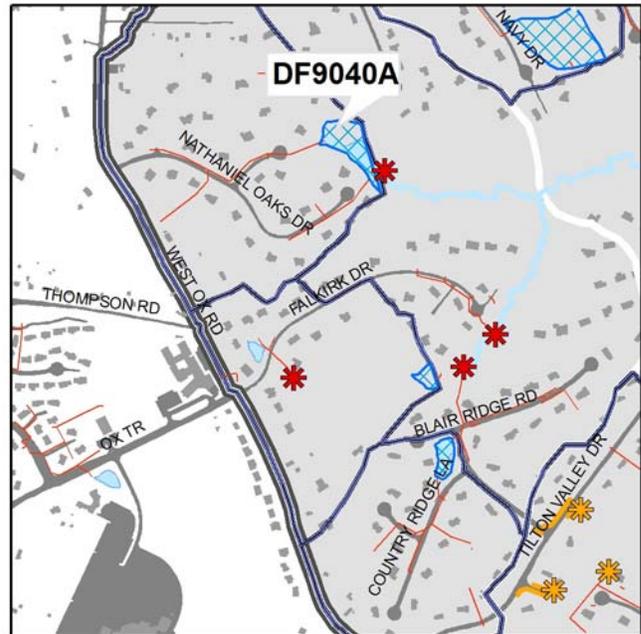


**Project Number:** DF9040A  
**Catchment Code:** DFSF0001  
**Candidate Site:** D-40

**Project Type:** Pond Retrofit  
**Project Size:** 1.4 acres  
**Treated Area:** 54.8 acres

**Project Location:** This project is located at the end of Nathaniel Oaks Drive.

**Project Description:** There are two concentrated inflow locations feeding runoff to this facility, which can be improved significantly by installing a new control structure and excavating the available space within the existing footprint to convert this dry pond to a wetland system. Installing a multistage riser will enable extended detention of the channel protection volume. In addition, removing or replacing the concrete pilot channels with meandering natural channels can optimize nutrient and sediment removal through reduction of stormwater runoff velocity. For public safety, a perimeter fence is recommended around the facility.



**Potential Project Benefits:**

Streamflow	100% of the channel protection volume can be stored.
Water Quality	The retrofit can treat 100% of the water quality volume. A forebay, micropool, and marsh can improve pollutant removal.

**Potential Project Constraints:**

Environmental	Permitting should not be an issue for a dry pond retrofit. Projects in RPAs may require exceptions or waivers.
Facility Access	Facility access currently exists from Nathaniel Oaks Drive.
Design / Construction	No significant design or construction issues have been noted. County staff will coordinate with the facility owner to implement the project.

**Costs:**

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.6	AC	\$5,000.00	\$3,000
Grading and Excavation	1860	CY	\$30.00	\$55,800
Riser	1	LS	\$10,000.00	\$10,000
Fencing	832	LF	\$20.00	\$16,640
Riprap Stabilization	50	LF	\$50.00	\$2,500
Wetland Planting	1590	SY	\$2.00	\$3,180
Dry Landscaping	1024	SY	\$2.50	\$2,560
<b>Base Construction Cost</b>				<b>\$93,680</b>
Mobilization (5%)				\$4,684
<b>Subtotal 1</b>				<b>\$98,364</b>
Contingency (25%)				\$24,591
<b>Subtotal 2</b>				<b>\$122,955</b>
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$55,330
<b>Estimated Project Cost</b>				<b>\$178,000</b>

*This project is part of the alternative project group for Regional Pond D-40.  
See Table 5-2 for the recommended disposition.*

Site Photo:



Concept Sketch:

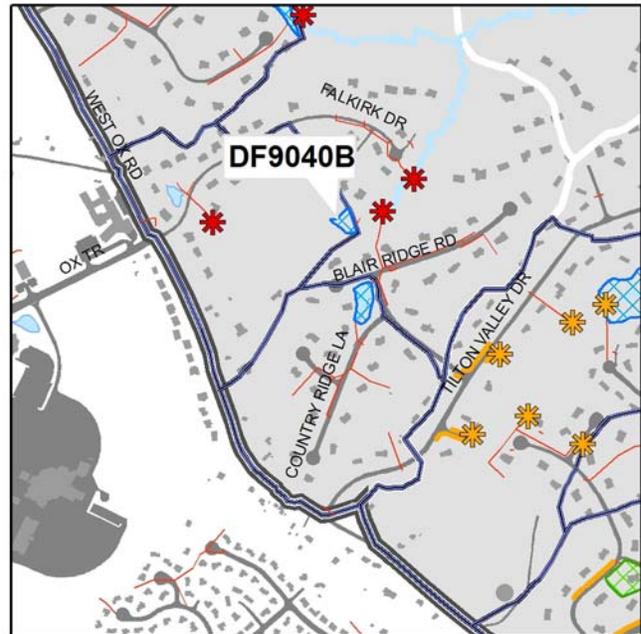


**Project Number:** DF9040B  
**Catchment Code:** DFSF0001  
**Candidate Site:** D-40

**Project Type:** Pond Retrofit  
**Project Size:** 0.3 acres  
**Treated Area:** 30.7 acres

**Project Location:** This project is between Falkirk Drive and Blair Ridge Road

**Project Description:** This retrofit project will focus on maximizing the performance of the facility within its existing footprint. Approximately half of the required channel protection volume can be achieved by replacing the riser with a multistage control structure. Water quality treatment can be improved by excavating the flat area within the pond and optimizing existing water quality components. A larger wetland area would incorporate both shallow and deeper micropools at the two inflow locations. However, this measure would disturb existing wetland features so the potential benefits of this improvement should be carefully considered.



