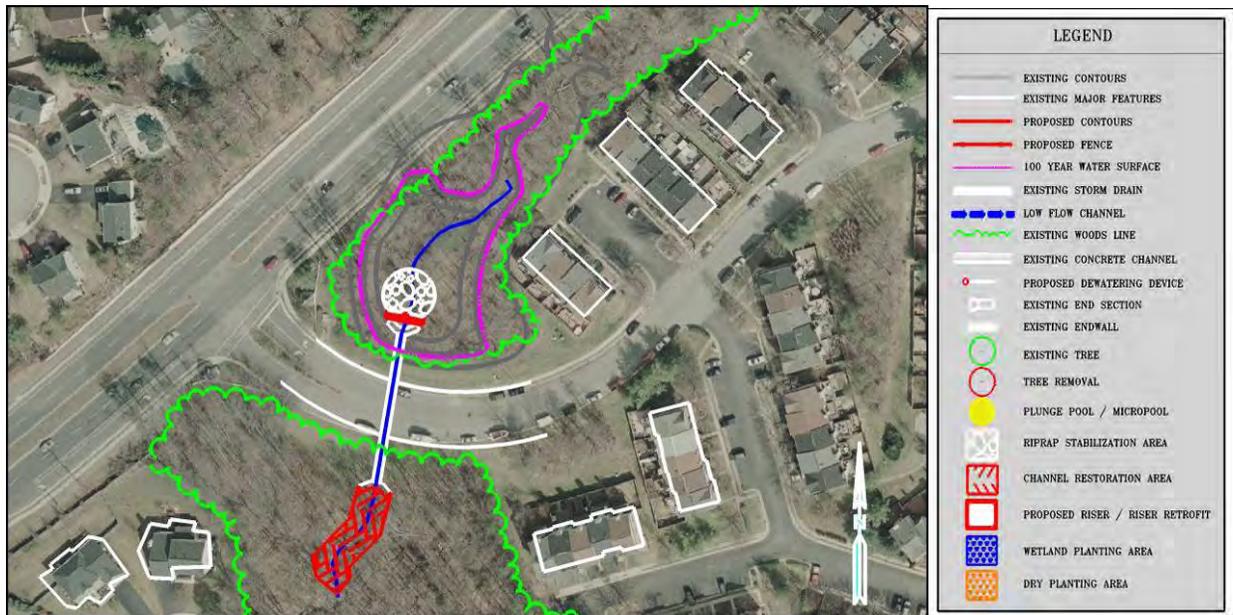


**AC9101 - Pond Retrofit**



**Address:** Under Mount Air Drive, near the intersection of Telegraph Road  
**Location:** Village of Mount Air  
**Land Owner:** Private - Residential  
**PIN:** 0994 06 C  
**Control Type** Water Quality and Quantity  
**Drainage Area** 40.95 acres  
**Receiving Waters** Unknown tributary of Accotink Creek

**Description:** This existing dry pond, 0629DP, is on the upstream side of the road culvert underneath Mount Air Drive near Telegraph Road. The pond is located within a forested area where a perennial stream channel flows through the road culvert. There is significant erosion on the downstream side of this culvert. The proposed retrofit consists of installing a weir wall control structure to modify the outflow characteristics to provide water quality treatment. The receiving stream on the downstream side of the road culvert will be stabilized to prevent further erosion.



*Project Area Map: Conceptual plan showing potential project location*

**Project Benefits:** Adding the control structure will extend the detention time, which will increase the settling of suspended solids and capture of floatables, thus improving the health of the downstream channel. It is estimated that an annual total of 6,479 lbs of sediment, 63 lbs of total nitrogen and 12 lbs of total phosphorus would be reduced by this project.

**Project Design Considerations:** The road culvert underneath Mount Air Drive is located in a residential community with several townhouse buildings within close proximity. Coordination with residents and possibly a HOA will be necessary to retrofit this site since it is located on private land. The base flow component of the control structure will require maintenance to prevent clogging. All components of the existing embankment and stream channel should be analyzed to ensure that it is designed to handle the impounded water. Environmental permitting issues are expected due to the in-stream location of this facility. Minimal tree loss is expected to obtain access and to clear the upstream embankment during construction. Existing utility conflicts are not anticipated with this retrofit. Access to the site is very good from Mount Air Drive.

<b>Costs:</b>				
<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
Clear and Grub	1	AC	\$8,500.00	\$8,500
New Riser	1	LS	\$8,000.00	\$8,000
Channel Stabilization	120	LF	\$50.00	\$6,000
Rip Rap Stabilization	80	SY	\$100.00	\$8,000
Soil Borings	1	LS	\$8,500.00	\$8,500
			<b>Initial Project Costs</b>	<b>\$39,000</b>
Plantings	1	LS	5% of Project	\$1,950
Ancillary Items	1	LS	5% of Project	\$1,950
Erosion and Sediment Control	1	LS	10% of Project	\$3,900
			<b>Base Construction Costs</b>	<b>\$46,800</b>
			Mobilization (5%)	\$2,340
			<b>Subtotal 1</b>	<b>\$49,140</b>
			Contingency (25%)	\$12,285
			<b>Subtotal 2</b>	<b>\$61,425</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$27,641
			<b>Estimated Project Cost</b>	<b>\$89,000</b>



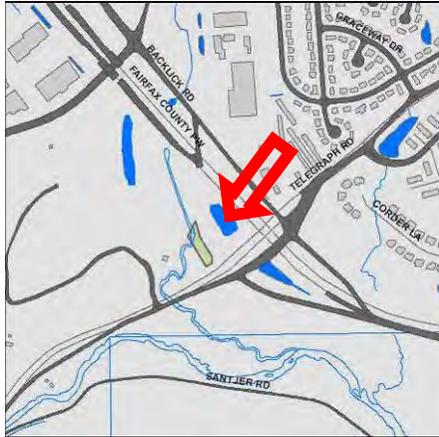
*Site Photo: Existing Facility Overview*



*Site Photo: Existing Control Structure*

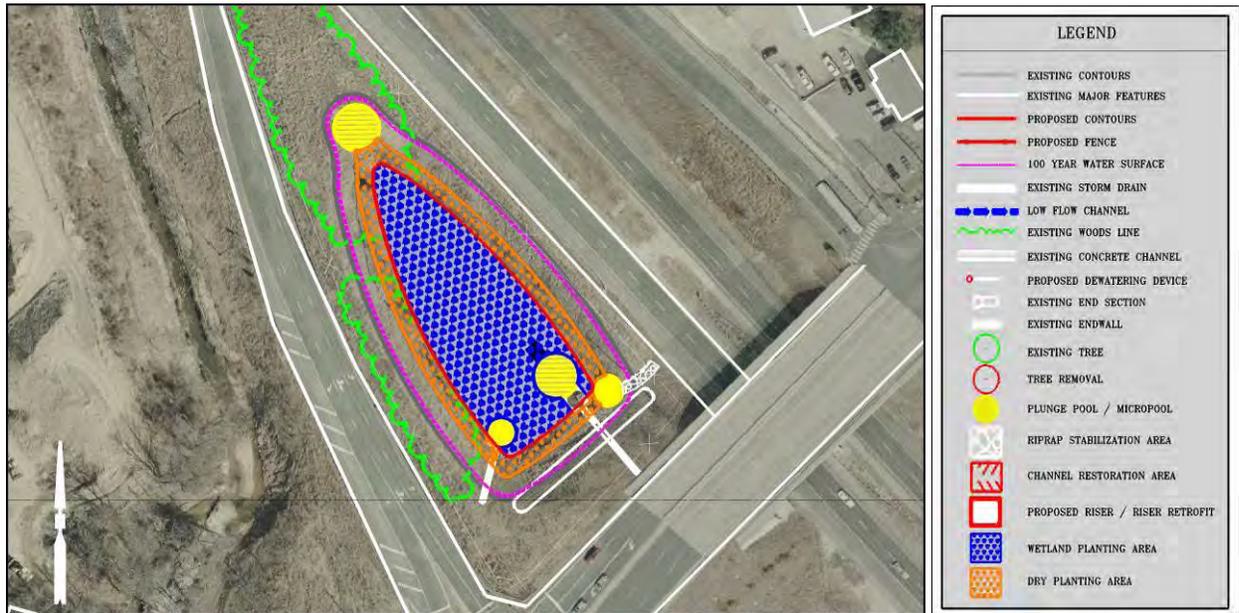
*This page intentionally left blank.*

**AC9102 - Pond Retrofit**



**Address:** Along off ramp from Fairfax County Parkway to Telegraph Road  
**Location:** Intersection of Telegraph Rd and Fairfax County Parkway  
**Land Owner:** State - VDOT  
**PIN:** N/A  
**Control Type:** Water Quality and Quantity  
**Drainage Area:** 21.29 acres  
**Receiving Waters:** Long Branch

**Description:** This is an existing dry pond, owned by the Virginia Department of Transportation (VDOT), which provides 2- and 10-year peak flow attenuation. The retrofit will modify the pond to a shallow wetland facility. This project will improve water quality and habitat by excavating for additional storage, adding plunge pools at the inflows, along with wetland and dry plantings.



*Project Area Map: Conceptual plan showing potential project location*

**Project Benefits:** This facility has the potential to meet the water quality treatment requirement by providing extended detention of the half-inch, 48-hour storm. Retrofitting this facility will improve the removal of suspended solids and floatables by extending detention time, which will improve water quality and habitat. These proposed improvements will also help prevent future downstream channel erosion. It is estimated that an annual total of 7,046 lbs of sediment, 86 lbs of total nitrogen and 12 lbs of total phosphorus would be reduced by this project.

**Project Design Considerations:** Since this facility is owned and maintained by VDOT, coordination with VDOT will be necessary. Based on a recent inspection of this facility, no baseflow was found; however, the presence of potential wetlands may present environmental permitting issues. No tree loss will occur with this retrofit. In a recent inspection of this facility, it appears as if there has been some recent maintenance or work performed on this pond. Access to this facility is very good from an access road off of Fairfax County Parkway. Overhead power lines are present over the access road; however, they appear to be relatively high and should not interfere with construction equipment. No other utility conflicts are anticipated with this project.

**Costs:**

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	1.3	AC	\$8,500.00	\$11,050
Plungepool / Micropool	4	EA	\$400.00	\$1,600
Grading and Excavation	2591	CY	\$35.00	\$90,685
Soil Borings	1	LS	\$8,500.00	\$8,500
			Initial Project Costs	<b>\$111,835</b>
Plantings	1	LS	5% of Project	\$5,592
Ancillary Items	1	LS	5% of Project	\$5,592
Erosion and Sediment Control	1	LS	10% of Project	\$11,184
			Base Construction Costs	<b>\$134,203</b>
			Mobilization (5%)	\$6,710
			<b>Subtotal 1</b>	\$140,913
			Contingency (25%)	\$35,228
			<b>Subtotal 2</b>	\$176,141
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$79,263
			<b>Estimated Project Cost</b>	<b>\$255,000</b>



*Site Photo: Existing Facility Overview*



*Site Photo: Existing Control Structure*

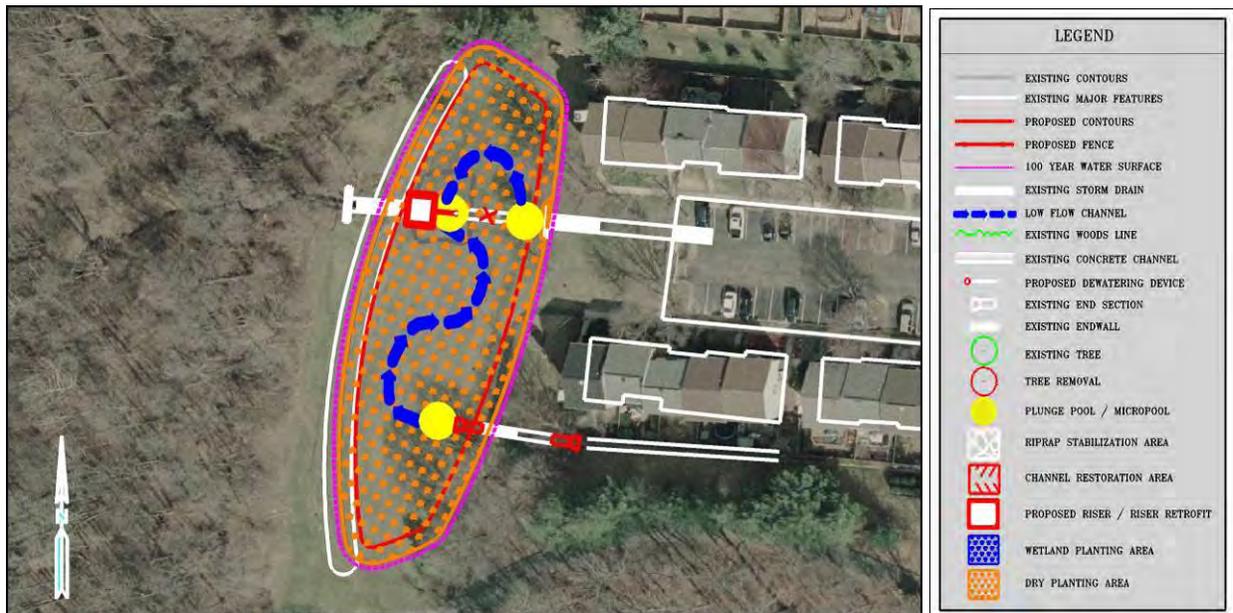
*This page intentionally left blank.*

**AC9105 - Pond Retrofit**



**Address:** At the end of Trestle Court  
**Location:** Pinewood Station  
**Land Owner:** Private - Residential  
**PIN:** 0994 04 D1  
**Control Type:** Water Quality and Quantity  
**Drainage Area:** 17.75 acres  
**Receiving Waters:** Long Branch

**Description:** This project is a retrofit of an existing dry pond (0095DP) currently providing quantity control for the multifamily residential houses in Pinewood Station. The pond will be upgraded to an extended detention facility to improve water quality and habitat and prevent downstream channel erosion. This project will consist of removing the existing headwalls and adding a riser structure, adding a plunge pool at each inflow for energy dissipation into the facility, excavating for additional storage, and replacing the concrete low-flow channel with a meandering natural channel.



