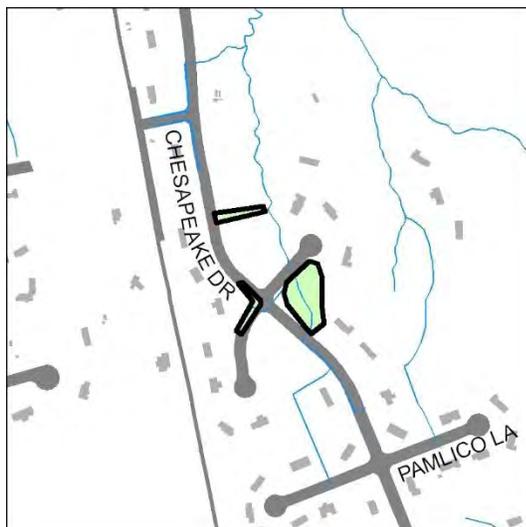


**PN9100 New Stormwater Pond, BMP/LID**



**Address:** 9511 Neuse Way  
**Location:** Riverside Manor Subdivision  
**Land Owner:** State/Private  
**PIN:** 0081 04 0011, 0081 04 0048C, 0081 04 0049, 0081 04 D, VDOT  
**Control Type:** Quality/Quantity  
**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*

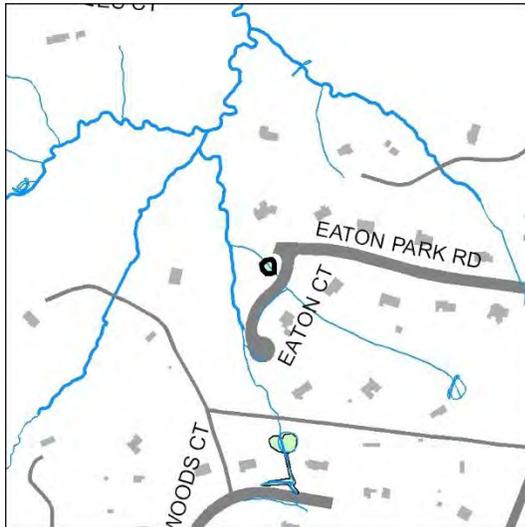
**Project Benefits:** Naturalized basins and swales will reduce sediment and nutrient loadings and slow runoff. An estimated 1,288 lbs/yr of total suspended solids, 16 lbs/yr of nitrogen, and 3 lbs/yr of phosphorus will be removed.

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

**Costs:**

<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
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
<b>Initial Project Costs</b>				<b>\$73,850.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$3,692.50
<i>Erosion and Sediment Control: 10% of project costs</i>				\$7,385.00
<b>Base Construction Costs</b>				<b>\$84,927.50</b>
<i>Mobilization (5%)</i>				\$4,246.38
<b>Subtotal 1</b>				<b>\$89,173.88</b>
<i>Contingency (25%)</i>				\$22,293.47
<b>Subtotal 2</b>				<b>\$111,467.34</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)</i>				\$50,160.30
<b>Total Costs</b>				<b>\$161,627.65</b>
<b>Estimated Project Costs</b>				<b>\$170,000.00</b>

## PN9101 New Stormwater Pond



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

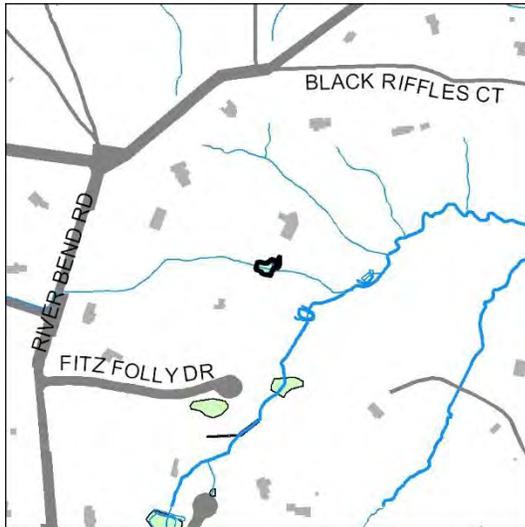
**Project Benefits:** The constructed wetlands will reduce stormwater peak flows for small storm events, reduce sediment and nutrient loadings, and provide for evaporation, evapotranspiration and wildlife habitat. An estimated 1,328 lbs/yr of total suspended solids, 17 lbs/yr of nitrogen, and 3 lbs/yr 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 exceptions or waivers. A storm drainage easement will be necessary. Accessibility is excellent from Eaton Court. Tree impacts are expected. No significant construction issues are anticipated.

**Costs:**

<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
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
<b>Initial Project Costs</b>				<b>\$33,325.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$1,666.25
<i>Erosion and Sediment Control: 10% of project costs</i>				\$3,332.50
<b>Base Construction Costs</b>				<b>\$38,323.75</b>
<i>Mobilization (5%)</i>				\$1,916.19
<b>Subtotal 1</b>				<b>\$40,239.94</b>
<i>Contingency (25%)</i>				\$10,059.98
<b>Subtotal 2</b>				<b>\$50,299.92</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility</i>				
<i>Relocation and Permits (45%)</i>				\$22,634.96
<b>Total Costs</b>				<b>\$72,934.89</b>
<b>Estimated Project Costs</b>				<b>\$80,000.00</b>

## 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*

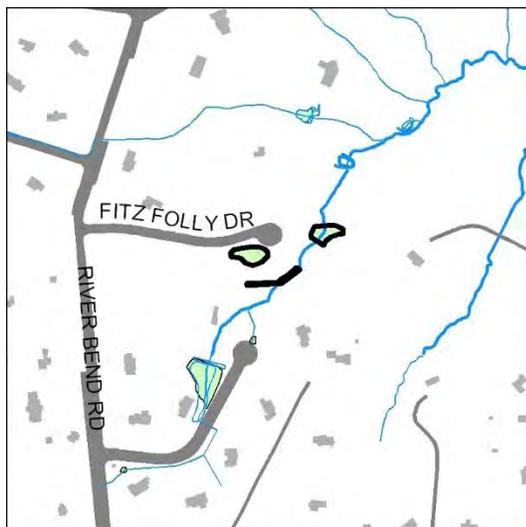
**Project Benefits:** The constructed wetlands will reduce stormwater peak flows for small storm events, reduce sediment and nutrient loadings, and provide for evaporation, evapotranspiration and wildlife habitat. The new outlet structure will allow for a more controlled stormwater discharge to enhance 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 will require a storm drainage easement. Accessibility may be difficult due to space constraints and tree cover. Minimal tree impacts and no significant construction issues anticipated.

**Costs:**

<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
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
<b>Initial Project Costs</b>				<b>\$57,655.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$2,882.75
<i>Erosion and Sediment Control: 10% of project costs</i>				\$5,765.50
<b>Base Construction Costs</b>				<b>\$66,303.25</b>
<i>Mobilization (5%)</i>				\$3,315.16
<b>Subtotal 1</b>				<b>\$69,618.41</b>
<i>Contingency (25%)</i>				\$17,404.60
<b>Subtotal 2</b>				<b>\$87,023.02</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility</i>				
<i>Relocation and Permits (45%)</i>				\$39,160.36
<b>Total Costs</b>				<b>\$126,183.37</b>
<b>Estimated Project Costs</b>				<b>\$130,000.00</b>

**PN9103 New Stormwater Pond, BMP/LID, Stream Restoration**



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

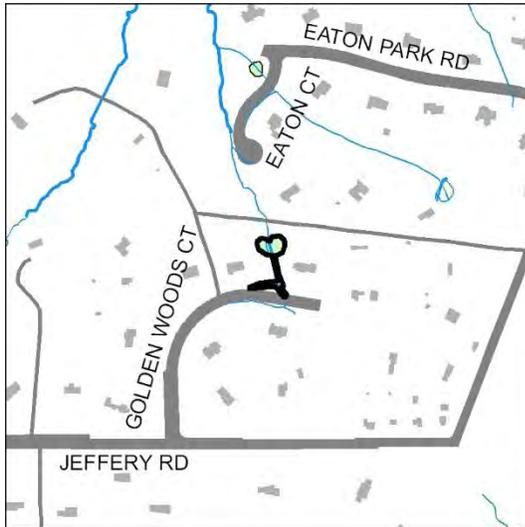
**Project Benefits:** This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The rain garden will also reduce stormwater runoff volumes by promoting infiltration. 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 exceptions or waivers. Part of the project is located within storm drainage easements. An additional storm drainage easement will be necessary for the new dry pond. Accessibility is excellent from Fitz Folly Drive. Minimal tree impacts and no significant construction issues anticipated.

