5.0 WMA Area Restoration Strategies for Nichol Run and Pond Branch Watershed

Section 5.0 provides descriptions of the restoration strategies proposed for the Nichol Run and Pond Branch watersheds. Restoration strategies were chosen based on needs of each WMA.

A majority of the Nichol Run watershed is rural. The majority of open space is located along the stream corridors and along the northern edge of the watershed. The central and southern portion of the watershed contains mostly estate and low density residential land uses. The expected changes in land use show decreases in open space and increases in estate residential land uses.

There are 16 existing stormwater facilities located in the Nichol Run watershed. Approximately 86 percent of Nichol Run watershed is not treated by an existing stormwater facility. This large area of the Nichol Run watershed that lacks existing stormwater controls indicates the need for new watershed management projects.

A majority of the Pond Branch watershed is also rural. The majority of open space is located along stream corridors and along the northeastern edge of the watershed. The central and southwestern portion of the watershed contains mostly estate and low density residential land uses. A golf course is located near the center of the watershed. As with Nichol Run, the expected changes in land use show decreases in open space and increases in estate residential land uses.

There are 22 existing stormwater facilities located in the Pond Branch watershed. Approximately 92 percent of the Pond Branch watershed is not treated by an existing stormwater facility. This large area of the Pond Branch watershed that lacks existing stormwater controls indicates the need for new watershed management projects.

5.1 Nichol Run Watershed WMAs

Each subsection of Section 5.1 includes a description of key WMA conditions, a description of proposed structural and non-structural projects in the WMA, a listing of 10-year and 25-year projects for the WMA and a map showing the types and locations of all 10-year and 25-year projects within the WMA. Each WMA in the Nichol Run watershed is described separately in alphabetical order. Additional project details, benefits, and design considerations for the projects in the 10-year implementation plan are included on the project fact sheets located in Section 5.3.

5.1.1 Jefferson WMA

Description of Key WMA Conditions

Approximately 17 percent of the Jefferson WMA consists of undeveloped open space. The expected changes in land use show a decrease in this open space and an increase in estate residential land uses. The development of green spaces causes greater volumes of stormwater run off and more intense peak flows. Loss of open space also leads to degraded wildlife habitat, increased pollutants in stormwater runoff and worsening stream conditions.

The Jefferson WMA contains 3 existing stormwater facilities. Approximately 81 percent of this WMA is not treated by an existing stormwater facility. According to the existing condition STEPL model results, the Jefferson WMA contributes approximately 20 percent of the total

suspended solids, 25 percent of the total nitrogen and 24 percent of the total phosphorus annual loads to the Nichol Run Watershed.

Jefferson WMA 10-Year Projects

The following structural project is designed to reduce stormwater runoff volumes, decrease peak flows, reduce pollutants in stormwater runoff, and improve overall habitat and stream quality in the Jefferson WMA.

NI9113 This culvert at Beach Mill Road is obstructed with debris, stream banks are eroding due to high energy storm flows through the culvert which may flood the road. Construct a micropool with an outlet structure upstream of the culvert in Beach Mill Road.

Jefferson WMA 25-Year Projects

The following structural projects are designed to reduce stormwater runoff volumes, decrease peak flows, reduce pollutants in stormwater runoff, and improve overall habitat and stream quality in the Jefferson WMA.

NI9107 Retrofit existing farm pond near Potowmack Street and Montpelier Road to provide storage and water quality benefits by installing an outlet structure and planting pond edges with emergent and riparian vegetation.

NI9109 Retrofit existing farm pond near Montpelier Road and Potowmack Street to provide storage and water quality benefits by installing an outlet structure and planting pond edges with emergent and riparian vegetation.

NI9112 Seneca Farms subdivision is in need of additional stormwater treatment. Install a naturalized extended detention dry pond within a small clearing in a natural drainage area.

NI9115 Retrofit existing dry pond near Elmview Place and Seneca Knoll Drive to enhanced extended detention dry pond with low marsh areas to provide additional water quality and quantity controls.

NI9300 Culvert under Rich Meadow Drive is clogged with sediment. Clear sediment from culvert and install rain garden to provide quality control and promote infiltration.

NI9301 Remove concrete obstruction in stream in Richland Meadows subdivision. Repair and stabilize stream erosion impacts and restore riparian buffer.

Jefferson WMA Non-Structural Projects

The following non-structural project is designed to improve water quality and wildlife habitat in areas with no existing stormwater management and no opportunity for new structural stormwater controls.

NI9900 Restore riparian buffer along stream in Potowmack Farm subdivision.

10-Year and 25-Year Project Information Tables for Jefferson WMA

Table 5.1 lists all structural and non-structural projects proposed in the Jefferson WMA. Project locations for all structural and non-structural projects are shown on Map 5.1.

Table 5.1 Project List – Jefferson WMA						
Structural Projects						
Project #	**Project Type**	**Subwatershed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
NI9113	Culvert Retrofit	NI-JB-0004	Near Beach Mill Road & Pipestem	Quality/ Quanity	County/ Private	0 - 10
NI9107	Stormwater Pond Retrofit	NI-JB-0003	Near Potowmack Street & Montpelier Road	Quality/ Quanity	Private	11 - 25
NI9109	Stormwater Pond Retrofit	NI-JB-0003	Near Montpelier Road & Potowmack Street	Quality/ Quanity	Private	11 - 25
NI9112	New Stormwater Pond	NI-JB-0003	Near Richland Grove Drive & Donmore Drive	Quality/ Quanity	Private	11 - 25
NI9115	Stormwater Pond Retrofit, BMP/LID	NI-JB-0005	Near Elmview Place & Seneca Knoll Drive	Quality/ Quanity	County/ Private	11 - 25
NI9300	Culvert Retrofit	NI-JB-0006	Near Rich Meadow Drive & Richland Valley Drive	Quality	Private	11 - 25
NI9301	Stream Restoration	NI-JB-0006	Richland Meadows Subdivision	Quality	Private	11 - 25
Non-Structural Projects						
Project #	**Project Type**	**Subwatershed**	**Location**	**Watershed Benefit**	**Land Owner**	
NI9900	Buffer Restoration	NI-JB-0002	Patowmack Farm	N/ A	Private	

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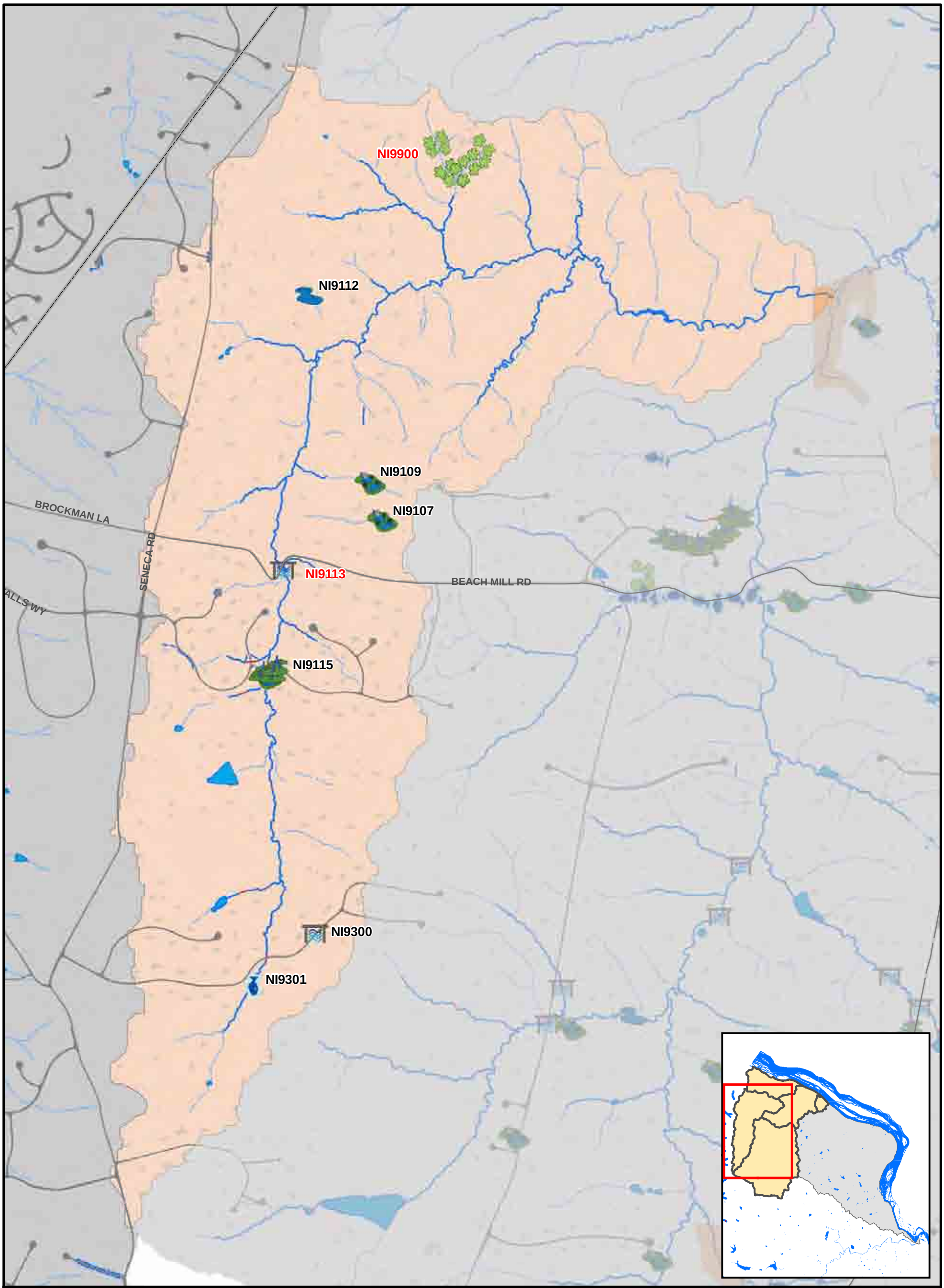

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- Buffer Restoration
- Stream Restoration
- BMP/LID
- Culvert Retrofit
- Dumpsite/Obstruction Removal
- New Stormwater Pond
- Outfall Improvement
- Stormwater Pond Retrofit
- Other
- Area-wide Drainage Improvement
- Community Outreach/Public Education
- Land Conservation Project
- Flood Protection/Mitigation
- Inspection/Enforcement Enhancement
- Rain Barrel Program
- Street Sweeping Program
- Studies, Surveys and Assessments

Implementation timeframe denoted by project label color. Red = 0-10 years Black = 11-25 years.

Map 5.1

WMA: Nichol - Jefferson
Proposed Projects

5.1.2 Lower Nichol WMA

Description of Key WMA Conditions

Approximately 48 percent of the Lower Nichol WMA consists of undeveloped open space. The expected changes in land use show a decrease in this open space and an increase in estate residential land uses. The development of green spaces causes greater volumes of stormwater run off and more intense peak flows. Loss of open space also leads to degraded wildlife habitat, increased pollutants in stormwater runoff and worsening stream conditions.

The Lower Nichol WMA contains 2 existing stormwater facilities. Approximately 79 percent of this WMA is not treated by an existing stormwater facility. According to the existing condition STEPL model results, the Lower Nichol WMA contributes approximately 17 percent of the total suspended solids, 12 percent of the total nitrogen and 13 percent of the total phosphorus annual loads to the Nichol Run Watershed.

Lower Nichol WMA 10-Year Projects

The following structural project is designed to reduce stormwater runoff volumes, decrease peak flows, reduce pollutants in stormwater runoff and improve overall habitat and stream quality in the Lower Nichol WMA.

NI9101 The area near Jefferson Run Road does not have existing stormwater treatment or controls. Improve existing wet pond (WP0200) by installing an outlet structure to increase capacity. Repair overflow spillway to prevent breach, vegetate sides of the pond and improve wetlands.

Lower Nichol WMA 25-Year Projects

The following structural projects are designed to reduce stormwater runoff volumes, decrease peak flows, reduce pollutants in stormwater runoff and improve overall habitat and stream quality in the Lower Nichol WMA.

NI9100 Expand existing natural wetland area near High Hill Court and Falcon Ridge Road and stabilize and vegetate eroded channel.

NI9102 This area does not have existing stormwater treatment or controls. Improve existing non-stormwater farm pond to a constructed wetland and install an outlet structure. Inspect the dam for seepage/breach and repair. Repair downstream streambank erosion.

NI9103 Retrofit existing wet pond near Springvale Road and Allenwood Lane to provide additional storage and water quality benefits by installing an outlet structure and planting pond edges with emergent and riparian vegetation.

NI9200 The dam of a former in-line farm pond in Great Falls Hills subivision was breached and the pond was washed out causing erosion and headcuts to the channel downstream. Repair head-cut and stabilize stream banks.

NI9500 The Beach Mill Downs subdivision is in need of stormwater controls. Intstall terraced rain garden on steep slopes near Patowmack Drive cul-de-sac and retrofit road-side swales to bioretention to improve water quality and promote infiltration.

Lower Nichol WMA Non-Structural Projects

The following non-structural project is designed to improve water quality and wildlife habitat in areas with no existing stormwater management and no opportunity for new structural stormwater controls.

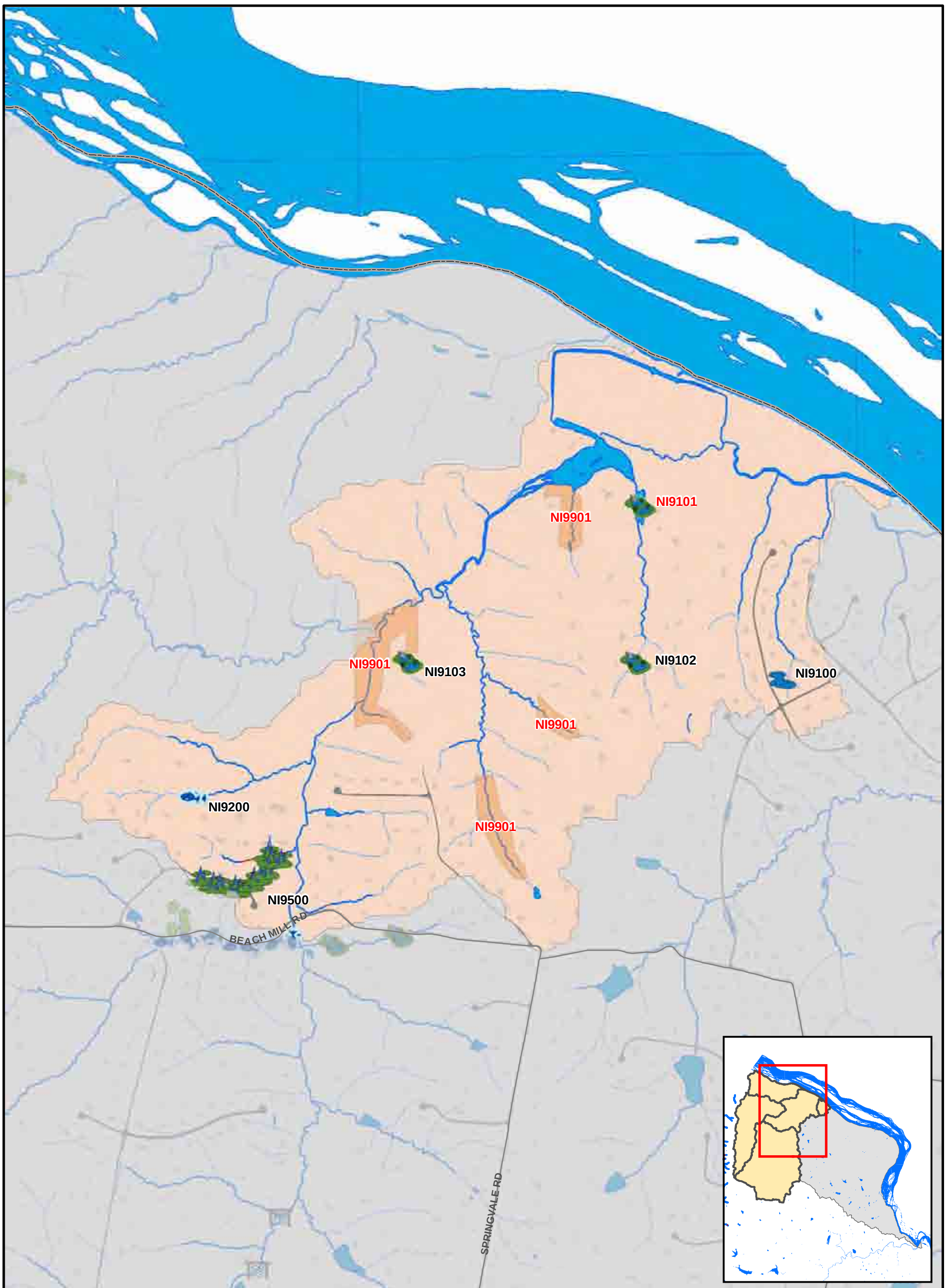
NI9901 Preserve open space and riparian buffers with conservation easement throughout lower reaches of Nichol Run.

10-Year and 25-Year Project Information Tables for Lower Nichol WMA

Table 5.2 lists all structural and non-structural projects proposed in the Lower Nichol WMA. Project locations for all structural and non-structural projects are shown on Map 5.2.

Table 5.2
Project List – Lower Nichol WMA

Structural Projects						
Project #	**Project Type**	**Subwatershed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
NI9101	Stormwater Pond Retrofit	NI-NI-0002	Near the end of Jefferson Run Road	Quality/ Quanity	Private	0 - 10
NI9100	New Stormwater Pond	NI-NI-0001	Near High Hill Court & Falcon Ridge Road	Quality	Private	11 - 25
NI9102	Stormwater Pond Retrofit	NI-NI-0002	Southdown Subdivision	Quality	Private	11 - 25
NI9103	Stormwater Pond Retrofit	NI-NI-0002	Near Springvale Road & Allenwood Lane	Quality/ Quanity	Private	11 - 25
NI9200	Stream Restoration	NI-NI-0004	Great Falls Hills Subdivision	Quality	Private	11 - 25
NI9500	BMP/LID	NI-NI-0004	Near Patowmack Drive cul-de-sac	Quality	County/ Private	11 - 25
Non-Structural Projects						
Project #	**Project Type**	**Subwatershed**	**Location**	**Watershed Benefit**	**Land Owner**	
NI9901	Conservation	NI-NI-0002	Riparian Areas in Lower Reaches of Nichol Run	N/ A	Private	



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Buffer Restoration
Stream Restoration
BMP/LID
Culvert Retrofit
Dumpsite/Obstruction Removal

New Stormwater Pond
Outfall Improvement
Stormwater Pond Retrofit
Other

Area-wide Drainage Improvement
Community Outreach/Public Education
Land Conservation Project
Flood Protection/Mitigation
Inspection/Enforcement Enhancement
Rain Barrel Program
Street Sweeping Program
Studies, Surveys and Assessments

Implementation timeframe denoted by project label color. Red = 0-10 years Black = 11-25 years.

Map 5.2

WMA: Nichol - Lower
Proposed Projects

5.1.3 Potomac (Nichol) WMA

Description of Key WMA Conditions

Approximately 82 percent of the Potomac WMA consists of undeveloped open space. The expected changes in land use show a decrease in this open space and an increase in estate residential land uses. The development of green spaces causes greater volumes of stormwater run off and more intense peak flows. Loss of open space also leads to degraded wildlife habitat, increased pollutants in stormwater runoff and worsening stream conditions.

The Potomac WMA does not contain any existing stormwater facilities, and therefore has no stormwater treatment. According to the existing condition STEPL model results, the Potomac WMA contributes approximately 20 percent of the total suspended solids, seven percent of the total nitrogen and nine percent of the total phosphorus annual loads to the Nichol Run Watershed.

There are no projects proposed in Potomac (Nichol) WMA. The majority of land area within this WMA is protected as park land.

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5.1.4 Upper Nichol WMA

Description of Key WMA Conditions

Approximately 11 percent of the Upper Nichol WMA consists of undeveloped open space. The expected changes in land use show a decrease in this open space and increases in estate residential land uses. The development of green spaces causes greater volumes of stormwater run off and more intense peak flows. Loss of open space also leads to degraded wildlife habitat, increased pollutants in stormwater runoff and worsening stream conditions.

The Upper Nichol WMA contains 11 existing stormwater facilities. Approximately 79 percent of this WMA is not treated by an existing stormwater facility. According to the existing condition STEPL model results, the Upper Nichol WMA contributes approximately 43 percent of the total suspended solids, 56 percent of the total nitrogen and 53 percent of the total phosphorus annual loads to the Nichol Run Watershed.

Upper Nichol WMA 10-Year Projects

The following structural projects are designed to reduce stormwater runoff volumes, decrease peak flows, reduce pollutants in stormwater runoff and improve overall habitat and stream quality in the Upper Nichol WMA.

