

**Virginia Soil and Water Conservation Board  
Stormwater Management Technical Advisory Committee  
July 16, 2008**

**Stormwater Management Regulations Technical Advisory Committee Members Present**

Michelle, Brickner, Fairfax County  
Joseph Battiata, CONTECH Stormwater Solutions  
Doug Beisch, Williamsburg Environmental Group  
Barbara Brumbaugh, City of Chesapeake  
F. Todd Chalmers, Balzer and Associates, Inc.  
Jack Frye, Department of Conservation and Recreation  
Mike Gerel, Chesapeake Bay Foundation  
Normand Goulet, Northern Virginia Regional Commission  
Barrett Hardiman, Home Builders Association of Virginia  
Steven P. Herzog, Hanover County  
William J. Johnston, City of Virginia Beach  
Bob Kerr, Kerr Environmental Services Corporation  
Steve Kindy, Virginia Department of Transportation  
John Matusik, The Engineering Groupe, Inc.  
Roy Mills, Virginia Department of Transportation  
Doug Moseley, GKY & Associates, Inc.  
Fernando Pasquel, Michael Baker Corp.  
Jeff Perry, Henrico County  
Chris Pomeroy, Aqualaw PLC  
David Rundgren, New River Valley PDC  
Alyson Sappington, Thomas Jefferson Soil and Water Conservation District  
Gerry Seeley, Jr. Virginia Department of Environmental Quality  
Ingrid Stenbjorn, Town of Ashland  
William H. Street, James River Association  
George Simpson, Roanoke County  
John Tippet, Friends of the Rappahannock  
Joe C. Wilder, Frederick County

**Stormwater Management Regulations Technical Advisory Committee Members Not Present**

Kevin Haile, Loudoun County  
Lee Hill, Department of Conservation and Recreation  
Mark Smith, U.S. EPA Region III

**Facilitator**

Barbara Hulburt, The McCammon Group

**DCR Staff Present**

David C. Dowling  
Ryan J. Brown  
Christine Watlington  
Michael R. Fletcher  
Doug Fritz  
Scott Crafton  
Eric Capps  
Kevin Landry  
Joseph H. Maroon  
Elizabeth Andrews, Office of the Attorney General

**Others Present**

Ann Jennings, Chesapeake Bay Foundation  
Bobby Beamer, Virginia Tech  
Frederick Chalmer, Balzer  
Tyler Craddock, Virginia Chamber of Commerce  
Shelley Frie, CH2mHill  
Brent Fults, CBNLT  
Andy Herr, Terry Peterson Residential  
Julia Hillegass, HRPDC  
Larry Land, VACO  
Allan Rowley, Arlington County  
Stuart Reed, ESS/CBNLT  
Valerie Rourk DEQ-OLAP  
Seth Shreve, Greeley & Hansen  
Kurt Stephenson, VT  
Morris Walton, VDOT  
Laurel Woodworth, Center for Watershed Protection

Ms. Hulburt welcomed attendees to the meeting. She then turned the meeting over to Mr. Dowling.

Mr. Dowling welcomed members to the 2<sup>nd</sup> meeting of the Stormwater Management TAC. He reviewed the list of materials provided in member packets.

The following items were provided in member packets:

1. Agenda
2. Department of General Services notice on Rainwater Harvesting Systems (encouraging use in state government)

3. Virginia Rainwater Harvesting Manual from Cabell Brand Center (2007)
4. Part I and II of the Stormwater Draft Regulatory Language
5. Compilation of runoff reduction spreadsheet comments from the design charettes
6. Virginia Municipal Stormwater Association's Position Paper on Stormwater Management Program Technical Criteria Development
7. E-mail from Pete Rigby of Paciulli, Simmons & Associates, Ltd. (Engineers ~ Planners ~ Surveyors ~ Landscape Architects ~ Wetland Specialists ~ Environmental Scientists ~ Archeologists) in Fairfax concerning the Water Quantity Language.
8. Reminder sheet on where to find the CWP technical memo
9. Copies of the Center for Watershed Protection's PPT entitled "Proposed Virginia Stormwater Management Regulations: Water Quality and Quantity Criteria & Compliance"

Copies of these items are available from DCR.

Mr. Dowling addressed the regulatory schedule. He said that DCR fully recognized and appreciated the concerns of some members of the TAC and those expressed in the VAMSA memo regarding advancing this regulation to the Board in September. He said that DCR had continued improvements to the regulation over the last year. He said that it was his believe that everyone recognized the significant efforts made during the last TAC, during the period between TACs, and over the course of the last several months to engage interested parties in the regulatory process. He said that DCR had consulted with hundreds of individuals and experts concerning different aspects of these regulations.

Mr. Dowling said that DCR believed that the regulations had been much improved based on this feedback and that the expectation was that they would be further refined through the positive collaboration of the TAC. He said that DCR is continuing to prepare to advance a set of proposed regulations to the Board in September for consideration and with their approval to the Administration and most importantly the public for their consideration. He again said that these would be proposed regulations and that the Department was willing to continue dialogue and make refinements and improvements based on comments received where reasonable to do so.

Mr. Dowling said that the intention was to complete additional testing of the regulations prior to the September Board meeting. He said that, at this time, staff was considering one or two meetings in mid to late August.

