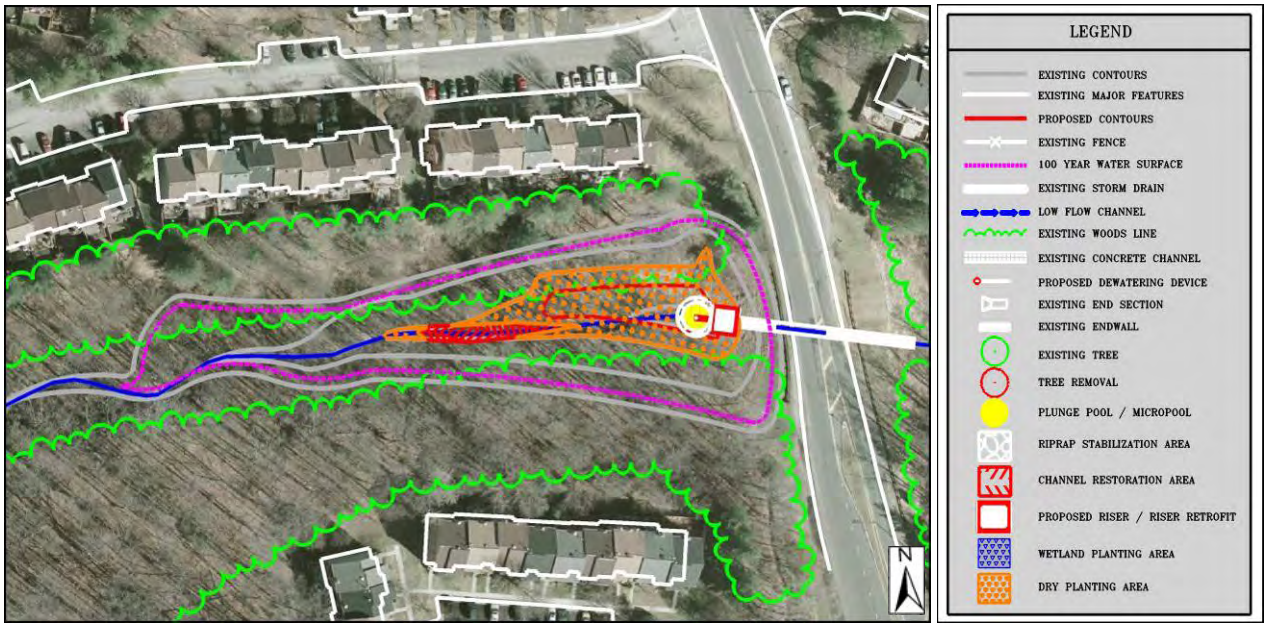
AC9133 - Pond Retrofit

Address:	Between the 7200 block of Gentian Court and the 7800 block of Wintercress Lane
Location:	Hunter Village neigborhood
Land Owner:	Private - Residential
PIN:	0894 15 N
Control Type	Water Quality and Quantity
Drainage Area	48.11 acres
Receiving Waters	Unknown tributary of Accotink Creek

Description: This project is a retrofit of existing dry pond 0462DP located on the upstream side of Hunter Village Drive, which treats a high-density residential area in the Hunter Village neighborhood. The existing riser structure is mostly buried under debris and sediment. To improve the treatment provided at this site, excavation and clearing are proposed to provide extended detention for water quality. A new riser structure and dewatering device are also proposed. A micropool would be placed at the base of the new riser to settle sediment and other pollutants before being discharged into the downstream channel. A small portion of the channel in the upper portion of the facility would also be stabilized to prevent further erosion. This project is located downstream of the proposed pond retrofit AC9134.



Project Area Map: Conceptual plan showing potential project location

Project Benefits: The replacement of the existing control structure would provide water quality treatment and peak flow management for the contributing drainage area by modifying the outflow characteristics. These proposed improvements will also help reduce future downstream channel erosion by reducing peak flow rates and erosive velocities. It is estimated that an annual total of 6,534 lbs of sediment, 63 lbs of total nitrogen and 15 lbs of total phosphorus would be reduced by this project.

Project Design Considerations: Coordination with residents and an HOA will be necessary to retrofit this facility as it is located on private land. Access to this facility is very good from Hunter Village Drive. Existing utility conflicts are possible due to a sanitary sewer manhole adjacent to the stream channel. Minimal tree removal will be required on the upstream side of the embankment. Environmental permitting issues are expected with this retrofit due to the in-stream location of this facility.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.3	AC	$12,000.00	$3,600
Plungepool / Micropool	1	EA	$400.00	$400
New Riser	1	LS	$8,000.00	$8,000
Embedded Dewatering Pipe	1	EA	$500.00	$500
Channel Stabilization	130	LF	$50.00	$6,500
Rip Rap Stabilization	35	SY	$100.00	$3,500
Grading and Excavation	449	CY	$35.00	$15,715
Soil Borings	1	LS	$8,500.00	$8,500
			Initial Project Costs	**$46,715**
Plantings	1	LS	5% of Project	$2,336
Ancillary Items	1	LS	5% of Project	$2,336
Erosion and Sediment Control	1	LS	10% of Project	$4,672
			Base Construction Costs	**$56,059**
			Mobilization (5%)	$2,803
			Subtotal 1	$58,862
			Contingency (25%)	$14,716
			Subtotal 2	$73,578
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	$33,110
			Estimated Project Cost	**$107,000**

Site Photo: Existing Facility

Site Photo: Existing Control Structure

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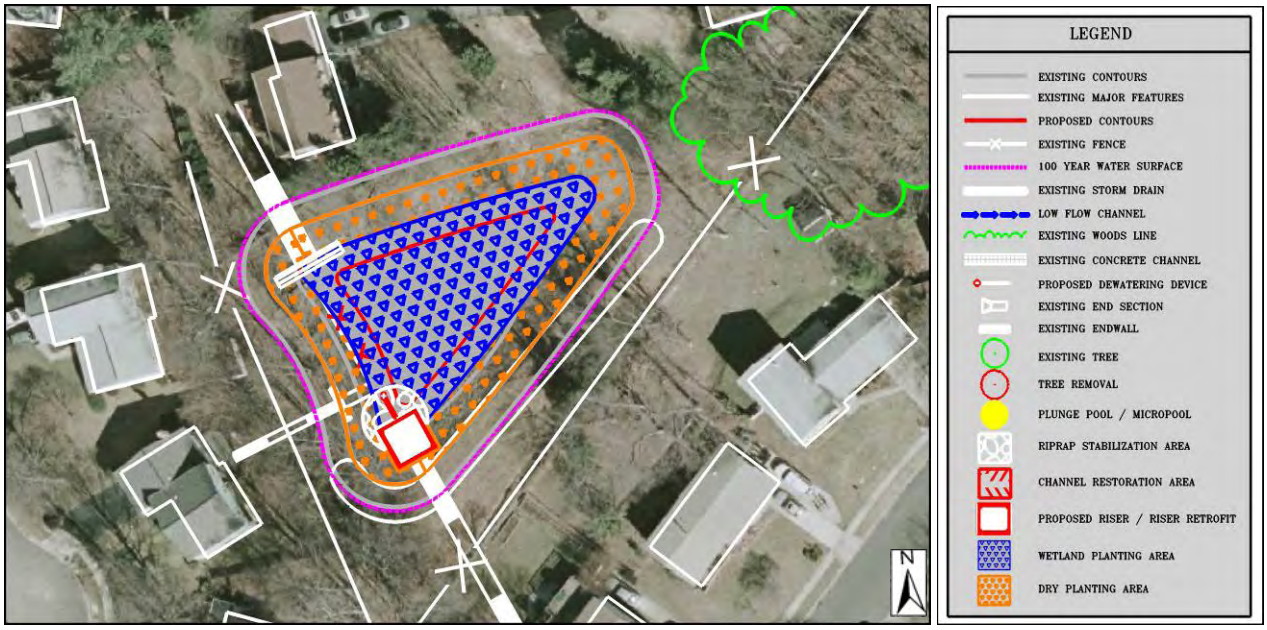
AC9136 - Pond Retrofit

Address:	At the end of Kenwood Avenue Near 8311 Kenwood Avenue
Location:	Kenwood Oaks neigborhood
Land Owner:	Private - Residential
PIN:	0891 14 0004, 0891 14 0005, 0891 14 0006
Control Type	Water Quality and Quantity
Drainage Area	37.10 acres
Receiving Waters	Unknown tributary of Accotink Creek

Description: This project is an existing dry pond that will be converted to a shallow wetland. Recommendations include excavating the bottom to create the wetalnd, excavation for additional storage,and modifying the spillway characteristics of the riser structure to change the ouflow characteristics. Retrofit would also include installing a new dewatering system, and removing the concrete low-flow channels and replacing them with natural, meandering channels to lengthen the flow path.



Project Area Map: Conceptual plan showing potential project location

Project Benefits: This facility would provide some of the water quality treatment required for the contributing drainage area by providing extended detention of the half-inch, 48-hour storm. Wetland vegetation and natural processes would help reduce nutrients. Retrofitting this facility would promote the removal of suspended solids and floatables to downstream channels. Approximately 5,800 lbs of sediment, 57 lbs of total nitrogen and 12 lbs of total phosphorus would be reduced annually by this project.

