

GLOSSARY OF TERMS

AFFORESTATION - The establishment of a tree cover on an area from which it has always or very long been absent , or the planting of open areas which are not presently in forest cover.

BEST MANAGEMENT PRACTICES (BMP) - Structural devices that temporarily store or treat urban stormwater runoff to reduce flooding, remove pollutants, and provide other amenities.

EXTENDED DETENTION - A storm water design feature that provides for the gradual release of a volume of water (0.25 - 1.0 inches per impervious acre) over a 12- to 48-hour interval to increase settling of urban pollutants, and protect channel from frequent flooding.

FIRST FLUSH - The delivery of a disproportionately large load of pollutants during the early part of storms due to the rapid runoff of accumulated pollutants.

FISH BARRIERS - An impediment in a stream, such as a sudden vertical drop, or a structure such as a culvert, which inhibits the ability of fish to swim.

HEC-2 - U. S. Army Corps of Engineers Water Surface profiles computer program used to determine the water surface elevation in natural or man-made channels.

HYDRAULIC ANALYSIS - Determining through the use of computer models the behavior of water including the planning and construction of facilities for prevention of excessive damage by water.

HYDROLOGIC- Determining the occurrence and distribution of the waters of the earth.

MACRO-INVERTEBRATE - Organisms living in or on bottom substrates that provide an indication of the water quality of the stream.

MICROPOOL - A smaller permanent pool used in a storm water pond due to extenuating circumstances, i.e. concern over the thermal impacts of larger ponds, impacts on existing wetlands, or lack of topographic relief.

RIPARIAN REFORESTATION - The replanting of the banks and floodplain of a stream with native forest and shrub species to stabilize soils, improve both surface and ground water quality, increase stream shading, and enhance wildlife habitat.

STORMWATER MANAGEMENT RETROFIT - Modify an existing stormwater management structure to change the focus of the flow control. Typically, the focus is shifted to managing the smaller, more frequent storms.

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TEN-YEAR FREQUENCY STORM - A rainfall event which occurs, on average, approximately every 10 years. In Rockville, a ten-year storm event is associated with 5.1 inches of rainfall over a 24-hour period.

TR-20 - Technical Release 20 developed by the Soil Conservation Service, entitled Project Formulation - Hydrology. A computer program which provides for hydrologic analyses of a watershed under present conditions and various combinations of land use/cover and structural or channel modifications using single event storm rainfall-frequency data.

TR-55 - Technical Release 55 developed by the Soil Conservation Service entitled, Urban Hydrology for Small Watersheds. It is a simplified procedure to calculate storm runoff volume, peak rate of discharge, hydrographs, and storage volumes required for detention structures.

TWO -YEAR FREQUENCY STORM - A rainfall event which occurs, on average, approximately every two years. In Rockville, a two-year storm event is 3.2 inches of rainfall over a 24-hour period.

WEIR - A structure that extends across the width of a channel and is intended to impound, delay or in some way alter the flow of water through the channel.

REFERENCES

1. City of Rockville Approved and Adopted Master Plan, October 25, 1993.
2. City of Rockville Storm Water Management Task Force Report to Mayor and Council, September 10, 1992.
3. Engineering Technologies Associates, Inc. 1989. City of Rockville Maryland - Stormwater Management Program Evaluation Cabin John Branch. Prepared for the City of Rockville, Maryland.
4. Environmental Guidelines, Guidelines for Environmental Management of Development in Montgomery County. The Maryland-National Capital Park and Planning Commission, Montgomery County Planning Department, June 1994.
5. Greenhorne and O'Mara, Inc. 1987. Phase I report investigation of water quality at Westmont Lake.
6. Greenhorne and O'Mara, Inc. 1990. Cabin John Lake biological field survey.
7. Loiederman Associates, Inc. 1994. Unpublished. Draft, Stormwater Management Evaluation of Tower Oaks Project. Prepared for Tower-Dawson Development, Inc.
8. Metropolitan Council of Governments. Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMP's, July 1987.
9. Metropolitan Council of Governments. Upper Cabin John Creek Watershed Management Study for City of Rockville, Maryland, December 1994.
10. Metropolitan Council of Governments. A Current Assessment of Urban Best Management Practices, Techniques for Reducing Non-Point Source Pollution in the Coastal Zone. March 1992. pp 117-127.
11. Montgomery County Government Consent Order Submission - Part 1 and Part 2 - NPDES Permit Application for Municipal Separate Storm Sewer Discharges, November 30, 1994.
12. Morris, Henry M. and Wiggert, James M. Applied Hydraulics in Engineering. New York: John Wiley and Sons, Inc., 1972. pp 3, 366.