NI9106 Finger Lakes Estates does not have any stormwater treatment. Improve two existing non-stormwater ponds to wet retention ponds; naturalize existing swales directing water to ponds and construct rain gardens at the swale outlets.

NI9111 Patrician Woods is in need of additional stormwater treatment. Improve existing dry pond (1412DP) to an enhanced extended detention dry pond including removal of concrete trickle ditch, introduction of wetland vegetation and new outlet structure.

NI9118 Dogwood Farm subdivision is in need of water quality treatment. Retrofit existing dry pond (0857DP) to enhanced extended detention dry pond with low marsh areas and replace concrete trickle ditches within and draining to the pond with vegetated swales.

NI9119 Falls Point and Forestville Estates are in need of additional water quality treatment. Improve existing dry pond (0797DP) to enhanced extended detention dry pond with low marsh areas. Repair eroded streambanks and restore riparian buffers upstream.

NI9201 The lower portion of Harkney Branch is trying to lengthen and is actively eroding meanders, threatening Beach Mill Road between Utterbach Store Road and its confluence with Nichol Run. Install cross vanes and J-hooks to direct stream energy away from Beach Mill Road.

NI9202 Nichol Run streambanks are eroded downstream of a culvert and driveway bridge. Install plunge pool below culvert and replace driveway bridge at 732 Springvale Road. Construct new stream channels with step pools and access to floodplain.

NI9401 Sediment is collecting upstream of a culvert on Springvale Road. Construct a micropool with outlet structure upstream of the culvert and encourage wetland vegetation growth.

Upper Nichol WMA 25-Year Projects

The following structural projects are designed to reduce stormwater runoff volumes, decrease peak flows, reduce pollutants in stormwater runoff and improve overall habitat and stream quality in the Upper Nichol WMA.

NI9104 Retrofit existing farm pond near Beach Mill Road and Springvale Road to constructed wetland with proper outlet structure, repair eroded spillway and stabilize downstream erosion impacts.

NI9105 Retrofit existing farm pond Near Beach Mill Road and Springvale Road to provide storage and water quality benefits by installing an outlet structure and planting pond edges with emergent and riparian vegetation.

NI9108 The area around Mulmary subdivision is in need of additional stormwater treatment. Construct new naturalized extended detention dry basin above culvert to provide quantity and quality stormwater controls.

NI9110 Erosive impacts are occurring on and downstream of gravel drive off of Creamcup Lane. Retrofit existing pond above drive to a micropool with outlet structure to improve quality and reduce erosion. Stabilize erosion impacts downstream and repair gravel drive.

NI9116 Retrofit existing dry pond near Woodland Falls Drive cul-de-sac with improved outlet structure for extended detention and continue to allow pond to naturalize.

NI9117 Retrofit existing dry pond near Green Branch Court and Utterback Store Road with improved outlet structure, removal of concrete channel and natural vegetation to provide additional water quality and water quantity controls.

NI9120 Retrofit existing dry pond near Farm Road and Utterback Store Road with improved outlet structure and natural vegetation to provide additional water quality and water quantity controls. Naturalize swale below pond to promote infiltration and improve water quality.

NI9400 Culvert under unnamed road off of Springvale Road is clogged and damaged. Clean out and repair or replace culvert.

NI9402 Culvert under Fawn Drive is clogged with debris and too small to properly convey water through the culvert during storm events. Increase culvert size, create engineered plunge pool at outfall and create micropool with outlet structure upstream.

NI9403 Stream is incised and culvert below unnamed road off of Utterback Store Road is too small to properly convey water throughout the culvert during storm events. Increase culvert size and install second, higher, floodplain culvert on the east side of the main culvert to help develop floodplain. Regrade stream banks above and below culvert to create a new floodplain bench.

NI9404 The area around Running Brook Estates and Beckmans Hills subdivisions is in need of additional stormwater control and improved road crossings. Install plunge pool downstream of culvert on Wolfe Hill Lane. Install micropool above culvert on Utterback Store Road. Retrofit existing farm pond to a wet retention pond with proper outlet structure and improved vegetation to provide water quality and water quantity

treatment.

NI9405 Springvale Knolls Subdivision is in need of additional water quality controls. Install rain garden at the end of the existing swale along Down Patrick Road and naturalize swale to provide water quality control and promote infiltration.

Upper Nichol WMA Non-Structural Projects

The following non-structural project is designed to improve water quality and wildlife habitat in areas with no existing stormwater management and no opportunity for new structural stormwater controls.

NI9902 Stop mowing gas line easement between Patowmack Drive & Beach Mill Road and naturalize to wildflower meadow. Preserve open space and riparian buffers with conservation easement on two headwater reaches of Nichol Run.

10-Year and 25-Year Project Information Tables for Upper Nichol WMA

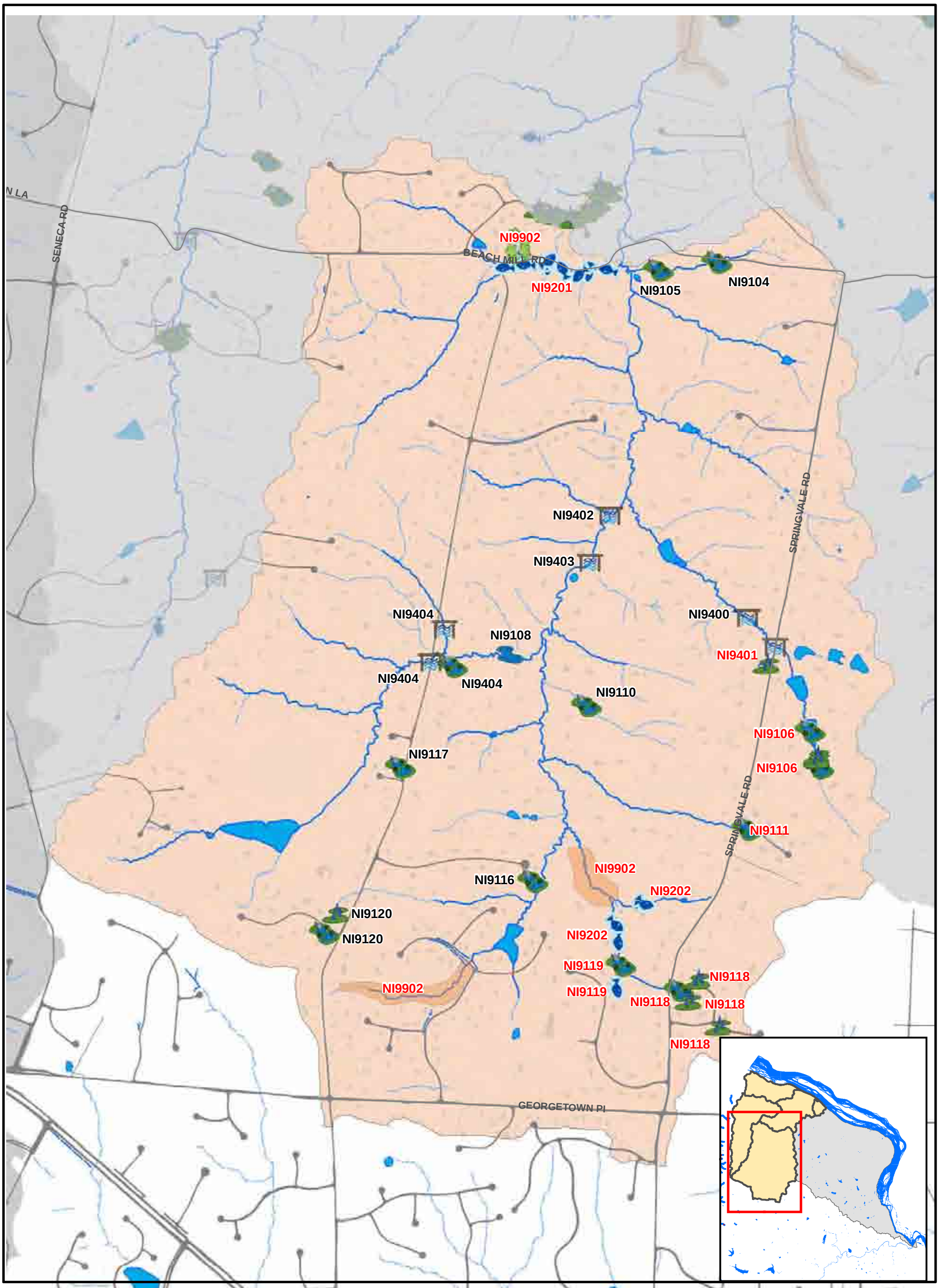
Table 5.3 lists all structural and non-structural projects proposed in the Upper Nichol WMA. Project locations for all structural and non-structural projects are shown on Map 5.3.

Table 5.3
Project List – Upper Nichol WMA

Structural Projects

Project #	Project Type	Subwatershed	Location	Watershed Benefit	Land Owner	Phase
NI9106	Stormwater Pond Retrofit, BMP/LID	NI-NI-0009	Finger Lakes Estates Subdivision	Quality/ Quanity	County/ Private	0 - 10
NI9111	Stormwater Pond Retrofit	NI-NI-0014	Patrician Woods Subdivision, Patrician Woods Court & Springvale Road	Quality/ Quanity	County	0 - 10
NI9118	Stormwater Pond Retrofit, BMP/LID	NI-NI-0015	Dogwood Farm Section 2 Subdivision	Quality/ Quanity	County/ Private	0 - 10
NI9119	Stormwater Pond Retrofit, Stream Restoration	NI-NI-0015	Near Falls Pointe Drive cul-de-sac	Quality/ Quanity	County	0 - 10
NI9201	Stream Restoration	NI-HB-0001	Woodleaf Subdivision	Quality	County/ Private	0 - 10
NI9202	Stream Restoration	NI-NI-0015	Spring Valley Woods Subdivision	Quality	Private	0 - 10
NI9401	Culvert Retrofit	NI-NI-0009	Down Patrick Farms Subdivision	Quality/ Quanity	Private	0 - 10
NI9104	Stormwater Pond Retrofit	NI-NI-0005	Near Beach Mill Road & Springvale Road	Quality/ Quanity	Private	11 - 25
NI9105	Stormwater Pond Retrofit	NI-NI-0005	Near Beach Mill Road & Springvale Road	Quality/ Quanity	Private	11 - 25
NI9108	New Stormwater Pond	NI-NI-0010	Mulmary Subdivision	Quality/ Quanity	Private	11 - 25
NI9110	Stormwater Pond Retrofit	NI-NI-0013	Near Creamcup Lane cul-de-sac	Quality/ Quanity	Private	11 - 25

Table 5.3 Project List – Upper Nichol WMA						
Structural Projects						
Project #	**Project Type**	**Subwatershed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
NI9116	Stormwater Pond Retrofit	NI-NI-0016	Near Woodland Falls Drive cul-de-sac	Quality/ Quanity	County	11 - 25
NI9117	Stormwater Pond Retrofit	NI-NI-0013	Green Branch Court & Utterback Store Road	Quality/ Quanity	Private	11 - 25
NI9120	Stormwater Pond Retrofit, BMP/LID	NI-NI-0016	Near Farm Road & Utterback Store Road	Quality/ Quanity	County/ Private	11 - 25
NI9400	Culvert Retrofit	NI-NI-0008	Springvale Knolls Subdivision	N/ A	County/ Private	11 - 25
NI9402	Culvert Retrofit	NI-NI-0007	Martin Redmon Subdivision	Quality/ Quanity	County/ Private	11 - 25
NI9403	Culvert Retrofit	NI-NI-0007	Ross F. Rogers Subdivision	Quality	County/ Private	11 - 25
NI9404	Stormwater Pond Retrofit, Culvert Retrofit	NI-NI-0010	Near Utterback Store Road & Wolfe Hill Lane	Quality/ Quanity	County/ Private	11 - 25
NI9405	BMP/LID	NI-NI-0008	Springvale Knolls Subdivision	Quality	County/ Private	11 - 25
Non-Structural Projects						
Project #	**Project Type**	**Subwatershed**	**Location**	**Watershed Benefit**	**Land Owner**	
NI9902	Buffer Restoration, Conservation	NI-HB-0001	Gas Line Eeasement between Patowmack Drive & Beach Mill Road	N/ A	Private	



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- Buffer Restoration
- Stream Restoration
- BMP/LID
- Culvert Retrofit
- Dumpsite/Obstruction Removal
- New Stormwater Pond
- Outfall Improvement
- Stormwater Pond Retrofit
- Other
- Area-wide Drainage Improvement
- Community Outreach/Public Education
- Land Conservation Project
- Flood Protection/Mitigation
- Inspection/Enforcement Enhancement
- Rain Barrel Program
- Street Sweeping Program
- Studies, Surveys and Assessments

Implementation timeframe denoted by project label color. Red = 0-10 years Black = 11-25 years.

Map 5.3

WMA: Nichol - Upper
Proposed Projects

5.2 Pond Branch Watershed WMAs

Each subsection of Section 5.2 includes a description of key WMA conditions, a description of proposed structural and non-structural projects in the WMA, a listing of 10-year and 25-year projects for the WMA and a map showing the types and locations of all 10-year and 25-year projects within the WMA. Each WMA in the Pond Branch watershed is described separately in alphabetical order. Additional project details, benefits and design considerations for the projects in the 10-year implementation plan are included on the project fact sheets located in Section 5.3.

5.2.1 Clark WMA

Description of Key WMA Conditions

Approximately 13 percent of the Clark WMA consists of undeveloped open space. The expected changes in land use show a decrease in this open space and an increase in estate residential land uses. The development of green spaces causes greater volumes of stormwater run off and more intense peak flows. Loss of open space also leads to degraded wildlife habitat, increased pollutants in stormwater runoff and worsening stream conditions.

The Clark WMA contains 7 existing stormwater facilities. Approximately 88 percent of this WMA is not treated by an existing stormwater facility. According to the existing condition STEPL model results, the Clark WMA contributes approximately 28 percent of the total suspended solids, 34 percent of the total nitrogen and 34 percent of the total phosphorus annual loads to the Pond Branch Watershed.

Clark WMA 10-Year Projects

The following structural projects are designed to reduce stormwater runoff volumes, decrease peak flows, reduce pollutants in stormwater runoff and improve overall habitat and stream quality in the Clark WMA.

PN9100 Riverside Manor does not have any stormwater treatment. Install a new naturalized extended detention basin in existing depression with mature trees. Replace concrete trickle ditch and grass swale along Chesapeake Drive with vegetated swales.

PN9101 Eaton Park subdivision has no existing stormwater treatment. Install a new constructed wetland to capture drainage from Eaton Court and Eaton Park Road.

PN9102 The area around River Bend Road and Oak Falls Court has no existing stormwater treatment. Retrofit breached farm pond to a new constructed wetland. Repair earthen dam, install outlet structure and vegetate with wetland plants.

PN9103 Fitz Folly Farms is in need of additional water quality treatment. Construct enhanced extended detention dry pond in empty lot and terraced rain gardens on steeper slopes. Intercept overland flow and stabilize overland and in-stream erosion impacts.

PN9104 Golden Woods and Crampton subdivisions are in need of additional water quality treatment. Enlarge and retrofit dry pond (0649DP) to enhanced extended detention dry pond with low marsh areas. Replace concrete swale with vegetated swale and check dams.

PN9105 The Morrison Estate is in need of additional water quality treatment. Retrofit existing dry pond (0677DP) to enhanced extended detention dry pond with low marsh areas. Install rain gardens in two natural drainage areas.

PN9126 A culvert under Walker Road is collapsed or completely blocked with sediment. Replace road culvert and retrofit upstream pond to a wet retention pond to provide storage and water quality treatment for Squire's Haven subdivision.

PN9127 Riverbend Estates and Dogwood Hills are in need of water quality treatment. Retrofit two dry ponds to enhanced extended detention dry ponds. Install rain garden around existing inlet. Daylight storm sewer and install vegetated swale with check dams.

PN9400 Culvert at Potomac Forest Drive is clogging with debris and causing severe erosion downstream. Install micropool with control structure to reduce clogging upstream; install energy dissipation and stabilize stream banks downstream.

PN9408 Stream is eroded below a shared driveway culvert. Construct micropool above culvert; replace culvert and direct pipe toward new stream channel. Relocate stream channel below culvert away from steep bank; stabilize banks with boulder toe and live stakes.

Clark WMA 25-Year Projects

The following structural projects are designed to reduce stormwater runoff volumes, decrease peak flows, reduce pollutants in stormwater runoff and improve overall habitat and stream quality in the Clark WMA.

PN9125 Flooding is overtopping road. Improve existing farm pond (FM0029) to a stormwater wet pond, lower water level, install outlet structure and aeration, and improve riparian buffer. Replace culvert, raise road bed and stabilize streambanks.

PN9401 Construct micropool with outlet structure above culvert at Carrwood Road.

PN9402 Potomac Ridge Road is threatened by an inadequate culvert and resulting stream erosion. Install micropool above culvert, repair damaged culvert and repair stream erosion downstream.

PN9405 Improve culvert at Forest Brook Lane by constructing a micropool with outlet structure above culvert to provide water quality and water quantity controls.

PN9406 Streambanks are eroded downstream of the culvert. Retrofit culvert with control structure to create micro-pool. Repair and stabilize eroded streambanks. Replace concrete trickle ditches with vegetated swales with check dams.

Clark WMA Non-Structural Projects

The following non-structural projects are designed to reduce stormwater flow volume and decrease peak flows in areas with no existing stormwater management and no opportunity for new structural stormwater controls.

PN9902 Preserve open space and riparian buffers with conservation easement on lower reaches of Clarks Branch. Restore degraded riparian buffers along Clarks Branch.

PN9903 Targeted Rain Barrel and Homeowner Education Programs at the Beach Mill Farms Subdivision, Club View Ridge Subdivision, Eagon Hills Subdivision, Dogwood Hills Subdivision, Riverbend Estates Subdivision, Walker Hill Estates Subdivision, Arnon Meadow Subdivision and along Club View Drive.

10-Year and 25-Year Project Information Tables for Clark WMA

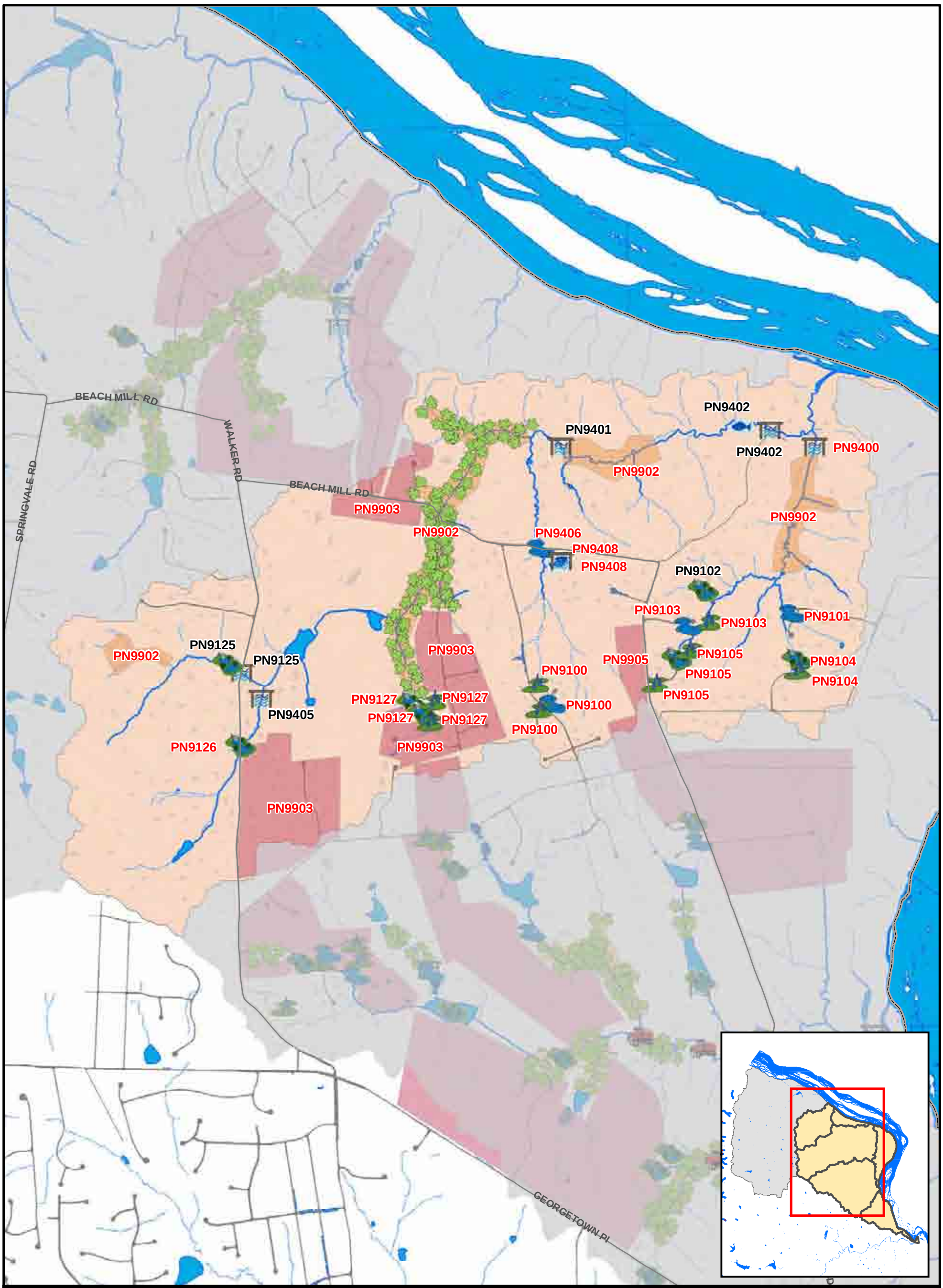
Table 5.4 lists all structural and non-structural projects proposed in the Clark WMA. Project locations for all structural and non-structural projects are shown on Map 5.4.