Mr. Dowling said that the Engineers and Surveyors Institute in Northern Virginia has also expressed an interest in testing the spreadsheet through Loudoun County public works staff, using site plans that are submitted there as the "test case."

Mr. Dowling said that additionally, a couple of consulting firms have indicated interest in evaluating the methodology using projects that they are involved in. He said those wishing to help in that regard should contact DCR staff with an approach and timeline can

be firmed up. He said that information such as this would also be valuable and necessary to feed into the economic analysis.

Mr. Dowling said that as the regulations work through the Administrative review process, following Board approval, there may be additional discussion meetings.

Mr. Dowling reviewed the tentative schedule as follows:

- Take proposed regulations to the Board at the September meeting [BMP clearinghouse up; substantive parts of the handbook ready]
- Target October 15, 2008 for completion of Economic Analysis (target a preliminary analysis by September 9<sup>th</sup>, 2008)
- Target November 1, 2008 to file regulation on TownHall.
- Continue testing of the proposed regulation.
- Review by the Administration – November 2008 through April 2009.
  - Official OAG review – 3 days
  - 45 days DPB fiscal analysis review – Mid Dec. 2008
  - 14 days SNR – Jan. 1, 2009
  - No deadline Governor – April 1, 2009
  - Submit to Registrar – Early April 2009
  - Registrar publication – late April 2009
- 60 days public comment – May-June 2009; public hearings; concurrent EPA review.
- Make Regulations refinements; EPA review – by September 1, 2009.
- Take final regulation to the Board at the September 2009 meeting.
- Final Regulation Review by DPB, SNR, Governor – by November 15, 2009.
- File with Registrar and publish for 30 days – Dec. 31, 2009.
- EPA final approval by Dec. 31, 2009.

Mr. Dowling noted that DCR had also been working on the revisions to Part III (the local program criteria) to address comments received at the last TAC meeting. He said those updates would be circulated upon completion.

Ms. Hulburt introduced Mr. Hirschman from the Center for Watershed Protection for a presentation.

Mr. Hirschman gave the following presentation:

**Proposed Virginia Stormwater Management Regulations:  
Water Quality & Quantity Criteria and Compliance**

About the Center for Watershed Protection

- Non-profit 501(c)3, non-advocacy organization

- Work with watershed groups, local, state and federal governments
- Provide tools communities need to protect streams, lakes and rivers
- 20 staff in MD, SC, VA, NY  
www.cwp.org  
www.stormwatercenter.net

#### CWP Role

- Update Stormwater Quality & BMP Performance Data
- Develop Stormwater Quality Approach
  - Methods & Compilations
  - BMPs
- Assist with ASCE/DCR Charettes
- Participant in Stormwater Quantity Discussions

#### Presentation Overview

- Virginia Stormwater Epochs: 2007, 2008
- Key Concepts for Proposed Runoff Reduction Method
- Design Charettes
- Spreadsheet Tool
- Water Quantity Workgroup
- Take Home Points

#### Major Epochs in VA Stormwater

- BMP-ocene: Existing regs & Handbook
- LID-ocene: First round of Regs revisions, Spring/Summer 2007
- Reducto-cene: Refinements in Winter/Spring 2008 – focus on Runoff Reduction

#### Where We Were in 2007

- Site-Based Load Standards for Total Phosphorus (TP) & Total Nitrogen (TN)
- 40% Impervious cutoff:
  - TP standard < 40%
  - TN standard > 40%
- LID “Credits” Based on ability to reduce runoff volume
- BMP Lookup Table
- Virginia-specific event-mean concentrations (EMCs)

1. CBLAD Method

Reduce Load to Ave. Land Cover

	<b>Condition</b>
2. Performance Standard	Reduce Load to Site-Based Standard (e.g. 0.28 lbs/acre)
3. Technology Approach	Select from BMP Table (e.g. existing regs)
4. No Net Increase	Reduce Load to Pre-Developed Levels
5. One Size Fits All	80% TSS, 40% TP

Site-Based Performance Standards

	<b>Total Phosphorus</b>	<b>Total Nitrogen</b>
Low Impervious Sites (<40%)	0.28 lbs/acre/yr	3.00 lbs/acre/yr
High Impervious Sites (>40%)	0.45 lbs/acre/yr	2.68 lbs/acre/hr

- Low Impervious – P is critical pollutant (yards, soil loss)
- High Impervious – N is critical pollutant (atmospheric deposition contribution to stormwater)
- BMP treatment mechanisms can be designed to treat both P & N

Issues With 2007 Method

- Split TP/TN standard problematic
  - Incentive to create more impervious cover?
- LID Credits separate (optional) loop
- Lacked sizing/treatment criteria for BMPs
- Not integrated with water quantity
  - Channel Protection
  - Flood Control

2008 Refinements

“Reducto-cene” – Runoff Reduction Method

- More research on BMP performance
- Runoff Reduction as unifying approach
- Integrated with sizing/design
- Comply with TP; design for broader range of pollutants (including TN)
- No “Credits” – all BMPs (conventional, LID) in play
- Treatment train

- Compliance/site planning spreadsheet
- Integrating with water quality

2008 Refinement Period Process

- Developed Spreadsheet
- ASCE/DCR Charettes
- CWP Tech Memo
  - [www.cwp.org](http://www.cwp.org) > Resources > Controlling Runoff & Discharges > Stormwater Management > National/Regional Guidance
- Quantity Workgroup

