AC9302 Area-Wide Drainage Improvement

Address:	Various
Location:	Within the Ravensworth Neighborhood
Land Owner:	Private - Residential
PIN:	
Control Type	Water Quality
Drainage Area	35 acres
Receiving Waters	Unknown tributary of Lake Accotink

Description: All of this subwatershed, AC-AC-0240, is medium density land use with no existing stormwater management facilities. The project is distrubuted throughout the southeastern portion of the subwatershed and involves treating runoff before it reaches the stream system. Tree Box Filters will be installed at various inlets throughout the neighborhood.

Project Area Map

Project Benefits: This project will provide water quality treatment for stormwater runoff through the removal of pollutants and increased infiltration. This will improve instream water quality and instream habitat.

Project Design Considerations: No other projects are recommended in this subwatershed. No environmental constraints are anticipated since the disturbance would be limited to the area imediately around the projects. Projects located on private property need to be coordinated with and approved by the property owner.

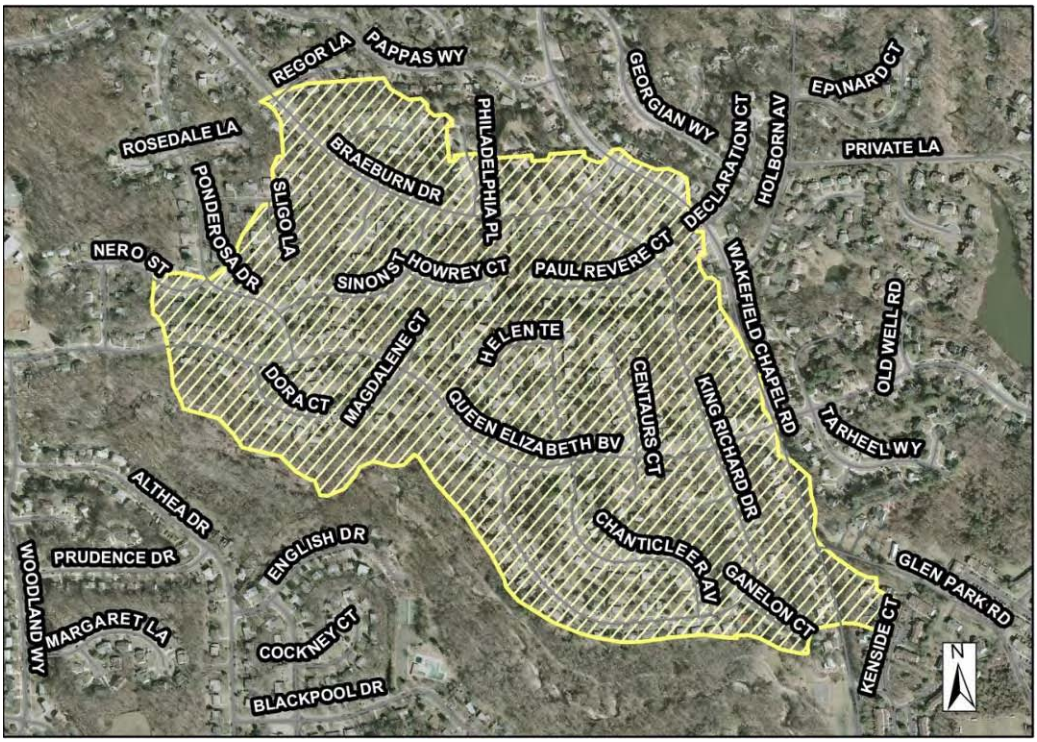
Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	16	EA	$10,000.00	$160,000
			Initial Project Cost	**$160,000**
Plantings	1	LS	5% of project	$8,000
Ancillary Items	1	LS	5% of project	$8,000
Erosion and Sediment Control	1	LS	10% of project	$16,000
			Base Construction Cost	**$192,000**
			Mobilization (5%)	$9,600
			Subtotal 1	$201,600
			Contingency (25%)	$50,400
			Subtotal 2	$252,000
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits			(45%)	$113,400
			Estimated Project Cost	**$365,000**