Project Design Considerations: As this facility is located on private land, coordination with local landowners will be necessary to retrofit this facility. Access to this facility is very good from a shared driveway along Kenwood Avenue. Existing utility conflicts are not anticipated and minimal tree removal is required for this retrofit. Environmental permitting issues may be encountered due to the presence of baseflow.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.4	AC	$8,500.00	$3,400
Paved Ditch Demolition & Haul Away	90	LF	$30.00	$2,700
Riser Retrofit	1	LS	$4,000.00	$4,000
Embedded Dewatering Pipe	1	EA	$500.00	$500
Rip Rap Stabilization	45	SY	$100.00	$4,500
Grading and Excavation	704	CY	$35.00	$24,640
Soil Borings	1	LS	$8,500.00	$8,500
			Initial Project Costs	**$48,240**
Plantings	1	LS	5% of Project	$2,412
Ancillary Items	1	LS	5% of Project	$2,412
Erosion and Sediment Control	1	LS	10% of Project	$4,824
			Base Construction Costs	**$57,888**
			Mobilization (5%)	$2,894
			Subtotal 1	$60,782
			Contingency (25%)	$15,196
			Subtotal 2	$75,978
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits			(45%)	$34,190
			Estimated Project Cost	**$110,000**

Site Photo: Existing Facility Overview

Site Photo: Concrete Low Flow Channel and Control Structure

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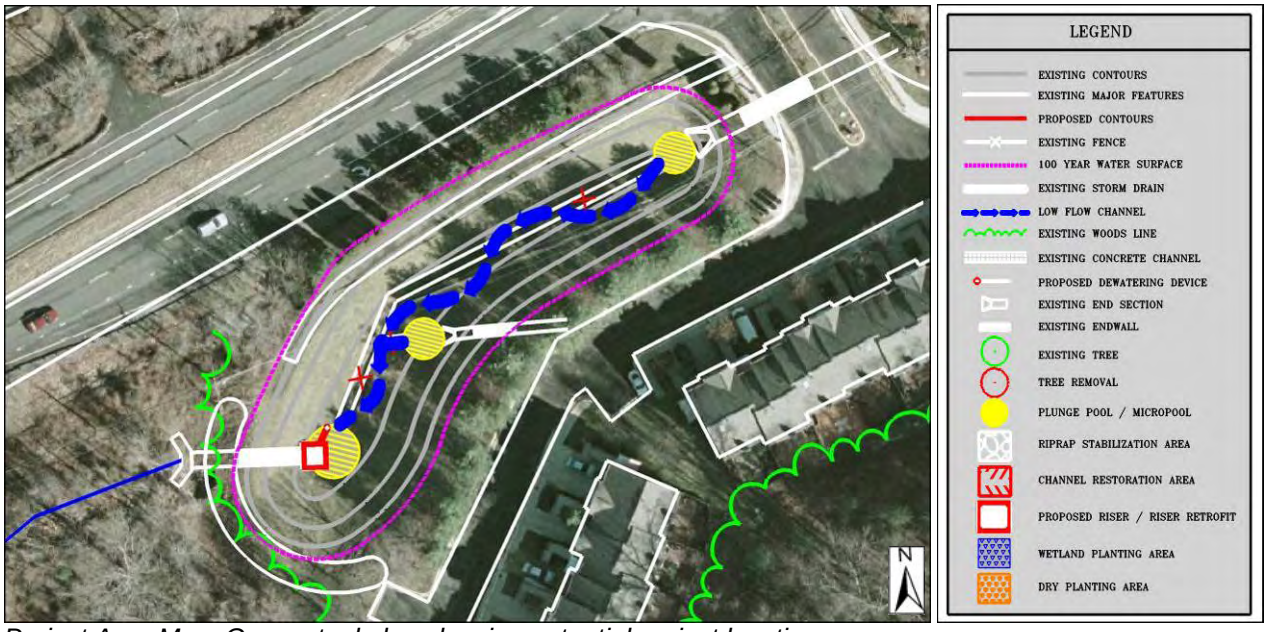
AC9139 - Pond Retrofit

Address:	Near the intersection of Old Keene Mill Road and Westmore Drive
Location:	Westhaven neigborhood
Land Owner:	Private - Residential
PIN:	0901 18 C
Control Type	Water Quality
Drainage Area	31.68 acres
Receiving Waters	Unknown tributary of Accotink Creek

Description: This is an existing dry pond, 0935DP, which will be converted to an extended detention facility. There is a concrete channel that carries runoff as well as baseflow from the inflow point to the outlet structure. This project will consist of modifying the spillway characteristics of the riser structure, installing a new dewatering device, removing the concrete low-flow channels and replacing them with meandering channels, and adding a micropool or plunge pool at each inflow into the facility. All of these proposed improvements will help improve water quality.



Project Area Map: Conceptual plan showing potential project location

Project Benefits: This facility has the potential to meet the water quality treatment requirement for the contributing drainage area via extended detention of the one-half inch, 48-hour storm, along with the wet storage provided by the micropools. The retrofit will also provide management of the 2-year peak flow rates. It is estimated that an annual total of 3,745 lbs of sediment, 37 lbs of total nitrogen and nine lbs of total phosphorus would be reduced by this project.

Project Design Considerations: Coordination with residents and an HOA will be necessary to retrofit this facility since it is located on private land. Access to this facility is good; however, no existing access road is present. Access is possible down a relatively steep slope at the end of Westmore Drive. A portion of the embankment has an asphalt pedestrian trail on top; however, the top width of the embankment is too narrow for construction vehicles. Overhead power lines and underground utilities are present on the interior embankment adjacent to Westmore Drive at the upstream end of the facility. Minimal tree removal is required for this retrofit. Environmental permitting issues may be encountered due to the presence of baseflow from a 33" storm sewer inflow into this facility.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Paved Ditch Demolition & Haul Away	265	LF	$30.00	$7,950
Plunge pool / Micropool	3	EA	$400.00	$1,200
Excavate to create low-flow channel	215	LF	$25.00	$5,375
Riser Retrofit	1	LS	$4,000.00	$4,000
Embedded Dewatering Pipe	1	EA	$500.00	$500
Soil Borings	1	LS	$8,500.00	$8,500
			Initial Project Costs	**$27,525**
Plantings	1	LS	5% of Project	$1,376
Ancillary Items	1	LS	5% of Project	$1,376
Erosion and Sediment Control	1	LS	10% of Project	$2,753
			Base Construction Costs	**$33,030**
			Mobilization (5%)	$1,652
			Subtotal 1	$34,682
			Contingency (25%)	$8,671
			Subtotal 2	$43,353
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	$19,509
			Estimated Project Cost	**$63,000**

Site Photo: Existing Facility and Control Structure

Site Photo: Existing Facility

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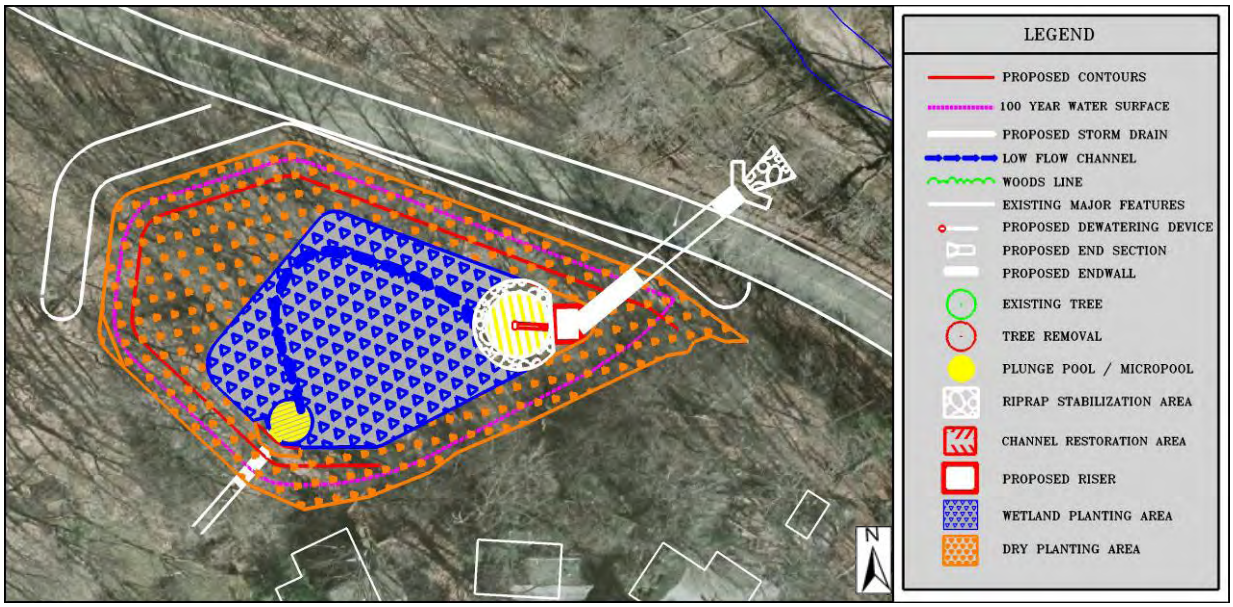
AC9144 - New Pond

Address:	Between Danbury Forest Drive and Thames Street
Location:	Lake Accotink Park
Land Owner:	County - FCPA
PIN:	0703 04 A
Control Type	Water Quality and Quantity
Drainage Area	11.38 acres
Receiving Waters	Long Branch Central

Description: The proposed facility between Danbury Forest Drive and Thames Street would be an extended detention dry pond which would provide water quality and water quantity treatment at the outfall of the existing storm drain system, before it crosses under the road and into the floodplain. The new riser structure would connect to the existing culvert under Danbury Forest Drive to avoid having to close the road and perform roadway work. The existing storm drain and culvert would be modified as little as possible.



Project Area Map: Conceptual plan showing potential project location

Project Benefits: This project would provide water quality treatment via extended detention of the half-inch, 48-hour storm and water quantity management of 2- and 10-year peak runoff volumes. The erosion at the outfall will be corrected and a forebay provided, which will reduce the amount of sediment flowing downstream to the next storm drain structure and into receiving waters. This will improve habitat through reduction of suspended sediment and various other nutrients. The new facility will have a new riser structure to detain water before it enters Accotink Creek. It is estimated that a total of 862 lbs of sediment, nine lbs of total nitrogen and two lbs of total phosphorus would be reduced by this project.

Project Design Considerations: This project would be located behind a residential community with easy access to the site, so the design should take this into consideration. FCPA will require any trees damaged by construction to be replaced or trimmed. The eroded outfall is located at the edge of a forest, so the new facility would impact some mature trees. The site is located in a headwater area and would impound an intermittent stream, so environmental permitting would be required. Access is available along the storm drain easement between houses.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.7	AC	$15,000.00	$10,500
Plungepool / Micropool	2	EA	$400.00	$800
Excavate to create low-flow channel	175	LF	$25.00	$4,375
New Riser	1	LS	$8,000.00	$8,000
Embedded Dewatering Pipe	1	EA	$500.00	$500
New Endwall	1	EA	$2,500.00	$2,500
Outfall Pipe	35	LF	$300.00	$10,500
Rip Rap Stabilization	65	SY	$100.00	$6,500
Grading and Excavation	7000	CY	$35.00	$245,000
Embankment	1750	CY	$50.00	$87,500
Soil Borings	1	LS	$8,500.00	$8,500
			Initial Project Costs	**$384,675**
Plantings	1	LS	5% of Project	$19,234
Ancillary Items	1	LS	5% of Project	$19,234
Erosion and Sediment Control	1	LS	10% of Project	$38,468
			Base Construction Costs	**$461,611**
			Mobilization (5%)	$23,081
			Subtotal 1	$484,692
			Contingency (25%)	$121,173
			Subtotal 2	$605,865
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits			(45%)	$272,639
			Estimated Project Cost	**$879,000**