Compliance/Site Planning Spreadsheet

1. Post-Development Project & Land Cover Information					
<b>Constants</b>					
Annual Rainfall (inches)	43				
Target Rainfall Event (inches)	1.00				
Phosphorus EMC (mg/L)	0.28				
Target Phosphorus Load (lb/acre/yr)	0.28				
Pj	0.90				
<b>Land Cover (acres)</b>					
	<b>A soils</b>	<b>B Soils</b>	<b>C Soils</b>	<b>D Soils</b>	<b>Totals</b>
Forest/Open Space -- undisturbed, protected forest/open space or	0.0	2.0	4.0		6.0
Managed Turf -- disturbed, graded for yards or other turf to be		6.0	14.0		20.0
Impervious Cover (all soil types)	14.0				14.0
				<b>Total</b>	40.0
<b>Rv Coefficients</b>					
	<b>A soils</b>	<b>B Soils</b>	<b>C Soils</b>	<b>D Soils</b>	
Forest/Open Space	0.02	0.03	0.04	0.05	
Managed Turf	0.15	0.20	0.22	0.25	
Impervious Cover	0.95				

Key Concepts for Runoff Reduction Method

1. Site-Based Pollutant Loads
2. Water Quality – Beyond Impervious Cover
3. Treatment Volumes
4. Runoff Reduction (RR) & Pollutant Removal (PR) Practices
5. Level 1 & 2 Practices
6. Spreadsheet Compliance Tool

1. Site-Based Pollutant Load Standards

- What we do know
  - Total phosphorus
  - Post-to-pre, OR
  - Average land cover condition, OR
  - NOTHING
- What is proposed
  - TP basis for comps; TN also considered
  - No comparison to pre-development
  - Load limit tied to Trib Strategy goals for Urban Land = 0.28 lbs/acre/year (TP)

## 2. Water Quality – Beyond Impervious Cover

- What we do now
  - Simple Method, CB Method
  - $R_v = 0.05 \times 0.009(I)$
  - I = impervious cover
  - Impervious is sole indicator of water quality
- What is proposed
  - New runoff coefficients for turf (disturbed soils), forest cover
  - Incentives in design process to keep forest, minimize soil disturbance

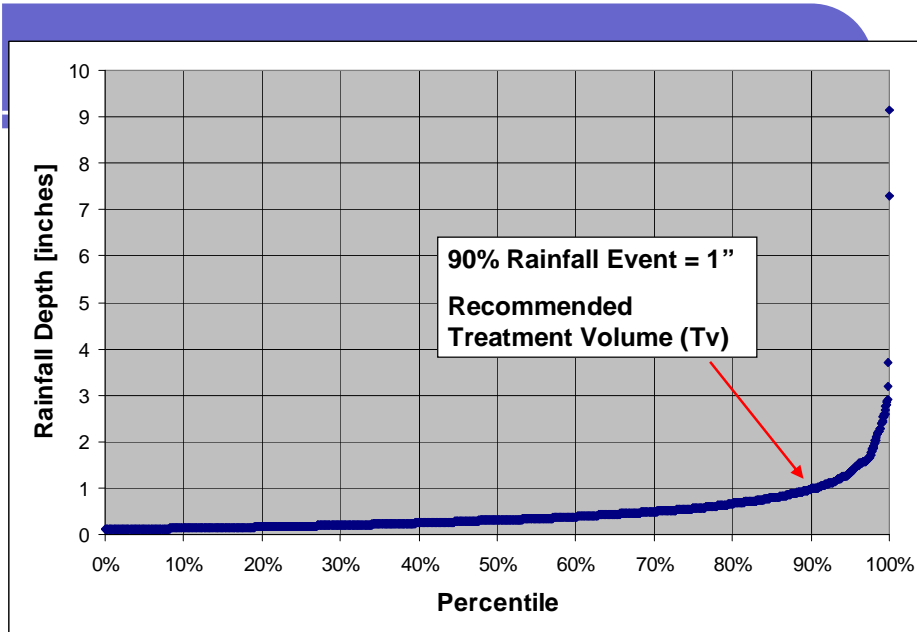
## Derivation of Land Cover Coefficients

Based on Recent Research on  
Compacted Soils and Watershed Forestry  
Disturbed Soils (Pitt et al 2005)  
Forests (Cappella et al 2005)  
IC (Adapted from Schueler, 1987)

## 3. Treatment Volume

- What we do now
  - $WQV = 0.5'' \times$   
impervious
- What is proposed
  - $T_v = 90^{\text{th}}$   
percentile  
storm event  
(1'')  $\times$  Site  
 $R_v$





## Rainfall Analysis Around VA

Location	90 <sup>th</sup> Percentile Rainfall Depth (in)
Abington	0.97
Near Harrisonburg	1.05
Lynchburg	1.23
Richmond	1.29
Northern Virginia	1.14

### Benefits of Treatment Volume

- ✓ Provides incentives to preserve forest, reforest, conserve soils and restore soils

- ✓ Captures and treats the 90% Storm (1 inch) and provides some treatment for larger storms
- ✓ Consistent with other state manuals and is widely accepted
- ✓ Based on the most recent science in regard to runoff coefficients and the performance of practices