Table 5.4
Project List – Clark WMA

Structural Projects

Project #	Project Type	Subwatershed	Location	Watershed Benefit	Land Owner	Phase
PN9100	New Stormwater Pond, BMP/LID	PN-CL-0004	Riverside Manor Subdivision	Quality/ Quanity	County/ Private	0 - 10
PN9101	New Stormwater Pond	PN-CL-0003	Eaton Court & Eaton Park Road	Quality	Private	0 - 10
PN9102	Stormwater Pond Retrofit	PN-CL-0003	Near River Bend Road & Oak Falls Court	Quality	Private	0 - 10
PN9103	New Stormwater Pond, BMP/LID, Stream Restoration	PN-CL-0003	Fitz Folly Farms Subdivision	Quality/ Quanity	County/ Private	0 - 10
PN9104	Stormwater Pond Retrofit, BMP/LID	PN-CL-0003	Golden Woods Subdivision	Quality/ Quanity	County	0 - 10
PN9105	Stormwater Pond Retrofit, BMP/LID	PN-CL-0003	Morison Estate Subdivision	Quality/ Quanity	County/ Private	0 - 10
PN9126	Stormwater Pond Retrofit	PN-CL-0008	Squire's Haven Section 2 Subdivision	Quality/ Quanity	Private	0 - 10
PN9127	Stormwater Pond Retrofit, BMP/LID	PN-CL-0006	Eagon Hills & River Bend Estates Subdivision	Quality/ Quanity	County/ Private	0 - 10
PN9400	Culvert Retrofit	PN-CL-0002	Potomac Forest Subdivision	Quality/ Quanity	County/ Private	0 - 10
PN9408	Stream Restoration	PN-CL-0004	Fitz Folly Farms Subdivision & Riverside Manor Subdivision	Quality/ Quanity	Private	0 - 10
PN9125	Stormwater Pond Retrofit, Culvert Retrofit	PN-CL-0009	Near Walker Road & Forest Brook Lane	Quality/ Quanity	Private	11 - 25
PN9401	Culvert Retrofit	PN-CL-0001	Near Carrwood Road & Bell Drive	Quality/ Quanity	County/ Private	11 - 25

Table 5.4 Project List – Clark WMA						
Structural Projects						
Project #	**Project Type**	**Subwatershed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
PN9402	Stream Restoration, Culvert Retrofit	PN-CL-0001	Near Potomac Ridge Road & Potomac Forest Drive	Quality/ Quanity	County/ Private	11 - 25
PN9405	Culvert Retrofit	PN-CL-0008	Near Walker Road & Forest Brook Lane	Quality/ Quanity	County/ Private	11 - 25
PN9406	New Stormwater Pond	PN-CL-0004	Riverside Manor Subdivision	Quality/ Quanity	County/ Private	11 - 25
Non-Structural Projects						
Project #	**Project Type**	**Subwatershed**	**Location**	**Watershed Benefit**	**Land Owner**	
PN9902	Conservation, Buffer Restoration	PN-CL-0001/ 02/05/09	Riparian Areas along Lower Reaches of Clarks Branch	Quality/ Quanity	Private	
PN9903	Rain Barrel Program	PN-CL-0005/ 06/08	Club View Ridge, Beach Mill Farms, Eagon Hills, Dogwood Hills, Riverbend Estates, Walker Hill Estates, & Arnon Meadow Subdivisions	Quality	Private	



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- Buffer Restoration
- Stream Restoration
- BMP/LID
- Culvert Retrofit
- Dumpsite/Obstruction Removal
- New Stormwater Pond
- Outfall Improvement
- Stormwater Pond Retrofit
- Other
- Area-wide Drainage Improvement
- Community Outreach/Public Education
- Land Conservation Project
- Flood Protection/Mitigation
- Inspection/Enforcement Enhancement
- Rain Barrel Program
- Street Sweeping Program
- Studies, Surveys and Assessments

Implementation timeframe denoted by project label color. Red = 0-10 years Black = 11-25 years.

Map 5.4

WMA: Pond - Clark
Proposed Projects

5.2.2 Mine Run WMA

Description of Key WMA Conditions

Approximately 18 percent of the Mine Run WMA consists of undeveloped open space. The expected changes in land use show a decrease in this open space and an increase in estate residential land uses. The development of green spaces causes greater volumes of stormwater run off and more intense peak flows. Loss of open space also leads to degraded wildlife habitat, increased pollutants in stormwater runoff and worsening stream conditions.

The Mine Run WMA contains 11 existing stormwater facilities. Approximately 96 percent of this WMA is not treated by an existing stormwater facility. According to the existing condition STEPL model results, the Mine Run WMA contributes approximately 26 percent of the total suspended solids, 34 percent of the total nitrogen and 32 percent of the total phosphorus annual loads to the Pond Branch Watershed.

Mine Run WMA 10-Year Projects

The following structural projects are designed to reduce stormwater runoff volumes, decrease peak flows, reduce pollutants in stormwater runoff, and improve overall habitat and stream quality in the Mine Run WMA.

PN9108 The area near the northern Deerfield Court cul-de-sac is in need of additional water quality treatment. Construct new enhanced extended detention dry pond. Replace rip-rap swale with vegetated infiltration trench and check dams and install a new rain garden upstream of driveway culvert.

PN9109 Retrofit an existing non-stormwater pond in Deerfield Pond Subdivision to wet retention pond with increased storage. Improve wetland vegetation above road culvert and add outlet structure to create a new constructed wetland. Install a rain garden around existing inlet on corner.

PN9110 Install a bioretention area behind the Great Falls Elementary School, along the lower end of the basketball courts. Install educational signage and institute educational programs.

PN9111 Retrofit existing non-stormwater wet pond (WP0209) located in the Marmota Farm Subdivision to wet retention pond by installing proper outlet structure, constructing sediment forebay in western inlet and lowering water level slightly to provide storage. Repair stream erosion above pond. Install a micropool upstream of road culvert and a constructed wetland below culvert.

PN9112 The area around the Rossmore Court cul-de-sac does not have existing stormwater treatment. Retrofit existing farm pond to a wet retention pond and enlarge pond for additional storage capacity. Restore riparian buffer around pond and upstream.

PN9113 Arnon Lake Subdivision does not have existing stormwater treatment. Install a new constructed wetland in a low clearing within the forested area adjacent to a private driveway.

PN9114 The Arnon Ridge area is in need of additional water quality treatment. Retrofit naturalized dry pond (0182DP) to enhanced extended detention dry pond by installing

outlet structure. Replace concrete and grass swales with vegetated swales and check dams.

PN9117 Expand existing dry pond (0303DP) to intercept drainage from Monalaine Court; retrofit to naturalized extended detention dry pond. Construct new naturalized extended detention basin in existing depression near Lagovista Ct. and daylight stormwater pipe from Riverbend Road.

PN9118 Retrofit existing farm pond (FM0002) near River Bend Road & Hidden Springs Road to wet retention pond; install outlet structure and lower water level for additional storage. Repair and stabilize erosion impacts to spillway and downstream channel and culvert at River Bend Road.

PN9119 Fallswood subdivision is in need of additional water quality treatment. Retrofit existing dry pond (1443DP) to naturalized extended detention dry pond with a new outlet structure and naturalized vegetation.

PN9120 This area of Cornwell Farm subdivision does not have existing stormwater treatment. Retrofit two existing ponds to wet retention ponds; install outlet structures and lower water levels for additional storage, plant emergent and riparian vegetation.

PN9122 Streambanks of the Mine Run Branch in the Jackson Hills Subdivision are incised and undercut. Re-grade and stabilize erosion impacts upstream of Riverbend Road. Retrofit nearby farm pond to wet retention pond to provide storage and water quality treatment for homes along Riverbend Road.

PN9124 This area of Jackson Hills does not have existing stormwater treatment. Retrofit existing pond to a wet retention pond; install outlet structure and lower the water level for additional storage, and plant emergent and riparian vegetation.

PN9200 A tributary of the Mine Run Branch in the Arnon Lake Subdivision is lengthening and eroding meanders. Re-construct stream channel to start meander below Arnon Chapel Road and lengthen stream more evenly to reduce potential for erosion at downstream tight meanders and sediment deposition in the downstream pond.

Mine Run WMA 25-Year Projects

The following structural projects are designed to reduce stormwater runoff volumes, decrease peak flows, reduce pollutants in stormwater runoff, and improve overall habitat and stream quality in the Mine Run WMA.

PN9121 Improve existing farm pond (FM0009) to stormwater wet pond, install outlet structure, lower water level, install aeration, and encourage wetland growth. Improve existing farm pond to constructed wetland, install outlet structure and wetland vegetation.

PN9404 Culvert at Old Dominion Drive is too small to properly convey stormwater flows. Increase culvert size and repair stream erosion above and below culvert using instream structures to direct the stream energy away from streambanks.

Mine Run WMA Non-Structural Projects

The following non-structural projects are designed to reduce stormwater flow volume and decrease peak flows in areas with no existing stormwater management and no opportunity for new structural stormwater controls.

PN9904 Preserve open space and riparian buffers with conservation easement along headwater reaches of Mine Run Branch. Restore degraded riparian buffers along Mine Run Branch throughout Mine Run watershed.

PN9905 Targeted Rain Barrel and Homeowner Education Programs at the Jackson Hills Subdivision, Cornwell Farm Subdivision, Weant Subdivision, Washington Great Falls Survey Subdivision, Great Falls Estates Sec. 2 Subdivision, Maria Avenue Subdivision, Deer Park Subdivision, Riverside Meadows Subdivision, Laylin Family Trust, Arnon Ridge Subdivision, Chamborley subdivision, John W. Hanes Jr. Gunnell Run Farm, Deerfield Pond Subdivision and Deerfield Farm Subdivision.
Educate homeowners regarding riparian buffers and landscaping in headwaters areas at the John W. Hanes Jr. Gunnell Run Farm, Deerfield Pond, and Deerfield Farm Subdivisions.

PN9906 Remove obstructions at SPA points PNMR5-2-O5, PNMR5-2-O8 to O10 and PNMR004-T002 in the Cornwell Farm Subdivision.

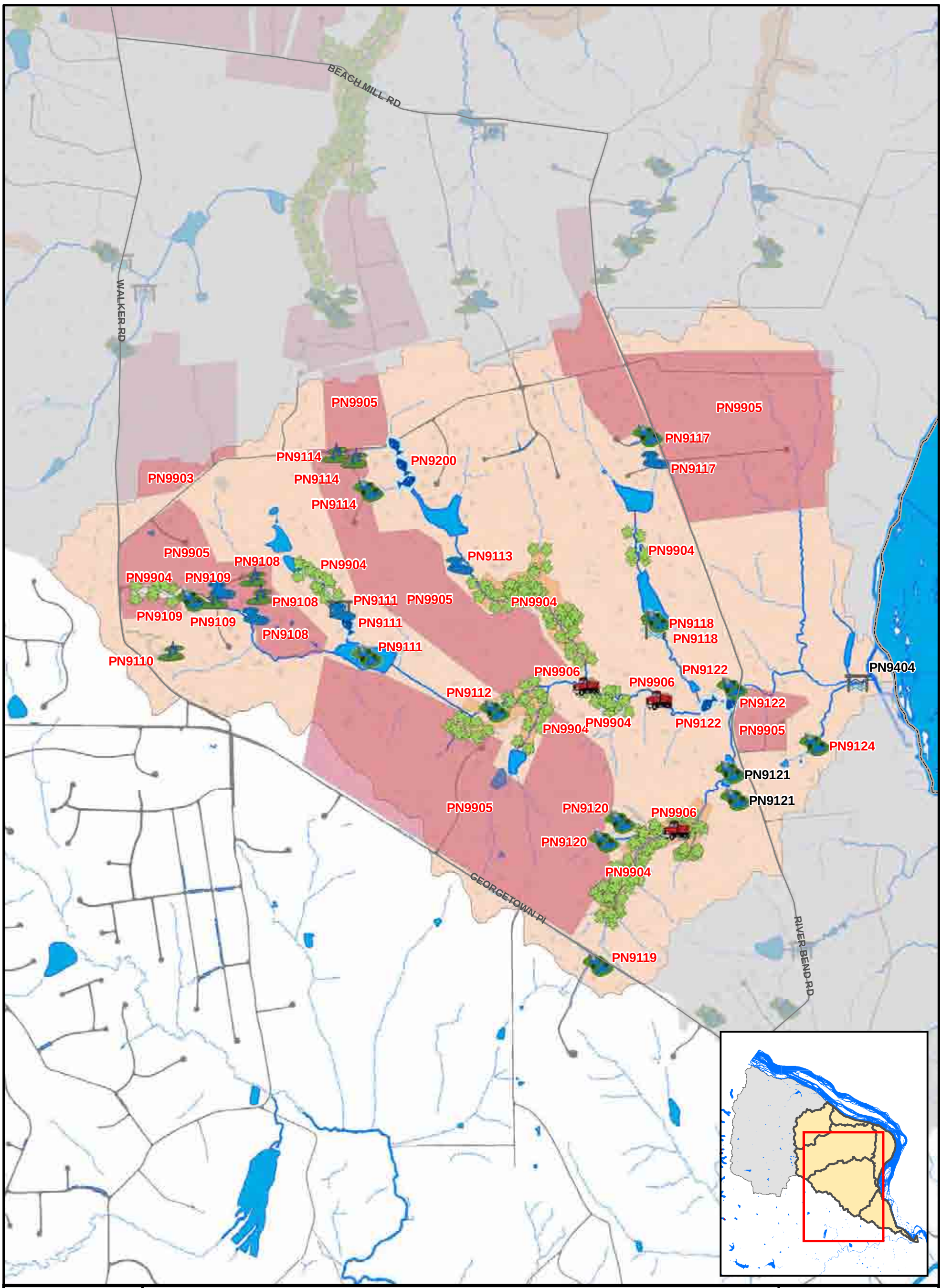
10-Year and 25-Year Project Information Tables for Mine Run WMA

Table 5.5 lists all structural and non-structural projects proposed in the Mine Run WMA. Project locations for all structural and non-structural projects are shown on Map 5.5.

Table 5.5
Project List – Mine Run WMA

Structural Projects						
Project #	**Project Type**	**Subwatershed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
PN9108	New Stormwater Pond, BMP/LID	PN-MR-0008	Near northern Deerfield Court cul-de-sac	Quality/ Quanity	County/ Private	0 - 10
PN9109	New Stormwater Pond, Stormwater Pond Retrofit, BMP/LID	PN-MR-0008	Deerfield Pond Subdivision	Quality/ Quanity	County/ Private	0 - 10
PN9110	BMP/LID, Education	PN-MR-0008	Great Falls Elementary School	Quality	County	0 - 10
PN9111	New Stormwater Pond, Stormwater Pond Retrofit, Culvert Retrofit, Stream Restoration	PN-MR-0008	Marmota Farm Subdivision	Quality/ Quanity	Private	0 - 10
PN9112	Stormwater Pond Retrofit	PN-MR-0007	Near Rossmore Court cul-de-sac	Quality/ Quanity	Private	0 - 10
PN9113	New Stormwater Pond	PN-MR-0006	Arnon Lake Subdivision	Quality	Private	0 - 10
PN9114	Stormwater Pond Retrofit, BMP/LID	PN-MR-0006	Arnon Ridge Subdivision	Quality/ Quanity	County/ Private	0 - 10
PN9117	New Stormwater Pond, Stormwater Pond Retrofit	PN-MR-0005	Monalaine Court & River Bend Road	Quality/ Quanity	County/ Private	0 - 10

Table 5.5 Project List – Mine Run WMA						
Structural Projects						
Project #	**Project Type**	**Subwatershed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
PN9118	Stormwater Pond Retrofit, Culvert Retrofit	PN-MR-0005	Near River Bend Road & Hidden Springs Road	Quality/ Quanity	Private	0 - 10
PN9119	Stormwater Pond Retrofit	PN-MR-0004	Fallswood Subdivision	Quality/ Quanity	County	0 - 10
PN9120	Stormwater Pond Retrofit	PN-MR-0004	Cornwell Farm Subdivision	Quality/ Quanity	Private	0 - 10
PN9122	Stormwater Pond Retrofit, Stream Restoration	PN-MR-0003	Jackson Hills Subdivision	Quality/ Quanity	Private	0 - 10
PN9124	Stormwater Pond Retrofit	PN-MR-0001	Jackson Hills Subdivision	Quality/ Quanity	Private	0 - 10
PN9200	Stream Restoration	PN-MR-0006	Arnon Lake Subdivision	Quality	Private	0 - 10
PN9121	Stormwater Pond Retrofit	PN-MR-0004	Jackson Hills Subdivision	Quality/ Quanity	Private	11 - 25
PN9404	Culvert Retrofit	PN-MR-0001	Great Falls Park	Quality	Federal	11 - 25
Non-Structural Projects						
Project #	**Project Type**	**Subwatershed**	**Location**	**Watershed Benefit**	**Land Owner**	
PN9904	Conservation, Buffer Restoration	PN-MR-0003/ 04/05/06/07/08	Riparian Areas along Headwaters of Mine Run Branch	Quality/ Quanity	County/ Private	
PN9905	Rain Barrel Program	PN-MR-0001/ 02/03/04/05/ 06/07/08	Jackson Hills, Great Falls Estates, Weant, Riverside Meadow, Potomac Meadows, Laylin Family Trust, John W. Hanes Jr. Gunnell's Run Farm, Arnon Ridge, River Bend Forest Sec. 2, Cornwell Farm, Marmota Farm, Deerfield Farm & Deerfield Pond Subdivisions	Quality	County/ Private	
PN9906	Obstruction Removal	PN-MR-0003/04	Cornwell Farm Subdivision	N/ A	County/ Private	



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Buffer Restoration
Stream Restoration
BMP/LID
Culvert Retrofit
Dumpsite/Obstruction Removal

New Stormwater Pond
Outfall Improvement
Stormwater Pond Retrofit
Other

Area-wide Drainage Improvement
Community Outreach/Public Education
Land Conservation Project
Flood Protection/Mitigation
Inspection/Enforcement Enhancement
Rain Barrel Program
Street Sweeping Program
Studies, Surveys and Assessments

Implementation timeframe denoted by project label color. Red = 0-10 years Black = 11-25 years.

Map 5.5

WMA: Pond - Mine Run
Proposed Projects

5.2.3 Pond WMA

Description of Key WMA Conditions

Approximately 12 percent of the Pond WMA consists of undeveloped open space. The expected changes in land use show a decrease in this open space and an increase in estate residential land uses. The development of green spaces causes greater volumes of stormwater run off and more intense peak flows. Loss of open space also leads to degraded wildlife habitat, increased pollutants in stormwater runoff and worsening stream conditions.

The Pond WMA contains 2 existing stormwater facilities. Approximately 97 percent of this WMA is not treated by an existing stormwater facility. According to the existing condition STEPL model results, the Pond WMA contributes approximately 12 percent of the total suspended solids, 17 percent of the total nitrogen and 16 percent of the total phosphorus annual loads to the Pond Branch Watershed.

Pond WMA 10-Year Projects

The following structural projects are designed to reduce stormwater runoff volumes, decrease peak flows, reduce pollutants in stormwater runoff, and improve overall habitat and stream quality in the Pond WMA.

PN9116 Flooding is overtopping Beach Mill Road near Springvale Road and causing erosion at two road culverts. Install outlet structure in wet pond (WP0202) to provide storage. Raise the road bed, install larger culverts, and stabilize streambanks above and below the culverts.

PN9123 This area of Southdown Farm Subdivision does not have existing stormwater treatment. Retrofit an existing pond to a wet retention pond; install outlet structure and lower the water level for additional storage, and plant emergent and riparian vegetation.

