

Carsins Runs I-95 Section 200 Stream Restoration Site

Natural Resources Inventory

Prepared for
MDTA



Maryland
Transportation
Authority

Maryland Transportation Authority
2310 Broening Highway
Baltimore, Maryland 21224



KCI Technologies, Inc.
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1 INTRODUCTION

1.1 Project Description

The Maryland Transportation Authority is proposing stream restoration along approximately 1,500 linear feet of Carsins Run in Harford County, Maryland. As part of this effort, KCI Technologies, Inc. (KCI) developed this Natural Resources Inventory (NRI), including a forest stand delineation (FSD) and wetland delineation, to identify and characterize environmental resources that could potentially be impacted within the study area. KCI conducted a wetland investigation to determine the presence of wetlands and other “waters of the United States” (WUS) systems within the study area in accordance with the methodologies outlined in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0)* (Environmental Laboratory, 2012), and other relevant guidance documents. Additionally, KCI conducted an FSD to summarize forest species composition, apparent seral stage, degree of structural complexity, environmental condition, and ecosystem function of forest stands that could potentially be impacted within the study area. Forest stands throughout the study area were identified and delineated in accordance with the methodologies outlined in the *State Forest Conservation Technical Manual, Third Edition* (MDNR, 1997) and *Harford County Forest Cover Conservation and Replacement Manual* (Harford County Department of Planning and Zoning [HCDPZ], 1992).

Prior to the commencement of field activities, KCI reviewed readily available primary source materials to determine the presence or absence of natural resources within the study area. Relevant information found during this search is described in detail below and references utilized during the literature review are included as Appendix A to this report.

1.2 Study Area Description

The project study area extends along a 600-linear foot (LF) forested stream corridor that crosses Interstate 95 (I-95) north of the MD Route 22 interchange, and adjacent to Ripken Stadium. Carsins Run flows generally southeast through the study area, through a box culvert beneath I-95, and continues outside the study area to its eventual confluence with Swan Creek. The study area also includes an approximately 700-LF segment of an intermittent tributary to Carsins Run that originates at a wetland southeast of Ripken Stadium. The study area is surrounded by residential property and forested land. A Site Location Map depicting the study area is enclosed as Attachment 1 to this report.

2 METHODOLOGY

2.1 Review of Existing Data / Literature Review

Prior to conducting field activities, KCI reviewed readily available primary source materials including USGS maps, National Wetland Inventory (NWI) maps, Federal Emergency Management Agency (FEMA) floodplain data, and the city/county soil survey to determine the presence or absence of regulated natural resources (wetlands and streams) within the study area.

2.2 Wetland Delineation Methodology

KCI performed a field reconnaissance for the entire study area to determine the presence or absence of wetland areas during February 2018. Based upon this review, KCI determined that normal conditions were present on the site and that the "Routine Determination" method would be appropriate in order to identify wetland boundaries within the study area. In the field, wetland delineations were conducted using the criteria outlined in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0)* (Environmental Laboratory, 2012).

During the course of the field investigation, dominant plant species within suspected wetland areas were identified and recorded for each stratum present. The United States Army Corps of Engineers (USACE) *2016 National Wetland Plant List* (Lichvar, 2016) was used to determine the indicator status of the vegetation found within each community. KCI then characterized the plant community as hydrophytic or upland based upon the results of the Dominance Test and the Prevalence Index worksheets within the *Wetland Determination Data Form – Eastern Mountains and Piedmont Region*.

KCI assessed wetland hydrology within the study area based on the presence of one primary or two or more secondary hydrology indicators. Surface water inundation, depth to soil saturation, drift lines, water marks, and sediment deposits are some of the primary indicators listed in the *Wetland Determination Data Form – Eastern Mountains and Piedmont Region*. Secondary indicators include surface soil cracks, a sparsely vegetated concave surface, drainage patterns, and moss trim lines, as well as other less commonly found indicators.

