

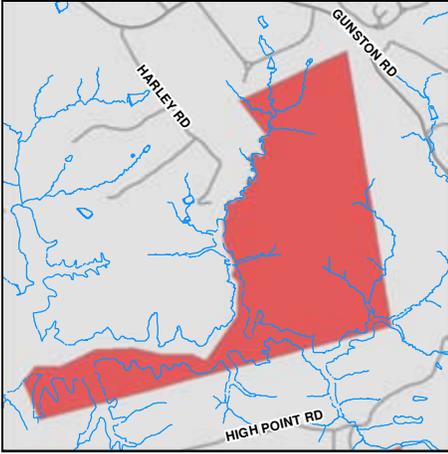
5.11 Lower Occoquan – Project Fact Sheets

Project fact sheets for each 10-yr structural project included in the Lower Occoquan Watershed Management Plan are included in this section. Individual project fact sheets are comprised of the following information:

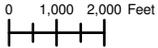
- Address / Location
- Land owner
- PIN (Tax map and parcel info)
- Control type (Water quality control, water quantity control, or both)
- Drainage area
- Receiving waters
- Description of proposed project
- Aerial view and sketch of proposed project
- Project Benefits
- Project Design Considerations
- Project Costs
- Site photos (existing conditions)

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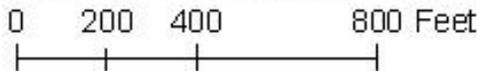
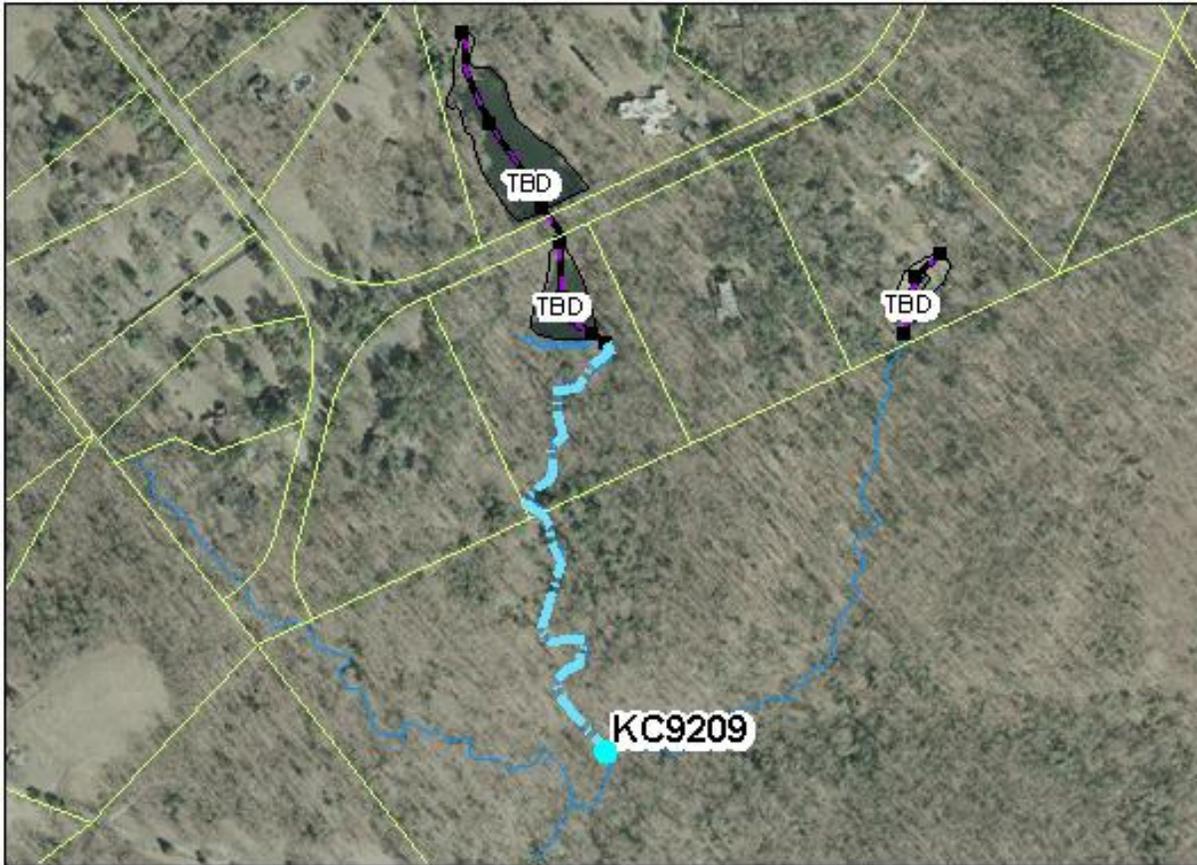
KC9209 Stream Restoration



Address: Behind 10809 Harley Rd., Lorton, Virginia
Location: Stream near Harley Rd.
Land Owner: Public/Private – Virginia Department of Conservation and Economic Development, private owner
PIN: 1182 01 0004, 1144 03020016
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of Kane Creek



Description: The stream south of Springfield Drive in Lorton shows indicators of poor channel morphology. The stream is downstream of two ponds, and ultimately discharges into Belmont Bay. A project is proposed to repair bank and bed erosion to restore channel morphology. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics and rapid vegetation establishment. To reduce further erosion the banks will be armored using geofabrics, fabric-encapsulated rocks or equivalent.



- Stream Restoration
- Storm Network
- Property Line
- Streams

Kane Creek Watershed Management Area

Project Benefits: Restoration will minimize sediment loads to the stream while maintaining capacity and controlling unwanted meander. The stream is severely eroded in some areas. The restoration and stabilization will reduce current erosion and minimize future erosion. Below are the project's estimated pollutant removal amounts.

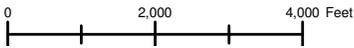
TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal (Lbs/Yr)
9.06	12.32	4.78

Project Design Considerations: Field investigation revealed that the stream is severely eroded, especially directly downstream from the pond, and has created a "waterfall" that drops approximately 5 feet. The stream is narrowing and deepening, and receives discharge from upstream pond and runoff from primarily wooded areas to the east and west. Energy dissipation devices downstream of the pond would be beneficial in reducing erosion to the stream by decreasing velocities.

Cost:

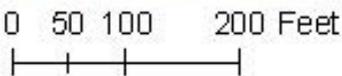
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct New Channel	1207	LF	\$200	\$241,400
Clear and Grub	1.39	AC	\$10,000	\$13,900
Plantings	1	LS	\$25,000	\$25,000
Additional Cost, First 500 LF	500	LF	\$200	\$100,000
Erosion and Sediment Control	1	LS	10%	\$38,030
Ancillary Items	1	LS	5%	\$19,015
Base Construction Cost				\$437,345
Mobilization (5%)				\$21,867
Subtotal 1				\$459,212
Contingency (25%)				\$114,803
Subtotal 2				\$574,015
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$258,307
Total				\$832,322
Estimated Project Cost				\$840,000

MB9104 Stormwater Pond Retrofit



Address: 10418 Old Colchester Rd., Lorton, Virginia
Location: Pond at Mason Neck West Park
Land Owner: Public/Local – Fairfax County Park Authority
PIN: 1134 01 0040A
Control Type: Water quality and quantity control
Drainage Area: 6.62 acres
Receiving Waters: Tributary of Giles Run

Description: A dry pond retrofit is proposed at Mason Neck West Park located off of Old Colchester Road in Lorton. The project proposes to create an extended detention dry pond with sediment forebays. The retrofit will modify the existing pond to provide adequate downstream channel protection and allow for better function of temporary ponding using a control structure, which promotes particulate pollutant settlement.



-  SW Pond Retrofit
-  Storm Network
-  Sediment Forebay
-  Property Line
-  Streams

Mill Branch-Giles Run South Watershed Management Area

Project Benefits: Extending the time stormwater is treated in the pond promotes particulate pollutant settlement and reduces erosion in the channel downstream. Installing the sediment forebays will reduce debris and coarse sediment in the pond. This will reduce costly maintenance and improve water quality. Removing the existing concrete pilot channels will encourage low flows with high concentrations of pollutants to infiltrate. The plantings in the proposed aquatic bench and safety bench will increase the ponds biological uptake of pollutants, such as nitrogen and phosphorus. Below are the project’s estimated pollutant removal amounts.

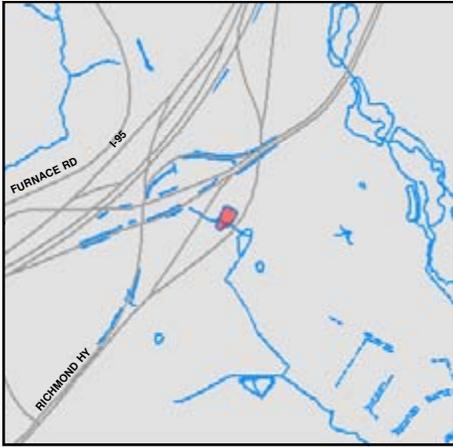
TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal I(Lbs/Yr)
0.39	3.96	0.83

Project Design Considerations: The project occurs on a state park with ample open space. County records show that the pond is not located in a storm drain easement. The available head difference in the pond appears minimal. The pond has three concrete pilot channels to direct low flows to the outlet. These should be removed. Due to the ponds minimal head, a micro-pool will need to be created. The pond’s safety bench and aquatic bench should be landscaped to prevent access to the pool, due to the pond’s location in the park. The pond receives many inflows. Sediment forebays should be constructed for inflows that drain 10 percent or more of the contributing drainage area. The total area of the sediment forebays should equal approximately 10 percent of the pond’s surface.

