

2.2.4 Middle South Run

Field Reconnaissance

The Middle South Run WMA is located in the west central portion of the Pohick Creek watershed and contains a total of 10 subwatersheds. The Middle South Run WMA is bounded on the west by Ox Road (Route 123) and to the north and east by the Fairfax County Parkway. The WMA is essentially bisected by Lee Chapel Road, which runs from the northeast to the southwest. Silverbrook Road forms the extreme southern border of the Middle South Run WMA. The eastern border of the WMA runs to the dam at Lake Mercer, short of Hooes Road.

The Middle South Run WMA is comprised primarily of single family detached residential properties, with the majority of the observed single family detached dwellings were constructed on estimated ¼ to ½ acre lots, including several large subdivisions such as Barrington, Timber Ridge, the Woods at South Run, and South Run Oaks. The residential development in this WMA is largely characterized by street patterns terminating in cul-de-sacs (i.e. not as many through streets). The age of development in this WMA ranges from an estimated 20 to 25 years old (1980's) up to new construction (2005 or newer) with little evidence of infill development. Land cover consists primarily of impervious surface associated with residential development (i.e. rooftops, streets and driveways, sidewalks, etc.) and associated landscaping, including managed turf. Curb and gutter on streets was observed in several subdivisions, primarily those with smaller lot sizes.

The Middle South Run WMA includes Lake Mercer, a PL-566 flood control structure completed in 1985. This WMA also includes Lake Mercer Park, located around Lake Mercer; the South Run District Park, which covers 182 acres and includes ball fields and courts, and the South Run RECenter; and a portion of Burke Lake Park to the northeast. Observed stormwater management facilities in the Middle South Run WMA consist primarily of dry detention basins, which are typically designed for stormwater volume control and not for water quality treatment. Among the non-residential land uses observed, Middle South Run contains limited, low intensity commercial development, primarily associated with industries/activities supporting residential development. No significant institutional facilities were observed in the Middle South Run WMA aside from a portion of Silverbrook Elementary School, located on the south side of Silverbrook Road.

Impervious Areas and Treatment Types

Increased impervious surfaces can result in channel erosion and downstream degradation. Water discharging from an impervious surface does not have time to slow down or infiltrate into the ground. This increases the quantity and velocity of stormwater runoff. This increased discharge into receiving waters begins to degrade the banks of the streams and instream habitat. It has been shown that levels of 10-20% impervious surface can significantly reduce the overall health of a stream (Annual Report, 2005). As one method of preventing stream degradation, stormwater management detention facilities are used throughout Fairfax County. By utilizing land use data and the contributing areas which drain to these stormwater management detention facilities, the County can identify areas of impervious surfaces and trace the flow path of the resulting discharges and quantify the treatment provided by the specific type of stormwater

management detention facility. Below are the four primary stormwater management facility types and treatment provided.

- *Quantity* -Detention storage facilities that only provide quantity control
- *Quality*: -Detention storage facilities that only provide quality control
- *Quantity & Quality*:-Detention storage facilities that provide quantity + quality control
- *None*: -Areas that do not drain to detention facilities (uncontrolled runoff/no treatment), however some of these areas also are undeveloped open space and parks and therefore were not designed to capture and treat rainfall runoff.

Utilizing the Technical Memorandum 3 guidance document, Table 17 below identifies the current and future impervious surface areas based on the existing and future land use conditions for Middle South Run as well as the associated treatment types. See **Map 2.2.4-1** for existing and future land use for Middle South Run. While, Middle South Run is fully developed it is also home to Lake Mercer, and large forested areas. These two factors allow Middle South Run to have a relatively low impervious area in compared to other WMAs within Pohick Creek.

Table 17: Middle South Run Impervious Areas and Treatment Types

WMA Name	Percent Impervious				Current Treatment Types			
	Current Condition		Ultimate Condition		Quantity	Quality	Quantity/ Quality	None
	(acres)	%	(acres)	%	(acres)	(acres)	(acres)	(acres)
Middle South Run	320.37	16.96	320.72	16.98	158.24	72.84	100.09	1557.95

Stormwater Infrastructure

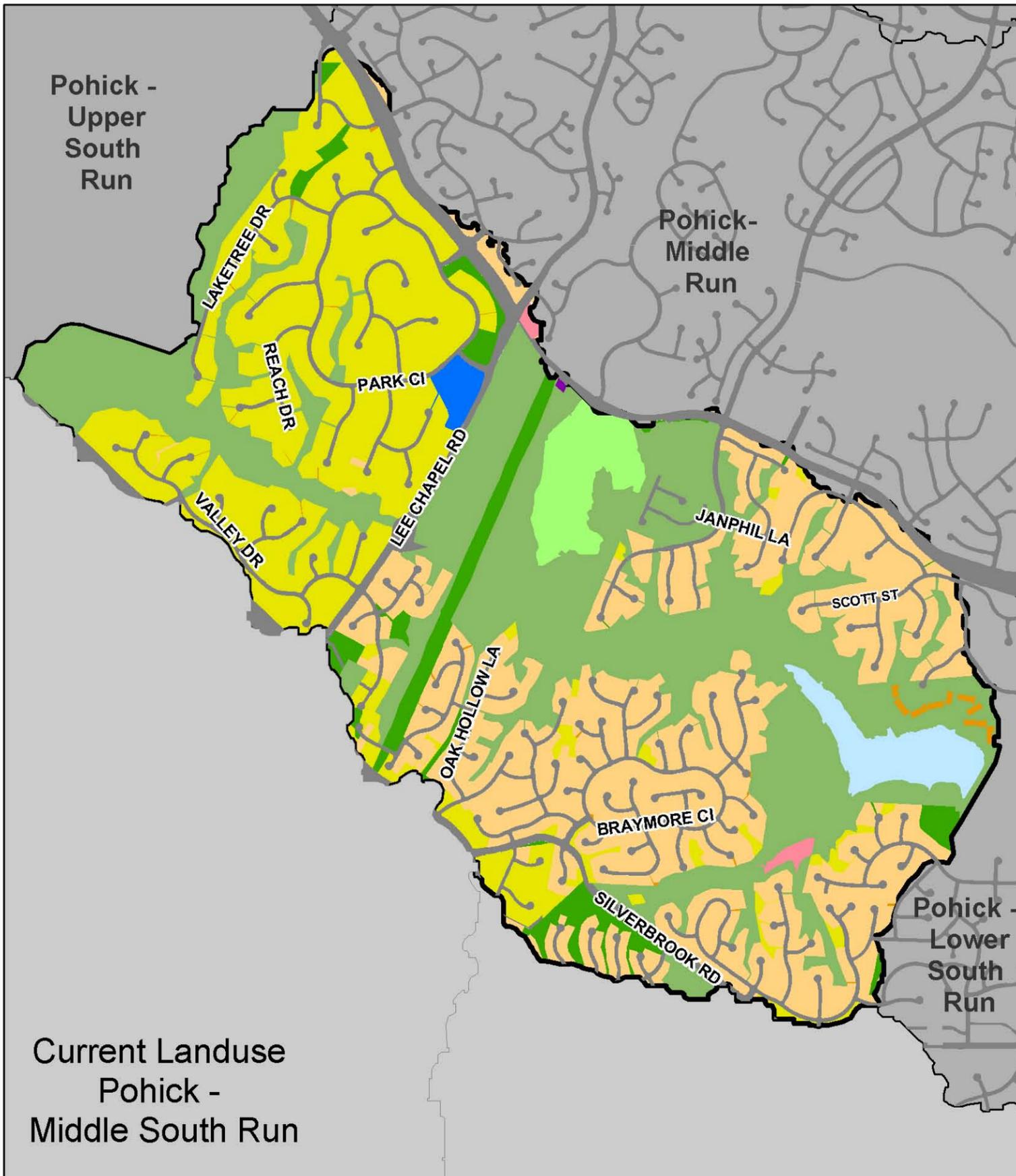
During the watershed’s development, a series of flood control lakes were constructed in the watershed between 1970 and 1985 under the federal Watershed Protection and Flood Prevention Act (PL 566) of 1954. These lakes (Lake Royal, Lake Barton, Woodglen Lake, Lake Braddock, Lake Mercer and Huntsman Lake) all provide significant flood control capacity in residentially developed areas. In addition to the PL 566 facilities, the Pohick Creek watershed also includes Burke Lake, a 218 acre recreational lake that serves as the centerpiece of Burke Lake Park.

Map 2.2.4-2 depicts the observed stormwater infrastructure conditions in the Middle South Run WMA. The upstream portions of the WMA, west of Lee Chapel Road, contain a combination of curb and gutter stormwater collection and overland stormwater collection leading to a piped network of storm drains discharging directly into Middle South Run and its tributaries and directly to Lake Mercer. 11 stormwater management facilities are evident upstream of Lake Mercer, including 10 dry detention basins and one wet retention basin. Moving downstream to the east, the newer development in the Middle South Run WMA contains the majority of the stormwater management structures and facilities noted above, including more prevalent use of curb and gutter stormwater collection. Development east of Lee Chapel Road also tends to be more dense, with the majority of the single family residential development clustered onto smaller lots (1/4 acre and below).

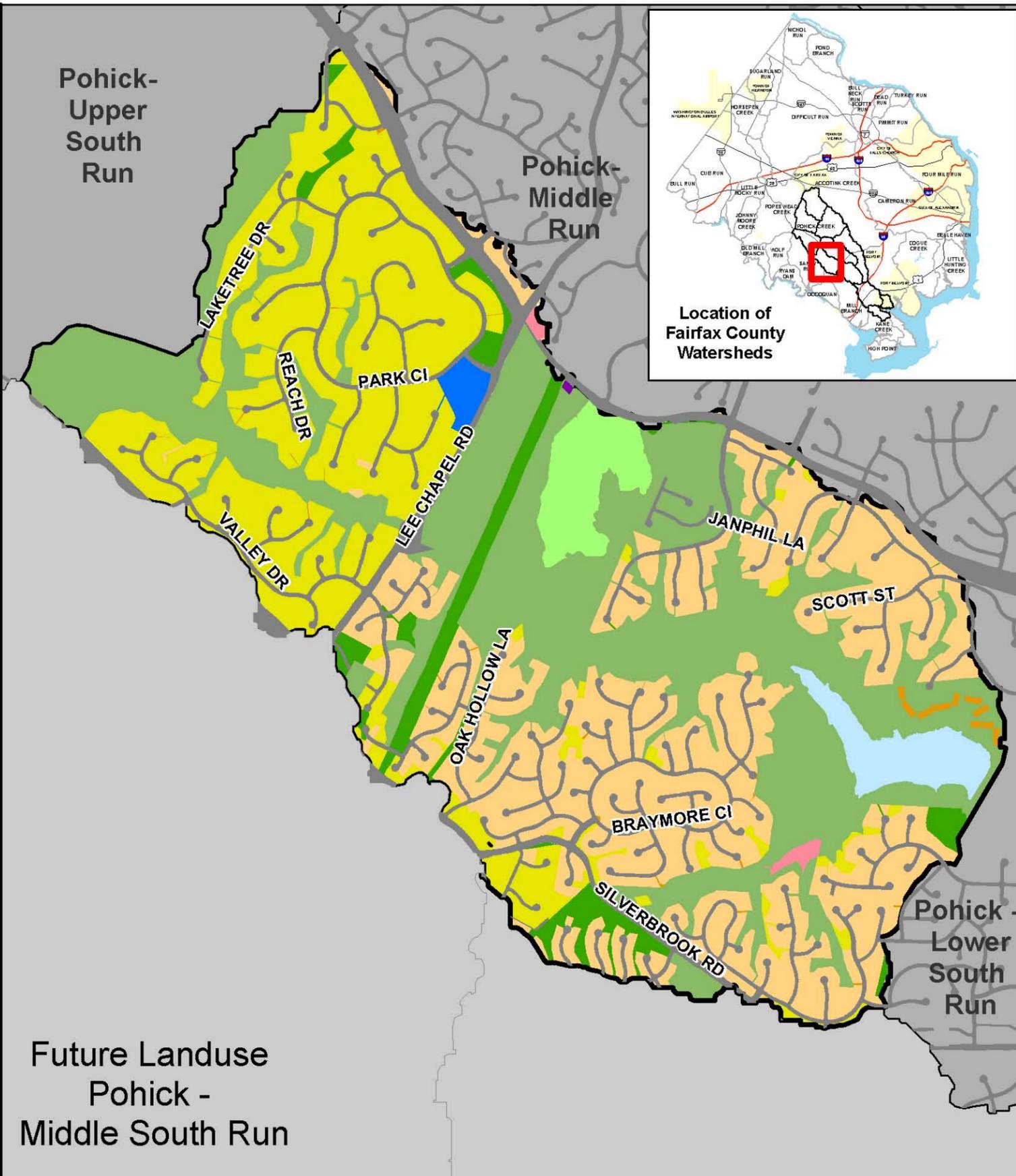
Stream Conditions

The Stream Conditions **Map 2.2.4-3** denotes the generally observed stream conditions as documented in the 2005 SPA and through additional, windshield level field reconnaissance performed for this study. The Stream Conditions Map demonstrates the general conditions of the main stem streams and tributaries in the WMA along with a series of features that typically impact stream condition, including stream channel erosion, channel widening, stream buffer condition, discharge pipe and ditch impacts, and utility and road crossing impacts.