**Potential Project Benefits:**

Streamflow	About 50% of the channel protection volume can be met.
Water Quality	Approximately 50% of the water quality volume can be treated. Wetlands and micropools could improve performance.

**Potential Project Constraints:**

Environmental	A permit may be required from both the U.S. Army Corps of Engineers and VDEQ. Projects in RPAs may require exceptions or waivers.
Facility Access	A paved maintenance road off of Falkirk Drive provides access to this facility.
Design / Construction	Analysis of the benefit tradeoff of excavating established wetlands to add additional water quality components must be carefully considered. County staff will coordinate with the facility owner to implement the project.

**Costs:**

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.2	AC	\$5,000.00	\$1,000
Grading and Excavation	429	CY	\$30.00	\$12,870
Riser	1	LS	\$10,000.00	\$10,000
Wetland Planting	385	SY	\$2.00	\$770
Dry Landscaping	260	SY	\$2.50	\$650
<b>Base Construction Cost</b>				<b>\$25,290</b>
Mobilization (5%)				\$1,265
<b>Subtotal 1</b>				<b>\$26,555</b>
Contingency (25%)				\$6,639
<b>Subtotal 2</b>				<b>\$33,193</b>
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$14,937
<b>Estimated Project Cost</b>				<b>\$48,000</b>

*This project is part of the alternative project group for Regional Pond D-40.  
See Table 5-2 for the recommended disposition.*

**Site Photo:**



**Concept Sketch:**

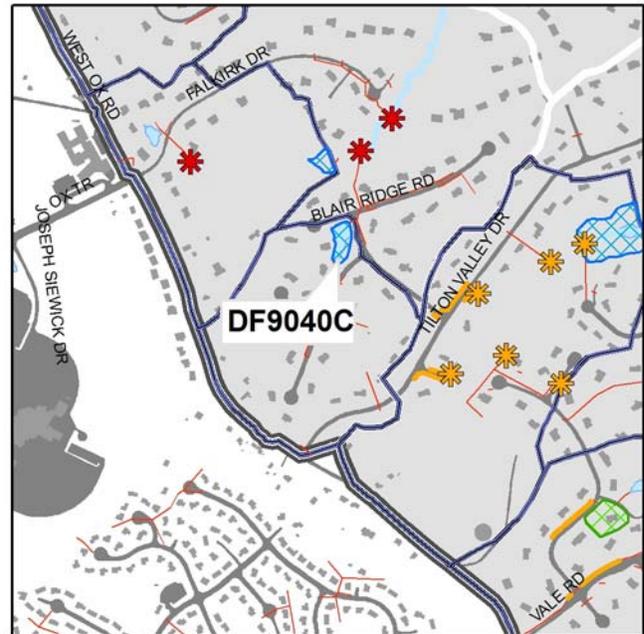


**Project Number:** DF9040C  
**Catchment Code:** DFSF0001  
**Candidate Site:** D-40

**Project Type:** Pond Retrofit  
**Project Size:** 0.5 acres  
**Treated Area:** 30.4 acres

**Project Location:** This project is located near Blair Ridge Road and Country Ridge Lane.

**Project Description:** Due to the location of this facility in a residential neighborhood, boundary constraints limit design improvements to the available space within the pond footprint. The channel protection volume for this facility can be met by excavation within the existing pond footprint and by modifying the existing riser structure. The concrete pilot channels would be removed and the pond bottom excavated to the invert of the existing channel. Water quality treatment for this facility would be met by further excavating the pond bottom to create shallow wetlands, incorporating a deeper micropool at the inflow point.



**Potential Project Benefits:**

Streamflow	100% of the channel protection volume for this facility can be met.
Water Quality	Wet marsh areas will meet 90% of the water quality volume.

**Potential Project Constraints:**

Environmental	Environmental permitting issues are not anticipated for this facility. Projects in RPAs may require exceptions or waivers.
Facility Access	Facility access currently exists from Birdsboro Drive and Blair Ridge Road.
Design / Construction	No significant design or construction issues have been noted. County staff will coordinate with the facility owner to implement the project.

**Costs:**

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.2	AC	\$5,000.00	\$1,000
Remove Pilot Channels	220	LF	\$6.00	\$1,320
Grading and Excavation	1206	CY	\$30.00	\$36,180
Riser	1	LS	\$10,000.00	\$10,000
Wetland Planting	694	SY	\$2.00	\$1,388
Dry Landscaping	155	SY	\$2.50	\$387
<b>Base Construction Cost</b>				<b>\$50,276</b>
Mobilization (5%)				\$2,514
<b>Subtotal 1</b>				<b>\$52,789</b>
Contingency (25%)				\$13,197
<b>Subtotal 2</b>				<b>\$65,987</b>
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$29,694
<b>Estimated Project Cost</b>				<b>\$96,000</b>

*This project is part of the alternative project group for Regional Pond D-40. See Table 5-2 for the recommended disposition.*

