

**FAIRFAX COUNTY PLANNING COMMISSION
ENVIRONMENT COMMITTEE
WEDNESDAY, OCTOBER 6, 2010**

COMMITTEE MEMBERS PRESENT:

Walter L. Alcorn, At-Large
Frank A. de la Fe, Hunter Mill District
Jay P. Donahue, Dranesville District
Earl L. Flanagan, Mount Vernon District
James R. Hart, At-Large, Chairman
Kenneth A. Lawrence, Providence District
Timothy J. Sargeant, At-Large

COMMITTEE MEMBERS ABSENT:

None

COUNTY STAFF PRESENT:

Randy Bartlett, Director, Stormwater Management Division, Department of Public Works and Environmental Services
Pamela G. Nee, Chief, Environment and Development Review Branch (EDRB), Planning Division (PD), Department of Planning and Zoning (DPZ)
John Bell, Planner III, EDRB, PD, DPZ
S. Robin Ransom, Assistant Director, Planning Commission Office
Jeanette Nord, Associate Clerk, Planning Commission Office

ENVIRONMENTAL QUALITY ADVISORY COUNCIL MEMBER PRESENT:

Stella Koch, At-Large, Chair

OTHERS PRESENT:

Veenu Lynton, Northern Virginia Community College

ATTACHMENT:

◆ Understanding Stormwater

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Chairman James R. Hart called the meeting to order at 7:05 p.m., in the Board Conference Room, 12000 Government Center Parkway, Fairfax, Virginia 22035.

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Commissioner Hart MOVED THAT THE ENVIRONMENT COMMITTEE MINUTES OF SEPTEMBER 30, 2010 BE APPROVED.

Commissioner de la Fe seconded the motion which carried unanimously.

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Randy Bartlett, Director, Stormwater Management Division, Department of Public Works and Environmental Services (DPWES), gave a presentation on understanding stormwater, as shown in the attachment. He explained the County's stormwater management system in relation to State and Federal regulations. There was a lengthy discussion regarding the impacts of stormwater management on land use and development, which could be significant in terms of cost and green building/LEED certification.

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The following additional Committee meetings were scheduled to be held at 7:00 p.m., in the Board Conference Room:

Wednesday, December 2, 2010 – Presentation by Ellen Eggerton, Engineer III, Building Plan Review Division, Land Development Services, DPWES, on data collection and monitoring energy usage for existing green buildings (Note: Originally scheduled for October 28, 2010).

Thursday, January 13, 2011 – Discussion of the strawman document on Green Building Policy.

Thursday, February 3, 2011 – Continuation of the discussion on stormwater management.

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The meeting was adjourned at 8:14 p.m.
James R. Hart, Chairman

An audio recording of this meeting is available in the Planning Commission Office, 12000 Government Center Parkway, Suite 330, Fairfax, Virginia 22035.

Minutes by: Jeanette Nord

Approved: December 2, 2010

Linda B. Rodeffer, Clerk
Fairfax County Planning Commission

Understanding Stormwater



Cheat Sheet

- MS4 – Municipal Separate Storm Sewer System
- TMDL – Total Daily Maximum Load
- WIP – Watershed Implementation Plan
- E3 – Everything by Everyone Everywhere
- N – Nitrogen
- P – Phosphorous
- DCR –Dept. of Conservation and Recreation

Missions

- **Flood Protection** – Protect Property and Life
 - 10 year and greater storms – over 3”
- **Stream Protection** – Habitat & Property Protection
 - Peak Flow rates & Duration of High Flows
- **Water Quality**
 - First 1-2”
 - **Local Health & Habitat**
 - Fecal Coli form
 - Floatables & Suspended Solids
 - Contaminants
 - **Chesapeake Bay**
 - Nutrients
 - Suspended solids



History

- Before 1960 – Move Water Away Quickly & Drain the swamp
- 1970's – Flooding –Flood plains adopted
- 1970's – Erosion and Sediment Control & Detention
- 1980's – Stormwater Quality – Trash and Bacteria & Oils & Occoquan Down Zoning
- 1990's Chesapeake Bay – Nutrient Removal
- 2000's Stream Protection – Restore Habitat