PN9201 High energy stormflows and obstructions have caused severe erosion and washed out a pedestrian bridge near River Park Drive in the Riverbend Knolls Subdivision. Replace bridge; stabilize banks; install step pools and instream structures to dissipate energy and direct energy away from banks.

Pond WMA 25-Year Projects

The following structural project is designed to reduce stormwater runoff volumes, decrease peak flows, reduce pollutants in stormwater runoff, and improve overall habitat and stream quality in the Pond WMA.

PN9407 Driveway culvert to 198 River Park Drive is undersized; replace culvert with bridge to allow proper conveyance of stormwater flows and reduce liklihood of clogging with debris. Stormwater behind 180 River Park Drive is bypassing blocked/damaged stormwater culvert; replace culvert, re-direct stormwater into culvert and repair damage to gravel road.

Pond WMA Non-Structural Projects

The following non-structural projects are designed to reduce stormwater flow volume and decrease peak flows in areas with no existing stormwater management and no opportunity for new structural stormwater controls.

PN9900 Preserve open space and riparian buffers with conservation easement along headwater reaches of Pond Branch. Restore degraded riparian buffers along Pond Branch.

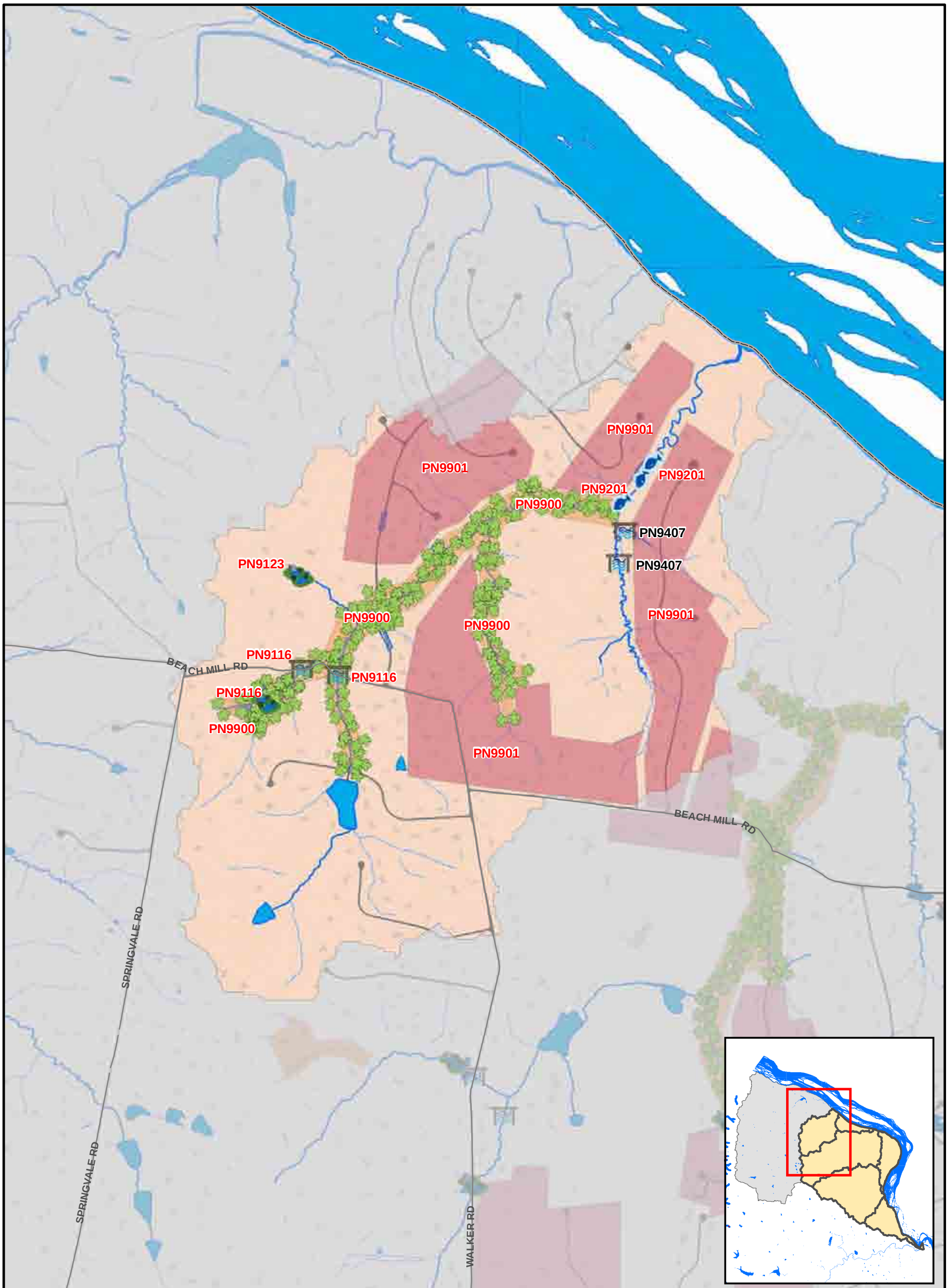
PN9901 Targeted Rain Barrel Program at the Deepwoods Hollow Subdivision, Riverbend Knolls Subdivision, Riverbend Farms Subdivision, Merryelle Acres Subdivision, Falcon Ridge Subdivision and adjacent to Beach Mill Road.

10-Year and 25-Year Project Information Tables for Pond WMA

Table 5.6 lists all structural and non-structural projects proposed in the Pond WMA. Project locations for all structural and non-structural projects are shown on Map 5.6.

Table 5.6
Project List – Pond WMA

Structural Projects						
Project #	**Project Type**	**Subwatershed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
PN9116	Stormwater Pond Retrofit, Culvert Retrofit	PN-PN-0004	Near Beach Mill Road & Springvale Road	Quality/ Quanity	County/ Private	0 - 10
PN9123	Stormwater Pond Retrofit	PN-PN-0003	Near Bliss Lane & Commonage Drive	Quality/ Quanity	Private	0 - 10
PN9201	Stream Restoration	PN-PN-0001	Riverbend Knolls Subdivision	Quality	County/ Private	0 - 10
PN9407	Culvert Retrofit	PN-PN-0002	Near River Park Drive & River Park Lane	N/ A	County/ Private	11 - 25
Non-Structural Projects						
Project #	**Project Type**	**Subwatershed**	**Location**	**Watershed Benefit**	**Land Owner**	
PN9900	Conservation, Buffer Restoration	PN-PN-0004	Riparian Areas along Headwaters of Pond Branch	Quality/ Quanity	Private	
PN9901	Rain Barrel Program	PN-PN-0001	Deepwoods Hollow, Riverbend Knolls, Riverbend Farm, Riverbend Farm Sec. 1, Merryelle Acres, Rector, & Falcon Ridge Subdivisions	Quality	Private	



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Buffer Restoration
Stream Restoration
BMP/LID
Culvert Retrofit
Dumpsite/Obstruction Removal

New Stormwater Pond
Outfall Improvement
Stormwater Pond Retrofit
Other

Area-wide Drainage Improvement
Community Outreach/Public Education
Land Conservation Project
Flood Protection/Mitigation
Inspection/Enforcement Enhancement
Rain Barrel Program
Street Sweeping Program
Studies, Surveys and Assessments

Implementation timeframe denoted by project label color. Red = 0-10 years Black = 11-25 years.

Map 5.6

WMA: Pond Branch
Proposed Projects

5.2.4 Potomac (Pond) WMA

Description of Key WMA Conditions

Approximately 78 percent of the Potomac WMA consists of undeveloped open space. The expected changes in land use show a decrease in this open space and an increase in estate residential land uses. The development of green spaces causes greater volumes of stormwater run off and more intense peak flows. Loss of open space also leads to degraded wildlife habitat, increased pollutants in stormwater runoff and worsening stream conditions.

The Potomac WMA contains 2 existing stormwater facilities. Approximately 97 percent of this WMA is not treated by an existing stormwater facility. According to the existing condition STEPL model results, the Potomac WMA contributes approximately 33 percent of the total suspended solids, 15 percent of the total nitrogen and 18 percent of the total phosphorus annual loads to the Pond Branch Watershed.

Potomac WMA 10-Year Projects

There are no 10-year structural projects proposed in the Potomac WMA.

Potomac WMA 25-Year Projects

The following structural projects are designed to reduce stormwater runoff volumes, decrease peak flows, reduce pollutants in stormwater runoff, and improve overall habitat and stream quality in the Potomac WMA.

PN9106 Retrofit dry pond 1197DP to naturalized extended detention dry pond with naturalized basin bottom and improved outlet structure to provide additional water quality and water quantity control.

PN9107 Retrofit Dry Pond DP0245 to extended detention dry pond. Retrofit outlet structure for extended detention, construct berm on south corner for additional capacity, and naturalize basin bottom with aesthetic meadow plants.

PN9403 Culvert at Riverbend Road is too small to properly convey stormwater flows. Raise road bed above flood level, increase culvert size and install micropool with outlet structure above culvert to provide additional stormwater control.

Potomac WMA Non-Structural Projects

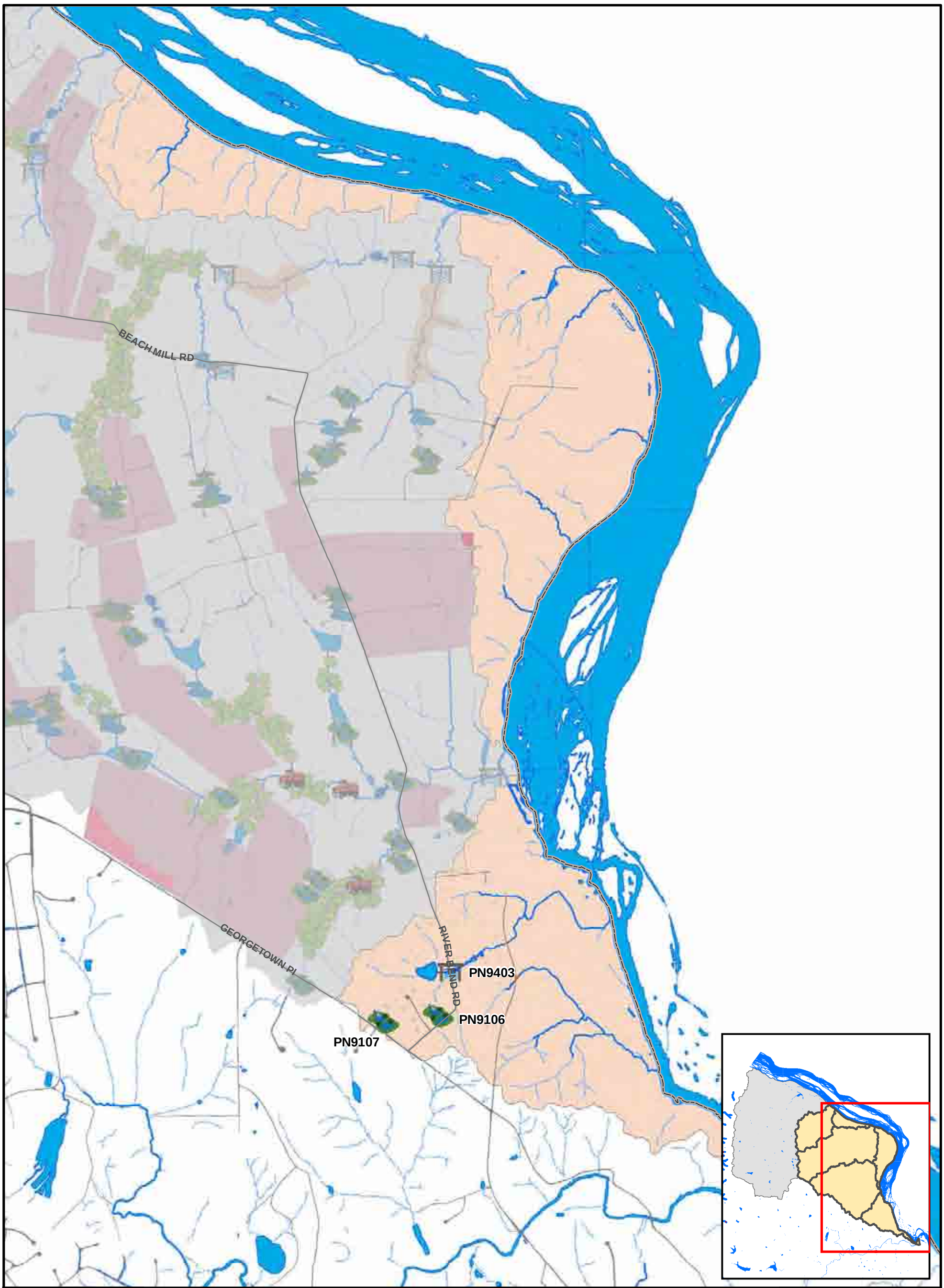
There are no non-structural projects proposed in the Potomac WMA.

10-Year and 25-Year Project Information Tables for Potomac WMA

Table 5.7 lists all structural and non-structural projects proposed in the Potomac WMA. Project locations for all structural and non-structural projects are shown on Map 5.7.

Table 5.7
Project List – Potomac WMA

Structural Projects						
Project #	**Project Type**	**Subwatershed**	**Location**	**Watershed Benefit**	**Land Owner**	**Phase**
PN9106	Stormwater Pond Retrofit	PN-PO-0006	Riverbend Subdivision	Quality/ Quanity	County	11 - 25
PN9107	Stormwater Pond Retrofit	PN-PO-0006	St. Francis Episcopal Church	Quality/ Quanity	County	11 - 25
PN9403	Culvert Retrofit	PN-PO-0005	Great Falls Heights Subdivision	Quality/ Quanity	County/ Private	11 - 25



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Buffer Restoration
Stream Restoration
BMP/LID
Culvert Retrofit
Dumpsite/Obstruction Removal
New Stormwater Pond
Outfall Improvement
Stormwater Pond Retrofit
Other
Area-wide Drainage Improvement
Community Outreach/Public Education
Land Conservation Project
Flood Protection/Mitigation
Inspection/Enforcement Enhancement
Rain Barrel Program
Street Sweeping Program
Studies, Surveys and Assessments

Implementation timeframe denoted by project label color. Red = 0-10 years Black = 11-25 years.

Map 5.7

WMA: Pond - Potomac
Proposed Projects

5.3 Project Fact Sheets

Project fact sheets for the 36 top ranked 10-year projects are provided in this section. Each fact sheet includes the following information:

- Project number
- Project location map and address
- Land owner
- Parcel ID numbers
- Stormwater control type
- Drainage area
- Receiving waters
- Project description
- Project area map showing proposed projects
- Project benefits
- Project design considerations
- Project costs

Fact sheets are organized numerically with Nichol Run watershed projects listed before Pond Branch watershed projects.

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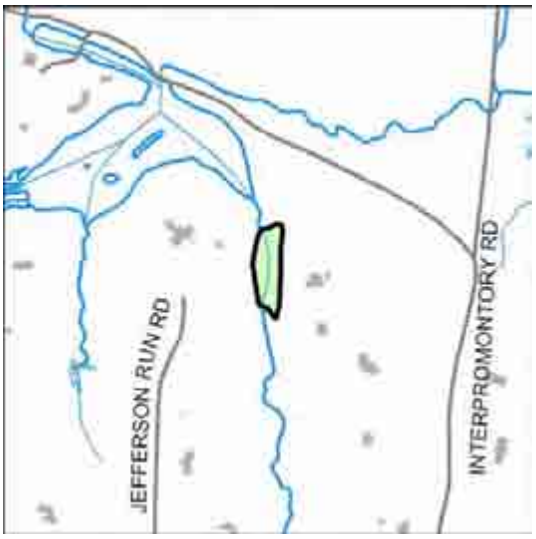
NI9101 Stormwater Pond Retrofit



Address:	5 Jefferson Run Road
Location:	Near the end of Jefferson Run Road
Land Owner:	Private
PIN:	0032 02 0003G
Control Type	Quality/Quanity
Drainage Area	66.2 acres
Receiving Waters	Nichol Run

Description: This area does not have existing stormwater treatment or controls. Improve existing wet pond (WP0200) by installing an outlet structure to increase capacity. Repair overflow spillway to prevent breach, vegetate sides of the pond and improve wetlands.

Project Area Map

Project Benefits: This project will reduce sediment and nutrient loadings, improve water quality in downstream waterbodies, increase storage volume, reduce peak stormwater flows up to the 10-year event, and provide for evapotranspiration and wildlife habitat. This project will also repair the damaged spillway. An estimated 2,881 lbs/yr of total suspended solids, 34 lbs/yr of nitrogen, and 8 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. A dam safety permit may be necessary. Projects in RPAs may require exemptions or waivers. This is a privately owned pond, and may require a storm drainage easement. Accessibility is good from a nearby ingress-egress easement on park lands and the walking trail. There are no tree impacts or significant construction issues anticipated.

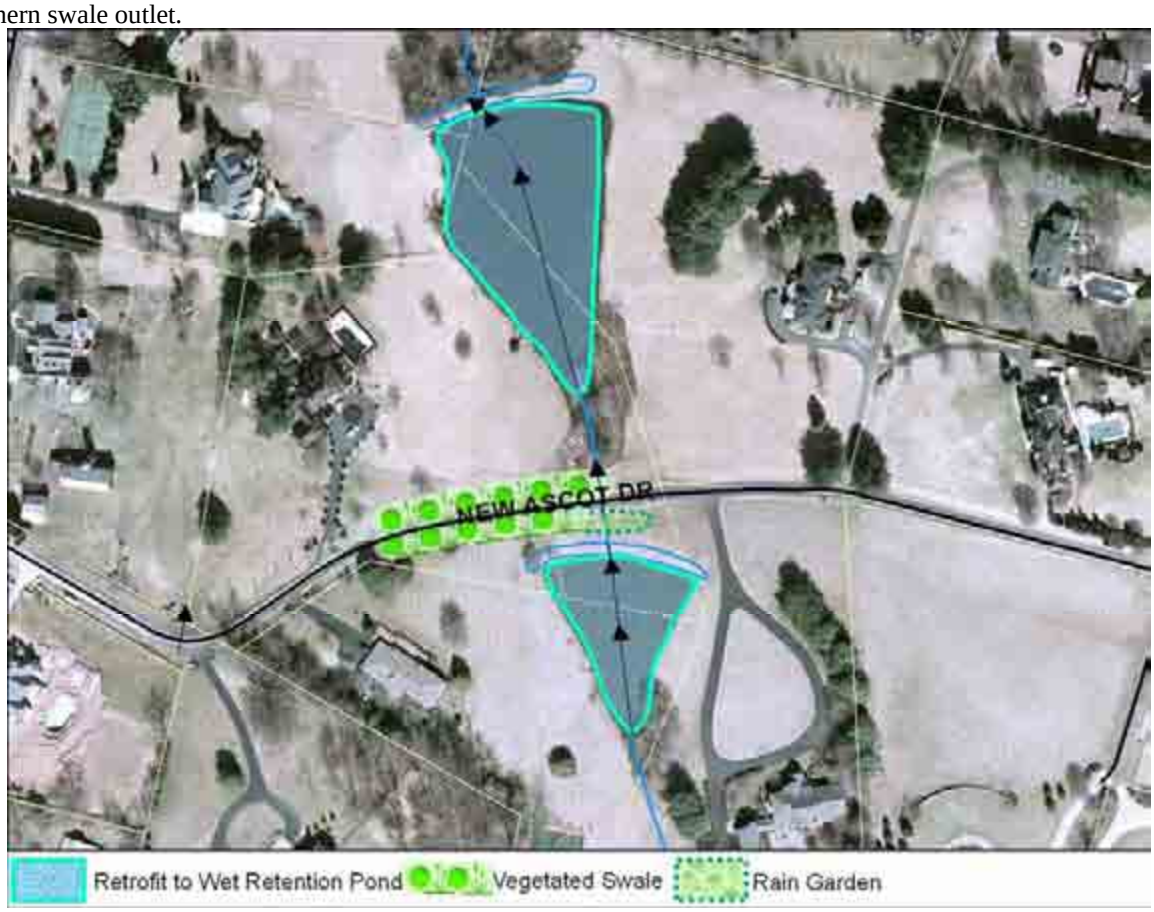
Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	40	$40.00	$1,600.00
Plantings	AC	0.1	$25,000.00	$2,500.00
Clear and Grub	AC	0.1	$8,500.00	$850.00
Grading and Excavation	CY	100	$35.00	$3,500.00
Embankment	CY	200	$50.00	$10,000.00
Outflow Pipe	LF	30	$125.00	$3,750.00
RipRap Stabilization	SY	15	$100.00	$1,500.00
Structural BMP Retrofit and Incidentals (Med)	LS	1	$15,000.00	$15,000.00
			Initial Project Costs	**$38,700.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$1,935.00
Erosion and Sediment Control: 10% of project costs				$3,870.00
			Base Construction Costs	**$44,505.00**
			Mobilization (5%)	$2,225.25
			Subtotal 1	**$46,730.25**
			Contingency (25%)	$11,682.56
			Subtotal 2	**$58,412.81**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$26,285.77
			Total Costs	**$84,698.58**
			Estimated Project Costs	***$90,000.00***

NI9106 Stormwater Pond Retrofit, BMP/LID

Address:	10440 New Ascot Drive
Location:	Finger Lakes Estates Subdivision
Land Owner:	County/Private
PIN:	0032 02 0003G
Control Type	Quality/Quanity
Drainage Area	73.31 acres
Receiving Waters	Nichol Run

Description: Finger Lakes Estates does not have any stormwater treatment. Improve two existing non-stormwater ponds to wet retention ponds, naturalize existing swales directing water to ponds and construct rain garden at the southern swale outlet.