Site Photo:



Concept Sketch:

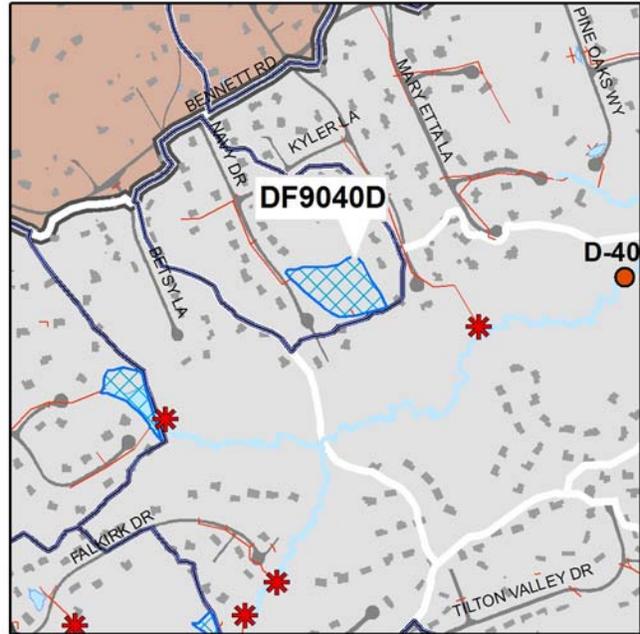


**Project Number:** DF9040D  
**Catchment Code:** DFSF0002  
**Candidate Site:** D-40

**Project Type:** Pond Retrofit  
**Project Size:** 3.1 acres  
**Treated Area:** 32.5 acres

**Project Location:** This project is located at the end of Navy Drive.

**Project Description:** This facility can be improved significantly by replacing the existing riser and excavating the available space to convert this dry pond to a wetland system. Excavating the pond bottom to create shallow wetlands would provide water quality treatment. Channel protection can be created by installing a multistage riser. Optimum removal of nutrients and sediment can take place by meandering flow channels through wetland areas.



**Potential Project Benefits:**

Streamflow	Approximately 90% of the channel protection volume can be achieved.
Water Quality	85% of the water quality volume can be met by excavating to convert this dry pond into a wetland.

**Potential Project Constraints:**

Environmental	Permitting issues should be minimal for this project. Projects in RPAs may require exceptions or waivers.
Facility Access	Facility access currently exists from Navy Drive.
Design / Construction	No significant design or construction issues have been noted. County staff will coordinate with the facility owner to implement the project.

**Costs:**

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.3	AC	\$5,000.00	\$1,500
Grading and Excavation	988	CY	\$30.00	\$29,640
Riser	1	LS	\$10,000.00	\$10,000
Wetland Planting	959	SY	\$2.00	\$1,918
Dry Landscaping	260	SY	\$2.50	\$1,062
<b>Base Construction Cost</b>				<b>\$44,121</b>
Mobilization (5%)				\$2,206
<b>Subtotal 1</b>				<b>\$46,327</b>
Contingency (25%)				\$11,582
<b>Subtotal 2</b>				<b>\$57,908</b>
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$26,059
<b>Estimated Project Cost</b>				<b>\$84,000</b>

*This project is part of the alternative project group for Regional Pond D-40. See Table 5-2 for the recommended disposition.*

**Site Photo:**



**Concept Sketch:**

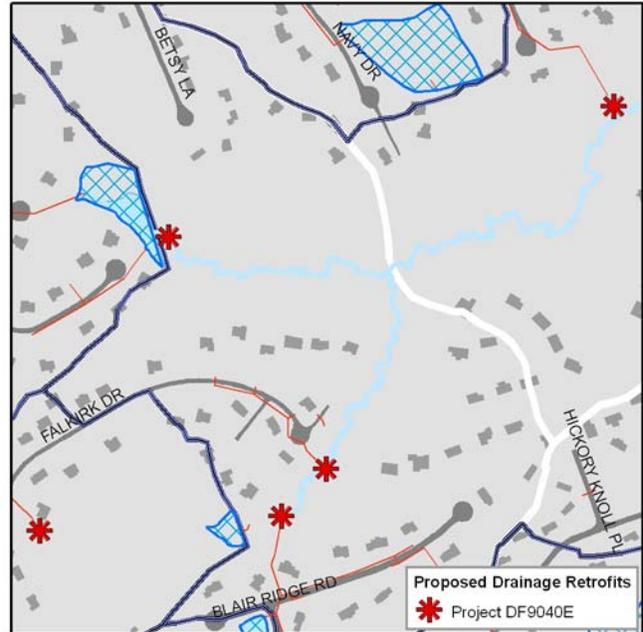


**Project Number:** DF9040E  
**Catchment Code:** DFSF0002  
**Candidate Site:** D-40

**Project Type:** Drainage Retrofit  
**Project Size:** 5 Outfalls

**Project Location:** This project will be distributed throughout the catchment where piped drainage systems discharge into natural channels.

**Project Description:** This project is intended to reduce scour and erosion at outfalls where flows from the storm drain system enter the stream. Reduction of erosive velocities will reduce the amount of sediment transported downstream.