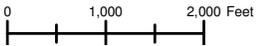
Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.44	AC	\$8,500	\$3,740
Grading and Excavation	1500	CY	\$35	\$52,500
Structural BMP Retrofit and Incidentals	1	LS	\$10,000	\$10,000
Embankment	55	CY	\$50	\$2,750
Outflow Pipe	90	LF	\$125	\$11,250
Rip Rap Stabilization	75	SY	\$100	\$7,500
Organic Compost Soil Amendment	350	CY	\$40	\$14,000
Plantings	1	LS	5%	\$5,087
Ancillary Items	1	LS	5%	\$5,087
Erosion and Sediment Control	1	LS	10%	\$10,174
Base Construction Cost				\$122,088
Mobilization (5%)				\$6,104
Subtotal 1				\$128,192
Contingency (25%)				\$32,048
Subtotal 2				\$160,241
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$72,108
Total				\$232,349
Estimated Project Cost				\$240,000

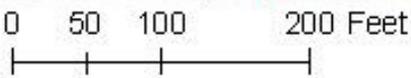
MB9105 Stormwater Pond Retrofit



Address: Near 10595 Furnace Rd., Lorton, Virginia
Location: Pond near Richmond Hwy and ramp
Land Owner: Public - Virginia Department of Transportation
PIN: US Route 1 (Richmond Highway)
Control Type: Water quality and quantity control
Drainage Area: 21.57 acres
Receiving Waters: Tributary of Occoquan River



Description: This project proposes the retrofit of an existing pond between Richmond Highway and west of the Old Colchester Road ramp to create a wetland system with sediment forebay and bench planting. The primary problem indicators are pollutants, including nitrogen, phosphorus and total suspended solids. The retrofit will modify the existing pond to increase the time stormwater travels through the facility. The retrofit will add areas of high marsh and low marsh to the pond with tree peninsulas and will create a better functioning environment for gravitational settling, biological uptake and microbial activity.



-  SW Pond Retrofit
-  Storm Network
-  Sediment Forebay
-  Property Line
-  Streams

Mill Branch-Giles Run South Watershed Management Area

Project Benefits: Installing the sediment forebay will reduce debris and coarse sediment in the wetland, reducing required maintenance. The extra travel time of water through the wetland will provide better downstream channel erosion protection. The wetland system will promote pollutant settlement and biological uptake of excessive nutrients. Below are the project’s estimated pollutant removal amounts.

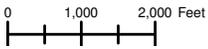
TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal (Lbs/Yr)
9.18	137.76	38.26

Project Design Considerations: Pond water quality treatment functions could be greatly improved with this retrofit. The existing pond footprint will need to be enlarged. The expansion should minimize impacts to the existing vegetation and should incorporate this vegetation into the wetland’s tree peninsulas. The existing pond does not have a discharge structure. County records show that the pond is not located in a storm drain easement, but it is located in the road right-of-way.

Cost:

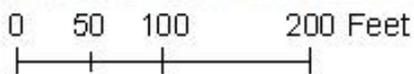
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.36	AC	\$8,500	\$3,060
Grading and Excavation	1800	CY	\$35	\$63,000
Structural BMP Retrofit and Incidentals	1	LS	\$15,000	\$15,000
Embankment	35	CY	\$50	\$1,750
Outflow Pipe	100	LF	\$125	\$12,500
Rip Rap Stabilization	125	SY	\$100	\$12,500
Organic Compost Soil Amendment	290	CY	\$40	\$11,600
Plantings	1	LS	5%	\$5,971
Ancillary Items	1	LS	5%	\$5,971
Erosion and Sediment Control	1	LS	10%	\$11,941
Base Construction Cost				\$143,292
Mobilization (5%)				\$7,165
Subtotal 1				\$150,457
Contingency (25%)				\$37,614
Subtotal 2				\$188,071
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$84,632
Total				\$272,703
Estimated Project Cost				\$280,000

MB9107 Stormwater Pond Retrofit



Address: 10119 Giles Run Rd., Burke, Virginia
Location: Dry pond near Giles Run Rd.
Land Owner: Private – private owners
PIN: 1132 03 E2
Control Type: Water quality and quantity control
Drainage Area: 0.79 acres
Receiving Waters: Tributary of Giles Run

Description: A dry pond is located in an industrial area off of Richmond Highway. This project proposes retrofitting the existing dry pond to create an extended detention dry pond with sediment forebays. The retrofit will modify the existing discharge structure to increase the time stormwater is detained in the pond. The pond will be expanded to handle this larger treatment volume. This retrofit will provide better downstream channel protection and promote particulate pollutant settlement. Pollutant indicators include nitrogen, phosphorous and total suspended solids.



-  SW Pond Retrofit
-  Storm Network
-  Sediment Forebay
-  Property Line
-  Streams

Mill Branch-Giles Run South Watershed Management Area

Project Benefits: Installing the sediment forebays will reduce debris and coarse sediment in the pond, which will reduce maintenance requirements. Extending the detention time of the stormwater will improve the pond's downstream channel erosion protection. Below are the project's estimated pollutant removal amounts.

TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal I(Lbs/Yr)
0.53	7.21	1.07

Project Design Considerations: This project is located on private property. Per County records, this pond is not located in a storm drain easement. A swale will need to be added to direct runoff to the sediment forebay. The two forebays will be approximately 10 percent of the pond area. The expanded pond will have a safety bench, and an aquatic bench will be planted around the perimeter of the pond. The expansion of the pond should incorporate the existing vegetation as much as possible. The landscaping plan should allow the pond to mature into a native forest in the right places, yet keep turf along the embankment and all access areas.

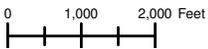
Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.1	AC	\$8,500	\$850
Grading and Excavation	670	CY	\$35	\$23,450
Structural BMP Retrofit and Incidentals	1	LS	\$10,000	\$10,000
Embankment	25	CY	\$50	\$1,250
Outflow Pipe	75	LF	\$125	\$9,375
Rip Rap Stabilization	50	SY	\$100	\$5,000
Organic Compost Soil Amendment	80	CY	\$40	\$3,200
Plantings	1	LS	5%	\$2,656
Ancillary Items	1	LS	5%	\$2,656
Erosion and Sediment Control	1	LS	10%	\$5,313
Base Construction Cost				\$63,750
Mobilization (5%)				\$3,188
Subtotal 1				\$66,938
Contingency (25%)				\$16,734
Subtotal 2				\$83,672
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$37,652
Total				\$121,324
Estimated Project Cost				\$130,000

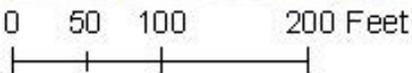
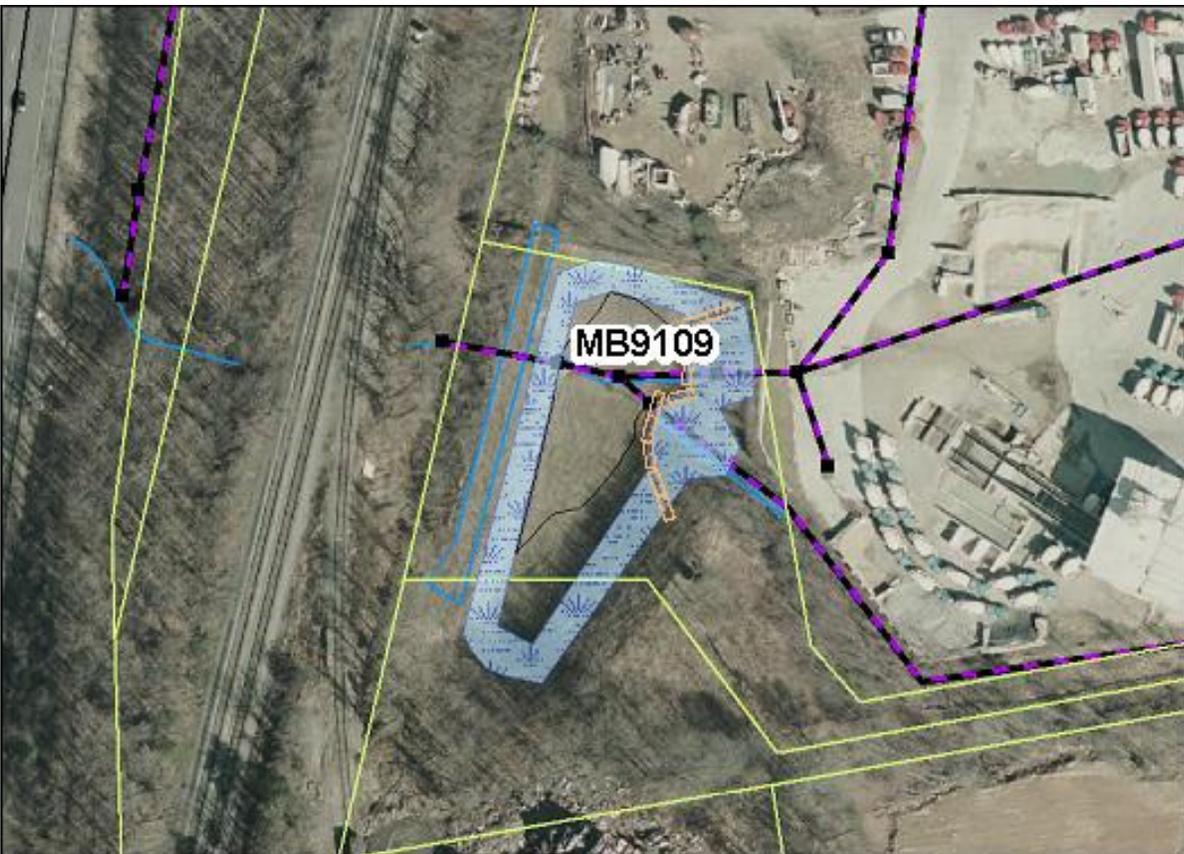
MB9109 Stormwater Pond Retrofit



