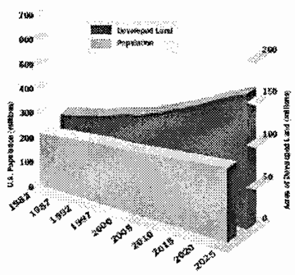
Construction and Development Industry Effluent Guidelines 2007 - 2009

Proposal by NRDC & Waterkeeper Alliance
June 4, 2007

Proposal Framework

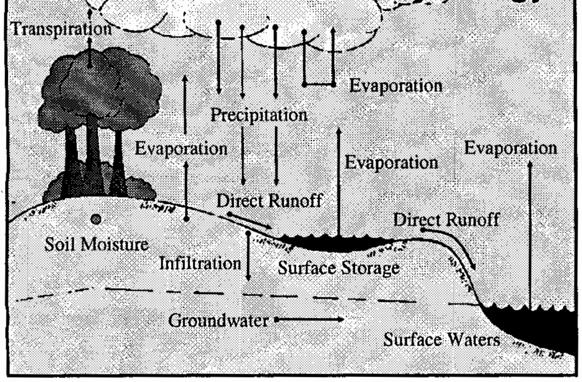
- Current system provides inadequate protection.
- It's cheaper to do it right the first time than retrofit or pay to remediate streams.
- First do no harm – keep mud on construction sites and maintain pre-development hydrology and temperature
- Apply economically achievable/ economically sound solutions.

Current System: Increased Pavement = Increased Water Pollution



Sources: Data and extrapolations from National Resources Inventory, 2001; U.S. Census Bureau, 2000.

Goal: Maintain Natural Hydrology



Challenge: Efficiently & Effectively Control Stormwater Discharges

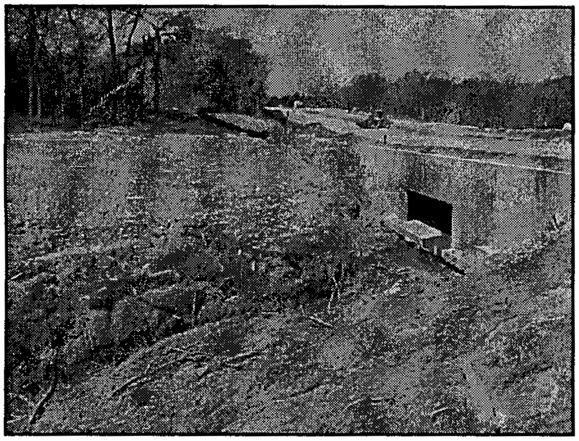
- **Current "write-your-own-permit" approach neither efficient nor effective**
- **CWA: Goal of the technology-based effluent guidelines program is to efficiently reduce/ eliminate pollution**
- **Ambient-based WQS/TMDL approach supposed to be a second layer**
- **Problem with urban SWM is that we have yet to effectively apply a first technology layer**

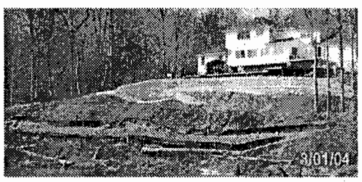
Construction: Current Program

- **Current BPJ permits: lots of paperwork and open-ended laundry list of BMPs**
- **Construction General Permit SWPPPs: 50 individual compliance items (mostly paper).**
- **"It is critical to recognize that the BMP solution to storm water problems has been inadequate, based on 15+ years of experience with construction, industrial, and Phase I MS4 storm water permits." (CA Cons. Gen. Permit)**

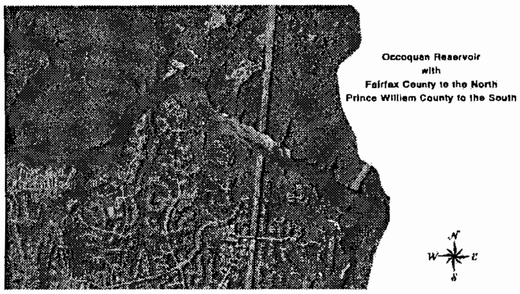
Gaps in Current Program

- 1994 national survey of 43 local governments nationwide conducted by Washington Metropolitan Council of Governments (Corish):
  - Few than a fifth of the local governments required that a minimum portion of each site must remain undisturbed.
  - A third of respondents said they impose no time limit for revegetation of exposed areas.
  - Almost two thirds fail to prohibit the clearing of steep slopes.