**Potential Project Benefits:**

Streamflow	The project will reduce velocity from the outfalls and help reduce erosive potential immediately downstream.
Water Quality	Water quality improvements would be associated with the reduction of scour at outfall locations and within the downstream channels. Habitat would be improved by reducing sediment loads from erosion.

**Potential Project Constraints:**

Environmental	Environmental impacts and permit requirements are not anticipated for this project; however, projects in RPAs may require exceptions or waivers
Facility Access	Generally, access can be obtained from adjacent roads.
Design / Construction	No unusual design or construction issues were identified.

**Costs:**

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Outfall Protection	5	EA	\$8,000.00	\$40,000
<b>Base Construction Cost</b>				<b>\$40,000</b>
Mobilization (5%)				\$2,000
<b>Subtotal 1</b>				<b>\$42,000</b>
Contingency (25%)				\$10,500
<b>Subtotal 2</b>				<b>\$52,500</b>
Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)				\$23,625
<b>Estimated Project Cost</b>				<b>\$76,000</b>

*This project is part of the alternative project group for Regional Pond D-40. See Table 5-2 for the recommended disposition.*

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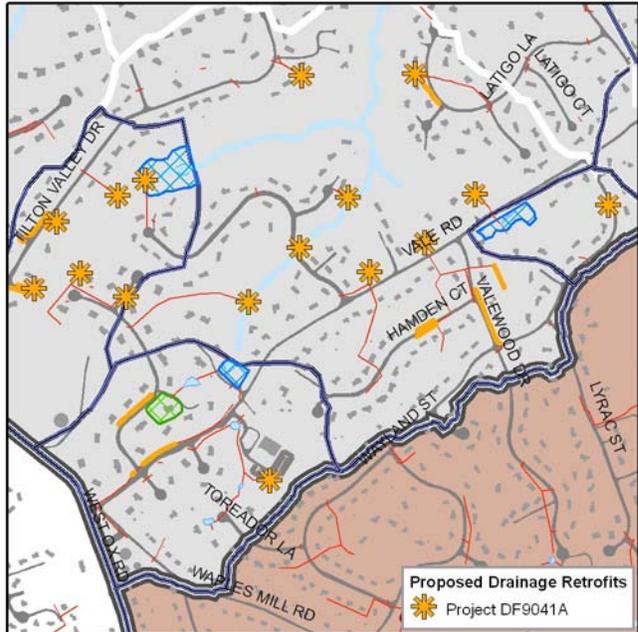
**Project Number:** DF9041A  
**Catchment Code:** DFSF9902  
**Candidate Site:** D-41

**Project Type:** Drainage Retrofit  
**Project Size:** 18 Outfalls and 2390 ft of ditch removal

**Project Location:** This project will be distributed throughout the catchment at points where the storm drainage system discharges into natural channels, and at any location where stormwater is conveyed by paved ditches in the catchment.

**Project Description:** This project is intended to reduce scour and erosion at outfalls where flows from the storm drain system enter the stream. Reduction of erosive velocities will reduce the amount of sediment transported downstream.

Additionally, this project includes the removal of concrete lined ditches to be replaced with grass-covered dry swales using stone or check dams to control critical high velocity areas.



**Potential Project Benefits:**

Streamflow	The project will reduce velocity from the outfalls and erosive potential immediately downstream. Swales will reduce both volume and velocity.
Water Quality	Replacing ditches with swales will provide treatment before stormwater reaches the stream system. Water quality will also benefit from the reduction of sediment loads associated from scour at the outfall locations. Habitat would be improved by reducing sediment loads from erosion.

**Potential Project Constraints:**

Environmental	Environmental impacts and permit requirements are not anticipated for this project; however, projects in RPAs may require exceptions or waivers
Facility Access	Generally, access can be obtained from adjacent roads or storm drain easements.
Design / Construction	No significant design or construction issues were identified for this project. Design should incorporate check dams or other features to ensure flow velocity is not erosive.

**Costs:**

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Paved Ditch Demolition (Haul Away)	2390	LF	\$18.00	\$43,020
Dry Swale w/ Underdrain	2390	LF	\$50.00	\$119,500
Outfall Protection	18	EA	\$8,000.00	\$144,000
<b>Base Construction Cost</b>				<b>\$306,520</b>
Mobilization (5%)				\$15,326
<b>Subtotal 1</b>				<b>\$321,846</b>
Contingency (25%)				\$80,462
<b>Subtotal 2</b>				<b>\$402,308</b>
Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)				\$181,038
<b>Estimated Project Cost</b>				<b>\$583,000</b>

*This project is part of the alternative project group for Regional Pond D-41. See Table 5-2 for the recommended disposition.*

