

Post-Development Stormwater Runoff Performance Standards



December 9, 2014

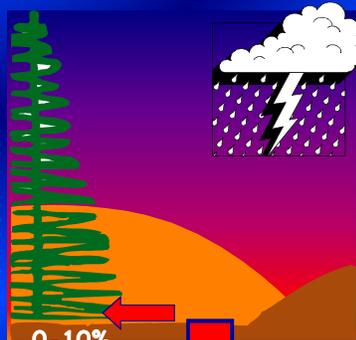


Topics

- Why performance standards?
- What practices/requirements are in effect in other States?
- The Workgroup's preliminary and final recommendations regarding on-site stormwater management performance standards



Why Post-Development Stormwater Standards

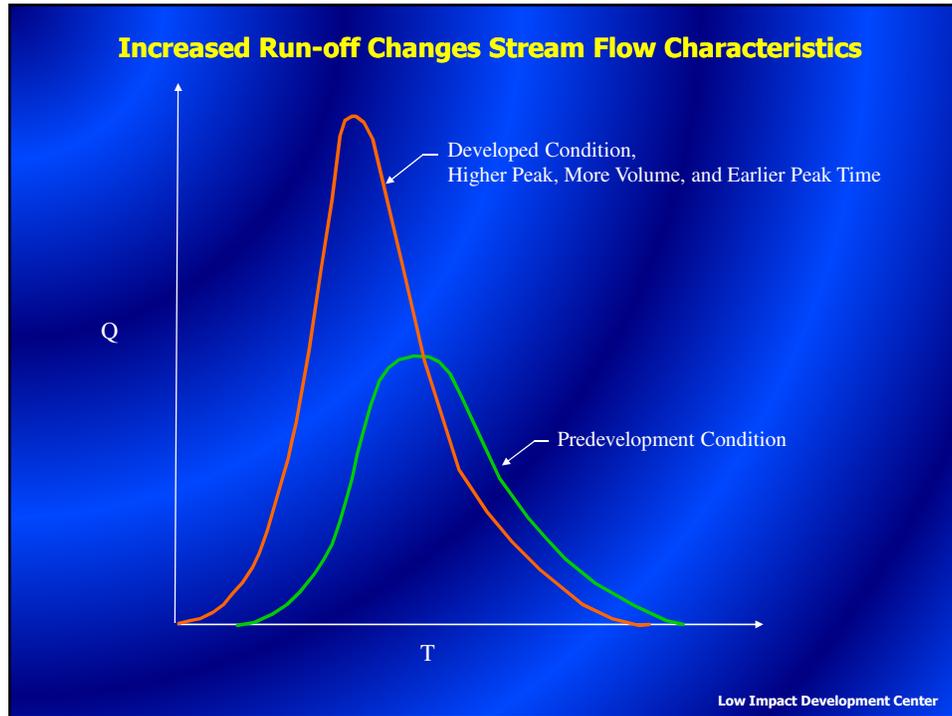


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Development Increases Run-off