Soil pits were typically excavated to a depth of approximately 18-24 inches, barring refusal, or immediately below the A-horizon. KCI recorded soil texture and the color of the matrix and any concretions or soft masses within a representative soil sample were assigned hue, value, and chroma utilizing the *Munsell Soil Color Charts* (Munsell, 2000). All soil samples were thoroughly investigated for the presence of redoximorphic features and/or hydric soil indicators included in *Field Indicators of Hydric Soils* (NRCS, 2016) and the *Wetland Determination Data Form – Eastern Mountains and Piedmont Region*. KCI then classified soils as hydric or non-hydric based upon the presence or absence of hydric soil characteristics and indicators.

KCI determined areas to be wetlands once all three wetland parameters (vegetation, hydrology, and soils), as described above, were identified (Environmental Laboratory, 1987 and 2012). When wetlands and streams were identified in the field, their boundaries were flagged along the wetland/upland interface or along the ordinary high water mark, respectively. Closed wetland systems were identified with a “WP” in the system name, while open or linear systems that extended outside of the study area were identified with a “WL” in the system name. Boundaries were marked in the field using consecutively numbered flagging tape, and flag locations were subsequently field located utilizing a total station survey apparatus. A map showing delineated wetlands and waterways is included as Appendix B to this report.

Vegetation, hydrologic, and soils data collected in the field, as well as information derived from the pre-fieldwork data review, were transferred to *Wetland Determination Data Forms - Eastern Mountains and Piedmont Region* in accordance with USACE protocols (1987 and 2012). Appendix C includes the Wetland Determination Data Forms for the upland and wetland sample plot locations and Stream Features Datasheets for WUS systems throughout the study area.

Representative photographs were taken throughout the study area and specifically of wetlands and stream systems in order to document field conditions at the time of the delineation. These photos have been included as Appendix E to this report.

2.3 Forest Stand Delineation Methodology

KCI identified and delineated forest stands throughout the study area in accordance with the methodologies outlined in the *State Forest Conservation Technical Manual, Third Edition* (MDNR, 1997) and the Harford County *Harford County Forest Cover Conservation and Replacement Manual (HCDPZ, 1992)*.

Preliminary field maps were generated in house for the entire subject property. These maps (Environmental Features and Forest Survey Maps) were prepared showing approximate boundaries of the forest stands delineated from aerial photographs, topography (steep slopes between 15 and 25% and greater than 25% are indicated), streams (intermittent and perennial), and wetlands and their buffers. The Environmental Features map marked with soils, steep slopes, forest buffers, land uses, critical habitat areas, and 100-year floodplains was used to assess any major forest stands present. Sample plot locations, individual specimen trees (trees with a diameter at breast height (DBH) over 30”, or having 75% of the DBH of current State champion of that species), champion trees, and forest structure data were marked on the Forest Survey Map with critical habitats, historic areas, net tract area, and forest circumference line. These field maps were used for later development of the FSD map.

KCI assessed the entire forested section of the project corridor to confirm the boundaries of the forest stands and to document stand condition. Forest stands under one acre in size were included in larger adjacent stands unless it was apparent that some unique characteristic (such as rare, threatened, or endangered species present) would make it critical to evaluate the stand as a separate entity.

A 1/10-acre fixed-plot method was used to document stand condition. The sample plots were determined based on size, topography, contiguity, and forest community features. Sample plots within stands were delineated by tying white and orange flagging to trees. After plots were delineated, the number and species of dominant and co-dominant trees, the percent canopy cover, the percent of understory cover, percent herbaceous ground cover, presence of exotic or invasive species, basal area, size of specimen trees, condition and health of stand, and understory species composition were recorded on the Forest Sampling Data Forms. A map showing delineated forest stands is included as Appendix B. Completed Forest Sampling Data Forms are included in Appendix C.

Priority retention areas were identified and labeled on the FSD map. Priority retention of stands is based on raking of high to low as described below.