Site Photo: Storm Drain Outfall to Proposed Facility

Site Photo: Proposed Facility Location

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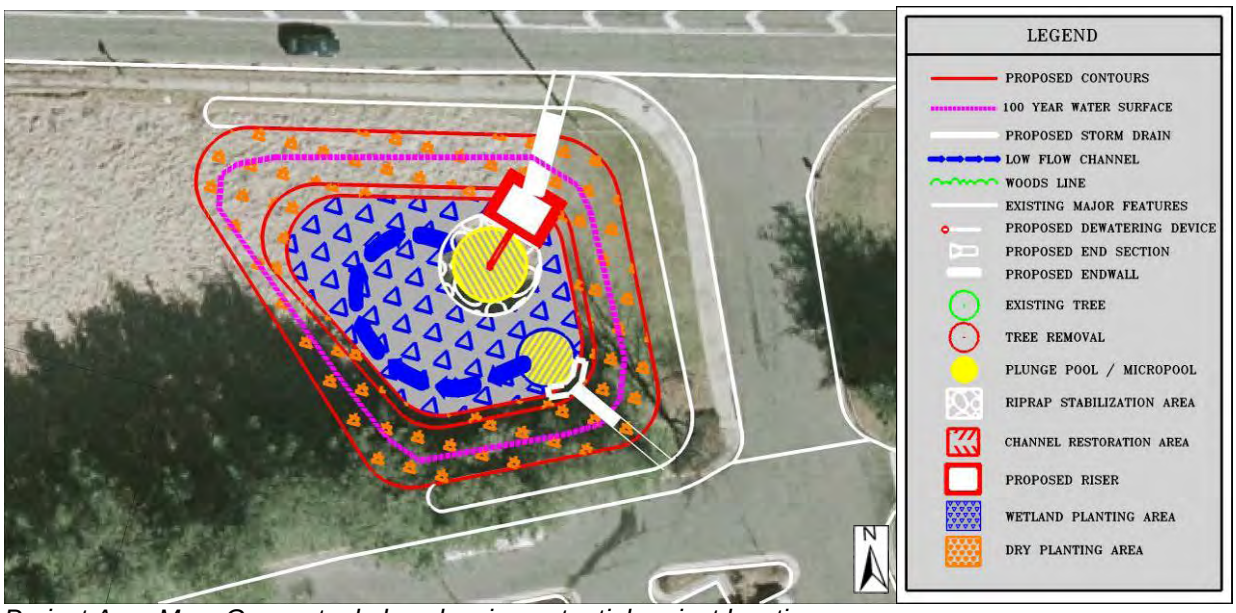
AC9147 - New Pond

Address:	Between the intersections of Braddock Road with Rolling Road and Burke Lake Road
Location:	Kings Park Shopping Center
Land Owner:	Private - Commercial
PIN:	N/A
Control Type	Water Quality and Quantity
Drainage Area	3.95 acres
Receiving Waters	Unknown tributary of Long Branch Central

Description: A new extended detention dry pond is proposed in a grass median between Braddock Road and the Kings Park Shopping Center. Existing storm drains from the Shopping Center cross underneath the site before crossing Braddock Road and discharging into Long Branch Central, giving the potential for treatment of both water quality and quantity. This project would require modification of the storm drainage system to discharge into the proposed facility. The proposed riser would connect to the existing storm drain under Braddock Road to avoid road work.



Project Area Map: Conceptual plan showing potential project location

Project Benefits: This project would provide water quantity management of 2- and 10-year peak runoff and water quality treatment, through extended detention, of the half-inch, 48-hour storm. Micropools will provide wet storage to augment pollutant removal and provide more sedimentation. An estimated 656 lbs of sediment, seven lbs of total nitrogen and one lb of total phosphorus would be reduced by this project.

Project Design Considerations: There appear to be no utilities in the project area except overhead lines. The adjacent land use is commercial, so no environmental constraints or permitting issues are anticipated. Access to the site is excellent from the road and parking lot.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.2	AC	$15,000.00	$3,000
Plunge pool / Micropool	2	EA	$400.00	$800
Excavate to create low-flow channel	105	LF	$25.00	$2,625
New Riser	1	LS	$8,000.00	$8,000
Embedded Dewatering Pipe	1	EA	$500.00	$500
Outfall Pipe	35	LF	$300.00	$10,500
New End Wall	1	EA	$2,500.00	$2,500
Rip Rap Stabilization	30	SY	$100.00	$3,000
Grading and Excavation	1447	CY	$35.00	$50,645
Embankment	362	CY	$50.00	$18,100
Soil Borings	1	LS	$8,500.00	$8,500
			Initial Project Costs	**$108,170**
Plantings	1	LS	5% of Project	$5,409
Ancillary Items	1	LS	5% of Project	$5,409
Erosion and Sediment Control	1	LS	10% of Project	$10,817
			Base Construction Costs	**$129,805**
			Mobilization (5%)	$6,490
			Subtotal 1	$136,295
			Contingency (25%)	$34,074
			Subtotal 2	$170,369
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)				$76,666
			Estimated Project Cost	**$247,000**

Site Photo: Proposed Facility Location

Site Photo: Proposed Facility Drainage Area

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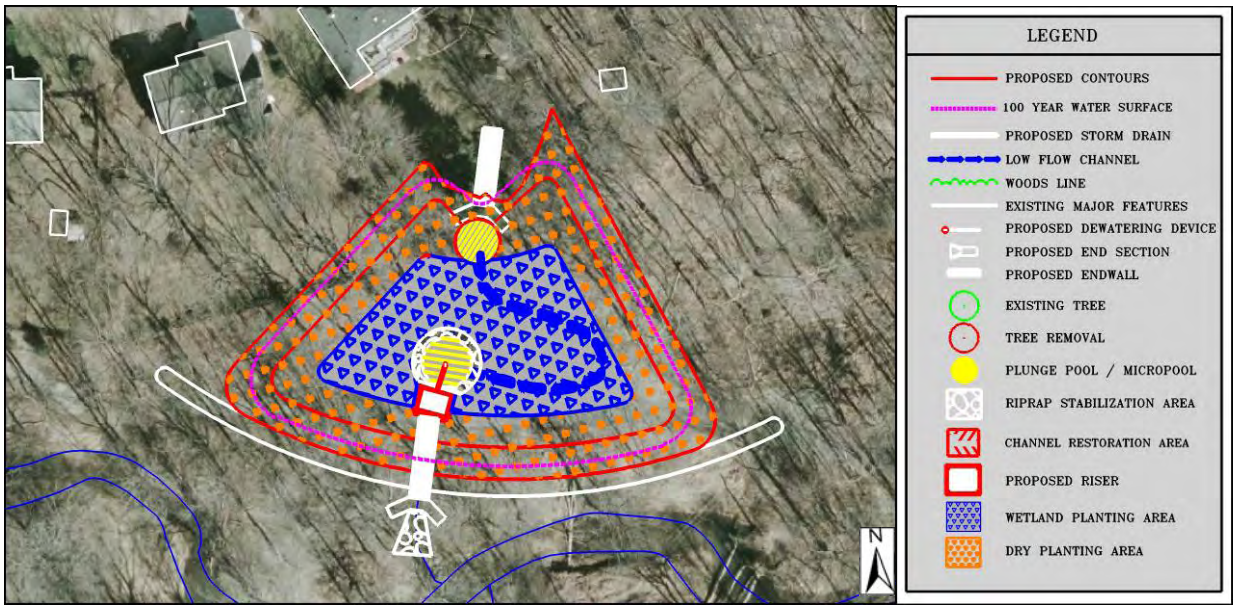
AC9148 - New Pond

Address:	Behind 4808 Springbrook Drive, at the end of Hercules Court
Location:	Long Branch Stream Valley Park
Land Owner:	County - FCPA
PIN:	0694 12 B
Control Type	Water Quality and Quantity
Drainage Area	35.66 acres
Receiving Waters	Unknown tributary of Long Branch Central

Description: An extended detention dry pond is proposed in the Long Branch Stream Valley Park at the existing storm drain outfall behind the houses on Springbrook Drive to treat both the water quality and quantity of the runoff from this residential neighborhood. The new pond would involve excavation, construction of an embankment, installation of a riser structure, and internal pond features including a plungepool, a micropool and a meandering low-flow channel. The outfall of the facility would need to be under the pedestrian path so as to allow the path to remain in use.



Project Area Map: Conceptual plan showing potential project location

Project Benefits: This project would provide water quality treatment via extended detention of the half-inch, 48-hour storm and water quantity management of 2- and 10-year peak runoff volumes. The storm drain at this location does not convey baseflow, only stormwater, so this is an excellent location for an extended detention stormwater facility. A micropool will enhance the treatment of a stormwater facility at this location and increase the removal of suspended sediment and nutrients. An estimated 2,628 lbs of sediment, 29 lbs of total nitrogen and six lbs of total phosphorus would be reduced by this project.

Project Design Considerations: There are likely no utilities in the project area, although this should still be investigated to confirm. The removal of some trees would be required, although many of the trees in the area are already dead. In any event, FCPA will require any trees damaged by construction to be replaced or trimmed. No permitting is anticipated. There is an existing pedestrian path between the proposed facility and the main channel, which may need to be relocated in some places to allow for construction of the embankment. The path provides easy access to the site for construction equipment as well as for residents, so it provides an opportunity for interpretive signs and outreach.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.5	AC	$15,000.00	$7,500
Plungepool / Micropool	2	EA	$400.00	$800
New Riser	1	LS	$8,000.00	$8,000
Embedded Dewatering Pipe	1	EA	$500.00	$500
Rip Rap Stabilization	40	SY	$100.00	$4,000
Grading and Excavation	6398	CY	$35.00	$223,930
Embankment	1600	CY	$50.00	$80,000
Outfall Pipe	40	LF	$300.00	$12,000
Outlet Protection	1	EA	$8,000.00	$8,000
New Endwall	1	EA	$2,500.00	$2,500
Excavate to create low-flow channel	170	LF	$25.00	$4,250
Soil Borings	1	LS	$8,500.00	$8,500
			Initial Project Costs	**$359,980**
Plantings	1	LS	5% of Project	$17,999
Ancillary Items	1	LS	5% of Project	$17,999
Erosion and Sediment Control	1	LS	10% of Project	$35,998
			Base Construction Costs	**$431,976**
			Mobilization (5%)	$21,599
			Subtotal 1	$453,575
			Contingency (25%)	$113,394
			Subtotal 2	$566,969
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits			(45%)	$255,136
			Estimated Project Cost	**$822,000**

Site Photo: Storm Drain Outfall to Proposed Facility

Site Photo: Proposed Facility Location

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AC9161 - Pond Retrofit

Address:	Near the intersection of Americana Drive and Commons Drive
Location:	Patriot Village neigborhood
Land Owner:	Private - Residential
PIN:	0702 01 0026
Control Type	Water Quality
Drainage Area	80.55 acres
Receiving Waters	Unknown tributary of Accotink Creek

Description: This existing dry pond (0294DP) near the intersection of Americana Drive and Commons Drive in the Patriot Village neighborhood is recommended to be retrofitted by modifying the outlet structure to provide storage, creating a micropool at the outlet, installing sediment forebays at inlets, excavating the pond outlet to provide better storage and stabilizing the existing stream channel. Field observations indicated that the existing riser structure is failing, so the pond is only functioning as a culvert with little detention.