Appendix A
Cabin John Watershed Management Plan Recommendations
May 1995

SWM Project Recommendations					
Facility Number	Name of Facility	Cost to City per Ac-Ft of Storage	Rockville Priority Ranking	Total Cost - Design and Construction	FY to be designed
1-A	Fleet Street	\$172,300	Low	\$400,000	FY 2003
1-B	Mount Vernon Place	\$23,300	High	\$90,000	FY 1996
2	Elwood Smith *	\$96,800	Moderate*	\$785,000	FY 1998
3	Rockville Heights	\$8,100	Not Recommended	----	----
4	Hungerford Swim Center	\$37,800	High	\$783,000	FY 1996
5	New Mark Commons	\$14,000	Not Recommended	----	----
6	Dogwood Park	\$108,000	Not Recommended	----	----
7	Seven Locks/Detention Center	\$128,000	Alternative Recommended	----	----
7A	Villages at Tower Oaks	N/A	High	----	By devel. (1995)
8	Dawson Farm	\$26,700	Low	\$230,000	FY 2000
9	Wootton Parkway	\$108,800	Moderate	\$100,000	FY 1997
10	Potomac Woods #1(East)	\$51,600	High	\$190,000	FY 1996
11	Potomac Woods #2	\$145,100	Not Recommended	----	----
12	Potomac Woods #3 (West)	\$47,800	Moderate	\$97,000	FY 1999
13	Locks Pond Court	\$31,000	High	\$78,000	FY 1995
14	North Farm	\$39,500	Moderate	\$78,000	FY 1999
15	Woodmont Country Club	\$59,500	Low	\$550,000	FY 2003
16	Montrose Park-Alternatives	Unknown	High	\$75,000	FY 1997

* Contingencies per City staff recommendations

Appendix A
Cabin John Watershed Study Recommendations
May 1995

Stream Restoration Areas				
Facility Number	Name of Facility	Linear Feet of Channel	Construction Cost	FY to be designed
1	Upper/Middle Cabin John Creek Maintstem Leverton Rd to Wootton Parkway	1130	\$100,000	FY 1998
2	Elwood Smith Tributary E. Lynfield Dr. & Elwood Smith Branch	250	\$40,000	FY 1995
3	Bogley Branch Baseball field to Seven Locks Road	1030	\$90,000	FY 1996
4	Dogwood Park Tributary	400	\$120,000	FY 1998

Removal of Fish Barriers				
Location Number	Location	Upstream Length for Fish Habitat	Construction Cost	FY to be designed
1	Upper/Middle Cabin John Creek - Wootton Parkway Culvert	> 2000'	\$7,500	FY 1998
2	Dawson Farm Creek - Wootton Parkway Culvert	1300'	\$7,500	FY 1998
3	Seven Locks Tributary - Tower Oaks Culvert	1000'	\$7,500	FY 1998
4	Seven Locks Tributary - Above Monroe Street Tower Oaks Development	300'	-	Stream Restoration Work Approved by MDE
5	Bogley Branch - Maintenance Road access via hiker/biker trail; below Potomac Woods Park baseball field	700'	-	FY 1995
6	Elwood Smith Tributary - Cabin John Parkway Culvert	>1800'	\$7,500	FY 1998