**Costs:**

<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
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
<b>Initial Project Costs</b>				<b>\$279,000.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$13,950.00
<i>Erosion and Sediment Control: 10% of project costs</i>				\$27,900.00
<b>Base Construction Costs</b>				<b>\$320,850.00</b>
<i>Mobilization (5%)</i>				\$16,042.50
<b>Subtotal 1</b>				<b>\$336,892.50</b>
<i>Contingency (25%)</i>				\$84,223.13
<b>Subtotal 2</b>				<b>\$421,115.63</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility</i>				
<i>Relocation and Permits (45%)</i>				\$189,502.03
<b>Total Costs</b>				<b>\$610,617.66</b>
<b>Estimated Project Costs</b>				<b>\$620,000.00</b>

**PN9104 Stormwater Pond Retrofit, BMP/LID**



<b>Address:</b>	250 Golden Woods Court
<b>Location:</b>	Golden Woods Subdivision
<b>Land Owner:</b>	County
<b>PIN:</b>	0082 12 0004, 0082 12 0005
<b>Control Type</b>	Quality/Quantity
<b>Drainage Area</b>	29.59 acres
<b>Receiving Waters</b>	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*

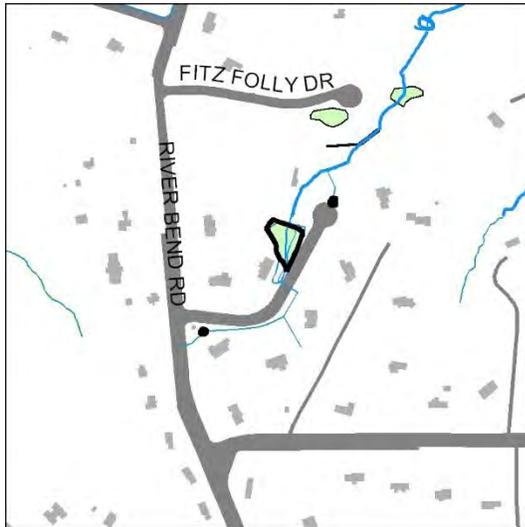
**Project Benefits:** This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. This project will also increase the storage capacity for the existing pond. 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:**

<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
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
<b>Initial Project Costs</b>				<b>\$90,475.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$4,523.75
<i>Erosion and Sediment Control: 10% of project costs</i>				\$9,047.50
<b>Base Construction Costs</b>				<b>\$104,046.25</b>
<i>Mobilization (5%)</i>				\$5,202.31
<b>Subtotal 1</b>				<b>\$109,248.56</b>
<i>Contingency (25%)</i>				\$27,312.14
<b>Subtotal 2</b>				<b>\$136,560.70</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)</i>				\$61,452.32
<b>Total Costs</b>				<b>\$198,013.02</b>
<b>Estimated Project Costs</b>				<b>\$200,000.00</b>

**PN9105 Stormwater Pond Retrofit, BMP/LID**



<b>Address:</b>	9306 Morison Lane
<b>Location:</b>	Morison Estate Subdivision
<b>Land Owner:</b>	County/Private
<b>PIN:</b>	0082 15 0007A, 0082 15 0009, 0082 15 0002
<b>Control Type</b>	Quality/Quantity
<b>Drainage Area</b>	26.34 acres
<b>Receiving Waters</b>	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*

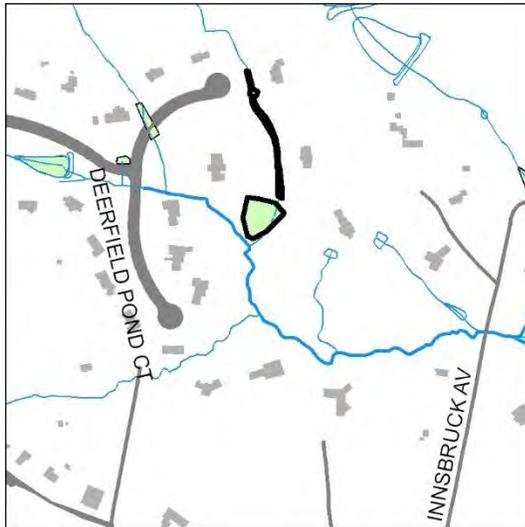
**Project Benefits:** This project will improve water quality by reducing sediment and nutrient loadings, reducing peak stormwater flows for storms up to the 10-year event, and providing for evapotranspiration and wildlife habitat. The improved outlet structure will allow for a more controlled stormwater 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 exceptions or waivers. This is an existing county facility, and is located within a storm drainage easement. The rain garden located at the end of Morison Lane is located on private land and will require an additional storm drainage easement. Accessibility is excellent from Morison Lane. There are no tree impacts or significant construction issues anticipated.

**Costs:**

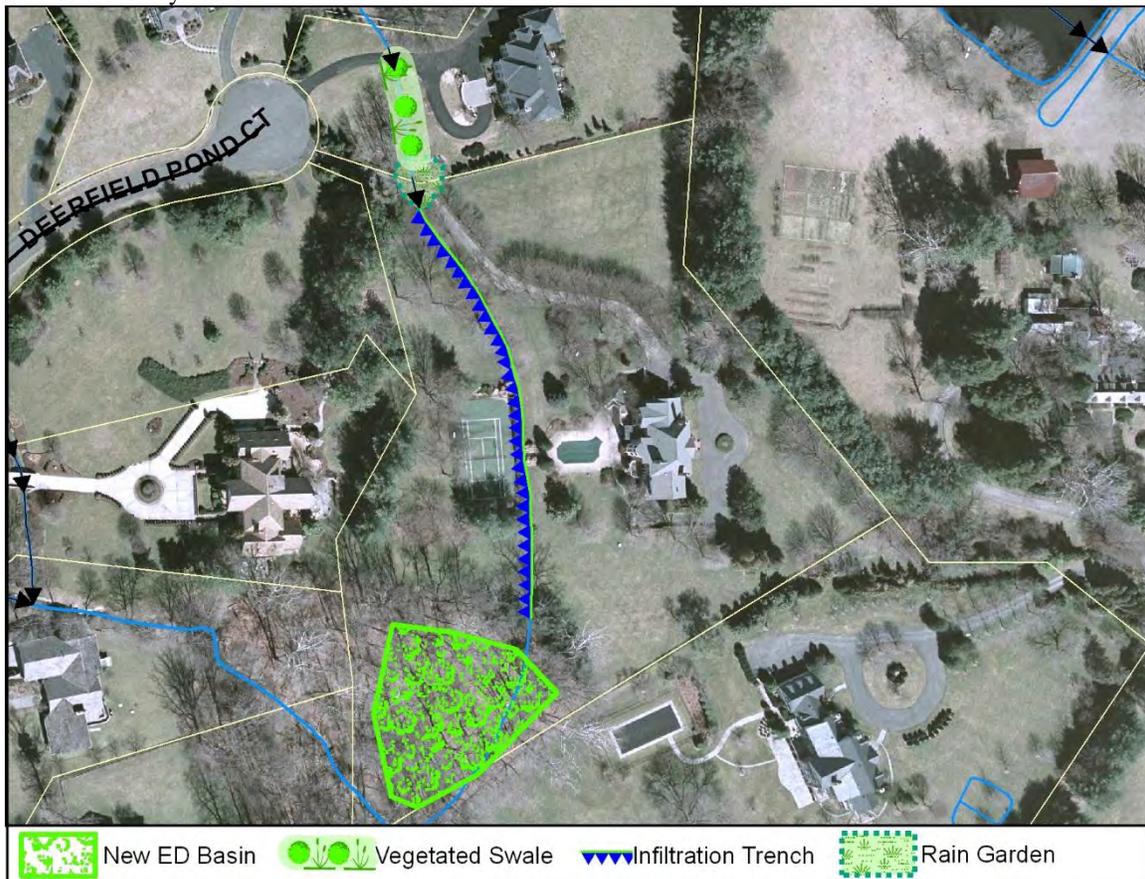
<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
Bioretention Filters & Basin	SY	80	\$150.00	\$12,000.00
Organic Compost Soil Amendment	CY	120	\$40.00	\$4,800.00
Plantings	AC	0.5	\$25,000.00	\$12,500.00
Clear and Grub	AC	0.1	\$8,500.00	\$850.00
Grading and Excavation	CY	950	\$35.00	\$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
<b>Initial Project Costs</b>				<b>\$89,150.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$4,457.50
<i>Erosion and Sediment Control: 10% of project costs</i>				\$8,915.00
<b>Base Construction Costs</b>				<b>\$102,522.50</b>
<i>Mobilization (5%)</i>				\$5,126.13
<b>Subtotal 1</b>				<b>\$107,648.63</b>
<i>Contingency (25%)</i>				\$26,912.16
<b>Subtotal 2</b>				<b>\$134,560.78</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)</i>				\$60,552.35
<b>Total Costs</b>				<b>\$195,113.13</b>
<b>Estimated Project Costs</b>				<b>\$200,000.00</b>

## PN9108 New Stormwater Pond, BMP/LID



<b>Address:</b>	601 Deerfield Pond Court
<b>Location:</b>	Near northern Deerfield Court cul-de-sac
<b>Land Owner:</b>	County/Private
<b>PIN:</b>	0083 13 0020, 0083 14 0019, 0083 14 0029
<b>Control Type</b>	Quality/Quantity
<b>Drainage Area</b>	25.29 acres
<b>Receiving Waters</b>	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*

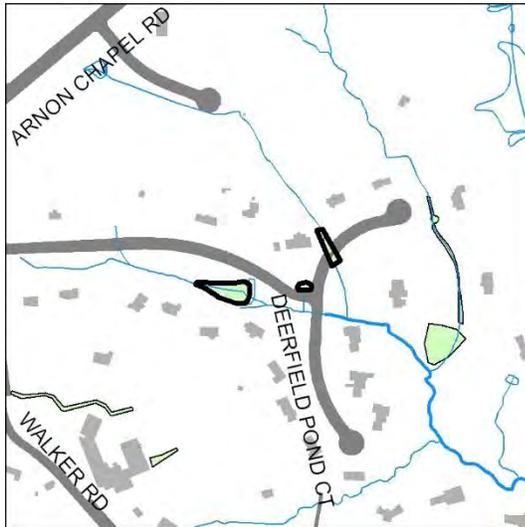
**Project Benefits:** This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The rain garden and infiltration trench will also reduce stormwater runoff 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 exceptions or waivers. The majority of the project is located within a storm drainage easement, which may need to be enlarged to include the entirety of the new dry basin. Accessibility is good from Deerfield Pond Court, but may be difficult due to residential properties, access easements will be needed for future maintenance. Minimal tree impacts and no significant construction issues anticipated.