Can also help address channel protection

#### 4. Runoff Reduction (RR) & Pollutant Removal (PR) Practices

- What we do now
  - BMP performance based solely on pollutant concentrations in vs. out
  - Performance for some BMPs under-reported
  - Not all practices (e.g., LID) assigned rates
- What is proposed
  - Runoff reduction + Pollutant removal = Total BMP Performance

#### Runoff Reduction (RR)

Runoff reduction is defined as the total volume reduced through canopy interception, soil infiltration, evaporation, rainfall harvesting, engineered infiltration, extended filtration or evapotranspiration at small sites  
*Recharge, water and even channel protection requirements can be collapsed into a single runoff reduction volume that would maintain predevelopment runoff conditions*

#### Stormwater Practices Differ Sharply in Ability to Reduce Runoff Volume

Wet Ponds, ED Ponds and Constructed Wetlands and Filters Reduce Runoff Volumes by zero to 10%.

Bioretention, Infiltration, Dry Swales and Related Practices Reduce Runoff Volumes by 50 to 90%

#### Benefits of Runoff Reduction (RR)

Provides common basis to measure aggregate performance of site design runoff reduction practices and standard stormwater practices together.

Can better maintain predevelopment runoff volume, duration and velocity.

Promotes groundwater recharge.

Enhances reliability of pollutant MASS reductions.

Runoff Reduction Practices\*

1. Protected Open Space Receiving Runoff from Developed Areas
2. Rooftop Disconnection (4 options)
3. Pervious Parking
4. Green Roof
5. Grass Channels
6. Bioretention & Dry Swales
7. Wet Swales
8. Infiltration
9. Extended Detention

Each Practice Must Meet Design Specs to Receive the RR “Credit”

\* Forest conservation, soil conservation, soil restoration are “self crediting”

5. Level 1 & 2 BMP Design

- What we do now
  - Poor verification of BMP performance based on design choices (Blue Book)
- What is proposed
  - Design checklists & specs
    - Level 1 – standard design (media performance)
    - Level 2 – enhanced design (75<sup>th</sup> percentile performance)

Deriving Level 1 and 2 Design Factors

Extensive Process to Assign Design Factors to Level 1 and 2:

- ✓ Design Point Tables in Stormwater Retrofit Manual
- ✓ Updated National Pollutant Removal Database
- ✓ Extensive Research on Runoff Reduction Rates
- ✓ Review of more than 100 BMP performance studies
- ✓ Professional Judgment

Primary Design Factors

Five Factors to Segregate Level 1 and 2 Design:

Increased Treatment Volume  
Increased Runoff Reduction Capability  
Enhanced Design Geometry  
Vegetative Condition  
Multiple Treatment Pathways

Example of “Short” Design Table

**Table 8 Wet Pond Design Guidance**

<b>Level 1 Design (RR: 0 TP: 50)</b>	<b>Level 2 Design (RR: 0 TP: 75)</b>
TV = (Rv)(A)	TV = 1.5 (Rv)(A)
Single Pond Cell, with Forebay	Wet ED or Multiple Cell Design
Pool Depth Range of 3 to 12 feet	Pool Depth Range of 4 to 8 feet
Flow path 1:1 or less	Flow path 1.5:1 or more
Pond intersects with groundwater	Adequate Water Balance

The Treatment Train

Several runoff reduction practices are needed in a series to achieve compliance at most sites

Utilize Step-Wise Design Approach

- ✓ Conserve Natural Areas & Soils
- ✓ Apply Good Site Design (Reduce Impervious & Disturbed Soils)
- ✓ Apply Engineered Runoff Reduction Practices
- ✓ Apply Standard Treatment Practices
- ✓ Offset Fee for Unmet Load (Local Option)

6. Spreadsheet Compliance Tool

- |                                                                                                                                                                                                    |                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• <u>What we do now</u><ul style="list-style-type: none"><li>○ Variable – most use Blue Book method</li><li>○ Worksheets or spreadsheets</li></ul></li></ul> | <ul style="list-style-type: none"><li>• <u>What is proposed</u><ul style="list-style-type: none"><li>○ Somewhat uniform use of spreadsheet tool</li></ul></li></ul> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|

ASCE/DCR Design Charettes

- 5 workshops
- Over 250 participants

- Design consultants (over 50%)
- Local gov't (over 25%)
- State & Federal gov't
- Environmental
- Academic
- Vendors

#### Feedback from Charettes

- Integrate with Water Quality
- In some cases, had to reach deep for compliance (for sample plans)
- BMPs in series, spreadsheet bug
- Good site planning tool
- Runoff reduction practices optional??? (should they be required)
- Redevelopment?
- Cost/maintenance for distributed practices
- Compliance for linear projects
- Local code conflicts
- Design-specific runoff reduction rates
- Add TN to spreadsheet

#### Spreadsheet – Beta Version

- TN comps included
- Accommodates BMPs in series
- Compliance by site – BMP design by drainage area
- Some water quantity comps
- Working out kinks

*Will the new method ensure nitrogen loads do not increase loads from urban land as a result of future land development?*

- ✓ We really think so
- ✓ Better BMP Math
- ✓ Better BMP Design
- ✓ More Reliable