*Project Area Map: Conceptual plan showing potential project location*

**Project Benefits:** This facility will meet the water quality treatment requirement by providing extended detention of the half-inch, 48-hour storm. It would also likely meet the peak flow management requirements of the 2 and 10-year storm. Retrofitting this facility would promote the removal of suspended solids and floatables through extended detention and the use of micropools at the inlets, thus improving water quality and habitat. These proposed improvements will also help prevent 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 2,989 lbs of sediment, 27 lbs of total nitrogen and seven 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 to improve public knowledge. Coordination with residents and the HOA will be necessary to retrofit this facility since it is located on private land. Environmental permitting issues may be encountered due to the presence of baseflow into this facility. No tree loss will occur with this retrofit. There is good access to this facility at the end of Trestle Court. Several underground utilities and sanitary sewer manholes were identified near the townhouses located at the end of Trestle Court; however, utility conflicts in the pond or on the pond embankment are not anticipated.

<b>Costs:</b>				
<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
Paved Ditch Demolition & Haul Away	50	LF	\$30.00	\$1,500
Plungepool / Micropool	3	EA	\$400.00	\$1,200
Excavate to create low-flow channel	220	LF	\$25.00	\$5,500
New Riser	1	LS	\$8,000.00	\$8,000
Embedded Dewatering Pipe	1	EA	\$500.00	\$500
Grading and Excavation	1229	CY	\$35.00	\$43,015
Remove Existing Headwall	1	EA	\$300.00	\$300
New End wall	2	EA	\$2,500.00	\$5,000
Soil Borings	1	LS	\$8,500.00	\$8,500
			Initial Project Costs	<b>\$73,515</b>
Plantings	1	LS	5% of Project	\$3,676
Ancillary Items	1	LS	5% of Project	\$3,676
Erosion and Sediment Control	1	LS	10% of Project	\$7,352
			Base Construction Costs	<b>\$88,219</b>
			Mobilization (5%)	\$4,411
			<b>Subtotal 1</b>	<b>\$92,630</b>
			Contingency (25%)	\$23,158
			<b>Subtotal 2</b>	<b>\$115,788</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$52,105
			<b>Estimated Project Cost</b>	<b>\$168,000</b>



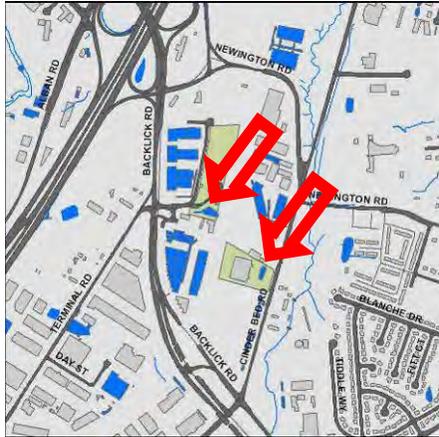
*Site Photo: Existing Facility Overview*



*Site Photo: Existing Control Structure*

*This page intentionally left blank.*

## AC9106 - Pond Retrofit



**Address:** Behind 8157 Backlick Road, In front of 8308 Cinderbed Road

**Location:** Backlick and Cinderbed Roads

**Land Owner:** State - VDOT, Private - Commercial

**PIN:** 0993 01 0038, 0994 01 0004B

**Control Type:** Water Quality and Quantity

**Drainage Area:** 6.96 acres, 13.24 acres

**Receiving Waters:** Long Branch

**Description:** This project is a retrofit of two dry ponds that treat runoff from Newington Industrial Park. AC9106A is an existing dry pond, owned by the Virginia Department of Transportation (VDOT), which will be upgraded to a shallow wetland facility to improve water quality and habitat and reduce downstream channel erosion. There is a concrete channel that carries runoff to the plunge pool. The pond will also receive a new riser, dewatering device, and wetland plantings.

AC9106B is also an existing dry pond (DP0474). There are two concrete low-flow channels within the pond that drain runoff from the surrounding industrial area. This project will consist of removing the concrete channels, incorporating a meandering natural channel through each pond, and adding micropools or plunge pools at each inflow. The project will also include modifications to the riser structure and removing curb and gutter along the parking lot to allow for sheetflow into the facility.



*Project Area Map: Conceptual plan showing potential project location*

**Project Benefits:** These facilities have the potential to meet the water quality treatment requirement for the contributing drainage areas via extended detention of the one-half inch, 48-hour storm, as well as managing the peak flow of the 2-year and 10-year peak runoff volumes. Retrofitting these facilities will promote the removal of suspended solids and floatables to downstream channels and improve water quality and habitat. 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 8,238 lbs of sediment, 56 lbs of total nitrogen and 12 lbs of total phosphorus would be reduced by this project.

**Project Design Considerations:** Site AC9106A is owned and maintained by VDOT, coordination with VDOT will be necessary to retrofit this facility. Baseflow and wetlands currently in AC9106A may present environmental permitting issues. Minimal tree loss will occur and existing utility conflicts are not anticipated with retrofitting this site. Access to site AC9106A is very good from an access road off of Terminal Road.

Currently, site AC9106B is located within a fenced, private industrial property. Coordination with the property owners will be necessary to retrofit this site. Other than the fence surrounding the entire property, access is good due to a gravel road leading to the riser from the parking lot. The storm drain may need to be adjusted to ensure the pond bottom remains stable. Retrofitting site AC9106B will require no tree loss. No environmental permitting issues or existing utilities conflicts are expected with retrofitting site AC9106B.

**Costs:**

<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
Clear and Grub	0.4	AC	\$8,500.00	\$3,400
Paved Ditch Demolition & Haul Away	415	LF	\$30.00	\$12,450
Plungepool / Micropool	7	EA	\$400.00	\$2,800
Excavate to create low-flow channel	235	LF	\$25.00	\$5,875
New Riser	1	LS	\$8,000.00	\$8,000
Riser Retrofit	1	LS	\$4,000.00	\$4,000
Embedded Dewatering Pipe	2	EA	\$500.00	\$1,000
Grading and Excavation	838	CY	\$35.00	\$29,330
Curb-Gutter Removal	225	LF	\$5.00	\$1,125
Soil Borings	2	LS	\$8,500.00	\$17,000
			Initial Project Costs	<b>\$84,980</b>
Plantings	1	LS	5% of Project	\$4,249
Ancillary Items	1	LS	5% of Project	\$4,249
Erosion and Sediment Control	1	LS	10% of Project	\$8,498
			Base Construction Costs	<b>\$101,976</b>
			Mobilization (5%)	\$5,099
			<b>Subtotal 1</b>	<b>\$107,075</b>
			Contingency (25%)	\$26,769
			<b>Subtotal 2</b>	<b>\$133,844</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$60,230
			<b>Estimated Project Cost</b>	<b>\$194,000</b>



*Site Photo: Existing Facility Overview*



*Site Photo: Existing Facility Overview*

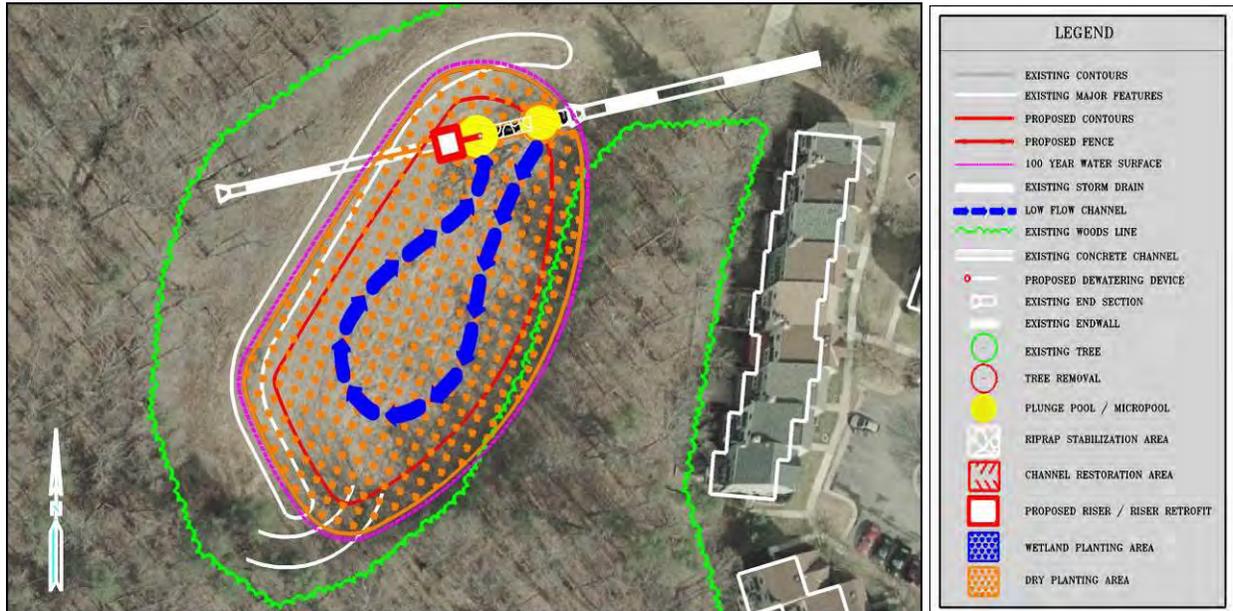
*This page intentionally left blank.*

**AC9110 - Pond Retrofit**



**Address:** At the end of Briarleigh Way, near the intersection of Birchleigh Way and Crestleigh Way  
**Location:** Amberleigh  
**Land Owner:** Private - Residential  
**PIN:** 0904 10 L, 0904 10 F  
**Control Type:** Water Quality and Quantity  
**Drainage Area:** 13.62 acres  
**Receiving Waters:** Unknown tributary of Long Branch

**Description:** This project is a retrofit of dry pond (0700DP) receives runoff from the high-density residential Amberleigh neighborhood. It is surrounded by woods with some small trees growing within the facility. This project will consist of removing the existing headwall and replacing it with a new riser structure including a dewatering device, a meandering low flow channel, a micropool and a plunge pool at the riser and the pond inflow and excavating for additional storage. The addition of a riser to the outlet pipe of this facility will allow the pond to meet water quality and quantity goals for habitat improvement and prevention of downstream channel erosion.



*Project Area Map: Conceptual plan showing potential project location*

**Project Benefits:** This facility will meet the water quality treatment requirement for the contributing drainage area by providing extended detention of the half-inch, 48-hour storm. It also meets the peak flow management requirements of the 2 and 10-year storm. By providing extended detention and wet storage in micropools, retrofitting this facility would promote the removal of suspended solids and floatables to downstream channels, which will enhance water quality and habitat. It is estimated that an annual total of 3,501 lbs of sediment, 38 lbs of total nitrogen and eight 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. No environmental permitting issues are expected with this pond retrofit. Minimal tree loss is expected within the facility and on the embankment with this retrofit. No design or construction issues were identified at this site. Existing utility conflicts are not anticipated. Access to this facility is very good from an access road located at the end of Briarleigh Way.

<b>Costs:</b>				
<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
Clear and Grub	0.6	AC	\$8,500.00	\$5,100
Plunge pool / Micropool	2	EA	\$400.00	\$800
Excavate to create low-flow channel	325	LF	\$25.00	\$8,125
New Riser	1	LS	\$8,000.00	\$8,000
Embedded Dewatering Pipe	1	EA	\$500.00	\$500
Grading and Excavation	1938	CY	\$35.00	\$67,830
Remove Existing Headwall	1	EA	\$300.00	\$300
Soil Borings	1	LS	\$8,500.00	\$8,500
			Initial Project Costs	<b>\$99,155</b>
Plantings	1	LS	5% of Project	\$4,958
Ancillary Items	1	LS	5% of Project	\$4,958
Erosion and Sediment Control	1	LS	10% of Project	\$9,916
			Base Construction Costs	<b>\$118,987</b>
			Mobilization (5%)	\$5,949
			<b>Subtotal 1</b>	<b>\$124,936</b>
			Contingency (25%)	\$31,234
			<b>Subtotal 2</b>	<b>\$156,170</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$70,277
			<b>Estimated Project Cost</b>	<b>\$226,000</b>



*Site Photo: Facility Inflow and Overall Facility*

*This page intentionally left blank.*

## AC9111 - Pond Retrofit



**Address:** Behind 6530 Birchleigh Way, near the intersection of Birchleigh Way and Crestleigh Way

**Location:** Amberleigh

**Land Owner:** Private - Residential

**PIN:** 0904 10 F

**Control Type:** Water Quality and Quantity

**Drainage Area:** 25.49 acres

**Receiving Waters:** Unknown tributary of Long Branch

**Description:** This proposed project is a retrofit of dry pond 0180DP, which receives runoff from the high-density residential Amberleigh neighborhood and its associated recreational areas. It has woods on three sides as well as some trees growing within the facility. The stream channel that flows into and within the facility is incised. This project will involve removing the existing headwall, tree removal, dry plantings and rip rap stabilization at the riser. The addition of a riser to the outlet pipe of this facility will allow the facility to achieve water quality and some quantity goals for habitat improvement and reduction of downstream channel erosion.



*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, as well as manage the 2-year peak runoff volume. Retrofitting this facility would promote the removal of suspended solids and floatables to downstream channels through extended detention, which will improve water quality and habitat. These proposed improvements will also help prevent future downstream channel erosion. Peak flow rates, erosive velocities and channel sediment loads are expected to be reduced by this project. It is estimated that an annual total of 6,121 lbs of sediment, 69 lbs of total nitrogen and 15 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 to increase public knowledge of the project. Coordination with residents and the 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 of this facility. Some tree loss is expected with this retrofit. In-stream construction will require base flow diversion. The base flow component of the replaced control structure will require monitoring to prevent clogging. Stabilization of the stream channel within the existing facility would be incorporated with this retrofit. Existing utility conflicts are not anticipated. Access to this facility will require crossing through several hundred feet of recreational area located at the intersection of Crestleigh Way and Greenleigh Lane.