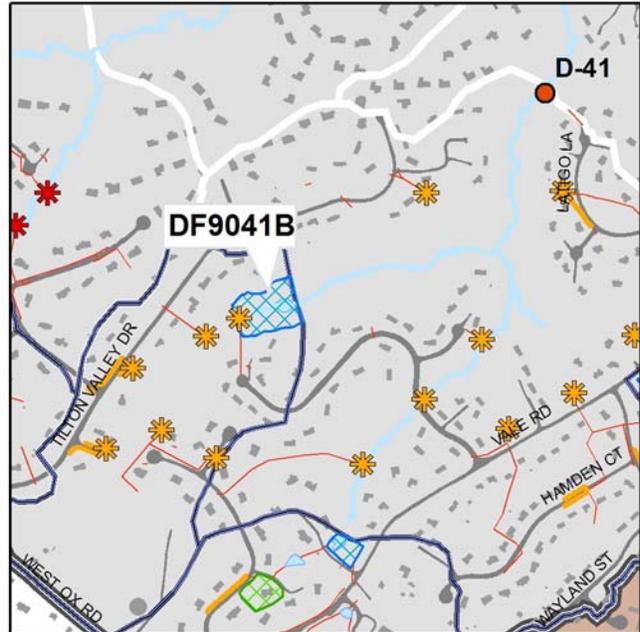
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**Project Number:** DF9041B  
**Catchment Code:** DFSF9902  
**Candidate Site:** D-41

**Project Type:** Pond Retrofit  
**Project Size:** 2.4 acres  
**Treated Area:** 58 acres

**Project Location:** This project is between Tilton Valley Drive and Hickory Hills Drive.

**Project Description:** Management of smaller storms can be improved by installing a multi-stage control structure. Although it is not recommended to interrupt the existing stream channel, there is available space to excavate between the stream channel and the wood line to create additional storage space. Excavation to create water quality volume is not recommended at this location because this is an in-stream pond.



**Potential Project Benefits:**

Peak Flow	Excavation and a new control structure will provide roughly 30% of the channel protection volume.
Water Quality	Indirect improvements to water quality are expected from reduction of high velocity flows and stream erosion downstream.

**Potential Project Constraints:**

Environmental	Environmental permitting issues would be anticipated for any activity in and around a stream corridor. Forest and wetland impacts are anticipated during construction. A permit may be required from both the U.S. Army Corps of Engineers and VDEQ. Projects in RPAs may require exceptions or waivers.
Facility Access	This facility has a paved maintenance access road to the embankment.
Design / Construction	Care should be taken to insure that the natural stream channel is minimally disturbed during construction. County staff will coordinate with the facility owner to implement the project.

**Costs:**

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.1	AC	\$5,000.00	\$500
Grading and Excavation	356	CY	\$30.00	\$10,680
Riser	1	LS	\$10,000.00	\$10,000
Dry Landscaping	528	SY	\$2.50	\$1,320
<b>Base Construction Cost</b>				<b>\$22,500</b>
Mobilization (5%)				\$1,125
<b>Subtotal 1</b>				<b>\$23,625</b>
Contingency (25%)				\$5,906
<b>Subtotal 2</b>				<b>\$29,531</b>
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$13,289
<b>Estimated Project Cost</b>				<b>\$43,000</b>

*This project is part of the alternative project group for Regional Pond D-41. See Table 5-2 for the recommended disposition.*

Site Photo:



Concept Sketch:

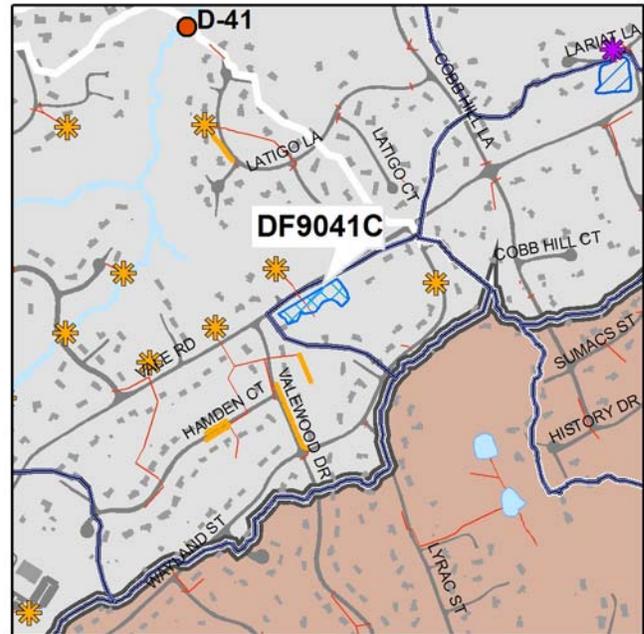


**Project Number:** DF9041C  
**Catchment Code:** DFSF9902  
**Candidate Site:** D-41

**Project Type:** Pond Retrofit  
**Project Size:** 1.0 acres  
**Treated Area:** 15 acres

**Project Location:** This project is located on the south side of Vale Road, east of Valewood Drive.

**Project Description:** Stabilization is required for erosion on the backside of the embankment and within the downstream channel. Maintenance to remove sediment accumulated in the culvert under Vale Road is also required. To reduce erosive velocities of smaller storms leaving this facility, a new multi-stage riser would create approximately one-third of the required channel protection volume for this drainage area. Excavation is not recommended due to impacts to adjacent woods.



**Potential Project Benefits:**

Streamflow	This facility is limited to approximately 30% of the calculated channel protection volume.
Water Quality	The existing facility already provides some retention and vegetative uptake. Improvements to water quality would be obtained through the reduction in scour forming discharges downstream

**Potential Project Constraints:**

Environmental	Environmental permitting would be minimal. Projects in RPAs may require exceptions or waivers.
Facility Access	This facility is near a public road where access is good.
Design / Construction	No significant design or construction issues have been noted. County staff will coordinate with the facility owner to implement the project.