Regulatory Arena

- County Codes – PFM Defines Design Standards
 - Local flood protection
 - Local stream protection
 - State and Federal Quality Stnds
- State Stormwater Regulations
- Local Impairments and TMDLs – New development can not contribute to the impairment
 - Bacteria
 - Sediment
 - Flow
 - PCB's
- Accotink TMDL – Volume and Flow
- Chesapeake Bay TMDL
 - Nitrogen – 14% from STW
 - Phosphorous – Filter first 1-2" plant uptake
 - Sediment – Stream bank erosion
- MS-4 Municipal Separate Storm Sewer System
 - Montgomery Co. Retrofit 30% existing impervious area
 - D.C. retain 1.2" on new private development and redevelopment – 1.7" Federal

Stormwater Words

- Quality – Nutrient Removal; Bacteria; Other Pollutants
- Quantity – Peak Flow; Total flow
- Detention – Flood Control & Stream Protection
- Retention – Water Quality – Some Stream Protection
- Erosive Potential=flow*quantity- stream protection
- BMP-best management practice – traditional quantity
- LIDs – low impact development – new quality
- Design Year storm
 - 100 yr means 1% chance
 - 2 yr means 50% chance
 - Basin Size ?
 - 2 yr 24 hr(3.2”) vs 2 yr 30 min (1.3”)
 - 10 yr 24 hr(5.2”) vs 10 yr 30 min (2.0”)
 - 95%ile event – 1.7”

Flooding >10 Year Event



- FEMA Flood Plain --100 Yr Event
- Overland Relief – Pipes Designed to 2-10yr storm
- Detention – Reduce Post Development 10yr storm
- 4 Mile Run
- Adequate Outfall
- Not Retention
- Not Extended Draw Down
- Not the First 1”



Stream Protection

- Peak Flow
- Erosive Potential
- Strategies
 - Reduce peak with extended draw down
 - Reduce erosive potential – peak*total
- Restoration
 - Reintroduce Flood Plain
 - Step Pools and Riffles



Water Quality

- Local Impairments - TMDLs

- Bacteria
- Sediment
- Flow

- Chesapeake Bay

- Nitrogen
- Phosphorous
- Sediment



Strategies

- Detain – typ 2 and 10yr
 - Store and Release
 - Peak Shave
 - Flood control
 - Stream Protection
- Retain –typ first flush 1-2”
 - Store and No Release
 - Infiltrate
 - Reuse
 - Evaportranspotation
 - Quality –reduce nutrients



Strategies

- Treatment – typ. first flush 1-2”
 - Quality – Not designed for Flood or Stream Protection
 - Filter
 - Rain gardens
 - Filterra
 - Green Roof
 - Porous Pavement
 - Vegetated Swales



Strategies

- Retrofit
 - Add BMP/LID to Existing Develop
 - Modify Existing Dry Pond
 - Nutrient Removal
 - Sediment removal
 - Peak Shaving



Strategies

- Restore
 - Typically Streams
 - Re-connect Flood Plain
 - Create Habitat
 - Reduce Sediments
 - Protect Property
 - Dissipates Energy



Current Theory

- Mimic a Good Forest
 - Reduce impervious areas
 - Infiltrate from impervious areas
 - Retain 1 year storm – 90% of events
 - Reduce Peak Flows to less than 1 yr good forested rate
- Reduce Sprawl
- Treatment Train



- Implement New Science During Redevelopment
- Retain and Restore Habitat

Cost - Perspective

- LEEDS STW @ Tysons = \$1.5m or \$60,000/acre
- Case Study – STW cost \$4.7 million
 - 25 acres - STW=\$190,000/acre
 - @ 1 FAR - Bld = \$220 m or \$9m/ac
 - Below grade parking = \$100m or \$4m/ac (2.6/1000@\$35,000)
 - \$190,000 STW vs \$13,000,000 bld and parking @ 1 FAR
- Case Study – STW \$1.6 million
 - 9 acres - STW = \$177,000/acres
 - Underground Garage - \$88,650,000
 - Office Building - \$262,000,000 2.5 FAR plus Transferred Density

Closing

- Water is a Resource
- Competing Missions
- Evolving Science
- Emerging Regulations
- Water Reuse
- Lack of Funding
- Will Require a Cultural Shift
 - No longer Free
 - Will Require O&M commitment
 - STW will become a resource, not waste product