Address: 8115 Mims St., Lorton, Virginia
Location: Pond at Cardinal Concrete
Land Owner: Private – Cardinal Concrete Co., Lorton Storage LLC, Liliana Enterprises LLC
PIN: 1132 04 0001, 1132 04 0002B, 1132 04 0002C
Control Type: Water quality and quantity control
Drainage Area: 97.26 acres
Receiving Waters: Tributary of Giles Run



Description: This project proposes retrofitting the existing pond west of Mims Street to create an extended detention pond with a sediment forebay. The pond currently receives stormwater runoff from a private concrete company. The primary pollutant problem indicators include nitrogen, phosphorus and total suspended solids. The pond's existing discharge structure will be modified to increase the time stormwater is treated in the facility. This will provide better downstream channel protection and will promote particulate settlement.



-  SW Pond Retrofit
-  Storm Network
-  Sediment Forebay
-  Property Line
-  Streams

Mill Branch-Giles Run South Watershed Management Area

Project Benefits: Installing the sediment forebay will reduce debris and coarse sediment in the pond. This will reduce pond maintenance costs. The proposed aquatic bench planting and safety bench plantings will increase infiltration and increase biological uptake of pollutants. By extending the time stormwater remains in the pond, downstream erosion will be reduced. Below are the project's estimated pollutant removal amounts.

TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal I(Lbs/Yr)
7.24	106.98	16.36

Project Design Considerations: County records show that the pond is located in a storm drain easement. The pond outfalls under a railroad track into the drainage system along Henry G. Shirley Memorial Highway. This highly industrialized area would benefit from additional stormwater treatment. The proposed sediment forebay should be sized to be at least 10 percent of the surface area of the pond. The pond will probably need to be expanded to accommodate the larger detention volume (see hatching on map). The aquatic bench and safety bench planting should incorporate the existing vegetation as much as possible.

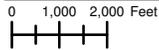
Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.38	AC	\$8,500	\$3,230
Grading and Excavation	1800	CY	\$35	\$63,000
Structural BMP Retrofit and Incidentals	1	LS	\$15,000	\$15,000
Embankment	55	CY	\$50	\$2,750
Outflow Pipe	125	LF	\$125	\$15,625
Rip Rap Stabilization	75	SY	\$100	\$7,500
Organic Compost Soil Amendment	430	CY	\$40	\$17,200
Plantings	1	LS	5%	\$6,215
Ancillary Items	1	LS	5%	\$6,215
Erosion and Sediment Control	1	LS	10%	\$12,431
Base Construction Cost				\$149,166
Mobilization (5%)				\$7,458
Subtotal 1				\$156,624
Contingency (25%)				\$39,156
Subtotal 2				\$195,780
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$88,101
Total				\$283,882
Estimated Project Cost				\$290,000

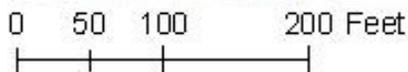
MB9111 Stormwater Pond Retrofit



Address: 9816 Richmond Hwy., Lorton, Virginia
Location: Pond west of Richmond Hwy.
Land Owner: Private – Shepherd Family LP
PIN: 1132 01 0019, 1132 01 0060
Control Type: Water quality and quantity control
Drainage Area: 16.80 acres
Receiving Waters: Tributary of Giles Run



Description: This project proposes retrofitting an existing wet pond east of Mims Street to create a constructed wetland system, with sediment forebay and an engineered landscaping plan. The retrofit will extend the flow path of stormwater runoff in the wetland by enlarging the facility’s size and creating high and low marsh areas. The primary pollutant indicators are nitrogen, phosphorous and total suspended solids. The retrofit will increase pollutant removal and provide better channel protection above the permanent pool of standing water. The pool prevents re-suspension of sediments and other pollutants.



-  SW Pond Retrofit
-  Storm Network
-  Sediment Forebay
-  Property Line
-  Streams

Mill Branch-Giles Run South Watershed Management Area

Project Benefits: Installing the sediment forebay will reduce debris and coarse sediment in the wetland, resulting in less maintenance. Extending the flow path of water through the wetland will provide better downstream channel protection. Below are the project’s estimated pollutant removal amounts.

TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal (Lbs/Yr)
26.78	5.55	1.35

Project Design Considerations: The existing wet pond collects runoff from an industrial area. Part of the pond is located on a wooded single-family home site. The remaining part of the pond is on a commercial parcel. Both parcels are owned by the same limited partnership. County records show no storm drain easements for the pond. When the pond is expanded, the area north of the pond should be regraded to a pretreatment swale. This swale would then discharge to sediment forebay. The total volume of the sediment forebays should be at least 15 percent of the treatment volume. To maximize the flow path in the wetland and increase pool vegetation, internal structures such as tree peninsulas and high marsh wedges should be added. The expansion should try to incorporate the existing vegetation as much as possible.

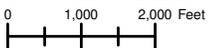
Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.22	AC	\$8,500	\$1,870
Grading and Excavation	1000	CY	\$35	\$35,000
Structural BMP Retrofit and Incidentals	1	LS	\$15,000	\$15,000
Embankment	40	CY	\$50	\$2,000
Outflow Pipe	75	LF	\$125	\$9,375
Rip Rap Stabilization	75	SY	\$100	\$7,500
Organic Compost Soil Amendment	180	CY	\$40	\$7,200
Plantings	1	LS	5%	\$3,897
Ancillary Items	1	LS	5%	\$3,897
Erosion and Sediment Control	1	LS	10%	\$7,795
Base Construction Cost				\$93,534
Mobilization (5%)				\$4,677
Subtotal 1				\$98,211
Contingency (25%)				\$24,553
Subtotal 2				\$122,763
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$55,244
Total				\$178,007
Estimated Project Cost				\$180,000

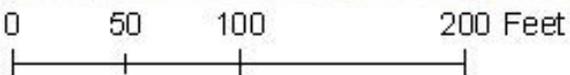
MB9114 Stormwater Pond Retrofit



Address: 9850 Furnace Rd, Lorton, Virginia
Location: I-95 Landfill
Land Owner: Public/Local – Fairfax County Board of Supervisors
PIN: 1073 01 0020
Control Type: Water quality and quantity control
Drainage Area: 2.59 acres
Receiving Waters: Tributary of Giles Run



Description: This project proposes to retrofit an existing dry pond at the Fairfax County Landfill off of Furnace Road in Lorton. A sediment forebay will be added to provide pretreatment to the pond's two inflows. The pond's existing discharge structure will be modified to increase the time water is detained in the pond. To handle the larger detention volume the pond will be enlarged. And an aquatic bench will be added to increase biological uptake of pollutants.



-  SW Pond Retrofit
-  Storm Network
-  Sediment Forebay
-  Property Line
-  Streams

Mill Branch-Giles Run South Watershed Management Area

Project Benefits: Extending the time that stormwater remains in the pond will promote the settlement of particulate pollutants, reducing the total suspended solids discharging from the pond. The pond's extended detention will also provide better downstream channel protection against erosion. Adding the aquatic bench, designed with an engineered planting plan, will improve the pond's biological uptake of nutrients and reduce phosphorus and nitrogen from the stormwater runoff. Below are the project's estimated pollutant removal amounts.

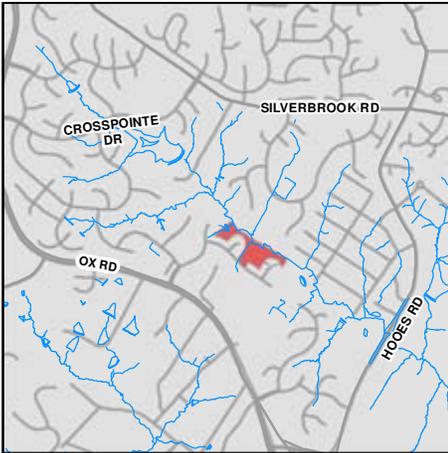
TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal I(Lbs/Yr)
0.22	4.48	1.00

Project Design Considerations: Providing proper stormwater treatment at a landfill should be given a high priority. Also, because the site is owned by the County this project will be easier to implement. Currently, this pond is labeled as To-Be-Determined (TBD) in the County's system, which means this pond is not actively maintained. Implementing the project would insure this pond is maintained, better treating the landfill's stormwater runoff. This pond retrofit is just downstream of another proposed project at the landfill, MB9506, a bioretention area.