Increased Run-off due to Impervious Surfaces

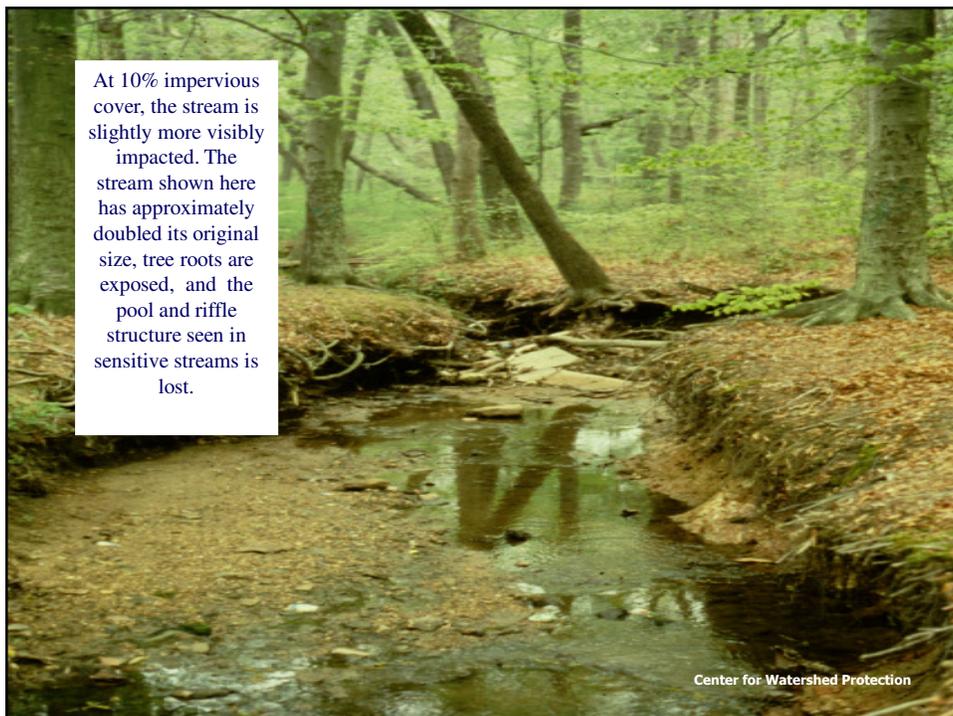
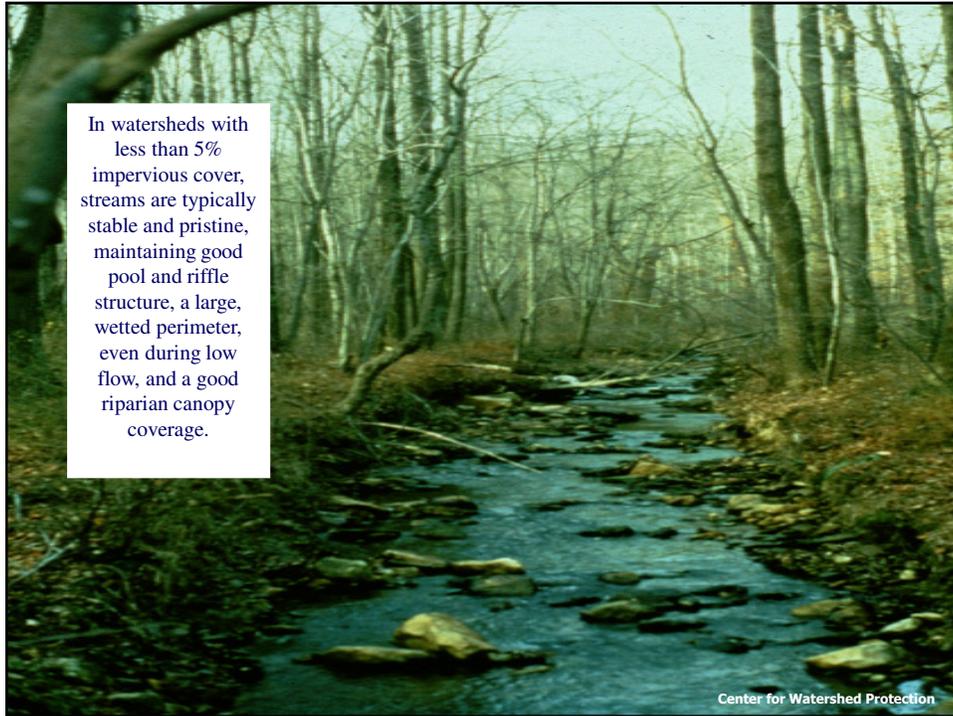




Effects of Higher Flow Volumes and Higher Flow Velocities...

- Stream widening and erosion
- Decreased channel stability
- Reduced fish passage
- Loss of pool-riffle structure
- Lower summer base flows
- Loss of riparian tree canopy
 - Temperature impacts
- Decreased substrate quality
 - Embeddedness (fine sediments become embedded into the coarse substrate)





