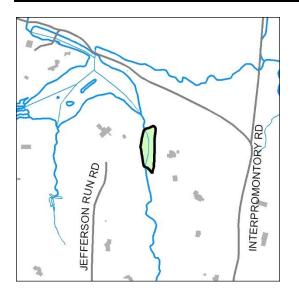
## NI9101 Stormwater Pond Retrofit



Address: Location:

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



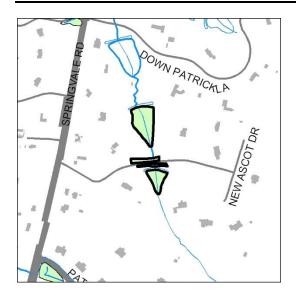
Project Area Map

**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 exceptions or waivers. This is a privately owned pond, and will 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.

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
		Init	ial Project Costs	\$38,700.00
Plantings: 5% of project costs (unless incl. as line	e item)			\$0.00
Ancillary Items: 5% of project cost				\$1,935.00
Erosion and Sediment Control: 10% of project co.	sts			\$3,870.00
		Base Co	nstruction Costs	\$44,505.00
		N	lobilization (5%)	\$2,225.25
			Subtotal 1	\$46,730.25
		Са	ontingency (25%)	\$11,682.56
			Subtotal 2	\$58,412.81
	Engineering Design	, Surveys, Land A	cquisition, Utility	. ,
			nd Permits (45%)	\$26,285.77
			Total Costs	\$84,698.58
		Estimated Proje	ect Costs	\$90,000.00

# NI9106 Stormwater Pond Retrofit, BMP/LID



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



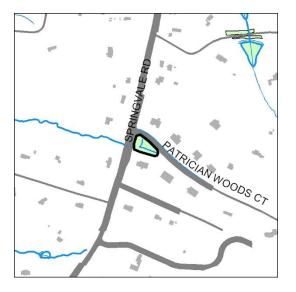
Project Area Map

**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 exceptions 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 will be necessary. Accessibility is excellent from New Ascot Drive. There are no tree impacts or significant construction issues anticipated.

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
Plantings: 5% of project costs (unless incl. as line it Ancillary Items: 5% of project cost Erosion and Sediment Control: 10% of project costs		1111	ial Project Costs	<b>\$117,150.00</b> \$0.00 \$5,857.50 <u>\$11,715.00</u>
			nstruction Costs Iobilization (5%)	<b>\$134,722.50</b> \$6,736.13
_			Subtotal 1 ontingency (25%)	\$141,458.63 \$35,364.66
Er	igineering Design		Subtotal 2 cquisition, Utility ad Permits (45%)	<b>\$176,823.28</b> \$79,570.48
-		Kelocallon ar	Total Costs	\$19,370.48 \$256,393.76
		Estimated Proje	ect Costs	\$260,000.00

# NI9111 Stormwater Pond Retrofit



Address: Location:

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



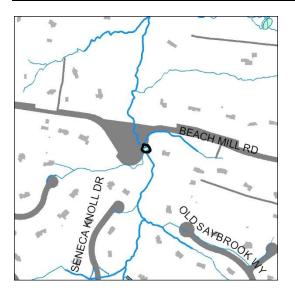
Project Area Map

**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 exceptions 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	Ouantity	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
Plantings: 5% of project costs (unless incl. as line iten Ancillary Items: 5% of project cost Erosion and Sediment Control: 10% of project costs	n)	Ini	tial Project Costs	<b>\$93,800.00</b> \$0.00 \$4,690.00 <u>\$9,380.00</u>
			nstruction Costs Iobilization (5%)	<b>\$107,870.00</b> \$5,393.50
		Ca	Subtotal 1 ontingency (25%)	<b>\$113,263.50</b> \$28,315.88
Eng	ineering Design	, Surveys, Land A	Subtotal 2 Acquisition, Utility 2d Permits (45%)	<b>\$141,579.38</b> \$63,710.72
			Total Costs	\$205,290.09
		Estimated Proje	ect Costs	\$210,000.00

# NI9113 Culvert Retrofit



Address: Location: Land Owner: PIN:

Control Type Drainage Area Receiving Waters 11295 Beach Mill Road Near Beach Mill Road & Pipestem State/County/Private 0024 01 0024A, 0024 07 0003A, VDOT Quality/Quanity 432 acres 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