- **High Priority** – includes areas within critical habitats for RTE species; areas associated within intermittent and perennial streams, slopes over 25%, hydric soils, highly erodible soils with a K value greater than 0.35 on slopes of 15% or more, and 100-year floodplain areas; stands with high structural diversity; contiguous forested areas of 100 acre that connect larger forests; forests within a corridor 300 feet wide between two larger forested tracts; forest stands that include specimen or champion trees or associated with a historic site.
- **Moderate Priority** – includes forests with good structural diversity, contiguous forests of 20 acre or more that connect to larger forests, forested stream buffers, and forest areas that provide a landscaping or buffer function.
- **Low Priority** – includes forest stands with poor structural diversity and areas with none of the characteristics listed above.
- **Disturbed** – includes forest stands with a high percentage of land cover with exotic or invasive species and none of the characteristic listed above.

Specimen trees within stands throughout the entire study corridor were identified in the field with white and orange flagging. Specimen trees and sample plot locations were documented using Global Positional System (GPS) with submeter accuracy. Specimen tree health was characterized using the following criteria:

Health	Characteristics
Excellent	Tree form normal for the species Full crown/no vines in crown No major branches dead Leaves normal size and color for the species, with no spotting or insect infestation No cracks in bark that expose the inner layers No weak branch union, cankers, decay No root severing, exposed roots, roots compacted from foot traffic, decay, dieback No invasive vines on tree (bittersweet, wild grape, poison ivy, English ivy)
Good	Competition from adjacent tree species but otherwise normal tree form for the

Health	Characteristics
	species 80-90% full crown/no vines in crown, <10% smaller branches dead >80% leaves normal size and color for the species, <10% spotting, less than 5% insect infestation > 10% of tree has cracks in bark that are 4” in diameter No weak branch union, cankers, decay No root severing, exposed roots, roots compacted from foot traffic, decay, dieback No invasive vines on tree (bittersweet, wild grape, poison ivy, English ivy)
Fair	Tree has lost a major limb or is leaning to one side <75% full crown/vines may be present in crown <30% of branches may have dead wood >60% leaves normal size and color for the species, >20% spotting on leaves >30% of tree has cracks in bark that are 4” or greater in diameter Weak branch union is present, cankers present, decay, present One or more root problem is present but does not appear to be causing tree dieback One or more invasive vines (bittersweet, wild grape, poison ivy, English ivy) are present and competing with crown growth Presence of Insect infestation appears to be causing tree dieback
Poor	Tree has lost major limbs and is leaning to one side <50% full crown/vines are dominant in crown >50% of branches may have dead wood <50% leaves normal size and color for the species, >40% spotting on leaves >50% of tree has cracks in bark that are 4” or greater in diameter Weak branch union is present, cankers present, decay, present One or more root problems are present and appears to be causing tree dieback Invasive vines on tree (bittersweet, wild grape, poison ivy, English ivy) are present and are dominating over crown growth Presence of Insect infestation appears to be causing tree dieback

Note: Trees may have one or more of the characteristics listed under each category.

Representative site photographs were taken throughout the study area and of each sample plot within the forest stands. These photos have been included as Appendix E to this report.

MDTA submitted inquiries requesting information regarding the possibility of rare, threatened, and endangered species within or adjacent to the study area to the United States Fish and Wildlife Service (USFWS) and Maryland Department of Natural Resources (MDNR) in February 2018. An inquiry letter has also been sent to the Maryland Historical Trust (MHT) in regards to possible historical areas within the limits of the study area and adjacent land. USFWS did not identify RTE species within the project area. The responses from MDNR and MHT are currently pending. Copies of the correspondence with MHT, MDNR, and USFWS are included as Appendix F.