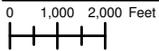
Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.15	AC	\$8,500	\$1,275
Grading and Excavation	900	CY	\$35	\$31,500
Structural BMP Retrofit and Incidentals	1	LS	\$10,000	\$10,000
Embankment	30	CY	\$50	\$1,500
Outflow Pipe	100	LF	\$125	\$12,500
Rip Rap Stabilization	75	SY	\$100	\$7,500
Organic Compost Soil Amendment	120	CY	\$40	\$4,800
Plantings	1	LS	5%	\$3,454
Ancillary Items	1	LS	5%	\$3,454
Erosion and Sediment Control	1	LS	10%	\$6,908
Base Construction Cost				\$82,890
Mobilization (5%)				\$4,145
Subtotal 1				\$87,035
Contingency (25%)				\$21,759
Subtotal 2				\$108,793
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$48,957
Total				\$157,750
Estimated Project Cost				\$160,000

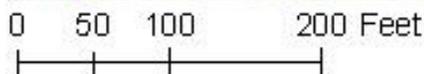
MB9122 Stormwater Pond Retrofit



Address: 8605 Cross Chase Court, Fairfax Station, Virginia
Location: Behind 8605 Cross Chase Ct
Land Owner: Crosspointe Swim and Racquet Inc.
PIN: 1062 1015C, 1062 1016A
Control Type: Water quality and quantity control
Drainage Area: 9.83 acres
Receiving Waters: Tributary of Giles Run



Description: This project proposes the retrofit of an existing public pond east of Cross Chase Circle to create a wetland system with sediment forebays and bench planting. The existing dry pond receives runoff from two pipes and a channel, and sheet flow from the back of the residential houses. The wetland retrofit will include adding two sediment forebays for the stormwater inflows, expanding the pond to provide more time to treat stormwater in the pond and creating high and low marsh areas in the pond to increase the biological uptake in the pond.



-  SW Pond Retrofit
-  Storm Network
-  Sediment Forebay
-  Property Line
-  Streams

Mill Branch-Giles Run North Watershed Management Area

Project Benefits: Pollutant removal will be achieved through settling and biological uptake within the wetland. Increasing the time it takes for stormwater to travel through the pond will reduce stormwater runoff volume and peak discharge rates. This project will increase shading and contact with plant life, resulting in cooler water temperatures and improved habitat. Below are the project's estimated pollutant removal amounts.

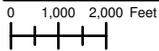
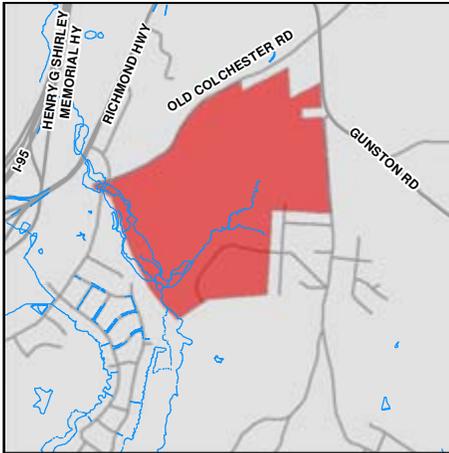
TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal I(Lbs/Yr)
0.12	0.78	0.30

Project Design Considerations: County records show that this pond is within a storm drain easement and actively maintained under the pond ID 0775DP. The facility footprint will need to be expanded to accommodate the addition of the new sediment forebays and the additional detention time. When the pond is expanded, care should be taken to try and incorporate the existing vegetation into the proposed planting plan. Care should be taken when designing the wetland system to establish a stable ecology which will deter excessive mosquito reproduction.

Cost:

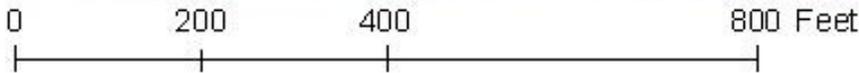
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.38	AC	\$8,500	\$3,230
Grading and Excavation	1200	CY	\$35	\$42,000
Structural BMP Retrofit and Incidentals	1	LS	\$10,000	\$10,000
Embankment	45	CY	\$50	\$2,250
Outflow Pipe	45	LF	\$125	\$5,625
Rip Rap Stabilization	50	SY	\$100	\$5,000
Organic Compost Soil Amendment	275	CY	\$40	\$11,000
Plantings	1	LS	5%	\$3,955
Ancillary Items	1	LS	5%	\$3,955
Erosion and Sediment Control	1	LS	10%	\$7,911
Base Construction Cost				\$94,926
Mobilization (5%)				\$4,746
Subtotal 1				\$99,672
Contingency (25%)				\$24,918
Subtotal 2				\$124,590
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$56,066
Total				\$180,656
Estimated Project Cost				\$190,000

MB9202 Stream Restoration



Address: 10207 Old Colchester Rd, Lorton, Virginia
Location: Stream near Old Colchester Rd. (upstream)
Land Owner: Public – United States of America
PIN: 1134 01 0048
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of South Branch

Description: This project proposes the restoration of a stream southeast of Old Colchester Road that flows from east to west. The project proposes to restore channel morphology by improving bed and bank erosion. Erosion will be stabilized through the use of bank shaping, toe protection, erosion-control fabrics and rapid vegetation establishment. The banks will be armored using geofabrics, fabric encapsulated rocks or the equivalent to reduce further erosion. The stream receives runoff from residential housing to the east and surrounding wooded areas.



- Stream Restoration
- Storm Network
- Property Line
- Streams

Mill Branch-Giles Run South Watershed Management Area

Project Benefits: The stream stabilization will reduce sediment loads to the stream while maintaining capacity of the stream channel and controlling unwanted meander. There is an area of high erosion near residential properties. Restoration will help minimize potential impacts to residences over time. It will also help stabilize the existing mature vegetation along the banks. Reducing erosion from this stream will reduce instream sediment and its associated pollutants. Below are the project's estimated pollutant removal amounts.

TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal I(Lbs/Yr)
10.32	14.03	5.44

Project Design Considerations: Field investigation revealed severe erosion and would indicate a high priority should be set for this project. The area of highest erosion is the farthest upstream point where a "waterfall" has formed due to approximately 10 feet of erosion. Conditions marginally improve further downstream. The stream is created by several small swales discharging from the adjacent residential areas at the same point, which is causing severe erosion.

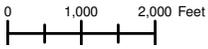
Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct New Channel	945	LF	\$200	\$189,000
Clear and Grub	1.08	AC	\$10,000	\$10,800
Plantings	1	LS	\$25,000	\$25,000
Additional Cost, First 500 LF	500	LF	\$200	\$100,000
Erosion and Sediment Control	1	LS	10%	\$32,480
Ancillary Items	1	LS	5%	\$16,240
Base Construction Cost				\$373,520
Mobilization (5%)				\$18,676
Subtotal 1				\$392,196
Contingency (25%)				\$98,049
Subtotal 2				\$490,245
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$220,610
Total				\$710,855
Estimated Project Cost				\$720,000

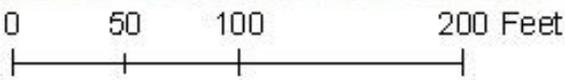
MB9506 BMP/LID



Address: 9850 Furnace Rd, Lorton, Virginia
Location: I-95 Landfill
Land Owner: Public/Local – Fairfax County Board of Supervisors
PIN: 1073 01 0020
Control Type: Water quality and quantity control
Drainage Area: 3.72 acres
Receiving Waters: Tributary of Giles Run



Description: This project proposes the construction of a bioretention area at Fairfax County Landfill. The bioretention landscaping feature will receive runoff from parking lots. The bioretention landscaping feature will have a filter layer made of 18 – 48 inches of sand placed below a mulch layer. During a storm, the runoff will pond 6 – 9 inches, drain through the bioretention filter media, infiltrate into the native soil or outfall to the storm system. The primary indicators are upland sediment, total suspended solids and pollutants, including nitrogen and phosphorous.



- Bioretention Area
- Storm Network
- Property Line

Mill Branch-Giles Run South Watershed Management Area

Project Benefits: The bioretention area will create an ideal environment for filtration, biological uptake and microbial activity. The bioretention areas will promote infiltration and decrease runoff volume from site. Below are the project's estimated pollutant removal amounts.

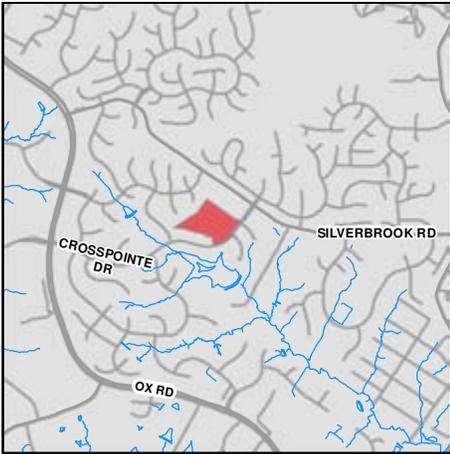
TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal I(Lbs/Yr)
0.24	4.85	0.97

Project Design Considerations: The Watershed Advisory Group (WAG) identified this project as critical. Increased priority is due to high pollutants on the landfill site. During field investigations the site was not accessible because it is in a secure area. The site selected is a good location for bioretention due to storm pipe network and topography.