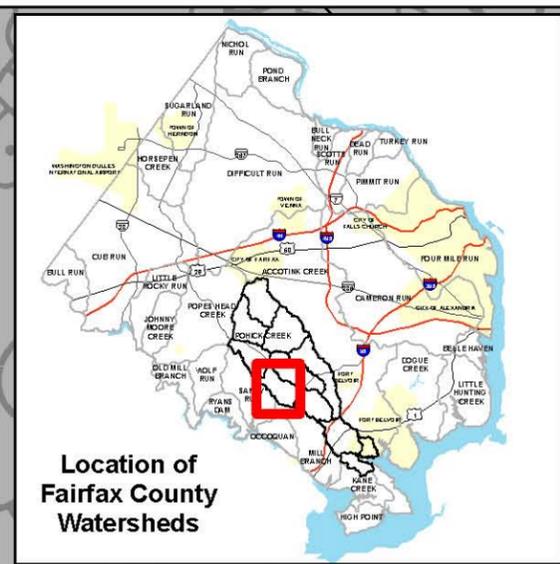
In the Middle South Run WMA, the most prevalent stream condition features noted include disturbed stream buffers and stream channel erosion and/or widening. Upstream of Lake Mercer, significant channel widening has been documented, along with some limited capture of channel incision and scour. In addition, pipe discharge and ditch discharge into the WMA's streams, numerous in the WMA, have an impact on the streams and tributaries as well, as pipes and ditches discharge stormwater runoff directly into the streams in many instances, contributing to the observed widening and erosive conditions. Several significant obstructions were documented in the WMA, and road crossing impacts in the WMA, while generally minor, were also documented at Lee Chapel Road as well as the interior of several of the WMA's subdivisions. Instances of demonstrated stream head cutting, or an abrupt vertical drop in the bed of a stream channel that demonstrates active erosion (NC DWQ, 2005), were limited, with one series of recorded examples on a minor tributary to Middle South Run in the center of the WMA.



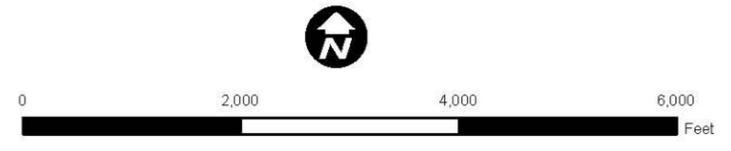
Current Landuse
Pohick -
Middle South Run



Future Landuse
Pohick -
Middle South Run



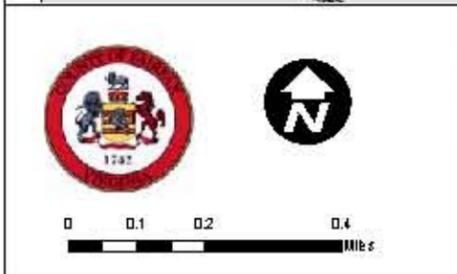
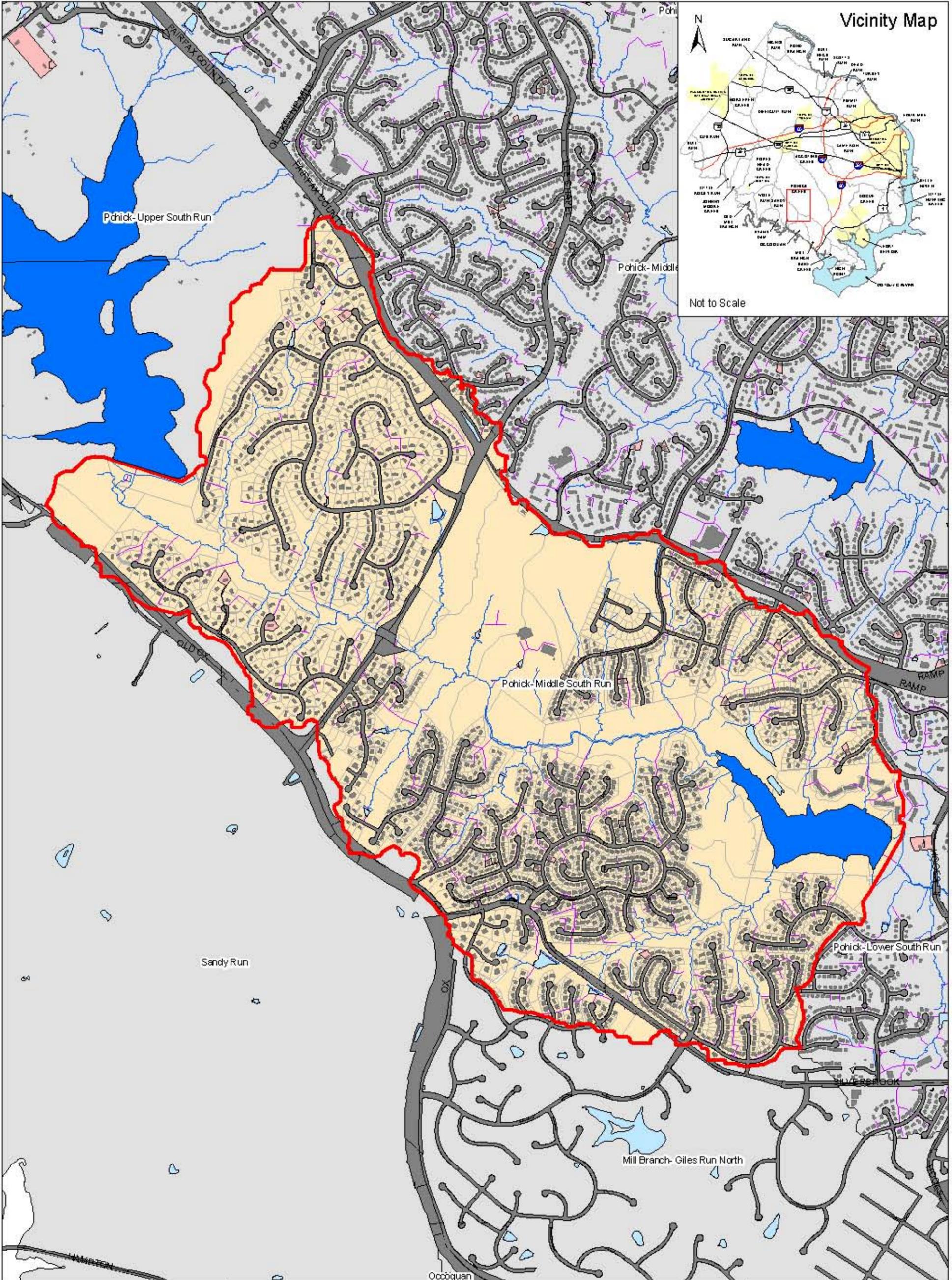
Location of
Fairfax County
Watersheds



Legend

WMA Boundary	Estate Residential	Institutional
Open Space	Low Density Residential	Low Intensity Commercial
Forested	Medium Density Residential	High Intensity Commercial
Golf Course	High Density Residential	Industrial
	Transportation	Water

Map 2.2.4-1
Pohick Creek- Middle South Run
Existing and Future Land Use

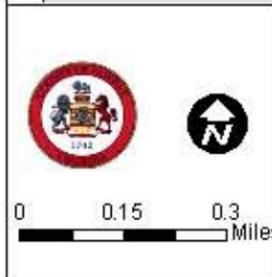
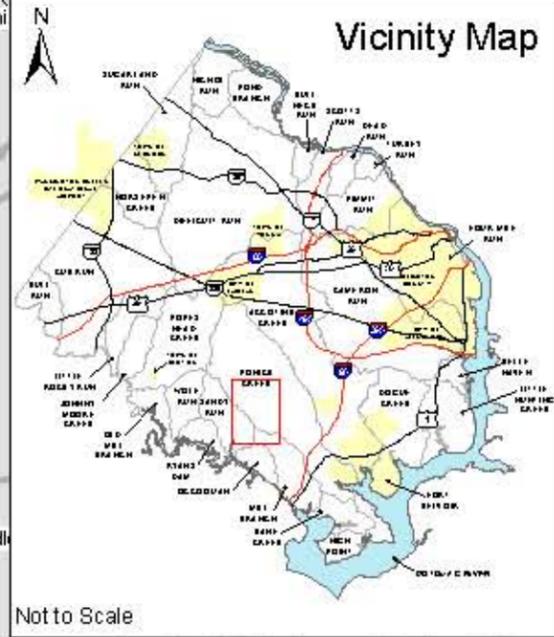


Legend

Storm Drainage	Roads	Drainage Complaints	WMA - Other
Rivers and Streams	Subbasins	Lake	Pohick- Middle South Run
	Buildings	Storm Drainage Facilities	

Map 2.2.4-2

Pohick Creek
Middle South Run
Stormwater Infrastructure



Legend							
— Poor/Very Poor Habitat	● CEM - Type 2: Incision	▭ Disturbed Buffer	■ Lake	▭ Other WMA Boundaries			
— Streams and Rivers	● CEM - Type 3: Widening	▭ Roads	▭ Storm Drainage Facilities	▭ Pohick - Middle South Run			
— Erosion/Bank Instability							
Obstruction Impact	Dump Site Impact	Head Cut Height	Pipe Impact	Ditch Impact	Utility Impact	Crossing Impact	
⊕ Minor to Moderate	⊕ Minor to Moderate	● 0.5' - 1'	● Minor to Moderate	⊕ Minor to Moderate	⊕ Minor to Moderate	⊕ Minor to Moderate	
⊕ Moderate to Severe	⊕ Moderate to Severe	● 1' - 2'	● Moderate to Severe	⊕ Moderate to Severe	⊕ Moderate to Severe	⊕ Moderate to Severe	
⊕ Severe to Extreme	⊕ Severe to Extreme	● > 2'	● Severe to Extreme	⊕ Severe to Extreme	⊕ Severe to Extreme	⊕ Severe to Extreme	

Map 2.2.4-3

Pohick Creek Middle South Run Stream Conditions

2.2.5 Lower South Run

Field Reconnaissance

The Lower South Run WMA is located in the southern portion of the Pohick Creek watershed west of Interstate 95 and contains a total of 12 subwatersheds. The Lower South Run WMA is bounded by Pohick Road to the north and northeast, with the remaining portion of the northern border comprised of the Fairfax County Parkway. The southern border of the WMA essentially follows Silverbrook Road, with portions of the WMA running just to the south of the intersection of Hooes Road and Silverbrook Road. The Lower South Run WMA is comprised primarily of single family detached residential properties in a number of established subdivisions, including Newington Heights, Newington Commons, Chapel Acres, and South Run Forest.

The majority of the observed single family detached dwellings were constructed on estimated ¼ to ½ acre lots. The age of development in this WMA ranges from an estimated 35 to 30 years old (1970's) up to approximately 20 years old (1980's) with appreciable evidence of recent infill development in several areas. In addition, much of the southern portion of this WMA has been redeveloped as part of the Laurel Hill redevelopment project, including significant construction of residential structures and associated commercial and institutional development. In addition to the single family development, the Lower South Run WMA also contains a significant amount of single family attached (i.e. townhouses) development, especially along South Run Road, which bisects this WMA. These developments are characterized by their density, as well as street construction patterns that feature cul-de-sacs and dead end drives (i.e. limited through street access).

Among the observed infill/redevelopment evidence observed, the Lower South Run WMA lies within the Laurel Hill project in southern Fairfax County. Land cover consists primarily of impervious surface associated with residential development (i.e. rooftops, streets and driveways, sidewalks, etc.) and associated landscaping, including managed turf. Observed stormwater management facilities in the Lower South Run WMA consist primarily of dry detention basins. Among the non-residential land uses observed, Lower South Run contains limited, low intensity commercial development, primarily associated with industries/activities supporting residential development. No significant institutional facilities were observed in the Lower South Run WMA other than the Newington Forest Elementary School and the Silverbrook United Methodist Church, although several future school sites are located in the WMA.

The Lower South Run WMA also includes Lower South Run Stream Valley Park and the Newington Heights Community Park.

Impervious Areas and Treatment Types

Increased impervious surfaces can result in channel erosion and downstream degradation. Water discharging from an impervious surface does not have time to slow down or infiltrate into the ground. This increases the quantity and velocity of stormwater runoff. This increased discharge into receiving waters begins to degrade the banks of the streams and instream habitat. It has been shown that levels of 10-20% impervious surface can significantly reduce the overall health of a stream (Annual Report, 2005). As one method of preventing stream degradation,

stormwater management detention facilities are used throughout Fairfax County. By utilizing land use data and the contributing areas which drain to these stormwater management detention facilities, the County can identify areas of impervious surfaces and trace the flow path of the resulting discharges and quantify the treatment provided by the specific type of stormwater management detention facility. Below are the four primary stormwater management facility types and treatment provided.