3 RESULTS

3.1 Literature Review Results

3.1.1 Watershed and Land Use

The study area is located within the Swan Creek watershed (02130706). Carsins Run flows through the study area. The Maryland Surface Water Use Designation for Carsins Run and all its tributaries in this area is “Use I”, pursuant to which they are protected for “water contact recreation and protection of nontidal, warmwater, aquatic life” (COMAR 26.08.02.08). Due to this designation, in-stream work may not be conducted during the period of March 1 through June 15, inclusive, during any year (COMAR 26.08.02.11). Additionally, KCI reviewed Maryland’s High Quality Waters (Tier II) list to identify any Tier II waters within the study area. No Tier II waters were identified in the study area (MDE, 2010). According to the Maryland 303(d) list of impaired waterways, the Swan Creek watershed is listed as Category 5 – impaired for phosphorus and total suspended solids.

The Maryland Department of Planning, Land Use/Land Cover geographic information systems (GIS, 2011) indicated the majority of the study area, and its immediate surroundings, is classified as “Forest” (Code 41), “Low Density Residential” (Code 11), “Commercial” (Code 14), and Transportation (80).

3.1.2 Topography

The study area is located within the Piedmont Physiographic Province. According to a review of the *Aberdeen, Maryland 7.5’ Topographic Quadrangle* (United States Geological Survey, 2016) and other sources, the topography within the study area is moderately sloping to the east and south. Elevations range from approximately 180 feet above mean sea level (MSL) at the southern end of the study area to 210 feet above MSL at the western end of the study area. A copy of the relevant USGS quadrangle map for the study area is included as Attachment 2 to this report.

3.1.3 Soils

According to the *Soil Survey of Harford County, Maryland* (United States Department of Agriculture-Soil Conservation Service [USDA-SCS], 1975) and more recently available digital Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO) soils data for the County (NRCS Web Soil Survey, 2018), the predominant soil association found within the vicinity of the study area is the Codorus-Hatboro-Alluvial Land Association. Soils in this association are described as deep, nearly level, moderately well drained to very poorly drained soils that are underlain by stratified alluvial sediment on floodplains. Within this association, six distinct soil units are present within the study area:

- Aldino silt loam, 3-8% slopes (AdB)
- Alluvial land (Av)
- Codorus silt loam (Cu)

- Delanco silt loam, 3-8% slopes (DcB)
- Elsinboro loam, 2-5% slopes, moderately eroded (EsB2)
- Montalto silt loam, 8-15% slopes, moderately eroded (MsC2)

Mapped soil units are classified hydric based upon their listing on the National Hydric Soils List by State (USDA-NRCS, continuously updated) and the State and County lists in the web soil survey (NRCS Web Soil Survey, 2018). Hydric soils are defined as those soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile. The table below summarizes hydric components of soils within the study area as listed in either the National Hydric Soils List by State or the web soil survey.

Soil Series	Hydric (Y/N)	Hydric Component	Percent of map unit
Aldino silt loam, 3-8% slopes (AdB)	No	Watchung	5%
Alluvial land (Av)	Yes	Alluvial Land	100%
Codorus silt loam (Cu)	No	Hatboro	15%
Delanco silt loam (DcB)	No	N/A	N/A
Elsinboro loam, 2-5% slopes, moderately eroded (EsB2)	No	N/A	N/A
Montalto silt loam, 8-15% slopes, moderately eroded (MsC2)	No	N/A	N/A

A copy of the soil survey map for the study area is included as Attachment 3 to this report.

3.14 National Wetlands Inventory

The *National Wetlands Inventory (NWI) Map for Aberdeen, Maryland* (U.S. Fish and Wildlife Service [USFWS], 1981-2016) identifies Carsins Run and an adjacent wetland as palustrine, forested, broad-leaved deciduous, temporarily flooded (PFO1A) systems within the study area. Attachment 4 shows the locations of NWI-classified wetlands in the vicinity of the study area.

3.1.5 FEMA-Designated Floodplains

According to a review of Federal Emergency Management Agency (FEMA) Q3 Flood Data, the study area is within the 100-year floodplain associated with Carsins Run (*FEMA Panel No. 24025C0191E*) and (*FEMA Panel No. 24025C0193E*). Attachment 5 shows the locations of FEMA-designated floodplains in the vicinity of the study area.