Stream Corridor Degradation

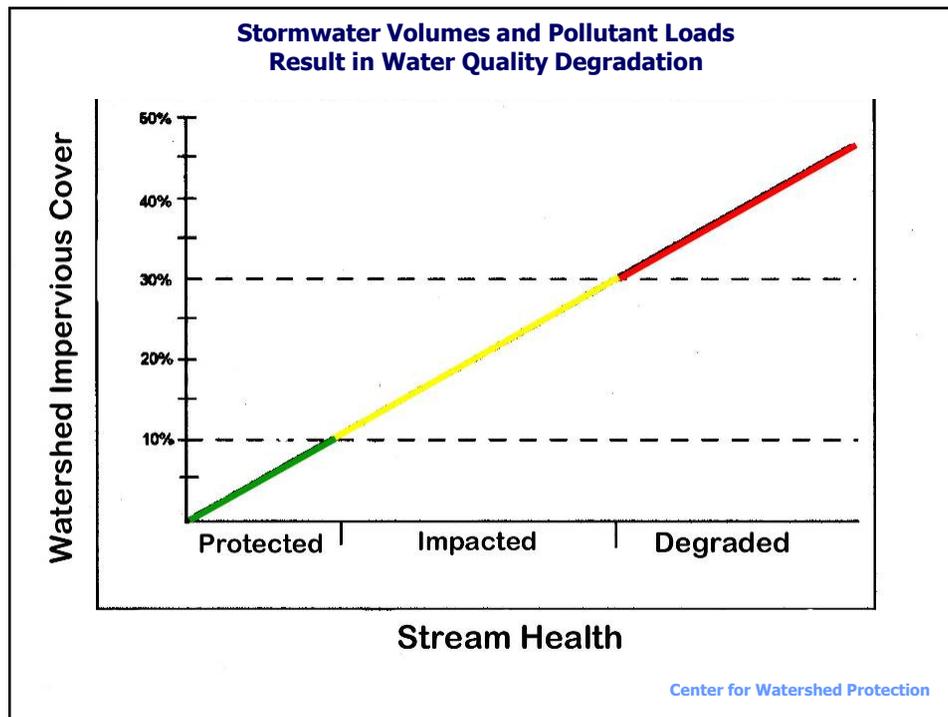


Pollutants in Stormwater Discharges

Nutrients
Pathogens
Sediment
Toxic Contaminants
Oil and Grease
Thermal Stress

Increased quantity
Decreased quality

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Why Post-Development Stormwater Performance Standards?

- Because in most cases it is when we do new development (or in some cases redevelopment) that we create wide expanses of imperviousness and alter the natural hydrology
- It is almost always less expensive to do it right the first time, vs. retrofitting improvements in later

Illinois Post Development Stormwater Runoff Performance Standards Workgroup

Work in 2012 and 2013

- Technical Advisors:
 - United States EPA
 - Illinois EPA
 - Association of Illinois Soil and Water Conservation Districts (AISWCD) facilitators
- Active Workgroup Members:
 - ACEC-IL (represented by Crawford, Murphy & Tilly, Inc.)
 - Center for Neighborhood Technology (CNT)
 - City of Aurora
 - City of Peoria
- Active Workgroup Members (continued):
 - Geosyntec Consultants
 - Illinois Department of Transportation
 - Lake County SWMC
 - Madison County Planning & Development
 - Metropolitan Planning Council
 - Metropolitan Water Reclamation District of Greater Chicago (MWRDGC)
 - Openlands
 - Prairie Rivers Network
 - Sierra Club-IL Chapter



Workgroup's Overall Objective

To provide recommendations to the Illinois Environmental Protection Agency from which implementable performance stormwater standards can be developed to improve water quality in waters of the state of Illinois

Workgroup Created Four Teams to Address Specific Aspects of Recommended Standards

- 1) APPLICABILITY**
- 2) REQUIREMENTS (STANDARDS)**
- 3) GREEN INFRASTRUCTURE AND DESIGN / INCENTIVES**
- 4) MAINTENANCE, MONITORING AND ENFORCEMENT**

Committee Research and Interviews - Other States

- Minnesota
- Wisconsin
- Ohio
- West Virginia and Tennessee
- California
- Five (5) states summarized in IEPA Green Infrastructure Report – ME, NJ, MN, WI & MD

Wisconsin NR 151

- Performance standards include requirements for total suspended solids, peak flow, infiltration
- The infiltration performance standard requires that, to the MEP, a portion of the runoff volume be infiltrated:
 - Residential – 90 percent of pre-development infiltration volume or 25 percent of the 2 year-24 hour design storm.
 - Non-residential – 60 percent of predevelopment infiltration volume or 10 percent of the 2 year-24 hour design storm.
- To protect groundwater, the WI standards identify areas where infiltration is discouraged.

Ohio

Requirements in Construction General Permit
applicable in the
Big Darby Watershed

Groundwater Recharge Requirements

- The SWPPP shall ensure that the **overall site post-development groundwater recharge equals or exceeds the pre-development groundwater recharge**
- The SWPPP shall describe the conservation development strategies, BMPs and other practices deemed necessary by the permittee to maintain or improve pre-development rates of groundwater recharge

West Virginia

Manage a 1-inch storm

The West Virginia MS4 general permit included performance standards for new and redevelopment projects:

The permittee must implement and enforce via ordinance and/or other enforceable mechanism(s) the following requirements for new and redevelopment: [...]
*Site design standards for all new and redevelopment that require, in combination or alone, **management measures that infiltrate, evapotranspire and reuse of, at a minimum, the first one inch of rainfall from a 24-hour storm. This first one inch of rainfall must be 100% managed with no discharge to surface waters***

West Virginia Permit – Incentives for Sustainable Development Practices

A *credit* of 0.2 inches from the one inch runoff reduction standard may be applied to any of the following types of development:

- Redevelopment
- Brownfield redevelopment
- High density (>7 units per acre)
- Vertical Density (Floor to Area Ratio of 2 or >18 units per acre)
- Mixed use and Transit Oriented Development (within ½ mile of transit)

Minnesota

Requirements in the Construction General Permit

- Where a project's ultimate development replaces vegetation and/or other pervious surfaces with one or more acres of cumulative impervious surface, the Permittee(s) must design the project so that the water quality volume **of one inch of runoff from the new impervious surfaces created by the project is retained on site (i.e. infiltration or other volume reduction practices)** and not discharged to a surface water.