**Costs:**

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.1	AC	\$5,000.00	\$500
Outlet Protection	1	EA	\$8,000.00	\$8,000
Riser	1	LS	\$10,000.00	\$10,000
<b>Base Construction Cost</b>				<b>\$18,500</b>
Mobilization (5%)				\$925
<b>Subtotal 1</b>				<b>\$19,425</b>
Contingency (25%)				\$4,856
<b>Subtotal 2</b>				<b>\$24,281</b>
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$10,927
<b>Estimated Project Cost</b>				<b>\$35,000</b>

*This project is part of the alternative project group for Regional Pond D-41.  
 See Table 5-2 for the recommended disposition.*

**Site Photo:**



**Concept Sketch:**

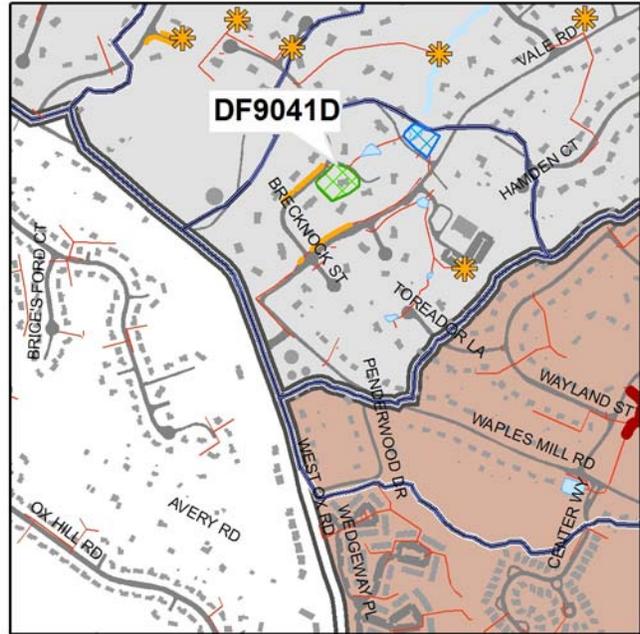


**Project Number:** DF9041D  
**Catchment Code:** DFSF9902  
**Candidate Site:** D-41

**Project Type:** LID Retrofit  
**Project Size:** 9 SY  
**Treated Area:** 0.9 acres

**Project Location:** This project is recommended at a private residence along Brecknock Street at the intersection with a pipestem driveway.

**Project Description:** This project would be a rain garden demonstration site placed in a residential setting to provide an example how these facilities can be incorporated into the landscape. This location was chosen because of ideal topography, but an additional advantage to this location is that it is in a community with managed lawns, and can demonstrate the nutrient removal potential of this application. If land rights cannot be acquired at the recommended site, then it is recommended that a nearby location be pursued.



**Potential Project Benefits:**

Streamflow	This project would provide some volume reduction through infiltration
Water Quality	This facility would be expected to provide water quality improvements through filtration and vegetative uptake.

**Potential Project Constraints:**

Environmental	Projects in RPAs may require exceptions or waivers.
Facility Access	Access to this facility is excellent.
Design / Construction	No outstanding design or construction issues were identified. However, since the facility would be on private property, property owner coordination and agreement would be required

**Costs:**

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
LID Structural Control	9.0	SY	\$120.00	\$1,080
<b>Base Construction Cost</b>				<b>\$1,080</b>
Mobilization (5%)				\$54
<b>Subtotal 1</b>				<b>\$1,134</b>
Contingency (25%)				\$284
<b>Subtotal 2</b>				<b>\$1,418</b>
Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)				\$638
<b>Estimated Project Cost</b>				<b>\$2,000</b>

*This project is part of the alternative project group for Regional Pond D-41. See Table 5-2 for the recommended disposition.*

Concept Sketch

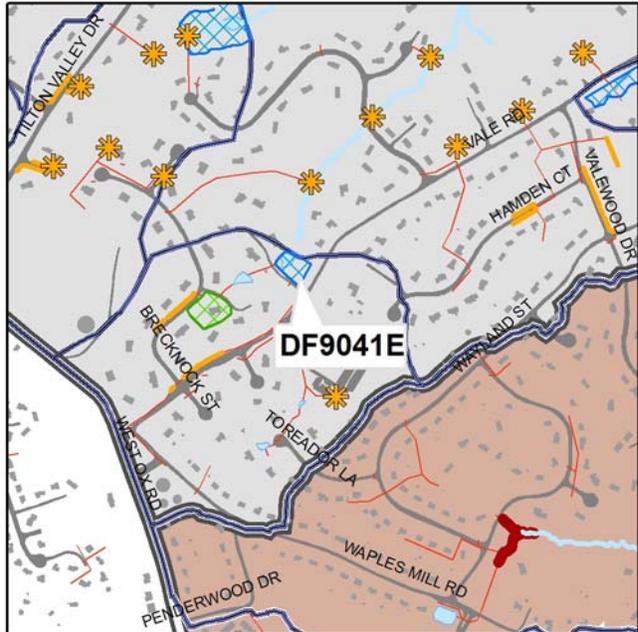


**Project Number:** DF9041E  
**Catchment Code:** DFSF9902  
**Candidate Site:** D-41

**Project Type:** Pond Retrofit  
**Project Size:** 0.6 acres  
**Treated Area:** 60.3 acres

**Project Location:** A private drive off Vale Road.

**Project Description:** The channel is extremely eroded upstream and downstream of the outfall of this facility. The full channel protection and water quality volumes cannot be met without completely redesigning the embankment and excavating private property. However, small improvements can be made to help handle smaller storms. If a new riser is installed along with outfall protection, the erosion potential of the outfall and the channel downstream will decrease significantly. Also, the woody vegetation on the embankment should be removed and the embankment stabilized.



