guidelines, and new technologies for controlling erosion and sedimentation. Two workshops for the spring have been scheduled:

March 3-4, 2010 - The Village Inn Golf and Conference Center, Clemmons, NC

April 12-13, 2010 - McKimmon Center, Raleigh, NC

Professional engineers and land surveyors may earn 12 PDHs and landscape architects may receive 10 continuing education credits for completion of both days.

Agendas and registration information may be found online at:

<http://www.ncsu.edu/wrri/erosionworkshops.html>

Qualified Inspection Personnel SCC Resolution

The following Resolution regarding Qualified Inspection Personnel for the North Carolina construction activities for Erosion and Sedimentation Control was passed by the SCC on November 12, 2009.

WHEREAS, the sediment runoff degrades land resources, and sediment is a pollutant of concern for waters of the state that can adversely impact aquatic habitat; and

WHEREAS, the North Carolina General Assembly enacted the Sedimentation Pollution Control Act (SPCA) to preserve land resources and protect water quality from potentially adverse impacts associated with land-disturbing activities, and

WHEREAS, the operation and performance of erosion and sedimentation control measures must be inspected on a routine basis to ensure that the maintenance of the measures are being performed so that the measures continue to perform as planned and designed; and

WHEREAS, the SPCA currently has no education or training requirements for personnel assigned to conduct inspections of erosion and sedimentation control measures; and

WHEREAS, establishing minimum education or training requirements for inspection personnel would result in improved operation and performance of erosion and sedimentation control measures, which would preserve land resources and protect water quality; and

WHEREAS, the North Carolina Sedimentation Control Commission is charged with developing and adopting rules and regulation for the control of sedimentation resulting from land disturbing activities.

THEREFORE, BE IT RESOLVED that the Sedimentation Control Commission recommends that the North Carolina General Assembly investigate and consider enacting statutory authority requiring qualified personnel for the inspection of erosion and sedimentation control measures.

ADOPTED this the 12th day of November 2009, by the North Carolina Sedimentation Control Commission. ❖

U S EPA Effluent Limit

(continued from page 1)

21,000 sites nationwide will come under this rule each year once the 10 acre size is in place, according to EPA estimates. The greatly reduced cost for PTS compared to active treatment systems, which capture all runoff and pump it through a chemical treatment and filtration system, was one reason for selecting PTS. They estimated the cost to be <0.1% of overall construction costs for typical projects.

Overall, the two aspects of the rules that are more stringent than the current NC requirements are turbidity standards and monitoring on sites 10 acres or more, as well as requiring stabilization within 14 days. NC already requires surface outlets and baffles in our sediment basins. The 'non-numeric' effluent limitations for all sites, including those under 10 acres have yet to be refined.

For NC, our application of these rules is tied to our State's Construction General Permit (CGP). A new NC CGP permit will be issued in August 2011; and at this time, NC will be subject to these rules.

Further information can be found at <http://www.epa.gov/waterscience/guide/construction>.

Information on chemical treatment PTS can be found at http://www.soil.ncsu.edu/lockers/McLaughlin_R/Webstuff/SECREFF/publications.html and scheduled workshops on these at <http://www.soil.ncsu.edu/training/training.php>.

Final Rule: Federal Register, December 1, 2009. EPA: 40 CFR Part 450, *Effluent Limitations Guidelines and Standards for the Construction and Development Point Source Category; Final Rule*. <http://edocket.access.gpo.gov/2009/pdf/E9-28446.pdf>. ❖

Self Inspections Proposed Rule

A public hearing was held on Proposed Rule 15A NCAC 04B. 0131 Self Inspections on January 11, 2010. Written comments on the proposed rule were accepted until February 15, 2010. (see [Sediments Issue 15\(3\), page 4 for draft rule.](#)) ❖

Report from the National Science Foundation Transportation Research Board Annual Meeting

Jan. 10-14, 2010, Washington, DC

By Richard A. McLaughlin, PhD,
Soil Science Dept., NC State University

The annual meeting of the Transportation Research Board had over 3,500 presentations in more than 600 sessions over the five day period. As large as this meeting was, there was little attention paid to water quality or stormwater issues involved in transportation. In fact, there were only about 10 presentations and posters directly dealing with this subject.

One session was devoted to stormwater Low Impact Development (LID) concepts applied to non-point source runoff from roads and associated areas. One presentation covered a review of the environmental programs in six departments of transportation (DOT): New York, Washington, D.C., Maryland, North Carolina, Texas, and Florida¹. One common issue for these DOTs was dealing the total maximum daily loads (TMDLs) which are developed for water bodies into which their roads drain. Over 40,000 TMDLs have been developed in the United States, and road runoff is a factor in most of them. There has been some interest in either credit trading or impervious

surface trading, but these programs have not been widely implemented by DOTs. The reviewers strongly suggested that the DOTs get involved in TMDL development before they are finalized in order to have some influence on the science being used. Some programs were highlighted, such as Maryland's approach to incentives and disincentives for compliance and their innovative design, build, operate, and maintain contracts for best management practices (BMPs) they want installed. One interesting fact mentioned was that it costs a sewage treatment plant \$30-40 to remove a kilogram of nitrogen from wastewater, but \$12-15,000 for a constructed BMP to achieve the same for stormwater. This raises questions about where the emphasis should be when spending public money.