- *Quantity* -Detention storage facilities that only provide quantity control
- *Quality*: -Detention storage facilities that only provide quality control
- *Quantity & Quality*:-Detention storage facilities that provide quantity + quality control
- *None*: -Areas that do not drain to detention facilities (uncontrolled runoff/no treatment), however some of these areas also are undeveloped open space and parks and therefore were not designed to capture and treat rainfall runoff.

Utilizing the Technical Memorandum 3 guidance document, Table 18 below identifies the current and future impervious surface areas based on the existing and future land use conditions for Lower South Run as well as the associated treatment types. See **Map 2.2.5-1** for existing and future land use for Lower South Run. The majority of Lower South WMA is built out however there is a small area within the WMA that fall in the Laurel Hill area. This area is in the process of being redeveloped and changing land use from institutional to golf course, residential, and other recreational land uses. Current stormwater management treatment type consists of none this is due to the large tracks of forested land use.

Table 18: Lower South Run Impervious Areas and Treatment Types

WMA Name	Percent Impervious				Current Treatment Types			
	Current Condition		Ultimate Condition		Quantity	Quality	Quantity/ Quality	None
	(acres)	%	(acres)	%	(acres)	(acres)	(acres)	(acres)
Lower South Run	315.12	16.18	319.09	16.38	170.43	10.80	78.99	1687.47

Stormwater Infrastructure

During the watershed’s development, a series of flood control lakes were constructed in the watershed between 1970 and 1985 under the federal Watershed Protection and Flood Prevention Act (PL 566) of 1954. These lakes (Lake Royal, Lake Barton, Woodglen Lake, Lake Braddock, Lake Mercer and Huntsman Lake) all provide significant flood control capacity in residentially developed areas. In addition to the PL 566 facilities, the Pohick Creek watershed also includes Burke Lake, a 218 acre recreational lake that serves as the centerpiece of Burke Lake Park.

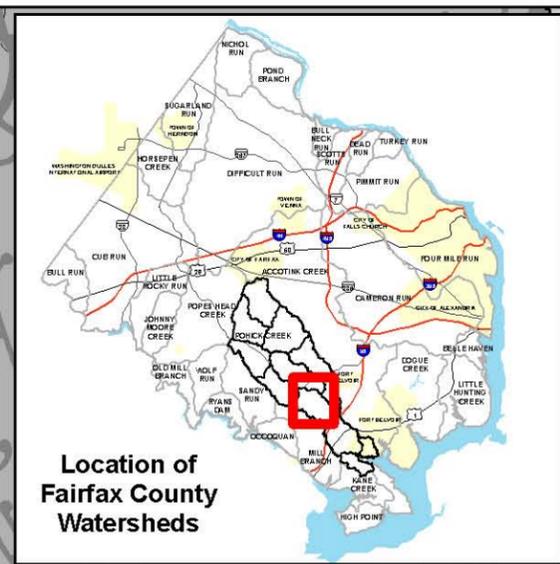
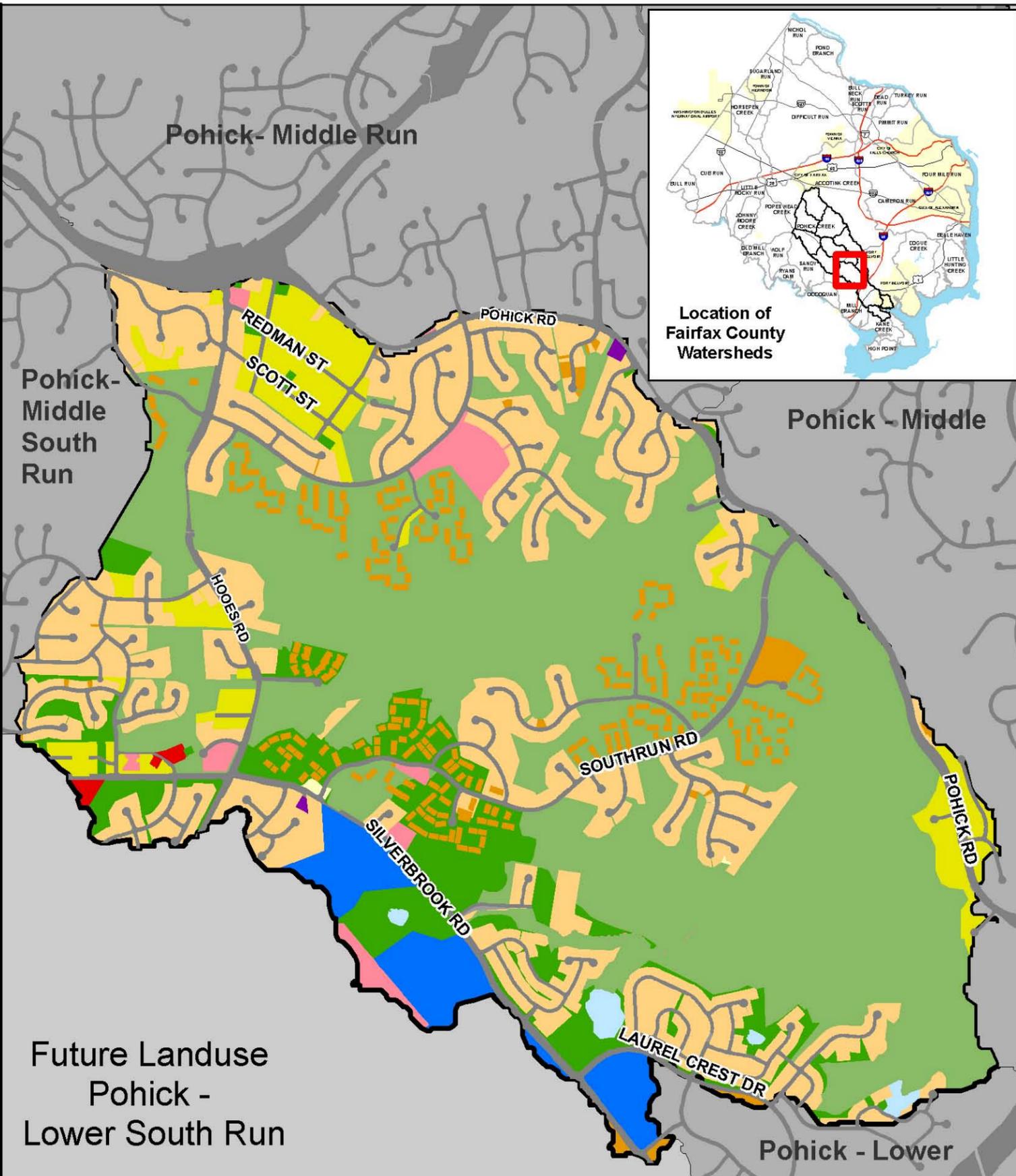
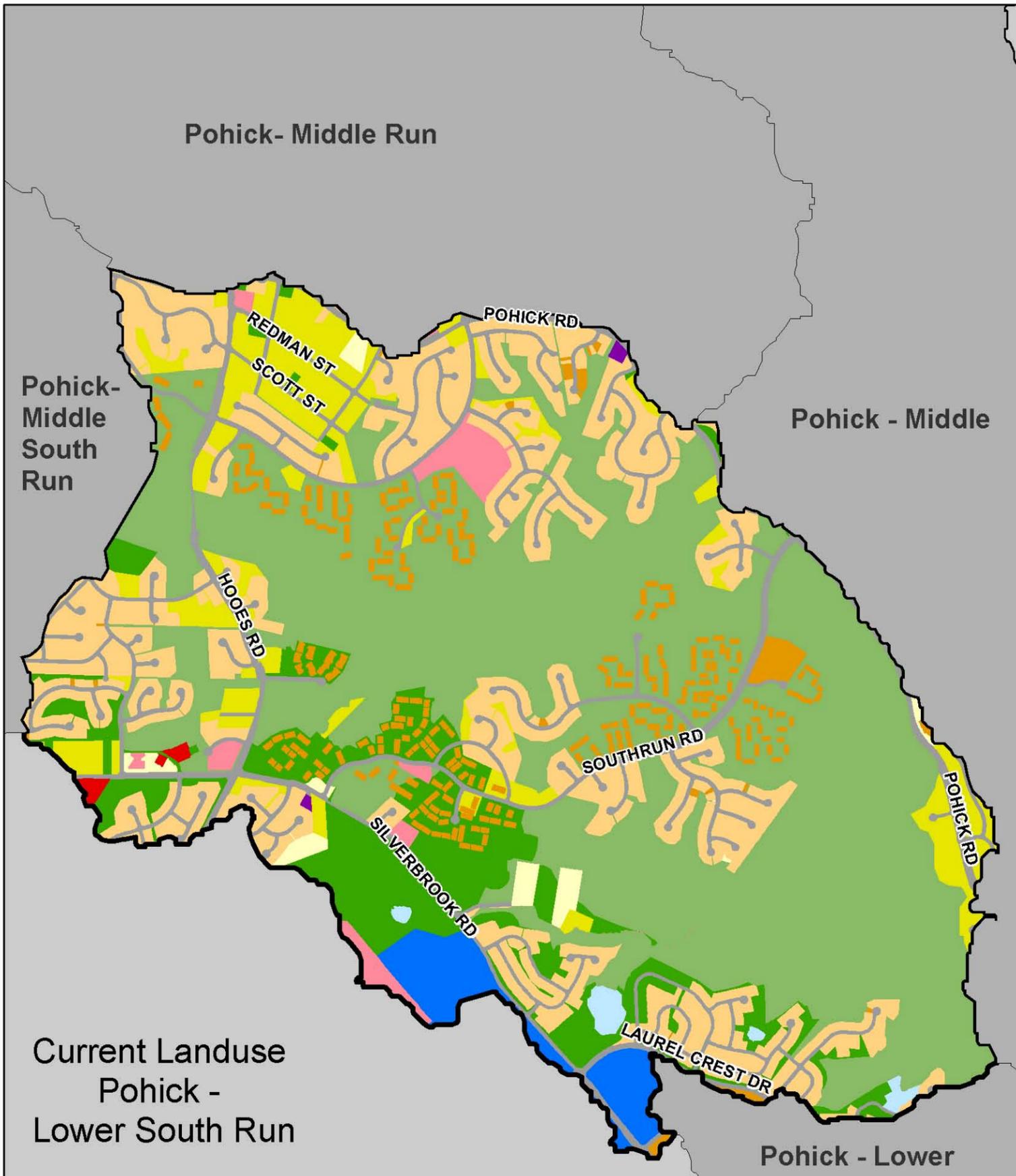
Map 2.2.5-2 demonstrates the observed stormwater infrastructure conditions in the Lower South Run WMA. Stormwater infrastructure consists primarily of curb and gutter stormwater collection leading to a piped network of storm drains discharging to either dry detention basins or directly into Lower South Run and its associated stream valleys and tributaries. The Lower South Run WMA contains approximately 26 dry detention facilities designed to manage stormwater quantity. In addition, the WMA contains one underground chamber. It should be

noted that as part of the Laurel Hill redevelopment project, a number of additional stormwater management facilities appear planned for construction. Given the current Fairfax County requirements for stormwater management, these facilities are likely to be designed to manage both the volume (quantity) of stormwater runoff as well as the quality of that runoff.

Stream Conditions

The Stream Conditions **Map 2.2.5-3** denotes the generally observed stream conditions as documented in the 2005 SPA and through additional, windshield level field reconnaissance performed for this study. The Stream Conditions Map demonstrates the general conditions of the main stem streams and tributaries in the WMA along with a series of features that typically impact stream condition, including stream channel erosion, channel widening, stream buffer condition, discharge pipe and ditch impacts, and utility and road crossing impacts.

In the Lower South Run WMA, the most prevalent stream condition features noted include disturbed stream buffers and stream channel erosion and/or widening. It should be noted, however, that with the Lower South Run WMA's wider stream valleys, the main stem of South Run and some of its tributaries have avoided the extremem widening and erosion/incision conditions plaguing other portions of the watershed. Channel wideing and incision conditions are noted in the head waters of the South Run main stem and Rocky Branch, a tributary, but the downstream main stem of South Run appears more stable. Pipe discharge into the WMA's streams have a demonstrated impact as well, as these pipes discharge stormwater runoff directly into the streams in many instances, contributing to the upstream widening and erosive conditions. Road crossing impacts in the Lower South Run WMA are generally minor, with the exception of a severe instance on Hooes Road to the west. Finally, a handful of obstructions are noted as moderate to severe, including areas to the north of Newington Forest Avenue and the area to the south in the Rocky Branch tributary.

