



## Stormwater Management for Homeowners Low Impact Development (LID)



Historically, Virginia has been blessed with abundant natural resources and clean water. Rainwater would flow over the land and be absorbed by the soil to recharge

the groundwater. Eventually, the rainwater would reach the streams and flow to the Chesapeake Bay where it created one of the most unique environments in the world. The Chesapeake Bay was teeming with life and produced an abundance of fish, crabs, oysters and other life.

The current state of the Bay is less rosy; we hear almost daily about the dire condition of the oyster and crab populations.



While over-fishing plays a part in the diminishing yields, water flowing from the rivers and tributaries of the Chesapeake Bay also has a great influence on the health of the Bay. On its way down to the Bay, this water will have picked up contaminants such as sediment, nutrients such as nitrogen and phosphorus, and pollutants.

Stormwater pollution can be divided into "point source" and "non-point source." "Point source" pollution has a known point of origin, while "non-point source" pollution runs off from yards, parking lots, roads, and agriculture fields into drainage ditches, creeks and streams. Animal feces, (lawn) fertilizers, pesticides, discarded motor oil, and soaps from washing your car all have the potential of being picked up by stormwater and washed into these water bodies. The following photo shows samples of stormwater that is collected every ten minutes after the start of the storm (see arrow at the 10 o'clock position and go clockwise).



In addition to the increased pollutant load that results from development, the increase in homes, driveways, roads, parking lots and stores will also increase the amount of runoff as a result of the increase in areas impervious to rainwater. This rainwater runoff will cause more flooding; in particular,

when the drainage system is not adequate. For example, a property with 2,000 square feet of impervious area (roofs and driveways) produces 1,246 gallons of stormwater per one inch of rain (see the table on the next page). York County gets an average of 43 inches of rainfall, which would result in 53,580 gallons of runoff in one year. A 100 home subdivision would therefore produce more than 5.3 million gallons of runoff (not counting the roads) in a year. The increased water volume will cause flooding, more erosion and even more sediment and pollutants to enter the bay.

Roof Size (sq. ft.)	Precipitation (inches)				
	0.1	0.5	1	1.5	2
500	31.2gl	155.8gl	311.7gl	467.5gl	623.3gl
	\$2.72	\$3.23	\$3.87	\$4.50	\$5.14
1000	62.3gl	311.7gl	623.3gl	935.0gl	1246.7gl
	\$2.85	\$3.87	\$5.14	\$6.41	\$7.68
1500	93.5gl	467.5gl	935.0gl	1402.5gl	1870.0gl
	\$2.98	\$4.50	\$6.41	\$8.31	\$10.21
2000	124.7gl	623.3gl	1246.7gl	1870.0gl	2493.3gl
	\$3.10	\$5.14	\$7.68	\$10.21	\$12.75
2500	155.8gl	779.2gl	1558.3gl	2337.5gl	3116.7gl
	\$3.23	\$5.77	\$8.95	\$12.12	\$15.29
3000	187.0gl	935.0gl	1870.0gl	2805.0gl	3740.0gl
	\$3.36	\$6.41	\$10.21	\$14.02	\$17.83
3500	218.2gl	1090.8gl	2181.7gl	3272.5gl	4363.3gl
	\$3.49	\$7.04	\$11.48	\$15.93	\$20.37
4000	249.3gl	1246.7gl	2493.3gl	3740.0gl	4986.7gl
	\$3.61	\$7.68	\$12.75	\$17.83	\$22.91

*Runoff water produced by a roof (in gallons). The price given indicates the amount of money that could be saved by capturing the runoff in cisterns and rain barrels and reusing this water for irrigation and vehicle washing.*

## What can a homeowner do to help the Bay?



Far too often you can see a home where the downspouts are connected to the drainage ditch in front of the home, while the yard is being serviced by a sprinkler system. The owners are trying to get the rainwater away from the home while they use expensive chlorinated drinking water to irrigate their plants.



Rainwater is a valuable resource that can be harvested by using rain barrels and cisterns for re-use as irrigation water and other non-potable (non-consumptive) uses.



Rainwater can also be used to create rain gardens, which are slightly depressed areas that receive runoff from the roof, driveway or downspout. They contain soils that allow water to infiltrate rapidly. In most cases, the soil in rain gardens is modified with organic materials and sand to improve water infiltration.



When considering new construction or renovation, a green roof may be an alternative to consider. Green roofs contain a layer of a soil medium that is planted. The soil and plants absorb a large portion of the rainfall; they keep the structure much cooler in the summer and warmer in the winter than a normally shingled and insulated roof, which would save energy costs. Green roofs are heavier and would need structural reinforcement.

Another way to reduce runoff includes installing permeable pavement for driveways, decks and patios. Permeable pavement comes as porous concrete or a more open grid. This example shows open grid paving stones and reinforced grass. They are placed on a gravel bed that allows water to infiltrate rather than run off.



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We can all help with stormwater management.

It is up to EVERYONE to help keep York County beautiful!

[www.yorkcounty.gov/stormwater](http://www.yorkcounty.gov/stormwater)