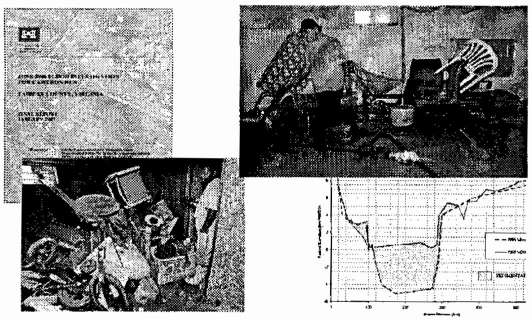




- The construction and development industry is a major source of drinking water supply impairment.



Cameron Run, Fairfax County VA, June 2006 Flood: $10 Million in Damages



Solution: Discharge Limits for the Construction Industry

- We propose:
  - No visible off site discharge of sediment
  - A numeric effluent limit for off site discharges
    - More environmentally effective
    - Reduced paperwork burdens
    - Easier to enforce
    - Consistency and clarity
    - Less subjective
    - More predictability

Basis for Our Construction Proposal

- State NTU numeric discharge limits
- Existing EPA Effluent Guidelines for Stormwater
- Construction E&S technology studies

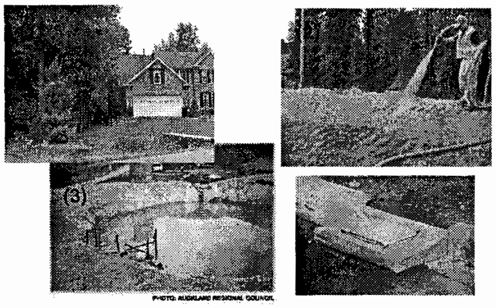
Examples of State NTU Limits

- Precedent for using numeric NTU limits in at least some constructions permits in:
  - Georgia: 10/25 NTU "shift" limit
  - North Carolina: 10/25/50 NTU "shift" limit
  - Oregon: 160 NTU action level
  - Washington State: 25/250 NTU action levels

Industries with Numeric Stormwater ELGs

Crushed Stone Mine Dewatering
Cement Manufacturing
Coal Mining & Coal Pile Runoff (includes open pit mines)

Construction Site E&S Controls: 1) Site Planning: clearing and grading restrictions; 2) Stabilization; 3) Sediment capture; 4) Perimeter and inlet controls



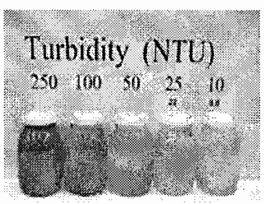
Numeric Limits Achieved by BMPs

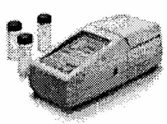
- 2005 WA Survey of 188 construction sites
- BMPs:
  - Inlet protection
  - Pond or basin
  - Disturbed soil protected with mulch, reseeding, blanket, etc.

Table 12: Use of Best Management Practices

BMP	Number of Sites	Mean		
		Transparency (cm)	Turbidity (NTU)	TSS (mg/L)
1	23	20.8	47.6	453.0
2	38	19.7	61.0	230.1
3	27	22.1	48.6	303.9
1&2	21	23.1	47.6	348.9
1&3	14	24.4	35.8	559.5
2&3	24	21.8	50.2	316.0
All 3	13	26.7	35.8	548.0

Monitoring Turbidity





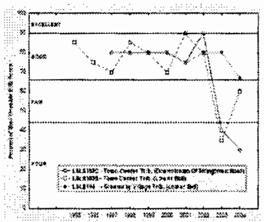
Portable Turbidimeter

Problem: Post Construction

- Stormwater pollution problems:
  - Streambank erosion = property losses
  - Siltation of reservoirs, harbors, creeks
  - Widespread aquatic life losses – habitat and chemical pollution/degradation
  - Infrastructure damages due to flooding
  - Recreational losses: bathing beaches
  - Pollution/loss of drinking water supplies including aquifers