**Costs:**

<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
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
<b>Initial Project Costs</b>				<b>\$186,450.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$9,322.50
<i>Erosion and Sediment Control: 10% of project costs</i>				\$18,645.00
<b>Base Construction Costs</b>				<b>\$214,417.50</b>
<i>Mobilization (5%)</i>				\$10,720.88
<b>Subtotal 1</b>				<b>\$225,138.38</b>
<i>Contingency (25%)</i>				\$56,284.59
<b>Subtotal 2</b>				<b>\$281,422.97</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility</i>				
<i>Relocation and Permits (45%)</i>				\$126,640.34
<b>Total Costs</b>				<b>\$408,063.30</b>
<b>Estimated Project Costs</b>				<b>\$410,000.00</b>

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



<b>Address:</b>	9903 Deerfield Pond Drive
<b>Location:</b>	Deerfield Pond Subdivision
<b>Land Owner:</b>	County/Private
<b>PIN:</b>	0083 13 B, 0083 13 0006, 0083 13 0007, 0083 13 0018A, 0083 13 0022
<b>Control Type</b>	Quality/Quantity
<b>Drainage Area</b>	92.88 acres
<b>Receiving Waters</b>	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*

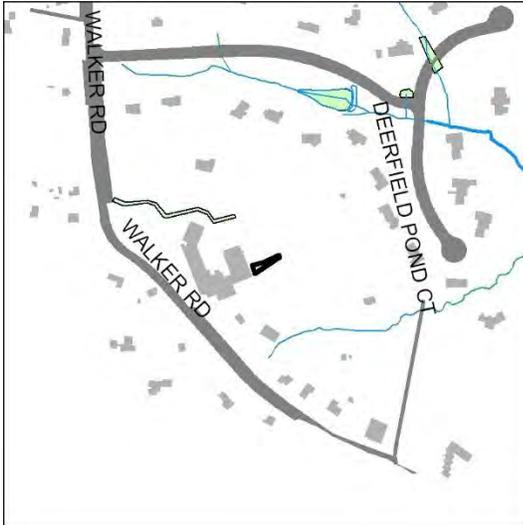
**Project Benefits:** This project will reduce sediment and nutrient loadings, improve water quality in downstream waterbodies, increase storage volume, reduce peak stormwater flows up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The rain garden will also reduce stormwater 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. The existing pond and new constructed wetland are located within storm drainage easements. The rain garden at the corner of Deerfield Pond Court and Deerfield Pond Drive is located on private land and will require an additional storm drainage easement. Accessibility is excellent from nearby roads. There are no tree impacts or significant construction issues anticipated.

**Costs:**

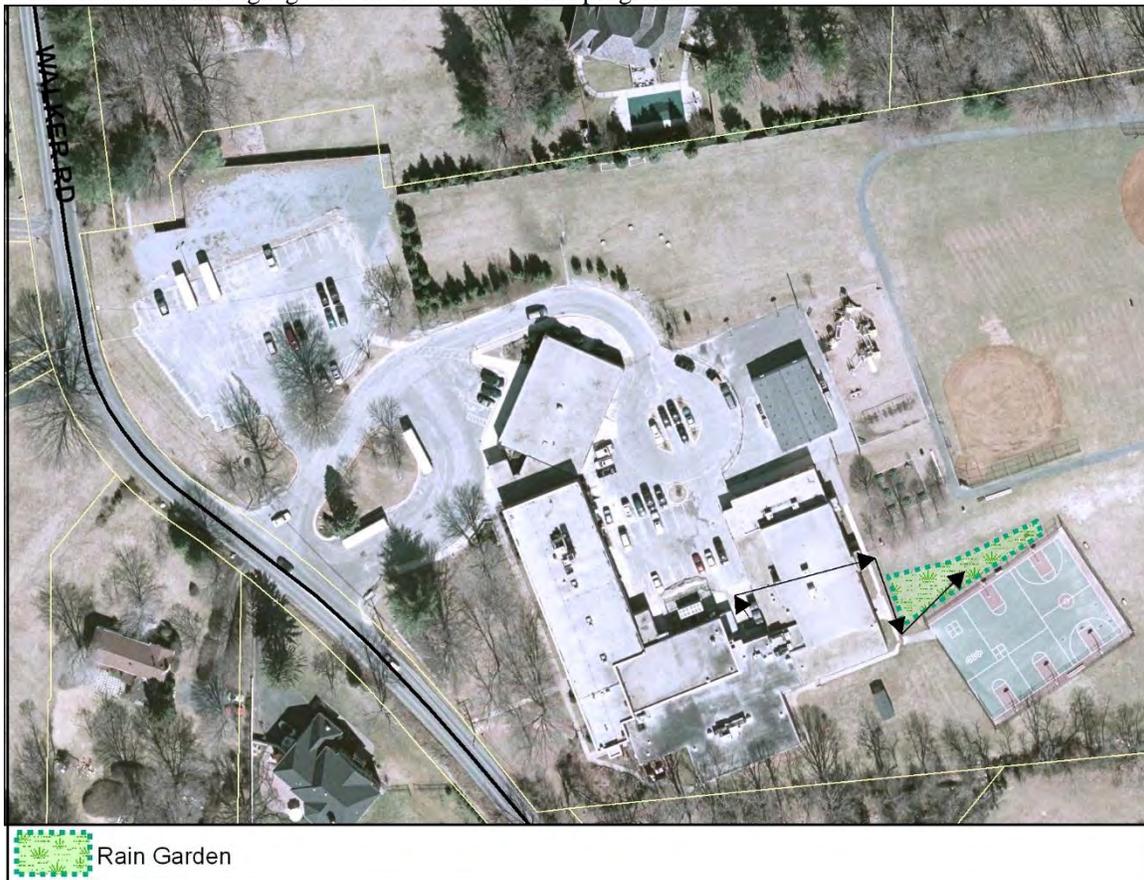
<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
Bioretention Filters & Basin	SY	200	\$150.00	\$30,000.00
Organic Compost Soil Amendment	CY	80	\$40.00	\$3,200.00
Plantings	AC	0.16	\$25,000.00	\$4,000.00
Clear and Grub	AC	0.1	\$8,500.00	\$850.00
Grading and Excavation	CY	925	\$35.00	\$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
			<b>Initial Project Costs</b>	<b>\$124,175.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$6,208.75
<i>Erosion and Sediment Control: 10% of project costs</i>				\$12,417.50
			<b>Base Construction Costs</b>	<b>\$142,801.25</b>
			<i>Mobilization (5%)</i>	\$7,140.06
			<b>Subtotal 1</b>	<b>\$149,941.31</b>
			<i>Contingency (25%)</i>	\$37,485.33
			<b>Subtotal 2</b>	<b>\$187,426.64</b>
			<i>Engineering Design, Surveys, Land Acquisition, Utility</i>	
			<i>Relocation and Permits (45%)</i>	\$84,341.99
			<b>Total Costs</b>	<b>\$271,768.63</b>
			<b>Estimated Project Costs</b>	<b>\$280,000.00</b>

## PN9110 BMP/LID, Education



<b>Address:</b>	701 Walker Road
<b>Location:</b>	Great Falls Elementary School
<b>Land Owner:</b>	County
<b>PIN:</b>	0074 01 0055A, 0074 14 0003A
<b>Control Type</b>	Quality
<b>Drainage Area</b>	3.84 acres
<b>Receiving Waters</b>	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*

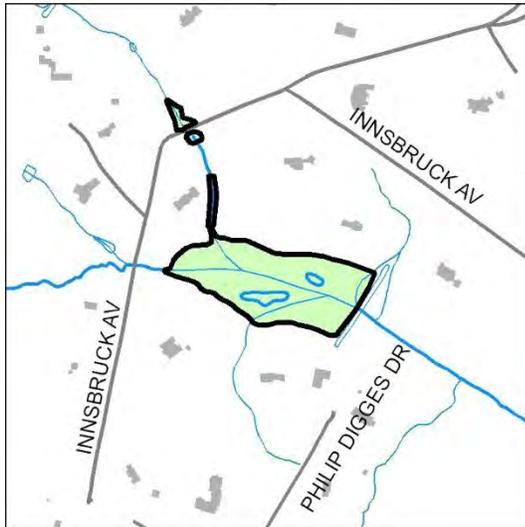
**Project Benefits:** This project will improve water quality by reducing sediment and nutrient loadings, reduce stormwater peak flows for small storm events, reduce stormwater runoff volumes by promoting infiltration, and provide for evapotranspiration and wildlife habitat. An estimated 1,080 lbs/yr 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:**