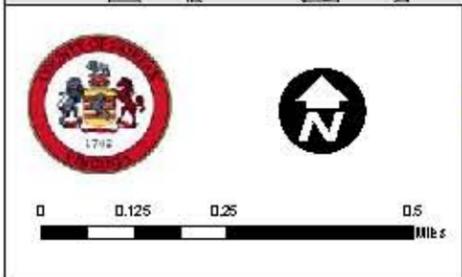
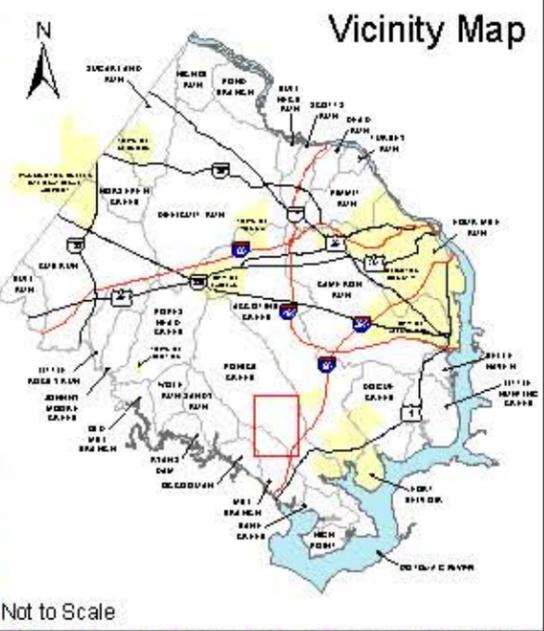
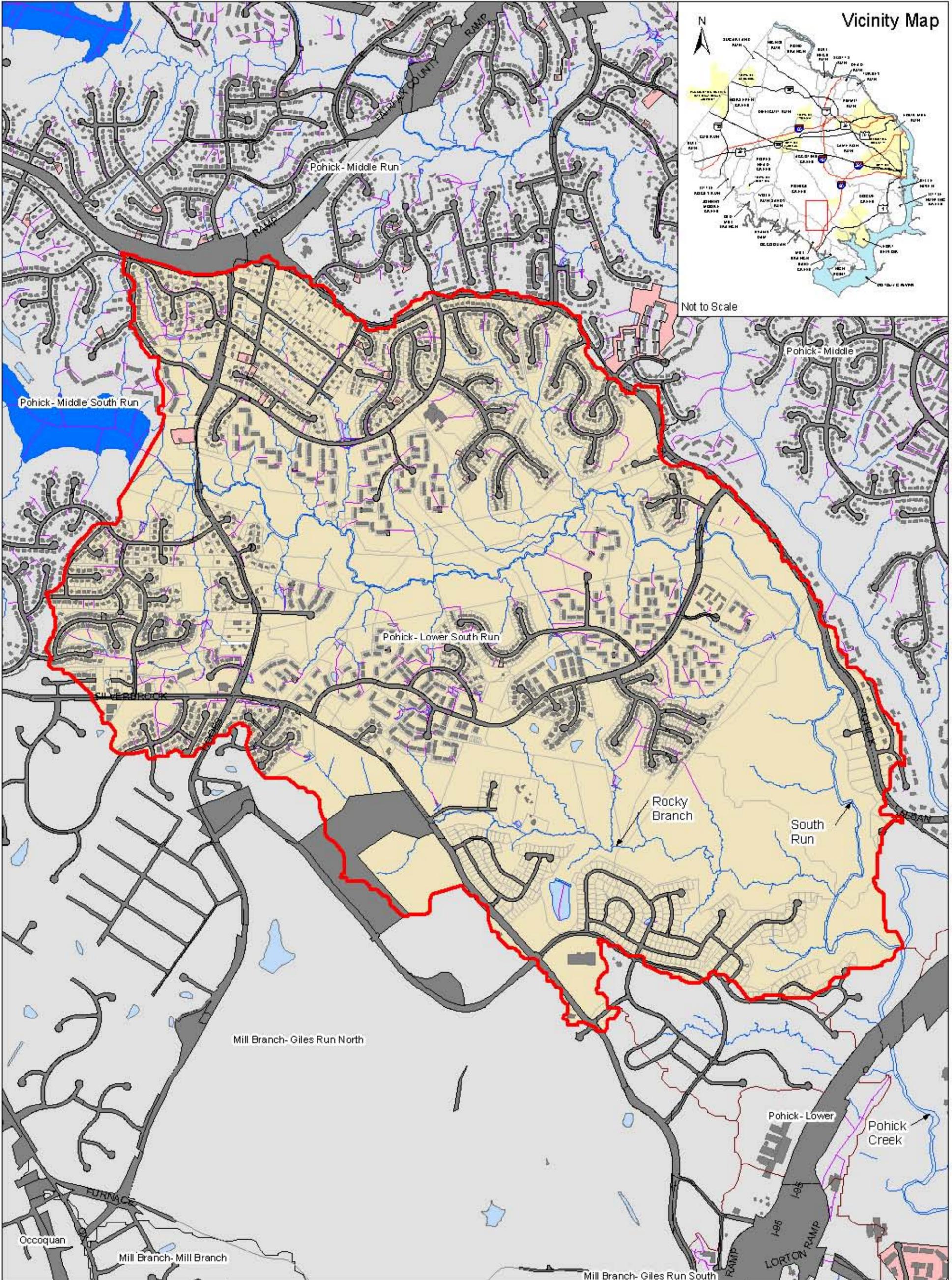


0 1,900 3,800 5,700 Feet

Legend

WMA Boundary	Estate Residential	Institutional
Open Space	Low Density Residential	Low Intensity Commercial
Forested	Medium Density Residential	High Intensity Commercial
Golf Course	High Density Residential	Industrial
	Transportation	Water

Map 2.2.5-1
Pohick Creek- Lower South Run
Existing and Future Land Use

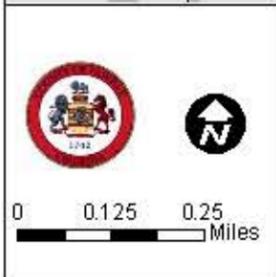
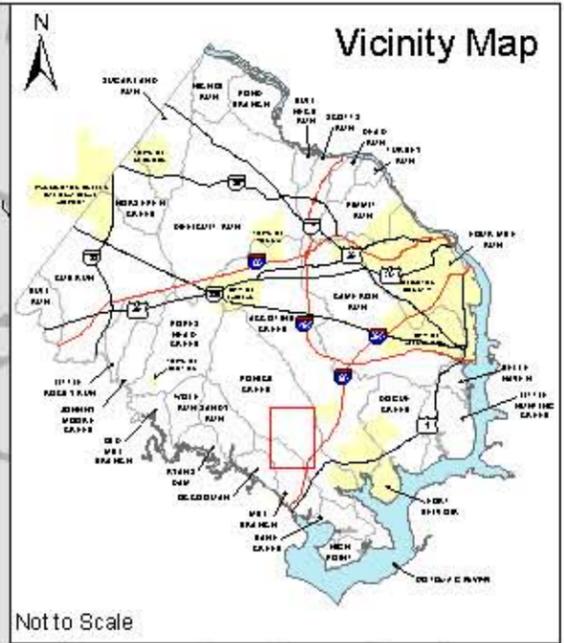
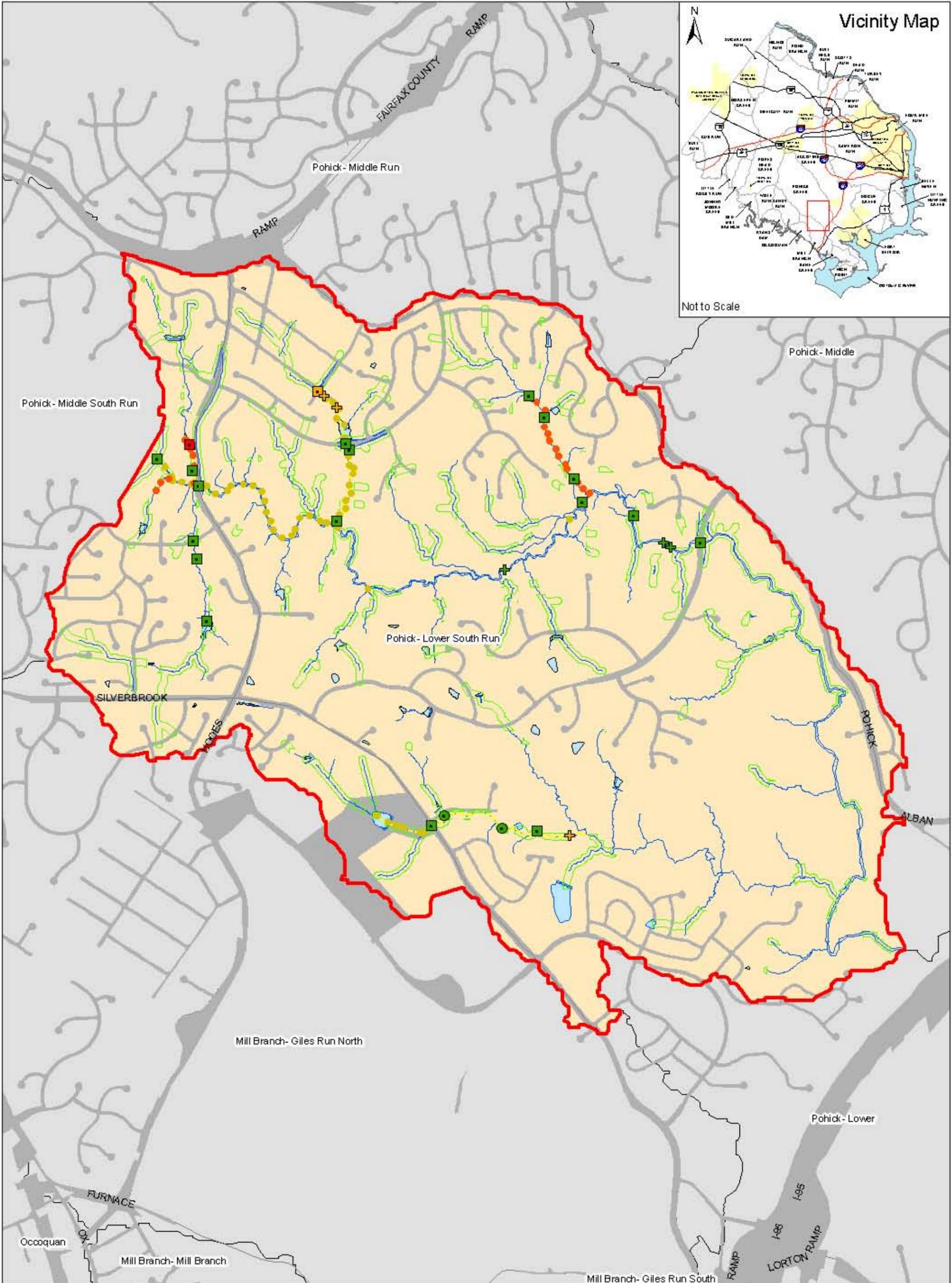


Legend

Storm Drainage	Roads	Drainage Complaints	VMA - Other
Rivers and Streams	Subbasins	Lake	Pohick - Lower South Run
	Buildings	Storm Drainage Facilities	

Map 2.2.5-2

Pohick Creek
Lower South Run
Stormwater Infrastructure



Legend

Poor/Very Poor Habitat	CEM - Type 2: Incision	Disturbed Buffer	Lake	Other WMA Boundaries
Streams and Rivers	CEM - Type 3: Widening	Roads	Storm Drainage Facilities	Pohick - Lower South Run
Erosion/Bank Instability				

Obstruction Impact	Dump Site Impact	Head Out Height	Ripe Impact	Ditch Impact	Utility Impact	Crossing Impact
Minor to Moderate	Minor to Moderate	0.5' - 1'	Minor to Moderate	Minor to Moderate	Minor to Moderate	Minor to Moderate
Moderate to Severe	Moderate to Severe	1' - 2'	Moderate to Severe	Moderate to Severe	Moderate to Severe	Moderate to Severe
Severe to Extreme	Severe to Extreme	> 2'	Severe to Extreme	Severe to Extreme	Severe to Extreme	Severe to Extreme

Map 2.2.5-3
Pohick Creek
Lower South Run
Stream Conditions

2.2.6 Middle Run

Field Reconnaissance

The Middle Run WMA is located in the central portion of the Pohick Creek watershed and contains a total of 12 subwatersheds. The Middle Run WMA is bounded on the north by Old Keene Mill Road and to the northeast roughly by Sydenstricker Road. The Fairfax County Parkway bisects the WMA to the east, with Lee Chapel Road bisecting the WMA on the western side. The Middle Run WMA is comprised primarily of multi-family attached/detached residential properties along with single family detached residential properties, including a host of subdivisions such as Orange Hunt Estates, Rolling Valley, Lake Forest, Whisperwood, Newington Woods, and Cherry Run.