#### TP & TN Computations

<b>Site Results</b>		
<b>Phosphorous</b>		
<b>TOTAL LOAD REDUCTION REQUIRED (LB/YEAR)</b>		<b>15.18</b>
<b>AFTER APPLICATION OF RUNOFF REDUCTION PRACTICES</b>		
<b>TOTAL ADJUSTMENT TO TREATMENT VOLUME (cf)</b>		19,116
<b>ADJUSTED TREATMENT VOLUME (cf)</b>		21,540
<b>ADJUSTED TREATMENT VOLUME (ac-ft)</b>		0.49
<b>ADJUSTED POST-DEVELOPMENT PHOSPHOROUS LOAD (TP) (lb/yr)</b>		13.5
<b>PHOSPHOROUS LOAD REDUCTION ACHIEVED (LB/YR)</b>		<b>12.01</b>
<b>AFTER APPLICATION OF POLLUTANT REMOVAL RATES</b>		
Step 3 Load Reduction (lb/yr) for Site		<b>3.56</b>
Remaining Load Reduction (lb/yr) Needed	<b>CONGRATULATIONS!! YOU EXCEEDED TARGET</b>	
<b>Nitrogen</b>		
<b>TOTAL LOAD REDUCTION REQUIRED (LB/YR)</b>		83.58
<b>AFTER APPLICATION OF RUNOFF REDUCTION PRACTICES</b>		
<b>ADJUSTED POST-DEVELOPMENT LOAD (TN) (LB/YR)</b>		96.8
<b>LOAD REDUCTION ACHIEVED (LB/YEAR)</b>		85.92
<b>AFTER APPLICATION OF POLLUTANT REMOVAL RATES</b>		
Step 3 Load Reduction (lb/yr) for Site		<b>20.58</b>
Remaining Load Reduction (lb/yr) Needed	<b>CONGRATULATIONS!! YOU EXCEEDED TARGET</b>	

Some Comps for Water Quality

<b>Channel Protection</b>	
Allowable $Q_{Developed} = Q_{Forested} \times V_{forested} / V_{Developed}$	
<b>Target Rainfall Event (in)</b>	2.60
<b>Runoff Reduction Volume (cf)</b>	19,116.22
<b>Drainage Area A</b>	
<b>Drainage Area (acres)</b>	19.00
<b>Runoff Reduction Volume (cf)</b>	12,657.08
<b>Drainage Area B</b>	
<b>Drainage Area (acres)</b>	18.00
<b>Runoff Reduction Volume (cf)</b>	6,459.13

Water Quantity Workgroup

- 4 meetings; work in between
- Where/when quantity control needed; where not?
  - Channel Protection
  - Flood Control
- Integrate with MS-19
- Link with runoff reduction

#### Quantity Control Options

1. Discharge to man-made system
2. Discharge to restored system
3. Discharge to “natural” stable system
  - Energy (developed)  $\leq$  Energy (pre-development)
4. Energy Balance
  - Energy (developed)  $\leq$  Energy (forested) (1-yr storm)
  - $Q_{10}$  post to pre
5. 1 % Rule (exemption)
  - DA or %

#### Take Home Points

- Focus on Good Design & Better BMPs
- Integrate Structural, Non-structural, LID
- Incentives to Preserve/Restore Forest & Reduce Disturbed Soils
- Quality & Quantity Play Nice Together
- Feasible/Achievable Across Range of Sites
- Meets Water Quality Goals

Mr. Hirschman said that one of the original objectives was that this would be something that could be used across the State. He said the intention was to keep it understandable so that local plan reviewers, local surveyors, and engineers would be able to use this tool.

At this time the committee recessed for a break. Following the break, Ms. Hulburt said that Mr. Hirschman and Mr. Crafton would answer questions.

A member asked if, when going through the charettes, if there was discussion that the cost for the BMPs would be incrementally factored in. He asked how much of the cost would be left with the builder/developer.

Mr. Hirschman said that while no side by side comparisons were done, there would definitely be an increase in costs.

Mr. Dowling said that was an issue of concern to the whole regulatory process. He said that there are ongoing discussion with Virginia Tech and others regarding the best way to estimate the costs.

A member noted that for an MS4 jurisdiction, the permit says that the owner must treat to the Maximum Extent Practicable (MEP). The member asked if that meant the MS4 jurisdiction would be required to do Design 2.

Mr. Dowling said that staff would look into that question.

Another member asked for clarification of the question.

The member said that for an MS4 jurisdiction the permit says that you must treat to the MEP. Having multiple designs, one being stated as being slightly tougher than the second implies that the second one is the Maximum Extend Practicable.

Mr. Dowling said that DCR is setting a regulatory standard that must be achieved through the BMPs. He said that would be the threshold that would need to be achieved. How that is attained would not be dictated through the regulations.

Mr. Brown asked Mr. Fritz if the MS4 Program Manager it was correct that the overall effluent limitations for MS4 is the MEP standard, but the six minimum control measures put together equal the MEP. He said that the permit requires the implementation of a consistent state program. The locality is not required to pick one method or the other.

Mr. Fritz said that the key to the MEP was the evaluation and improvement of the BMP selected. It is implementing the six minimum control measures but is also evaluating what has been implemented. He said that this is trying to meet a federal requirement and in some cases there will be TMDLs that are much more stringent.

A member said that the discussion was mixing concepts.

Mr. Dowling said that DCR staff would give the issue further consideration discussion.