<b>Costs:</b>				
<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
Clear and Grub	0.4	AC	\$8,500.00	\$3,400
Tree Removal	3	EA	\$2,000.00	\$6,000
Plunge pool / Micropool	1	EA	\$400.00	\$400
New Riser	1	LS	\$8,000.00	\$8,000
Embedded Dewatering Pipe	1	EA	\$500.00	\$500
Rip Rap Stabilization	55	SY	\$100.00	\$5,500
Remove Existing Headwall	1	EA	\$300.00	\$300
Soil Borings	1	LS	\$8,500.00	\$8,500
			Initial Project Costs	<b>\$32,600</b>
Plantings	1	LS	5% of Project	\$1,630
Ancillary Items	1	LS	5% of Project	\$1,630
Erosion and Sediment Control	1	LS	10% of Project	\$3,260
			Base Construction Costs	<b>\$39,120</b>
			Mobilization (5%)	\$1,956
			<b>Subtotal 1</b>	<b>\$41,076</b>
			Contingency (25%)	\$10,269
			<b>Subtotal 2</b>	<b>\$51,345</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$23,105
			<b>Estimated Project Cost</b>	<b>\$74,000</b>



*Site Photo: Existing Facility Inflow*

*This page intentionally left blank.*

**AC9112 - Pond Retrofit**



**Address:** Behind 6700 Springfield Center Drive  
**Location:** Springfield Industrial Park  
**Land Owner:** Private - Commercial  
**PIN:** 0904 01 0011  
**Control Type:** Water Quality and Quantity  
**Drainage Area:** 61.84 acres  
**Receiving Waters:** Unknown tributary of Long Branch

**Description:** This is an existing dry pond (DP0366), which will be converted to a shallow wetland facility. Currently, the riser at this facility appears to be very old. Along with replacing the riser, retrofitting this facility will require removal of accumulated sediment, and additional excavation and grading to provide more storage capacity to manage peak flows. The project would also address stabilization of the outfall of the barrel pipe and the downstream channel due to erosion. The retrofit will allow the pond to meet water quality and quantity goals for habitat improvement and prevention of downstream channel erosion.



*Project Area Map: Conceptual plan showing potential project location*

**Project Benefits:** This facility will meet the water quality treatment requirement for the contributing drainage area by providing extended detention of the half-inch, 48-hour storm. It will also meet the peak flow management requirements of the 2-year storm and also for a large portion of the 10-year storm. Retrofitting this facility would promote the removal of suspended solids and floatables to downstream channels thus improving water quality and habitat. Retrofitting this facility would also help to reduce future downstream erosion by reducing peak flow rates and erosive velocities. It is estimated that an annual total of 13,283 lbs of sediment, 44 lbs of total nitrogen and 17 lbs of total phosphorus would be reduced by this project.

**Project Design Considerations:** Since this facility is located in a private commercial/industrial area, coordination with the property owner and railroad company will be necessary to retrofit this facility. An existing access road off of Springfield Center Drive will need to be used to access this facility. Access will be difficult to this facility and will require the removal of trees, the disturbance of a stream channel or floodplain, and steep slope modification. In-stream construction will require base flow diversion. The base flow component of the replaced control structure will require regular maintenance to prevent clogging. Environmental permitting issues are expected due to the in-stream location of this facility. Some tree removal within the facility and on the upstream side of the pond embankment can be expected with this retrofit. Overhead power lines, sanitary sewer markers, and gas and electric markers are all present within close proximity to the existing riser. These utilities may constrain the retrofit potential of this facility.

**Costs:**

ITEM	QUANTITY	UNITS	UNIT COST	TOTAL
Clear and Grub	0.8	AC	\$12,000.00	\$9,600
Plunge pool / Micropool	2	EA	\$400.00	\$800
New Riser	1	LS	\$8,000.00	\$8,000
Embedded Dewatering Pipe	1	EA	\$500.00	\$500
Channel Stabilization	115	LF	\$50.00	\$5,750
Rip Rap Stabilization	175	SY	\$100.00	\$17,500
Grading and Excavation	2367	CY	\$35.00	\$82,845
Soil Borings	1	LS	\$8,500.00	\$8,500
			Initial Project Costs	<b>\$133,495</b>
Plantings	1	LS	5% of Project	\$6,675
Ancillary Items	1	LS	5% of Project	\$6,675
Erosion and Sediment Control	1	LS	10% of Project	\$13,350
			Base Construction Costs	<b>\$160,195</b>
			Mobilization (5%)	\$8,010
			<b>Subtotal 1</b>	<b>\$168,205</b>
			Contingency (25%)	\$42,051
			<b>Subtotal 2</b>	<b>\$210,256</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$94,615
			<b>Estimated Project Cost</b>	<b>\$305,000</b>



*Site Photo: Inside Existing Facility*



*Site Photo: Existing Control Structure*

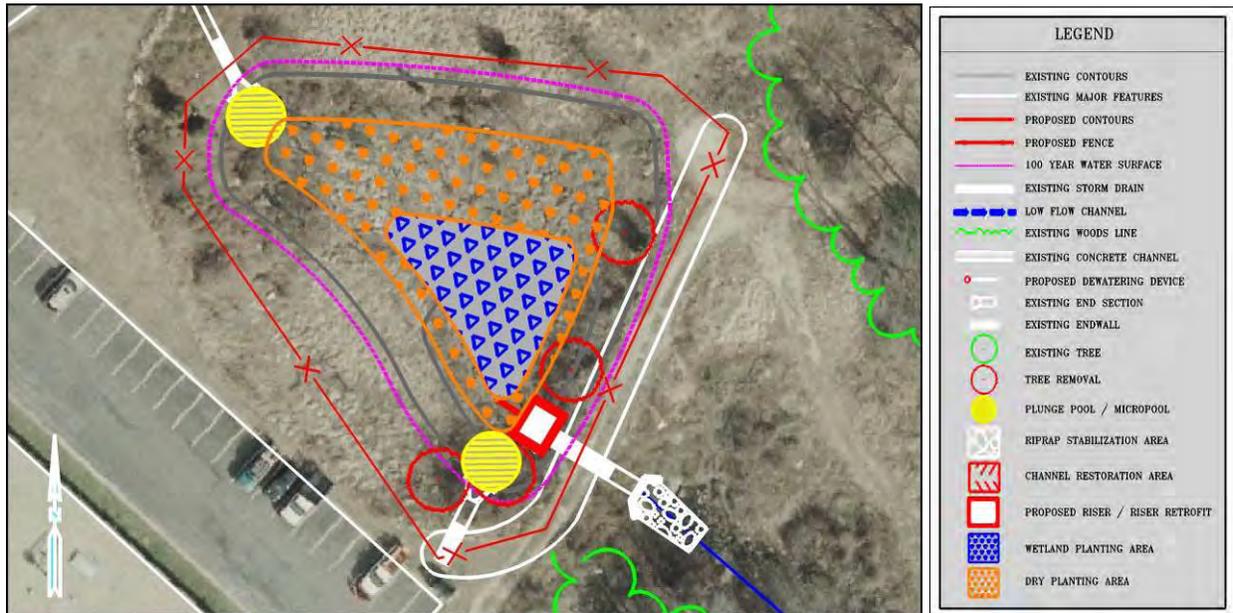
*This page intentionally left blank.*

## AC9113 - Pond Retrofit



**Address:** Next to 6700 Springfield Center Drive  
**Location:** Springfield Industrial Park  
**Land Owner:** Private - Commercial  
**PIN:** 0904 01 0011  
**Control Type:** Water Quality  
**Drainage Area:** 38.14 acres  
**Receiving Waters:** Unknown tributary of Long Branch

**Description:** This project is a retrofit of existing dry pond DP0367 located in a highly vegetated area near the Springfield Industrial Park. The retrofit will convert the dry pond to become a shallow wetland to improve water quality and habitat. The concrete riser of this facility was found to be in disrepair, so, as part of this retrofit, the current riser will be replaced. Two plunge pools and wetland plantings are also proposed as part of this retrofit.



*Project Area Map: Conceptual plan showing potential project location*

**Project Benefits:** This facility will partially meet the water quality treatment requirements through extended detention of the half-inch, 48-hour storm along with some sedimentation through extended detention and nutrient uptake from wetland vegetation. It is estimated that an annual total of 11,309 lbs of sediment, 101 lbs of total nitrogen and 19 lbs of total phosphorus would be reduced by this project.

**Project Design Considerations:** Since this facility is located in a private commercial/industrial area, coordination with the property owner will be necessary to retrofit this facility. Access to this facility is very good from a parking lot along Springfield Center Drive. Environmental permitting issues may be encountered due to the presence of wetlands within this facility. Moderate tree loss is expected with this pond retrofit associated with maintenance clearing of the pond embankment and from expanding the facility. Overhead power lines are present near the downstream embankment, but they appear to be relatively high and should not interfere with construction equipment. No other utility conflicts are anticipated with this project. No other design or construction issues were identified at this site.

<b>Costs:</b>				
<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
Clear and Grub	0.3	AC	\$8,500.00	\$2,550
Tree Removal	4	EA	\$2,000.00	\$8,000
Plunge pool / 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	1203	CY	\$35.00	\$42,105
Fencing	560	LF	\$20.00	\$11,200
Soil Borings	1	LS	\$8,500.00	\$8,500
			Initial Project Costs	<b>\$81,655</b>
Plantings	1	LS	5% of Project	\$4,083
Ancillary Items	1	LS	5% of Project	\$4,083
Erosion and Sediment Control	1	LS	10% of Project	\$8,166
			Base Construction Costs	<b>\$97,987</b>
			Mobilization (5%)	\$4,899
			<b>Subtotal 1</b>	<b>\$102,886</b>
			Contingency (25%)	\$25,722
			<b>Subtotal 2</b>	<b>\$128,608</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$57,874
			<b>Estimated Project Cost</b>	<b>\$186,000</b>



*Site Photo: Existing Facility Overview*



*Site Photo: Existing Control Structure*

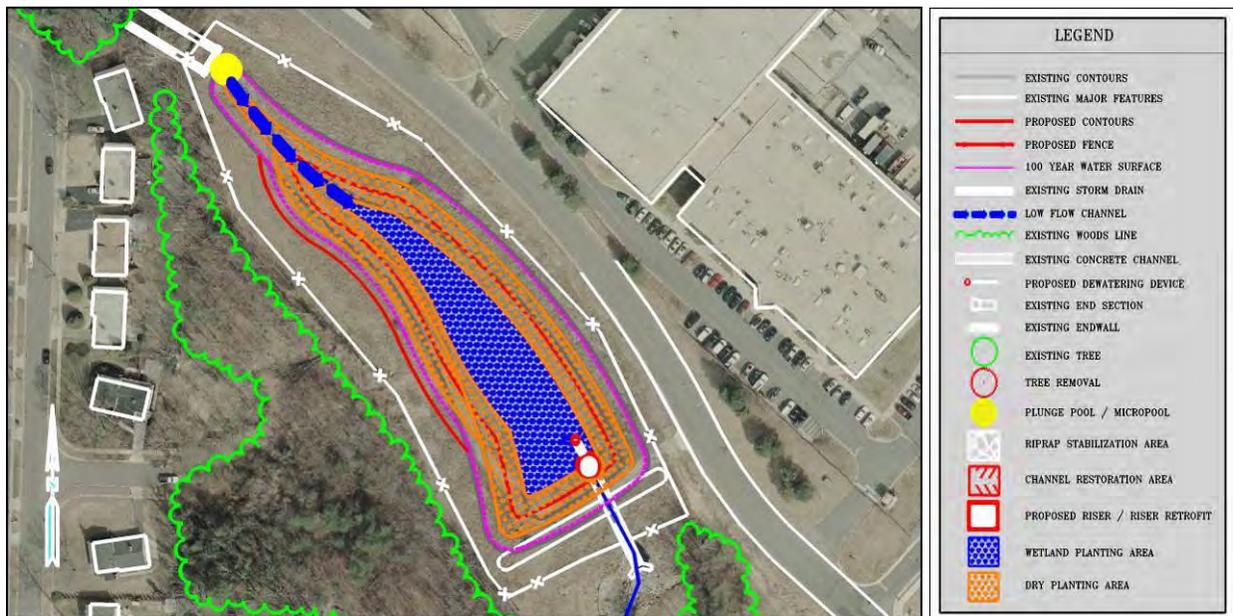
*This page intentionally left blank.*

## AC9114 - Pond Retrofit



**Address:** Across from 6805 Springfield Center Drive  
**Location:** Springfield Industrial Park  
**Land Owner:** State - VDOT  
**PIN:** N/A  
**Control Type** Water Quality and Quantity  
**Drainage Area** 119.41 acres  
**Receiving Waters** Unknown tributary of Long Branch

**Description:** This project is a retrofit of dry pond VDOT29028 that will be converted to a shallow wetland facility. This project will consist of a new riser structure including a dewatering device, excavating for additional storage, a plunge pool at the inflow and wetland plantings to improve water quality and habitat and reduce downstream channel erosion. This facility has a large drainage area and conveys baseflow.



*Project Area Map: Conceptual plan showing potential project location*

**Project Benefits:** This facility will meet the water quality treatment requirement through extended detention of the one-half inch, 48-hour storm. It will also manage the 2-year peak runoff volumes as well as the majority of the 10-year peak runoff volume. Retrofitting this facility would help to prevent future downstream erosion by reducing peak flow rates and erosive velocities. This retrofit will also promote the removal of suspended solids and floatables to downstream channels through extended detention, and reduce nutrient pollutant through uptake by wetland vegetation. It is estimated that an annual total of 15,912 lbs of sediment, 148 lbs of total nitrogen and 30 lbs of total phosphorus would be reduced by this project.

**Project Design Considerations:** Since this facility is owned and maintained by VDOT, coordination with VDOT will be necessary. Access to facility is very good from Springfield Center Drive. Environmental permitting issues may be encountered due to the presence of baseflow from twin 42" storm sewer pipes that discharge into this facility. Minimal tree loss is expected with this pond retrofit. Existing utility conflicts are not anticipated. No design or construction issues were identified at this site. Currently, a chain link fence in good condition surrounds this facility.