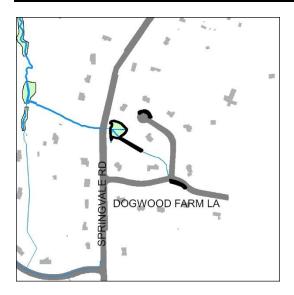
**Project Benefits:** This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new outlet structure will allow for a more controlled stormwater discharge 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 exceptions or waivers. The micropool is located partially within a right-of-way, a conservation easement, and on private land. A storm drainage easement will be necessary. Accessibility is excellent from Beach Mill Road. There are minimal tree impacts and no 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
Plantings: 5% of project costs (unless incl. as line item) Ancillary Items: 5% of project cost <u>Erosion and Sediment Control: 10% of project costs</u>		Init	ial Project Costs	<b>\$16,970.00</b> \$0.00 \$848.50 \$1,697.00
			nstruction Costs Iobilization (5%)	<b>\$19,515.50</b> \$975.78
		Ca	Subtotal 1 ontingency (25%)	<b>\$20,491.28</b> \$5,122.82
Engine	ering Design	•	Subtotal 2 cquisition, Utility ad Permits (45%)	<b>\$25,614.09</b> \$11,526.34
		Keiocallon an	Total Costs	\$11, <u>520.54</u> \$37,140.44
		Estimated Proje	ect Costs	\$40,000.00

# NI9118 Stormwater Pond Retrofit, BMP/LID



Address: Location:

Land Owner: PIN:

Control Type Drainage Area Receiving Waters 800 Grace Meadow Court Dogwood Farm Section 2 Subdivision County/Private 0073 12 0010, 0073 12 0011, 0073 12 0012, 0073 12 0014, 0074 15 0003, 0074 15 0004, 0074 15 0013, VDOT Quality/Quanity 23.45 acres 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** 

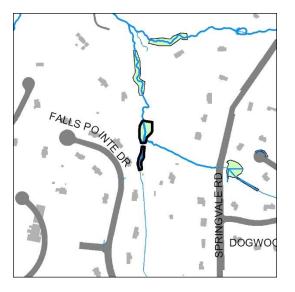
**Project Benefits:** This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new outlet structure will allow for a more controlled stormwater discharge 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 exceptions or waivers. Dry pond 0857DP is an exiting county facility, and is located in a storm drainage easement. Additional storm drainage easements will be necessary for the two trickle ditches 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.

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
Plantings: 5% of project costs (unless incl. as line item, Ancillary Items: 5% of project cost Erosion and Sediment Control: 10% of project costs		1111	ial Project Costs	<b>\$102,750.00</b> \$0.00 \$5,137.50 <u>\$10,275.00</u>
			nstruction Costs Iobilization (5%)	<b>\$118,162.50</b> \$5,908.13
		Ca	Subtotal 1 ontingency (25%)	<b>\$124,070.63</b> \$31,017.66
Engin	eering Design	•	Subtotal 2 cquisition, Utility ad Permits (45%)	<b>\$155,088.28</b> \$69,789.73
			Total Costs	\$224,878.01
		Estimated Proje	ect Costs	\$230,000.00

Costs

### NI9119 Stormwater Pond Retrofit, Stream Restoration



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

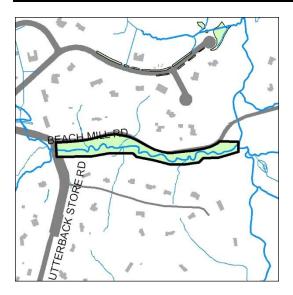
**Project Benefits:** This project will improve water quality by reducing sediment and nutrient loadings, reduce peak stormwater flows for storms up to the 10-year event, and provide for evapotranspiration and wildlife habitat. The new outlet structure will allow for a more controlled stormwater discharge 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 exceptions 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:	<b>TT 1</b> .			<b>T</b> . 1
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
Plantings: 5% of project costs (unless incl. as line Ancillary Items: 5% of project cost Erosion and Sediment Control: 10% of project cos		In	itial Project Costs	<b>\$150,700.00</b> \$0.00 \$7,535.00 <u>\$15,070.00</u>
			onstruction Costs Mobilization (5%)	<b>\$173,305.00</b> \$8,665.25
-		С	Subtotal 1 ontingency (25%)	<b>\$181,970.25</b> \$45,492.56
H	Engineering Design	, Surveys, Land	Subtotal 2	<b>\$227,462.81</b> \$102,358.27
			Total Costs	\$329,821.08
		Estimated Proj	ect Costs	\$330,000.00