**Potential Project Benefits:**

Streamflow	Installing a new riser into this facility would reduce peak discharges but is limited to less than 20% of the calculated channel protection volume.
Water Quality	Indirect improvements to water quality are expected from reduction of high velocity flows and stream erosion downstream.

**Potential Project Constraints:**

Environmental	Environmental impacts from this project would be minor. Projects in RPAs may require exceptions or waivers.
Facility Access	Access for this facility is excellent.
Design / Construction	To maximize benefits and avoid disturbance of private property, the design will be somewhat more complex than a typical pond retrofit. County staff will coordinate with the facility owner to implement the project.

**Costs:**

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.1	AC	\$5,000.00	\$500
Grading and Excavation	988	CY	\$30.00	\$29,640
Outlet Protection	1	EA	\$8,000.00	\$8,000
Reconstruct Embankment	120	CY	\$60.00	\$7,200
Riser	1	LS	\$10,000.00	\$10,000
Wetland Planting	411	SY	\$2.00	\$822
<b>Base Construction Cost</b>				<b>\$56,162</b>
Mobilization (5%)				\$2,808
<b>Subtotal 1</b>				<b>\$58,970</b>
Contingency (25%)				\$14,743
<b>Subtotal 2</b>				<b>\$73,713</b>
Engineering Design, Surveys, Land Acquisition, Utility Relocations and Permits (45%)				\$33,171
<b>Estimated Project Cost</b>				<b>\$107,000</b>

*This project is part of the alternative project group for Regional Pond D-41.  
See Table 5-2 for the recommended disposition.*

Site Photo: :



Concept Sketch:

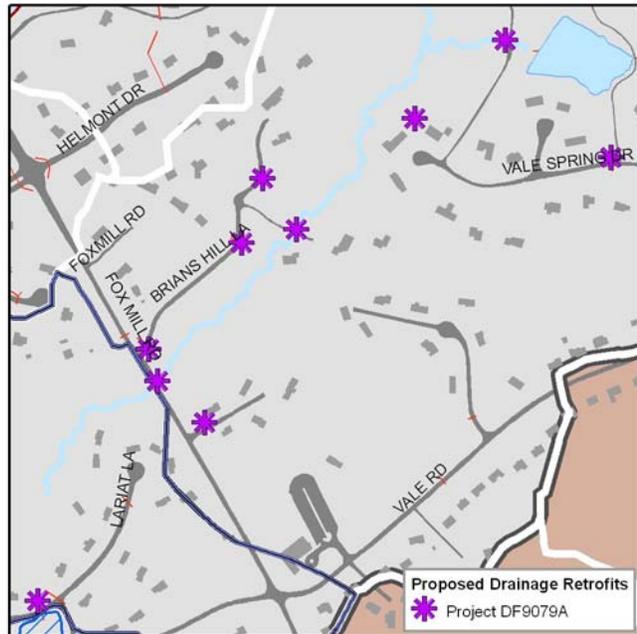


**Project Number:** DF9079A  
**Catchment Code:** DFSF9802  
**Candidate Site:** D-79

**Project Type:** Drainage Retrofit  
**Project Size:** 10 Outfalls

**Project Location:** This project will be distributed throughout the catchment at points where the storm drainage system discharges into natural channels.

**Project Description:** This project is intended to reduce scour and erosion at outfalls where flows from the storm drain system enter the stream. Reduction of erosive velocities will reduce the amount of sediment transported downstream.



**Potential Project Benefits:**

Streamflow	The project will reduce velocity from the outfalls and erosive potential immediately downstream.
Water Quality	Water quality will benefit from the reduction of sediment loads associated from scour at the outfall locations. Habitat would be improved by reducing sediment loads from erosion.

**Potential Project Constraints:**

Environmental	Environmental impacts and permit requirements are not anticipated for this project; however, projects in RPAs may require exceptions or waivers
Facility Access	Generally, access can be obtained from adjacent roads or storm drain easements.
Design / Construction	No significant design or construction issues were identified for this project.

**Costs:**

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Outfall Protection	10	EA	\$8,000.00	\$80,000
<b>Base Construction Cost</b>				<b>\$80,000</b>
Mobilization (5%)				\$4,000
<b>Subtotal 1</b>				<b>\$84,000</b>
Contingency (25%)				\$21,000
<b>Subtotal 2</b>				<b>\$105,000</b>
Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)				\$47,250
<b>Estimated Project Cost</b>				<b>\$152,000</b>

*This project is part of the alternative project group for Regional Pond D-79.  
 See Table 5-2 for the recommended disposition.*