Loss of Biodiversity

- Inadequately controlled stormwater from imperviousness – bugs are indicators of widespread fisheries losses (current 2002)



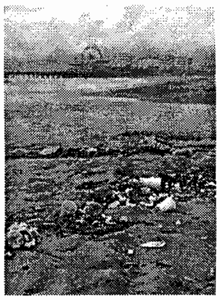
Clarksburg Town Center, MD. Source: Montgomery County Department of Environmental Protection 2005 Special Protection Area Program Annual Report

Depletion of Drinking Water Sources

- A typical suburban development with 23% impervious cover would deprive groundwater aquifers of over 40 million gallons of recharge per square mile annually.

Cahill Associates (1993)

- **Stormwater discharges carry sediment, nutrients, toxics, heat, pathogens, and trash...**

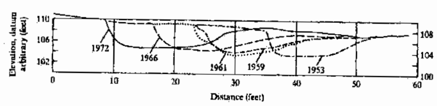


... and can ruin a day at the beach.

Exposed Wastewater Infrastructure

WSSC Sewer Line Reconstruction capital budget (prop. FY08): $25 million

Lateral migration of Watts Branch as measured by Leopold 1953-72



Post-Construction: Solution

- **Enforceable Discharge Standard:**
  - No Net Increase in Stormwater Discharges for New Developments
- **No Net Increase =**
  - Maintain peak flows
  - Maintain infiltration
  - Maintain surface discharge volumes
  - Maintain stream temperatures

States and Counties that are Leading the Way and Already Doing This

- States
  - New Jersey: Stormwater regs require post-development hydrology to match pre-dev levels
  - Maryland: Post-dev. = pre-development recharge levels' ESD the presumptiva norm
  - Delaware: Green technology BMPs the preferred practices
  - Virginia: Removing LID barriers in State SWM manual.
  - Wisconsin: Infitrate 25% of post-development runoff from 2 yr. storm.
- Localities
  - Stafford County, VA: Adopted by reference national LID hydrology manual.
  - Portland, OR – New dev. & redev. SWM required with green infrastructure techniques encouraged.

LID Best Management Practices

- Bioretention and rain gardens
- Stormwater planters, tree planting
- Green rooftop systems
- Rain barrels and cisterns / water re-use
- Infiltration
- Permeable paving
- Open channels
- Vegetative buffers
- Stormwater wetlands

Economics

- Externalities
- Economic Achievability
- Costs & Benefits

Problem: Externalities

- Increased flooding
- Increased pollution of natural waterbodies
- Increased drinking water supply and treatment costs
- Reduced downstream property values
- Diminished recreational use of waters
- Increased public health and productivity costs

Public Cost of Stormwater Pollution

- Flood damage and insurance costs:
  - Floods cause about $2 billion worth of damages per year in the U.S. (Young, 2005)
  - Improved stormwater controls would save $14 million per year in flood *insurance* costs. (EPA, 2002)
- Public health costs:
  - $21 to $51 million per year in medication, doctor visits, and lost work time from swimming in contaminated beaches in Los Angeles and Orange County beaches alone. (Given, Pendleton, and Boehm, 2006)

LID Offers Economically Sound Solution

- LID can help reduce system-wide operations and maintenance cost
- LID can help extend the useful life of pipe infrastructure as populations increase
- LID offers ecosystem services that conventional stormwater controls do not. (ECONorthwest, 2007)

Economic Achievability

- Compare EPA's February 2002 Economic Analysis for Proposed ELG:
  - Option 2/2 (Active construction: design for 80% TSS removal plus inspection/maintenance certification / Post-construction: design for 80% annual runoff capture plus BMP certification (with 10% LID))
    - Cost increase for buyers: less than 0.5%
    - Industry impact: facility closures = less than 1%

Economic Benefits of LID

- Reduced flooding costs
- Reduced CSO control costs
- Reduced filtration costs
- Reduced energy costs
- Increased amenity values

One study of the Blackberry Creek watershed Near Chicago, IL, estimated that adopting LID practices throughout a watershed would reduce downstream flooding, resulting in $54 - $343 in benefits per developed acre. (Johnston et al., 2004)