#### Nichol Run and Pond Branch Watershed Management Plan

## NI9201 Stream Restoration



Address: Location: Land Owner: PIN:

Control Type Drainage Area Receiving Waters 10894 Woodleaf Lane Woodleaf Subdivision State/County/Private 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 Quality 176.11 acres 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

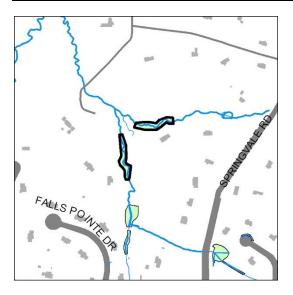
**Project Benefits:** This project will stabilize streambanks and improve water quality by reducing sediment and nutrient loadings. An estimated 72,260 lbs/yr of total suspended solids, 58 lbs/yr of nitrogen, and 22 lbs/yr of phosphorus will be removed.

**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 exceptions or waivers. This project is located on private land and along or within a road right-of-way. A small portion of this project crosses a gas line easement. Accessibility is good from Beach Mill Road but may be difficult due to tree cover. Minimal tree impacts and no 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
		Init	ial 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 Co.	nstruction Costs	\$52,020.00
		М	obilization (5%)	\$2,601.00
			Subtotal 1	\$54,621.00
		Со	ntingency (25%)	\$13,655.25
			Subtotal 2	\$68,276.25
Engine	ering Design	, Surveys, Land A	cquisition, Utility	
	0 0	Relocation an	d Permits (45%)	\$30,724.31
			Total Costs	\$99,000.56
		Estimated Proje	ct Costs	\$100,000.00

### NI9202 Stream Restoration



Address: Location: Land Owner: PIN: Control Type Drainage Area Receiving Waters

732 Springvale Road Spring Valley Woods Subdivision Private 0073 09 0003A, 0073 09 0004A Quality 177.13 acres 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 exceptions or waivers. Storm drainge easements will 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
Plantings: 5% of project costs (unless incl. as line item) Ancillary Items: 5% of project cost Erosion and Sediment Control: 10% of project costs		Init	ial Project Costs	<b>\$260,475.00</b> \$0.00 \$13,023.75 \$26,047.50
			nstruction Costs Iobilization (5%)	<b>\$299,546.25</b> \$14,977.31
		Ca	Subtotal 1 entingency (25%)	<b>\$314,523.56</b> \$78,630.89
Enginee	ering Design		<b>Subtotal 2</b> cquisition, Utility ad Permits (45%)	<b>\$393,154.45</b> \$176,919.50
			Total Costs	\$570,073.96
		Estimated Proje	ct Costs	\$580,000.00

### Nichol Run Watershed Nichol Run - Upper Watershed Management Area

# NI9401 Culvert Retrofit



Address: Location: Land Owner: PIN:

Control Type Drainage Area Receiving Waters 535 Springvale Road Down Patrick Farms Subdivision Private 0072 06 0009A3, 0072 15 0004, VDOT Quality/Quanity 99.93 acres 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 exceptions or waivers. Storm drainage easements will be necessary. Accessibility is excellent from Springvale Road. Minimal tree impacts and no significant construction issues anticipated.

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
Plantings: 5% of project costs (unless incl. as line iten Ancillary Items: 5% of project cost Erosion and Sediment Control: 10% of project costs	.,			\$0.00 \$3,522.50 \$7,045.00
	n) Base Construction Costs Mobilization (5%)		<b>\$81,017.50</b> \$4,050.88	
			Subtotal 1 ontingency (25%)	\$85,068.38 \$21,267.09
Eng	ineering Design	, Surveys, Land A	Subtotal 2 Acquisition, Utility ad Permits (45%)	<b>\$106,335.47</b> \$47,850.96
			Total Costs	\$154,186.43
		Estimated Proje	ect Costs	\$160,000.00