Project Area Map: Conceptual plan showing potential project location

Project Benefits: The replacement of the existing control structure located on the upstream side embankment of Americana Drive has the potential to provide water quality treatment for the contributing drainage area; however, it is unlikely that 2-year or 10-year detention could be met. Replacing the current riser and changing the outflow characteristics will promote the removal of pollutants, floatables, and suspended solids. It is estimated that an annual total of 7,580 lbs of sediment, 75 lbs of total nitrogen and 14 lbs of total phosphorus would be reduced by this project.

Project Design Considerations: Coordination with the apartment complex owners will be necessary to retrofit this facility since it is located on private land. Access to this facility is very good from Americana Drive. Existing utility conflicts are not anticipated with this retrofit. Environmental permitting issues are expected due to the in-stream location of this facility. Some tree removal may be necessary as well. In-stream construction will require base flow diversion. The base flow component of the replaced control structure will require regular maintenance to prevent clogging.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.5	AC	$12,000.00	$6,000
New Riser	1	LS	$8,000.00	$8,000
Rip Rap Stabilization	150	SY	$100.00	$15,000
Soil Borings	1	LS	$8,500.00	$8,500
			Initial Project Costs	**$37,500**
Plantings	1	LS	5% of Project	$1,875
Ancillary Items	1	LS	5% of Project	$1,875
Erosion and Sediment Control	1	LS	10% of Project	$3,750
			Base Construction Costs	**$45,000**
			Mobilization (5%)	$2,250
			Subtotal 1	$47,250
			Contingency (25%)	$11,813
			Subtotal 2	$59,063
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	$26,578
			Estimated Project Cost	**$86,000**

Site Photo: Existing Facility Embankment

Site Photo: Existing Facility and Control Structure

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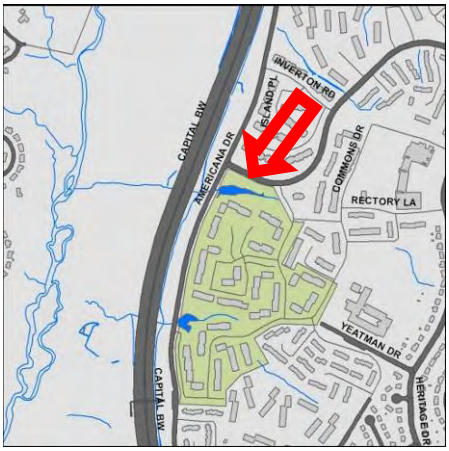
AC9162 - Pond Retrofit



Address:	Americana Drive at Patriot Drive
Location:	Patriot Village neigborhood
Land Owner:	Private - Residential
PIN:	0702 01 0026
Control Type	Water Quality and Quantity
Drainage Area	82.8 acres
Receiving Waters	Unknown tributary of Accotink Creek

Description: This existing dry pond, 0393DP, is located on the upstream side of the culvert underneath Americana Drive directly upstream of Capital Beltway. This facility is in an existing perennial stream channel in a forested area between residential communities. There is moderate erosion on the upstream side of this culvert. The proposed project will remove the existing concrete channel that is failing, restore the deteriorating stream channel, and install a new control structure on the upstream side of the culvert to provide water quality treatment and some management of the 2-year storm event. The receiving stream on the downstream side of the culvert will also be stabilized to prevent further erosion.

Project Area Map: Conceptual plan showing potential project location

Project Benefits: This project has the potential to manage up to the 2 year design storm with the addition of a control structure on the upstream side of the existing cross culvert underneath Americana Drive near Patriot Drive. Managing this design storm will help to reduce flow rates which will reduce the potential for future downstream channel erosion. Water quality treatment will be provided with the addition of a plungepool and micropool and extended detention. It is estimated that an annual total of 11,578 lbs of sediment, 113 lbs of total nitrogen and 21 lbs of total phosphorus would be reduced by this project.

Project Design Considerations: Due to the size of the contributing drainage area, peak flow management of the 10-year design storm is unlikely. All components of the existing embankment and stream channel should be analyzed to ensure that the integrity of the cross culvert is not compromised as a result of the change in hydraulic characteristics at this site. This project is located within the 100 year floodplain so any adjustments to the characteristics of stream must adhere to FEMA regulations. Retrofitting a control structure will cause water levels to rise on the upstream side of the embankment within the pond footprint. The base flow component of the control structure will require regular maintenance inspection to prevent clogging. Environmental permitting measures are expected due to the in-stream location of this facility. Tree clearing is expected to provide access to the culvert and stream channel. Existing utility conflicts are not anticipated with this retrofit; however, sanitary sewer manholes and a sewer pipe crossing under the channel are present on the floodplain upstream of this culvert. Access is good from Americana Drive.

The project is upstream of stream restoration project AC9233. Design work for both projects should be carried out concurrently.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.4	AC	$8,500.00	$3,400
Paved Ditch Demolition & Haul Away	60	LF	$30.00	$1,800
Plungepool / Micropool	2	EA	$400.00	$800
New Control Structure - Weir	1	LS	$10,000.00	$10,000
Channel Stabilization	200	LF	$50.00	$10,000
Soil Borings	1	LS	$8,500.00	$8,500
			Initial Project Costs	**$34,500**
Plantings	1	LS	5% of Project	$1,725
Ancillary Items	1	LS	5% of Project	$1,725
Erosion and Sediment Control	1	LS	10% of Project	$3,450
			Base Construction Costs	**$41,400**
			Mobilization (5%)	$2,070
			Subtotal 1	$43,470
			Contingency (25%)	$10,868
			Subtotal 2	$54,338
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)				$24,452
			Estimated Project Cost	**$79,000**

Site Photo: Existing Stream Channel

Site Photo: Existing Control Structure

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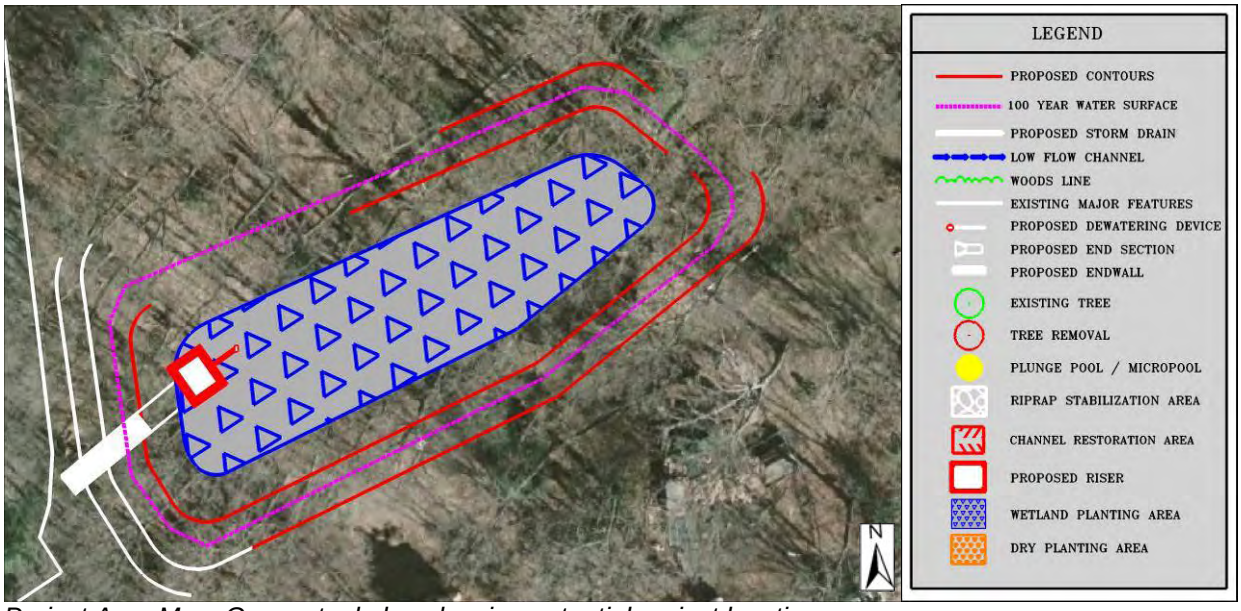
AC9172 - New Pond

Address:	Next to 7820 Libeau Lane,
Location:	End of Libeau Lane
Land Owner:	Private - Residential
PIN:	0592 01 0033
Control Type	Water Quality and Quantity
Drainage Area	10.77 acres
Receiving Waters	Unknown tributary of Accotink Creek

Description: On the east side of Wheatwheel Lane, there is an existing flood control structure which does not provide any water quality treatment and only provides water quantity treatment for larger storms. To provide water quality and water quantity treatment at this location, an extended detention facility will be built upstream of the flood control structure by creating a secondary impoundment and riser. The proposed facility would be set back from the existing control structure to ensure that it does not impact the flood control function.



Project Area Map: Conceptual plan showing potential project location

Project Benefits: This project will provide water quality treatment via extended detention of the half-inch, 48 hour storm and water quantity management of 2- and 10-year peak runoff volumes. An additional impoundment structure would provide an area for settlement of pollutants and suspended sediments. Plantings within the impoundment area would provide additional nutrient uptake. Attenuation of peak flows would be provided by the secondary impoundment structure as well as the existing flood control structure. It is estimated that a total of 996 lbs of sediment, 10 lbs of total nitrogen and two lbs of total phosphorus would be reduced by this project.