AC9305 Area-Wide Drainage Improvement

Address:	Various
Location:	Within the Canterbury Woods Neighborhood
Land Owner:	Private - Residential
PIN:	
Control Type	Water Quality
Drainage Area	138 acres
Receiving Waters	Unknown tributary of Long Branch

Description: The majority of the subwatershed AC-LB-0005 is medium density residential with no stormwater management facilities. The water quality downstream of this subwatershed is impaired with few opportunities for retrofits. This area-wide improvement would treat the stormwater runoff at the source.. This project is located north of the stream and involves the installation of Tree Box Filters and rain gardens. Locating rain gardens is recommended around yard inlets.



Project Area Map

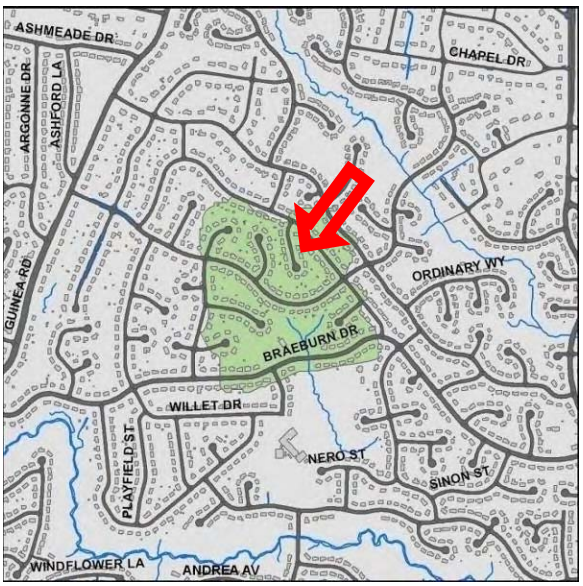
Project Benefits: This project will provide water quality treatment of stormwater runoff through various methods of treatment. The amount of nutrients, suspended solids, and other harmful pollutants will be reduced before reaching stream, thus improving in-stream habitat. There will also be a slight improvement in the peak flow attenuation due to the disconnection of rooftops and increased infiltration.

Project Design Considerations: Environmental constraints will be small as the disturbance will only be in the immediate vicinity of the existing storm drain system. Rain gardens may require utility research to ensure there are no conflicts. Some modification of the storm drainaige system may be required. Projects located on private property need to be coordinated with and approved by the property owner. Easements would be required for rain gardens on private property.

Costs:

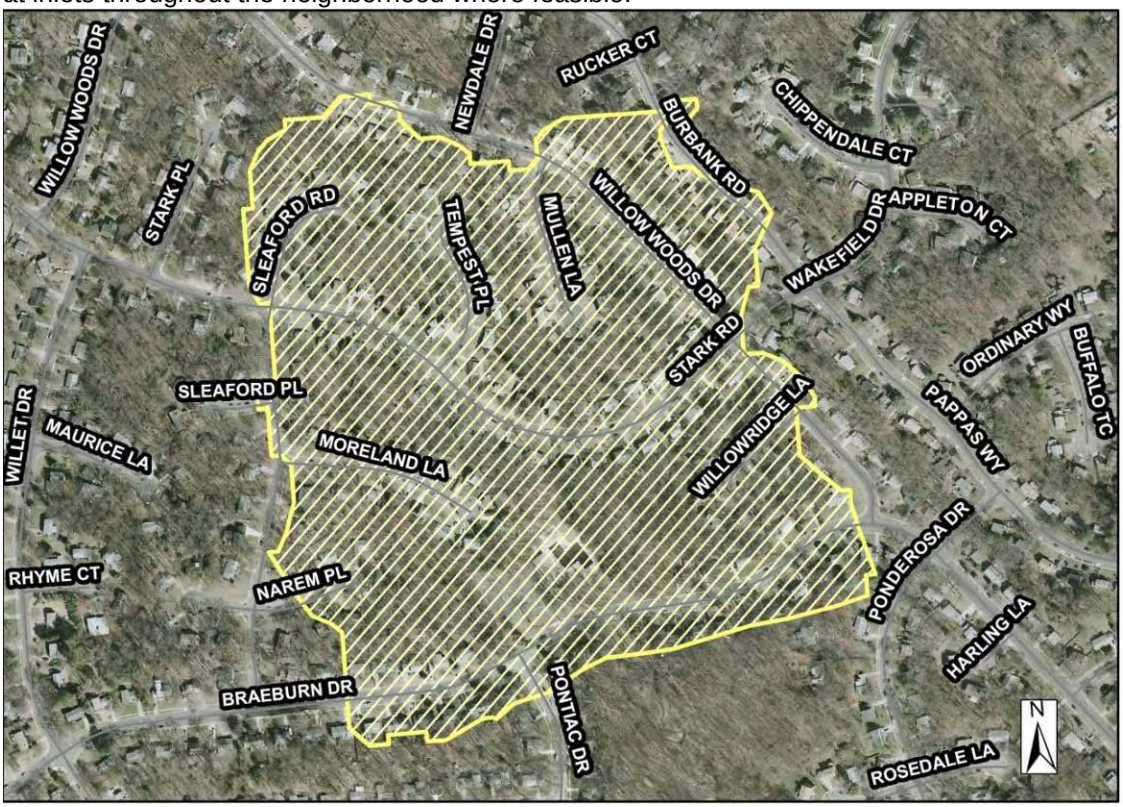
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	65	EA	$10,000.00	$650,000
Rain Garden	1500	SY	$50.00	$75,000
			Initial Project Cost	**$725,000**
Plantings	1	LS	5% of project	$36,250
Ancillary Items	1	LS	5% of project	$36,250
Erosion and Sediment Control	1	LS	10% of project	$72,500
			Base Construction Cost	**$870,000**
			Mobilization (5%)	$43,500
			Subtotal 1	$913,500
			Contingency (25%)	$228,375
			Subtotal 2	$1,141,875
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)				$513,844
			Estimated Project Cost	**$1,656,000**

AC9306 Area-Wide Drainage Improvement



Address:	Various
Location:	Within the Willow Woods Neighborhood
Land Owner:	Private - Residential
PIN:	
Control Type	Water Quality
Drainage Area	64 acres
Receiving Waters	Unknown tributary of Long Branch Creek

Description: In this medium density residential neighborhood, there are no stormwater management facilities to treat runoff. Water quality downstream of this subwatershed is impaired. This project will treat the runoff at the source. Rain gardens will be placed around yard inlets and Tree Box Filters will be placed at inlets throughout the neighborhood where feasible.



Project Area Map

Project Benefits: This project will provide water quality treatment of stormwater runoff. The amount of nutrients, suspended solids, and other harmful pollutants will be reduced before reaching stream, thus improving in-stream habitat. There will also be a small amount of improvement in peak flow attenuation due to increased infiltration throughout the subwatershed.

Project Design Considerations: Environmental constraints, if any, will be small as the disturbance will only be in the immediate vicinity of the existing storm drains. Some project types may require utility research to ensure there are no conflicts, or modification of the storm drainaige system may be required. Projects located on private property need to be coordinated with and approved by the property owner. Easements must also be obtained for installation and maintenance of the rain gardens.