Mr. Street said that there had been a mention of conflicts with local codes. He said that there were elements of this that the James River Association was particularly interested in. He asked if there would be an opportunity to encourage localities to look at those and remove the obstacles. He asked if DCR had suggestions for the process for how those conflicts would be avoided.

A member said that in the Chesapeake Bay Area under the Phase III, CBLA was working on the procedures. He said that a similar process may be applied.

Mr. Dowling said that when DCR is looking at a qualified program in a locality that can operate a stormwater management program there will be model ordinances that



incorporates the changes and DCR will be looking for the necessary changes from the locality.

Mr. Crafton said that once the regulation is finished and localities are confronted with having to adopt local programs, DCR will be providing instructional information that will communicate the necessary changes.

Mr. Herzog said that a lot of the code requirements are there because the citizens of the locality demand it because they have a certain expectation of what their community should look like. He said that there needs to be an education process that the state has to take the lead on saying that life is going to change or not.

Mr. Crafton said that there are also communities that have advanced codes to address some of these issues. He said that may provide an opportunity to find different methods of addressing these requirements.

A member said that it is important to consider the localities west of I-95. He said that it is important to remember that training and education is very important. Secondly he said that in the total volume calculation it said that the intent was to create an incentive to conserve forests and reduce mass grading. He asked how that would apply to a site that has been farmed for 100 years.

Mr. Hirschman said that disturbed soils would be considered a post-development condition. He said the question was whether or not impervious cover was put on top of the soil. Land that has been farmed for 100 years already has a certain runoff condition. He said there could be hydrologic benefit to not disturbing any more.

Mr. Crafton said that the proposed method gives credit for making decisions to improve or preserve good cover conditions while the current methods do not. He said that with the current method would not give the developer any advantage but with the proposed method there would be a benefit from conserving parts of sites that have treatment options and not disturbing the entire site.

A member asked if there was a benefit to reforesting.

Mr. Hirschman said that would depend on whether it is just reforestation or if the soil was amended. He said that it would change the runoff coefficient. He noted that one of the runoff reduction credits was sheet flow to open space.

Ms. Hulburt asked Mr. Frye to introduce the next presenter.

Mr. Frye introduced David Crawford from the Cabell Brand Center for a presentation regarding Water Reuse.

Mr. Frye said that rainwater capture had been considered an LID practice for some time. He said that in the past session of the General Assembly Senate Bill 378 was passed which added to the stormwater part of the Code the following statement regarding the regulations:

*Promote the reclamation and reuse of stormwater for uses other than potable water in order to protect state waters and the public health and to minimize the direct discharge of pollutants into state waters.*

Mr. Frye said that because of that specific presentation it would be helpful to have Mr. Crawford make this presentation. He said there are different levels of knowledge regarding rainwater harvesting. He said that Mr. Crawford represents Cabell Brand, a company in Salem, Virginia. He noted that a copy of the Virginia Rainwater Harvesting Manual was provided in member packets.

Mr. Crawford addressed the issue of water reuse.

Mr. Crawford thanked DCR staff for the opportunity to speak. He said that he hoped the Rainwater Harvesting Manual would provide additional information. He said that Virginia is considered to be a leader on the issue of rainwater harvesting.

Mr. Crawford said that nationally there is a movement toward systems that will maintain themselves and provide economic value in the future.

Mr. Crawford said that the average per gallon cost of a retention system in Virginia was between \$50-60. He said that Cabell Brand has tried to look nationally at the per gallon cost of retention vs. detention. He said that there are solutions that run as little as \$0.25 per gallon.

He said that the average rainwater system in the U.S. has 1000 sq. ft. of roof that will yield about 620 gallons of water for 1 inch of rain. He said Oregon has passed a law that says that for every 1000 sq. ft. roof the intent is to collect 75% of the 1 inch rain event.

Mr. Crawford said that if a rainwater system was designed properly it could collect a minimum of one inch of rain.

Mr. Crawford said that most people do not consider the cost of detention. He said that about 80% of the cost of a rainwater system is just the storage.

Mr. Crawford noted that the Cabell Brand Center has information available regarding laws across the country. He gave several examples of laws and concepts.

Mr. Crawford said that the quality of rainwater is typically better than the water from most municipal systems.

Mr. Crawford reviewed several rainwater harvesting systems designed by the Cabell Brand Center.

Ms. Stenbjorn asked if with the reuse of water running through a toilet then discharging to a sanitary sewer were there any concerns with utility departments not being able to track usage.

Mr. Crawford said that in most cases, the system was receiving less pollutants the utilities were not concerned about the inability to track reusage. He said that the users were paying for the water.

Mr. Crawford said there are attempts to get standards included in the national plumbing code.

At this time the committee recessed for lunch.

## **Discussion on Part II**

Ms. Hulburt called on Mr. Brown to lead a discussion of Part II.

Mr. Brown began on page 19 of the July 11, 2008 draft. The draft is available at the following address: <http://www.dcr.virginia.gov/documents/stmdp1n2.pdf>

### **4VAC50-60-40 Authority and Applicability**

Mr. Brown said that this section was much as it was the last time it was reviewed by the TAC.

A member said he thought there had been a reference added to the Clean Water Act as part of the authority.

Mr. Dowling said that was included on line 817 under other laws and regulations.

A member asked why the Clean Water Act was included.

Mr. Brown said that it was part of the authority of the program.

A member asked about the definition of land disturbing activities and whether that was consistent with the way it was applied in the Clean Water Act.

