Stormwater Updates
PENC Webinar – 2/25/2014

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NC Division of Energy, Mineral and Land Resources
Stormwater Program

Today's Webinar:

First 25 minutes:

- Brief organizational update
- Low Impact Development & Storm-EZ
- BMP manual updates

Last 25 minutes:

- Technical Review Workgroup Products
- Minimum Design Criteria Team
- Temporary gravel rule

Image: NC LID Guidebook

Low Impact Development & Storm-EZ

Photo: NCSU Stormwater Group

Successful LID Projects

Tonbo Meadows, Wilmington
Meadow & woods preserved
Minimized grading
Rain gardens

Images: NC LID Guidebook

Whole Foods, North Raleigh
Discharges LESS after development than before.

Photos: www.sandec.com

NC LID Guidebook definition:

LID creates a landscape that mimics the natural hydrologic functions of infiltration, runoff, and evapotranspiration.

A development is LID when:

1. Pre- & post- development rainfall fates (based on volume) are a close match for the 90th percentile storm event.

2. The integrity of surface waters is maintained (hydrology, flows and structure).

Photo: NC LID Guidebook

What are "RAINFALL FATES?"

Before development, there are **two** rainfall fates:

1. Runoff
2. LI fates: Infiltration, ET, Evaporation
   Post-filtration discharge (bioretention)
   Re-use from a cistern

After development, we add a **third** fate:

3. Treated runoff (wet pond/wetland)

Photo: www.nowiknow.com

The "Conventional" Approach:
All SW directed via pipes to a wet pond

Before:

Runoff
+
Infiltration, ET,
Evaporation

After:

Treated Runoff
+
Infiltration, ET, Evaporation

One way to be LID

Before:

Runoff
+
Infiltration, ET,
Evaporation

After:

Runoff
+
Infiltration,
ET, Evaporation

Another way to be LID

Before:

Runoff
+
Infiltration, ET,
Evaporation

After:

Runoff
+
Infiltration

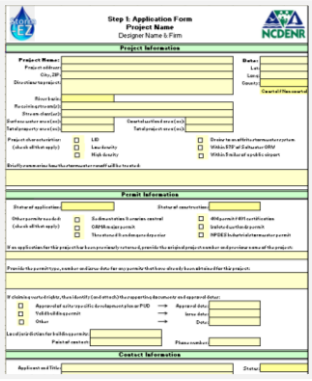
Another way to be LID

Before:

Runoff
+
Infiltration, ET,
Evaporation

After:

Runoff
+
Infiltration, Post-Filtration Discharge,
ET, Evaporation

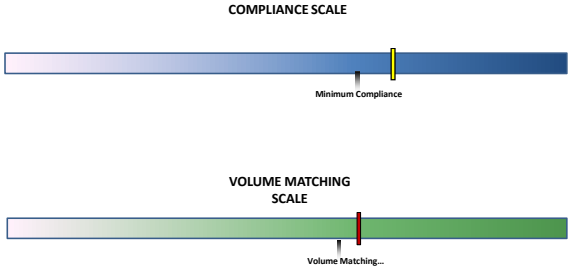


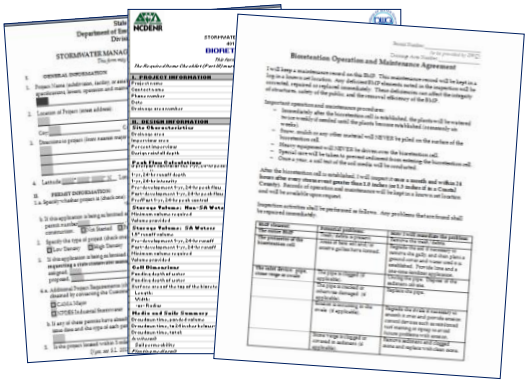
Accepts data on pre- and post-dev land uses & SW practices.

Uses SCS Method to calculate pre- and post-development rainfall fates.

Works for both the "treated runoff" approach and LID.

Hunter Freeman, PE, Withers & Ravenel





LID will meet all of these programs!

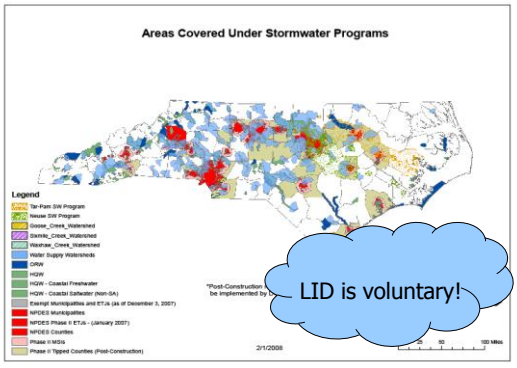



Photo: en.wikipedia.org

March 26-27, 2014
Raleigh Convention Center
There are still spaces left!