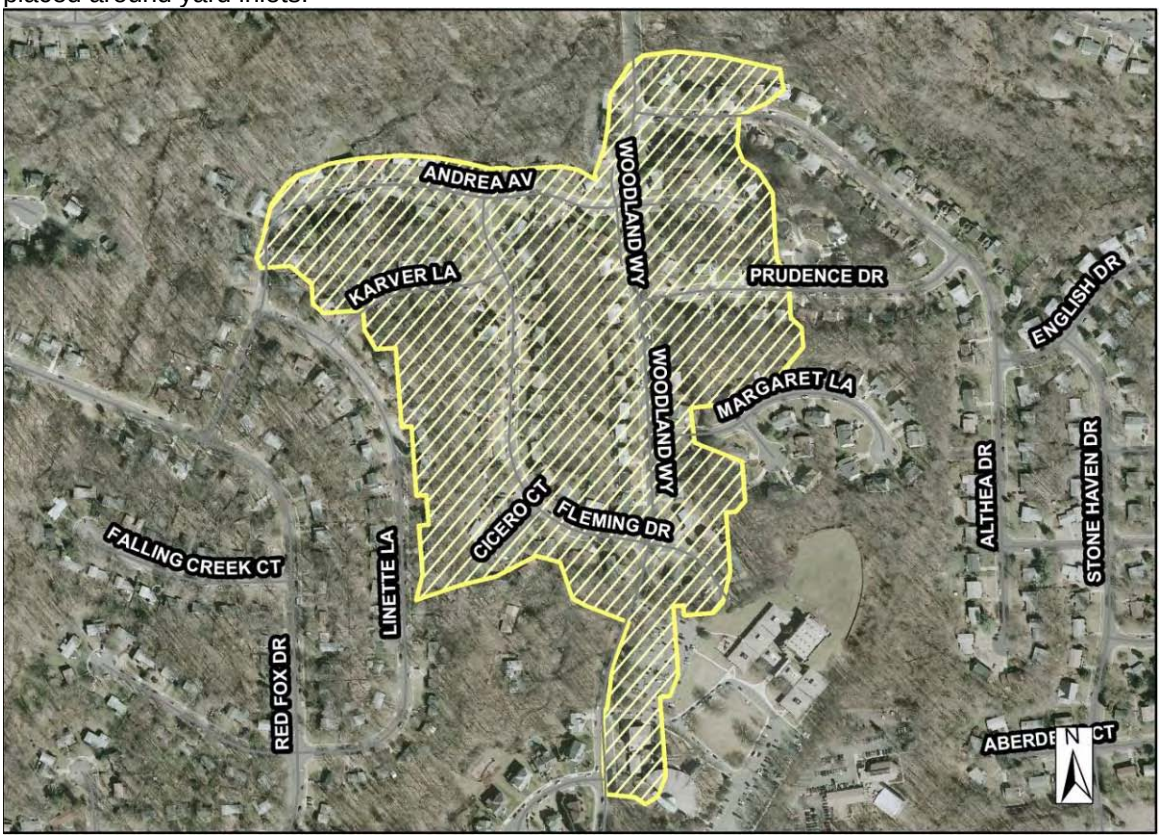
Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	27	EA	$10,000.00	$270,000
Rain Garden	577	SY	$50.00	$28,860
			Initial Project Cost	**$298,860**
Plantings	1	LS	5% of project	$14,943
Ancillary Items	1	LS	5% of project	$14,943
Erosion and Sediment Control	1	LS	10% of project	$29,886
			Base Construction Cost	**$358,632**
			Mobilization (5%)	$17,932
			Subtotal 1	$376,564
			Contingency (25%)	$94,141
			Subtotal 2	$470,705
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits			(45%)	$211,817
			Estimated Project Cost	**$683,000**

AC9307 Area-Wide Drainage Improvement

Address:	Various
Location:	Within the Woodland Forest Neighborhood
Land Owner:	Private - Residential
PIN:	
Control Type	Water Quality
Drainage Area	41 acres
Receiving Waters	Unknown tributary of Long Branch Creek

Description: This is a medium density residential neighborhood downstream of dry pond 1022DP. This project is located in a headwater subwatershed and would improve the water quality of stormwater runoff before it enters Long Branch. Tree Box Filters will be placed at certain inlets and rain gardens will be placed around yard inlets.



Project Area Map

Project Benefits: This project will provide water quality treatment of stormwater runoff. The amount of nutrients, suspended solids, and other harmful pollutants will be reduced before reaching stream, thus improving in-stream habitat. There will also be some improvement in peak flow attenuation due to increased infiltration.