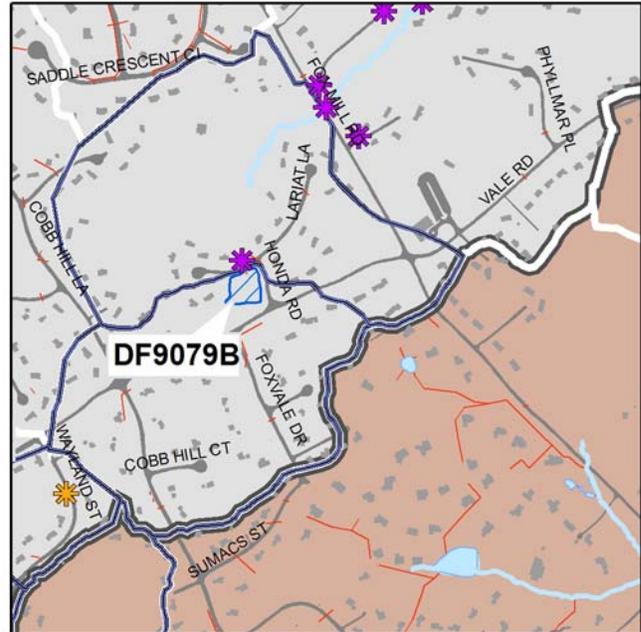
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**Project Number:** DF9079B  
**Catchment Code:** DFSF9802  
**Candidate Site:** D-79

**Project Type:** Culvert Retrofit  
**Project Size:** 0.8 acres  
**Treated Area:** 49.6 acres

**Project Location:** This project is located near the intersection of Honda Road and Lariat Lane.

**Project Description:** This project will consist of retrofitting an impoundment structure to the existing culvert to provide detention. Re-grading in this area will provide additional detention volume. Any detention at this location may help to reduce flooding impacts downstream at the Fox Mill crossing.



**Potential Project Benefits:**

Streamflow	This project can provide 100% of the channel protection storage.
Water Quality	There is sufficient storage to provide 100% of the water quality volume.

**Potential Project Constraints:**

Environmental	There may be some permitting issues associated with the temporary impoundment of runoff in the floodplain above this culvert. Some forest impacts would occur during construction. Projects in RPAs may require exceptions or waivers.
Facility Access	Access can be easily obtained from Honda Road and Lariat Lane.
Design / Construction	No significant design or construction issues were identified for this project.

**Costs:**

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.2	AC	\$5,000.00	\$1,000
Excavation	710	CY	\$35.00	\$24,850
Impoundment Structure	1	LS	\$5,000.00	\$5,000
Landscaping	770	SY	\$2.50	\$1,925
Wetland Planting	260	SY	\$2.00	\$520
<b>Base Construction Cost</b>				<b>\$33,295</b>
Mobilization (5%)				\$1,665
<b>Subtotal 1</b>				<b>\$34,960</b>
Contingency (25%)				\$8,740
<b>Subtotal 2</b>				<b>\$43,700</b>
Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)				\$19,665
<b>Estimated Project Cost</b>				<b>\$63,000</b>

*This project is part of the alternative project group for Regional Pond D-79.  
See Table 5-2 for the recommended disposition.*

Concept Sketch



**Project Number:** DF92120  
**Catchment Code:** DFSF0005  
**Candidate Site:** S120

**Project Type:** Stream Restoration  
**Project Size:** 446 Linear Feet

**Project Location:** This project is located east of Fox Mill Road and north of Deerfield Drive.

**Project Description:** The stream has raw, vertical streambanks and moderate to severe incision. However, the bed morphology is relatively well defined. The riparian area on the left side of the stream is in pasture. The stream is located on private property. The proposed restoration would involve constructing a new plan and profile for about half the reach with a nested channel, and stabilizing the streambanks along the other half with moderate regrading. A forested buffer would be re-established in the pasture portion of the riparian zone.



**Potential Project Benefits:**

Stream Stability	Restoration of a more natural stream pattern, and stabilization of streambanks will reduce erosion.
Water Quality	Water quality will be improved by a significant reduction in current and future bank and bed erosion.
Instream Habitat	Erosion reduction, recreating an aquatic channel, and re-establishing a riparian buffer will improve physical habitat conditions.

**Potential Project Constraints:**

Environmental	The site will not require forest clearing or impacts to jurisdictional wetlands. It will require a permit from the U.S. Army Corps of Engineers. Projects in RPAs may require exceptions or waivers.
Facility Access	Access to this facility will require an easement on private property but is open and unconstrained adjacent to the stream.
Design / Construction	Design efforts are minor compared to other stream restoration projects. General constructability is good.

Difficult Run Watershed Management Plan  
 Concept Plans  
 South Fork Run

**Costs:**

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Reconstruct new pattern and profile	484	LF	\$250.00	\$121,000
Stabilize in place -- grading	428	LF	\$175.00	\$74,900
Buffer restoration	included above	LF	\$25.00	\$0
Add'l cost, first 500 LF	500	LF	\$200.00	\$100,000
<b>Base Construction Cost</b>				<b>\$295,900</b>
Mobilization (5%)				\$14,795
<b>Subtotal 1</b>				<b>\$310,695</b>
Contingency (25%)				\$77,674
<b>Subtotal 2</b>				<b>\$388,369</b>
Engineering, Survey, Land Acquisition, Utility Relocations and Permits (45%)				\$174,766
<b>Estimated Project Cost</b>				<b>\$563,000</b>

**Concept Sketch:**