NC STATE UNIVERSITY
College of Agriculture and Life Sciences | College of Engineering
Stormwater Engineering Group
Biological & Agricultural Engineering
NC COOPERATIVE EXTENSION

Low Impact Development & Storm-EZ Technical Workshops

May 7-8, 2014 – Boone, NC

May 14-15, 2014 - Raleigh, NC

May 21-22, 2014 - Wilmington, NC

More on the horizon – check the NCSU web site.

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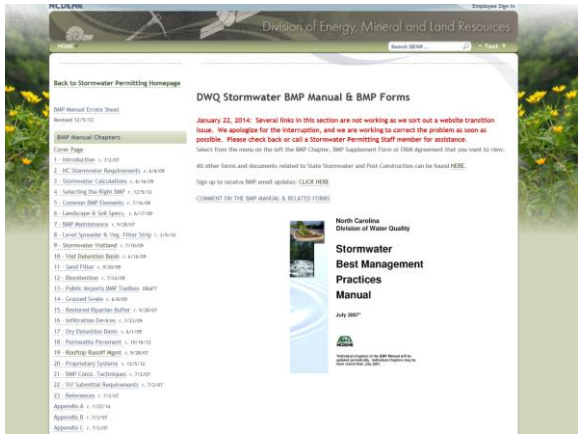
LID – State Technical Review Team:

Withers & Ravenel
Red Line Engineering
Estes Design Group
Morrisville, Raleigh, Greensboro, Charlotte
NCSU Stormwater Group
UNC-Chapel Hill
Coastal Federation
American Rivers
Division of Water Resources
DEMLR

Low Impact Development & Storm-EZ

For more information,
Attend the LID Summit.
Attend the NCSU-BAE LID & Storm-EZ workshops.
View our public notice on March 26, 2014.



BMP Manual Updates

Photo: NCSU Stormwater Group

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BMP Manual Updates:

Disconnected Impervious Surface (DIS)
Rainwater Harvesting
Green Roof

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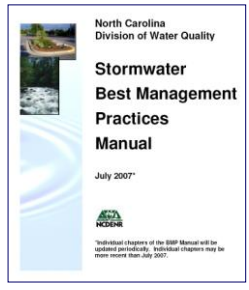
BMP Manual Updates will provide:



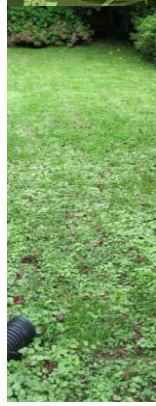
- More options
- More credit
- More infiltration designs

These apply to ***both*** LID & conventional development.

Disconnected Impervious Surface (DIS): (new chapter)

- Two types:
  - Downspout disconnection
  - Pavement disconnection
- Can achieve a range of credit based on the design and soil type.

Photos: NCSU Stormwater Group



Downspout Disconnection

- 500 square feet max to downspout.
- 7% max slope with uniform grading.
- Dense lawn with no clumping species.
- Minimum 5-foot distance between foundation & vegetated area.
- Sites must be tilled to eight inches prior to vegetation establishment.

Photo: Natalie Carmen, NCSU

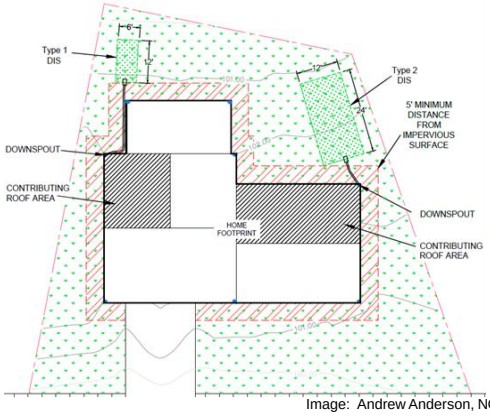
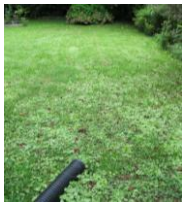


Image: Andrew Anderson, NCSU

Photo: Natalie Carmen, NCSU

Downspout Disconnection

Minimum size	6' wide X 12' long		12' wide X 24' long	
HSG	A/B	C/D	A/B	C/D
Runoff reduction credit	45%	30%	65%	50%



Photos: Natalie Carmen, NCSU

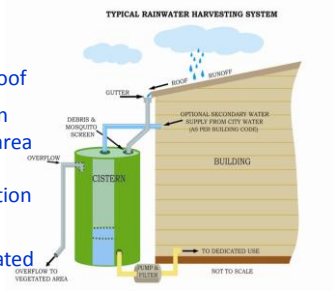
Pavement Disconnection

- Maximum of 100 feet to a 10-foot grassed shoulder.
- Gravel or specialized curb slightly lower than road surface to promote drainage and protect pavement edge.
- Maximum slope of 8% for both pavement and shoulder (graded to promote diffuse flow).