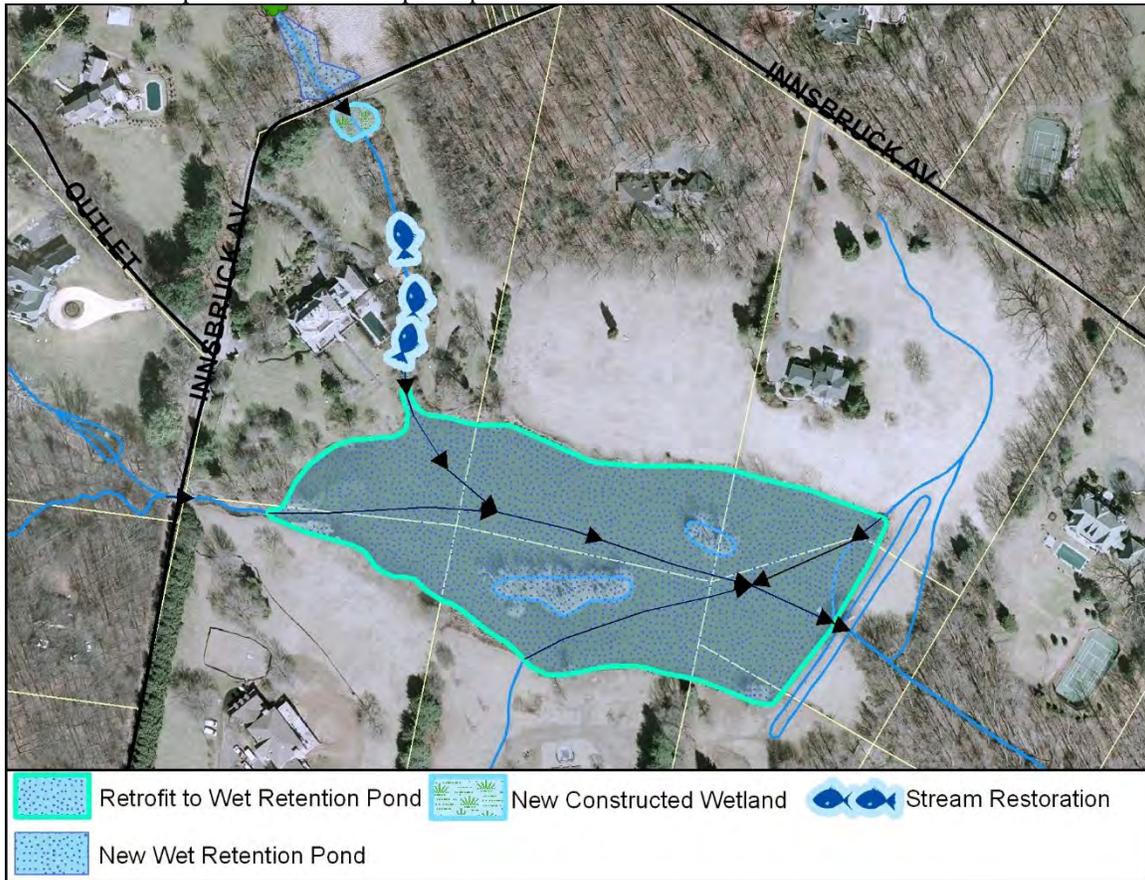
<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
Percolation/Infiltration Trench	SY	0	\$75.00	\$0.00
Bioretention Filters & Basin	SY	250	\$150.00	\$37,500.00
Organic Compost Soil Amendment	CY	15	\$40.00	\$600.00
<b>Initial Project Costs</b>				<b>\$38,100.00</b>
<i>Plantings: 5%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

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



**Address:** 619 Innsbruck 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/Quantity  
**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*

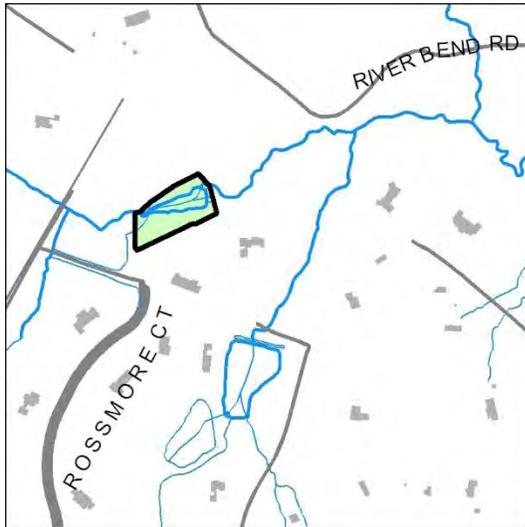
**Project Benefits:** This project will reduce sediment and nutrient loadings, improve water quality in downstream waterbodies, increase storage volume, reduce peak stormwater flows up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new outlet structure will allow for 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 exceptions or waivers. This is an existing stormwater facility but is not located within a County storm drainage easement. Storm drainage easements will be necessary. Accessibility is excellent from Insbruck Avenue. Tree impacts are expected. No significant construction issues are anticipated.

**Costs:**

<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
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
			<b>Initial Project Costs</b>	<b>\$378,250.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$18,912.50
<i>Erosion and Sediment Control: 10% of project costs</i>				\$37,825.00
			<b>Base Construction Costs</b>	<b>\$434,987.50</b>
			<i>Mobilization (5%)</i>	\$21,749.38
			<b>Subtotal 1</b>	<b>\$456,736.88</b>
			<i>Contingency (25%)</i>	\$114,184.22
			<b>Subtotal 2</b>	<b>\$570,921.09</b>
			<i>Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)</i>	\$256,914.49
			<b>Total Costs</b>	<b>\$827,835.59</b>
			<b>Estimated Project Costs</b>	<b>\$830,000.00</b>

## PN9112 Stormwater Pond Retrofit



<b>Address:</b>	9638 Georgetown Pike
<b>Location:</b>	Near Rossmore Court cul-de-sac
<b>Land Owner:</b>	Private
<b>PIN:</b>	0131 01 0050B, 0131 05 0023A
<b>Control Type</b>	Quality/Quantity
<b>Drainage Area</b>	98.31 acres
<b>Receiving Waters</b>	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*

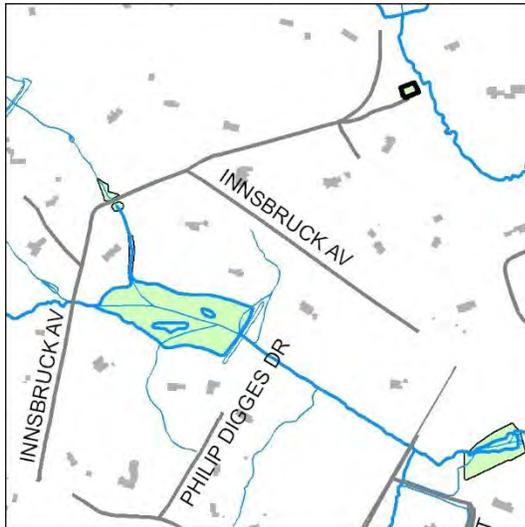
**Project Benefits:** This project will reduce sediment and nutrient loadings, improve water quality in downstream waterbodies, increase storage volume, reduce peak stormwater flows up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new outlet structure will allow for 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 exceptions or waivers. This is a privately owned pond, and will require a storm drainage easement. Accessibility is excellent via an ingress-egress easement.. There are no tree impacts or significant construction issues anticipated.

**Costs:**

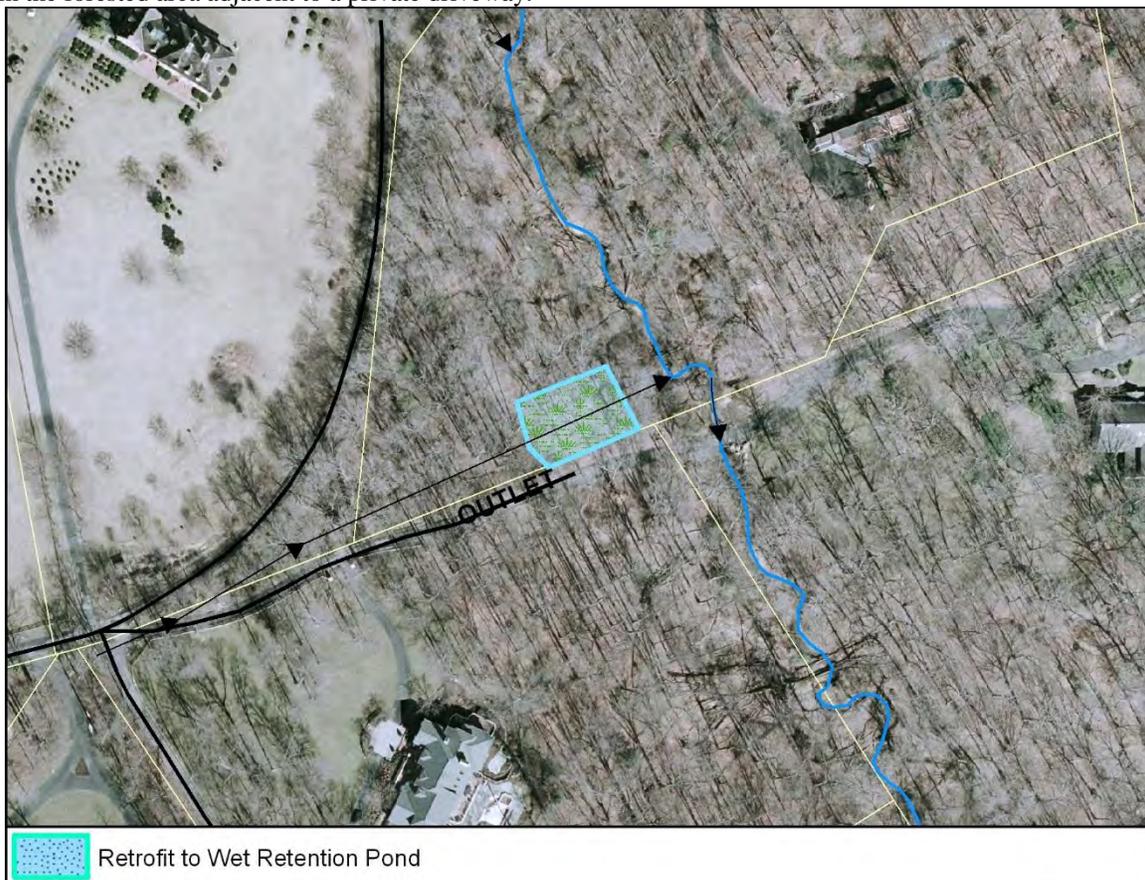
<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
Organic Compost Soil Amendment	CY	25	\$40.00	\$1,000.00
Plantings	AC	0.1	\$25,000.00	\$2,500.00
Clear and Grub	AC	0.1	\$8,500.00	\$850.00
Grading and Excavation	CY	2200	\$35.00	\$77,000.00
Embankment	CY	150	\$50.00	\$7,500.00
Outflow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

## PN9113 New Stormwater Pond



**Address:** 550 Innsbruck 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 exceptions or waivers. A storm drainage easement will 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:**