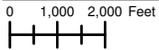
Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Bioretention Filters and Basins	300	SY	\$150	\$45,000
Plantings	1	LS	5%	\$2,250
Ancillary Items	1	LS	5%	\$2,250
Erosion and Sediment Control	1	LS	10%	\$4,500
Base Construction Cost				\$54,000
Mobilization (5%)				\$2,700
Subtotal 1				\$56,700
Contingency (25%)				\$14,175
Subtotal 2				\$70,875
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$31,894
Total				\$102,769
Estimated Project Cost				\$110,000

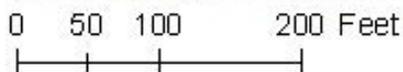
MB9510 BMP/LID



Address: 9350 Crosspointe Dr., Fairfax Station, Virginia
Location: Silverbrook Elementary School
Land Owner: Public/Local – Fairfax County School Board
PIN: 0974 01 0028
Control Type: Water quality and quantity control
Drainage Area: 3.14 acres
Receiving Waters: Tributary of Giles Run



Description: This project proposes the construction of a bioretention area at Silverbrook Elementary School on Crosspointe Drive. The bioretention landscaping feature will receive runoff from the parking lot and building. A filter layer made of 18 – 48 inches of sand will be placed below a mulch layer. During a storm, the runoff will pond 6 –9 inches in the bioretention area, filter through the bioretention media soil, and either outfall to the existing storm system or infiltrate into the native soil. The primary indicators are upland sediment, total suspended solids and pollutants, including nitrogen and phosphorous.



-  Bioretention Area
-  Storm Network
-  Property Line

Mill Branch-Giles Run North Watershed Management Area

Project Benefits: Bioretention will capture sheet flow and create an ideal environment for filtration, biological uptake and microbial activity. The bioretention areas will promote infiltration, decrease runoff volume from the site and reduce peak outflow to the storm system. Bioretention areas at schools provide great examples of environmental stewardship and help educate the students about proper stormwater management. Reducing erosion from this stream will reduce instream sediment and its associated pollutants. Below are the project's estimated pollutant removal amounts.

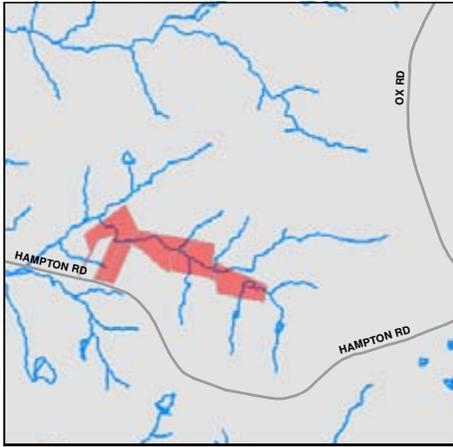
TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal I(Lbs/Yr)
0.54	8.52	2.08

Project Design Considerations: Construction of bioretention area at this location should have minimal impacts. The existing topography and the storm pipe network make this a location ideal. Area is upstream of a regional pond.

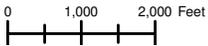
Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Bioretention Filters and Basins	625	SY	\$150	\$93,750
Plantings	1	LS	5%	\$4,688
Ancillary Items	1	LS	5%	\$4,688
Erosion and Sediment Control	1	LS	10%	\$9,375
Base Construction Cost				\$112,500
Mobilization (5%)				\$5,625
Subtotal 1				\$118,125
Contingency (25%)				\$29,531
Subtotal 2				\$147,656
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$66,445
Total				\$214,102
Estimated Project Cost				\$220,000

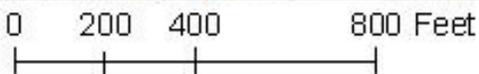
SA9201 Stream Restoration



Address: Next to 8721 Birch Cliff Dr., Fairfax Station, Virginia
Location: Stream section upstream of Birch Cliff Dr.
Land Owner: Private – private owners
PIN: 1052 08 0002, 1052 08 0003, 1052 08 0030, 1052 08 0032, 1052 08 0034, 1061 07 0041
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of Occoquan River



Description: The stream near Birch Cliff Drive conveying runoff from houses, wooded area, and substation area upstream of outfall to Occoquan Reservoir has indicators of poor channel morphology. This project proposes spot improvements along the stream to restore channel morphology and repair eroded areas. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics and rapid vegetation establishment.



- Stream Restoration
- Storm Network
- Property Line
- Streams

Sandy Run Watershed Management Area

Project Benefits: Stabilization will reduce sediment loads to the stream while maintaining capacity and controlling unwanted meander. Implementation of these measures, including bank shaping, toe protection, erosion control fabrics and rapid vegetation establishment will repair existing erosion and help prevent future erosion over time. Reducing erosion from this stream will reduce instream sediment and its associated pollutants. Below are the project's estimated pollutant removal amounts.

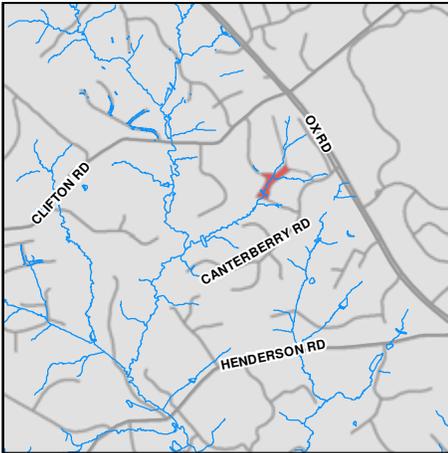
TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal (Lbs/Yr)
9.74	6.62	2.57

Project Design Considerations: The Watershed Advisory Group (WAG) commented that manmade impediments to the flow of the natural stream, including a fence near the culvert, are a hindrance to any effort at this site. Field investigation revealed areas of slight to moderate erosion. Several peninsulas and islands have formed from sediment deposition. A dam has been created before the culvert. The stream has several areas that need spot repairs and cleanup of the man-made features that are obstructing natural flow.

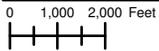
Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Spot Improvements Along Channel	2053	LF	\$100	\$205,300
Clear and Grub	2.36	AC	\$10,000	\$23,600
Plantings	1	LS	\$25,000	\$25,000
Additional Cost, First 500 LF	500	LF	\$200	\$100,000
Erosion and Sediment Control	1	LS	10%	\$35,390
Ancillary Items	1	LS	5%	\$17,695
Base Construction Cost				\$406,985
Mobilization (5%)				\$20,349
Subtotal 1				\$427,334
Contingency (25%)				\$106,834
Subtotal 2				\$534,168
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$240,376
Total				\$774,543
Estimated Project Cost				\$780,000

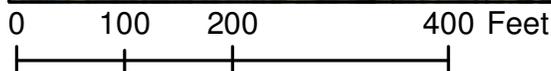
SA9209 Stream Restoration



Address: Near 10746 Beechnut Ct., Fairfax Station, Virginia
Location: Stream upstream of Beechnut Ct.
Land Owner: Private – Wildwood Hills Estates Homeowners Association, private owners, Canterbury Estates Community Association
PIN: 0873 11 C, 0873 12 0002, 0873 12 0003, 0873 12 0004, 0873 09 A1, 0873 09 0013
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of Sandy Run



Description: The stream section upstream of Beechnut Court in Fairfax Station conveys runoff from wooded area, housing, and Ox Road has indicators of poor channel morphology. This project proposes spot improvements along the stream to restore channel morphology and repair eroded areas. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics, and rapid vegetation establishment. The banks will be armored to reduce further erosion using geofabrics, fabric encapsulated rocks or equivalent.



- Stream Restoration
- Storm Network
- Property Line
- Streams

Sandy Run Watershed Management Area

Project Benefits: This project will help stabilize the streambanks and will reduce sediment loads to the stream while maintaining capacity and controlling unwanted meander. Additionally, restoration will repair existing erosion and will help to reduce further erosion. Reducing erosion from this stream will reduce instream sediment and its associated pollutants. Below are the project's estimated pollutant removal amounts.

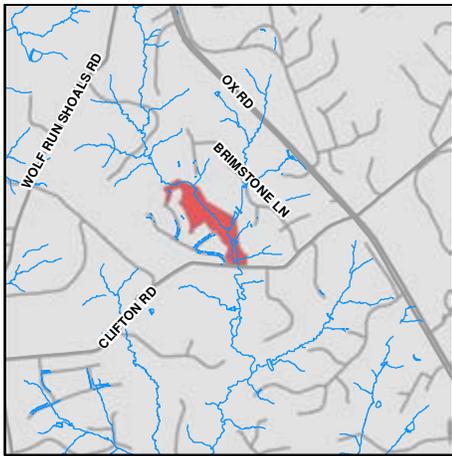
TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal I(Lbs/Yr)
6.82	5.46	2.12

Project Design Considerations: The Watershed Advisory Group (WAG) identified this project as critical. The field investigation identified streambank cut approximately 2 feet or more along majority of the length of the stream. The stream is close to several homes. Erosion could eventually have impacts on these properties if erosion is not contained. Measures implemented (as described above) should minimize potential for future erosion. Also a culvert consisting of three pipes, has one pipe entirely blocked. The culvert needs to be restored to maximize benefits of this restoration. The culvert is shown on the aerial map as a pipe in line with the stream. The culvert crosses a dirt road near the cul-de-sac.

