



## Developing a Standard & Specification for Biosoil Media: A Delaware Perspective

Presented at:

2<sup>nd</sup> National LID Conference

Wilmington Hilton Riverside  
Wilmington, NC  
March 12-14, 2007

Randy Greer, PE  
Delaware DNREC

## Background



- Conservation Design Manual released in 1997
- Goals
  - Maximize recharge
  - Minimize runoff
  - Reduced reliance on structural SWM

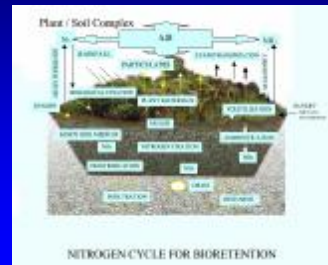
## Bioretention



- Hydrologic Cycle
- Mimic Natural Hydrologic Cycle = Quantity Mgt.



## Biological Processes in Plant/Soil Complex = Quality Mgt.



## Bioretention – “Past”

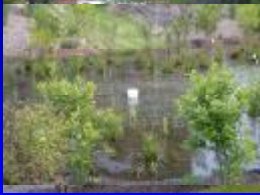


- Original guidelines from PG County, MD
  - Sizing criteria
  - Materials
  - Plant selection

## Many Successful Installations



## Some Not-So-Successful Installations!



- Day 1 – No Problem
- Day 4 – Problem?
- Day 10 – PROBLEM!

## “Anecdotal Forensics”



- Approx. 25% failure rate – Unacceptable
- 4 Issues Identified
  - Design
  - Construction
  - Materials
  - Maintenance

## Material Issues



## Bioretention – “Present”



- “Green Technology”
  - Bioswales
  - Filter strips
  - Terraces
  - Riparian Buffers
  - **Bioretention**

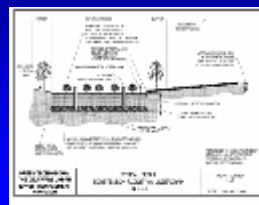
## Standards & Specifications



- Design guidelines
- Typical detail
- Material specifications
- Plant lists
- Construction methods
- Maintenance guidelines

## Material Specifications

### Bio-soil Media



- Equal parts by volume
  - Triple-shredded hardwood mulch
  - Sphagnum peat
  - Concrete sand
- Drum mixed batch
- DNREC approved supplier

## Mulch Specifications



- Free of dirt & debris
- Triple shredded hardwood
- Single shredded may be used as top dressing

## Peat Moss Specifications



- Virgin sphagnum peat moss
- Typically must be imported from Canada

## Sand Specifications



- ASTM C-33 concrete sand
- Clean, washed
- Fineness modulus of 2.75 or greater

## Mixing Specifications



- Batch mixed
- Use of appropriate mixing equipment
- Trommel screen

## What about QA/QC?



## Bio soil Media Conformance Testing Protocol Step 1 – Visual Inspection



- Typically two 5 gal. samples
- Visually checked to see if sample generally consists of equal parts sand, peat moss & triple-shredded hardwood mulch