### **4VAC50-60-53. General Requirements**

A member said that the first sentence seemed to create a stand alone design standard.

Mr. Brown said the section was intended to be a descriptive statement of the rest of the section. He said the goal was to make sure there is language included that is explicitly not creating a new standard, but describing what follows. He said DCR would work on the language for the purpose of clarity.

A member said that “objectives” might be better than “requirements” in the title.

**4VAC50-60-56. Applicability of other laws and regulations.**

Mr. Brown said that this section does not limit the applicability of other laws which may apply.

**4VAC50-60-63. Water Quality Criteria Requirements.**

Mr. Brown said that the five subdivisions of this section set out the standards.

A member said that establishing the 0.28 per acre per year limit was a huge shift in policy. He said the concern is that it limits flexibility. He noted this would severely increase the cost of development and eliminate some of the buildable lots.

A member questioned the 40% break. He said that a developer would be better off at 41% than at 39% and that it would be a numbers game. He asked if 2 and 3 could be combined to say the site has to reduce the pollutant load by 10%.

Mr. Hirschman asked about the effect of just keeping that standard for prior developed land.

A member asked about the definition of redevelopment.

Another member asked where the 10% figure came from. He noted that most BMPs are rated to get more than 10% reduction.

Mr. Brown said that the last TAC concluded that was a little too aggressive. He said the intent is not to encourage sprawl and discourage redevelopment.

Mr. Herzog said that redevelopment meant more constraints. He said that a 10% reduction in downtown Richmond is a big deal. But on a site that is 50% impervious a 10% reduction may not have the same impact. He asked for a definition of prior development.

Mr. Crafton said that the draft defined prior developed land as land that was developed before. He said that development was also defined.

Mr. Crafton said that the 40% break was determined to be a good place for the division. He said the intent is to get more water quality protection where there is room to achieve it.

A member suggested combining points one and two and removing prior developed and redevelopment and say that the phosphorus load shall be reduced to an amount at a percentage below the predeveloped level but can never go lower than 0.28.

Another member said that there should be a definition of project area rather than the entire redevelopment site.

It was again noted that a major concern was the definition of redevelopment.

A member noted there was a very explicit requirement of 0.28 per acre. She said that she would like to see it stated that if a developer follows the steps as outlined, the requirement would be met.

A member noted that on line 842 it said that “under no circumstance shall the total phosphorus load be required to be reduced below 0.28 pounds per acre per year.”

A member said that he would like to understand more about how this policy decision was reached.

Mr. Hirschman said that what was most problematic was the split standard. He said that with the previous system, the low impervious sites it was very difficult to achieve the TN and more achievable to reach TP. He said when the new spread sheet was developed it was a lot more complicated to build in the variables. He said the question was whether both standards should be kept. He said that removing TN (and the 40% break) would get away from the math games and keep it as simple as possible.

A member said that looking at the economics the gains appear unfeasible. He asked if the achievability of TN had been considered.

Mr. Crafton said that when the graphs were first discussed they were basically curve with the load going across increasing imperviousness. He said the nitrogen load on the low impervious site was clearly a much harder test. He said that staff has not discounted the fact that there is goal for nitrogen in the tributary strategies.

Mr. Crafton said that short of going to some specified list of conditions, adding the TN standard to the TP standard would reintroduce that same difficulty. He said the other problem would be determining the short list of applicable situations.

Mr. Crafton said that the thinking was that if the loads can be calculated this would be a more practical way to go.

Mr. Gerel said that this was an opportunity to look at the TN. He said that not enough had been done to give up.

Mr. Crafton said he would offer the same challenge to the TAC that was offered to members of the water quantity work group. If members make the proposals, DCR could consider them.

Mr. Capps said staff did reviewed the research and looked at the 40% break. He said the concern was how to comply and what gains would be reached at 40%. He said there were concerns with the practicality and this is what staff has come back with for consideration.

Mr. Dowling said that while DCR appreciates the concept of including a nitrogen limit, that it still will be calculated and will reported against the Bay standards. He said that the intent is to develop a product that is simpler to be applied.

A member said this was worth discussion. He said that these were all new sources of pollution coming into the waterways and in many cases the waters were already impaired. He said that it was important to look at nitrogen and not remove it completely from consideration. He said that if someone came later with a new BMP that was great on phosphorus but did nothing on nitrogen should that be encouraged or allowed?

Ms. Hulburt said that the issues were the justification for taking TN out and if the spreadsheet is not being used how could it be tracked.

A member said that the numbers assigned to nitrogen were ambitious.

A member said that nitrogen should be considered in the design to keep the focus on design modifications.

Mr. Hirschman said that his concern was to create something that the user would understand. He said that it was important to keep simplicity in mind.

A member asked if on line 845 the reference should be planning area. He said the terms should be clear and consistent throughout the document.

A member asked if item 4 gave the authority to eliminate the open space that may be left from the per acre calculation.

Mr. Crafton said that DCR's intent was to ensure that the portion that is being developed is addressed.

A member said that the handbook could have the recommended guidance.

A member suggested that on item 5 the phrase “and implementation plan in place” be added after “approved by the EPA.”

Mr. Brown said that in some cases DCR is bound by the Clean Water Act.

Mr. Capps said that if a wasteload allocation has been established in a TMDL, and the TMDL approved by EPA, that must be looked at and enforced.