<b>Costs:</b>				
<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
Clear and Grub	1.4	AC	\$8,500.00	\$11,900
Plunge pool / Micropool	1	EA	\$400.00	\$400
Excavate to create low-flow channel	170	LF	\$25.00	\$4,250
New Riser	1	LS	\$8,000.00	\$8,000
Embedded Dewatering Pipe	1	EA	\$500.00	\$500
Grading and Excavation	8192	CY	\$35.00	\$286,720
Soil Borings	1	LS	\$8,500.00	\$8,500
			Initial Project Costs	<b>\$320,270</b>
Plantings	1	LS	5% of Project	\$16,014
Ancillary Items	1	LS	5% of Project	\$16,014
Erosion and Sediment Control	1	LS	10% of Project	\$32,027
			Base Construction Costs	<b>\$384,325</b>
			Mobilization (5%)	\$19,216
			<b>Subtotal 1</b>	<b>\$403,541</b>
			Contingency (25%)	\$100,885
			<b>Subtotal 2</b>	<b>\$504,426</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$226,992
			<b>Estimated Project Cost</b>	<b>\$731,000</b>



*Site Photo: Existing Facility Overview*



*Site Photo: Existing Control Structure*

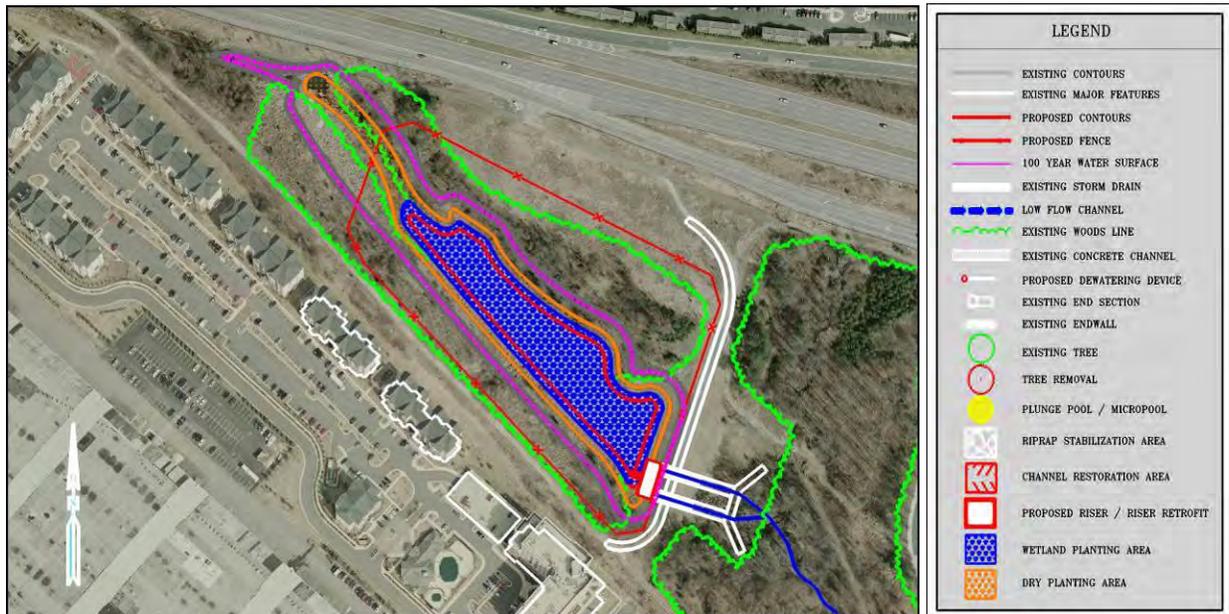
*This page intentionally left blank.*

## AC9120 - Pond Retrofit



**Address:** Behind 6700 Metropolitan Center Drive, At the end of Metropolitan Center Drive  
**Location:** Franconia / Springfield Metro  
**Land Owner:** Public - Metro  
**PIN:** 0902 01 0060  
**Control Type:** Water Quality and Quantity  
**Drainage Area:** 277.87 acres  
**Receiving Waters:** Long Branch

**Description:** This in-stream dry pond (DP0296) currently treats the runoff from a high-density residential area near the Springfield Metro Station. The pond has a significant amount of trash and debris around the riser with overgrown vegetation throughout the facility. This project is a quantity control pond that will be converted to a shallow wetland by modifying the spillway characteristics of the existing riser, installing a new dewatering system and excavating to create permanent wet storage for water quality treatment.



*Project Area Map: Conceptual plan showing potential project location*

**Project Benefits:** Incorporating a permanent wet storage component into this facility will provide approximately 50 percent of the water quality treatment volume required for the contributing drainage area. The available storage volume above the permanent pool has potential to provide peak flow management of the 2-year storm. Retrofitting this facility will promote uptake of nutrients, removal of pollutants, suspension of floatables and overall increases in water quality and habitat. Peak flow rates, erosive velocities and downstream channel sediment loads can also be reduced by this project. It is estimated that an annual total of 14,454 lbs of sediment, 119 lbs of total nitrogen and 27 lbs of total phosphorus would be reduced by this project.

**Project Design Considerations:** Access to this facility is good due to an existing paved road on top of the pond embankment that originates from Franconia Springfield Parkway. Existing utility conflicts are not anticipated. Environmental permitting issues are anticipated due to the in-stream location of this facility. This retrofitted facility would require minor tree removal and impacts to existing stream channels. In-stream construction will require base flow diversion.

<b>Costs:</b>				
<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
Clear and Grub	0.9	AC	\$12,000.00	\$10,800
Riser Retrofit	1	LS	\$4,000.00	\$4,000
Embedded Dewatering Pipe	1	EA	\$500.00	\$500
Grading and Excavation	21248	CY	\$35.00	\$743,680
Soil Borings	1	LS	\$8,500.00	\$8,500
			Initial Project Costs	<b>\$767,480</b>
Plantings	1	LS	5% of Project	\$38,374
Ancillary Items	1	LS	5% of Project	\$38,374
Erosion and Sediment Control	1	LS	10% of Project	\$76,748
			Base Construction Costs	<b>\$920,976</b>
			Mobilization (5%)	\$46,049
			<b>Subtotal 1</b>	\$967,025
			Contingency (25%)	\$241,756
			<b>Subtotal 2</b>	\$1,208,781
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$543,951
			<b>Estimated Project Cost</b>	<b>\$1,753,000</b>



*Site Photo: Existing Facility Overview*



*Site Photo: Existing Control Structure*

*This page intentionally left blank.*

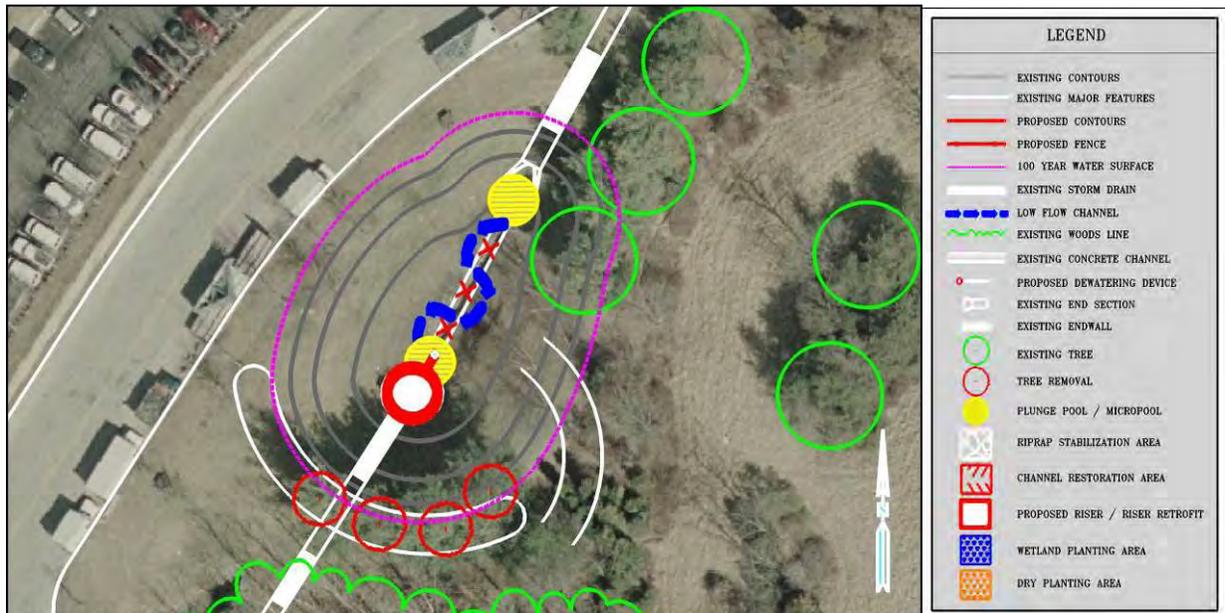
**AC9123 - Pond Retrofit**



**Address:** At the end of 8500 block of Cinder Bed Road, next to 8581 Cinder Bed Road  
**Location:** Gateway 95 Business Park  
**Land Owner:** Private - Commercial  
**PIN:** 0993 04 B  
**Control Type:** Water Quality  
**Drainage Area:** 17.55 acres  
**Receiving Waters:** Unknown tributary of Accotink Creek

**Description:** This project is intended to convert existing dry pond DP0411 on Cinder Bed Road to improve water quality. The pond currently provides 2- and 10-year storm peak flow reduction. There are three inflows into the pond, one of which uses a concrete channel to convey flows to the riser structure. It appears that there used to be rip rap outfall protection at each of the inflows, but it has since been washed away.

To retrofit this pond, the concrete channel will be removed, a micropool and plunge pool will be provided and the riser will be modified. The riser modification will allow the pond to provide full water quality treatment as well as manage the 2-year storm to improve water quality and habitat and reduce downstream channel erosion. Some reduction of the 10-year peak flow would also be provided.



*Project Area Map: Conceptual plan showing potential project location*

**Project Benefits:** This facility will meet the water quality treatment requirement for the contributing drainage area by providing extended detention of the half-inch, 48-hour storm. Extended detention, combined with wet storage is plunge pools and micropools, will promote the removal of suspended solids and improve water quality and habitat. In particular, retrofitting this facility would help to reduce the impact of oil that was present in the low flow concrete pilot channel during a field inspection of this site. The proposed improvements would also help prevent future downstream channel erosion by reducing peak flows and erosive velocities. It is estimated that an annual total of 6,194 lbs of sediment, 40 lbs of total nitrogen and eight lbs of total phosphorus would be reduced by this project.

**Project Design Considerations:** Since this facility is located in a private commercial/industrial area , coordination with the property owner will be necessary to retrofit this facility. Access to this facility is very good from Cinder Bed Road. Environmental permitting issues may be encountered due to the presence of baseflow from a 42" storm sewer inflow into this facility. Minimal tree loss is expected on the downstream side of the embankment with this pond retrofit, although a few trees will need to be removed along the embankment. Existing utility conflicts are not anticipated. Due to the commercial/industrial drainage area to this facility, stormwater controls for oil and grease, sediment, and trash should all be incorporated in the retrofit.

<b>Costs:</b>				
<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
Paved Ditch Demolition & Haul Away	95	LF	\$30.00	\$2,850
Tree Removal	4	EA	\$2,000.00	\$8,000
Plunge pool / Micropool	2	EA	\$400.00	\$800
Excavate to create low-flow channel	90	LF	\$25.00	\$2,250
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	<b>\$26,900</b>
Plantings	1	LS	5% of Project	\$1,345
Ancillary Items	1	LS	5% of Project	\$1,345
Erosion and Sediment Control	1	LS	10% of Project	\$2,690
			Base Construction Costs	<b>\$32,280</b>
			Mobilization (5%)	\$1,614
			<b>Subtotal 1</b>	<b>\$33,894</b>
			Contingency (25%)	\$8,474
			<b>Subtotal 2</b>	<b>\$42,368</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$19,066
			<b>Estimated Project Cost</b>	<b>\$61,000</b>



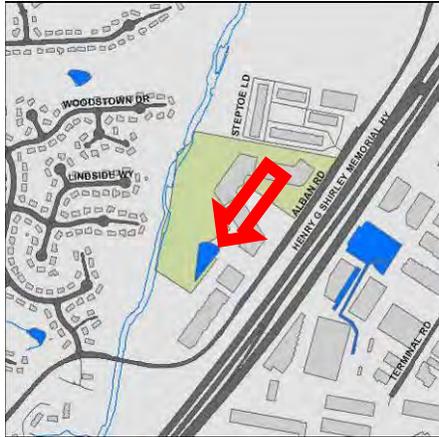
*Site Photo: Existing Control Structure*



*Site Photo: Concrete Low Flow Channel and Embankment*

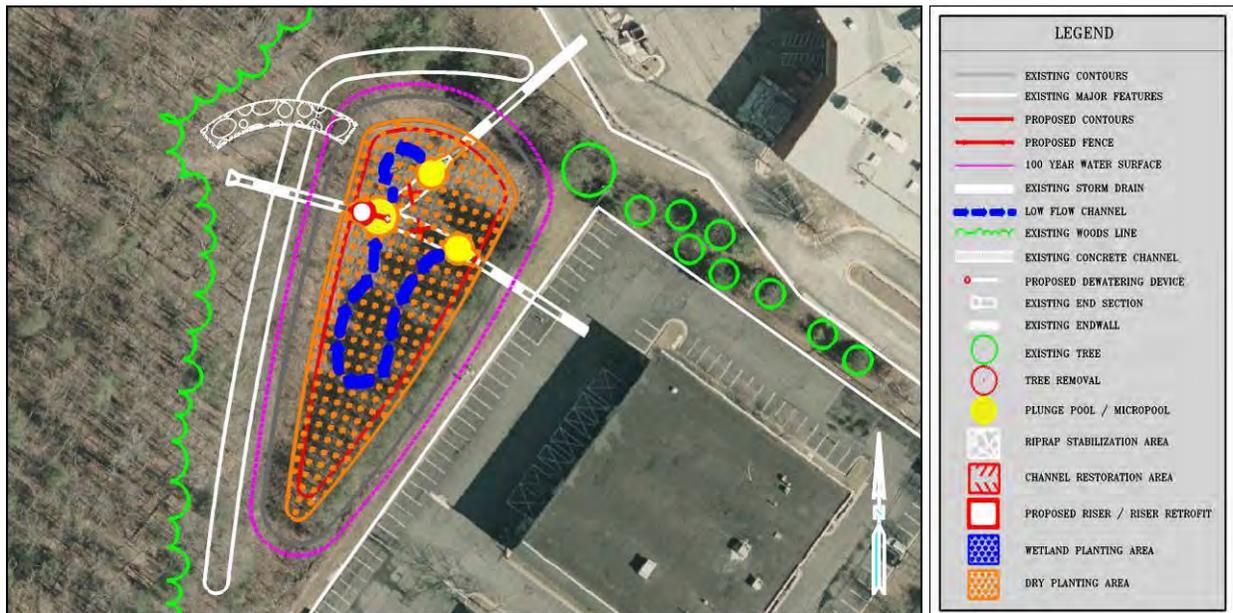
*This page intentionally left blank.*

**AC9126 - Pond Retrofit**



**Address:** Near the 8400 block of Alban Road, Behind 8400 Alban Road  
**Location:** Alban Industrial Center  
**Land Owner:** Private - Commercial  
**PIN:** 0993 01 0006D  
**Control Type:** Water Quality and Quantity  
**Drainage Area:** 21.45 acres  
**Receiving Waters:** Accotink Creek

**Description:** This existing dry pond, DP0338, provides little to no treatment due to the large size of the outlet pipe. There are currently two inflows into the facility that carry runoff through concrete channels directly to the outlet pipe. To provide water quality treatment, the pond would be excavated, the concrete channels would be removed and replaced with a meandering natural channel, and a new riser structure with a dewatering orifice would be installed.