<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
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
<b>Initial Project Costs</b>				<b>\$41,700.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$2,085.00
<i>Erosion and Sediment Control: 10% of project costs</i>				\$4,170.00
<b>Base Construction Costs</b>				<b>\$47,955.00</b>
<i>Mobilization (5%)</i>				\$2,397.75
<b>Subtotal 1</b>				<b>\$50,352.75</b>
<i>Contingency (25%)</i>				\$12,588.19
<b>Subtotal 2</b>				<b>\$62,940.94</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility</i>				
<i>Relocation and Permits (45%)</i>				\$28,323.42
<b>Total Costs</b>				<b>\$91,264.36</b>
<b>Estimated Project Costs</b>				<b>\$100,000.00</b>

**PN9114 Stormwater Pond Retrofit, BMP/LID**



<b>Address:</b>	501 Arnon Ridge Court
<b>Location:</b>	Arnon Ridge Subdivision
<b>Land Owner:</b>	County/Private
<b>PIN:</b>	0083 11 0002, 0083 11 0009, 0083 11 0010
<b>Control Type</b>	Quality/Quantity
<b>Drainage Area</b>	12 acres
<b>Receiving Waters</b>	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 easement. Additional storm drainage easements will 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:**

<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
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
<b>Initial Project Costs</b>				<b>\$83,050.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$4,152.50
<i>Erosion and Sediment Control: 10% of project costs</i>				\$8,305.00
<b>Base Construction Costs</b>				<b>\$95,507.50</b>
<i>Mobilization (5%)</i>				\$4,775.38
<b>Subtotal 1</b>				<b>\$100,282.88</b>
<i>Contingency (25%)</i>				\$25,070.72
<b>Subtotal 2</b>				<b>\$125,353.59</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)</i>				\$56,409.12
<b>Total Costs</b>				<b>\$181,762.71</b>
<b>Estimated Project Costs</b>				<b>\$190,000.00</b>

## 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/Quantity  
**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*

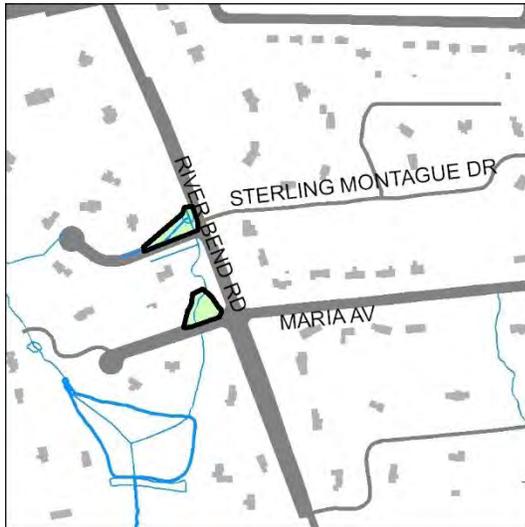
**Project Benefits:** The constructed wetlands will reduce stormwater peak flows for small storm events, reduce sediment and nutrient loadings, and provide for evaporation, evapotranspiration and wildlife habitat. The new outlet structure will allow for a more controlled stormwater discharge to enhance 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 exceptions or waivers. This is an existing private facility that is not located within a storm drainage easement. Storm drainage easements will 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:**

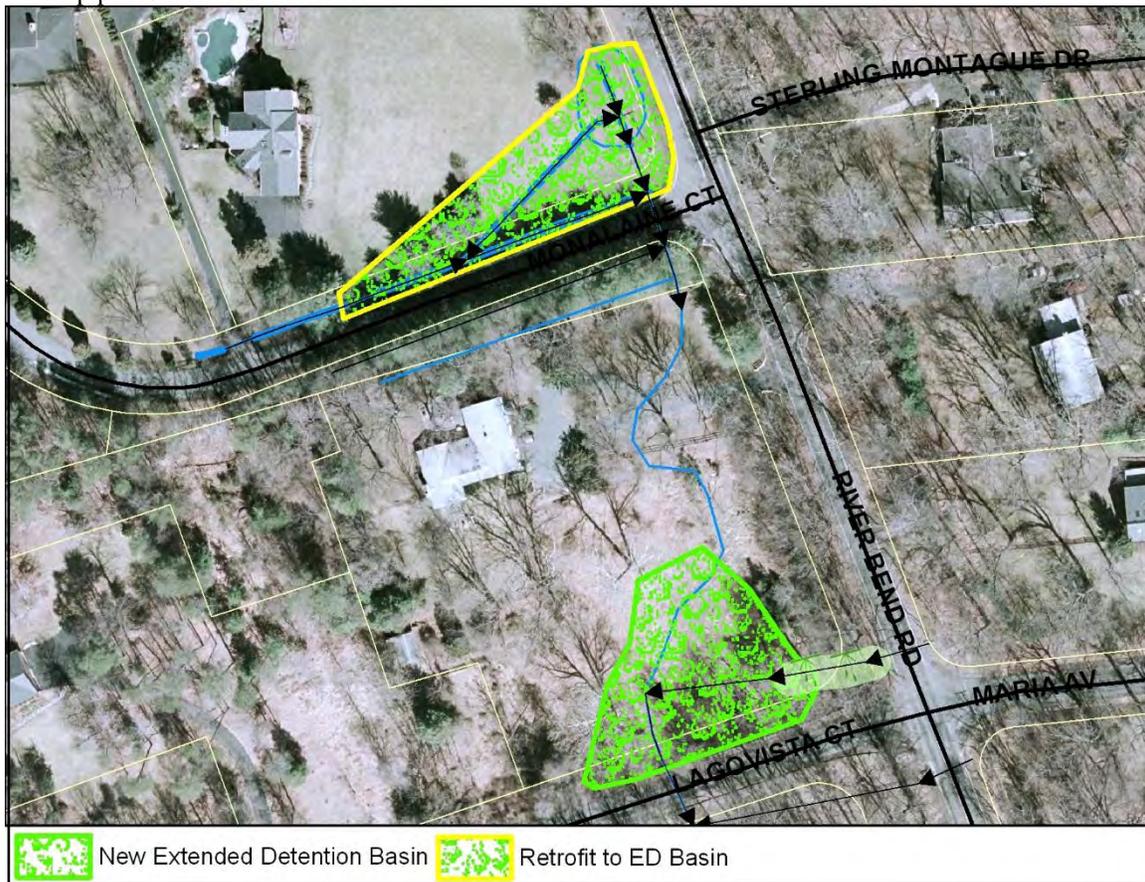
<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
Organic Compost Soil Amendment	CY	75	\$40.00	\$3,000.00
Plantings	AC	0.2	\$25,000.00	\$5,000.00
Clear and Grub	AC	0.2	\$8,500.00	\$1,700.00
Grading and Excavation	CY	2400	\$35.00	\$84,000.00
Earthen Berm	CY	150	\$35.00	\$5,250.00
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
<b>Initial Project Costs</b>				<b>\$181,950.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$9,097.50
<i>Erosion and Sediment Control: 10% of project costs</i>				\$18,195.00
<b>Base Construction Costs</b>				<b>\$209,242.50</b>
<i>Mobilization (5%)</i>				\$10,462.13
<b>Subtotal 1</b>				<b>\$219,704.63</b>
<i>Contingency (25%)</i>				\$54,926.16
<b>Subtotal 2</b>				<b>\$274,630.78</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility</i>				
<i>Relocation and Permits (45%)</i>				\$123,583.85
<b>Total Costs</b>				<b>\$398,214.63</b>
<b>Estimated Project Costs</b>				<b>\$400,000.00</b>

**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/Quantity  
**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*

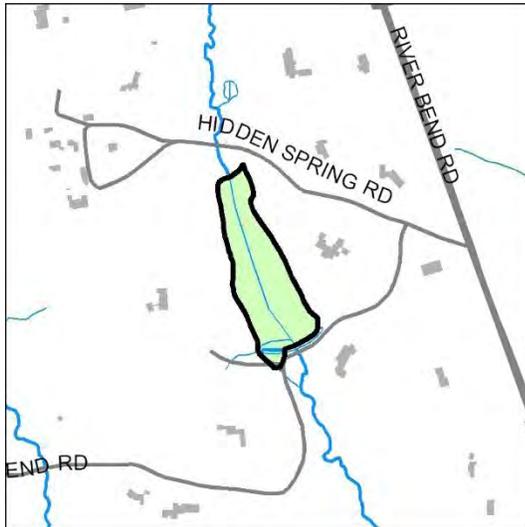
**Project Benefits:** This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. This project will also increase the storage capacity of the existing pond. 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. A storm drainage easement will be necessary for the privately-owned existing stormwater basin. 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:**

<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
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
<b>Initial Project Costs</b>				<b>\$161,080.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$8,054.00
<i>Erosion and Sediment Control: 10% of project costs</i>				\$16,108.00
<b>Base Construction Costs</b>				<b>\$185,242.00</b>
<i>Mobilization (5%)</i>				\$9,262.10
<b>Subtotal 1</b>				<b>\$194,504.10</b>
<i>Contingency (25%)</i>				\$48,626.03
<b>Subtotal 2</b>				<b>\$243,130.13</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility</i>				
<i>Relocation and Permits (45%)</i>				\$109,408.56
<b>Total Costs</b>				<b>\$352,538.68</b>
<b>Estimated Project Costs</b>				<b>\$360,000.00</b>

**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/Quantity  
**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*

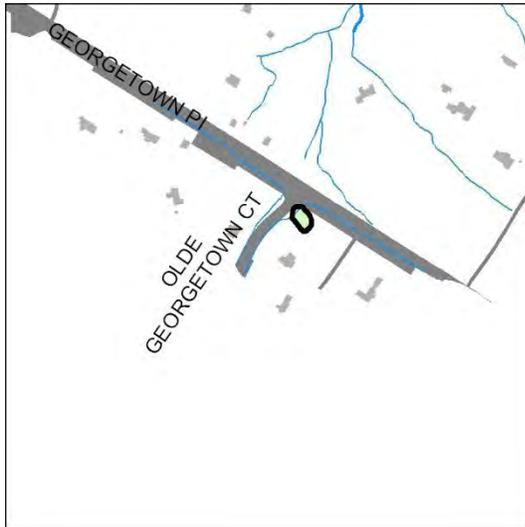
**Project Benefits:** This project will reduce sediment and nutrient loadings, improve water quality in downstream waterbodies, increase storage volume, reduce peak stormwater flows up to the 10-year event, and provide for evapotranspiration and wildlife habitat. This project will also repair damage 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 exceptions or waivers. The farm pond is privately owned by multiple owners. A storm drainage easement will be necessary. Accessibility is excellent via an ingress-egress easement from nearby roads. There are no tree impacts or significant construction issues anticipated.

