WATER QUALITY PROTECTION & ENHANCEMENT PROJECTS

In order to legally operate a storm drainage system, the City of Charlotte must meet the conditions of a Clean Water Act Permit. Many things are required by the Permit including municipal good housekeeping measures, construction site runoff controls, a public education program and protective ordinances such as the Post-Construction Controls Ordinance. The goal of the Permit is to protect and restore the water quality of Charlotte's creeks, lakes and rivers.

Large volumes of fast-moving water erode streambanks.

One of the ways that Storm Water Services meets the goals of the Permit is by building water quality enhancement projects such as ponds and rain gardens. Another way to improve water quality is to restore degraded streams back to their original functionality.

The Hunter Acres (l) and Raintree (r) Ponds were failing when Storm Water Services first inspected the areas. Improving existing ponds is an extremely cost-effective means of improving water quality, averaging only one-fifth the cost of creating new water quality measures that provide equivalent environmental benefit.

Storm Water Services has completed more than 30 water quality enhancement projects including 15 pond projects and 11 stream restoration projects with many more in progress.

Ponds provide many benefits including:

- Pollution Removal
- Flood Control
- Streambank Erosion Control

Privately-owned ponds are typically in severe disrepair, are not designed to provide the maximum pollutant removal efficiency and, most importantly, are not protected in a manner that guarantees that water quality benefits provided by the pond will continue in perpetuity. Owners could decide to let the dams fail or release the water and then the water quality benefit would be gone forever.

Pond Projects Completed Or About To Be Completed

Pond	Drainage Area (acres)	Approximate Pounds of Pollutants Removed Each Year	Estimated Pollution Removal Rate (%)	Cost ($)
Betty Coleman	98	197,535	88	$420,000
Birnen	65	98,580	87	$220,000
Bongaard	91	107,604	66	$400,000
Dogwood	43	62,963	89	$234,000
Enclave	138	159,434	69	$350,000
Hunter Acres	93	173,833	96	$419,000
Iveys	305	430,285	90	$540,000
McDonald	98	136,432	82	$550,000
Pence	20	8,127	90	$150,000
Pierson	120	41,242	56	$460,000
Raintree	65	100,390	91	$310,000
Revolution Park	309	325,683	49	$206,000
Shade Valley	27	9,791	63	$228,000
Stonebridge	394	329,894	37	$332,000
Wilora	166	242,384	68	$900,000
TOTAL	**2,032**	**2,424,177**	**75% average**	**$5,299,000**

For a total cost of $5.3 million, 75% of the pollutants coming from an area roughly the size of 1,500 football fields (or the size of the Town of Pineville) will be diverted from Charlotte's creeks in perpetuity.

The water leaving each water quality enhancement project is not tested. However, every completed project is evaluated to ensure stability and optimal operation. Research indicates that when stable and fully operational, water quality enhancement projects are proven pollution removal devices which means it is more cost-efficient to properly maintain a water quality enhancement project than it is to test it.

After completion of the project, monitoring and maintenance may include several things such as:

- Functionality – remove outlet clogs, adjust outlet rates, evaluate dam stability, remove sediment,
- Stability – replant dead vegetation remove invasive plants, correct erosion problems,
- Habitat – observe aquatic life and calculate habitat index scores,
- Citizen Interaction – respond to Service Requests, issue easement violations.

Localized improved water quality is obvious downstream of completed water quality enhancement projects. Stream banks are more stable, biodiversity of plants and animals exists and pollution is removed. Over time, the construction of hundreds, maybe thousands of water quality enhancement projects, along with public education and ordinance enforcement, will result in measurable regional water quality improvements as well.