*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 by providing extended detention of the half-inch, 48-hour storm, along with peak flow reduction for both the 2- and 10-year events. Retrofitting this facility would promote the removal of suspended solids and floatables to downstream channels through extended detention and wet storage in plunge pools and micropools. Retrofitting this facility would also help to reduce future downstream erosion by reducing peak flow rates and erosive velocities. It is estimated that an annual total of 7,756 lbs of sediment, 51 lbs of total nitrogen and nine lbs of total phosphorus would be reduced by this project.

**Project Design Considerations:** Since this facility is located in an industrial area off of Alban Road, coordination with the property owner will be necessary to retrofit the facility. Access to this facility is very good from a parking lot off of Alban Road. No environmental permitting issues or tree losses are expected with this retrofit. The addition of a riser would help this facility achieve water quality improvement goals for habitat improvement and prevention of downstream channel erosion. No other design or construction issues were identified at this site. No existing utility conflicts are anticipated.

<b>Costs:</b>				
<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
Clear and Grub	0.7	AC	\$12,000.00	\$8,400
Paved Ditch Demolition & Haul Away	125	LF	\$30.00	\$3,750
Plunge pool / Micropool	3	EA	\$400.00	\$1,200
Excavate to create low-flow channel	260	LF	\$25.00	\$6,500
New Riser	1	LS	\$8,000.00	\$8,000
Embedded Dewatering Pipe	1	EA	\$500.00	\$500
Grading and Excavation	523	CY	\$35.00	\$18,305
Soil Borings	1	LS	\$8,500.00	\$8,500
			Initial Project Costs	<b>\$55,155</b>
Plantings	1	LS	5% of Project	\$2,758
Ancillary Items	1	LS	5% of Project	\$2,758
Erosion and Sediment Control	1	LS	10% of Project	\$5,516
			Base Construction Costs	<b>\$66,187</b>
			Mobilization (5%)	\$3,309
			<b>Subtotal 1</b>	<b>\$69,496</b>
			Contingency (25%)	\$17,374
			<b>Subtotal 2</b>	<b>\$86,870</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$39,092
			<b>Estimated Project Cost</b>	<b>\$126,000</b>



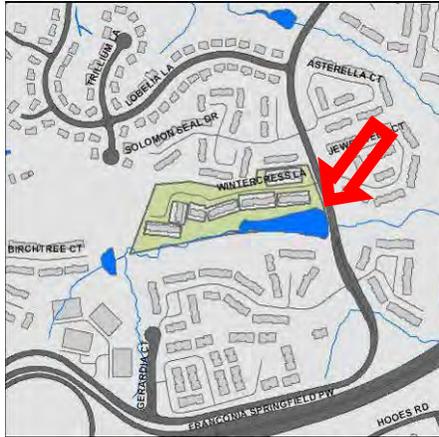
*Site Photo: Existing Facility and Concrete Low Flow Channels*



*Site Photo: Existing Facility*

*This page intentionally left blank.*

**AC9133 - Pond Retrofit**



**Address:** Between the 7200 block of Gentian Court and the 7800 block of Wintercress Lane  
**Location:** Hunter Village  
**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.

<b>Costs:</b>				
<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
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	<b>\$46,715</b>
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	<b>\$56,059</b>
			Mobilization (5%)	\$2,803
			<b>Subtotal 1</b>	\$58,862
			Contingency (25%)	\$14,716
			<b>Subtotal 2</b>	\$73,578
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$33,110
			<b>Estimated Project Cost</b>	<b>\$107,000</b>



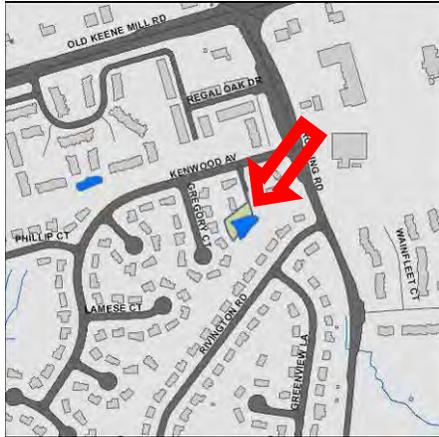
*Site Photo: Existing Facility*



*Site Photo: Existing Control Structure*

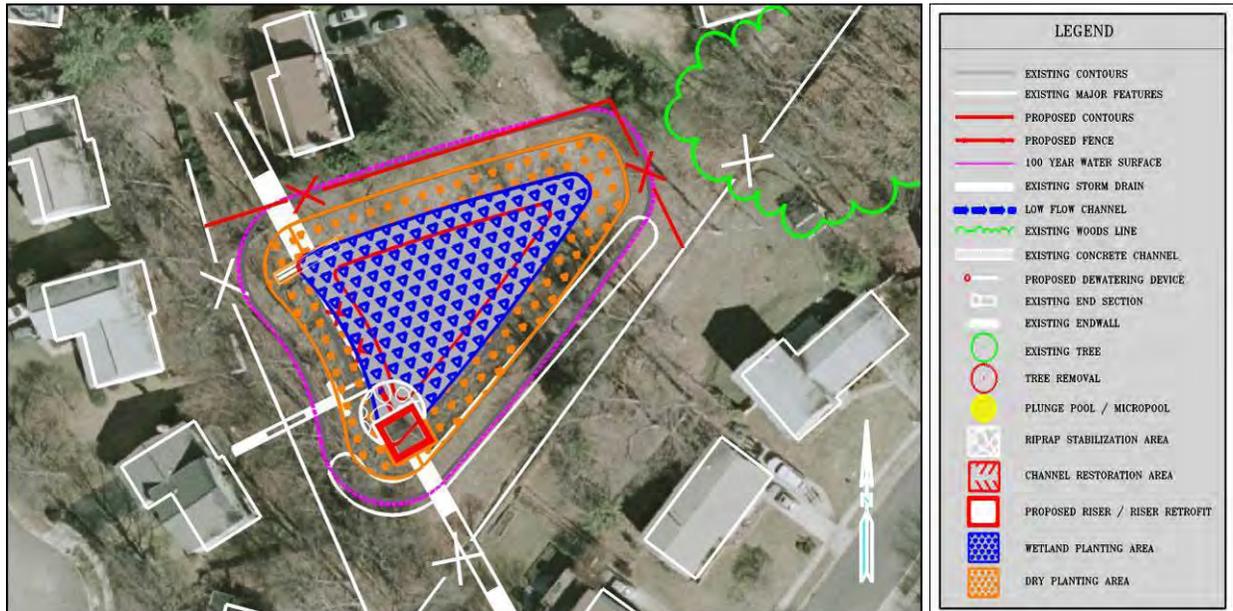
*This page intentionally left blank.*

**AC9136 - Pond Retrofit**



**Address:** At the end of Kenwood Avenue Near 8311 Kenwood Avenue  
**Location:** Kenwood Oaks  
**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 wetland, excavation for additional storage, and modifying the spillway characteristics of the riser structure to change the outflow 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	<b>\$48,240</b>
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	<b>\$57,888</b>
			Mobilization (5%)	\$2,894
			<b>Subtotal 1</b>	<b>\$60,782</b>
			Contingency (25%)	\$15,196
			<b>Subtotal 2</b>	<b>\$75,978</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$34,190
			<b>Estimated Project Cost</b>	<b>\$110,000</b>



*Site Photo: Existing Facility Overview*



*Site Photo: Concrete Low Flow Channel and Control Structure*

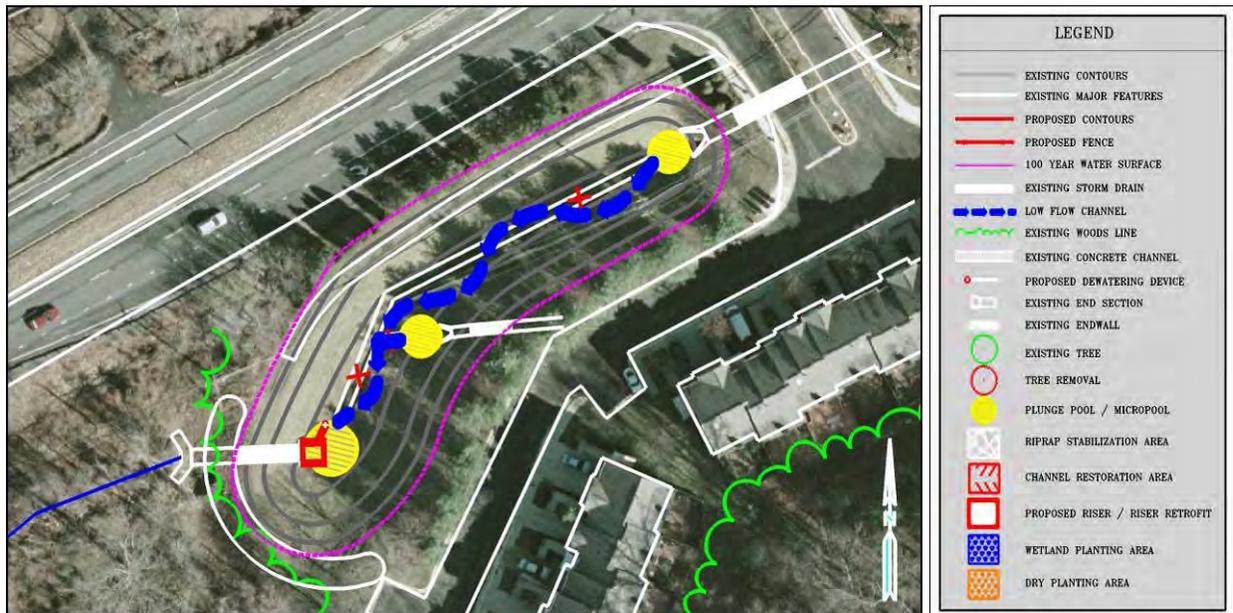
*This page intentionally left blank.*

**AC9139 - Pond Retrofit**



**Address:** Near the intersection of Old Keene Mill Road and Westmore Drive  
**Location:** Westhaven  
**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.

<b>Costs:</b>				
<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
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	<b>\$27,525</b>
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	<b>\$33,030</b>
			Mobilization (5%)	\$1,652
			<b>Subtotal 1</b>	<b>\$34,682</b>
			Contingency (25%)	\$8,671
			<b>Subtotal 2</b>	<b>\$43,353</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$19,509
			<b>Estimated Project Cost</b>	<b>\$63,000</b>