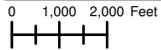
Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Spot Improvements Along Channel	1321	LF	\$100	\$132,100
Clear and Grub	1.52	AC	\$10,000	\$15,200
Plantings	1	LS	\$25,000	\$25,000
Additional Cost, First 500 LF	500	LF	\$200	\$100,000
Erosion and Sediment Control	1	LS	10%	\$27,230
Ancillary Items	1	LS	5%	\$13,615
Base Construction Cost				\$313,145
Mobilization (5%)				\$15,657
Subtotal 1				\$328,802
Contingency (25%)				\$82,201
Subtotal 2				\$411,003
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$184,951
Total				\$595,954
Estimated Project Cost				\$600,000

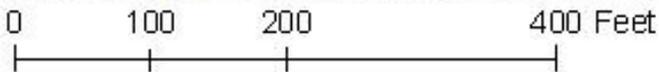
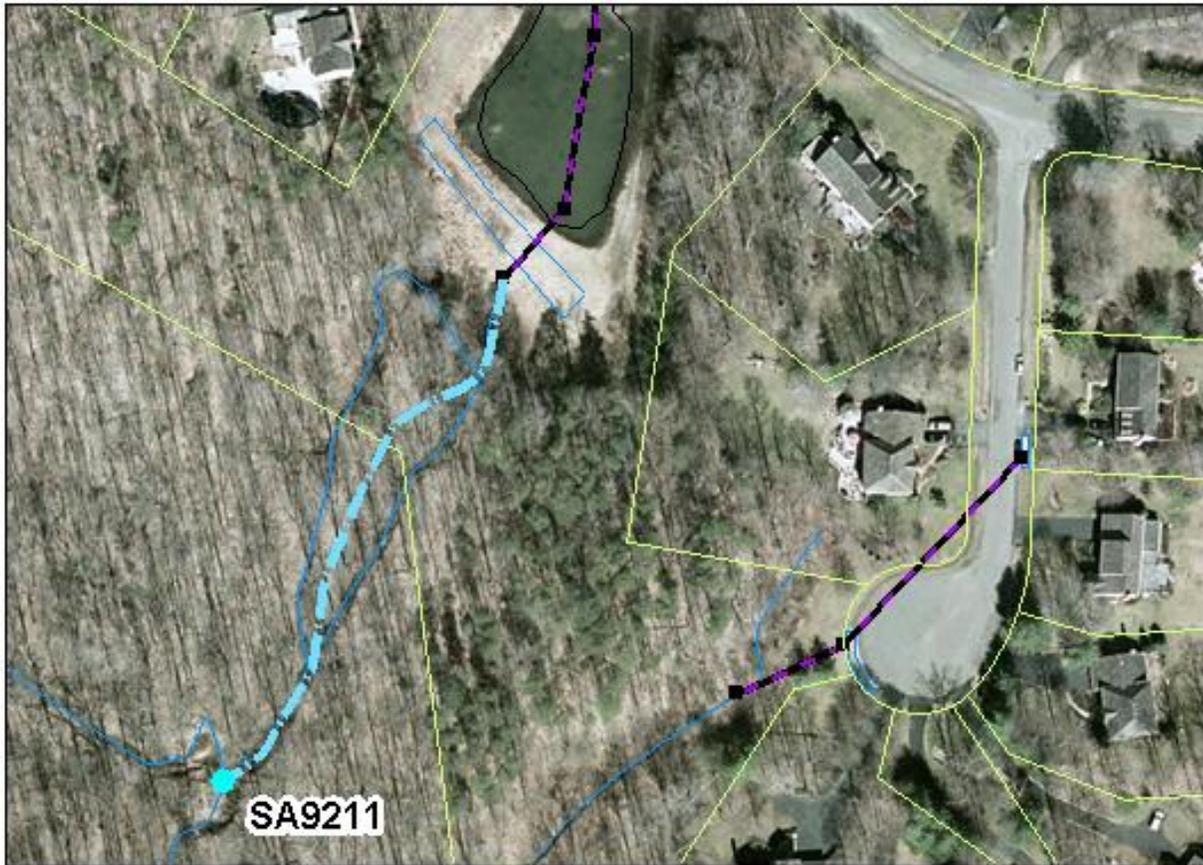
SA9211 Stream Restoration



Address: Behind 6901 Streamwood Pl., Fairfax Station, Virginia
Location: Stream near Stream Wood Pl.
Land Owner: Public/Local – Fairfax County Park Authority
PIN: 0871 05 C, 0871 0502 A
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of Sandy Run



Description: The stream section east of Streamwood Place in Fairfax Station where two streams converge, conveys runoff from adjacent houses, streets and wooded area has indicators of poor channel morphology. This project proposes spot improvements along the stream to restore channel morphology and repair eroded areas. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics and rapid vegetation establishment. The banks will be armored to reduce further erosion using geofabrics, fabric encapsulated rocks or equivalent.



- - - - Stream Restoration
 - - - - Storm Network
 - Property Line
 - Streams
- Lower Occoquan Watershed Management Plan 5-93

Sandy Run Watershed Management Area

Project Benefits: Stabilization will reduce sediment loads to the stream while maintaining capacity and controlling unwanted meander. The stream is downstream of an existing pond and west of several homes. Erosion could have impacts on private homeowners' properties over time. Restoration will improve existing erosion and prevent future impacts. Reducing erosion from this stream will reduce instream sediment and its associated pollutants. Below are the project's estimated pollutant removal amounts.

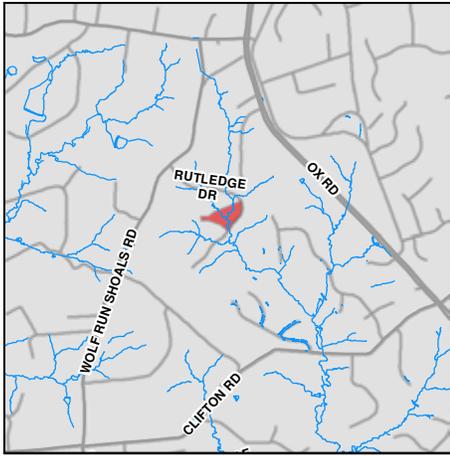
TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal (Lbs/Yr)
2.24	1.53	0.59

Project Design Considerations: This project is proposed on property owned by Fairfax County Park Authority and should be closely coordinated with the Park Authority. A section of stream is close to houses and roadways. Erosion has already had impacts on existing mature vegetation. The Watershed Advisory Group (WAG) has identified this project as critical. Field investigation revealed minor to moderate erosion. There are areas of significant sediment deposition. Spot improvements are recommended. This project should be executed in conjunction with project SA9803

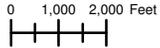
Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Spot Improvements Along Channel	446	LF	\$100	\$44,600
Clear and Grub	0.51	AC	\$10,000	\$5,100
Plantings	1	LS	\$25,000	\$25,000
Additional Cost, First 500 LF	446	LF	\$200	\$89,200
Erosion and Sediment Control	1	LS	10%	\$16,390
Ancillary Items	1	LS	5%	\$8,195
Base Construction Cost				\$188,485
Mobilization (5%)				\$9,424
Subtotal 1				\$197,909
Contingency (25%)				\$49,477
Subtotal 2				\$247,387
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$111,324
Total				\$358,711
Estimated Project Cost				\$360,000

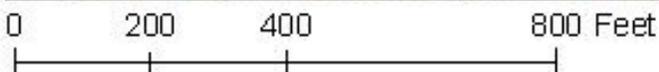
SA9213 Stream Restoration



Address: 6650 Rutledge Dr., Fairfax Station, Virginia
Location: Stream section downstream of Rutledge Rd.
Land Owner: Private – private owners
PIN: 0871 11 0019, 0871 11 0020
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of Sandy Run



Description: The stream section east of Wolf Run Shoals Road in Fairfax Station conveying runoff primarily from wooded area, several houses, and a building with parking lot, has indicators of poor channel morphology. This project proposes spot improvements along the stream to restore channel morphology and repair eroded areas. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics, and rapid vegetation establishment.



- Stream Restoration
- Storm Network
- Property Line
- Streams

Sandy Run Watershed Management Area

Project Benefits: Stabilization will reduce sediment loads to the stream while maintaining capacity and controlling unwanted meander. Implementation of measures above, including bank shaping, toe protection, erosion control fabrics and rapid vegetation establishment will repair existing erosion and help prevent future erosion over time. Reducing erosion from this stream will reduce instream sediment and its associated pollutants. Below are the project's estimated pollutant removal amounts.

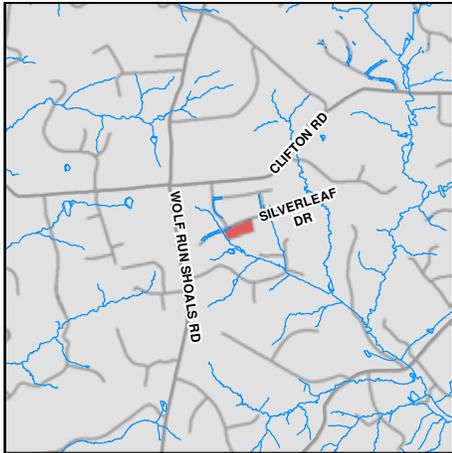
TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal I(Lbs/Yr)
6.13	4.90	1.90

Project Design Considerations: The Watershed Advisory Group (WAG) has identified this project as critical. Field investigation identified moderate to severe erosion in spots. There are several areas of sediment deposition. Restoration will allow the stream to flow more naturally with less sediment creating less islands or peninsulas. The stream runs through private home lots. If not repaired, erosion could ultimately affect these homes.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Spot Improvements Along Channel	1135	LF	\$100	\$113,500
Clear and Grub	1.3	AC	\$10,000	\$13,000
Plantings	1	LS	\$25,000	\$25,000
Additional Cost, First 500 LF	500	LF	\$200	\$100,000
Erosion and Sediment Control	1	LS	10%	\$25,150
Ancillary Items	1	LS	5%	\$12,575
Base Construction Cost				\$289,225
Mobilization (5%)				\$14,461
Subtotal 1				\$303,686
Contingency (25%)				\$75,922
Subtotal 2				\$379,608
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$170,824
Total				\$550,431
Estimated Project Cost				\$560,000

SA9701 Outfall Improvement



0 1,000 2,000 Feet

Address: Near 7399 Beach Plum Dr., Fairfax Station, Virginia
Location: Paved ditch along Silverleaf Dr.
Land Owner: Private – private owners
PIN: 0864 05 0028
Control Type: Water quality and quantity control
Drainage Area: N/A
Receiving Waters: Tributary of Sandy Run

Description: This project proposes removing the outfall section of an existing concrete swale along Silverleaf Drive to reduce erosive velocities to the stream and reduce pollutants. Currently, stormwater runs off of Silverleaf Drive into the concrete swale and directly into the adjacent stream with no stormwater treatment. The receiving stream has poor channel morphology. Replacing the existing concrete swale with a natural swale with check dams and step pools, to reduce velocity and encourage infiltration, would help downstream erosion.



