If there were an averaged sized lot, let's say 55 by 150, that had 15 trees; and a significant amount of those trees were remove so there were only a few left (let's say 3). Assuming a soil test on the lot passed as a buildable parcel, what sort of impact would the cutting of the trees have on the ability of said lot to retain its stormwater on-site?

To accurately answer this question, I would have to know the types of trees, their DBH, and the size of their canopy. It would also be important to know how much these trees overlap—are they all within one area of the property, grouped together, with their crowns intermingled, or are they spread around the property without their crowns overlapping much at all. If only 3 trees remain out of 15, and the trees are not overlapping, you lose 80 percent of your existing canopy.

However, focusing on stormwater, I made some assumptions on the types and sizes of trees that might typically be found on a lot in your area in order to estimate the impact the removal of trees would be on this typical site. Using the National Tree Benefits Calculator, I looked up the amount of stormwater intercepted by 15 trees of the species and size as follows:

- 3 loblolly pines – 12 inches average DBH (2,021 gallons/year each)
- 3 laurel oaks – 12 inches average DBH (1,931 gallons/year each)
- 3 sweetgums – 12 inches average DBH (1,646 gallons/year each)
- 3 Eastern redcedars – 8 inches average DBH (501 gallons/year each)
- 3 Eastern redbuds – 4 inches average DBH (228 gallons/year each)

The total annual amount of stormwater intercepted by these trees is 18,981 gallons.

If 12 of the trees were removed and 3 of the largest trees were left—2 laurel oaks and 1 sweetgum—the amount of stormwater intercepted would drop to 5,508 gallons annually, a reduction in stormwater interception of 71 percent. Some of the additional 13,473 gallons *not* intercepted would infiltrate into the open soil, grass or herbaceous vegetation, but an increase in the amount of runoff would be very likely. The amount of runoff would depend upon the intensity and duration of the rainfall event, as well as on the absorption rate of the groundcover. If the tree canopy is not left as open land but is instead replaced with impervious surfaces such as driveways, rooftops and other structures (without any tree canopy cover over these surfaces), then much of the 13,473 gallons not intercepted by the 12 trees removed would certainly be runoff.

The Center for Urban Forest Research and the National Tree Benefits Calculator describe the benefits of trees to stormwater runoff as follows:

> Urban stormwater runoff (or "non-point source pollution") washes chemicals (oil, gasoline, salts, etc.) and litter from surfaces such as roadways and parking lots into streams, wetlands, rivers and oceans. The more impervious the surface (e.g., concrete, asphalt, rooftops), the more quickly pollutants are washed into our community waterways. Drinking water, aquatic life and the health of our entire ecosystem can be adversely affected by this process.

Trees act as mini-reservoirs, controlling runoff at the source. Trees reduce runoff by:

- Intercepting and holding rain on leaves, branches and bark
- Increasing infiltration and storage of rainwater through the tree's root system
- Reducing soil erosion by slowing rainfall before it strikes the soil

In addition to intercepting stormwater, trees have other significant and irreplaceable environmental benefits that can be calculated, including increasing property values, reducing temperatures, energy consumption and costs, improving air quality and reducing atmospheric carbon. They also contribute to improving human health and reducing health costs.