*Site Photo: Existing Facility and Control Structure*



*Site Photo: Existing Facility*

*This page intentionally left blank.*

**AC9144 - New Pond**



**Address:** Along Danbury Forest Drive, South of the intersection of Danbury Forest Drive and Braddock Road

**Location:** Kings Park

**Land Owner:** County - FCPA

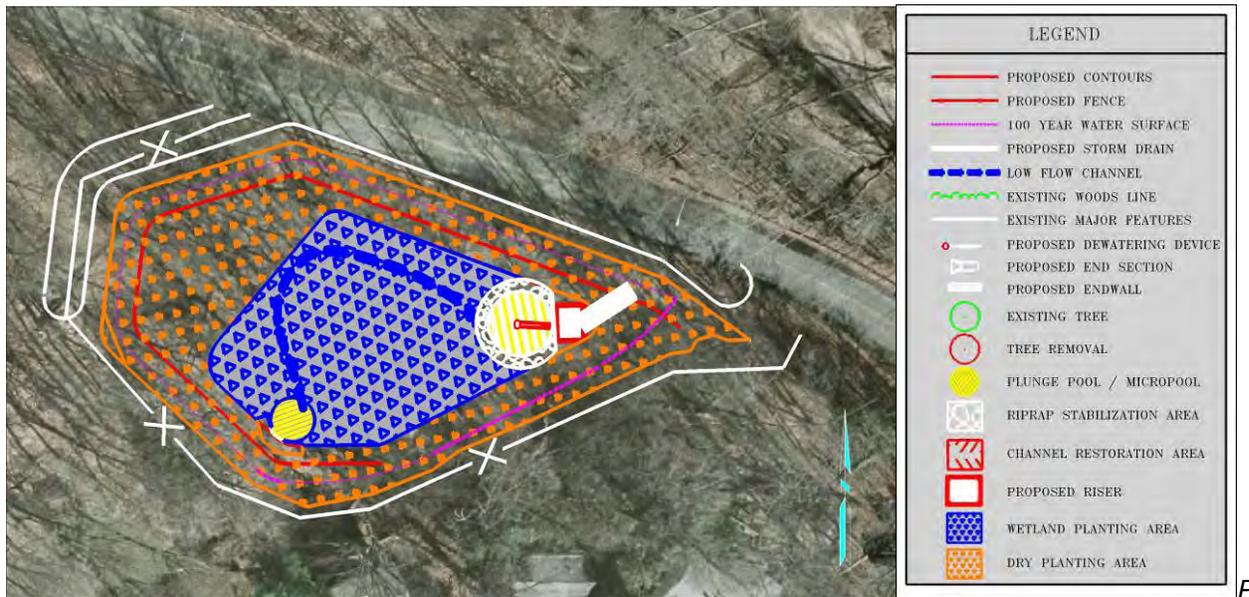
**PIN:** 0703 04 A

**Control Type:** Water Quality and Quantity

**Drainage Area:** 11.38 acres

**Receiving Waters:** Long Branch

**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.

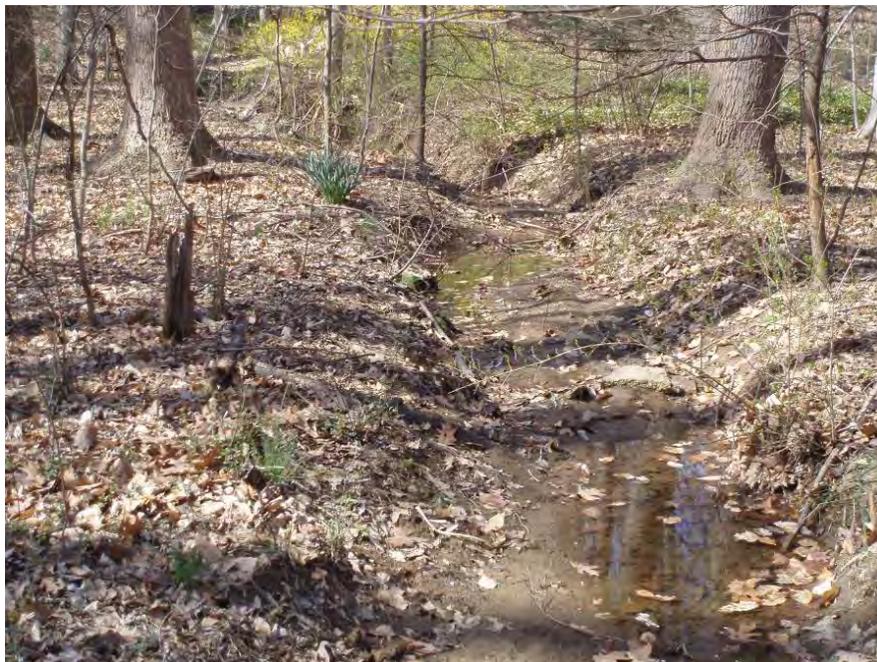
**Project Design Considerations:** This project would be located behind a residential community with easy access to the site, so the design should take this into consideration. FCPA will require any trees damaged by construction to be replaced or trimmed. The eroded outfall is located at the edge of 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	<b>\$384,675</b>
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	<b>\$461,611</b>
			Mobilization (5%)	\$23,081
			<b>Subtotal 1</b>	<b>\$484,692</b>
			Contingency (25%)	\$121,173
			<b>Subtotal 2</b>	<b>\$605,865</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$272,639
			<b>Estimated Project Cost</b>	<b>\$879,000</b>



*Site Photo: Storm Drain Outfall to Proposed Facility*



*Site Photo: Proposed Facility Location*

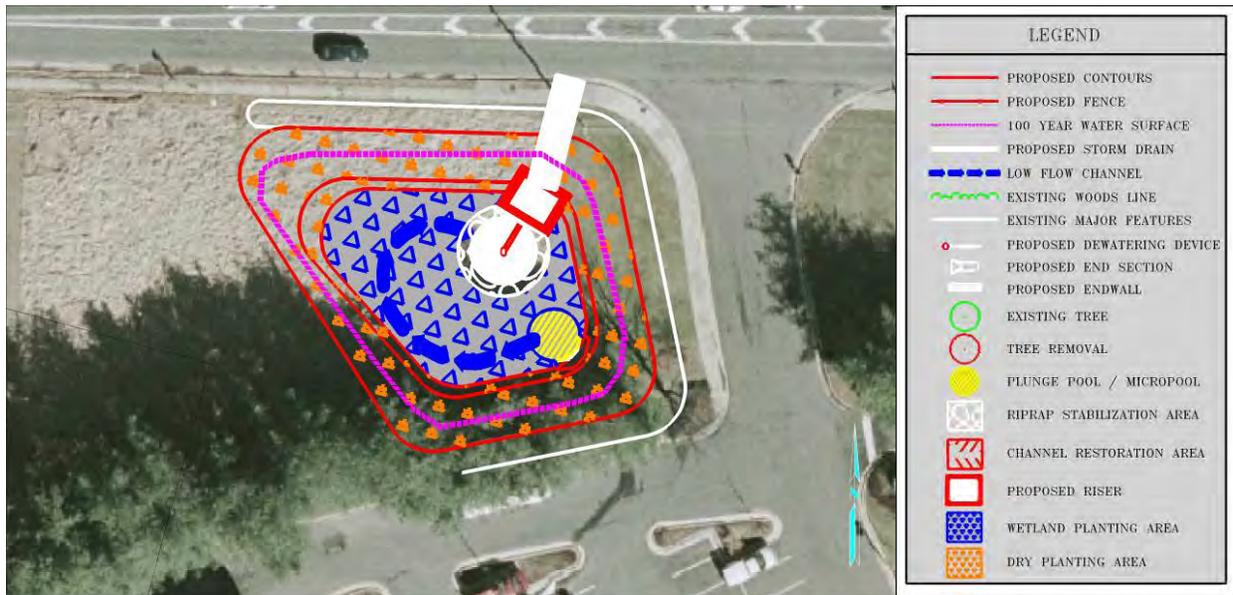
*This page intentionally left blank.*

**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:**  
**Control Type** Water Quality and Quantity  
**Drainage Area** 3.95 acres  
**Receiving Waters** Unknown tributary of Long Branch

**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 a stream, giving the potential for treatment of both water quality and quantity. This project would require modification of the storm drain 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	<b>\$108,170</b>
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	<b>\$129,805</b>
			Mobilization (5%)	\$6,490
			<b>Subtotal 1</b>	<b>\$136,295</b>
			Contingency (25%)	\$34,074
			<b>Subtotal 2</b>	<b>\$170,369</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$76,666
			<b>Estimated Project Cost</b>	<b>\$247,000</b>



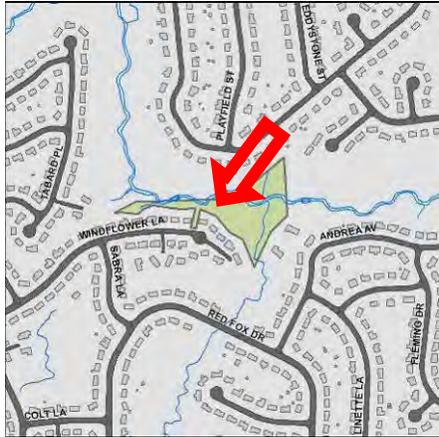
*Site Photo: Proposed Facility Location*



*Site Photo: Proposed Facility Drainage Area*

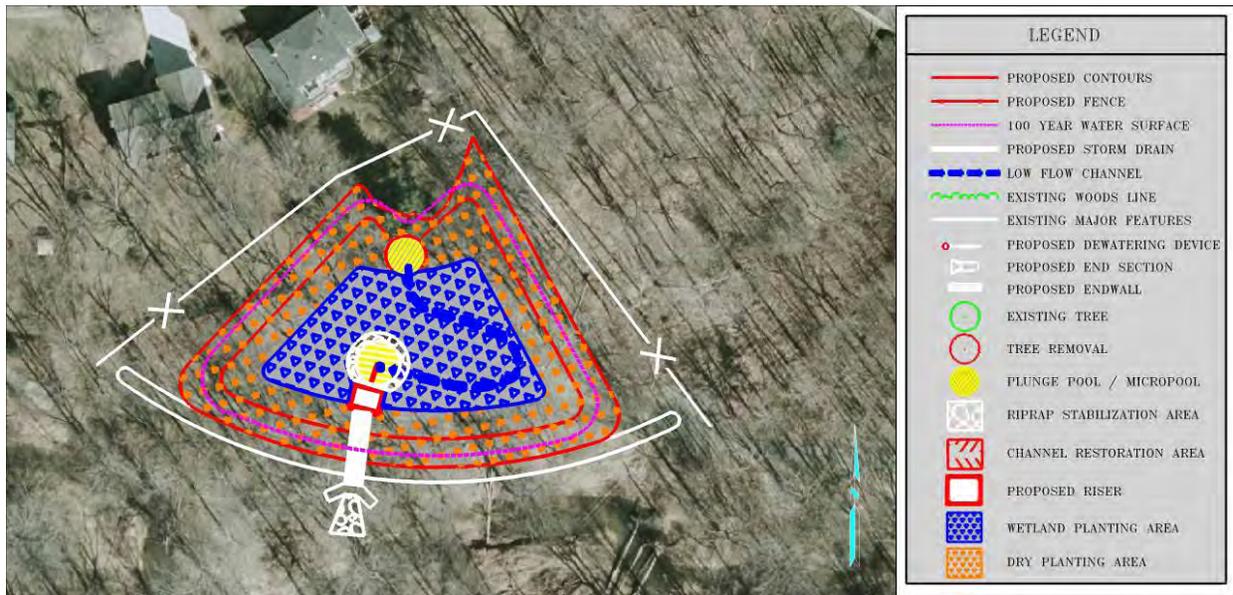
*This page intentionally left blank.*

**AC9148 - New Pond**



**Address:** Behind 4808 Springbrook Drive, at the end of Hercules Court  
**Location:** Long Branch 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

**Description:** An extended detention dry pond is proposed 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	<b>\$359,980</b>
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	<b>\$431,976</b>
			Mobilization (5%)	\$21,599
			<b>Subtotal 1</b>	<b>\$453,575</b>
			Contingency (25%)	\$113,394
			<b>Subtotal 2</b>	<b>\$566,969</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$255,136
			<b>Estimated Project Cost</b>	<b>\$822,000</b>



*Site Photo: Storm Drain Outfall to Proposed Facility*



*Site Photo: Proposed Facility Location*

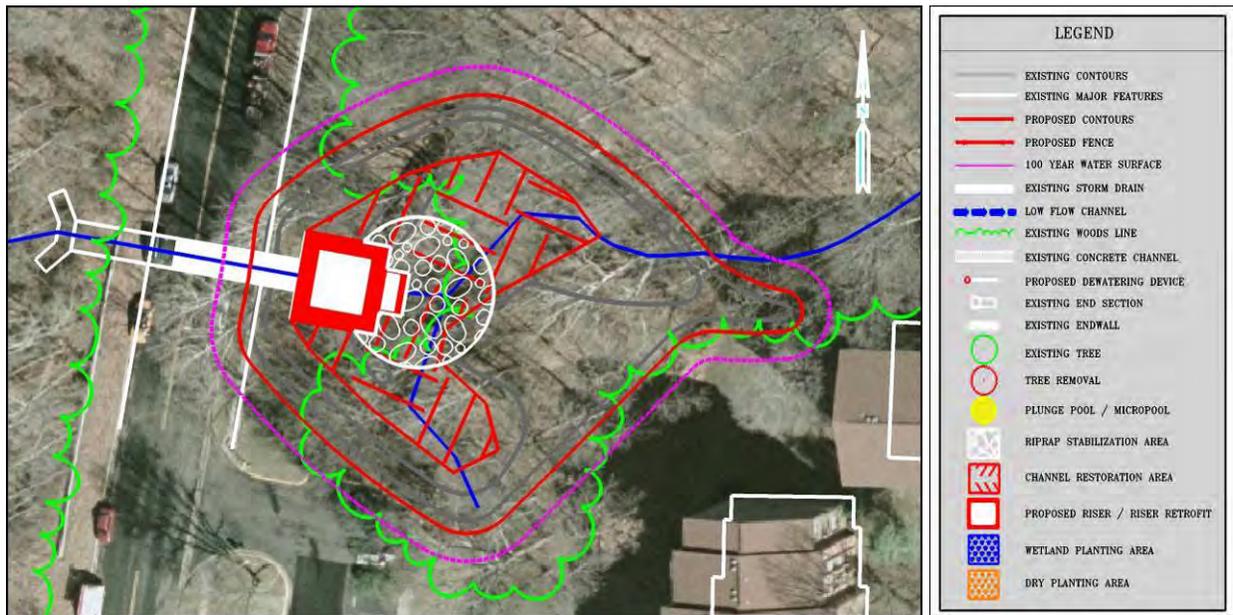
*This page intentionally left blank.*

**AC9161 - Pond Retrofit**



**Address:** Near the intersection of Americana Drive and Commons Drive  
**Location:** Patriot Village  
**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 is an existing dry pond, 0294DP, which will be retrofitted to provide water quality treatment. Field observations indicated that the existing riser structure is failing, so the pond is only functioning as a culvert with little detention. The project recommendations include retrofitting the pond by replacing the riser and repair of portions of badly eroded channel.



*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.