Photo: NCSU Stormwater Group

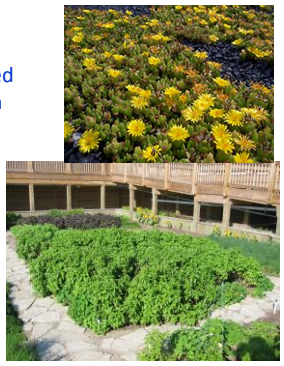
Rainwater Harvesting:

- Full 85% TSS reduction
- Rule of thumb: 1 gallon/square foot of roof
- New passive drawdown design to a vegetated area for a SF lot or small infiltration or bioretention for other sites
- Also may have a dedicated use



Green Roof:

- 85% TSS removal if designed to control the entire design storm
- Credit is based on the depth and plant available water in growing medium



Photos: NCSU Stormwater Group

BMP Manual Updates

For more information,
Attend the LID Summit.
Attend the NCSU-BAE LID & Storm-EZ workshops.
View our public notice on March 26, 2014.

Technical Review Team Products

Photo: en.wikipedia.org

Technical Review Workgroup

- Met from January 2013 to January 2014, usually in Wilmington.
- Included consultants, environmental group, local government, DEMLR and DWR.
- Addressed some specific concerns about the stormwater program.

Technical Review Group Products:

★1. Discrete SCS Method for Computing WQV

★2. Standards for Relaxing the 2-foot Separation from SHWT for Infiltration Devices

★3. Options for No Direct Discharge to SA Waters

★4. Definitions of Key Stormwater Terms

5. Alternative Design for Wet Detention Ponds
Will be conveyed to the MDC Team

1. Discrete SCS Method for Computing WQV

SCS Discrete Curve Number Method (USDA TR-55) is a **voluntary alternative** to the Simple Method if:

- The 90th percentile storm is used for runoff depth for non-SA waters & the 1-yr, 24-hr storm for SA waters.
- The runoff volume is the difference between pre and post development conditions.

"Discrete" means that the SCS Method is run twice:

- First, for the connected impervious surface
- Second, for the remainder of the site.
- The total runoff volume is the sum of the two results.

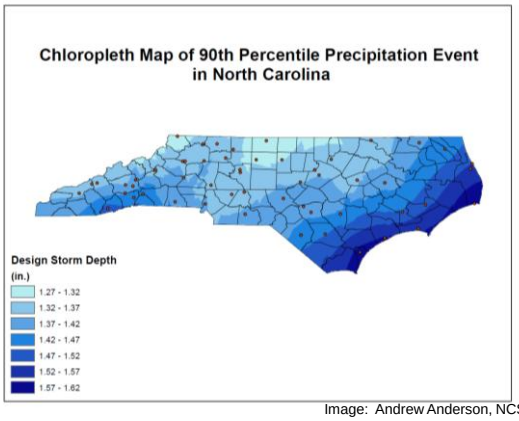


Image: Andrew Anderson, NCSU

2. Standards for Relaxing the 24" Separation from SHWT for Infiltration Devices

- Additional data needed to relax separation to 12" for typical infiltration devices.
- Small infiltration practices or practices with low loading ratios may automatically have only 12" separation.

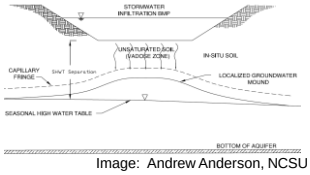
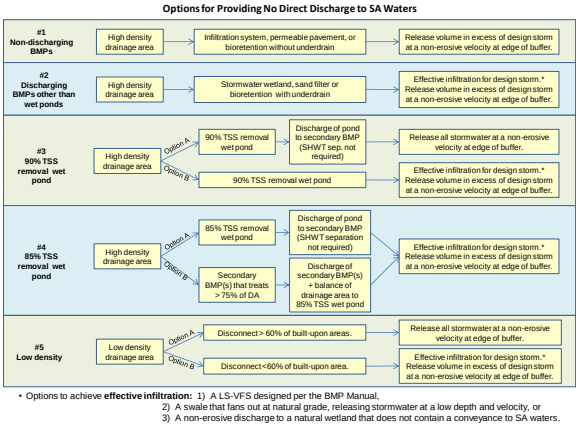