**Costs:**

<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
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
<b>Initial Project Costs</b>				<b>\$54,950.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$2,747.50
<i>Erosion and Sediment Control: 10% of project costs</i>				\$5,495.00
<b>Base Construction Costs</b>				<b>\$63,192.50</b>
<i>Mobilization (5%)</i>				\$3,159.63
<b>Subtotal 1</b>				<b>\$66,352.13</b>
<i>Contingency (25%)</i>				\$16,588.03
<b>Subtotal 2</b>				<b>\$82,940.16</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)</i>				\$37,323.07
<b>Total Costs</b>				<b>\$120,263.23</b>
<b>Estimated Project Costs</b>				<b>\$130,000.00</b>

## PN9119 Stormwater Pond Retrofit



<b>Address:</b>	801 Olde Georgetown Court
<b>Location:</b>	Fallswood Subdivision
<b>Land Owner:</b>	Private
<b>PIN:</b>	0132 07 0009
<b>Control Type</b>	Quality/Quantity
<b>Drainage Area</b>	3.45 acres
<b>Receiving Waters</b>	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 naturalized vegetation.



*Project Area Map*

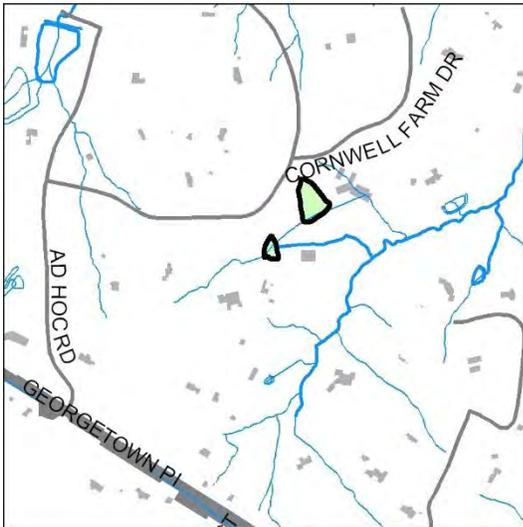
**Project Benefits:** This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new outlet structure will allow for a more controlled stormwater discharge 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 stormwater facility that is not within a storm drainage easement. A storm drainage easement will be necessary. Accessibility is excellent from Olde Georgetown Court. There are no tree impacts or significant construction issues anticipated.

**Costs:**

<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
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
<b>Initial Project Costs</b>				<b>\$42,175.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$2,108.75
<i>Erosion and Sediment Control: 10% of project costs</i>				\$4,217.50
<b>Base Construction Costs</b>				<b>\$48,501.25</b>
<i>Mobilization (5%)</i>				\$2,425.06
<b>Subtotal 1</b>				<b>\$50,926.31</b>
<i>Contingency (25%)</i>				\$12,731.58
<b>Subtotal 2</b>				<b>\$63,657.89</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)</i>				\$28,646.05
<b>Total Costs</b>				<b>\$92,303.94</b>
<b>Estimated Project Costs</b>				<b>\$100,000.00</b>

## PN9120 Stormwater Pond Retrofit



<b>Address:</b>	9401 Cornwell Farm Drive
<b>Location:</b>	Cornwell Farm Subdivision
<b>Land Owner:</b>	Private
<b>PIN:</b>	0132 06 0005A, 0132 06 0004A
<b>Control Type</b>	Quality/Quantity
<b>Drainage Area</b>	17.05 acres
<b>Receiving Waters</b>	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 exceptions or waivers. These ponds are privately owned and will require storm drainage easements. Accessibility is excellent from Cornwell Farm Drive. There are no tree impacts or significant construction issues anticipated.

**Costs:**

<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
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
<b>Initial Project Costs</b>				<b>\$68,350.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$3,417.50
<i>Erosion and Sediment Control: 10% of project costs</i>				\$6,835.00
<b>Base Construction Costs</b>				<b>\$78,602.50</b>
<i>Mobilization (5%)</i>				\$3,930.13
<b>Subtotal 1</b>				<b>\$82,532.63</b>
<i>Contingency (25%)</i>				\$20,633.16
<b>Subtotal 2</b>				<b>\$103,165.78</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility</i>				
<i>Relocation and Permits (45%)</i>				\$46,424.60
<b>Total Costs</b>				<b>\$149,590.38</b>
<b>Estimated Project Costs</b>				<b>\$150,000.00</b>

### PN9122 Stormwater Pond Retrofit, Stream Restoration



<b>Address:</b>	528 River Bend Road
<b>Location:</b>	Jackson Hills Subdivision
<b>Land Owner:</b>	Private
<b>PIN:</b>	0132 04 B
<b>Control Type</b>	Quality/Quantity
<b>Drainage Area</b>	76.58 acres
<b>Receiving Waters</b>	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*

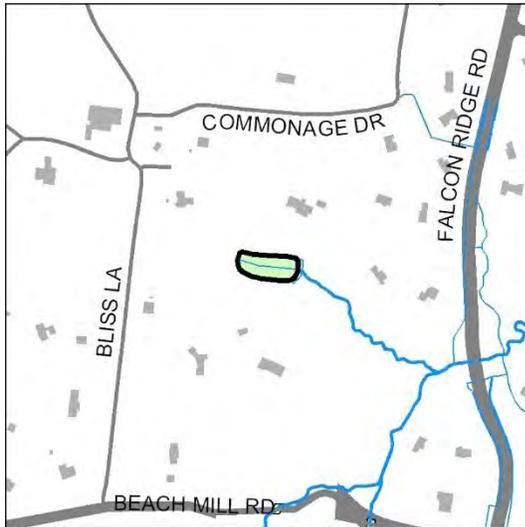
**Project Benefits:** This project will reduce sediment and nutrient loadings, improve water quality in downstream waterbodies, increase storage volume, reduce peak stormwater flows up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new outlet structure will allow for 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 exceptions or waivers. This is a privately owned pond, and will require a storm drainage easement. Accessibility is excellent from River Bend Road. There are no tree impacts or significant construction issues anticipated.

**Costs:**

<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
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
<b>Initial Project Costs</b>				<b>\$222,025.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$11,101.25
<i>Erosion and Sediment Control: 10% of project costs</i>				\$22,202.50
<b>Base Construction Costs</b>				<b>\$255,328.75</b>
<i>Mobilization (5%)</i>				\$12,766.44
<b>Subtotal 1</b>				<b>\$268,095.19</b>
<i>Contingency (25%)</i>				\$67,023.80
<b>Subtotal 2</b>				<b>\$335,118.98</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)</i>				\$150,803.54
<b>Total Costs</b>				<b>\$485,922.53</b>
<b>Estimated Project Costs</b>				<b>\$490,000.00</b>

## PN9123 Stormwater Pond Retrofit



**Address:** 221 Bliss Lane  
**Location:** Near Bliss Lane & Commonage Drive  
**Land Owner:** Private  
**PIN:** 0034 01 0008A  
**Control Type:** Quality/Quantity  
**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 exceptions or waivers. This is a privately owned pond, and will require a storm drainage easement. Accessibility is good via an ingress-egress easement from Bliss Lane, the access easement may need to be extended directly to the pond for future maintenance. There are no tree impacts or significant construction issues anticipated.

**Costs:**

<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
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
<b>Initial Project Costs</b>				<b>\$40,650.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$2,032.50
<i>Erosion and Sediment Control: 10% of project costs</i>				\$4,065.00
<b>Base Construction Costs</b>				<b>\$46,747.50</b>
<i>Mobilization (5%)</i>				\$2,337.38
<b>Subtotal 1</b>				<b>\$49,084.88</b>
<i>Contingency (25%)</i>				\$12,271.22
<b>Subtotal 2</b>				<b>\$61,356.09</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility</i>				
<i>Relocation and Permits (45%)</i>				\$27,610.24
<b>Total Costs</b>				<b>\$88,966.34</b>
<b>Estimated Project Costs</b>				<b>\$90,000.00</b>

## PN9124 Stormwater Pond Retrofit



<b>Address:</b>	531 Falls Road
<b>Location:</b>	Jackson Hills Subdivision
<b>Land Owner:</b>	Private
<b>PIN:</b>	0132 04 0009, 0132 04 0010B
<b>Control Type</b>	Quality/Quantity
<b>Drainage Area</b>	16.6 acres
<b>Receiving Waters</b>	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*

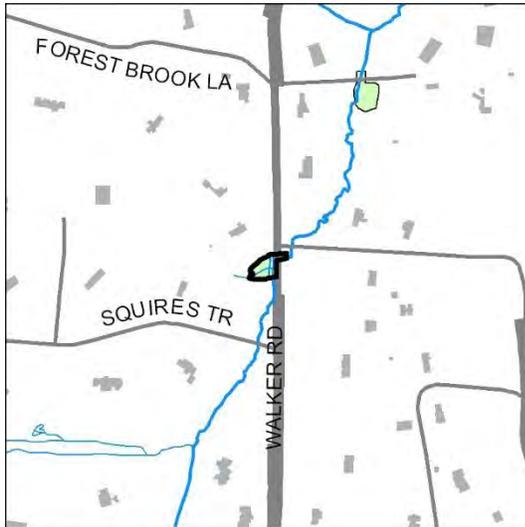
**Project Benefits:** This project will reduce sediment and nutrient loadings, improve water quality in downstream waterbodies, increase storage volume, reduce peak stormwater flows up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new outlet structure will allow for 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 exceptions or waivers. This pond is privately owned by multiple owners. A storm drainage easement will be necessary. Accessibility is good from Falls Road through a clearing on private property, access easements will be needed for future maintenance. There are no tree impacts or significant construction issues anticipated.