Project Area Map

Project Benefits: This project will reduce sediment and nutrient loadings, improve water quality in downstream waterbodies, increase storage volume, reduce peak stormwater flows up to the 10-year event, and provide for evapotranspiration and wildlife habitat. In addition, the rain garden will also reduce stormwater runoff volumes by promoting infiltration. An estimated 1,916 lbs/yr of total suspended solids, 23 lbs/yr of nitrogen, and 6 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. The proposed vegetated swales are located within or along an ingress-egress easement. The ponds are privately owned by multiple owners. Storm drainage easements may be necessary. Accessibility is excellent from New Ascot Drive. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Vegetated Swale	SY	130	$50.00	$6,500.00
Bioretention Filters & Basin	SY	275	$150.00	$41,250.00
Organic Compost Soil Amendment	CY	130	$40.00	$5,200.00
Plantings	AC	0.2	$25,000.00	$5,000.00
Clear and Grub	AC	0.2	$8,500.00	$1,700.00
Grading and Excavation	CY	150	$35.00	$5,250.00
Embankment	CY	250	$50.00	$12,500.00
Outflow Pipe	LF	50	$125.00	$6,250.00
RipRap Stabilization	SY	35	$100.00	$3,500.00
Structural BMP Retrofit and Incidentals (Med)	LS	2	$15,000.00	$30,000.00
			Initial Project Costs	**$117,150.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$5,857.50
Erosion and Sediment Control: 10% of project costs				$11,715.00
			Base Construction Costs	**$134,722.50**
			Mobilization (5%)	$6,736.13
			Subtotal 1	**$141,458.63**
			Contingency (25%)	$35,364.66
			Subtotal 2	**$176,823.28**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$79,570.48
			Total Costs	**$256,393.76**
			Estimated Project Costs	***$260,000.00***

NI9111 Stormwater Pond Retrofit

Address:	10507 Patrician Woods Court
Location:	Patrician Woods Subdivision, Patrician Woods Court & Springvale Road
Land Owner:	County
PIN:	0074 17 A, VDOT
Control Type	Quality/Quanity
Drainage Area	29.44 acres
Receiving Waters	Nichol Run

Description: Patrician Woods is in need of additional stormwater treatment. Improve existing dry pond (1412DP) to an enhanced extended detention dry pond including removal of concrete trickle ditch, introduction of wetland vegetation and new outlet structure.

Project Area Map

Project Benefits: This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. In addition, the new outlet structure will allow for a more controlled stormwater discharge to enhance the performance of the pond. Removal of the trickle ditch will reduce stormwater velocities. An estimated 1,141 lbs/yr of total suspended solids, 13 lbs/yr of nitrogen, and 2 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Projects in RPAs may require exemptions or waivers. This is an existing county facility, and is located within a storm drainage easement. Accessibility is excellent from Patrician Woods Court or Springvale Road. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	200	$40.00	$8,000.00
Plantings	AC	0.75	$25,000.00	$18,750.00
Clear and Grub	AC	0.1	$8,500.00	$850.00
Grading and Excavation	CY	870	$35.00	$30,450.00
Embankment	CY	300	$50.00	$15,000.00
Outflow Pipe	LF	30	$125.00	$3,750.00
RipRap Stabilization	SY	20	$100.00	$2,000.00
Structural BMP Retrofit and Incidentals (Med)	LS	1	$15,000.00	$15,000.00
			Initial Project Costs	**$93,800.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$4,690.00
Erosion and Sediment Control: 10% of project costs				$9,380.00
			Base Construction Costs	**$107,870.00**
			Mobilization (5%)	$5,393.50
			Subtotal 1	**$113,263.50**
			Contingency (25%)	$28,315.88
			Subtotal 2	**$141,579.38**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$63,710.72
			Total Costs	**$205,290.09**
			Estimated Project Costs	***$210,000.00***

NI9113 Culvert Retrofit

Address:	11295 Beach Mill Road
Location:	Near Beach Mill Road & Pipestem
Land Owner:	County/Private
PIN:	0024 01 0024A, 0024 07 0003A, VDOT
Control Type	Quality/Quanity
Drainage Area	432 acres
Receiving Waters	Jefferson Branch

Description: This culvert at Beach Mill Road is obstructed with debris, stream banks are eroding due to high energy storm flows through the culvert which may flood the road. Construct a micropool with an outlet structure upstream of the culvert in Beach Mill Road.

Project Area Map

Project Benefits: This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new outlet structure will allow for a more controlled stormwater discharge to enhance the performance of the micropool. An estimated 1,083 lbs/yr of total suspended solids and 13 lbs/yr of nitrogen will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. The area is located wtihin a right-of-way and conservation easement. A storm drainage easement may be necessary. Accessibility is excellent from Beach Mill Road. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	30	$40.00	$1,200.00
Plantings	AC	0.1	$25,000.00	$2,500.00
Clear and Grub	AC	0.12	$8,500.00	$1,020.00
Grading and Excavation	CY	250	$35.00	$8,750.00
Earthen Berm	CY	100	$35.00	$3,500.00
			Initial Project Costs	**$16,970.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$848.50
Erosion and Sediment Control: 10% of project costs				$1,697.00
			Base Construction Costs	**$19,515.50**
			Mobilization (5%)	$975.78
			Subtotal 1	**$20,491.28**
			Contingency (25%)	$5,122.82
			Subtotal 2	**$25,614.09**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$11,526.34
			Total Costs	**$37,140.44**
			Estimated Project Costs	***$40,000.00***

NI9118 Stormwater Pond Retrofit, BMP/LID

Address:	800 Grace Meadow Court
Location:	Dogwood Farm Section 2 Subdivision
Land Owner:	County/Private
PIN:	0073 12 0010, 0073 12 0011, 0073 12 0012, 0073 12 0014, 0074 15 0003, 0074 15 0004, 0074 15 0013, VDOT
Control Type	Quality/Quanity
Drainage Area	23.45 acres
Receiving Waters	Nichol Run

Description: Dogwood Farm subdivision is in need of water quality treatment. Retrofit existing dry pond (0857DP) to enhanced extended detention dry pond with low marsh areas and replace concrete trickle ditches within and draining to the pond with vegetated swales.

Project Area Map

Project Benefits: This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new outlet structure will allow for a more controlled stormwater discharge to enhance the performance of the pond. Removal of the trickle ditches will reduce stormwater velocities. An estimated 1,445 lbs/yr of total suspended solids, 16 lbs/yr of nitrogen, and 3 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. Dry pond 0857DP is an exiting county facility, and is located in a storm drainage easement. Additional storm drainage easements may be necessary. Two trickle ditches are located within or along the street rights-of-way. Accessibility is excellent from nearby roads. There are no tree impacts or significant construction issues anticipated.

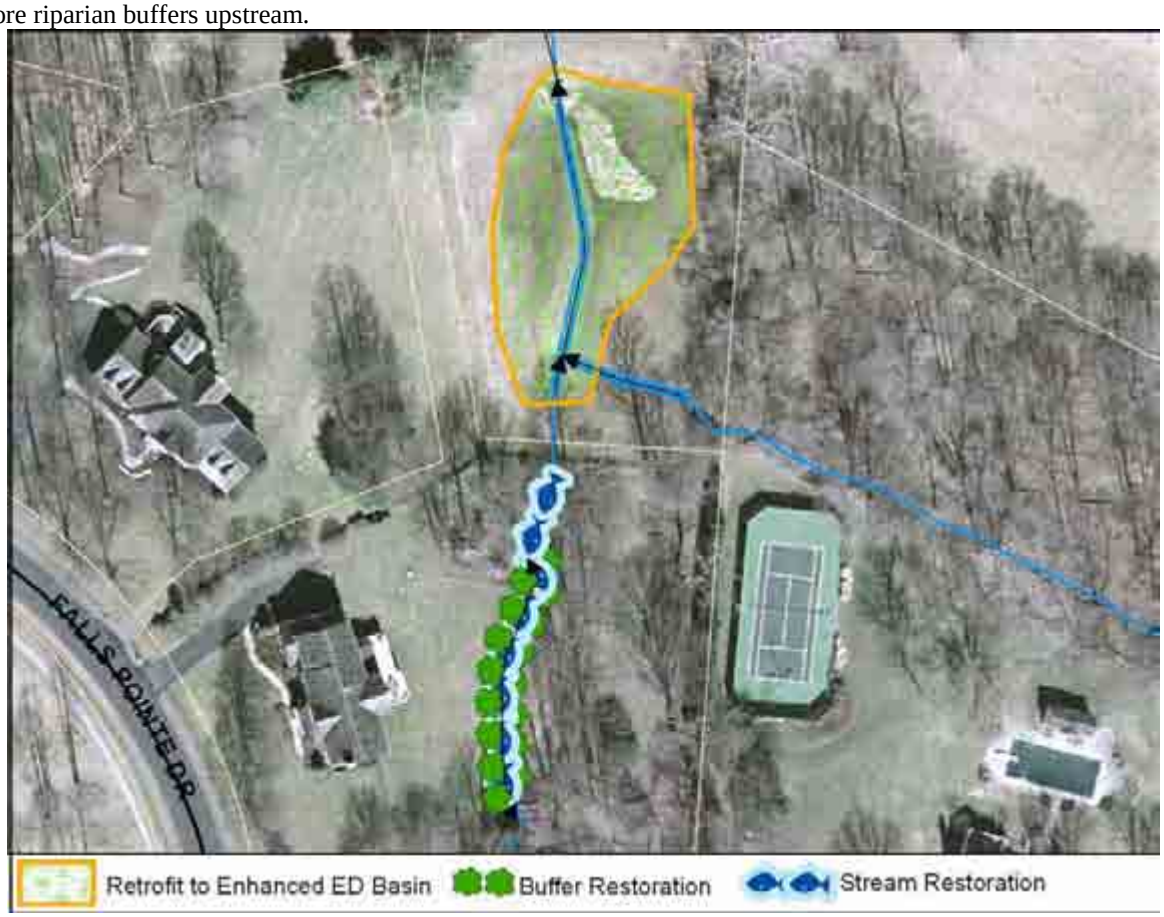
Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Vegetated Swale	SY	805	$50.00	$40,250.00
Organic Compost Soil Amendment	CY	150	$40.00	$6,000.00
Plantings	AC	0.3	$25,000.00	$7,500.00
Clear and Grub	AC	0	$8,500.00	$0.00
Grading and Excavation	CY	650	$35.00	$22,750.00
Embankment	CY	100	$50.00	$5,000.00
Outflow Pipe	LF	30	$125.00	$3,750.00
RipRap Stabilization	SY	25	$100.00	$2,500.00
Structural BMP Retrofit and Incidentals (Med)	LS	1	$15,000.00	$15,000.00
			Initial Project Costs	**$102,750.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$5,137.50
Erosion and Sediment Control: 10% of project costs				$10,275.00
			Base Construction Costs	**$118,162.50**
			Mobilization (5%)	$5,908.13
			Subtotal 1	**$124,070.63**
			Contingency (25%)	$31,017.66
			Subtotal 2	**$155,088.28**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$69,789.73
			Total Costs	**$224,878.01**
			Estimated Project Costs	***$230,000.00***

NI9119 Stormwater Pond Retrofit, Stream Restoration

Address:	10720 Falls Pointe Drive
Location:	Near Falls Pointe Drive cul-de-sac
Land Owner:	County
PIN:	0073 11 A, 0073 11 0016
Control Type	Quality/Quanity
Drainage Area	162.94 acres
Receiving Waters	Nichol Run

Description: Falls Point and Forestville Estates are in need of additional water quality treatment. Improve existing dry pond (0797DP) to enhanced extended detention dry pond with low marsh areas. Repair eroded streambanks and restore riparian buffers upstream.



Project Area Map

Project Benefits: This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new outlet structure will allow for a more controlled stormwater discharge to enhance the performance of the pond. Removal of the trickle ditch will reduce stormwater velocities. This project will also repair the eroded streambanks. Restoring the riparian buffer will help to slow down stormwater velocities, improve water quality, reduce stream temperatures, and provide for additional evapotranspiration and wildlife habitat. An estimated 4,694 lbs/yr of total suspended solids, 54 lbs/yr of nitrogen, and 10 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. This is an existing county facility, and is located within a storm drainage easement. Accessibility is good from Falls Pointe Drive. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	100	$40.00	$4,000.00
Plantings	AC	0.15	$25,000.00	$3,750.00
Clear and Grub	AC	0.2	$8,500.00	$1,700.00
Grading and Excavation	CY	800	$35.00	$28,000.00
Embankment	CY	150	$50.00	$7,500.00
Outflow Pipe	LF	30	$125.00	$3,750.00
RipRap Stabilization	SY	30	$100.00	$3,000.00
Construct New Channel	LF	210	$200.00	$42,000.00
Additional Cost (first 500LF)	LF	210	$200.00	$42,000.00
Structural BMP Retrofit and Incidentals (Med)	LS	1	$15,000.00	$15,000.00
			Initial Project Costs	**$150,700.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$7,535.00
Erosion and Sediment Control: 10% of project costs				$15,070.00
			Base Construction Costs	**$173,305.00**
			Mobilization (5%)	$8,665.25
			Subtotal 1	**$181,970.25**
			Contingency (25%)	$45,492.56
			Subtotal 2	**$227,462.81**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$102,358.27
			Total Costs	**$329,821.08**
			Estimated Project Costs	***$330,000.00***

NI9201 Stream Restoration

Address:	10894 Woodleaf Lane
Location:	Woodleaf Subdivision
Land Owner:	County/Private
PIN:	0033 01 0035A, 0033 11 0001, 0033 11 0002, 0033 11 0003, 0033 11 0004, 0033 11 0005, 0033 11 0006, 0033 11 0008, VDOT
Control Type	Quality
Drainage Area	176.11 acres
Receiving Waters	Harkney Branch

Description: Stream is trying to lengthen and is actively eroding meanders, threatening Beach Mill Road between Utterbach Store Road and its confluence with Nichol Run. Install cross vanes and J-hooks to direct stream energy away from Beach Mill Road.

Project Area Map

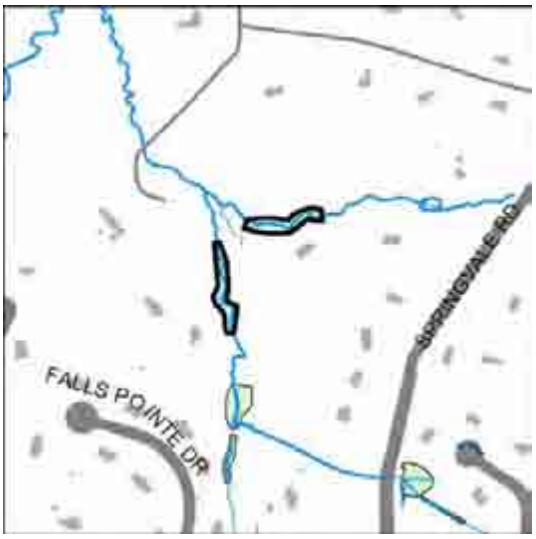
Project Benefits: This project will stabilize streambanks and improve water quality by reducing sediment and nutrient loadings. An estimated 72,260 lbs/yr of total suspended solids, 58 lbs/yr of nitrogen, and 22 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. Some areas of the project may be within the road right-of-way. Accessibility is good from Beach Mill Road but may be difficult due to tree cover. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Clear and Grub	AC	0.1	$8,500.00	$850.00
RipRap Stabilization	SY	425	$100.00	$42,500.00
			Initial Project Costs	**$43,350.00**
Plantings: 5% of project costs (unless incl. as line item)				$2,167.50
Ancillary Items: 5% of project cost				$2,167.50
Erosion and Sediment Control: 10% of project costs				$4,335.00
			Base Construction Costs	**$52,020.00**
			Mobilization (5%)	$2,601.00
			Subtotal 1	**$54,621.00**
			Contingency (25%)	$13,655.25
			Subtotal 2	**$68,276.25**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$30,724.31
			Total Costs	**$99,000.56**
			Estimated Project Costs	***$100,000.00***

NI9202 Stream Restoration



Address:	732 Springvale Road
Location:	Spring Valley Woods Subdivision
Land Owner:	Private
PIN:	0073 09 0003A, 0073 09 0004A
Control Type	Quality
Drainage Area	177.13 acres
Receiving Waters	Nichol Run

Description: Streambanks are eroded downstream of a culvert and driveway bridge. Install plunge pool below culvert and replace driveway bridge at 732 Springvale Road. Construct new stream channels with step pools and access to floodplain.

Project Area Map

Project Benefits: This project will stabilize streambanks and improve water quality by reducing sediment and nutrient loadings. The plunge pool will reduce stormwater velocities. An estimated 79,560 lbs/yr of total suspended solids, 64 lbs/yr of nitrogen, and 25 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. Storm drainge easements may be necessary. Accessibility is good from residential driveways. Tree impacts are expected. No significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Plantings	AC	0.3	$25,000.00	$7,500.00
Clear and Grub	AC	0.35	$8,500.00	$2,975.00
Construct New Channel	LF	750	$200.00	$150,000.00
Additional Cost (first 500LF)	LF	500	$200.00	$100,000.00
			Initial Project Costs	**$260,475.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$13,023.75
Erosion and Sediment Control: 10% of project costs				$26,047.50
			Base Construction Costs	**$299,546.25**
			Mobilization (5%)	$14,977.31
			Subtotal 1	**$314,523.56**
			Contingency (25%)	$78,630.89
			Subtotal 2	**$393,154.45**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$176,919.50
			Total Costs	**$570,073.96**
			Estimated Project Costs	***$580,000.00***

NI9401 Culvert Retrofit

Address:	535 Springvale Road
Location:	Down Patrick Farms Subdivision
Land Owner:	Private
PIN:	0072 06 0009A3, 0072 15 0004, VDOT
Control Type	Quality/Quanity
Drainage Area	99.93 acres
Receiving Waters	Nichol Run

Description: Sediment is collecting upstream of the culvert. Construct a micropool with outlet structure upstream of the culvert and encourage wetland vegetation growth.

Project Area Map

Project Benefits: This project will improve water quality by reducing sediment and nutrient loadings, reducing peak stormwater flows for storms up to the 10-year event, and providing for evapotranspiration and wildlife habitat. An estimated 1,134 lbs/yr of total suspended solids, 13 lbs/yr of nitrogen, and 3 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. Storm drainage easements may be necessary. Accessibility is excellent from Springvale Road. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	40	$40.00	$1,600.00
Plantings	AC	0.2	$25,000.00	$5,000.00
Clear and Grub	AC	0.1	$8,500.00	$850.00
Grading and Excavation	CY	900	$35.00	$31,500.00
Access Road	SY	200	$25.00	$5,000.00
Access Road Gate	EA	1	$2,500.00	$2,500.00
Embankment	CY	100	$50.00	$5,000.00
Structural BMP and Incidentals (Med)	LS	1	$15,000.00	$15,000.00
New Storm Pipe (Med)	LF	20	$200.00	$4,000.00
			Initial Project Costs	**$70,450.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$3,522.50
Erosion and Sediment Control: 10% of project costs				$7,045.00
			Base Construction Costs	**$81,017.50**
			Mobilization (5%)	$4,050.88
			Subtotal 1	**$85,068.38**
			Contingency (25%)	$21,267.09
			Subtotal 2	**$106,335.47**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$47,850.96
			Total Costs	**$154,186.43**
			Estimated Project Costs	***$160,000.00***

PN9100 New Stormwater Pond, BMP/LID

Address:	9511 Neuse Way
Location:	Riverside Manor Subdivision
Land Owner:	County/Private
PIN:	0081 04 0011, 0081 04 0048C, 0081 04 0049, 0081 04 D
Control Type	Quality/Quanity
Drainage Area	20.12 acres
Receiving Waters	Clarks Branch

Description: Riverside Manor does not have any stormwater treatment. Install a new naturalized extended detention basin in existing depression with mature trees. Replace concrete trickle ditch and grass swale along Chesapeake Drive with vegetated swales.