<b>Costs:</b>				
<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
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	<b>\$37,500</b>
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	<b>\$45,000</b>
			Mobilization (5%)	\$2,250
			<b>Subtotal 1</b>	<b>\$47,250</b>
			Contingency (25%)	\$11,813
			<b>Subtotal 2</b>	<b>\$59,063</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$26,578
			<b>Estimated Project Cost</b>	<b>\$86,000</b>



*Site Photo: Existing Facility Embankment*



*Site Photo: Existing Facility and Control Structure*

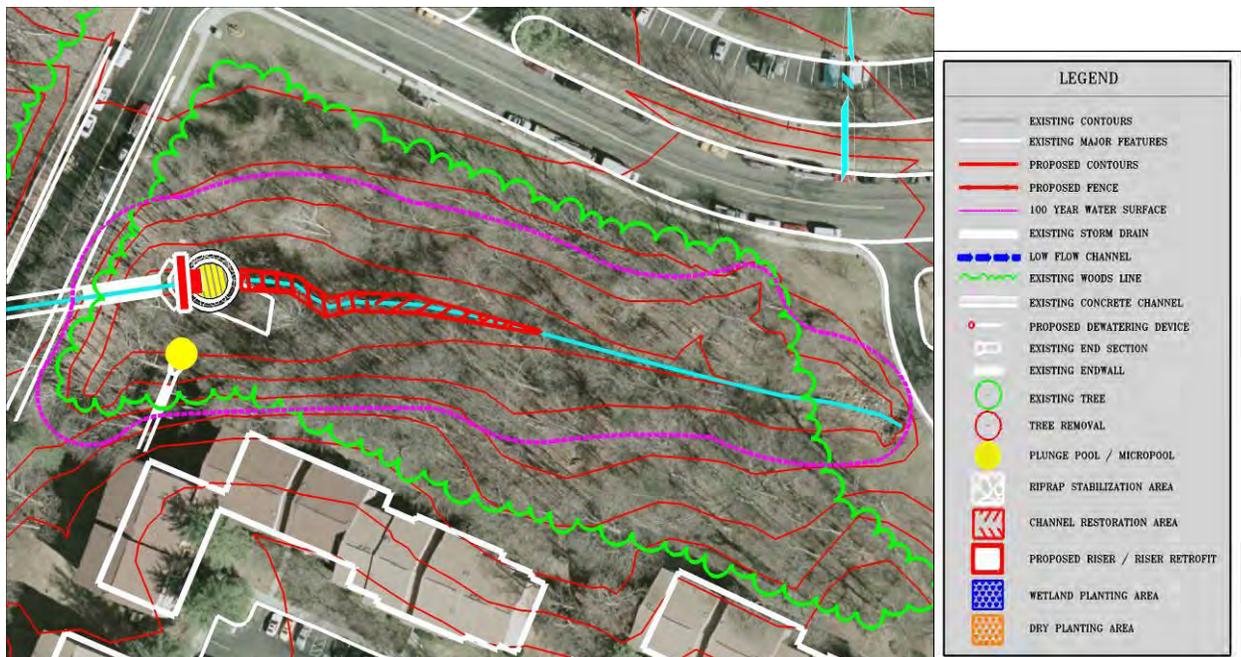
*This page intentionally left blank.*

**AC9162 - Pond Retrofit**



**Address:** Americana Drive at Patriot Drive  
**Location:** Patriot Village  
**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.

<b>Costs:</b>				
<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
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	<b>\$34,500</b>
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	<b>\$41,400</b>
			Mobilization (5%)	\$2,070
			<b>Subtotal 1</b>	<b>\$43,470</b>
			Contingency (25%)	\$10,868
			<b>Subtotal 2</b>	<b>\$54,338</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$24,452
			<b>Estimated Project Cost</b>	<b>\$79,000</b>



*Site Photo: Existing Stream Channel*



*Site Photo: Existing Control Structure*

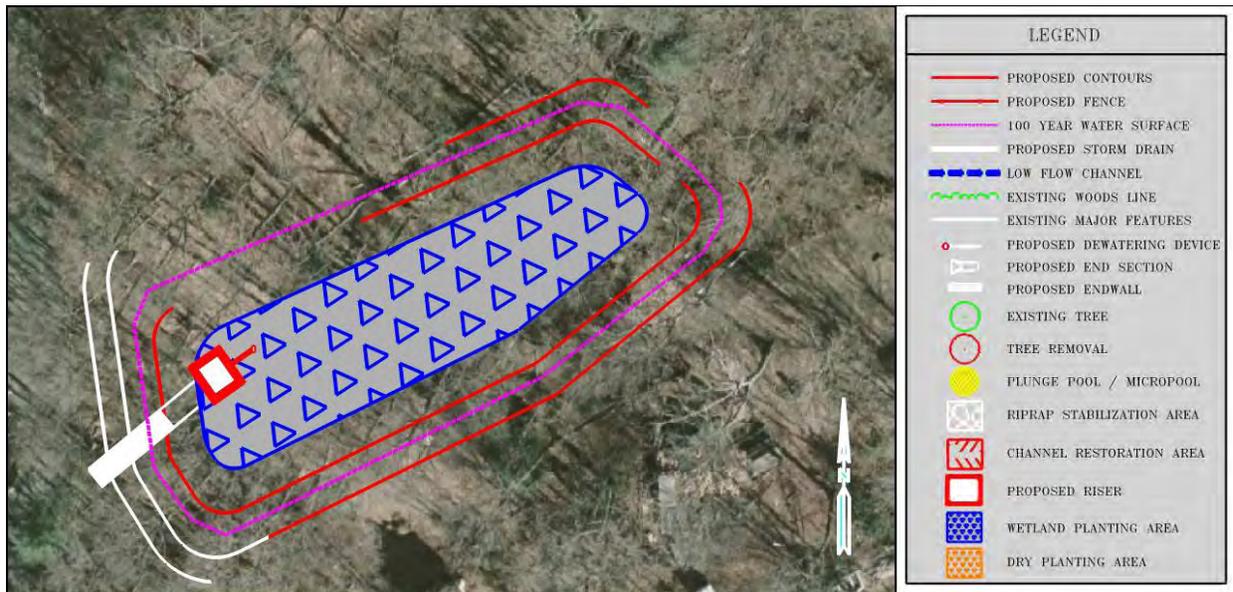
*This page intentionally left blank.*

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.

<b>Costs:</b>				
<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
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	<b>\$432,700</b>
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	<b>\$519,240</b>
			Mobilization (5%)	\$25,962
			<b>Subtotal 1</b>	<b>\$545,202</b>
			Contingency (25%)	\$136,301
			<b>Subtotal 2</b>	<b>\$681,503</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$306,676
			<b>Estimated Project Cost</b>	<b>\$988,000</b>



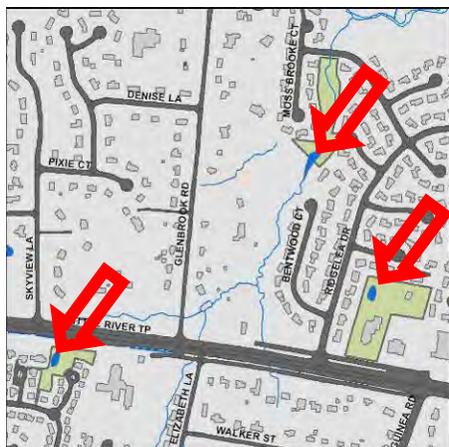
*Site Photo: Existing Flood Control Structure*



*Site Photo: Existing Channel Into Flood Control Structure*

*This page intentionally left blank.*

## AC9175 - Pond Retrofit



**Address:** Between Hunting Pines Court and Hunting Pines Place, Behind 3901 Bentwood Court, Behind 8922 Little River Turnpike

**Location:** Hunters Glen, Ridgelea Hills, 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.



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.

<b>Costs:</b>				
<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
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	<b>\$92,150</b>
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	<b>\$110,581</b>
			Mobilization (5%)	\$5,529
			<b>Subtotal 1</b>	<b>\$116,110</b>
			Contingency (25%)	\$29,028
			<b>Subtotal 2</b>	<b>\$145,138</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$65,312
			<b>Estimated Project Cost</b>	<b>\$210,000</b>



*Site Photo: Existing Facility Overview (AC9175A)*



*Site Photo: Existing Facility Overview (AC9175B)*

*This page intentionally left blank.*

**AC9178 - Pond Retrofit**



**Address:** Near the intersection of Monarch Lane and Happy Heart Lane, Next to 3351 Monarch Lane

**Location:** Prosperity Heights

**Land Owner:** Private - Residential

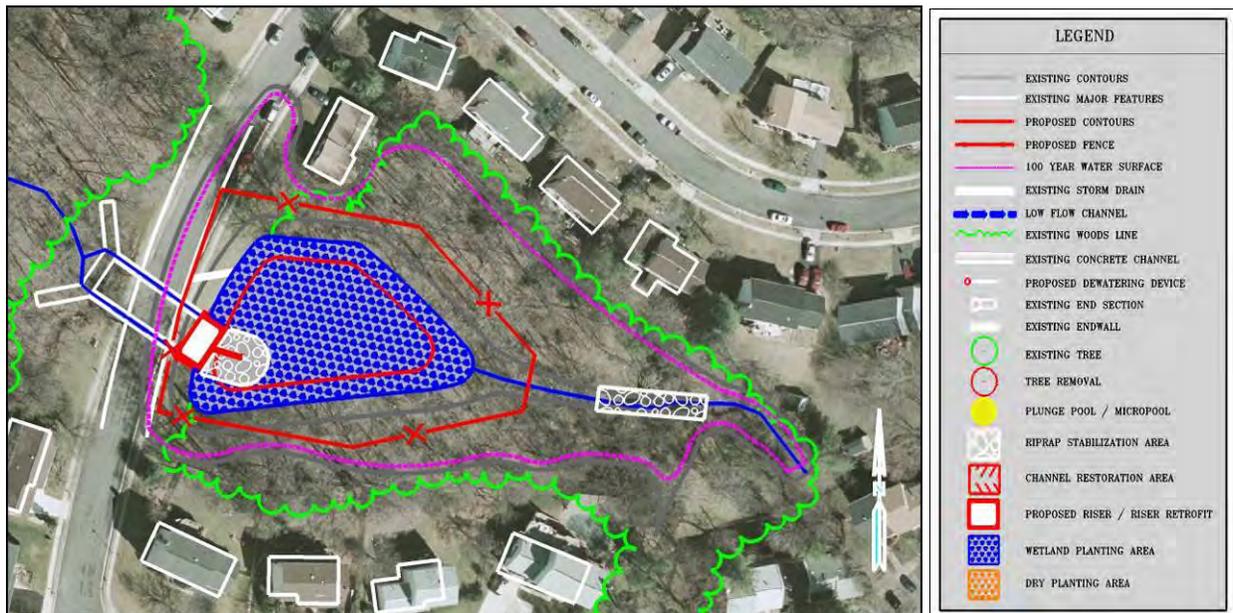
**PIN:** 0591 27 D

**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	<b>\$175,485</b>
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	<b>\$210,582</b>
			Mobilization (5%)	\$10,529
			<b>Subtotal 1</b>	\$221,111
			Contingency (25%)	\$55,278
			<b>Subtotal 2</b>	\$276,389
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$124,375
			<b>Estimated Project Cost</b>	<b>\$401,000</b>



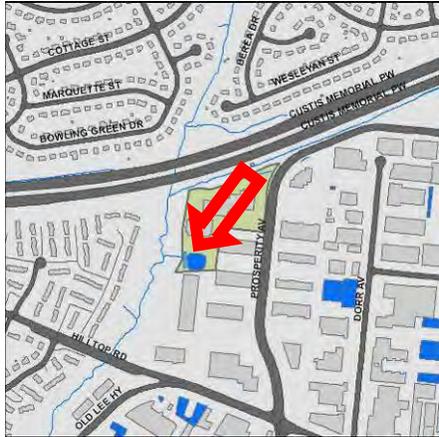
*Site Photo: Existing Facility Overview*



*Site Photo: Existing Facility Inflow and Control Structure*

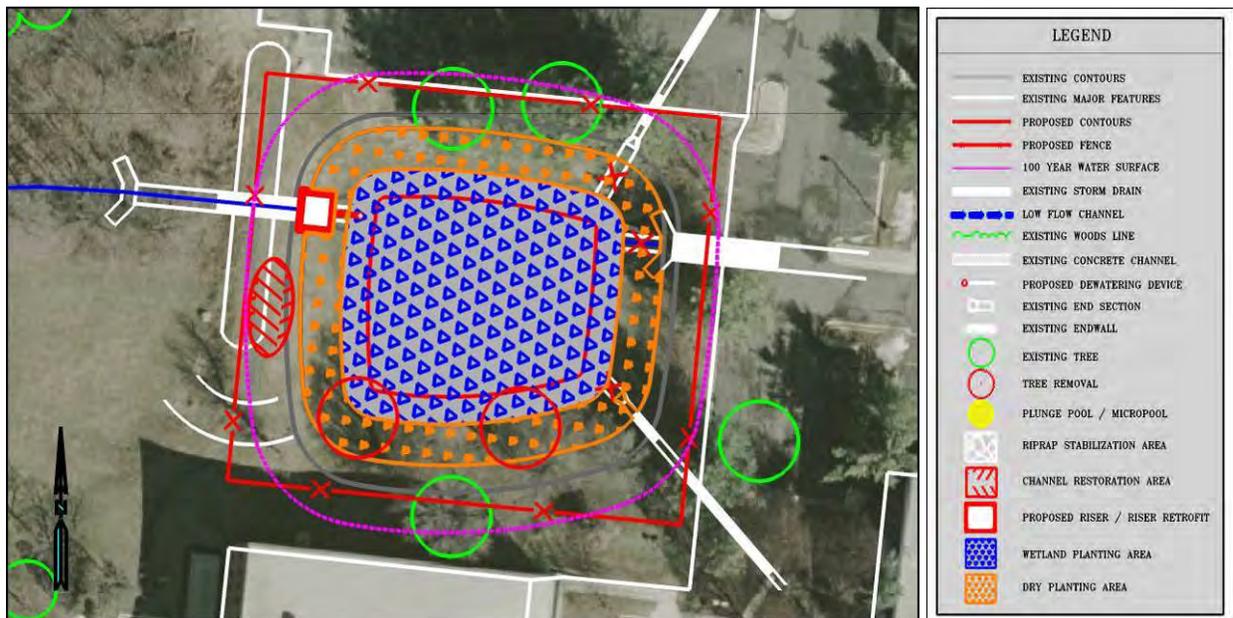
*This page intentionally left blank.*

**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

**Description:** Dry pond DP0146 receives runoff from the nearby 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 wetland 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	<b>\$108,735</b>
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	<b>\$130,483</b>
			Mobilization (5%)	\$6,524
			<b>Subtotal 1</b>	<b>\$137,007</b>
			Contingency (25%)	\$34,252
			<b>Subtotal 2</b>	<b>\$171,259</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$77,067
			<b>Estimated Project Cost</b>	<b>\$248,000</b>