IL Post-Construction Stormwater Runoff Performance Standards **Recommendations**

- The Recommendations are intended to reduce stormwater runoff from development sites. This helps reduce overall stormwater discharge volumes and can help prevent localized flooding.
- Management of stormwater will often be accomplished by mimicking natural systems
 - Many of the Best Management Practices are based on using retention/infiltration and reuse to control stormwater
- Green Infrastructure likely would be an integral part how to meet the proposed performance standards

DEFINITION OF GREEN INFRASTRUCTURE

"Green infrastructure" means any stormwater management technique or practice employed with the primary goal of preserving, restoring, or mimicking natural hydrology. Green infrastructure includes, but is not limited to, methods of using soil and vegetation to promote soil percolation, evapotranspiration, and filtration. Green infrastructure includes the preservation and restoration of natural landscape features, such as forests, floodplains, headwaters, and wetlands. Green infrastructure also includes rain gardens, permeable pavements, green roofs, infiltration planters, trees and tree boxes, and rainwater harvesting for non-potable uses, such as toilet flushing and landscape irrigation.
(Public Act 96-26)

Preliminary Workgroup Recommendations (2012)

- Retain a runoff volume equal to 1.35 inches of rainfall times the area of the proposed impervious surfaces onsite. (24-hr storm)
- Based on the 95th percentile storm which mimics the natural hydrology of a site
 - In Illinois ranges from 1.3 - 1.5 inches, lower in northern regions and higher in areas further south

Public Meetings and Public Comments

- 2 Public Meetings
 - Springfield, October 18, 2012
 - Aurora, October 23, 2012
- Public comment period
 - October 18 - November 30, 2012
 - 80 Comment Letters Received and Considered

Comments on Preliminary Recommendations

- Example comments:
 - *“The requirement for 1.35 inches of infiltration exceeds any other state or local requirement for volume control.”*
 - *“The workgroup proposal is significantly more stringent than existing and proposed county volume control standards in northeastern Illinois.”*
 - *“... the IEPA should not impose these more stringent requirements and should strongly consider the possibility that the proposed requirements may have gone beyond the ‘maximum extent practicable’.”*

Final Recommendations for Development Sites (2013)

- Applicable to sites disturbing 1 acre of ground or more
- New development sites must either demonstrate no net increase in runoff due to the development or retain runoff from a 1 inch 24 hour storm event
- Redevelopment sites must either demonstrate no net increase or retain a 0.8 inch 24 hour storm
 - *Redevelopment* is any human induced activity or change to an existing developed property where runoff characteristics are affected

Site Limitations

- The following types of sites would be limited with regard to the use of infiltration as a runoff control:
 - Vehicle fueling or maintenance areas
 - Areas with Karst topography
 - Areas subject to high infiltration rates
 - Areas with inadequate separation between the storm water BMP and groundwater
 - Areas with soil contamination
 - Source areas for drinking water or recharge areas
 - Class D (high clay) soils

Mitigation

- Site restrictions may result in areas where retention of storm water is not feasible. Mitigation would be provided for those sites.
- Mitigation should occur as close as possible to the construction site
- Off-site mitigation would require retention of 1.5 times the design storm.
- Fee-in-lieu might be considered provided a legal basis is enacted in support of this program.

Linear Projects



- Roadways and other utility projects will use a hierarchy of practices to retain onsite and/or treat the greatest amount of runoff feasible

How To Implement Performance Standards

- The Workgroup recommended implementation of post-development stormwater management requirements through NPDES permits:
 - Stormwater Discharges from Construction Sites (ILR10)
 - Municipal Separate Storm Sewer Systems (MS4) by updating ordinances and in reviewing site construction plans & site inspections

Other Points

- Counties implementing ordinances, which are at least as stringent as the State-wide stormwater performance standards, should be allowed to administer the stormwater management program
- A second round of recommendations could be undertaken at some time in the future to address the following:
 - Lowering of the threshold triggering a storm water permit to less than 1 acre
 - Basing performance standards on percentile storms rather than specific precipitation quantities
 - The protection of Biologically Significant Streams
 - Retrofitting of stormwater controls in developed areas
 - Mitigation ratios

Thank You for Your Questions



Rain Garden, South Park
Inverness, IL



Wetland Basin, Veterans Park
South Holland, IL



Bioswales in Parking Area
North Park, Lincolnshire, IL



Cistern, Ryerson
Woods, Lake County
Forest Preserves