Project Design Considerations: There are no environmental constraints as the disturbance will be limited to the area immediately around the existing storm drains. Projects located on private property need to be coordinated with and approved by the property owner. For rain gardens located on private property, an easement will be required for installation and maintenance.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	21	EA	$10,000.00	$210,000
Rain Garden	222	SY	$50.00	$11,100
			Initial Project Cost	**$221,100**
Plantings	1	LS	5% of project	$11,055
Ancillary Items	1	LS	5% of project	$11,055
Erosion and Sediment Control	1	LS	10% of project	$22,110
			Base Construction Cost	**$265,320**
			Mobilization (5%)	$13,266
			Subtotal 1	$278,586
			Contingency (25%)	$69,647
			Subtotal 2	$348,233
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits			(45%)	$156,705
			Estimated Project Cost	**$505,000**

AC9308 Area-Wide Drainage Improvement

Address:	Various
Location:	Within the Long Branch Neighborhood
Land Owner:	Private - Residential
PIN:	
Control Type	Water Quality
Drainage Area	30 acres
Receiving Waters	Unknown tributary of Long Branch Creek

Description: Subwatershed AC-LB-0025 is medium density residential with no stormwater management facilities. The water quality downstream of this subwatershed is impaired. This area-wide improvement would treat the runoff at the source, before it enters the streamt. This project involves the installation of Tree Box Filters and rain gardens.

Project Area Map

Project Benefits: This project will provide water quality treatment of stormwater runoff through various methods of treatment. The amount of nutrients, suspended solids, and other harmful pollutants will be reduced before reaching stream, thus improving in-stream habitat.. There will also be a slight improvement in the peak flow attenuation due to the disconnection of rooftops and increased infiltration.

Project Design Considerations: Environmental constraints will be small as the disturbance will only be in the immediate vicinity of the existing storm drain system. Rain gardens may require utility research to ensure there are no conflicts. Some modification of the storm drainaige system may be required. Projects located on private property need to be coordinated with and approved by the property owner.

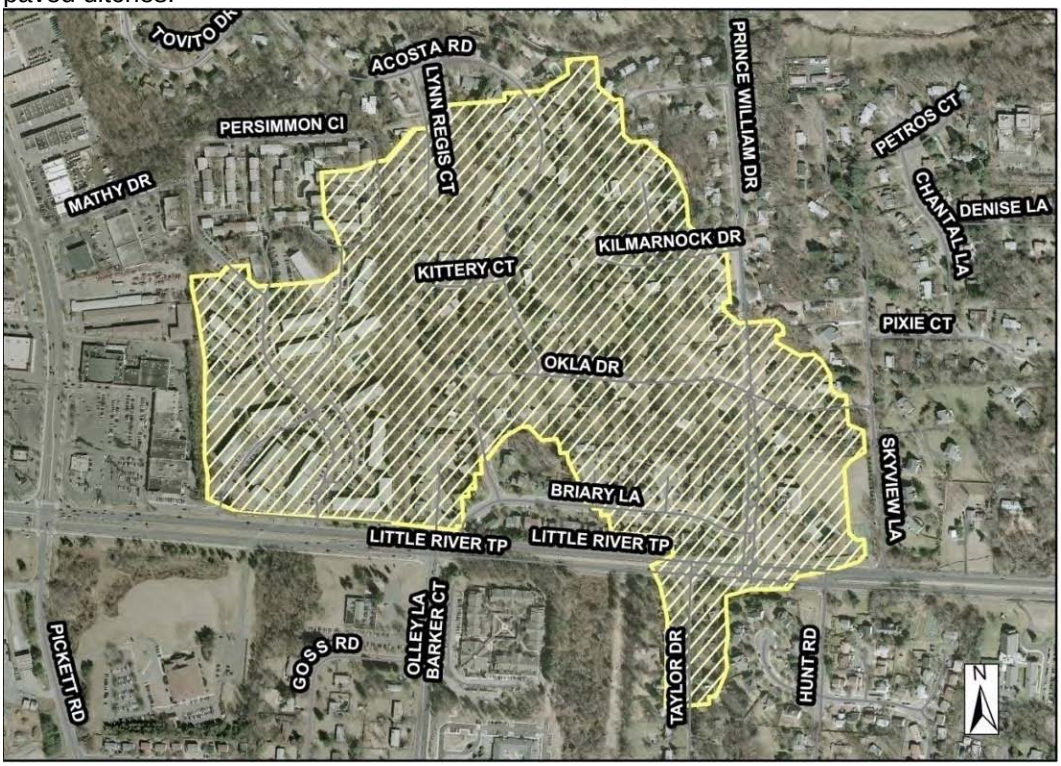
Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	12	EA	$10,000.00	$120,000
Rain Garden	400	SY	$50.00	$19,980
			Initial Project Cost	**$139,980**
Plantings	1	LS	5% of project	$6,999
Ancillary Items	1	LS	5% of project	$6,999
Erosion and Sediment Control	1	LS	10% of project	$13,998
			Base Construction Cost	**$167,976**
			Mobilization (5%)	$8,399
			Subtotal 1	$176,375
			Contingency (25%)	$44,094
			Subtotal 2	$220,469
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits			(45%)	$99,211
			Estimated Project Cost	**$320,000**