**Costs:**

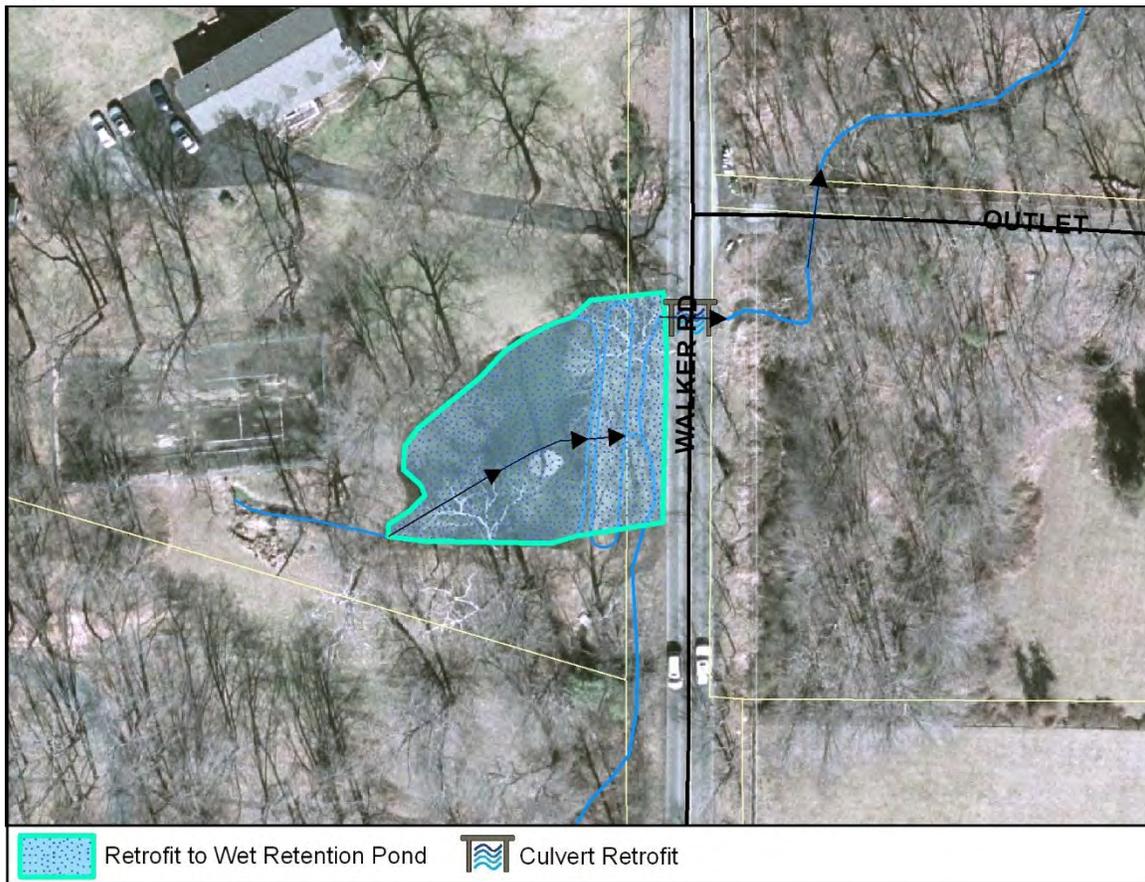
<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
Organic Compost Soil Amendment	CY	40	\$40.00	\$1,600.00
Plantings	AC	0.1	\$25,000.00	\$2,500.00
Clear and Grub	AC	0.1	\$8,500.00	\$850.00
Grading and Excavation	CY	100	\$35.00	\$3,500.00
Embankment	CY	100	\$50.00	\$5,000.00
Outflow 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
<b>Initial Project Costs</b>				<b>\$32,325.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$1,616.25
<i>Erosion and Sediment Control: 10% of project costs</i>				\$3,232.50
<b>Base Construction Costs</b>				<b>\$37,173.75</b>
<i>Mobilization (5%)</i>				\$1,858.69
<b>Subtotal 1</b>				<b>\$39,032.44</b>
<i>Contingency (25%)</i>				\$9,758.11
<b>Subtotal 2</b>				<b>\$48,790.55</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility</i>				
<i>Relocation and Permits (45%)</i>				\$21,955.75
<b>Total Costs</b>				<b>\$70,746.29</b>
<b>Estimated Project Costs</b>				<b>\$80,000.00</b>

## PN9126 Stormwater Pond Retrofit



<b>Address:</b>	502 Walker Road
<b>Location:</b>	Squire's Haven Section 2 Subdivision
<b>Land Owner:</b>	Private
<b>PIN:</b>	0074 03 0021B, 0074 04 A
<b>Control Type</b>	Quality/Quantity
<b>Drainage Area</b>	3.68 acres
<b>Receiving Waters</b>	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 exceptions or waivers. This is a privately owned pond, and will require a storm drainage easement. Accessibility is excellent from Walker Road. There are no tree impacts or significant construction issues anticipated.

**Costs:**

<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
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
<b>Initial Project Costs</b>				<b>\$111,450.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$5,572.50
<i>Erosion and Sediment Control: 10% of project costs</i>				\$11,145.00
<b>Base Construction Costs</b>				<b>\$128,167.50</b>
<i>Mobilization (5%)</i>				\$6,408.38
<b>Subtotal 1</b>				<b>\$134,575.88</b>
<i>Contingency (25%)</i>				\$33,643.97
<b>Subtotal 2</b>				<b>\$168,219.84</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)</i>				\$75,698.93
<b>Total Costs</b>				<b>\$243,918.77</b>
<b>Estimated Project Costs</b>				<b>\$250,000.00</b>

**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/Quantity  
**Drainage Area:** 61.68 acres  
**Receiving Waters:** Clarks Branch

**Description:** 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.



*Project Area Map*

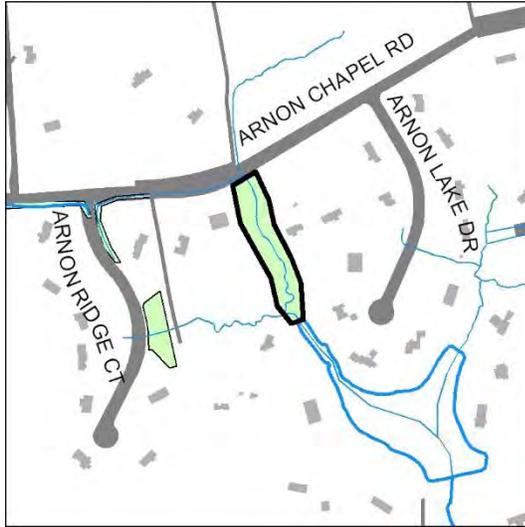
**Project Benefits:** This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new/improved outlet structures will allow for a more controlled stormwater 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. Existing pond 0086DP is located within a storm drainage easement; DP0892 is a privately-owned facility and will require a stormwater easement. Additional storm drainage easements will also be necessary for the rain garden and daylighting of the stream. Accessibility is good from Club View Drive or Lindsay Blake Lane. Access to 0892DP may be difficult due to tree cover. There are minimal tree impacts or significant construction issues anticipated.

**Costs:**

<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
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
<b>Initial Project Costs</b>				<b>\$152,075.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$7,603.75
<i>Erosion and Sediment Control: 10% of project costs</i>				\$15,207.50
<b>Base Construction Costs</b>				<b>\$174,886.25</b>
<i>Mobilization (5%)</i>				\$8,744.31
<b>Subtotal 1</b>				<b>\$183,630.56</b>
<i>Contingency (25%)</i>				\$45,907.64
<b>Subtotal 2</b>				<b>\$229,538.20</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility Relocation and Permits (45%)</i>				\$103,292.19
<b>Total Costs</b>				<b>\$332,830.39</b>
<b>Estimated Project Costs</b>				<b>\$340,000.00</b>

## 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*

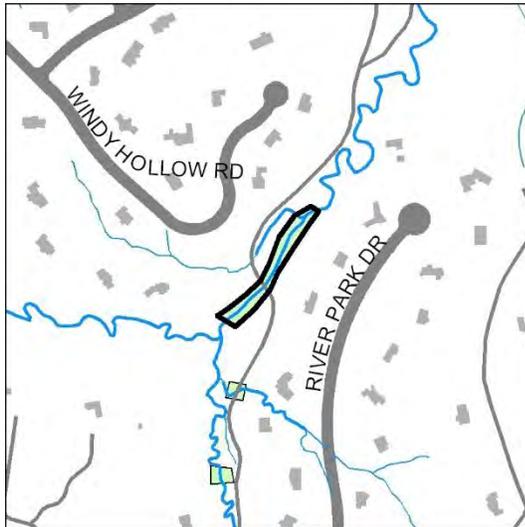
**Project Benefits:** This project will stabilize streambanks and improve water quality by reducing sediment and nutrient loadings. An estimated 5,960 lbs/yr of total suspended solids, 5 lbs/yr of nitrogen, and 2 lbs/yr of phosphorus will be removed.