The second paper of this session described efforts to determine which stormwater treatment options reduced thermal impacts of parking lot runoff the most, with brown trout being the test organism². The optimal water temperature range for brown trout is 45-65° F, with 80° F being a maximum tolerated. Over 20 systems have been or are being evaluated, and so far they have collected over 40 million data points. Of the five systems presented, the subsurface infiltration basin was the best at attenuating runoff temperatures, partly because it was the largest of those tested. This was followed by a gravel wetland, a bioretention area, a retention pond, and a grass swale, which did little to modify runoff temperature.

continued on next page

Stormwater LID Session Papers:

¹Taylor, S. 2010. NCHRP Project 20-68A, SCAN 08-03: Domestic Scan Program – Best Practices in Addressing National Pollutant Discharge Elimination System and Other Water Quality Issues in Highway System Management. Paper 10-1847.

²Rosen, R. 2010. Examination of Thermal Impacts from Stormwater Best Management Practices. Paper 10-1210.

³Erickson, A. J., J. S. Gulliver, P. T. Weiss, and B. J. Huser. 2010. Iron-Enhanced Sand Filtration for Stormwater Phosphorus Removal. Paper 10-3962.

⁴Pathapati, S-S., and J. J. Sansalone. 2010. Integrating Numerical and Physical Models for BMPs Loaded by Highway and Bridge Runoff. Paper 10-2506.

Soil Erosion Related to Highway Construction Session:

⁵McFalls, J., A. R. Desai, D. Foster, and M-H Li. 2010. Proposed Test Protocol for Evaluating the Performance of Sediment Control Devices for Roadside Stormwater Runoff. Paper 10-2526.

⁶Li, Ming-Han; J. McFalls. 2010. Stabilizing Stream-Bridge Crossings with Soil Bioengineering Techniques: Texas Department of Transportation Demonstration Project. Paper 10-2534.

⁷McLaughlin, R.; M. McCaleb. 2010. Improving Runoff Water Quality on Construction Sites: Issues and Opportunities. Paper 10-3127.

⁸Pritts, J., G. Schaner, and R. A. McLaughlin. Panel Discussion: EPA Effluent Limit Guidelines.

NSF Transportation Board

(continued from p

The third paper discussed the use of a sand filtration system enhanced with iron to remove phosphorus from storm water³. This involved both a laboratory column study and a field installation, although the latter was just initiated and no data were presented. In the column study, sand with 5, 2, and 0.3% iron filings were compared to a sand alone column for removal of P in solutions passed through the columns. The 5% mix was marginally better than the 2%, with removal rates of 80-90% initially. The 0.3% mix was much less effective. At the equivalent of 30-35 years of storm runoff, the 2% and 5% mixes were still removing 70-80% of the P in solution. Since this was simulated runoff with no other constituents such as solids, grease, or metals, the author indicated that maintenance would likely be much more frequent for field installations.

The fourth paper involved highly detailed numerical modeling of physical models of processes which control the effectiveness of BMPs installed to clean up highway runoff⁴. They suggested that protocols for testing BMPs should be standardized around the country and designed to provide the data needed to construct numerical models of the results. This would increase the potential that new BMPs could be modeled instead of physically tested.

Another session involved a variety of soil erosion testing related to highway construction and maintenance. The first paper primarily described a new testing facility at the Texas Transportation Institute (TTI), jointly operated by the Texas Department of Transportation and Texas A&M University⁵. They are interested in a standardized test of check dams of all types, so they constructed a parabolic concrete channel in which to test the devices. It is fed by a 1,600 gallon water tank in which they mix a combination of a fine silica and an industrial clay, continuously stirred. They used this mixture because they found that soil was too variable for a standardized test. The clay was added specifically because the silica was not reacting to polyacrylamide (PAM), a flocculant that is added to check dams by some manufacturers. The channel has a trough near the outlet in which they pack soil, allowing them to install the various check dams that require staples or stakes. The only data presented was for a silt fence, which they found captured 14% of the sediment delivered to it.

The second paper was a case study of a

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- 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>



project to first evaluate the stability of stream banks around bridges in Texas and then how one stream bank was stabilized⁶. Most of the banks around the bridges evaluated were unstable, and in many cases the bridge supports were seriously compromised. The authors attributed this to hard armoring, mostly using concrete, which usually failed, sometimes nearly taking out the bridge supports. The area immediately under and adjacent to the bridge they stabilized had rock gabions installed as a replacement for the concrete. The eroding bank upstream was stabilized using live staking into geogrids and geotextiles. These were successful in stabilizing the upstream section, with very good growth of the willows that were planted. They suggested that shrubby plants like this willow species are best because during high flow the plants bend onto the bank, both protecting it and allowing good flow in the channel. The rock gabions also started to vegetate naturally over time.