The majority of the observed multi-family dwellings were constructed on estimated ¼ or smaller lots, featuring dead end alleys and cul-de-sac street alignments, while the single family detached properties were constructed on estimated ¼ acre lots with similar street alignments. The age of development in this WMA ranges from an estimated 25 to 20 years old (1980's) up to approximately 15 to 10 years old (1990's) with little evidence of recent infill development. Land cover consists primarily of impervious surface associated with residential development (i.e. rooftops, streets and driveways, sidewalks, etc.), including more compact development associated with multi-family housing units, and associated landscaping, including managed turf. Curb and gutter on streets was observed as almost universally present in the Middle Run WMA.

The Middle Run WMA includes Huntsman Lake, a PL-566 flood control structure completed in 1973. Observed stormwater management facilities in the Middle Run WMA consist primarily of dry detention basins, which are typically designed for stormwater volume control and not for water quality treatment. The Middle Run WMA contains several stream valley and other smaller parks, including Middle Run Stream Valley Park, Huntsman Park, Orange Hunt Estate Park, and Rolling Valley West Park. Among the non-residential land uses observed, Middle Run contains limited, low intensity commercial development, primarily associated with industries/activities supporting residential development, such as Huntsman Square. Institutional facilities in the Middle Run WMA include Cherry Run Elementary School, Sangster Elementary School, a park and ride facility along the Fairfax County Parkway, and several churches, including South Run Baptist Church and Sydenstricker Methodist Church.

Impervious Areas and Treatment Types

Increased impervious surfaces can result in channel erosion and downstream degradation. Water discharging from an impervious surface does not have time to slow down or infiltrate into the ground. This increases the quantity and velocity of stormwater runoff. This increased discharge into receiving waters begins to degrade the banks of the streams and instream habitat. It has been shown that levels of 10-20% impervious surface can significantly reduce the overall health of a stream (Annual Report, 2005). As one method of preventing stream degradation, stormwater management detention facilities are used throughout Fairfax County. By utilizing land use data and the contributing areas which drain to these stormwater management detention facilities, the County can identify areas of impervious surfaces and trace the flow path of the resulting discharges and quantify the treatment provided by the specific type of stormwater

management detention facility. Below are the four primary stormwater management facility types and treatment provided.

- *Quantity* -Detention storage facilities that only provide quantity control
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Utilizing the Technical Memorandum 3 guidance document, Table 19 below identifies the current and future impervious surface areas based on the existing and future land use conditions for Middle Run as well as the associated treatment types. See **Map 2.2.6-1** for existing and future land use for Middle Run. As expected Middle Run WMA is heavily developed and contains a large percentage of impervious areas. While Huntsman Lake is located in Middle Run, the WMA experiences one of the highest percentages of impervious areas within Pohick Creek.

Table 19: Middle Run Impervious Areas and Treatment Types

WMA Name	Percent Impervious				Current Treatment Types			
	Current Condition		Ultimate Condition		Quantity	Quality	Quantity/ Quality	None
	(acres)	%	(acres)	%	(acres)	(acres)	(acres)	(acres)
Middle Run	720.42	28.36	799.67	31.48	186.31	7.48	204.43	2141.96

Stormwater Infrastructure

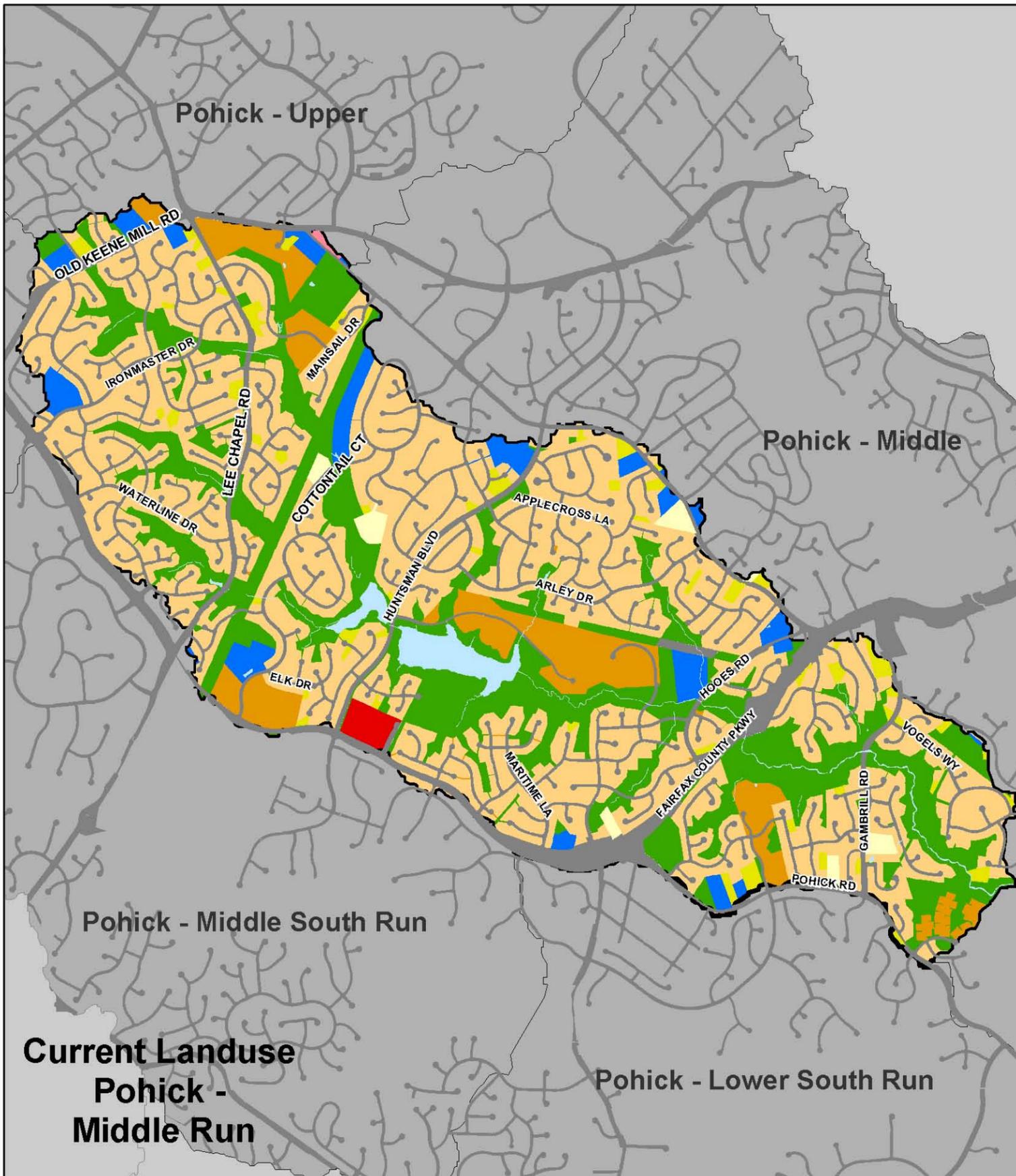
During the watershed’s development, a series of flood control lakes were constructed in the watershed between 1970 and 1985 under the federal Watershed Protection and Flood Prevention Act (PL 566) of 1954. These lakes (Lake Royal, Lake Barton, Woodglen Lake, Lake Braddock, Lake Mercer and Huntsman Lake) all provide significant flood control capacity in residentially developed areas. In addition to the PL 566 facilities, the Pohick Creek watershed also includes Burke Lake, a 218 acre recreational lake that serves as the centerpiece of Burke Lake Park.

Map 2.2.6-2 demonstrates the observed stormwater infrastructure conditions in the Middle Run WMA. Stormwater infrastructure consists primarily of curb and gutter stormwater collection leading to a piped network of storm drains discharging to either dry detention basins or directly into Middle Run and its associated stream valleys and tributaries. The Middle Run WMA contains approximately 37 dry detention facilities designed to manage stormwater quantity. In addition, the WMA contains two underground chambers and one infiltration trench for water quality management.

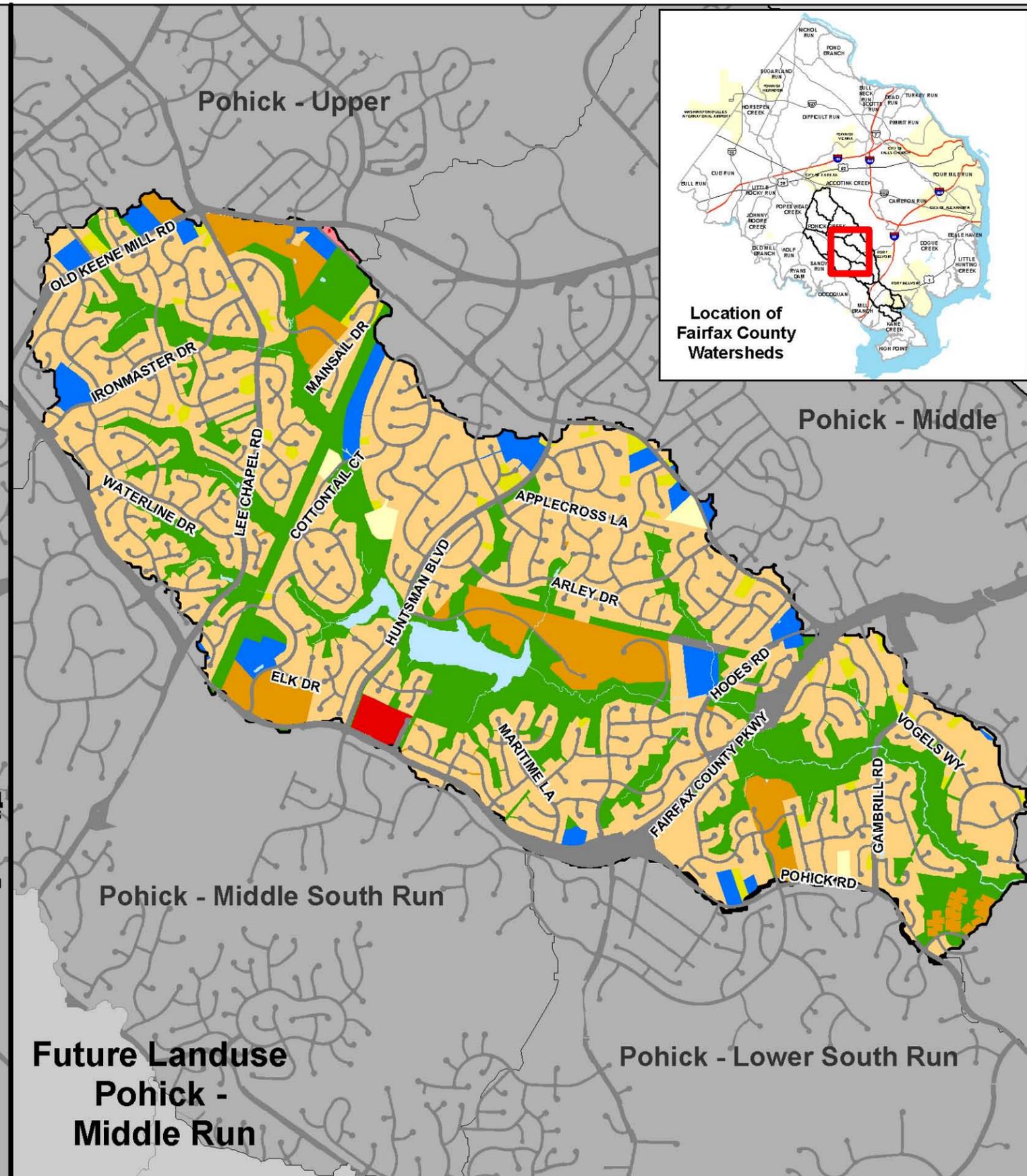
Stream Conditions

The Stream Conditions **Map 2.2.6-3** denotes the generally observed stream conditions as documented in the 2005 SPA and through additional, windshield level field reconnaissance performed for this study. The Stream Conditions Map demonstrates the general conditions of the main stem streams and tributaries in the WMA along with a series of features that typically impact stream condition, including stream channel erosion, channel widening, stream buffer condition, discharge pipe and ditch impacts, and utility and road crossing impacts.