**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 exceptions or waivers. Accessibility is excellent from Arnon Chapel Road. Tree impacts are expected. No significant construction issues anticipated.

**Costs:**

<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
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
<b>Initial Project Costs</b>				<b>\$152,000.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$7,600.00
<i>Ancillary Items: 5% of project cost</i>				\$7,600.00
<i>Erosion and Sediment Control: 10% of project costs</i>				\$15,200.00
<b>Base Construction Costs</b>				<b>\$182,400.00</b>
<i>Mobilization (5%)</i>				\$9,120.00
<b>Subtotal 1</b>				<b>\$191,520.00</b>
<i>Contingency (25%)</i>				\$47,880.00
<b>Subtotal 2</b>				<b>\$239,400.00</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility</i>				
<i>Relocation and Permits (45%)</i>				\$107,730.00
<b>Total Costs</b>				<b>\$347,130.00</b>
<b>Estimated Project Costs</b>				<b>\$350,000.00</b>

## 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*

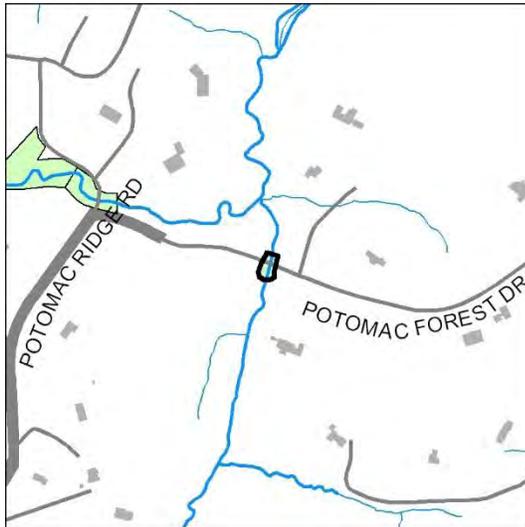
**Project Benefits:** Step pools will protect streambanks, reduce sediment and nutrient loadings, reduce stormwater peak flows, and provide for aquatic wildlife habitats. This project will also repair and stabilize streambanks. The washed out bridge will be replaced. An estimated 91,800 lbs/yr of total 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 exceptions or waivers. The majority of this project is located on a conservation easement with an ingress-egress easement crossing the site at the location of a washed out bridge. Bridge may be rebuilt for pedestrian/horse use only. Additional easements may be required in order to include the entire project area. Accessibility is excellent from River Park Drive. Existing trees are being actively impacted by receding streambanks, minimal additional tree impacts and no significant construction issues anticipated.

**Costs:**

<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
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
<b>Initial Project Costs</b>				<b>\$67,000.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$3,350.00
<i>Ancillary Items: 5% of project cost</i>				\$3,350.00
<i>Erosion and Sediment Control: 10% of project costs</i>				\$6,700.00
<b>Base Construction Costs</b>				<b>\$80,400.00</b>
<i>Mobilization (5%)</i>				\$4,020.00
<b>Subtotal 1</b>				<b>\$84,420.00</b>
<i>Contingency (25%)</i>				\$21,105.00
<b>Subtotal 2</b>				<b>\$105,525.00</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility</i>				
<i>Relocation and Permits (45%)</i>				\$47,486.25
<b>Total Costs</b>				<b>\$153,011.25</b>
<b>Estimated Project Costs</b>				<b>\$160,000.00</b>

**PN9400 Culvert Retrofit**



<b>Address:</b>	9111 Potomac Forest Drive
<b>Location:</b>	Potomac Forest Subdivision
<b>Land Owner:</b>	County/Private
<b>PIN:</b>	0082 04 0011A
<b>Control Type</b>	Quality/Quantity
<b>Drainage Area</b>	318.7 acres
<b>Receiving Waters</b>	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*

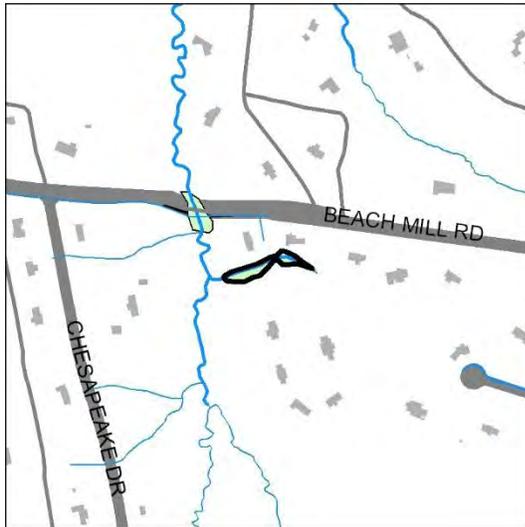
**Project Benefits:** This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. Streambanks downstream of culvert will be stabilized. Energy dissipation 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 exceptions or waivers. This project is located within the ingress-egress easement of Potomac Forest Drive. A storm drainage easement will be necessary. Accessibility is excellent from Potomac Forest Drive. Tree impacts are expected. No significant construction issues are anticipated.

**Costs:**

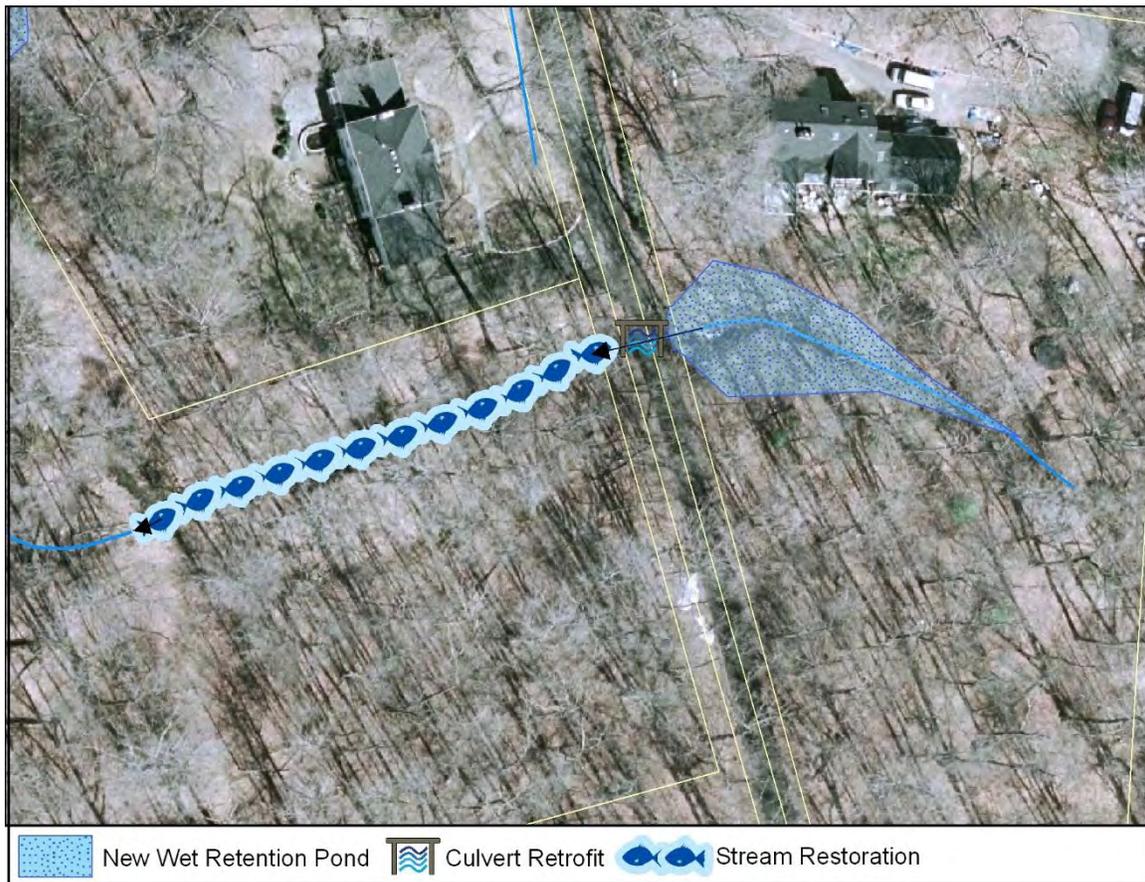
<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
Organic Compost Soil Amendment	CY	25	\$40.00	\$1,000.00
Plantings	AC	0.05	\$25,000.00	\$1,250.00
Clear and Grub	AC	0.05	\$8,500.00	\$425.00
Grading and Excavation	CY	550	\$35.00	\$19,250.00
Earthen Berm	CY	150	\$35.00	\$5,250.00
RipRap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

**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/Quantity  
**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 exceptions or waivers. Part of this project is located within an ingress egress easement. A storm drainage easement will 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:**

<i>Item</i>	<i>Units</i>	<i>Quantity</i>	<i>Unit Cost</i>	<i>Total</i>
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
<b>Initial Project Costs</b>				<b>\$232,825.00</b>
<i>Plantings: 5% of project costs (unless incl. as line item)</i>				\$0.00
<i>Ancillary Items: 5% of project cost</i>				\$11,641.25
<i>Erosion and Sediment Control: 10% of project costs</i>				\$23,282.50
<b>Base Construction Costs</b>				<b>\$267,748.75</b>
<i>Mobilization (5%)</i>				\$13,387.44
<b>Subtotal 1</b>				<b>\$281,136.19</b>
<i>Contingency (25%)</i>				\$70,284.05
<b>Subtotal 2</b>				<b>\$351,420.23</b>
<i>Engineering Design, Surveys, Land Acquisition, Utility</i>				
<i>Relocation and Permits (45%)</i>				\$158,139.11
<b>Total Costs</b>				<b>\$509,559.34</b>
<b>Estimated Project Costs</b>				<b>\$510,000.00</b>