Project Design Considerations: The presence of utilities in the project area would need to be determined before the final design can be implemented. Both existing wetlands and forest would be impacted and would require permitting. Access to the site is possible from Wheatwheel Lane. Maintenance on the site, once completed, would be important because of the amount of leaves and debris that originate from the forested area.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.8	AC	$15,000.00	$12,000
New Riser	1	LS	$8,000.00	$8,000
Embedded Dewatering Pipe	1	EA	$500.00	$500
Grading and Excavation	8120	CY	$35.00	$284,200
Embankment	2030	CY	$50.00	$101,500
Outfall Pipe	60	LF	$300.00	$18,000
Soil Borings	1	LS	$8,500.00	$8,500
			Initial Project Costs	**$432,700**
Plantings	1	LS	5% of Project	$21,635
Ancillary Items	1	LS	5% of Project	$21,635
Erosion and Sediment Control	1	LS	10% of Project	$43,270
			Base Construction Costs	**$519,240**
			Mobilization (5%)	$25,962
			Subtotal 1	$545,202
			Contingency (25%)	$136,301
			Subtotal 2	$681,503
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)				$306,676
			Estimated Project Cost	**$988,000**

Site Photo: Existing Flood Control Structure

Site Photo: Existing Channel Into Flood Control Structure

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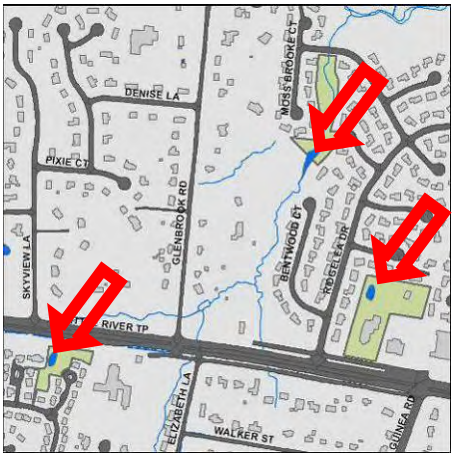
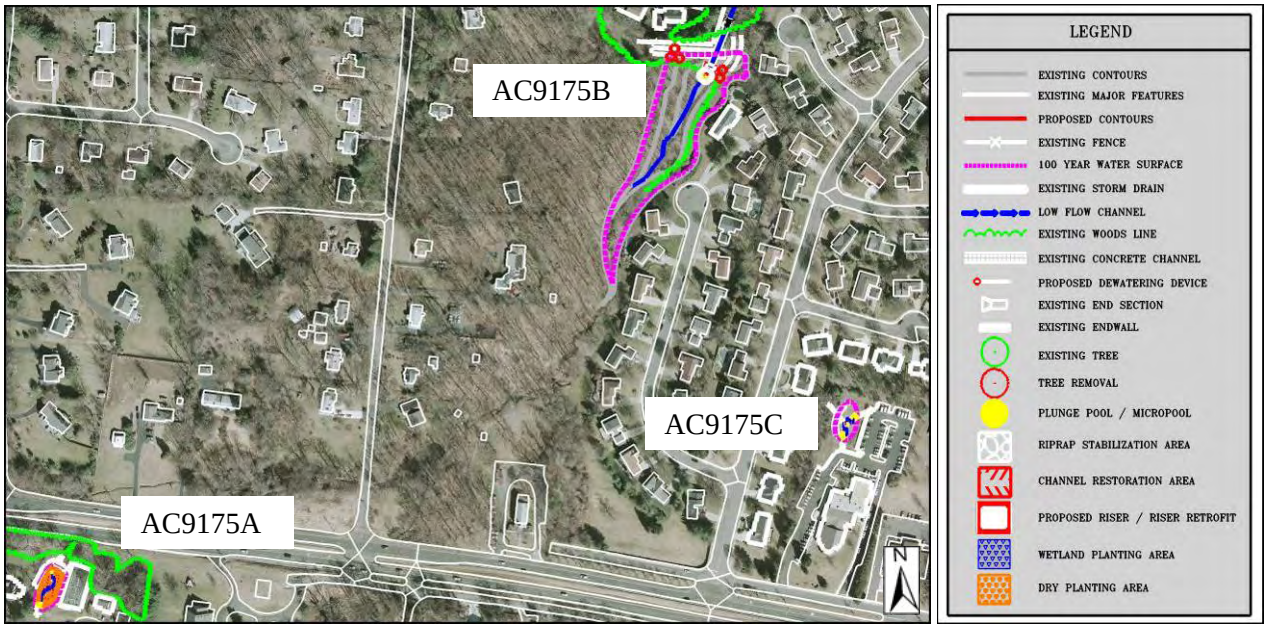
AC9175 - Pond Retrofit



Address:	Between Hunting Pines Court and Hunting Pines Place, Behind 3901 Bentwood Court, Behind 8922 Little River Turnpike
Location:	Hunters Glen and Ridgelea Hills neigborhoods and Bethlehem Lutheran Church
Land Owner:	Private
PIN:	0584 32 B, 0584 28 D, 0584 01 0061
Control Type	Water Quality
Drainage Area	15.32 acres, 107.01 acres, 3.55 acres
Receiving Waters	Unknown tributary of Crook Branch

Description: This project consists of retrofit of three existing dry ponds. AC9175A (0137DP) treats the runoff from Hunter's Glen neighborhood. AC9175B (0045DP) provides flood control for large storms in the Ridglea Hills neighborhood. It is located in a heavily forested area between residential neighborhoods. AC9175C (DP0133) is an existing dry pond at Bethlehem Church. The concrete channel within the facility directs runoff from the inflow directly to the riser structure. This project will consist of a new riser/control structures for each of the ponds, including a dewatering device, excavating for additional storage, and adding a micropool to each riser structure and a plunge pool to each inflow point where stormwater enters the pond.



Project Area Map: Conceptual plan showing potential project location

Project Benefits: Site AC9175A and Site AC9175C will meet the water quality treatment requirement via extended detention of the one-half inch, 48 hour storm. Site AC9175B has the potential to attenuate peak runoff volumes for high-frequency design storms with the addition of a control structure on the upstream side of the existing culvert. At site AC9175B, a control structure on the upstream side of the culvert will allow the pond to achieve water quality goals for habitat improvement and prevent downstream erosion. It is estimated that an annual total of 8,977 lbs of sediment, 95 lbs of total nitrogen and 22 lbs of total phosphorus would be reduced by this project.

Project Design Considerations: Site AC9175B is located between cul-de-sacs in a residential community with several houses within close proximity to this facility. Coordination with residents and an HOA will be necessary to retrofit sites AC9175A and AC9175B since they are located on private land. For site AC9175C, coordination with the church will be required. The storm drains that drain to Sites AC9175A and AC9175C may need to be adjusted to maintain stability within the facilities. Adding a control structure at AC9175B would cause water levels to rise on the upstream side of the embankment within the pond footprint, it is recommended to consider this in the design phase. All existing components of site AC9175B should be analyzed to ensure their integrity. Environmental permitting issues, utility conflicts, and tree impacts are not anticipated with sites AC9175A and AC9175C. At Site AC9175B, environmental permitting issues are anticipated due to the in-stream location of this facility and moderate tree loss, although existing utility conflicts are not anticipated. Access to Site AC9175A is good from Hunting Pines Place. Access to Site AC9175C is very good from the Bethlehem Lutheran Church. Access to Site AC9175B is difficult and will either need to occur from the end of Autumn Leaf Court or Bentwood Court.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	1.7	AC	$8,500.00	$14,450
Paved Ditch Demolition & Haul Away	100	LF	$30.00	$3,000
Tree Removal	5	EA	$2,000.00	$10,000
Plungepool / Micropool	6	EA	$400.00	$2,400
Excavate to create low-flow channel	150	LF	$25.00	$3,750
New Riser	3	LS	$8,000.00	$24,000
Embedded Dewatering Pipe	3	EA	$500.00	$1,500
Remove Existing Headwall	1	EA	$300.00	$300
Rip Rap Stabilization	55	SY	$100.00	$5,500
Grading and Excavation	50	CY	$35.00	$1,750
Soil Borings	3	LS	$8,500.00	$25,500
			Initial Project Costs	**$92,150**
Plantings	1	LS	5% of Project	$4,608
Ancillary Items	1	LS	5% of Project	$4,608
Erosion and Sediment Control	1	LS	10% of Project	$9,215
			Base Construction Costs	**$110,581**
			Mobilization (5%)	$5,529
			Subtotal 1	$116,110
			Contingency (25%)	$29,028
			Subtotal 2	$145,138
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)				$65,312
			Estimated Project Cost	**$210,000**

Site Photo: Existing Facility Overview (AC9175A)

Site Photo: Existing Facility Overview (AC9175B)

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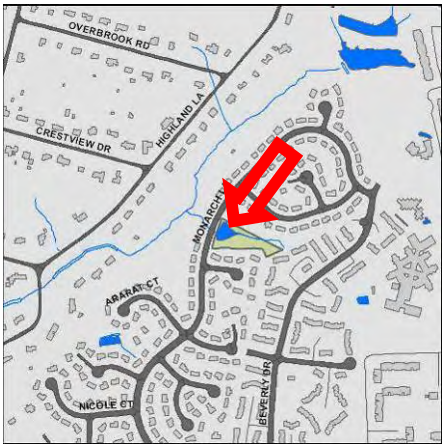
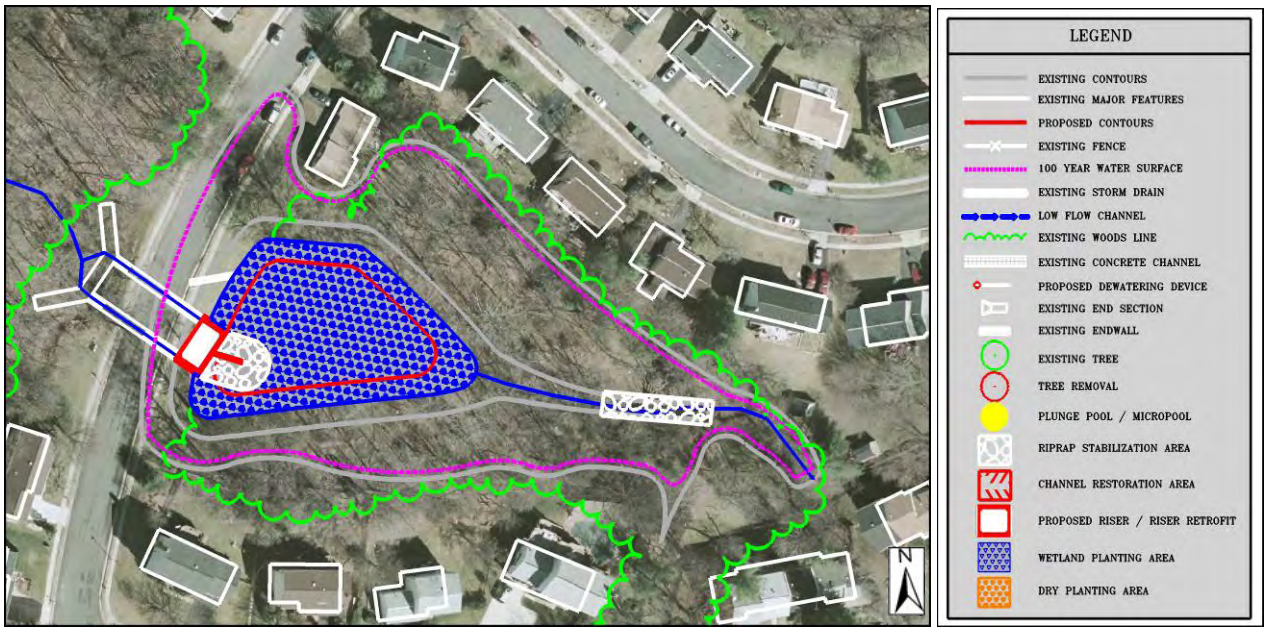
AC9178 - Pond Retrofit



Address:	Near the intersection of Monarch Lane and Happy Heart Lane, Next to 3351 Monarch Lane
Location:	Prosperity Heights neigborhood
Land Owner:	Private - Residential
PIN:	0591 27 D
Control Type	Water Quality and Quantity
Drainage Area	25.79 acres
Receiving Waters	Unknown tributary of Accotink Creek

Description: This facility is an existing dry pond (0169DP) treating the runoff from a residential area in the Prosperity Heights neighborhood. The proposed retrofit will convert the pond to a wetland facility. This project will consist of a removing the existing headwall and replacing with a new riser structure including a new dewatering system, and riprap stabilization.