The third paper presented a number of approaches to achieving the turbidity limit now being imposed on construction site runoff through a national standard recently set by the US EPA⁷. This included the use of PAM to reduce erosion and turbidity from slopes and methods to introduce PAM into runoff upstream of sediment basins. A case study was also presented which documented a construction site which was being monitored for water quality. The author described the construction activities which caused spikes in turbidity as well as the stabilization and treatment methods

which successfully brought the turbidity under control.

This session was followed by a panel discussion on the USEPA Effluent Limitation Guidelines which included two EPA staff members who were involved in developing the rule, as well as the third author since the rule was partially based on his research⁸. The first part of the discussion was a brief overview of the major aspects of the rule, as well as many aspects of it which are still being developed. The details of the rule, which was issued December 1, 2009, can be found at <http://www.epa.gov/waterscience/guide/construction/>. There were numerous questions for the EPA staff regarding details of monitoring, types of projects included, and timing for individual states. The rule will be implemented over the next four years, with each state required to come into compliance when their Construction General Permit (CGP) is renewed on the staggered five-year cycle. The Permit is what allows the states to administer their own program in place of EPA. Four states which do not have their own program will have to comply starting February 1 of this year. NC has its own program and our CGP Permit will be renewed in August 2011 at which time North Carolina will need to comply with the new rule. (See the lead article on page 1 for further details on the Effluent Limit Rule. ❖

To report possible violations of the NC SPCA call

1-866-STOPMUD 786-7683



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

Calendar of Events

2/21- 25/2010	Land Grant & Sea Grant National Water Conference , Hilton Head SC. Presentations posted: http://guest.cvent.com/EVENTS/Info/Agenda.aspx?e=aa264916-889a-4bb1-84af-9139e3d69b88	4/13/2010	Level II: Erosion & Sediment Control/Stormwater Certification , Asheboro, NC. http://www.bae.ncsu.edu/workshops/dot/
3/3-4/2010	Erosion & Sedimentation Control Planning and Design , Clemmons, NC http://www.ncsu.edu/wrri/erosionworkshops.html	4/21- 22/2010	Stormwater BMP Inspection & Maintenance Certification , Wrightsville Beach, NC http://www.bae.ncsu.edu/topic/bmp-im/
3/09/2010	Level I & II: Erosion & Sediment Control/Stormwater Recertification , Raleigh, NC http://www.bae.ncsu.edu/workshops/dot/	4/28/2010	Level III-A&B Recertification: Design of Erosion & Sediment Control Plans , Raleigh, NC http://www.bae.ncsu.edu/workshops/dot/
3/11/2010	Level I: Erosion & Sediment Control/Stormwater Certification , Raleigh, NC http://www.bae.ncsu.edu/workshops/dot/	5/18- 20/2010	River Course 201: Stream Restoration Design Principles , Asheville, NC http://www.ncsu.edu/srp/rivercourse.html
3/16/2010	How to Control Turbidity on Construction Sites , Raleigh, NC http://www.soil.ncsu.edu/training/training.php	6/02/2010	Level III-A: Design of Erosion & Sediment Control Plans , Raleigh, NC http://www.bae.ncsu.edu/workshops/dot/
3/16/2010	Level Spreader Workshop , Apex, NC www.bae.ncsu.edu/stormwater/training.htm	6/03/2010	Level III-B: Design of Erosion & Sediment Control for Reclamation Plans , Raleigh, NC http://www.bae.ncsu.edu/workshops/dot/
3/17/2010	Level Spreader Workshop , Hickory, NC www.bae.ncsu.edu/stormwater/training.htm	7/18- 21/2010	2010 Soil and Water Conservation Society (SWCS) International Annual Conference , St. Louis, Missouri. Abstracts Due Dec. 17. http://www.swcs.org/en/conferences/
3/25- 26/2010	Certified Professional in Erosion and Sediment Control Review , Raleigh, NC www.cpesec.org/eventbrochures/RaleighNCMar2010.pdf	8/25- 26/2010 <i>tentative</i>	River Course 401: Construction Practices for Stream Restoration , Asheville, NC http://www.ncsu.edu/srp/rivercourse.html
4/12- 13/2010	Erosion & Sedimentation Control Planning and Design , Raleigh, NC http://www.ncsu.edu/wrri/erosionworkshops.html	11/15- 18/2010	SE Regional Stream Restoration Conference , Raleigh, NC. Abstracts Due June 30. http://www.ncsu.edu/srp/2010conference/