Photo Credit: Sonoma State University

Economic Benefits of LIDs

- Reduced flooding costs
- **Reduced CSO control costs**
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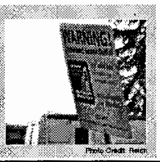
Portland's downspout disconnection program eliminates an estimated 1.2 billion gallons of stormwater runoff each year from the city's combined sewer system at a cost of $2.5 million. (City of Portland, 2007)



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Economic Benefits of LIDs

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- **Reduced filtration costs**
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Instead of using sand filters and storm drain structures to treat stormwater along a seawall on the Anacostia River, a bioretention filter strip was installed, saving $250,000. (Weinstein, 2002)

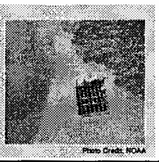

Photo Credit: NOAA

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Economic Benefits of LIDs

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- Reduced filtration costs
- **Reduced energy costs**
- Increased amenity values

Reduced pavement area and natural vegetation in the Village Homes LID development in Davis, CA help reduce home energy bills by 33-50% compared to surrounding neighborhoods. (RMI, 2006)

Local Government Commission

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Economic Benefits of LIDs

- Reduced flooding costs
- Reduced CSO control costs
- Reduced filtration costs
- Reduced energy costs
- **Increased amenity values**

Our preliminary analysis of properties on streets redeveloped by Seattle's Natural Drainage Systems Program indicate these modifications can add 6% to the value of the property.
(ECONorthwest, 2007)

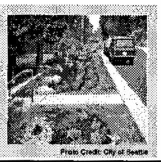

Photo Credit: City of Seattle

LID Benefits to Developers

- **Reduces land clearing and grading costs**
- **Reduces infrastructure costs (streets, curbs, gutters, sidewalk)**
- **Reduces SW management costs**
- **Increases lot yields and reduces impact fees**
- **Increases lot and community marketability**

Source: NAHB Research Center, The Practice of Low Impact Development (2003)

LID Benefits Developers

- **Increased number of buildable lots**
- Grassy swales, no curbs or gutters
- Green streets increase property values

By using LID techniques, a developer in Somerset Community, Prince George's County eliminated the need for stormwater retention ponds, which made room for six additional home sites.
(Guillette, 2007)

Photo Credit: ISP

LID Benefits Developers

- Increased number of buildable lots
- **Grassy swales, no curbs or gutters**
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Replacing curbs, gutters, and storm sewers with roadside swales in one residential subdivision in Lake County, IL, saved the developer $70,000 per mile, or $800 per residence.
(Drener and Price, 1997)

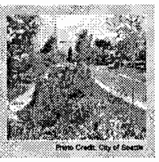

Photo Credit: City of Seattle

LID Benefits Developers

- Increased number of buildable lots
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- **Green streets increase property values**

A developer that used LID techniques in the Gap Creek subdivision in Sherwood, AR, sold lots for $3,000 more than lots in competing areas that did not use LID.
(Lehner, 1999)

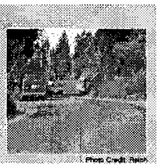
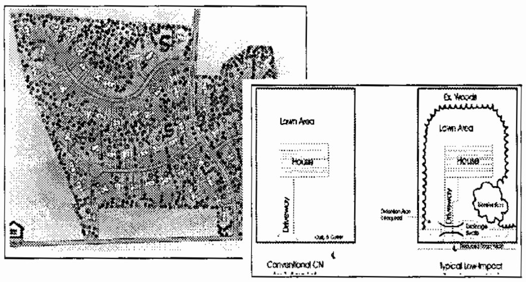


Photo Credit

Pembroke, Frederick County, MD (2003) LID



$60,000 in avoided curb & gutter + 17% savings in avoided pavement.

Need for Improved Analysis

- Cost-benefits
  - To give decision-makers a more accurate evaluation of benefits and costs, including the broad range of cost-offsets and benefits from LID
- Technology and Monitoring
  - Studies to monitor turbidity from construction sites
  - Analysis of state and local approaches to maintain pre-development hydrology