Project Area Map: Conceptual plan showing potential project location

Project Benefits: This facility would meet the water quality treatment requirement for the contributing drainage area via extended detention of the one-half inch, 48 hour storm, as well as peak flow management of the 2-year peak runoff volume. Retrofitting this facility would promote the removal of suspended solids and floatables through extended detention. These proposed improvements will also help prevent future downstream channel erosion. It is estimated that an annual total of 7,360 lbs of sediment, 60 lbs of total nitrogen and 16 lbs of total phosphorus would be reduced by this project.

Project Design Considerations: Coordination with residents and HOA will be necessary to retrofit this facility since it is located on private land. Environmental permitting issues are expected due to the in-stream location and the presence of wetlands in this facility. Some tree removal along the sides of the facility and modifications to an existing stream channel that flows to this facility will be necessary. In-stream construction will require base flow diversion. Existing utility conflicts are not anticipated. Access to this facility is very good as it is located directly off of Monarch Lane.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.5	AC	$8,500.00	$4,250
New Riser	1	LS	$8,000.00	$8,000
Embedded Dewatering Pipe	1	EA	$500.00	$500
Rip Rap Stabilization	160	SY	$100.00	$16,000
Grading and Excavation	3941	CY	$35.00	$137,935
Remove Existing Headwall	1	EA	$300.00	$300
Soil Borings	1	LS	$8,500.00	$8,500
			Initial Project Costs	**$175,485**
Plantings	1	LS	5% of Project	$8,774
Ancillary Items	1	LS	5% of Project	$8,774
Erosion and Sediment Control	1	LS	10% of Project	$17,549
			Base Construction Costs	**$210,582**
			Mobilization (5%)	$10,529
			Subtotal 1	$221,111
			Contingency (25%)	$55,278
			Subtotal 2	$276,389
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits			(45%)	$124,375
			Estimated Project Cost	**$401,000**

Site Photo: Existing Facility Overview

Site Photo: Existing Facility Inflow and Control Structure

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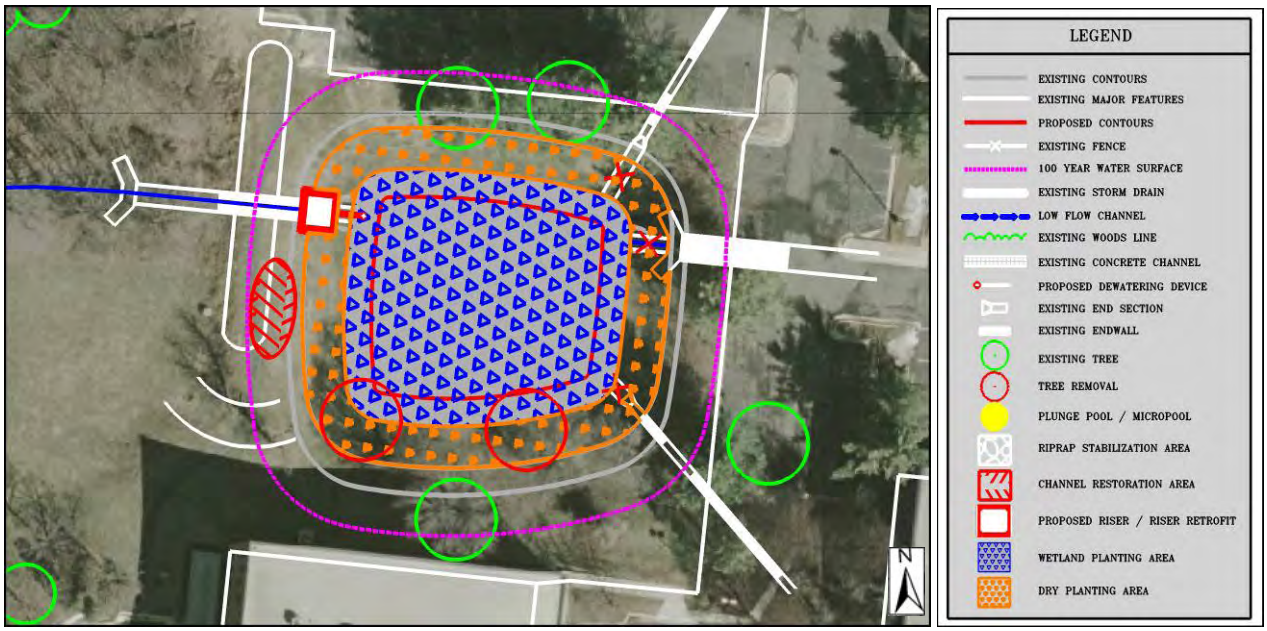
AC9181 - Pond Retrofit

Address:	Behind 2720 Prosperity Avenue
Location:	Prosperity Business Campus
Land Owner:	Private - Commercial
PIN:	0491 19 G
Control Type	Water Quality
Drainage Area	43.61 acres
Receiving Waters	Unknown tributary of Long Branch North

Description: Dry pond DP0146 receives runoff from the nearby Prosperity Business Park. This project is a retrofit that convert the pond to a shallow wetland by removing the existing concrete low-flow channels, excavating to create permanent wet storage and replacing the existing riser with a new riser and dewatering system.



Project Area Map: Conceptual plan showing potential project location

Project Benefits: This facility has the potential to meet approximately two-thirds of the water quality treatment requirement for the contributing drainage area in the form of permanent wet storage volume. Retrofitting this facility would promote the removal of suspended solids and floatables through settling in the new wet storage areas, as well as reduce nitrogen and phosphorus through uptake by wetlan plants. These proposed improvements will also help prevent future downstream channel erosion by reducing peak flows and erosive velocities. It is estimated that an annual total of 10,185 lbs of sediment, 110 lbs of total nitrogen and 20 lbs of total phosphorus would be reduced by this project.

Project Design Considerations: The proposed wet storage element in the facility is not capable of meeting 100 percent of the water quality volume requirement for the contributing drainage area. Since this facility is located in a private commercial/industrial area, coordination with the property owner will be necessary. Converting this facility to a wetland will create a permanent pool that is below the invert of the existing outlet pipe and, therefore, will not positively drain. Access to this facility is good and can be accessed from three different parking lots that surround this facility. Environmental permitting issues may be encountered due to the presence of baseflow from several storm drain inflows into this facility. Existing utility conflicts are not anticipated.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Paved Ditch Demolition & Haul Away	235	LF	$30.00	$7,050
Tree Removal	2	EA	$2,000.00	$4,000
New Riser	1	LS	$8,000.00	$8,000
Embedded Dewatering Pipe	1	EA	$500.00	$500
Grading and Excavation	2271	CY	$35.00	$79,485
Slope Stabilization	1	LS	$1,200.00	$1,200
Soil Borings	1	LS	$8,500.00	$8,500
			Initial Project Costs	**$108,735**
Plantings	1	LS	5% of Project	$5,437
Ancillary Items	1	LS	5% of Project	$5,437
Erosion and Sediment Control	1	LS	10% of Project	$10,874
			Base Construction Costs	**$130,483**
			Mobilization (5%)	$6,524
			Subtotal 1	$137,007
			Contingency (25%)	$34,252
			Subtotal 2	$171,259
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits			(45%)	$77,067
			Estimated Project Cost	**$248,000**

Site Photo: Existing Facility Overview

Site Photo: Existing Control Structure and Concrete Low Flow Channels

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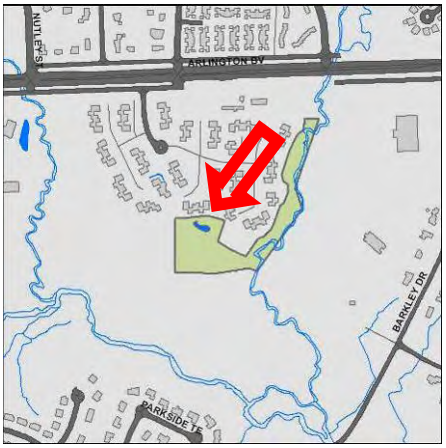
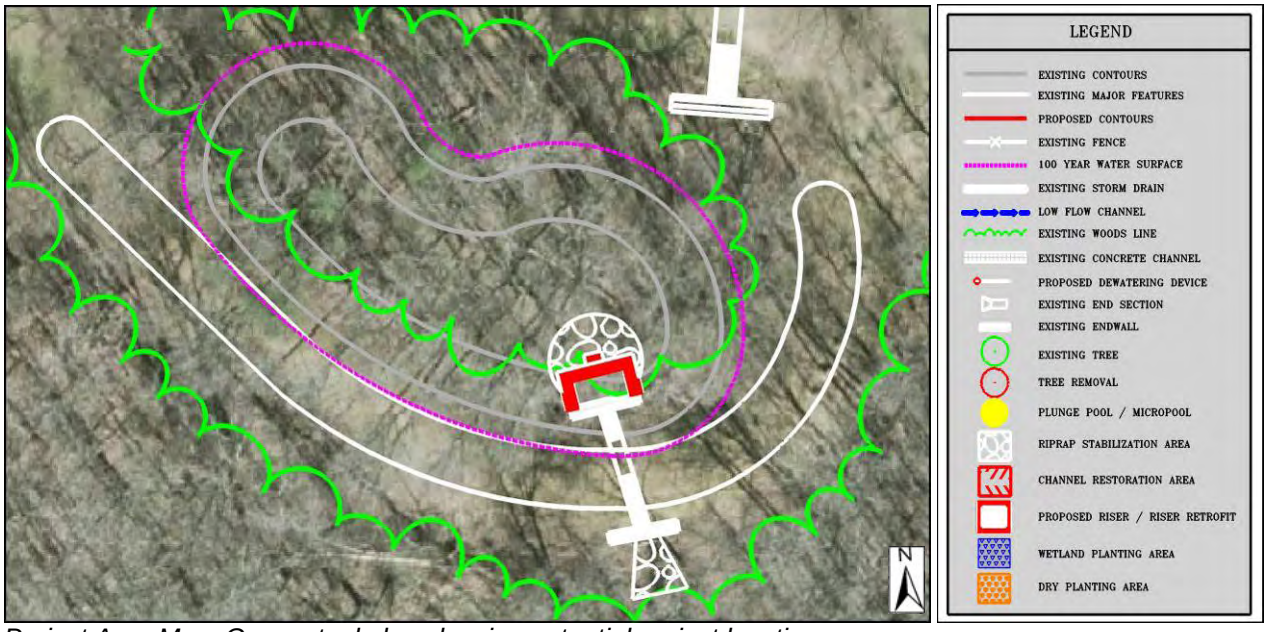
AC9182 - Pond Retrofit



Address:	At the end of Readsborough Court
Location:	Mantua Park
Land Owner:	County - FCPA
PIN:	0484 18 D
Control Type	Water Quality
Drainage Area	9.57 acres
Receiving Waters	Bear Branch

Description: This is an existing dry pond (0043DP), which will be retrofitted to improve water quality treatment and provide some peak flow management from a high-density residential area in Chesterfield Meadows Section 1 neighborhood. There is a small baseflow through the facility with existing wetlands within and downstream of the facility. The existing wetlands and stream provide some water quality improvement and will be disturbed as little as possible. This project will consist of a new weir or control structure and riprap stabilization on both the upstream and downstream side of the existing culvert.