Image: Andrew Anderson, NCSU

3. Options for No Direct Discharge to SA Waters

Some confusion regarding existing guidance:

- Infiltrate the entire design storm (1-yr, 24-hr)
- Provide diffuse flow to an area that can provide "effective infiltration."
- Use a secondary BMP



4. Definitions of Key Stormwater Terms

Terms:

- Diffuse Flow
- Non-erosive Flow
- Effective Infiltration
- Water Quality Design Storm Depth
- Water Quality Design Storm Intensity

Intent:

- Eventually include in state stormwater rules.
- For now, post definitions as guidance.

5. Alternative Design for Wet Detention Ponds

Addresses:
- Surface area
- Depth
- Storage volume
- Outlet requirements
- SHWT

To the MDC Team for consideration & action.

Technical Review Team Products

For more information:
View our public notice on February 28.

Minimum Design Criteria (MDC) Team

Division of Energy, Mineral and Land Resources

Minimum Design Criteria (MDC) Team

Members selected by Rep. Millis, PENC and DENR.

Includes:
- Professors
- Engineers
- Local governments
- NC Home Builders
- Assoc General Contractors
- A soil scientist
- Environmental Interests
- DEMLR, DWR, DOT

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Two Tasks of the MDC Team

1. To develop **MDCs** that encompass all requirements for siting, site preparation, design, construction, and maintenance of BMPs. Recommendations regarding MDCs due to the ERC on September 1, 2014.

2. To develop **a fast-track permitting process** for issuing state stormwater permits without a technical review when the applicant complies with the MDCs and the application is prepared by a qualified professional. The EMC shall adopt a fast-track rule by July 1, 2016.

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Task #1: Develop MDCs

MDCs shall protect state water quality standards.

Some challenges:
- 13 different BMPs, each with unique design criteria.
- September 1, 2014 deadline.

Assets:
- Existing BMP Manual to use as a starting point.
- Storm-EZ can provide a framework for implementation.
- Knowledge and creativity of team members.

Task #2: Develop Fast-Track Permitting Program

Required components:

1. Process for permit application, review, & determination.
2. Process for ensuring compliance with the MDCs.
3. Specification for the qualifications that professionals must have to prepare a fast-track permit application.
4. Process for establishing the liability of professionals who prepares a fast-track permit applications for when the BMPs fail to comply with the MDCs.

MDC Team Schedule

Starts in March 2014

Estimated duration: 18 months

There will be channels for public information and input, the details are still TBD.

Minimum Design Criteria (MDC) Team

For more information:
Join our stormwater listserv to receive notices.

Photo: en.wikipedia.org

Why is the EMC proposing a temporary rule?

HB 74 excludes “gravel” from the definition of "built-upon area." The EMC now seeks to:

- Define “gravel” to assist the regulatory community & protect the environment.
- Insure that “gravel” does not include aggregate materials that do not allow water to infiltrate.
- Be consistent with the Unified Soil Classification System (gravel diameter from 0.08 to 3 inches with < 5% fines).

What does the proposed temporary rule say?

Updates the definition of “built upon area” per HB 74.

Makes a small change to the definition of “permeable pavement.”

Adds a definition of “gravel:”
“Gravel” means a clean or washed loose aggregate of small, rounded, water-worn or pounded stones from a lower limit of 0.08 inches up to 3.0 inches in size. Gravel is not crushed stone or rock.

How does this affect development projects?

Areas (both new and existing) meeting the definition of "gravel" will be considered as pervious.

Areas (both new and existing) covered in aggregate that does not meet the definition of "gravel" will be considered as impervious.

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Temporary Rule Schedule

1-15 – 2/7	Public comment period w/hearing on 1/23. Between 30-40 comments (top comments: gradation, terms "rounded, water- worn or pounded," authority/need for a temporary rule.)
At present	Working with the Hearing Officer to revise the gravel definition. Implementation per the temporary rule for now.
3/13	Revised gravel definition to the EMC
3/17 – 3/21	Temporary rule to the Rules Review Commission

Gravel Temporary Rule:

For more information, see
http://portal.ncdenr.org/web/lr/public-notices
Join our stormwater listserv for future updates.

Division of Energy, Mineral and Land Resources

Special Thanks to:

Hunter Freeman, PE
Bill Hunt, PhD, PE
Andrew Anderson, FE
Natalie Carmen, FE
Mike Randall
Julie Ventaloro
Bradley Bennett

Quote of the Day:

Success usually comes to those who are too busy to be looking for it.

- Henry David Thoreau

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