0 50 100 200 Feet

 Outfall Improvement	 Storm Network	 Property Line
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Sandy Run Watershed Management Area

Project Benefits: Retrofitting the swale will reduce erosive flow velocities, increase stormwater infiltration and provide better downstream channel protection. The step pools created by the check dams will provide stormwater treatment and protect the downstream channel against erosion. Below are the project’s estimated pollutant removal amounts.

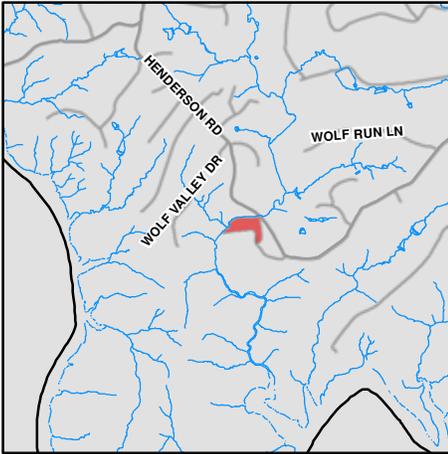
TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal I(Lbs/Yr)
0.850	1.36	0.53

Project Design Considerations: When the existing concrete channel is removed, the remaining soils will need to be amended to improve infiltration of the compacted soils. The number of check dams and step pools necessary for the retrofit will be determined by the existing slope of the swale. GIS contour data yields an estimated slope of 7 percent for the existing concrete swale. A settling basin might need to be constructed at the end of the proposed retrofit. This settling basin should receive flow from the culvert under Silverleaf Drive to be more effective at reducing erosive velocities in the stream. County records show that the project is not located in a storm drain easement, and the swale is located outside the road right-of-way and on private property.

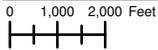
Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct New Channel	161	LF	\$200	\$32,200
Clear and Grub	0.02	AC	\$10,000	\$200
Plantings	0.02	AC	\$25,000	\$500
Additional Cost, First 500 LF	161	LF	\$200	\$32,200
Erosion and Sediment Control	1	LS	10%	\$6,510
Ancillary Items	1	LS	5%	\$3,255
Base Construction Cost				\$74,865
Mobilization (5%)				\$3,743
Subtotal 1				\$78,608
Contingency (25%)				\$19,652
Subtotal 2				\$98,260
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$44,217
Total				\$142,477
Estimated Project Cost				\$150,000

WR9201 Stream Restoration



Address: Behind 12101 Henderson Rd., Fairfax Station, Virginia
Location: Stream near Henderson Rd
Land Owner: Private – private owners
PIN: 0951 01 0025, 0951 12 0013, 0951 12 0016, 0953 01 0002A, 0953 01 0014, 0953 03 0008
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of Wolf Run



Description: The stream section east of Wolf Valley Drive in Fairfax Station is conveying runoff from wooded area and houses and has indicators of poor channel morphology. The stream crosses under Henderson Road and eventually outfalls to Occoquan Reservoir. This project proposes repairing bank and bed erosion to restore channel morphology. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics and rapid vegetation establishment. The banks will be armored using geofabrics, fabric encapsulated rocks or equivalent to reduce further erosion.



- Stream Restoration
- Storm Network
- Property Line
- Streams

Wolf Run Watershed Management Area

Project Benefits: Stabilization will reduce sediment loads to the stream while maintaining capacity and controlling unwanted meander. Because the stream crosses the existing road, erosion could have major structural and flooding impacts on the road. Restoration will help to repair the existing erosion and minimize the potential for further erosion. Reducing erosion from this stream will reduce instream sediment and its associated pollutants. Below are the project's estimated pollutant removal amounts.

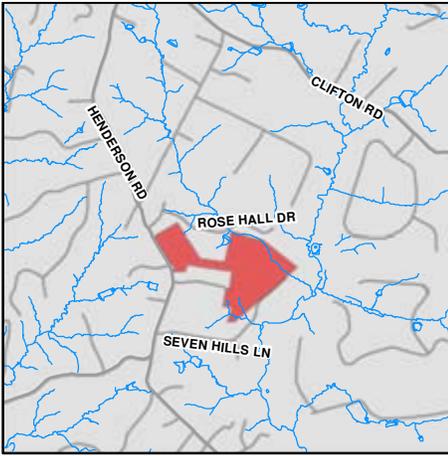
TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal I(Lbs/Yr)
37.27	59.63	23.11

Project Design Considerations: Field investigations identified that the stream has areas of highly eroded banks, widening, meander and fallen trees. An upstream bank of bridge support has erosion, exposing the support. The upstream end of the meandering stream has cut an overflow ditch through the woods. The downstream end has sediment deposit obstruction. Erosion has had impacts on mature vegetation by causing trees to lose stability. The stream has several areas of natural debris that could be impeding the natural flow of the stream.

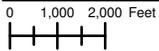
Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct New Channel	1823	LF	\$200	\$364,600
Clear and Grub	2.09	AC	\$10,000	\$20,900
Plantings	1	LS	\$25,000	\$25,000
Additional Cost, First 500 LF	500	LF	\$200	\$100,000
Erosion and Sediment Control	1	LS	10%	\$51,050
Ancillary Items	1	LS	5%	\$25,525
Base Construction Cost				\$587,075
Mobilization (5%)				\$29,354
Subtotal 1				\$616,429
Contingency (25%)				\$154,107
Subtotal 2				\$770,536
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$346,741
Total				\$1,117,277
Estimated Project Cost				\$1,120,000

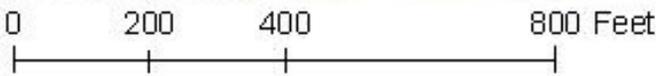
WR9208 Stream Restoration



Address: Near 12025 Seven Hills Lane, Clifton, Virginia
Location: Stream section upstream of Seven Hills Lane
Land Owner: Private – private owners
PIN: 0863 01 0017, 0863 13 0008, 0863 13 0009, 0863 13 0010, 0863 13 0011
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of Wolf Run



Description: The stream section east of Turtle Valley Drive is conveying runoff from open space and houses and has indicators of poor channel morphology. This project proposes repairing bank and bed erosion to restore channel morphology. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics and rapid vegetation establishment. The banks will be armored using geofabrics, fabric encapsulated rocks or equivalent to reduce further erosion.



- Stream Restoration
- Storm Network
- Property Line
- Streams

Wolf Run Watershed Management Area

Project Benefits: Stabilization will reduce sediment loads to the stream while maintaining capacity and controlling unwanted meander. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics and rapid vegetation establishment. The banks will be armored using geofabrics, fabric encapsulated rocks or equivalent to reduce further erosion. Reducing erosion from this stream will reduce instream sediment and its associated pollutants. Below are the project's estimated pollutant removal amounts.

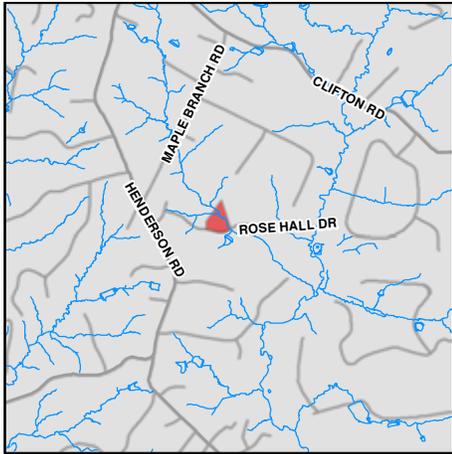
TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal I(Lbs/Yr)
37.50	60.00	23.25

Project Design Considerations: The banks are eroded in some places up to 4 feet. Some trees have fallen into the stream, and two bath tubs are near the streambank. The project area is on private property. The project area is close to homes and roadways. Drainage area is not highly impervious. Field investigations showed that the upstream sections had the most erosion.