Project Area Map

Project Benefits: Naturalized basins ans swales will reduce sediment and nutrient loadings and slow runoff. An estimated 1,288 lbs/yr of total suspended solids, 16 lbs/yr of nitrogen, and 3 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Storm drainage easements may be necessary. The concrete trickle ditch is located within the right-of-way. Accessibility is excellent from Chesapeake Drive. Tree impacts are expected. No significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Vegetated Swale	SY	540	$50.00	$27,000.00
Organic Compost Soil Amendment	CY	75	$40.00	$3,000.00
Plantings	AC	0.1	$25,000.00	$2,500.00
Clear and Grub	AC	0.1	$8,500.00	$850.00
Grading and Excavation	CY	400	$35.00	$14,000.00
Access Road	SY	280	$25.00	$7,000.00
Access Road Gate	EA	1	$2,500.00	$2,500.00
Structural BMP and Incidentals (Low)	LS	1	$10,000.00	$10,000.00
New Storm Pipe (Low)	LF	20	$100.00	$2,000.00
Embankment	CY	100	$50.00	$5,000.00
			Initial Project Costs	**$73,850.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$3,692.50
Erosion and Sediment Control: 10% of project costs				$7,385.00
			Base Construction Costs	**$84,927.50**
			Mobilization (5%)	$4,246.38
			Subtotal 1	**$89,173.88**
			Contingency (25%)	$22,293.47
			Subtotal 2	**$111,467.34**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$50,160.30
			Total Costs	**$161,627.65**
			Estimated Project Costs	***$170,000.00***

PN9101 New Stormwater Pond

Address:	9106 Eaton Park Road
Location:	Eaton Court & Eaton Park Road
Land Owner:	Private
PIN:	0082 11 A, 0082 16 0003
Control Type	Quality
Drainage Area	15.06 acres
Receiving Waters	Clarks Branch

Description: Eaton Park subdivision has no existing stormwater treatment. Install a new constructed wetland to capture drainage from Eaton Court and Eaton Park Road.

Project Area Map

Project Benefits: The constructed wetlands will reduce stormwater peak flows for small storm events, reduce sediment and nutrient loadings, and provide for evaporation, evapotranspiration and wildlife habitat. An estimated 1,328 lbs/yr of total suspended solids, 17 lbs/yr of nitrogen, and 3 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. A storm drainage easement may be necessary. Accessibility is excellent from Eaton Court. Tree impacts are expected. No significant construction issues are anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	40	$40.00	$1,600.00
Plantings	AC	0.09	$25,000.00	$2,250.00
Clear and Grub	AC	0.1	$8,500.00	$850.00
Grading and Excavation	CY	100	$35.00	$3,500.00
Access Road	SY	225	$25.00	$5,625.00
Access Road Gate	EA	1	$2,500.00	$2,500.00
Structural BMP and Incidentals (Low)	LS	1	$10,000.00	$10,000.00
New Storm Pipe (Low)	LF	20	$100.00	$2,000.00
Embankment	CY	100	$50.00	$5,000.00
			Initial Project Costs	**$33,325.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$1,666.25
Erosion and Sediment Control: 10% of project costs				$3,332.50
			Base Construction Costs	**$38,323.75**
			Mobilization (5%)	$1,916.19
			Subtotal 1	**$40,239.94**
			Contingency (25%)	$10,059.98
			Subtotal 2	**$50,299.92**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$22,634.96
			Total Costs	**$72,934.89**
			Estimated Project Costs	***$80,000.00***

PN9102 Stormwater Pond Retrofit

Address:	207 River Bend Road
Location:	Near River Bend Road & Oak Falls Court
Land Owner:	Private
PIN:	0082 01 0011D1, 0082 01 0012A1
Control Type	Quality
Drainage Area	15.32 acres
Receiving Waters	Clarks Branch

Description: The area around River Bend Road and Oak Falls Court has no existing stormwater treatment. Retrofit breached farm pond to a new constructed wetland. Repair earthen dam, install outlet structure and vegetate with wetland plants.

Project Area Map

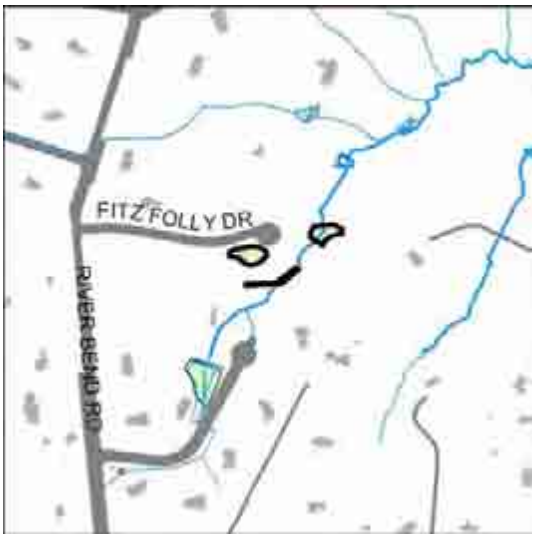
Project Benefits: The constructed wetlands will reduce stormwater peak flows for small storm events, reduce sediment and nutrient loadings, and provide for evaporation, evapotranspiration and wildlife habitat. The new outlet structure will allow for a more controlled stormwater discharge to enhance the performance of the wetland. This project will also repair the earthen dam. An estimated 774 lbs/yr of total suspended solids, 9 lbs/yr of nitrogen, and 2 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. A dam safety permit may be necessary. This is a privately owned pond, and may require a storm drainage easement. Accessibility may be difficult due to space constraints and tree cover. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	20	$40.00	$800.00
Plantings	AC	0.1	$25,000.00	$2,500.00
Clear and Grub	AC	0.13	$8,500.00	$1,105.00
Grading and Excavation	CY	1000	$35.00	$35,000.00
Embankment	CY	75	$50.00	$3,750.00
Outflow Pipe	LF	20	$125.00	$2,500.00
RipRap Stabilization	SY	20	$100.00	$2,000.00
Structural BMP Retrofit and Incidentals (Low)	LS	1	$10,000.00	$10,000.00
			Initial Project Costs	**$57,655.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$2,882.75
Erosion and Sediment Control: 10% of project costs				$5,765.50
			Base Construction Costs	**$66,303.25**
			Mobilization (5%)	$3,315.16
			Subtotal 1	**$69,618.41**
			Contingency (25%)	$17,404.60
			Subtotal 2	**$87,023.02**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$39,160.36
			Total Costs	**$126,183.37**
			Estimated Project Costs	***$130,000.00***

PN9103 New Stormwater Pond, BMP/LID, Stream Restoration



Address:	9303 Fitz Folly Drive
Location:	Fitz Folly Farms Subdivision
Land Owner:	County/Private
PIN:	0082 17 0003, 0082 17 0004, 0082 01 0019E, 0082 17 0002
Control Type	Quality/Quanity
Drainage Area	45.94 acres
Receiving Waters	Clarks Branch

Description: Fitz Folly Farms is in need of additional water quality treatment. Construct enhanced extended detention dry pond in empty lot and terraced rain gardens on steeper slopes. Intercept overland flow and stabilize overland and in-stream erosion impacts.

Project Area Map

Project Benefits: This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The rain garden will also reduce stormwater runoff volumes by promoting infiltration. This project will also repair erosion and stabilize the streambanks. An estimated 308 lbs/yr of total suspended solids, 4 lbs/yr of nitrogen, and 1 lb/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. Part of the project is located within storm drainage easements. Additional storm drainage easements may be necessary. Accessibility is excellent from Fitz Folly Drive. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Bioretention Filters & Basin	SY	650	$150.00	$97,500.00
Organic Compost Soil Amendment	CY	120	$40.00	$4,800.00
Plantings	AC	0.31	$25,000.00	$7,750.00
Clear and Grub	AC	0.2	$8,500.00	$1,700.00
Grading and Excavation	CY	1025	$35.00	$35,875.00
Access Road	SY	185	$25.00	$4,625.00
Access Road Gate	EA	1	$2,500.00	$2,500.00
Embankment	CY	125	$50.00	$6,250.00
Construct New Channel	LF	245	$200.00	$49,000.00
Additional Cost (first 500LF)	LF	245	$200.00	$49,000.00
Structural BMP and Incidentals (Med)	LS	1	$15,000.00	$15,000.00
New Storm Pipe (Med)	LF	25	$200.00	$5,000.00
			Initial Project Costs	**$279,000.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$13,950.00
Erosion and Sediment Control: 10% of project costs				$27,900.00
			Base Construction Costs	**$320,850.00**
			Mobilization (5%)	$16,042.50
			Subtotal 1	**$336,892.50**
			Contingency (25%)	$84,223.13
			Subtotal 2	**$421,115.63**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$189,502.03
			Total Costs	**$610,617.66**
			Estimated Project Costs	***$620,000.00***

PN9104 Stormwater Pond Retrofit, BMP/LID

Address:	250 Golden Woods Court
Location:	Golden Woods Subdivision
Land Owner:	County
PIN:	0082 12 0004, 0082 12 0005
Control Type	Quality/Quanity
Drainage Area	29.59 acres
Receiving Waters	Clarks Branch

Description: Golden Woods and Crampton subdivisions are in need of additional water quality treatment. Enlarge and retrofit dry pond (0649DP) to enhanced extended detention dry pond with low marsh areas. Replace concrete swale with vegetated swale and check dams.

Project Area Map

Project Benefits: This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. This project will also increase the storage capacity for the existing pond. The new outlet structure will allow for a more controlled stormwater discharge to enhance the performance of the pond. Removal of the trickle ditch will reduce stormwater velocities. An estimated 1,987 lbs/yr of total suspended solids, 24 lbs/yr of nitrogen, and 5 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. This is an existing county facility, and is located within a storm drainage easement. Accessibility is excellent from Golden Woods Court. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Vegetated Swale	SY	500	$50.00	$25,000.00
Organic Compost Soil Amendment	CY	75	$40.00	$3,000.00
Plantings	AC	0.15	$25,000.00	$3,750.00
Clear and Grub	AC	0.1	$8,500.00	$850.00
Grading and Excavation	CY	925	$35.00	$32,375.00
Embankment	CY	100	$50.00	$5,000.00
Outflow Pipe	LF	20	$125.00	$2,500.00
RipRap Stabilization	SY	30	$100.00	$3,000.00
Structural BMP Retrofit and Incidentals (Med)	LS	1	$15,000.00	$15,000.00
			Initial Project Costs	**$90,475.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$4,523.75
Erosion and Sediment Control: 10% of project costs				$9,047.50
			Base Construction Costs	**$104,046.25**
			Mobilization (5%)	$5,202.31
			Subtotal 1	**$109,248.56**
			Contingency (25%)	$27,312.14
			Subtotal 2	**$136,560.70**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$61,452.32
			Total Costs	**$198,013.02**
			Estimated Project Costs	***$200,000.00***

PN9105 Stormwater Pond Retrofit, BMP/LID

Address:	9306 Morison Lane
Location:	Morison Estate Subdivision
Land Owner:	County/Private
PIN:	0082 15 0007A, 0082 15 0009, 0082 15 0002
Control Type	Quality/Quanity
Drainage Area	26.34 acres
Receiving Waters	Clarks Branch

Description: The Morrison Estate is in need of additional water quality treatment. Retrofit existing dry pond (0677DP) to enhanced extended detention dry pond with low marsh areas. Install rain gardens in two natural drainage areas.

Project Area Map

Project Benefits: This project will improve water quality by reducing sediment and nutrient loadings, reducing peak stormwater flows for storms up to the 10-year event, and providing for evapotranspiration and wildlife habitat. The improved outlet structure will allow for a more controlled stormwater discharge to enhance the performance of the pond. Removal of the trickle ditch will reduce stormwater velocities. The rain gardens will also reduce stormwater runoff volumes by promoting infiltration. An estimated 1,690 lbs/yr of total suspended solids, 21 lbs/yr of nitrogen, and 4 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. This is an existing county facility, and is located within a storm drainage easement. Additional storm drainage easements may be necessary. Accessibility is excellent from Morison Lane. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Bioretention Filters & Basin	SY	80	$150.00	$12,000.00
Organic Compost Soil Amendment	CY	120	$40.00	$4,800.00
Plantings	AC	0.5	$25,000.00	$12,500.00
Clear and Grub	AC	0.1	$8,500.00	$850.00
Grading and Excavation	CY	950	$35.00	$33,250.00
Embankment	CY	100	$50.00	$5,000.00
Outflow Pipe	LF	30	$125.00	$3,750.00
RipRap Stabilization	SY	20	$100.00	$2,000.00
Structural BMP Retrofit and Incidentals (Med)	LS	1	$15,000.00	$15,000.00
			Initial Project Costs	**$89,150.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$4,457.50
Erosion and Sediment Control: 10% of project costs				$8,915.00
			Base Construction Costs	**$102,522.50**
			Mobilization (5%)	$5,126.13
			Subtotal 1	**$107,648.63**
			Contingency (25%)	$26,912.16
			Subtotal 2	**$134,560.78**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$60,552.35
			Total Costs	**$195,113.13**
			Estimated Project Costs	***$200,000.00***

PN9108 New Stormwater Pond, BMP/LID

Address:	601 Deerfield Pond Court
Location:	Near northern Deerfield Court cul-de-sac
Land Owner:	County/Private
PIN:	0083 13 0020, 0083 14 0019, 0083 14 0029
Control Type	Quality/Quanity
Drainage Area	25.29 acres
Receiving Waters	Mine Run Branch

Description: This area is in need of additional water quality treatment. Construct new enhanced extended detention dry pond. Replace rip-rap swale with vegetated infiltration trench and check dams and install a new rain garden upstream of driveway culvert.

Project Area Map

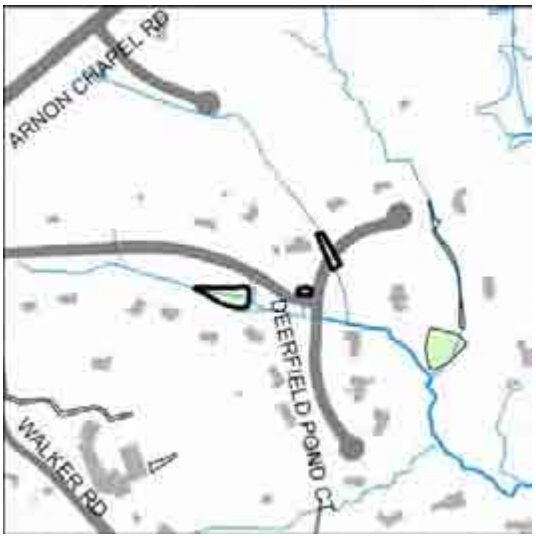
Project Benefits: This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The rain garden and infiltration trench will also reduce stormwater runoff volumes by promoting infiltration. An estimated 2,500 lbs/yr of total suspended solids, 38 lbs/yr of nitrogen, and 7 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. The majority of the project is located within a storm drainage easement, which may need to be enlarged. Accessibility is good from Deerfield Pond Court, but may be difficult due to residential properties. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Vegetated Swale	SY	120	$50.00	$6,000.00
Percolation/Infiltration Trench	SY	500	$75.00	$37,500.00
Organic Compost Soil Amendment	CY	155	$40.00	$6,200.00
Plantings	AC	0.5	$25,000.00	$12,500.00
Clear and Grub	AC	0.75	$8,500.00	$6,375.00
Grading and Excavation	CY	2000	$35.00	$70,000.00
Access Road	SY	775	$25.00	$19,375.00
Access Road Gate	EA	1	$2,500.00	$2,500.00
Embankment	CY	120	$50.00	$6,000.00
Structural BMP and Incidentals (Med)	LS	1	$15,000.00	$15,000.00
New Storm Pipe (Med)	LF	25	$200.00	$5,000.00
			Initial Project Costs	**$186,450.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$9,322.50
Erosion and Sediment Control: 10% of project costs				$18,645.00
			Base Construction Costs	**$214,417.50**
			Mobilization (5%)	$10,720.88
			Subtotal 1	**$225,138.38**
			Contingency (25%)	$56,284.59
			Subtotal 2	**$281,422.97**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$126,640.34
			Total Costs	**$408,063.30**
			Estimated Project Costs	***$410,000.00***

PN9109 New Stormwater Pond, Stormwater Pond Retrofit, BMP/LID



Address:	9903 Deerfield Pond Drive
Location:	Deerfield Pond Subdivision
Land Owner:	County/Private
PIN:	0083 13 B, 0083 13 0006, 0083 13 0007, 0083 13 0018A, 0083 13 0022
Control Type	Quality/Quanity
Drainage Area	92.88 acres
Receiving Waters	Mine Run Branch

Description: Retrofit existing non-stormwater pond to wet retention pond with increased storage. Improve wetland vegetation above road culvert and add outlet structure to create a new constructed wetland. Install a rain garden around existing inlet on corner.

Project Area Map

Project Benefits: This project will reduce sediment and nutrient loadings, improve water quality in downstream waterbodies, increase storage volume, reduce peak stormwater flows up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The rain garden will also reduce stormwater runoff volumes by promoting infiltration. An estimated 2,025 lbs/yr of total suspended solids, 24 lbs/yr of nitrogen, and 6 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. This is a privately owned pond that is located within a storm drainage easement. An additional storm drainage easement may be necessary. The project may be located along or within the road right-of-way. Accessibility is excellent from nearby roads. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Bioretention Filters & Basin	SY	200	$150.00	$30,000.00
Organic Compost Soil Amendment	CY	80	$40.00	$3,200.00
Plantings	AC	0.16	$25,000.00	$4,000.00
Clear and Grub	AC	0.1	$8,500.00	$850.00
Grading and Excavation	CY	925	$35.00	$32,375.00
Access Road	SY	150	$25.00	$3,750.00
Access Road Gate	EA	1	$2,500.00	$2,500.00
New Storm Pipe (Low)	LF	20	$100.00	$2,000.00
Embankment	CY	175	$50.00	$8,750.00
Outflow Pipe	LF	30	$125.00	$3,750.00
RipRap Stabilization	SY	30	$100.00	$3,000.00
Structural BMP and Incidentals (Med)	LS	1	$15,000.00	$15,000.00
Structural BMP Retrofit and Incidentals (Med)	LS	1	$15,000.00	$15,000.00
			Initial Project Costs	**$124,175.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$6,208.75
Erosion and Sediment Control: 10% of project costs				$12,417.50
			Base Construction Costs	**$142,801.25**
			Mobilization (5%)	$7,140.06
			Subtotal 1	**$149,941.31**
			Contingency (25%)	$37,485.33
			Subtotal 2	**$187,426.64**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$84,341.99
			Total Costs	**$271,768.63**
			Estimated Project Costs	***$280,000.00***

PN9110 BMP/LID, Education

Address:	701 Walker Road
Location:	Great Falls Elementary School
Land Owner:	County
PIN:	0074 01 0055A, 0074 14 0003A
Control Type	Quality
Drainage Area	3.84 acres
Receiving Waters	Mine Run Branch

Description: Install a bioretention area behind the Great Falls Elementary School, along the lower end of the basketball courts. Install educational signage and institute educational programs.

Project Area Map

Project Benefits: This project will improve water quality by reducing sediment and nutrient loadings, reduce stormwater peak flows for small storm events, reduce stormwater runoff volumes by promoting infiltration, and provide for evapotranspiration and wildlife habitat. An estimated 1,080 lbs/yr of total suspended solids, 13 lbs/yr of nitrogen, and 3 lbs/yr of phosphorus will be removed. This project provides an excellent opportunity for educational programs.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. A portion of the project is located in a Transco Gas easement. The property is owned by the county, so no storm drainage easements are necessary. Accessibility is excellent from the parking lot. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Percolation/Infiltration Trench	SY	0	$75.00	$0.00
Bioretention Filters & Basin	SY	250	$150.00	$37,500.00
Organic Compost Soil Amendment	CY	15	$40.00	$600.00
			Initial Project Costs	**$38,100.00**
Plantings: 5% of project costs (unless incl. as line item)				$1,905.00
Ancillary Items: 5% of project cost				$1,905.00
Erosion and Sediment Control: 10% of project costs				$3,810.00
			Base Construction Costs	**$45,720.00**
			Mobilization (5%)	$2,286.00
			Subtotal 1	**$48,006.00**
			Contingency (25%)	$12,001.50
			Subtotal 2	**$60,007.50**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$27,003.38
			Total Costs	**$87,010.88**
			Estimated Project Costs	***$90,000.00***

PN9111 Stormwater Pond (New/Retrofit),Culvert Retrofit, Stream Restoration

Address:	619 Insbruck Avenue
Location:	Marmota Farm Subdivision
Land Owner:	Private
PIN:	0083 12 0011, 0083 08 B3, 0083 08 0002, 0083 08 0003, 0083 08 0004, 0131 06 A, 0131 06 0005, 0083 08 0001
Control Type	Quality/Quanity
Drainage Area	485.29 acres
Receiving Waters	Mine Run Branch

Description: Retrofit existing non-stormwater wet pond (WP0209) to wet retention pond by installing proper outlet structure, constructing sediment forebay in western inlet and lowering water level slightly to provide storage. Repair stream erosion above pond. Install a micropool upstream of road culvert and a constructed wetland below culvert.