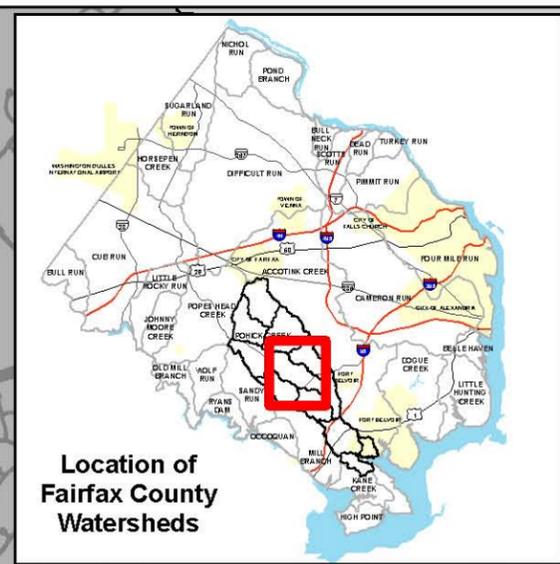
In the Middle Run WMA, the most prevalent stream condition features noted include disturbed stream buffers and stream channel widening. In addition, pipe discharge into the WMA's streams have a demonstrated impact as well, as these pipes discharge stormwater runoff directly into the streams in many instances, contributing to the observed widening conditions. Utility, road crossing, and obstructions noted in the Middle Run WMA generally had only a minor impact. No demonstrated stream head cutting, or an abrupt vertical drop in the bed of a stream channel that demonstrates active erosion (NC DWQ, 2005), were observed in this WMA



**Current Landuse
Pohick -
Middle Run**



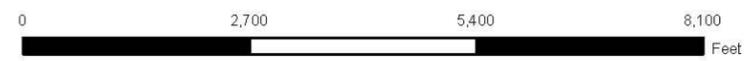
**Future Landuse
Pohick -
Middle Run**



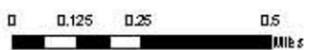
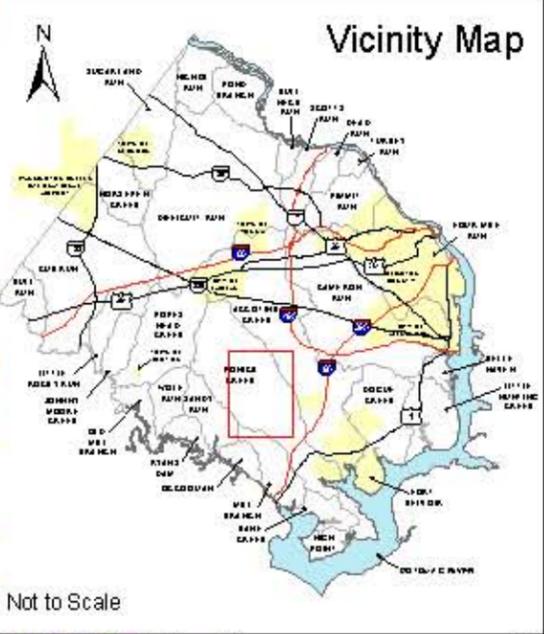
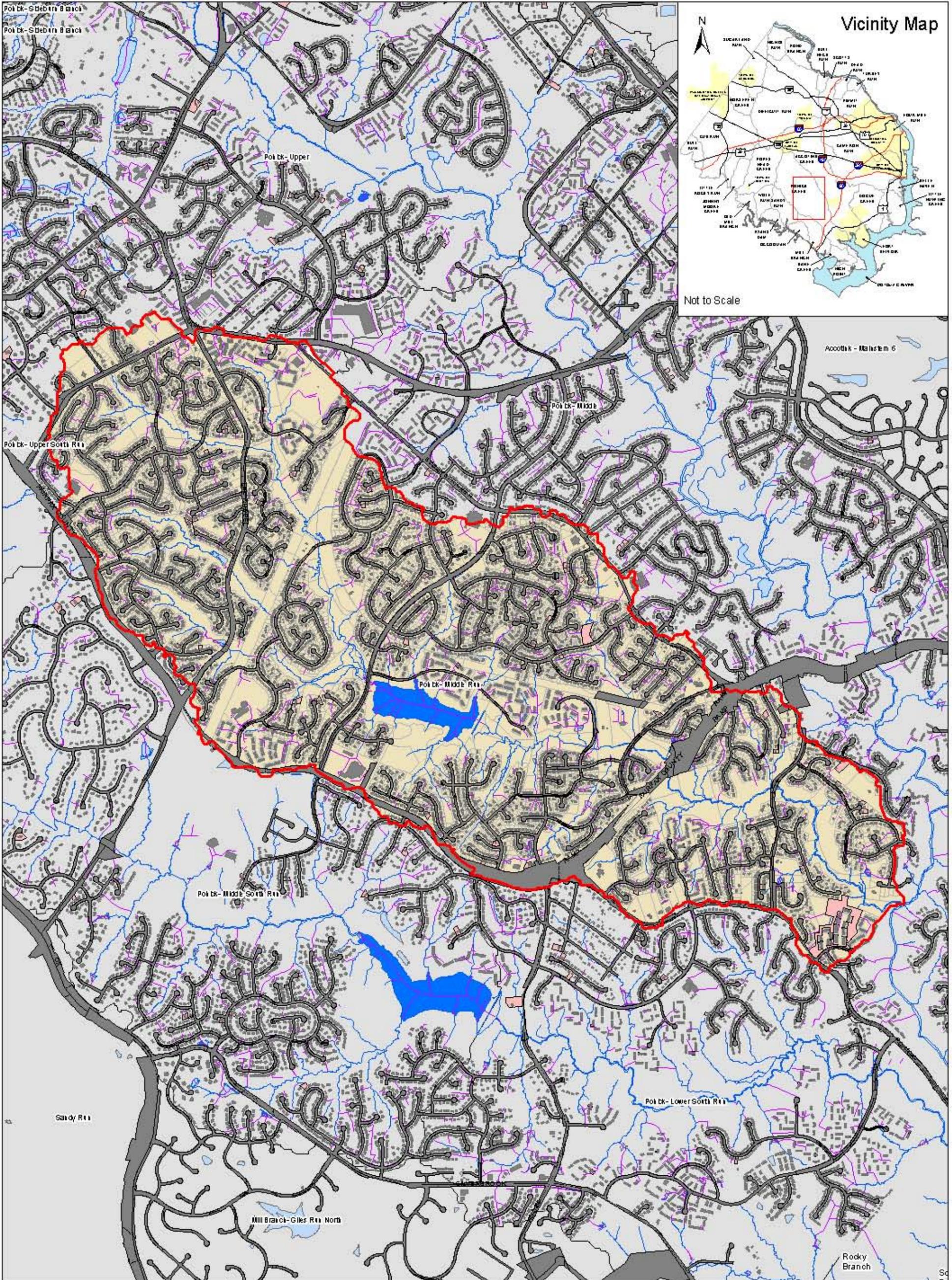
**Location of
Fairfax County
Watersheds**

Legend

- WMA Boundary
- Estate Residential
- Institutional
- Open Space
- Low Density Residential
- Low Intensity Commercial
- Forested
- Medium Density Residential
- High Intensity Commercial
- Golf Course
- High Density Residential
- Industrial
- Transportation
- Water



**Map 2.2.6-1
Pohick Creek- Middle Run
Existing and Future Land Use**



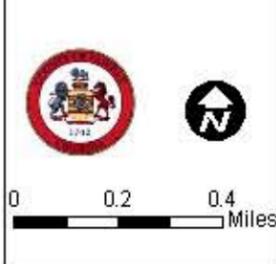
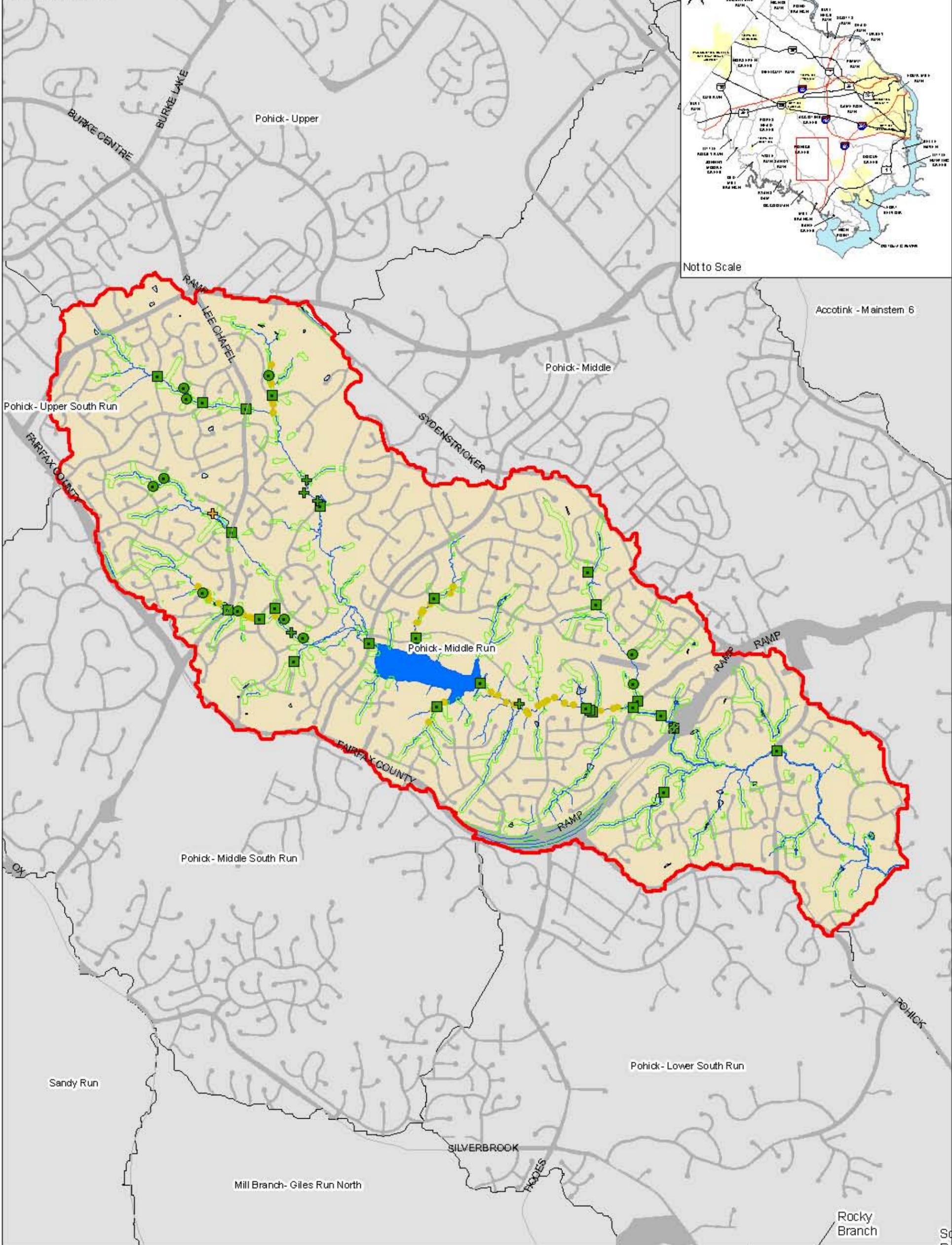
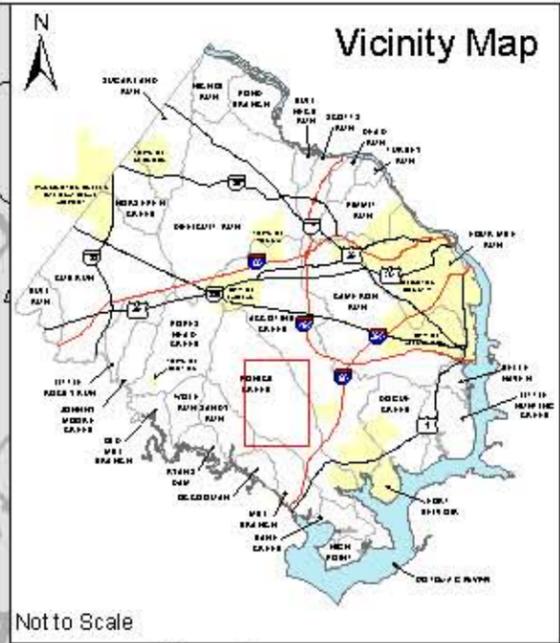
Legend

- Storm Drainage
- Rivers and Streams
- Roads
- Subbasins
- Buildings
- Drainage Complaints
- Lake
- Storm Drainage Facilities
- WMA - Other
- Pohick - Middle Run

Map 2.2.6-2

Pohick Creek
Middle Run
Stormwater Infrastructure

Pohick - Sideburn Branch
 Pohick - Sideburn Branch



Legend						
— Poor/Very Poor Habitat	● CEM - Type 2: Incision	□ Disturbed Buffer	■ Lake	□ Other WMA Boundaries		
— Streams and Rivers	● CEM - Type 3: Widening	■ Roads	■ Storm Drainage Facilities	■ Pohick - Middle Run		
■ Erosion/Bank Instability						
Obstruction Impact	Dump Site Impact	Head Cut Height	Pipe Impact	Ditch Impact	Utility Impact	Crossing Impact
⊕ Minor to Moderate	⊕ Minor to Moderate	● 0.5' - 1'	● Minor to Moderate	⊕ Minor to Moderate	⊕ Minor to Moderate	⊕ Minor to Moderate
⊕ Moderate to Severe	⊕ Moderate to Severe	● 1' - 2'	● Moderate to Severe	⊕ Moderate to Severe	⊕ Moderate to Severe	⊕ Moderate to Severe
⊕ Severe to Extreme	⊕ Severe to Extreme	● >2'	● Severe to Extreme	⊕ Severe to Extreme	⊕ Severe to Extreme	⊕ Severe to Extreme

Map 2.2.6-3

Pohick Creek Middle Run Stream Conditions

2.2.7 Pohick Creek-Upper

Field Reconnaissance

The Upper WMA is located in the northeastern headwaters of the Pohick Creek watershed and contains a total of 18 subwatersheds. The Upper WMA is bounded on the north by portions of Braddock Road; on the northeast by portions of Rolling Road, to the south by portions of Old Keene Mill Road; and on the west by portions of Guinea Road. The Upper WMA is bisected from southwest to northeast by Burke Lake Road and from east to west by the rail line that carries the Virginia Railway Express (VRE) through portions of Northern Virginia. The Upper WMA is comprised of the majority of the Burke area of Fairfax County, primarily of single family detached residential properties, with some significant multi-family residential development, in established neighborhoods including Lake Braddock, Dunleigh, Meadowbrook, Signal Hill, Rolling Valley West, Burke Heights, and Cardinal Glen.