Project Area Map: Conceptual plan showing potential project location

Project Benefits: Retrofitting this facility will promote removal of suspended solids through extended detention and improve the removal of nitrogen and phophorus through sedimentation in the floodplain and uptake by wetland plants. It is estimated that an annual total of 1,358 lbs of sediment, five lbs of total nitrogen and two lbs of total phosphorus would be reduced by this project.

Project Design Considerations: Since this facility is located in a residential community, installing signs around the facility is recommended for public awareness. Little coordination will be necessary to retrofit this facility since it is located on County land. Access to this facility is good from either the end of Eakin Park Court or Readsborough Courts and will require minimal tree removal. However, if trees are damaged by construction FCPA will require replacement or trimming. Several underground utilities and sanitary sewer manholes were identified behind the houses at the end of Eakin Park Court. Utility conflicts on the pond embankment or near the outlet pipe are not anticipated. Construction will focus on the area of the proposed control structure where some tree removal can be expected.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.2	AC	$12,000.00	$2,400
New Riser	1	LS	$8,000.00	$8,000
Rip Rap Stabilization	45	SY	$100.00	$4,500
Soil Borings	1	LS	$8,500.00	$8,500
			Initial Project Costs	**$23,400**
Plantings	1	LS	5% of Project	$1,170
Ancillary Items	1	LS	5% of Project	$1,170
Erosion and Sediment Control	1	LS	10% of Project	$2,340
			Base Construction Costs	**$28,080**
			Mobilization (5%)	$1,404
			Subtotal 1	$29,484
			Contingency (25%)	$7,371
			Subtotal 2	$36,855
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)				$16,585
			Estimated Project Cost	**$53,000**

Site Photo: Existing Facility Overview

Site Photo: Inflow into Facility

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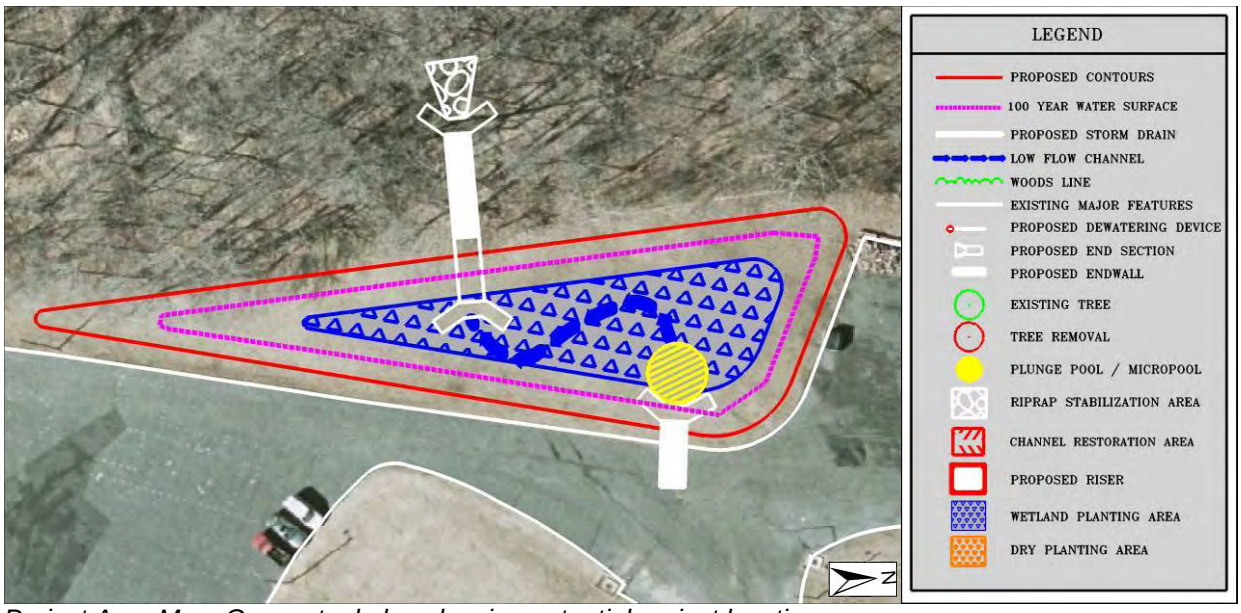
AC9183 - New Pond

Address:	9001 Arlington Boulevard
Location:	Kena Shriners Temple
Land Owner:	Private
PIN:	0484 01 0042A
Control Type	Water Quality and Quantity
Drainage Area	9.02 acres
Receiving Waters	Bear Branch

Description: The project site at the Kena Shriner Temple has a lot of curbed, paved area with storm drains and no existing treatment. The proposed facility would be located on the southwest portion of the site. Part of the existing storm drain system runs underneath this area. The existing pipe will be cut so that it discharges into the proposed facility for treatment. A riser structure will be used to provide detention before the water is discharged into the stream. Water quality will also be provided within the proposed facility. Although runoff from all the paved area will not reach the proposed facility, the treatment provided within the facility is sufficient for all of the impervious area on site if the lot is regraded in the future.



Project Area Map: Conceptual plan showing potential project location

Project Benefits: This project would provide water quality treatment of the half-inch, 48 hour storm as well as management of the 2-year peak flow volume. This large parking lot, which is currently untreated, likely contributes oil, grease, sediment, and pollutants to the forested area on the downstream side. A new facility will reduce loads of nutrients and suspended solids from the runoff before it reaches the stream, which would help improve the water quality and habitat. It is estimated that a total of 1,229 lbs of sediment, 15 lbs of total nitrogen and four lbs of total phosphorus would be reduced by this project.

Project Design Considerations: This facility would require the modification of the storm drain system to discharge the runoff within the open space next to the parking lot. As the property is privately owned, coordination and input from the owner will be required for this project. No environmental permitting issues are anticipated with this project and little to no tree removal is required; however, the area is near a Native American site (44FX0014). All construction access and staging should occur on paved areas to limit further disturbance. There are no anticipated conflicts with utilities.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.3	AC	$8,500.00	$2,550
Plungepool / Micropool	1	EA	$400.00	$400
Excavate to create low-flow channel	95	LF	$25.00	$2,375
Outlet Protection	1	EA	$8,000.00	$8,000
Outfall Pipe	65	LF	$300.00	$19,500
New Endwall	2	EA	$2,500.00	$5,000
Grading and Excavation	1546	CY	$35.00	$54,110
Embankment	387	CY	$50.00	$19,350
Soil Borings	1	LS	$8,500.00	$8,500
			Initial Project Costs	**$119,785**
Plantings	1	LS	5% of Project	$5,989
Ancillary Items	1	LS	5% of Project	$5,989
Erosion and Sediment Control	1	LS	10% of Project	$11,979
			Base Construction Costs	**$143,742**
			Mobilization (5%)	$7,187
			Subtotal 1	$150,929
			Contingency (25%)	$37,732
			Subtotal 2	$188,661
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)				$84,897
			Estimated Project Cost	**$274,000**

Site Photo: Existing Parking Area

Site Photo: Open Space For Proposed Facility

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AC9195 - Pond Retrofit

Address:	Between the 10100 block of Turnberry Place and the 10100 block of Ebenshire Court, Across from 10141 Valentino Drive
Location:	Oakton Village neigborhood
Land Owner:	Private - Residential
PIN:	0474 09 B, 0474 21 L, 0472 21 C, 0474 21 G
Control Type	Water Quality and Quantity
Drainage Area	30.19 acres
Receiving Waters	Unknown tributary of Accotink Creek

Description: This is an existing dry pond, 0100DP, which will be converted to an extended detention facility. There is a concrete channel that carries runoff as well as baseflow from the inflow point to the outlet structure. This project will consist of a new riser structure including a dewatering device, removing the concrete low-flow channels and replacing them with a meandering low flow channel and adding a plunge pool to each inflow into the facility.

Project Area Map: Conceptual plan showing potential project location

Project Benefits: This facility will meet the water quality treatment requirement via extended detention of the one-half inch, 48 hour storm. Retrofitting this facility would help to prevent future downstream erosion by reducing peak flow rates and erosive velocities. It is estimated that an annual total of 3,958 lbs of sediment, 39 lbs of total nitrogen and nine lbs of total phosphorus would be reduced by this project.

Project Design Considerations: Coordination with residents and the Concord Village HOA will be necessary to retrofit this facility as it is located on private land. Environmental permitting issues may be encountered due to the presence of baseflow. No tree loss is expected with this pond retrofit. Existing utility conflicts are not anticipated. Access to this facility is very good from Valentino Drive.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Paved Ditch Demolition & Haul Away	195	LF	$30.00	$5,850
Plungepool / Micropool	3	EA	$400.00	$1,200
Excavate to create low-flow channel	195	LF	$25.00	$4,875
New Riser	1	LS	$8,000.00	$8,000
Embedded Dewatering Pipe	1	EA	$500.00	$500
Soil Borings	1	LS	$8,500.00	$8,500
			Initial Project Costs	**$28,925**
Plantings	1	LS	5% of Project	$1,446
Ancillary Items	1	LS	5% of Project	$1,446
Erosion and Sediment Control	1	LS	10% of Project	$2,893
			Base Construction Costs	**$34,710**
			Mobilization (5%)	$1,736
			Subtotal 1	$36,446
			Contingency (25%)	$9,112
			Subtotal 2	$45,558
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	$20,501
			Estimated Project Cost	**$66,000**