Project Area Map

Project Benefits: This project will reduce sediment and nutrient loadings, improve water quality in downstream waterbodies, increase storage volume, reduce peak stormwater flows up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new outlet structure will allow for a more controlled stormwater discharge to enhance the performance of the pond. Aeration increases the level of dissolved oxygen to balance normal biological processes, circulates water to deter algae, and improves water quality within a pond. This project will also repair eroded streambanks. An estimated 2,500 lbs/yr of total suspended solids, 38 lbs/yr of nitrogen, and 7 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. This is an existing stormwater facility but is not located within a County storm drainage easement. Storm drainage easements may be necessary. Accessibility is excellent from Insbruck Avenue. Tree impacts are expected. No significant construction issues are anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	95	$40.00	$3,800.00
Plantings	AC	0.3	$25,000.00	$7,500.00
Clear and Grub	AC	0.4	$8,500.00	$3,400.00
Grading and Excavation	CY	4030	$35.00	$141,050.00
Access Road	SY	400	$25.00	$10,000.00
Access Road Gate	EA	2	$2,500.00	$5,000.00
Embankment	CY	500	$50.00	$25,000.00
Outflow Pipe	LF	100	$125.00	$12,500.00
RipRap Stabilization	SY	100	$100.00	$10,000.00
Construct New Channel	LF	240	$200.00	$48,000.00
Additional Cost (first 500LF)	LF	240	$200.00	$48,000.00
Structural BMP and Incidentals (Med)	LS	2	$15,000.00	$30,000.00
New Storm Pipe (Med)	LF	70	$200.00	$14,000.00
Structural BMP Retrofit and Incidentals (High)	LS	1	$20,000.00	$20,000.00
			Initial Project Costs	**$378,250.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$18,912.50
Erosion and Sediment Control: 10% of project costs				$37,825.00
			Base Construction Costs	**$434,987.50**
			Mobilization (5%)	$21,749.38
			Subtotal 1	**$456,736.88**
			Contingency (25%)	$114,184.22
			Subtotal 2	**$570,921.09**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$256,914.49
			Total Costs	**$827,835.59**
			Estimated Project Costs	***$830,000.00***

PN9112 Stormwater Pond Retrofit

Address:	9638 Georgetown Pike
Location:	Near Rossmore Court cul-de-sac
Land Owner:	Private
PIN:	0131 01 0050B, 0131 05 0023A
Control Type	Quality/Quanity
Drainage Area	98.31 acres
Receiving Waters	Mine Run Branch

Description: This area does not have existing stormwater treatment. Retrofit existing farm pond to a wet retention pond and enlarge pond for additional storage capacity. Restore riparian buffer around pond and upstream.

Project Area Map

Project Benefits: This project will reduce sediment and nutrient loadings, improve water quality in downstream waterbodies, increase storage volume, reduce peak stormwater flows up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new outlet structure will allow for a more controlled stormwater discharge to enhance the performance of the pond. This project will also increase the storage capacity for the existing pond. Restoring the riparian buffer will also reduce stream temperatures. An estimated 4,660 lbs/yr of total suspended solids, 56 lbs/yr of nitrogen, and 13 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. This is a privately owned pond, and may require a storm drainage easement. Accessibility is excellent via an ingress-egress easement.. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	25	$40.00	$1,000.00
Plantings	AC	0.1	$25,000.00	$2,500.00
Clear and Grub	AC	0.1	$8,500.00	$850.00
Grading and Excavation	CY	2200	$35.00	$77,000.00
Embankment	CY	150	$50.00	$7,500.00
Outflow Pipe	LF	40	$125.00	$5,000.00
RipRap Stabilization	SY	25	$100.00	$2,500.00
Structural BMP Retrofit and Incidentals (Low)	LS	1	$10,000.00	$10,000.00
			Initial Project Costs	**$106,350.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$5,317.50
Erosion and Sediment Control: 10% of project costs				$10,635.00
			Base Construction Costs	**$122,302.50**
			Mobilization (5%)	$6,115.13
			Subtotal 1	**$128,417.63**
			Contingency (25%)	$32,104.41
			Subtotal 2	**$160,522.03**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$72,234.91
			Total Costs	**$232,756.95**
			Estimated Project Costs	***$240,000.00***

PN9113 New Stormwater Pond

Address:	550 Insbruck Avenue
Location:	Arnon Lake Subdivision
Land Owner:	Private
PIN:	0083 01 0032, 0083 10 0021
Control Type	Quality
Drainage Area	10.05 acres
Receiving Waters	Mine Run Branch

Description: This area does not have existing stormwater treatment. Install a new constructed wetland in a low clearing within the forested area adjacent to a private driveway.

Project Area Map

Project Benefits: The constructed wetlands will reduce stormwater peak flows for small storm events, reduce sediment and nutrient loadings, and provide for evaporation, evapotranspiration and wildlife habitat. An estimated 1,993 lbs/yr of total suspended solids, 24 lbs/yr of nitrogen, and 6 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. A storm drainage easement may be necessary. Accessibility is excellent from an ingress-egress easement along a private driveway. Tree impacts are anticipated. No significant construction issues are anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	50	$40.00	$2,000.00
Plantings	AC	0.2	$25,000.00	$5,000.00
Clear and Grub	AC	0.2	$8,500.00	$1,700.00
Grading and Excavation	CY	250	$35.00	$8,750.00
Access Road	SY	170	$25.00	$4,250.00
Access Road Gate	EA	1	$2,500.00	$2,500.00
Structural BMP and Incidentals (Low)	LS	1	$10,000.00	$10,000.00
New Storm Pipe (Low)	LF	25	$100.00	$2,500.00
Embankment	CY	100	$50.00	$5,000.00
			Initial Project Costs	**$41,700.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$2,085.00
Erosion and Sediment Control: 10% of project costs				$4,170.00
			Base Construction Costs	**$47,955.00**
			Mobilization (5%)	$2,397.75
			Subtotal 1	**$50,352.75**
			Contingency (25%)	$12,588.19
			Subtotal 2	**$62,940.94**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$28,323.42
			Total Costs	**$91,264.36**
			Estimated Project Costs	***$100,000.00***

PN9114 Stormwater Pond Retrofit, BMP/LID

Address:	501 Arnon Ridge Court
Location:	Arnon Ridge Subdivision
Land Owner:	County/Private
PIN:	0083 11 0002, 0083 11 0009, 0083 11 0010
Control Type	Quality/Quanity
Drainage Area	12 acres
Receiving Waters	Mine Run Branch

Description: The Arnon Ridge area is in need of additional water quality treatment. Retrofit naturalized dry pond (0182DP) to enhanced extended detention dry pond by installing outlet structure. Replace concrete and grass swales with vegetated swales and check dams.

Project Area Map

Project Benefits: This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new outlet structure will allow for a more controlled stormwater discharge to enhance the performance of the pond. Removal of the trickle ditch will also reduce stormwater velocities. An estimated 1,156 lbs/yr of total suspended solids, 14 lbs/yr of nitrogen, and 2 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. This is a county facility, and is located within a storm drainage esement. Additional storm drainage easements may be necessary. Parts of the project are located along or within road rights-of-way. Accessibility is excellent from adjacent roads. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Vegetated Swale	SY	1040	$50.00	$52,000.00
Organic Compost Soil Amendment	CY	130	$40.00	$5,200.00
Plantings	AC	0.1	$25,000.00	$2,500.00
Clear and Grub	AC	0.1	$8,500.00	$850.00
Grading and Excavation	CY	100	$35.00	$3,500.00
Embankment	CY	100	$50.00	$5,000.00
Outflow Pipe	LF	20	$125.00	$2,500.00
RipRap Stabilization	SY	15	$100.00	$1,500.00
Structural BMP Retrofit and Incidentals (Low)	LS	1	$10,000.00	$10,000.00
			Initial Project Costs	**$83,050.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$4,152.50
Erosion and Sediment Control: 10% of project costs				$8,305.00
			Base Construction Costs	**$95,507.50**
			Mobilization (5%)	$4,775.38
			Subtotal 1	**$100,282.88**
			Contingency (25%)	$25,070.72
			Subtotal 2	**$125,353.59**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$56,409.12
			Total Costs	**$181,762.71**
			Estimated Project Costs	***$190,000.00***

PN9116 Stormwater Pond Retrofit, Culvert Retrofit

Address:	10223 Beach Mill Road
Location:	Near Beach Mill Road & Springvale Road
Land Owner:	County/Private
PIN:	0034 01 0034A, 0034 01 0034B, 0034 04 A, 0034 04 0062
Control Type	Quality/Quanity
Drainage Area	278.83 acres
Receiving Waters	Pond Branch

Description: Flooding is overtopping Beach Mill Road and causing erosion at two road culverts. Install outlet structure in wet pond (WP0202) to provide storage. Raise the road bed, install larger culverts, and stabilize streambanks above and below the culverts.

Project Area Map

Project Benefits: The constructed wetlands will reduce stormwater peak flows for small storm events, reduce sediment and nutrient loadings, and provide for evaporation, evapotranspiration and wildlife habitat. The new outlet structure will allow for a more controlled stormwater discharge to enhance the performance of the pond. This project will also reduce flooding caused by undersized culverts, and will repair and stabilize streambank damage caused by flooding. An estimated 2,423 lbs/yr of total suspended solids, 29 lbs/yr of nitrogen, and 7 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. This is an existing county facility but is not located within a storm drainage easement. Storm drainage easements may be necessary. The two culverts are located within the road rights-of-way. Accessibility is excellent from Beach Mill Road. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	75	$40.00	$3,000.00
Plantings	AC	0.2	$25,000.00	$5,000.00
Clear and Grub	AC	0.2	$8,500.00	$1,700.00
Grading and Excavation	CY	2400	$35.00	$84,000.00
Earthen Berm	CY	150	$35.00	$5,250.00
Embankment	CY	150	$50.00	$7,500.00
Outflow Pipe	LF	100	$125.00	$12,500.00
RipRap Stabilization	SY	80	$100.00	$8,000.00
New Storm Pipe (Med)	LF	200	$200.00	$40,000.00
Structural BMP Retrofit and Incidentals (Med)	LS	1	$15,000.00	$15,000.00
			Initial Project Costs	**$181,950.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$9,097.50
Erosion and Sediment Control: 10% of project costs				$18,195.00
			Base Construction Costs	**$209,242.50**
			Mobilization (5%)	$10,462.13
			Subtotal 1	**$219,704.63**
			Contingency (25%)	$54,926.16
			Subtotal 2	**$274,630.78**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$123,583.85
			Total Costs	**$398,214.63**
			Estimated Project Costs	***$400,000.00***

PN9117 New Stormwater Pond, Stormwater Pond Retrofit

Address:	414 River Bend Road
Location:	Monalaine Court & River Bend Road
Land Owner:	County/Private
PIN:	0084 01 0013E, 0084 10 0001
Control Type	Quality/Quanity
Drainage Area	33.96 acres
Receiving Waters	Mine Run Branch

Description: Expand existing dry pond (0303DP) to intercept drainage from McNalane Court; retrofit to naturalized extended detention dry pond. Construct new naturalized extended detention basin in existing depression; daylight stormwater pipe from Riverbend Road.

Project Area Map

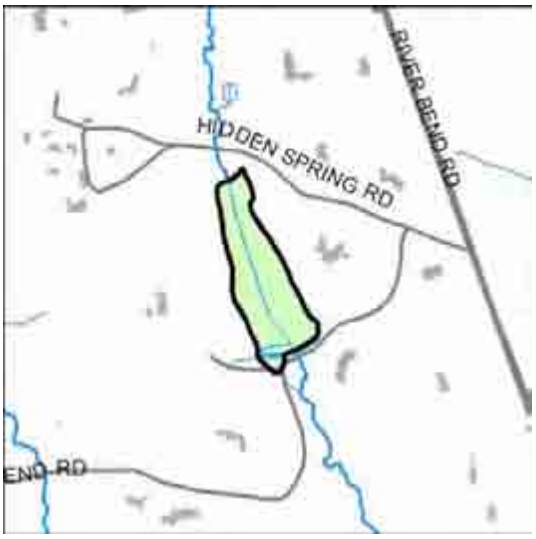
Project Benefits: This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. This project will also increase the storage capacity of the existing pond. The new outlet structure will allow for a more controlled stormwater discharge to enhance the performance of the pond. Removal of the trickle ditch will also reduce stormwater velocities. An estimated 978 lbs/yr of total suspended solids, 11 lbs/yr of nitrogen, and 2 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. This is an existing county facility, but is not located within a storm drainage easement. A storm drainage easement may be necessary. Part of the proposed enhanced extended detention dry pond is located within a storm drainage easement which may need to be enlarged. Accessibility is excellent from River Bend Road. No tree impacts are anticipated. Existing storm sewer must be daylighted. The dry ponds must be deep enough to intercept piped storm sewers.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	85	$40.00	$3,400.00
Plantings	AC	0.3	$25,000.00	$7,500.00
Clear and Grub	AC	0.33	$8,500.00	$2,805.00
Grading and Excavation	CY	2050	$35.00	$71,750.00
Access Road	SY	300	$25.00	$7,500.00
Access Road Gate	EA	1	$2,500.00	$2,500.00
Embankment	CY	225	$50.00	$11,250.00
Outflow Pipe	LF	75	$125.00	$9,375.00
RipRap Stabilization	SY	30	$100.00	$3,000.00
Structural BMP and Incidentals (Med)	LS	1	$15,000.00	$15,000.00
New Storm Pipe (Med)	LF	60	$200.00	$12,000.00
Structural BMP Retrofit and Incidentals (Med)	LS	1	$15,000.00	$15,000.00
			Initial Project Costs	**$161,080.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$8,054.00
Erosion and Sediment Control: 10% of project costs				$16,108.00
			Base Construction Costs	**$185,242.00**
			Mobilization (5%)	$9,262.10
			Subtotal 1	**$194,504.10**
			Contingency (25%)	$48,626.03
			Subtotal 2	**$243,130.13**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$109,408.56
			Total Costs	**$352,538.68**
			Estimated Project Costs	***$360,000.00***

PN9118 Stormwater Pond Retrofit, Culvert Retrofit



Address:	456 River Bend Road
Location:	Near River Bend Road & Hidden Springs Road
Land Owner:	Private
PIN:	0084 01 0020, 0084 01 0021, 0084 01 0025, 0084 01 0028, 0084 01 0034Z, 0084 01 0036, 0084 09 0012
Control Type	Quality/Quanity
Drainage Area	181.34 acres
Receiving Waters	Mine Run Branch

Description: Retrofit existing farm pond (FM0002) to wet retention pond; install outlet structure and lower water level for additional storage. Repair and stabilize erosion impacts to spillway and downstream channel and culvert at River Bend Road.

Project Area Map

Project Benefits: This project will reduce sediment and nutrient loadings, improve water quality in downstream waterbodies, increase storage volume, reduce peak stormwater flows up to the 10-year event, and provide for evapotranspiration and wildlife habitat. This project will also repair damage to the spillway. The new outlet structure will allow for a more controlled stormwater discharge to enhance the performance of the pond. This project will also repair damage to River Bend Road and stabilize the channel. An estimated 1,612 lbs/yr of total suspended solids, 19 lbs/yr of nitrogen, and 5 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. The farm pond is privately owned by multiple owners. A storm drainage easement may be necessary. Accessibility is excellent via an ingress-egress easement from nearby roads. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	40	$40.00	$1,600.00
Plantings	AC	0.1	$25,000.00	$2,500.00
Clear and Grub	AC	0.1	$8,500.00	$850.00
Grading and Excavation	CY	250	$35.00	$8,750.00
Embankment	CY	150	$50.00	$7,500.00
Outflow Pipe	LF	50	$125.00	$6,250.00
RipRap Stabilization	SY	75	$100.00	$7,500.00
Structural BMP Retrofit and Incidentals (High)	LS	1	$20,000.00	$20,000.00
			Initial Project Costs	**$54,950.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$2,747.50
Erosion and Sediment Control: 10% of project costs				$5,495.00
			Base Construction Costs	**$63,192.50**
			Mobilization (5%)	$3,159.63
			Subtotal 1	**$66,352.13**
			Contingency (25%)	$16,588.03
			Subtotal 2	**$82,940.16**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$37,323.07
			Total Costs	**$120,263.23**
			Estimated Project Costs	***$130,000.00***

PN9119 Stormwater Pond Retrofit

Address:	801 Olde Georgetown Court
Location:	Fallswood Subdivision
Land Owner:	County
PIN:	0132 07 0009
Control Type	Quality/Quanity
Drainage Area	3.45 acres
Receiving Waters	Mine Run Branch

Description: Fallswood subdivision is in need of additional water quality treatment. Retrofit existing dry pond (1443DP) to naturalized extended detention dry pond with a new outlet structure and naturlized vegetation.

Project Area Map

Project Benefits: This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new outlet structure will allow for a more controlled stormwater discharge to enhance the performance of the pond. An estimated 229 lbs/yr of total suspended solids, 3 lbs/yr of nitrogen, and 1 lb/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. This is an existing County facility, but is not within a storm drainage easement. A storm drainage easement may be necessary. Accessibility is excellent from Olde Georgetown Court. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	40	$40.00	$1,600.00
Plantings	AC	0.15	$25,000.00	$3,750.00
Clear and Grub	AC	0.1	$8,500.00	$850.00
Grading and Excavation	CY	360	$35.00	$12,600.00
Embankment	CY	100	$50.00	$5,000.00
Outflow Pipe	LF	55	$125.00	$6,875.00
RipRap Stabilization	SY	15	$100.00	$1,500.00
Structural BMP Retrofit and Incidentals (Low)	LS	1	$10,000.00	$10,000.00
			Initial Project Costs	**$42,175.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$2,108.75
Erosion and Sediment Control: 10% of project costs				$4,217.50
			Base Construction Costs	**$48,501.25**
			Mobilization (5%)	$2,425.06
			Subtotal 1	**$50,926.31**
			Contingency (25%)	$12,731.58
			Subtotal 2	**$63,657.89**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$28,646.05
			Total Costs	**$92,303.94**
			Estimated Project Costs	***$100,000.00***

PN9120 Stormwater Pond Retrofit

Address:	9401Cornwell Farm Drive
Location:	Cornwell Farm Subdivision
Land Owner:	Private
PIN:	0132 06 0005A, 0132 06 0004A
Control Type	Quality/Quanity
Drainage Area	17.05 acres
Receiving Waters	Mine Run Branch

Description: This area of Cornwell Farm subdivision does not have existing stormwater treatment. Retrofit two existing ponds to wet retention ponds; install outlet structures and lower water levels for additional storage, plant emergent and riparian vegetation.

Project Area Map

Project Benefits: This project will reduce sediment and nutrient loadings, improve water quality in downstream waterbodies, increase storage volume, reduce peak stormwater flows up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new outlet structures will allow for a more controlled stormwater discharge to enhance the performance of the ponds. An estimated 2,150 lbs/yr of total suspended solids, 26 lbs/yr of nitrogen, and 6 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. These ponds are privately owned and may require storm drainage easements. Accessibility is excellent from Cornwell Farm Drive. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	50	$40.00	$2,000.00
Plantings	AC	0.15	$25,000.00	$3,750.00
Clear and Grub	AC	0.1	$8,500.00	$850.00
Grading and Excavation	CY	350	$35.00	$12,250.00
Embankment	CY	175	$50.00	$8,750.00
Outflow Pipe	LF	130	$125.00	$16,250.00
RipRap Stabilization	SY	45	$100.00	$4,500.00
Structural BMP Retrofit and Incidentals (Low)	LS	2	$10,000.00	$20,000.00
			Initial Project Costs	**$68,350.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$3,417.50
Erosion and Sediment Control: 10% of project costs				$6,835.00
			Base Construction Costs	**$78,602.50**
			Mobilization (5%)	$3,930.13
			Subtotal 1	**$82,532.63**
			Contingency (25%)	$20,633.16
			Subtotal 2	**$103,165.78**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$46,424.60
			Total Costs	**$149,590.38**
			Estimated Project Costs	***$150,000.00***

PN9122 Stormwater Pond Retrofit, Stream Restoration

Address:	528 River Bend Road
Location:	Jackson Hills Subdivision
Land Owner:	Private
PIN:	0132 04 B
Control Type	Quality/Quanity
Drainage Area	76.58 acres
Receiving Waters	Mine Run Branch

Description: Mine Run streambanks are incised and undercut. Re-grade and stabilize erosion impacts upstream of Riverbend Road. Retrofit nearby farm pond to wet retention pond to provide storage and water quality treatment for homes along Riverbend Road.