The majority of the observed single family detached dwellings were constructed on lots estimated at ¼ acre or less with single family attached structures and multi-family developments more densely developed (well under ¼ acre per unit). As is the case in the majority of the Pohick Creek watershed, these developments are characterized by street patterns ending in cul-de-sacs with few through streets in the WMA. The age of development in this WMA ranges from an estimated 35 to 30 years old (1970's) up to approximately 5 to 10 years old (2000's) with some evidence of recent infill development in places. Land cover consists primarily of impervious surface associated with residential development (i.e. rooftops, streets and driveways, sidewalks, etc.) and associated landscaping, including managed turf. Curb and gutter are present almost universally in the Upper WMA.

The Upper WMA includes Lake Braddock, a PL-566 flood control structure completed in 1970. Observed stormwater management facilities in the Upper WMA include wet and dry detention/retention facilities as well as other facility types, including underground chambers. The Upper WMA also includes a portion of the Pohick Stream Valley Park and the Burke Station Park. Among the non-residential land uses observed, Upper contains commercial development, primarily associated with industries/activities supporting residential development, such as Burke Towne Plaza, Rolling Valley Mall, and Burke Village Center. Institutional facilities observed in the Upper WMA include the Burke Special Education Center, Lake Braddock High School, White Oak Elementary School, and the Rolling Road VRE station.

Impervious Areas and Treatment Types

Increased impervious surfaces can result in channel erosion and downstream degradation. Water discharging from an impervious surface does not have time to slow down or infiltrate into the ground. This increases the quantity and velocity of stormwater runoff. This increased discharge into receiving waters begins to degrade the banks of the streams and instream habitat. It has been shown that levels of 10-20% impervious surface can significantly reduce the overall health of a stream (Annual Report, 2005). As one method of preventing stream degradation, stormwater management detention facilities are used throughout Fairfax County. By utilizing land use data and the contributing areas which drain to these stormwater management detention facilities, the County can identify areas of impervious surfaces and trace the flow path of the

resulting discharges and quantify the treatment provided by the specific type of stormwater management detention facility. Below are the four primary stormwater management facility types and treatment provided.

- *Quantity* -Detention storage facilities that only provide quantity control
- *Quality*: -Detention storage facilities that only provide quality control
- *Quantity & Quality*:-Detention storage facilities that provide quantity + quality control
- *None*: -Areas that do not drain to detention facilities (uncontrolled runoff/no treatment), however some of these areas also are undeveloped open space and parks and therefore were not designed to capture and treat rainfall runoff.

Utilizing the Technical Memorandum 3 guidance document, Table 20 below identifies the current and future impervious surface areas based on the existing and future land use conditions for Upper as well as the associated treatment types. See **Map 2.2.7-1** for existing and future land use for Upper. As expected Upper WMA is fully developed and contains a large percentage of impervious areas. In addition, much of stormwater management treatment consists of quantity only which is consistent with older developments. Lake Braddock is located in Upper and along with many linear parks which follow the streams provide primarily the only open space in the WMA.

Table 20: Upper Impervious Areas and Treatment Types

WMA Name	Percent Impervious				Current Treatment Types			
	Current Condition		Ultimate Condition		Quantity (acres)	Quality (acres)	Quantity/ Quality (acres)	None (acres)
	(acres)	%	(acres)	%				
Upper	901.36	29.03	910.15	29.32	224.71	25.05	168.06	2686.88

Stormwater Infrastructure

During the watershed’s development, a series of flood control lakes were constructed in the watershed between 1970 and 1985 under the federal Watershed Protection and Flood Prevention Act (PL 566) of 1954. These lakes (Lake Royal, Lake Barton, Woodglen Lake, Lake Braddock, Lake Mercer and Huntsman Lake) all provide significant flood control capacity in residentially developed areas. In addition to the PL 566 facilities, the Pohick Creek watershed also includes Burke Lake, a 218 acre recreational lake that serves as the centerpiece of Burke Lake Park.

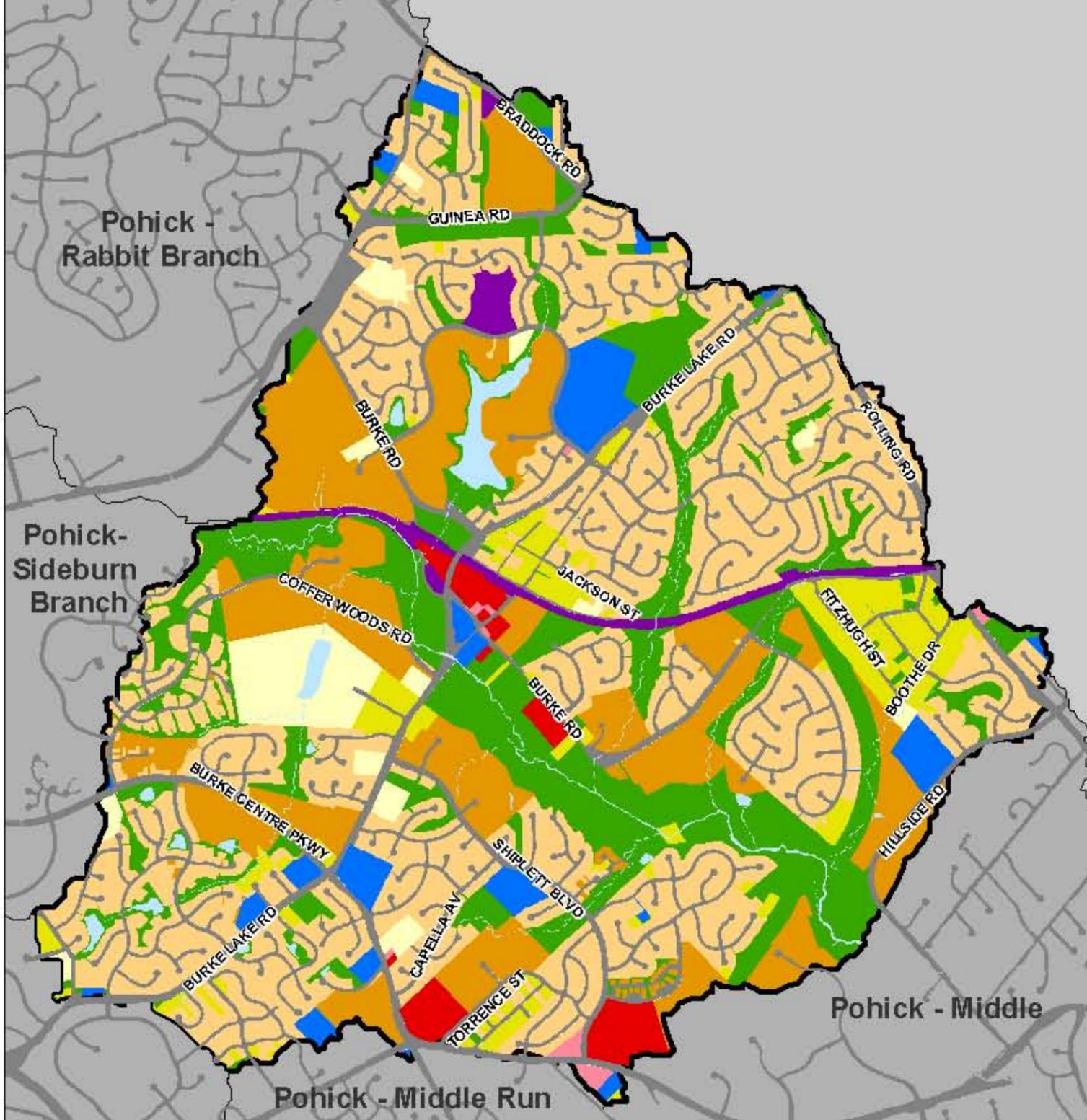
Map 2.2.7-2 demonstrates the observed stormwater infrastructure conditions in the Upper WMA. Stormwater infrastructure consists primarily of curb and gutter stormwater collection leading to a piped network of storm drains discharging to either dry detention basins or directly into the upper reaches of Pohick Creek and its associated stream valleys and tributaries. Some of the stormwater conveyance system in the Upper WMA consists of ditches as well. The Upper WMA contains a wide variety of stormwater management facilities and structures, including approximately 27 dry detention facilities designed to manage stormwater quantity. In addition, the WMA contains six underground chambers; four infiltration trench for water quality management; five rooftop detention facilities; seven wet retention basins; and one parking lot detention facility, which are typically designed to manage stormwater quantity only.

Stream Conditions

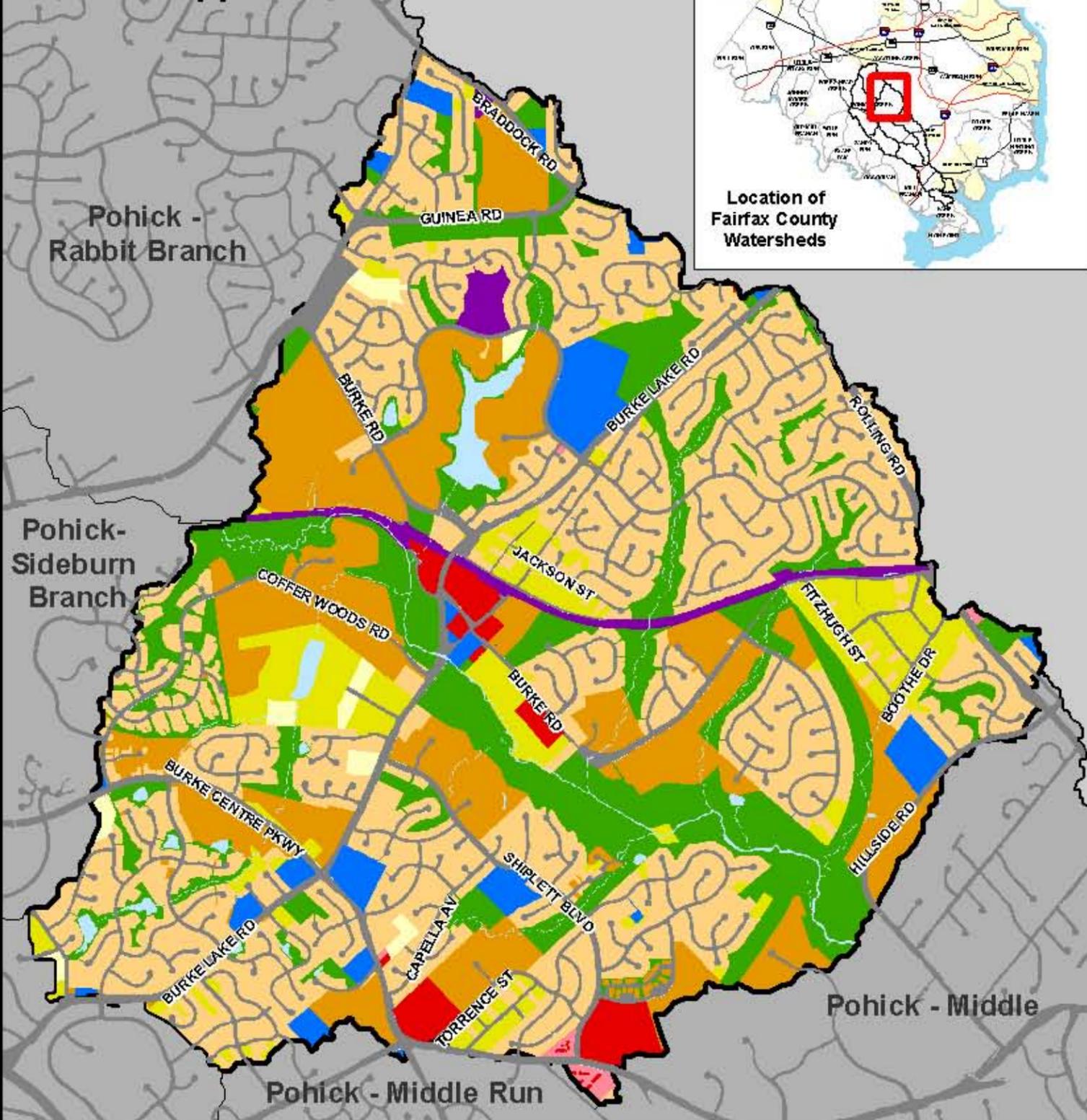
The Stream Conditions **Map 2.2.7-3** denotes the generally observed stream conditions as documented in the 2005 SPA and through additional, windshield level field reconnaissance performed for this study. The Stream Conditions Map demonstrates the general conditions of the main stem streams and tributaries in the WMA along with a series of features that typically impact stream condition, including stream channel erosion, channel widening, stream buffer condition, discharge pipe and ditch impacts, and utility and road crossing impacts.