*Site Photo: Existing Facility Overview*



*Site Photo: Existing Control Structure and Concrete Low Flow Channels*

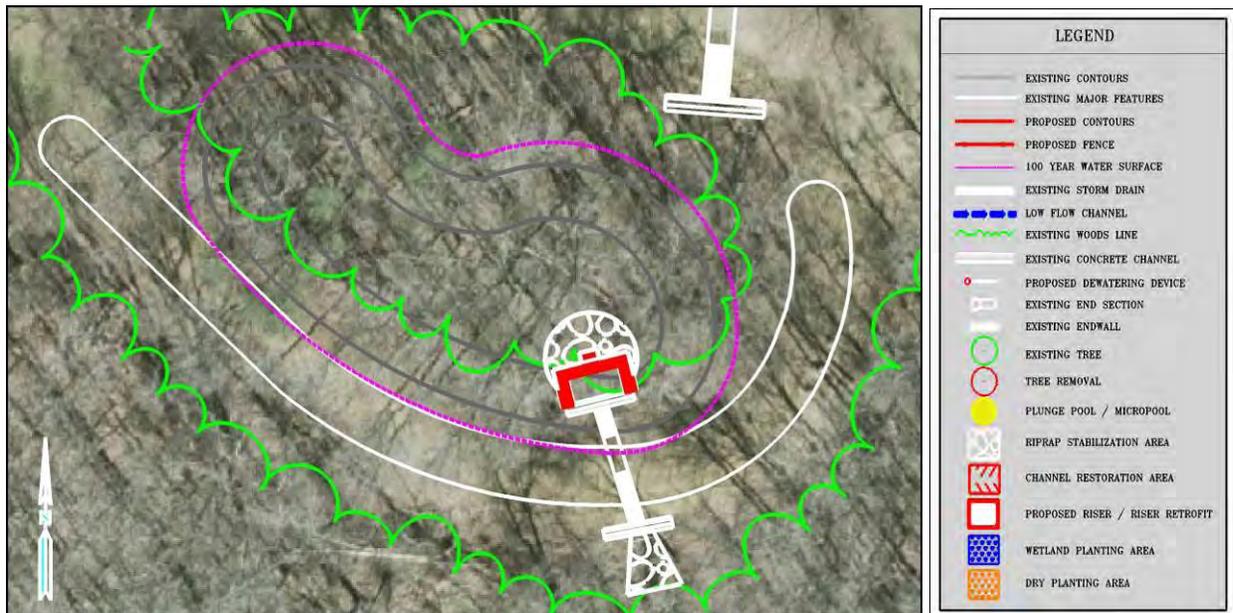
*This page intentionally left blank.*

**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. 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 phosphorus 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.

<b>Costs:</b>				
<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
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	<b>\$23,400</b>
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	<b>\$28,080</b>
			Mobilization (5%)	\$1,404
			<b>Subtotal 1</b>	<b>\$29,484</b>
			Contingency (25%)	\$7,371
			<b>Subtotal 2</b>	<b>\$36,855</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$16,585
			<b>Estimated Project Cost</b>	<b>\$53,000</b>



*Site Photo: Existing Facility Overview*



*Site Photo: Inflow into Facility*

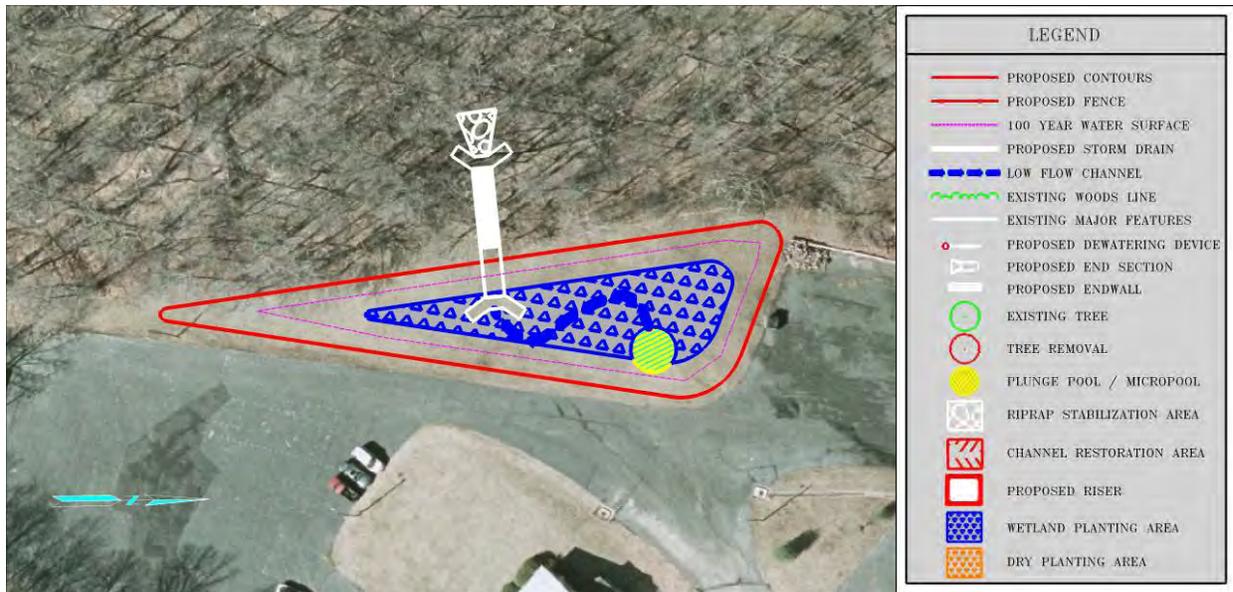
*This page intentionally left blank.*

AC9183 - New Pond



Address: 9001 Arlington Boulevard  
 Location: Kena Shriners  
 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.

<b>Costs:</b>				
<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
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	<b>\$119,785</b>
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	<b>\$143,742</b>
			Mobilization (5%)	\$7,187
			<b>Subtotal 1</b>	<b>\$150,929</b>
			Contingency (25%)	\$37,732
			<b>Subtotal 2</b>	<b>\$188,661</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$84,897
			<b>Estimated Project Cost</b>	<b>\$274,000</b>



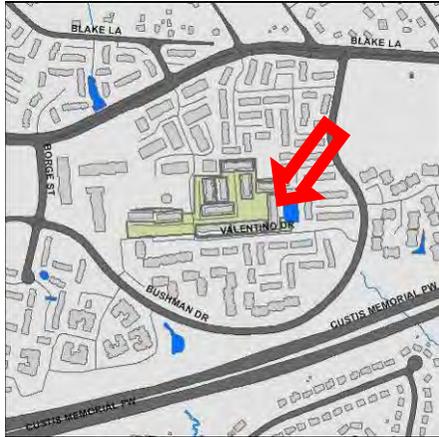
*Site Photo: Existing Parking Area*



*Site Photo: Open Space For Proposed Facility*

*This page intentionally left blank.*

**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

**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, 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 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.

<b>Costs:</b>				
<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>
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	<b>\$28,925</b>
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	<b>\$34,710</b>
			Mobilization (5%)	\$1,736
			<b>Subtotal 1</b>	<b>\$36,446</b>
			Contingency (25%)	\$9,112
			<b>Subtotal 2</b>	<b>\$45,558</b>
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$20,501
			<b>Estimated Project Cost</b>	<b>\$66,000</b>



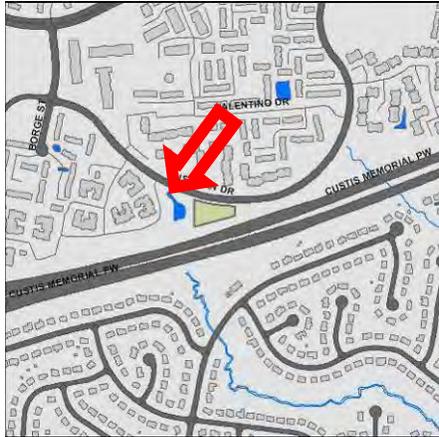
*Site Photo: Existing Facility Inflow and Control Structure*



*Site Photo: Existing Facility Overview*

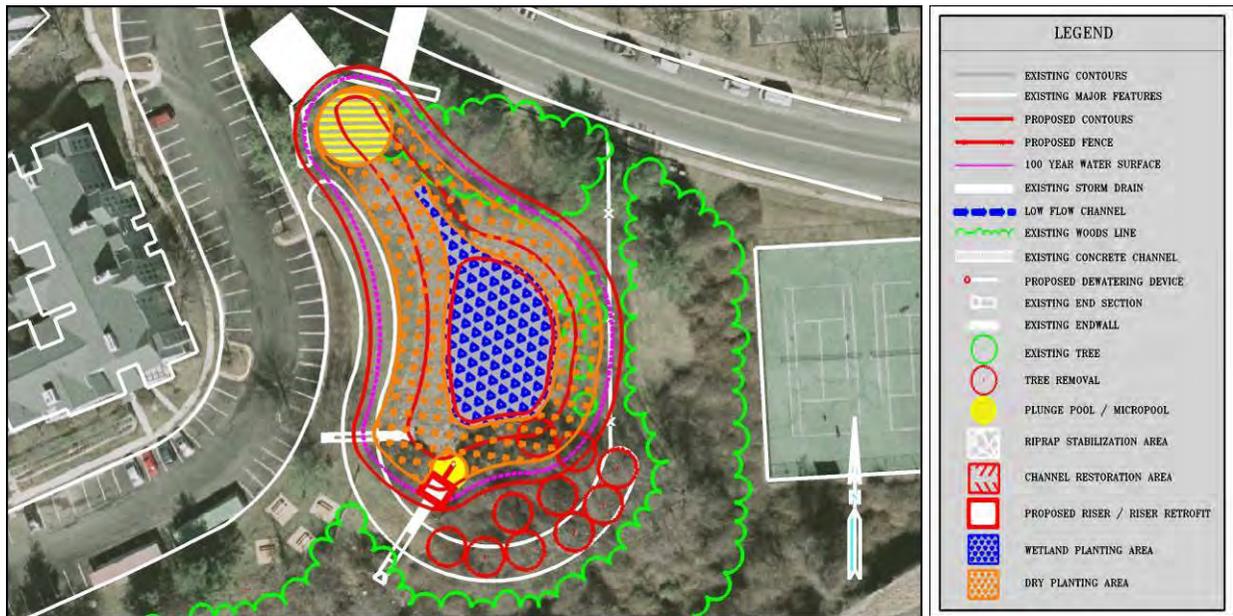
*This page intentionally left blank.*

**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 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.

<b>Costs:</b>					
<b>ITEM</b>	<b>QUANTITY</b>	<b>UNITS</b>	<b>UNIT COST</b>	<b>TOTAL</b>	
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	<b>\$77,060</b>	
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	<b>\$92,472</b>	
			Mobilization (5%)	\$4,624	
			<b>Subtotal 1</b>	<b>\$97,096</b>	
			Contingency (25%)	\$24,274	
			<b>Subtotal 2</b>	<b>\$121,370</b>	
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$54,617	
			<b>Estimated Project Cost</b>	<b>\$176,000</b>	



*Site Photo: Existing Facility Overview*



*Site Photo: Existing Facility Inflow*

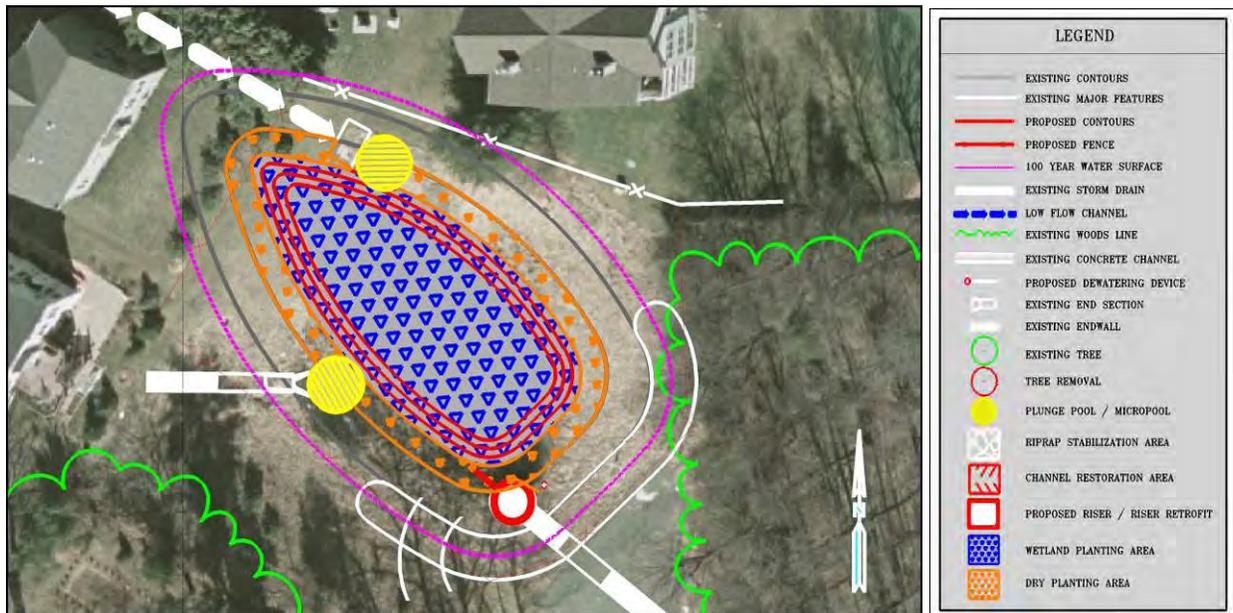
*This page intentionally left blank.*

**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), which will 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	<b>\$27,880</b>
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	<b>\$33,456</b>
			Mobilization (5%)	\$1,673
			<b>Subtotal 1</b>	\$35,129
			Contingency (25%)	\$8,782
			<b>Subtotal 2</b>	\$43,911
			Engineering Design, Surveys, Land Acquisition, Utility Relocations, and Permits (45%)	\$19,760
			<b>Estimated Project Cost</b>	<b>\$64,000</b>



*Site Photo: Existing Facility Overview*



*Site Photo: Existing Control Structure*

*This page intentionally left blank.*