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Creation of Non-SWM Wetland Sites				
Location Number	Location	Wet Pool Area (Acres)	Construction Cost	FY to be designed
1	Cabin John Creek - Dogwood Park #1	0.1	\$15,000	FY 2000
2	Cabin John Creek - Dogwood Park #2	0.05	\$ 4,500	FY 2000
3	Cabin John Creek - Dogwood Park #3	0.16	\$ 5, 300	FY 2000
4	Seven Locks Tributary - Tower Oaks #1	0.82	-	Completed by developer
5	Seven Locks Tributary - Tower Oaks #2	0.12	\$3,900	Private Ownership

Riparian Reforestation Sites				
Location Number	Location	Reforestation Acreage	Stream Length (Ft)	Land Ownership
1	Upper/Middle Cabin John Creek Mainstem - Edmonston to Leverton	0.86	1,500	Public
2	Upper/Middle Cabin John Creek Mainstem - Dogwood Park	0.91	200	Public
3	Upper Cabin John Creek - Elwood Smith Park	0.29	500	Public
4	Elwood Park Tributary & Cabin John Creek - Confluence Area	0.17	200	Public
5	Upper Dawson Farm Creek - Jefferson St. Area	0.10	200	Public
6	Dawson Farm Creek - Wootton Parkway Area	0.36	800	Private
7	Middle Cabin John Creek - Wootton Parkway Area	0.50	200	Private
8	Seven Locks Tributary - Wootton Parkway Area	0.28	400	Private

Appendix B
Comparison of City, State and Draft State regulations
August, 1994

	CITY	CURRENT STATE LAWS	PROPOSED STATE LAWS
When is SWM required	Residential zones: land disturbing activity greater than 5000 sq ft or creation of 2500 sq ft impervious area Non-residential zones: all land disturbing activity resulting in 2500 sq ft or more of impervious area since November 1, 1978	Developments that disturb over 5,000 square feet of land area.	Developments that disturb over 5,000 square feet of land area.
Enforcement Authority	Department of Public Works Chapter 19, Laws of Rockville Stormwater Management and Sediment Control Regulations	Department of the Environment Environment Article 4-201 - 4-215, Annotated Code of Maryland Dept. of the Environment, Title 26, Subtitle 09 Chapter 02	Department of the Environment Environment Article 4-201 - 4-215, Annotated Code of Maryland Dept. of the Environment, Title 26, Subtitle 09 Chapter 02
Requirements and Methods:			
Quantity Control	Manage the increase in peak discharge from 10 year post-developed to the 2-year pre-developed discharge (10/2) Priority of Methods: Infiltration Flow attenuation Retention (wet ponds) Detention (dry ponds)	In the City of Rockville and Montgomery County the State requires that the post-developed peak discharge for a 2- and 10- year frequency storm event to or less than the respective 2- and 10- year pre-developed peak discharge rates. Alternate minimum control requirements may be adopted subject to Administration approval. Priority of Methods: Infiltration Flow attenuation Retention (wet ponds) Detention (dry ponds)	Post-development 10-year storm to predeveloped conditions. 24 hour extended detention for the post-development 1-year storm event