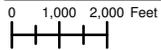
Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct New Channel	1676	LF	\$200	\$335,200
Clear and Grub	1.92	AC	\$10,000	\$19,200
Plantings	1	LS	\$25,000	\$25,000
Additional Cost, First 500 LF	500	LF	\$200	\$100,000
Erosion and Sediment Control	1	LS	10%	\$47,940
Ancillary Items	1	LS	5%	\$23,970
Base Construction Cost				\$551,310
Mobilization (5%)				\$27,566
Subtotal 1				\$578,876
Contingency (25%)				\$144,719
Subtotal 2				\$723,594
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%).				\$325,617
Total				\$1,049,212
Estimated Project Cost				\$1,050,000

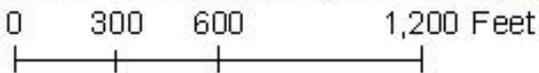
WR9209 Stream Restoration



Address: 12060 Rose Hall Dr., Clifton, Virginia
Location: Stream section upstream of Rose Hall Dr.
Land Owner: Private – private owners
PIN: 0863 13 0012, 0863 13 0013, 0863 13 0014, 0863 13 0015, 0863 13 0016, 0863 03 0001, 0863 03 0002, 0863 03 0003
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of Wolf Run



Description: Stream section near Rose Hall Drive conveying runoff from upstream houses and wooded area has indicators of poor channel morphology. The stream is in a steep wooded area and portions are close to homes and roadways. This project proposes repairing bank and bed erosion to restore channel morphology. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics and rapid vegetation establishment. The banks will be armored using geofabrics, fabric encapsulated rocks or equivalent to reduce further erosion.



	Stream Restoration		Storm Network		Property Line		Streams
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Lower Occoquan Watershed Management Plan 5-103

Wolf Run Watershed Management Area

Project Benefits: Stabilization will reduce sediment loads to the stream while maintaining capacity and controlling unwanted meander. The farthest upstream section is close to adjacent roadway and erosion is encroaching on the pavement. Restoration will repair erosion and reduce potential for future erosion in this area as well as other heavily eroded sections of stream and bank. Reducing erosion from this stream will reduce instream sediment and its associated pollutants. Below are the project's estimated pollutant removal amounts.

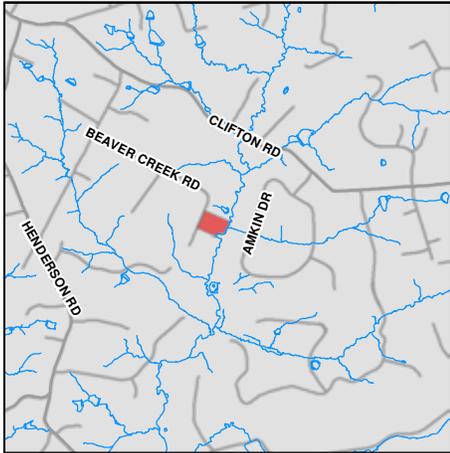
TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal I(Lbs/Yr)
55.05	88.07	34.13

Project Design Considerations: Field investigations revealed stream actively meandering with exposed banks (around 2 feet). There are sections of approximately 5 feet of undercut banks showing significant erosion. The stream has room for the banks to be stabilized. Due to the proximity of the existing roadway and several homes, this restoration project should be a high priority.

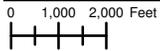
Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct New Channel	2460	LF	\$200	\$492,000
Clear and Grub	2.82	AC	\$10,000	\$28,200
Plantings	1	LS	\$25,000	\$25,000
Additional Cost, First 500 LF	500	LF	\$200	\$100,000
Erosion and Sediment Control	1	LS	10%	\$64,520
Ancillary Items	1	LS	5%	\$32,260
Base Construction Cost				\$741,980
Mobilization (5%)				\$37,099
Subtotal 1				\$779,079
Contingency (25%)				\$194,770
Subtotal 2				\$973,849
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$438,232
Total				\$1,412,081
Estimated Project Cost				\$1,420,000

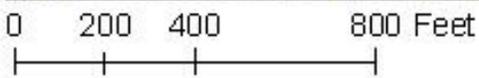
WR9211 Stream Restoration



Address: Behind 11724 Amkin Dr., Clifton, Virginia
Location: Stream section behind houses on Amkin Dr.
Land Owner: Private – private owners
PIN: 0863 05 0005, 0863 05 0026, 0863 05 0027, 0863 05 0028, 0863 05 0029, 0864 08 0030A, 0864 08 0031A
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of Wolf Run



Description: The stream section west of Amkin Drive is conveying runoff from upstream houses and wooded area and has indicators of poor channel morphology. The stream receives runoff from adjacent residential and wooded areas and conveys stormwater from the stream to the east. This project proposes repairing bank and bed erosion to restore channel morphology. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics and rapid vegetation establishment. The banks will be armored using geofabrics, fabric encapsulated rocks or equivalent to reduce further erosion.



- Stream Restoration
- Storm Network
- Property Line
- Streams

Wolf Run Watershed Management Area

Project Benefits: Stabilization will reduce sediment loads to the stream while maintaining capacity and controlling unwanted meander. Some areas of the stream are heavily eroded. Stream stabilization will repair currently existing erosion and prevent future erosion. Reducing erosion from this stream will reduce instream sediment and its associated pollutants. Below are the project's estimated pollutant removal amounts.

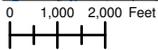
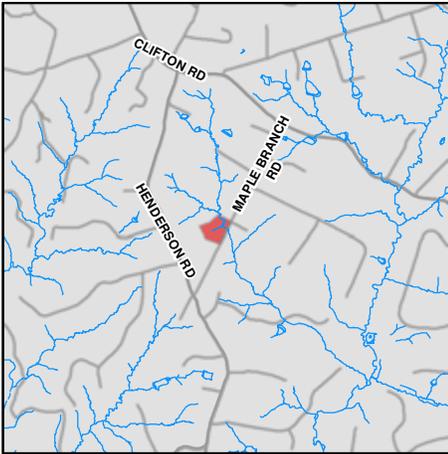
TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal I(Lbs/Yr)
16.39	26.23	10.16

Project Design Considerations: The Watershed Advisory Group (WAG) commented that the project could be important long-term, and numerous owners with property near the stream would welcome any project that stabilizes the stream and does not involve extreme invasion of property. Field investigation revealed streambank eroded 7 feet near the culvert. The stream is down cutting, meandering and undercutting trees. Eroded banks are threatening adjacent homeowner property.

Cost:

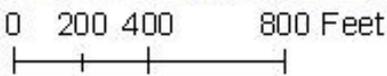
ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct New Channel	1914	LF	\$200	\$382,800
Clear and Grub	2.2	AC	\$10,000	\$22,000
Plantings	1	LS	\$25,000	\$25,000
Additional Cost, First 500 LF	500	LF	\$200	\$100,000
Erosion and Sediment Control	1	LS	10%	\$52,980
Ancillary Items	1	LS	5%	\$26,490
Base Construction Cost				\$609,270
Mobilization (5%)				\$30,464
Subtotal 1				\$639,734
Contingency (25%)				\$159,933
Subtotal 2				\$799,667
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$359,850
Total				\$1,159,517
Estimated Project Cost				\$1,160,000

WR9212 Stream Restoration



Address: 7610 Maple Branch Rd., Clifton, Virginia
Location: Stream section upstream of Maple Branch Rd.
Land Owner: Private – private owners
PIN: 0861 09 0004, 0863 02 0002, 0863 02 0003, 0863 02 0005, 0863 12 0004, 0863 12 0005A, 0863 12 0006A, 0863 12 0007
Control Type: Water quality control
Drainage Area: N/A
Receiving Waters: Tributary of Wolf Run

Description: The stream section near Maple Branch Road is conveying runoff from upstream houses and wooded area and has indicators of poor channel morphology. This project proposes repairing bank and bed erosion to restore channel morphology. Erosion will be stabilized through the use of bank shaping, toe protection, erosion control fabrics and rapid vegetation establishment. The banks will be armored using geofabrics, fabric encapsulated rocks or equivalent to reduce further erosion.



— Stream Restoration
 — Storm Network
 Property Line
 — Streams

Wolf Run Watershed Management Area

Project Benefits: Stabilization will reduce sediment loads to the stream while maintaining capacity and controlling unwanted meander. Implementing the suggested measures, including bank shaping, toe protection, erosion control fabrics and rapid vegetation establishment will repair the existing erosion and help to prevent future erosion. Reducing erosion from this stream will reduce instream sediment and its associated pollutants. Below are the project's estimated pollutant removal amounts.

TSS Removal (Tons/Yr)	TN Removal (Lbs/Yr)	TP Removal I(Lbs/Yr)
54.96	87.93	34.07

Project Design Considerations: The Watershed Advisory Group (WAG) commented that the road that crosses the stream is a major thoroughfare and the project should be high on the priority list due to potential road-closure and blockage consequences. Per field investigation, the stream is in an open area running across two roads. The streambanks have exposed roots and typical vertical slopes of two feet. One exposed slope had a vertical slope of four feet near the culvert crossing and needs improved. The stream exhibits signs of widening, eroding banks and sediment deposition.

Cost:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Construct New Channel	2456	LF	\$200	\$491,200
Clear and Grub	2.82	AC	\$10,000	\$28,200
Plantings	1	LS	\$25,000	\$25,000
Additional Cost, First 500 LF	500	LF	\$200	\$100,000
Erosion and Sediment Control	1	LS	10%	\$64,440
Ancillary Items	1	LS	5%	\$32,220
Base Construction Cost				\$741,060
Mobilization (5%)				\$37,053
Subtotal 1				\$778,113
Contingency (25%)				\$194,528
Subtotal 2				\$972,641
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$437,689
Total				\$1,410,330
Estimated Project Cost				\$1,420,000