Mr. Capps said that the section was developed to address compliance with the federal permit.

A member said that the TMDL process is also a stakeholder process. He said that if there is some concern other than sediment the people affected will have a voice in what the wasteload allocation will be.

At this time the committee took a break.

Following the break, Mr. Brown continued with Subsection B, beginning with line 850 on page 20 of the July 11, 2008 draft.

A member suggested that the phrase “within HUCs approved by the board,” be replaced with “within other areas approved by the board.”

Mr. Crafton said that the concern was that the watershed being impacted would be sacrificed for treatment occurring somewhere else. He said that the project could be in one location with the mitigation miles away.

A member said that the concern is that it be in the same watershed, but not somewhere else within the HUC.

Mr. Brown said that staff understood the concept and would work with the language in the next draft.

A member said that he was glad to see regional plans included.

Ms. Hulburt noted that an issue was the flexibility of the plan to target a specific area and that the locality should be able to do that in their plan.

A member said that he had concerns about degrading waters that are currently meeting standards.

Mr. Brown continued with Section C. He said that the language was much as it had been in September.

Mr. Crafton said that comments have been received that said DCR should consider requiring localities to allow offsite mitigation but that developers should be responsible for finding the site and getting the legal access. He said that the suggestion is, rather than making it a local option, the regulations should say “shall” provide for offsite mitigation.

A member said that would mean that logically everyone should be allowed to do offsite mitigation.

Mr. Capps said that the language had been written that way because some localities have said they did not want to allow offsite mitigation. He said that, as it was written in the draft, localities had the discretion.

A member noted that those localities where DCR administers the program might want that flexibility.

Mr. Capps noted that if DCR is administering the program there is no local program.

A members suggested that the demonstration language on line 861 be repeated at the beginning of item 3 on line 864.

A member asked if this section precluded localities from allowing third party entities to assume the responsibility for the developer.

Mr. Brown said that the restriction is that it has to be within the same HUC or adjacent downstream.

Mr. Crafton said that the requirements apply to the entity obtaining the permit.

#### **4VAC50-60-65. Water Quality Compliance**

A member asked if the handbook and the guidance would be binding.

Mr. Brown said that if those items are to be enforced they must go through the rule making process.

Mr. Brown noted that the handbook is under development.

A member asked if the handbook portions could just be referenced.

A member said that the handbook would address BMPs, phosphorus and nitrogen, but asked what happened if a TMDL was issued for sediment.

Mr. Capps said that the handbook would probably not go to that depth.



Mr. Crafton said that the Center for Watershed Protection had data on other constituents and removal rates. He said that the BMP Clearinghouse site will have notes within each of those for reference.

A member said whatever is referenced in the regulations would be tied to rulemaking. He asked if there could be flexibility that allowed DCR to issue periodic guidance.

Mr. Brown said that the Clearinghouse would not be incorporated by reference, but that the spreadsheet would be.

A member said there needed to be a clarification regarding who brought the methodology to the Board.

Mr. Capps said that DCR would prefer the locality to bring the program to the Board and seek general approval. He said that DCR did not want to be in the position of approving random methodologies. The locality that has to implement the program should bring forward what they believe to be an acceptable methodology.

Mr. Dowling said that the Soil and Water Conservation Board would not want to review something that the local government had not approved.

Mr. Crafton said that the Clearinghouse will have a laundry list of BMPs that have been evaluated by the committee and certified by DCR by the time the regulations become effective.

A member said that a previous draft had allowed for localities to disallow practices that may not fit for the jurisdiction.

A member suggested that on line 811 the reference to the Clearinghouse website should say "shall be utilized as needed."

Mr. Brown addressed subsection C.

A member said that the last sentence was unnecessary.

Mr. Crafton noted technical changes to the table.

A member asked if there would be prescriptive guidance on sizing based on a water balance.

Mr. Crafton said that this would initially rely on guidance from the Cabell Brand Center.

#### **4VAC50-60-66. Water Quantity**

Mr. Brown said that this section had been expanded and improved.

Mr. Crafton said that a work group of about 20 stakeholders had addressed this section. He said the work group addressed issues raised by the previous TAC. He said the work group considered whether the regulations should have a groundwater recharge requirement.

Mr. Brown said that the two subsections in Water Quantity were Channel Protection and Flood Protection. He said that the intent was to show that the method used should be based on what it was being discharged into.

A member asked that if the requirement was to be met during land disturbing activity or when the land disturbance was completed.

A member noted that in Subsection A, land disturbing activities had previously referred to clearing and grading but in this context was post development.

Mr. Brown said that the land disturbing activity is what DCR regulates.

A member asked how stable and unstable would be determined by the locality.

Mr. Crafton said that there would be guidance offered.

A member asked why forested condition was used as opposed to predevelopment.

Mr. Crafton said that this was how it was set up in the stormwater law.

A member asked if the definition of a natural stormwater conveyance could be expanded to include wetlands.

Another member said that would not apply if there was no channel.

A member suggested that subsection H be removed.

Ms. Hulburt noted the TAC was out of time and said that the committee would resume work at the next scheduled meeting on August 14, 2008.

Mr. Dowling thanked members for attending and for their work. He said the intent would be to have revised Parts II and III back to members prior to the next meeting.

There was no further discussion and the meeting was adjourned.