AC9312 Area-Wide Drainage Improvement

Address:	Various
Location:	Within the Westchester and Briars of Westchester Neighborhoods
Land Owner:	Private - Residential
PIN:	
Control Type	Water Quality
Drainage Area	85 acres
Receiving Waters	Unknown tributary of Crook Branch

Description: This is a low and medium density residential neighborhood downstream of dry pond 0200DP. This project is located in a headwater subwatershed and would improve the water quality of the runoff after it runs through the dry pond and before it enters Crook Branch. Tree Box Filters will be installed at various inlets, rain gardens will be installed at yard inlets and vegetated swales will be installed in place of the paved ditches.



Project Area Map

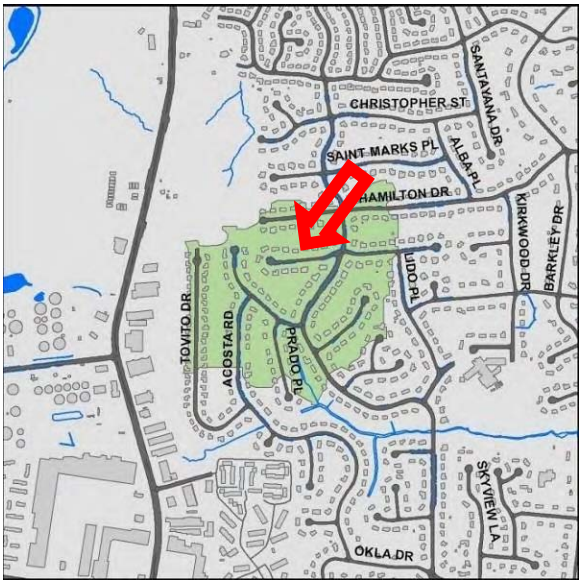
Project Benefits: This project will provide water quality treatment of stormwater runoff. The amount of nutrients, suspended solids, and other harmful pollutants will be reduced before reaching stream, thus improving in-stream habitat. There will also be some improvement in peak flow attenuation due to increased infiltration and removal of the paved ditches.

Project Design Considerations: There are no environmental constraints as the disturbance will be limited to the area immediately around existing storm drains. Projects located on private property need to be coordinated with and approved by the property owner. Easements will be required for any work on private property, such as the rain gardens, to allow for installation (including concrete channel removal) and maintenance.

Costs:

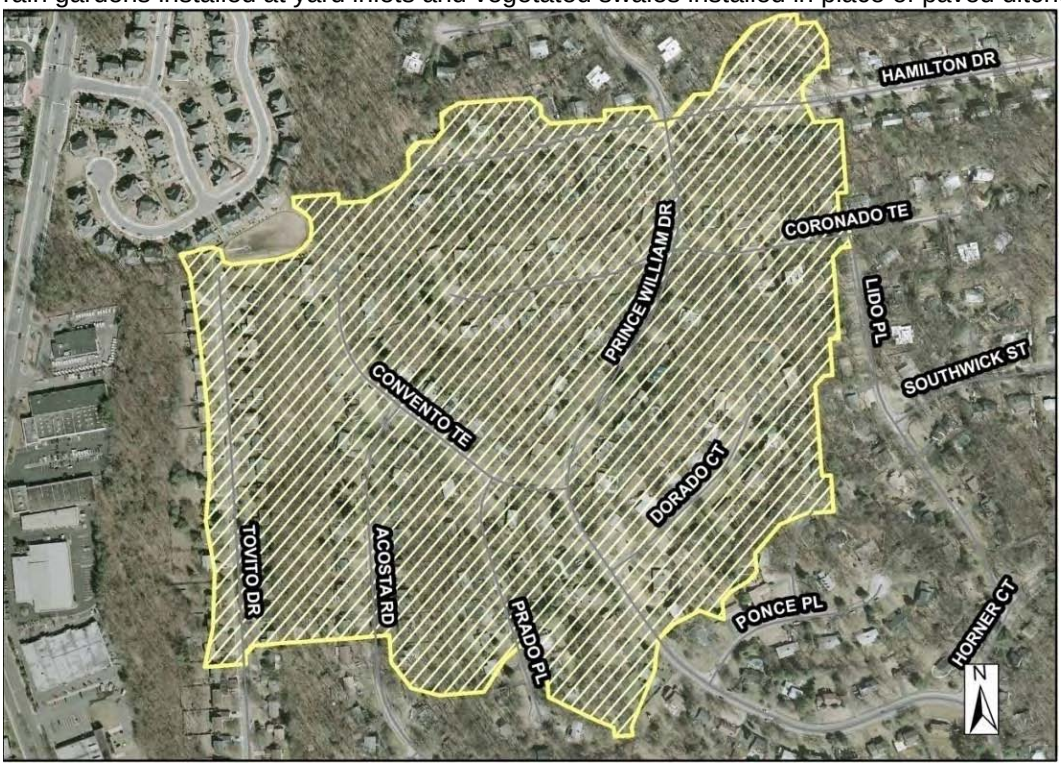
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	24	EA	$10,000.00	$240,000
Vegetated Swale	3906	SY	$50.00	$195,305
Rain Garden	755	SY	$50.00	$37,740
			Initial Project Cost	**$473,045**
Plantings	1	LS	5% of project	$23,652
Ancillary Items	1	LS	5% of project	$23,652
Erosion and Sediment Control	1	LS	10% of project	$47,305
			Base Construction Cost	**$567,654**
			Mobilization (5%)	$28,383
			Subtotal 1	$596,037
			Contingency (25%)	$149,009
			Subtotal 2	$745,046
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)				$335,271
			Estimated Project Cost	**$1,080,000**

AC9313 Area-Wide Drainage Improvement



Address:	Various
Location:	Within the Langhorne Acres Neighborhood
Land Owner:	Private - Residential
PIN:	
Control Type	Water Quality
Drainage Area	80 acres
Receiving Waters	Unknown tributary of Crook Branch

Description: This is a low and medium density residential neighborhood with no stormwater management facilities. This headwater subwatershed is an ideal location impliment runoff treatment to improve the water quality before it enters Crook Branch. Treatment includes Tree Box Filters installed at various inlets, rain gardens installed at yard inlets and vegetated swales installed in place of paved ditches.



Project Area Map

Project Benefits: This project will provide water quality treatment of stormwater runoff. The amount of nutrients, suspended solids, and other harmful pollutants will be reduced before reaching stream, thus improving in-stream habitat. There will also be a small amount of improvement in peak flow attenuation due to increased infiltration and removal of the paved ditches.

Project Design Considerations: There are no environmental constraints anticipated as the disturbance will be limited to immediately around the project. Projects located on private property need to be coordinated with and approved by the property owner. An easement will be required for projects on private property.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Tree Box Filters	21	EA	$10,000.00	$210,000
Vegetated Swale	7748	SY	$50.00	$387,390
Rain Garden	844	SY	$50.00	$42,180
			Initial Project Cost	**$639,570**
Plantings	1	LS	5% of project	$31,979
Ancillary Items	1	LS	5% of project	$31,979
Erosion and Sediment Control	1	LS	10% of project	$63,957
			Base Construction Cost	**$767,485**
			Mobilization (5%)	$38,374
			Subtotal 1	$805,859
			Contingency (25%)	$201,465
			Subtotal 2	$1,007,324
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits			(45%)	$453,296
			Estimated Project Cost	**$1,461,000**