Site Photo: Existing Facility Inflow and Control Structure

Site Photo: Existing Facility Overview

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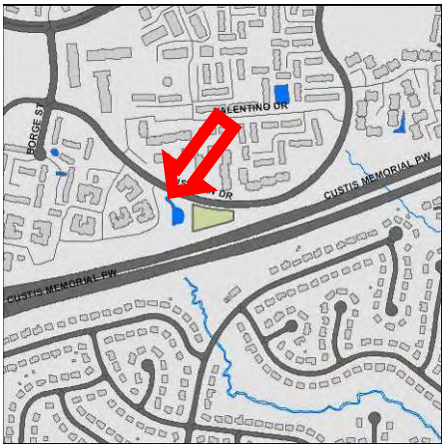
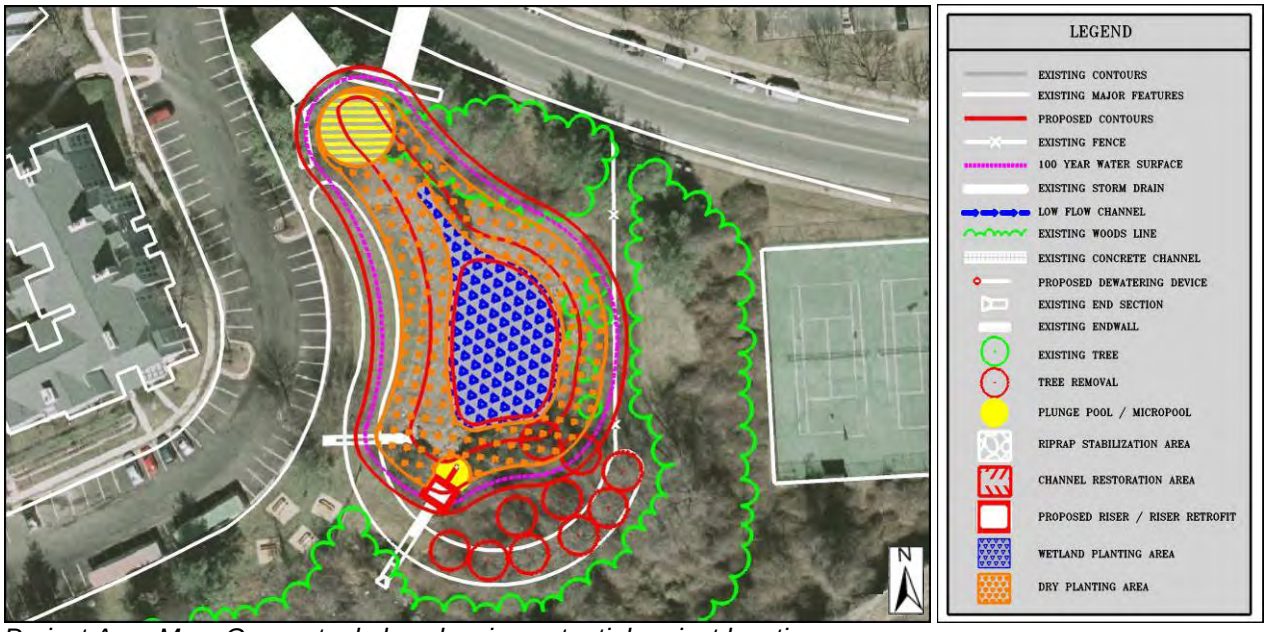
AC9196 - Pond Retrofit



Address:	Near the intersection of Appalachian Circle and Bushman Drive
Location:	Four Winds at Oakton Condominium
Land Owner:	Private - Residential
PIN:	
Control Type	Water Quality and Quantity
Drainage Area	30.19 acres
Receiving Waters	Unknown tributary of Accotink Creek

Description: This is an existing wet pond (WP0271) that will be converted to a wetland facility. The outlet pipe from the pond is moderately eroded and would be stabilized during this retrofit. This project will consist of adding a new riser structure including a dewatering device, excavating for additional storage, tree removal, and a micropool and plunge pool at the riser and inflow, respectively. The new riser should be designed to allow baseflow to pass through the facility.



Project Area Map: Conceptual plan showing potential project location

Project Benefits: Retrofitting the existing control structure located on the upstream side of the embankment has the potential to provide water quality treatment and some peak flow management. Installing a new riser and enlarging the facility will promote the removal of pollutants, floatables and suspended solids through extended detention. These proposed improvements will also help reduce future downstream channel erosion. Peak flow rates, erosive velocities and channel sediment loads will be reduced by this project. It is estimated that an annual total of 9,581 lbs of sediment, 94 lbs of total nitrogen and 20 lbs of total phosphorus would be reduced by this project.

Project Design Considerations: Since this facility is located in a residential community and is adjacent to recreational areas and parking lots, installing signs around the facility is recommended to promote public awareness. Coordination with residents and The Four Winds at Oakton HOA will be necessary to retrofit this facility since it is located on private land. Environmental permitting issues are expected due to the presence of extensive wetlands and the in-stream location of this facility. In-stream construction will require base flow diversion. Significant tree loss is expected on the embankment, around the edges, and at the upstream end of this facility. Existing utility conflicts are not anticipated. Access to this facility is very good from parking areas located along Appalachian Circle.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.6	AC	$8,500.00	$5,100
Tree Removal	10	EA	$2,000.00	$20,000
Plungepool / Micropool	2	EA	$400.00	$800
New Riser	1	LS	$8,000.00	$8,000
Embedded Dewatering Pipe	1	EA	$500.00	$500
Grading and Excavation	976	CY	$35.00	$34,160
Soil Borings	1	LS	$8,500.00	$8,500
			Initial Project Costs	**$77,060**
Plantings	1	LS	5% of Project	$3,853
Ancillary Items	1	LS	5% of Project	$3,853
Erosion and Sediment Control	1	LS	10% of Project	$7,706
			Base Construction Costs	**$92,472**
			Mobilization (5%)	$4,624
			Subtotal 1	$97,096
			Contingency (25%)	$24,274
			Subtotal 2	$121,370
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	$54,617
			Estimated Project Cost	**$176,000**

Site Photo: Existing Facility Overview

Site Photo: Existing Facility Inflow

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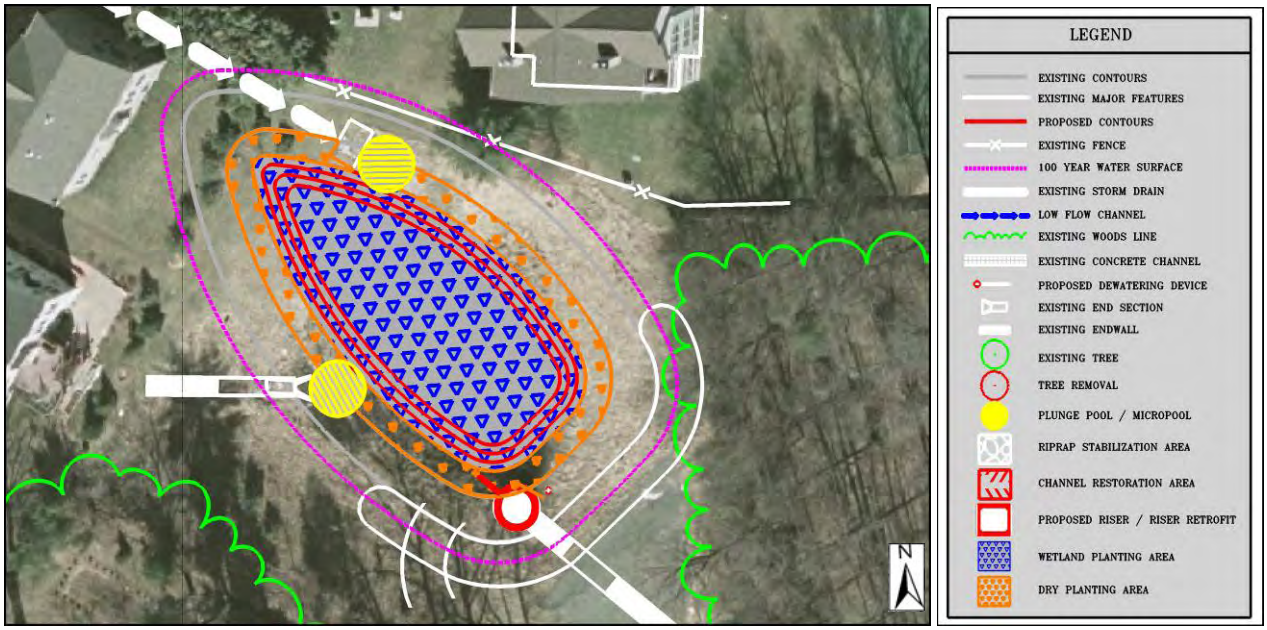
AC9199 - Pond Retrofit

Address:	At the end of Arrowhead Circle, Behind 10695 Dudley Heights Court
Location:	Rosehaven Estates
Land Owner:	Private - Residential
PIN:	0473 18 C
Control Type	Water Quality and Quantity
Drainage Area	32.65 acres
Receiving Waters	Unknown tributary of Accotink Creek

Description: This is an existing dry pond (1235DP) in Rosehaven Estates could be modified to provide a greater water quality volume and peak flow reduction. Over time, wetland vegetation has become established in the bottom of the pond, so it is not worth disturbing this area to create additional storage. This project will consist of modifying the existing riser structure including adding a dewatering device, installing plunge pool and a micropool for energy dissipation and settling, and wetland and dry plantings.



Project Area Map: Conceptual plan showing potential project location

Project Benefits: This facility has the potential to meet some of the water quality treatment requirement by providing extended detention of the half-inch, 48 hour storm. The permanent wet storage will promote uptake of nutrients and the removal of suspended solids and pollutants from the downstream channel. Retrofitting this facility would help to reduce future downstream erosion by reducing peak flow rates and erosive velocities. It is estimated that an annual total of 1,758 lbs of sediment, 17 lbs of total nitrogen and five lbs of total phosphorus would be reduced by this project.

Project Design Considerations: Coordination with residents and appropriate HOAs will be necessary to retrofit this facility since it is located on private land. Environmental permitting issues are expected due to the presence of extensive wetlands and baseflow from an inflow pipe. Minimal tree loss is expected with this retrofit. Existing utility conflicts are not anticipated. There is an access road that leads to this pond located off of Rosehaven Street near the intersection with Spruce Street.

Costs:

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.4	AC	$8,500.00	$3,400
Tree Removal	5	EA	$2,000.00	$10,000
Plungepool / Micropool	3	EA	$400.00	$1,200
Riser Retrofit	1	LS	$4,000.00	$4,000
Embedded Dewatering Pipe	1	EA	$500.00	$500
Grading and Excavation	8	CY	$35.00	$280
Soil Borings	1	LS	$8,500.00	$8,500
			Initial Project Costs	**$27,880**
Plantings	1	LS	5% of Project	$1,394
Ancillary Items	1	LS	5% of Project	$1,394
Erosion and Sediment Control	1	LS	10% of Project	$2,788
			Base Construction Costs	**$33,456**
			Mobilization (5%)	$1,673
			Subtotal 1	$35,129
			Contingency (25%)	$8,782
			Subtotal 2	$43,911
Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits			(45%)	$19,760
			Estimated Project Cost	**$64,000**

Site Photo: Existing Facility Overview

Site Photo: Existing Control Structure

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