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	CITY	CURRENT STATE LAWS	PROPOSED STATE LAWS
Quality Control	<p>Requirements and Methods By Priority</p> <p>Infiltration - one inch rainfall event</p> <p>Retention - Permanent pool must be at least 1/2 inch runoff from the drainage area</p> <p>Detention - 24 hour detention and release of total volume for one year event for central facilities</p> <p>Detention - 24 hour detention and release of total volume for one inch rainfall event for on-site facilities</p> <p>Other Water Quality Measures Acceptable to the Dept.</p>	<p>Infiltration</p> <p>Retention and Detention shall provide for a permanent pool of water or provide for a 24-hour detention and releasing the volume of runoff from a 1-year frequency storm.</p>	<p>Infiltration of the first one-half inch of runoff volume of impervious area.</p> <p>Shallow marsh with the first 0.4 inch runoff of volume.</p> <p>Retention practices per the following: Volume in inches Impervious area in acres 0.5 < 50 0.59 50-60 0.68 60-70 0.86 70 +</p> <p>Alternate minimum control requirements may be adopted subject to MDE approval.</p>
Predevelopment Definition	Assumes the land is a meadow in good hydrologic condition	All lands in the site to be developed shall be assumed to be in good hydrologic condition through methods approved by the Administration	All lands in the site to be developed shall be assumed to be in good hydrologic condition through methods approved by the Administration
Retrofitting	SWM for the entire site is required when land disturbing activity is more than 50% the of site SWM for entire site is required when impervious area more than doubles	Not required	Not required
Legal Requirements for On-Site Facilities	Require a written and recorded inspection and maintenance agreement	Requires an operation and maintenance plan	Requires an operation and maintenance plan
SWM Requirements for Roadways	Require SWM be provided for one-half contiguous rights-of-way up to 30 feet maximum		

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<p>SWM Waiver Categories</p> <p>City's Waiver is actually a fee-in-lieu</p> <p>State's waiver requires no SWM</p>	<p>1) The hydraulic characteristics of the receiving stream are such that on-site management is contrary to obtaining the objective of erosion prevention and water quality</p> <p>2) The proposed development will not generate more than a 10% increase in the 2 year predevelopment peak discharge rate</p> <p>3) The site is surrounded by existing developed areas which are served by an existing network of improved storm drain systems of adequate capacity to accommodate the runoff from the additional development</p> <p>4) There exists an adequate SWM alternative acceptable to the Mayor and Council</p> <p>a) construction and conveyance of a SWM facility to the City together with as-built drawings</p> <p>b) dedication and conveyance of land or granting of an easement to the City to be used for a public SWM facility.</p> <p>c) monetary contribution to City for use in connection with a public SWM facility.</p> <p>d) arrangement whereby the subject property is served by a private off-site SWM facility.</p>	<p>Based on a case by case review provided that the provisions for waivers contained in county municipal ordinances are approved by the Administration</p> <p>The Administration will approve provisions for waivers if they ensure that a development will not adversely impact stream quality due to channel erosion, pollution, siltation and sedimentation and local flooding.</p>	<p>Water Quantity:</p> <ol style="list-style-type: none"> The proposed development will not generate an increase in the 1-year pre-development discharge rate; The proposed development is completely surrounded by existing developed areas which are served by a network of enclosed public storm drainage systems capable of discharging the additional runoff from the proposed development at non-erosive velocities; or Direct discharges to tidewater are provided. <p>Water Quality:</p> <p>In no case will the minimum control requirements for stormwater quality specified in Regulation .06C of this chapter be waived.</p>
<p>SWM Fee-In-Lieu Contribution</p>	<p>Quality: \$6,000/imp. acre Quantity: \$40,000/imp. acre</p>		

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Exemptions	<ol style="list-style-type: none"> 1. Clearing or grading activities that are subject exclusively to State approval and enforcement under State law or regulations. 2. Agricultural land management activities. 3. Land development activities which the MDE determines will be regulated under specific State laws which provide for managing stormwater runoff. 	<ol style="list-style-type: none"> 1. Agricultural land management activities 2. Additions or modifications to existing single family detached residential structures 3. Land development activities which WRA determines will be regulated under specific State laws. 4. Residential development consisting of single family structures each on a lot of 2 acres or greater. 5. Development that does not disturb over 5000 sq ft of land area are exempt from providing on-site. 	<ol style="list-style-type: none"> 1. Agricultural land management activities 2. Additions or modifications to existing single family detached residential structures 3. Land development activities which WRA determines will be regulated under specific State laws. 4. Development that does not disturb over 5000 sq ft of land area are exempt from providing on-site