In the Upper WMA, the most prevalent stream condition features noted include disturbed stream buffers and stream channel widening and erosion/incision. In addition, pipe and ditch discharge into the WMA's streams have a demonstrated impact as well, including some severe impacts on the main stem of Pohick Creek, as these pipes and ditches discharge stormwater runoff directly into the streams in many instances, contributing to the observed widening and erosion conditions. Upstream of Lake Braddock, several road crossing impacts are noted, with some severe. Road crossings and obstructions noted in the remainder of the Upper WMA generally had only a minor impact, with some notable exceptions upstream of a wet retention basin north of Burke Centre Drive. Isolated stream head cutting, or an abrupt vertical drop in the bed of a stream channel that demonstrates active erosion (NC DWQ, 2005), was observed at the confluence of a tributary to Pohick Creek and Pohick Creek itself downstream of Burke Lake Road.

Current Landuse Pohick - Upper



Future Landuse Pohick - Upper



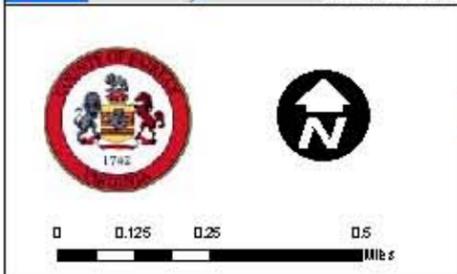
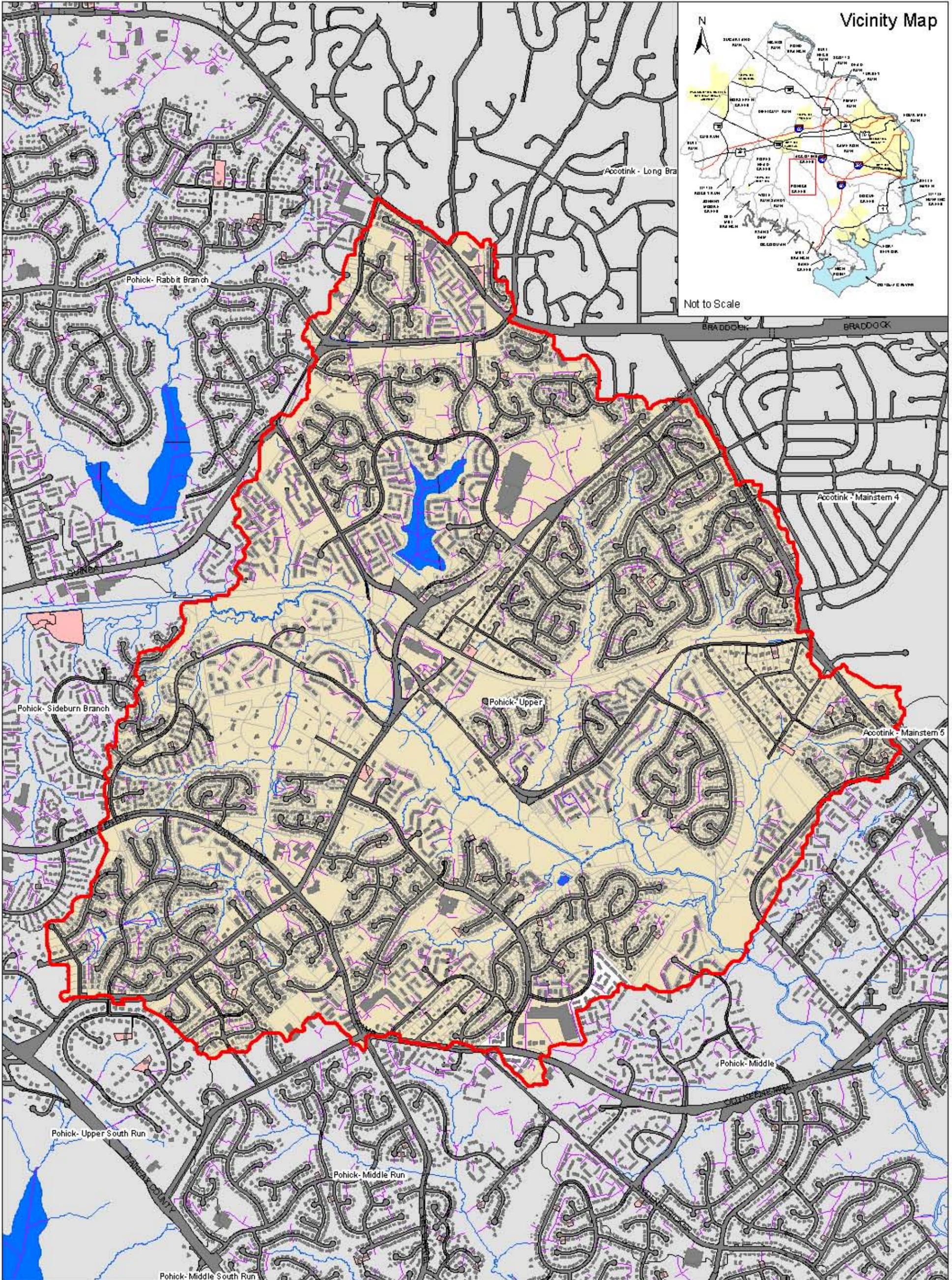
0 2,400 4,800 7,200 Feet

North arrow pointing up.

Legend

WMA Boundary	Estate Residential	Institutional
Agricultural	Low Density Residential	Low Intensity Commercial
Open Space	Medium Density Residential	High Intensity Commercial
Forested	High Density Residential	Industrial
Golf Course	Transportation	Water

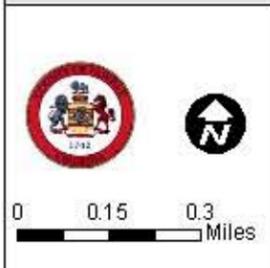
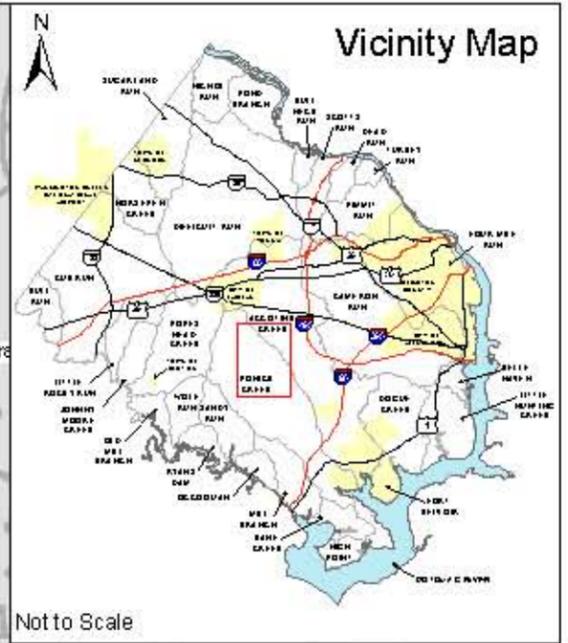
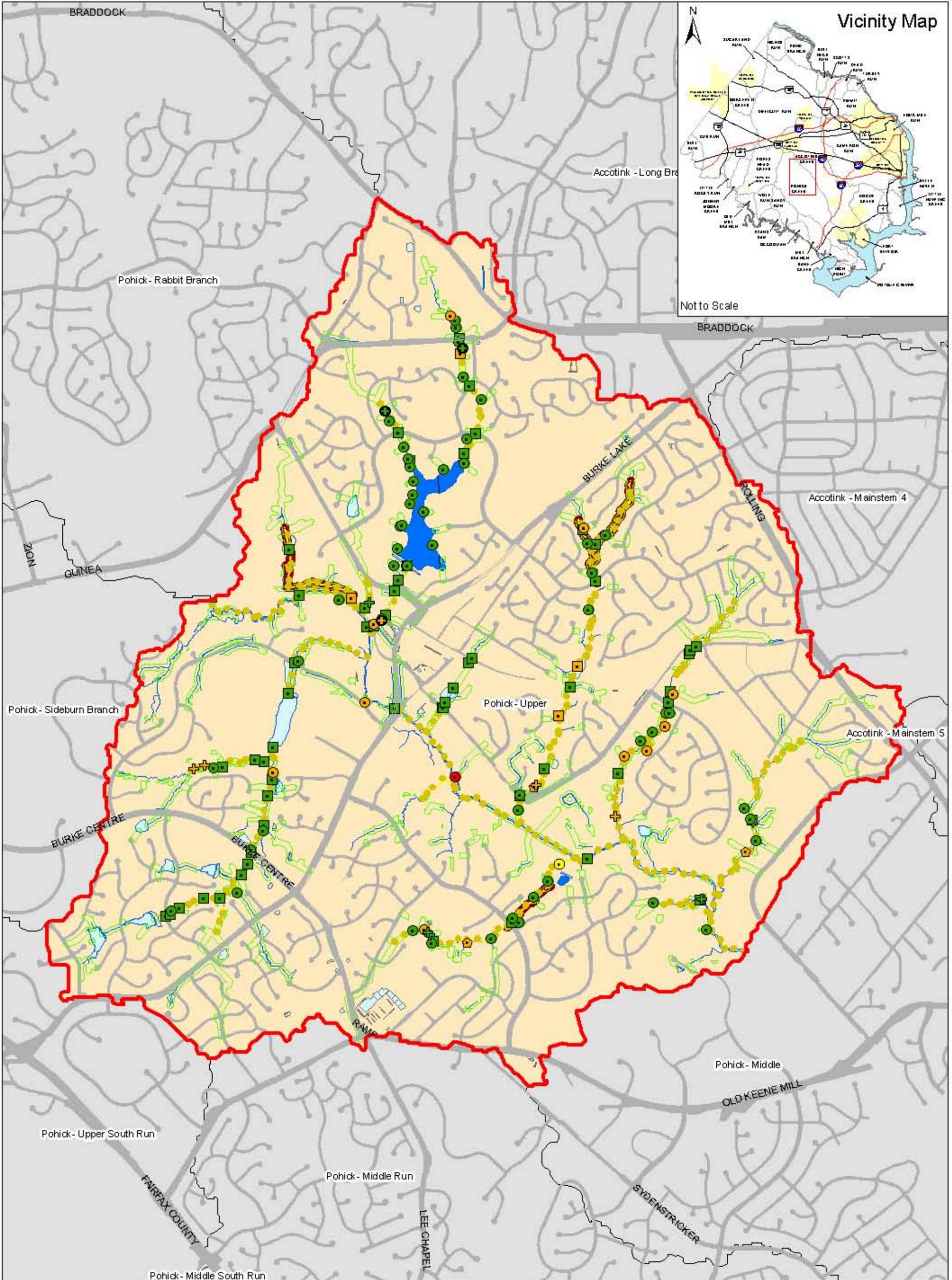
**Map 2.2.7-1
Pohick Creek- Upper
Existing and Future Land Use**



Legend

Storm Drainage	Roads	Drainage Complaints	WMA - Other
Rivers and Streams	Subbasins	Lake	Pohick - Upper
Buildings	Storm Drainage Facilities		

Map 2.2.7-2
 Pohick Creek
 Pohick Creek Upper
 Stormwater Infrastructure



Legend						
— Poor/Very Poor Habitat	● CEM - Type 2: Incision	□ Disturbed Buffer	■ Lake	□ Other WMA Boundaries		
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⊕ Severe to Extreme	⊕ Severe to Extreme	● > 2'	● Severe to Extreme	⊕ Severe to Extreme	⊕ Severe to Extreme	⊕ Severe to Extreme

Map 2.2.7-3
 Pohick Creek
 Pohick Creek Upper
 Stream Conditions