Project Area Map

Project Benefits: This project will reduce sediment and nutrient loadings, improve water quality in downstream waterbodies, increase storage volume, reduce peak stormwater flows up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new outlet structure will allow for a more controlled stormwater discharge to enhance the performance of the pond. This project will also stabilize and restore the streambanks. An estimated 23,176 lbs/yr of total suspended solids, 21 lbs/yr of nitrogen, and 8 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. This is a privately owned pond, and may require a storm drainage easement. Accessibility is excellent from River Bend Road. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	40	$40.00	$1,600.00
Plantings	AC	0.1	$25,000.00	$2,500.00
Clear and Grub	AC	0.05	$8,500.00	$425.00
Grading and Excavation	CY	150	$35.00	$5,250.00
Embankment	CY	100	$50.00	$5,000.00
Outflow Pipe	LF	50	$125.00	$6,250.00
RipRap Stabilization	SY	30	$100.00	$3,000.00
Construct New Channel	LF	470	$200.00	$94,000.00
Additional Cost (first 500LF)	LF	470	$200.00	$94,000.00
Structural BMP Retrofit and Incidentals (Low)	LS	1	$10,000.00	$10,000.00
			Initial Project Costs	**$222,025.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$11,101.25
Erosion and Sediment Control: 10% of project costs				$22,202.50
			Base Construction Costs	**$255,328.75**
			Mobilization (5%)	$12,766.44
			Subtotal 1	**$268,095.19**
			Contingency (25%)	$67,023.80
			Subtotal 2	**$335,118.98**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$150,803.54
			Total Costs	**$485,922.53**
			Estimated Project Costs	***$490,000.00***

PN9123 Stormwater Pond Retrofit

Address:	221 Bliss Lane
Location:	Near Bliss Lane & Commonage Drive
Land Owner:	Private
PIN:	0034 01 0008A
Control Type	Quality/Quanity
Drainage Area	28.9 acres
Receiving Waters	Pond Branch

Description: This area of Southdown Farm subdivision does not have existing stormwater treatment. Retrofit existing pond to a wet retention pond; install outlet structure and lower the water level for additional storage, and plant emergent and riparian vegetation.

Project Area Map

Project Benefits: This project will reduce sediment and nutrient loadings, improve water quality in downstream waterbodies, increase storage volume, reduce peak stormwater flows up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new outlet structure will allow for a more controlled stormwater discharge to enhance the performance of the pond. An estimated 1,742 lbs/yr of total suspended solids, 22 lbs/yr of nitrogen, and 5 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. This is a privately owned pond, and may require a storm drainage easement. Accessibility is excellent via an ingress-egress easement from Bliss Lane. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	40	$40.00	$1,600.00
Plantings	AC	0.1	$25,000.00	$2,500.00
Clear and Grub	AC	0.05	$8,500.00	$425.00
Grading and Excavation	CY	100	$35.00	$3,500.00
Embankment	CY	100	$50.00	$5,000.00
Outflow Pipe	LF	85	$125.00	$10,625.00
RipRap Stabilization	SY	20	$100.00	$2,000.00
Structural BMP Retrofit and Incidentals (Med)	LS	1	$15,000.00	$15,000.00
			Initial Project Costs	**$40,650.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$2,032.50
Erosion and Sediment Control: 10% of project costs				$4,065.00
			Base Construction Costs	**$46,747.50**
			Mobilization (5%)	$2,337.38
			Subtotal 1	**$49,084.88**
			Contingency (25%)	$12,271.22
			Subtotal 2	**$61,356.09**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$27,610.24
			Total Costs	**$88,966.34**
			Estimated Project Costs	***$90,000.00***

PN9124 Stormwater Pond Retrofit

Address:	531 Falls Road
Location:	Jackson Hills Subdivision
Land Owner:	Private
PIN:	0132 04 0009, 0132 04 0010B
Control Type	Quality/Quanity
Drainage Area	16.6 acres
Receiving Waters	Mine Run Branch

Description: This area of Jackson Hills does not have existing stormwater treatment. Retrofit existing pond to a wet retention pond; install outlet structure and lower the water level for additional storage, and plant emergent and riparian vegetation.

Project Area Map

Project Benefits: This project will reduce sediment and nutrient loadings, improve water quality in downstream waterbodies, increase storage volume, reduce peak stormwater flows up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new outlet structure will allow for a more controlled stormwater discharge to enhance the performance of the pond. An estimated 1,063 lbs/yr of total suspended solids, 13 lbs/yr of nitrogen, and 3 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. This pond is privately owned by multiple owners. A storm drainage easement may be necessary. Accessibility is good from Falls Road but may be difficult due to tree cover. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	40	$40.00	$1,600.00
Plantings	AC	0.1	$25,000.00	$2,500.00
Clear and Grub	AC	0.1	$8,500.00	$850.00
Grading and Excavation	CY	100	$35.00	$3,500.00
Embankment	CY	100	$50.00	$5,000.00
Outflow Pipe	LF	55	$125.00	$6,875.00
RipRap Stabilization	SY	20	$100.00	$2,000.00
Structural BMP Retrofit and Incidentals (Low)	LS	1	$10,000.00	$10,000.00
			Initial Project Costs	**$32,325.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$1,616.25
Erosion and Sediment Control: 10% of project costs				$3,232.50
			Base Construction Costs	**$37,173.75**
			Mobilization (5%)	$1,858.69
			Subtotal 1	**$39,032.44**
			Contingency (25%)	$9,758.11
			Subtotal 2	**$48,790.55**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$21,955.75
			Total Costs	**$70,746.29**
			Estimated Project Costs	***$80,000.00***

PN9126 Stormwater Pond Retrofit

Address:	502 Walker Road
Location:	Squire's Haven Section 2 Subdivision
Land Owner:	Private
PIN:	0074 03 0021B, 0074 04 A
Control Type	Quality/Quanity
Drainage Area	3.68 acres
Receiving Waters	Clarks Branch

Description: The culvert under Walker Road is collapsed or completely blocked with sediment. Replace road culvert and retrofit upstream pond to a wet retention pond to provide storage and water quality treatment for Squire's Haven subdivision.

Project Area Map

Project Benefits: This project will reduce sediment and nutrient loadings, improve water quality in downstream waterbodies, increase storage volume, reduce peak stormwater flows up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new outlet structure will allow for a more controlled stormwater discharge to enhance the performance of the pond. This project will also repair the damaged culvert. An estimated 8,375 lbs/yr of total suspended solids, 98 lbs/yr of nitrogen, and 24 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. This is a privately owned pond, and may require a storm drainage easement. Accessibility is excellent from Walker Road. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	40	$40.00	$1,600.00
Plantings	AC	0.1	$25,000.00	$2,500.00
Clear and Grub	AC	0.1	$8,500.00	$850.00
Grading and Excavation	CY	2000	$35.00	$70,000.00
Embankment	CY	150	$50.00	$7,500.00
Outflow Pipe	LF	120	$125.00	$15,000.00
RipRap Stabilization	SY	40	$100.00	$4,000.00
Structural BMP Retrofit and Incidentals (Low)	LS	1	$10,000.00	$10,000.00
			Initial Project Costs	**$111,450.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$5,572.50
Erosion and Sediment Control: 10% of project costs				$11,145.00
			Base Construction Costs	**$128,167.50**
			Mobilization (5%)	$6,408.38
			Subtotal 1	**$134,575.88**
			Contingency (25%)	$33,643.97
			Subtotal 2	**$168,219.84**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$75,698.93
			Total Costs	**$243,918.77**
			Estimated Project Costs	***$250,000.00***

PN9127 Stormwater Pond Retrofit, BMP/LID

Address:	354 Club View Drive
Location:	Eagon Hills & River Bend Estates Subdivision
Land Owner:	County/Private
PIN:	0081 05 A, 0081 05 0019, 0083 17 0003, 0081 11 0001, 0083 16 0003, 0083 16 0004
Control Type	Quality/Quanity
Drainage Area	61.68 acres
Receiving Waters	Clarks Branch

Description: Riverbend Esates and Dogwood Hills are in need of water quality treatment. Retrofit two dry ponds to enhanced extended detention dry ponds. Install rain garden around existing inlet. Daylight storm sewer and install vegetated swale with check dams.

Project Area Map

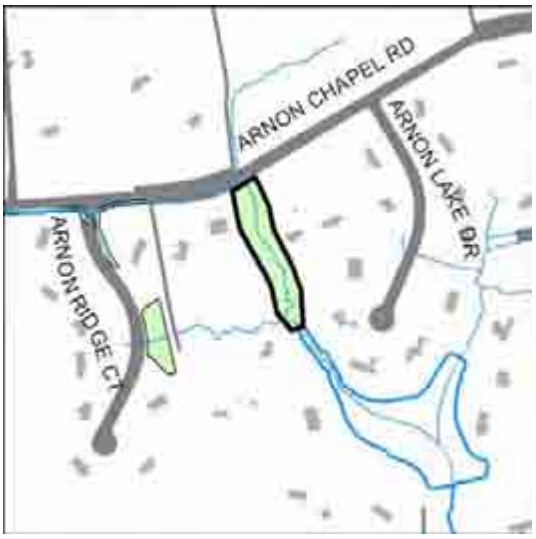
Project Benefits: This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new/improved outlet structures will allow for a more controlled stormwater discharge to enhance the performance of the ponds. The rain garden will also reduce stormwater runoff volumes by promoting infiltration. An estimated 2,832 lbs/yr of total suspended solids, 30 lbs/yr of nitrogen, and 6 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. These are county-owned facilities, though only 0086DP is located within a storm drainage easement. Additional storm drainage easements may be necessary. Accessibility is good from Club View Drive or Lindsay Blake Lane. Access to 0892DP may be difficult due to tree cover. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	155	$40.00	$6,200.00
Plantings	AC	0.5	$25,000.00	$12,500.00
Clear and Grub	AC	0.5	$8,500.00	$4,250.00
Grading and Excavation	CY	2200	$35.00	$77,000.00
Embankment	CY	150	$50.00	$7,500.00
Outflow Pipe	LF	125	$125.00	$15,625.00
RipRap Stabilization	SY	40	$100.00	$4,000.00
Structural BMP Retrofit and Incidentals (Low)	LS	1	$10,000.00	$10,000.00
Structural BMP Retrofit and Incidentals (Med)	LS	1	$15,000.00	$15,000.00
			Initial Project Costs	**$152,075.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$7,603.75
Erosion and Sediment Control: 10% of project costs				$15,207.50
			Base Construction Costs	**$174,886.25**
			Mobilization (5%)	$8,744.31
			Subtotal 1	**$183,630.56**
			Contingency (25%)	$45,907.64
			Subtotal 2	**$229,538.20**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$103,292.19
			Total Costs	**$332,830.39**
			Estimated Project Costs	***$340,000.00***

PN9200 Stream Restoration



Address:	9697 Arnon Chapel Road
Location:	Arnon Lake Subdivision
Land Owner:	Private
PIN:	0083 10 0010, 0083 10 0011, 0083 10 0015, 0083 10 0018
Control Type	Quality
Drainage Area	107.86 acres
Receiving Waters	Mine Run Branch

Description: Stream is lengthening and eroding meanders. Re-construct stream channel to start meander below Arnon Chapel Road and lengthen stream more evenly to reduce potential for erosion at downstream tight meanders and sediment deposition in the downstream pond.

Project Area Map

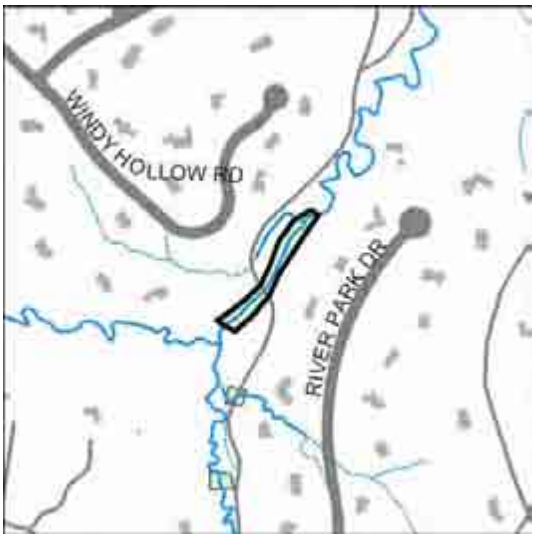
Project Benefits: This project will stabilize streambanks and improve water quality by reducing sediment and nutrient loadings. An estimated 5,960 lbs/yr of total suspended solids, 5 lbs/yr of nitrogen, and 2 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. Accessibility is excellent from Arnon Chapel Road. Tree impacts are expected. No significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
RipRap Stabilization	SY	120	$100.00	$12,000.00
Construct New Channel	LF	350	$200.00	$70,000.00
Additional Cost (first 500LF)	LF	350	$200.00	$70,000.00
			Initial Project Costs	**$152,000.00**
Plantings: 5% of project costs (unless incl. as line item)				$7,600.00
Ancillary Items: 5% of project cost				$7,600.00
Erosion and Sediment Control: 10% of project costs				$15,200.00
			Base Construction Costs	**$182,400.00**
			Mobilization (5%)	$9,120.00
			Subtotal 1	**$191,520.00**
			Contingency (25%)	$47,880.00
			Subtotal 2	**$239,400.00**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$107,730.00
			Total Costs	**$347,130.00**
			Estimated Project Costs	***$350,000.00***

PN9201 Stream Restoration



Address:	174 River Park Drive
Location:	Riverbend Knolls Subdivision
Land Owner:	County/Private
PIN:	0043 09 0006, 0043 09 0007, 0043 09 0008, 0043 09 0009, 0043 10 0003, 0043 10 0004, 0043 10 0005
Control Type	Quality
Drainage Area	644.7 acres
Receiving Waters	Pond Branch

Description: High energy stormflows and obstructions have caused severe erosion and washed out a pedestrian bridge near River Park Drive. Replace bridge; stabilize banks; install step pools and instream structures to dissipate energy and direct energy away from banks.

Project Area Map

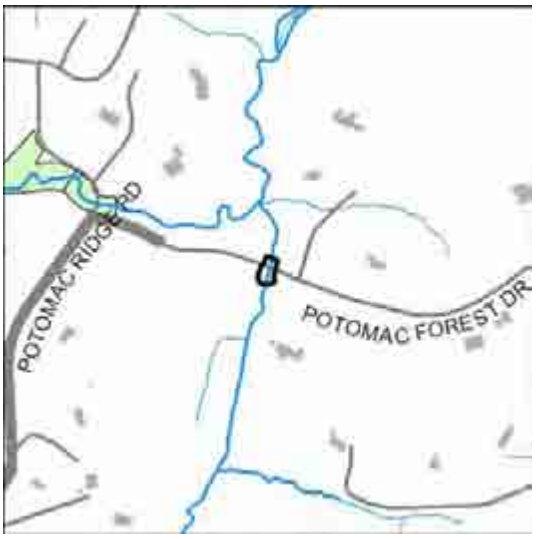
Project Benefits: Step pools will protect streambanks, reduce sediment and nutrient loadings, reduce stormwater peak flows, and provide for aquatic wildlife habitats. This project will also repair and stabilize streambanks. The washed out bridge will be replaced. An estimated 91,800 lbs/yr of total suspended solids, 73 lbs/yr of nitrogen, and 28 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. Parts of this project are located on a conservation easement and an ingress-egress easement. Accessibility is excellent from River Park Drive. There are no tree impacts or significant construction issues anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
RipRap Stabilization	SY	50	$100.00	$5,000.00
Construct New Channel	LF	100	$200.00	$20,000.00
Additional Cost (first 500LF)	LF	100	$200.00	$20,000.00
Change Channel Type - Step Pools	LF	550	$40.00	$22,000.00
			Initial Project Costs	**$67,000.00**
Plantings: 5% of project costs (unless incl. as line item)				$3,350.00
Ancillary Items: 5% of project cost				$3,350.00
Erosion and Sediment Control: 10% of project costs				$6,700.00
			Base Construction Costs	**$80,400.00**
			Mobilization (5%)	$4,020.00
			Subtotal 1	**$84,420.00**
			Contingency (25%)	$21,105.00
			Subtotal 2	**$105,525.00**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$47,486.25
			Total Costs	**$153,011.25**
			Estimated Project Costs	***$160,000.00***

PN9400 Culvert Retrofit



Address:	9111 Potomac Forest Drive
Location:	Potomac Forest Subdivision
Land Owner:	County/Private
PIN:	0082 04 0011A
Control Type	Quality/Quanity
Drainage Area	318.7 acres
Receiving Waters	Clarks Branch

Description: Culvert at Potomac Forest Drive is clogging with debris and causing severe erosion downstream. Install micropool with control structure to reduce clogging upstream; install energy dissipation and stabilize stream banks downstream.

Project Area Map

Project Benefits: This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. Streambanks downstream of culvert will be stabilized. Energy dissipation will reduce stormwater velocities. An estimated 5,487 lbs/yr of total suspended solids, 65 lbs/yr of nitrogen, and 16 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. This project is located within the ingress-egress easement of Potomac Forest Drive. A storm drainage easement may be necessary. Accessibility is excellent from Potomac Forest Drive. Tree impacts are expected. No significant construction issues are anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Organic Compost Soil Amendment	CY	25	$40.00	$1,000.00
Plantings	AC	0.05	$25,000.00	$1,250.00
Clear and Grub	AC	0.05	$8,500.00	$425.00
Grading and Excavation	CY	550	$35.00	$19,250.00
Earthen Berm	CY	150	$35.00	$5,250.00
RipRap Stabilization	SY	50	$100.00	$5,000.00
Structural BMP and Incidentals (High)	LS	1	$20,000.00	$20,000.00
New Storm Pipe (High)	LF	0	$300.00	$0.00
			Initial Project Costs	**$52,175.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$2,608.75
Erosion and Sediment Control: 10% of project costs				$5,217.50
			Base Construction Costs	**$60,001.25**
			Mobilization (5%)	$3,000.06
			Subtotal 1	**$63,001.31**
			Contingency (25%)	$15,750.33
			Subtotal 2	**$78,751.64**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$35,438.24
			Total Costs	**$114,189.88**
			Estimated Project Costs	***$120,000.00***

PN9408 Stream Restoration

Address:	9499 Beach Mill Road
Location:	Fitz Folly Farms Subdivision & Riverside Manor Subdivision
Land Owner:	Private
PIN:	0081 04 0050, 0081 04 0051, 0081 04 0052, 0081 10 0014
Control Type	Quality/Quanity
Drainage Area	25.46 acres
Receiving Waters	Clarks Branch

Description: Stream is eroded below a shared driveway culvert. Construct micropool above culvert; replace culvert and direct pipe toward new stream channel. Relocate stream channel below culvert away from steep bank; stabilize banks with boulder toe and live stakes.

Project Area Map

Project Benefits: This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. This project will also repair and stabilize streambanks. An estimated 7,088 lbs/yr of total suspended solids, 84 lbs/yr of nitrogen, and 20 lbs/yr of phosphorus will be removed.

Project Design Considerations: Minimal environmental permitting requirements are anticipated. Additional permitting may be required for a project within a stream or wetland. Projects in RPAs may require exemptions or waivers. Part of this project is located within an ingress egress easement. A storm drainage easement may be necessary. Accessibility is good from the ingress egress easement from Beach Mill Road, though it may be difficult due to tree cover. Tree impacts are expected. No significant construction issues are anticipated.

Costs:

Item	*Units*	*Quantity*	*Unit Cost*	*Total*
Vegetated Swale	SY	50	$50.00	$2,500.00
Organic Compost Soil Amendment	CY	90	$40.00	$3,600.00
Plantings	AC	0.35	$25,000.00	$8,750.00
Clear and Grub	AC	0.35	$8,500.00	$2,975.00
Grading and Excavation	CY	2300	$35.00	$80,500.00
Earthen Berm	CY	100	$35.00	$3,500.00
RipRap Stabilization	SY	250	$100.00	$25,000.00
Construct New Channel	LF	160	$200.00	$32,000.00
Additional Cost (first 500LF)	LF	160	$200.00	$32,000.00
Structural BMP and Incidentals (Med)	LS	1	$15,000.00	$15,000.00
New Storm Pipe (Med)	LF	135	$200.00	$27,000.00
			Initial Project Costs	**$232,825.00**
Plantings: 5% of project costs (unless incl. as line item)				$0.00
Ancillary Items: 5% of project cost				$11,641.25
Erosion and Sediment Control: 10% of project costs				$23,282.50
			Base Construction Costs	**$267,748.75**
			Mobilization (5%)	$13,387.44
			Subtotal 1	**$281,136.19**
			Contingency (25%)	$70,284.05
			Subtotal 2	**$351,420.23**
			Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)	$158,139.11
			Total Costs	**$509,559.34**
			Estimated Project Costs	***$510,000.00***