3.2 Wetland and Waters of the U.S. Field Investigation Results

The field investigation performed during February 2018 located two nontidal wetland systems, two perennial streams, and one intermittent stream, classified as “waters of the U.S.” Additionally, three ephemeral channels were identified within the study area. Information concerning these wetlands and streams is outlined below and included in the appendices to this report.

3.2.1 Waters of the U.S.

WUS WL001 (Perennial)

WUS WL001 (Flags WL001-001 to WL001-017A/B), Carsins Run, is a nontidal, perennial stream that enters the study area from the northwest, flows generally southeast, beneath I-95 through a box culvert, and continues outside of the study area to its confluence with Swan Creek. Approximately 1,197 LF of this stream is within the study area. This perennial stream had an approximate bankfull width of 12 feet with an average bankfull depth of 12 inches and an observed water depth of 6 inches at the time of the site investigation. WUS WL001 is identified on the *National Wetland Inventory Map for Aberdeen, Maryland* (USFWS, 1981-2016) as a palustrine, forested, broad-leaved deciduous, temporarily flooded (PFO1A) wetland system. Based on the field investigation, the Cowardin Classification for Carsins Run is riverine, lower perennial, unconsolidated bottom, cobble-gravel/sand (R2UB1/2).

More information regarding WUS WL001 can be found in the appendices of this report.

Waterway WL002 (Ephemeral)

Waterway WL002 (Flags WL002-001 to WL002-002A/B) is a nontidal, ephemeral channel west of Randolph Drive in the northern extents of the study area. Waterway WL002 originates at a stormwater outfall and conveys flow southwest to its confluence with WUS WL001. Approximately 13 LF of this stream is within the study area. This ephemeral channel had an approximate bankfull width of 4 feet with an average bankfull depth of 4 inches and an observed water depth of 1 inch at the time of the site investigation. Waterway WL002 is not identified on the *National Wetland Inventory Map for Aberdeen, Maryland* (USFWS, 1981-2016).

More information regarding Waterway WL002 can be found in the appendices of this report.

WUS WL003 (Intermittent)

WUS WL003 (Flags WL003-001 to WL003-039A/B) is a nontidal, intermittent stream that originates at a wetland northwest of I-95, west of WUS WL001 and Waterway WL004, and flows generally northeast to its confluence with WUS WL001. Approximately 928 LF of this stream is within the study area. This intermittent stream had an approximate bankfull width of 2 feet with an average bankfull depth of 12 inches and an observed water depth of 2 inches at the time of the site investigation. WUS WL003 is not identified on the *National Wetland Inventory Map for Aberdeen, Maryland* (USFWS, 1981-2016). Based on the field investigation, the Cowardin Classification for this system is riverine, intermittent, streambed, cobble-gravel/sand (R4SB3/4).

More information regarding WUS WL003 can be found in the appendices of this report.

Waterway WL004 (Ephemeral)

Waterway WL004 (Flags WL004-001 to WL004-008A/B) is a nontidal, ephemeral channel that originates as overflow from WUS WL003, northwest of I-95, and flows generally northeast to its confluence with WUS WL001. Approximately 136 LF of this channel is within the study area. This ephemeral channel had an approximate bankfull width of 1.5 feet with an average bankfull depth of 4 inches and an observed water depth of less than 0.5 inch at the time of the site investigation. Waterway WL004 is not identified on the *National Wetland Inventory Map for Aberdeen, Maryland* (USFWS, 1981-2016).

More information regarding Waterway WL004 can be found in the appendices of this report.

WUS WL005 (Perennial)

WUS WL005 (Flags WL005-001 to WL005-005A/B) is a nontidal, perennial stream that originates at Carsins Run at a split with WL001, flows generally south, and continues outside of the project area. This channel appears to convey the majority of the Carsins Run flow into a large wetland system (WL008), although the mapped Carsins Run takes a southwest turn. Approximately 47 LF of this stream is within the study area. This perennial stream had an approximate bankfull width of 15 feet with an average bankfull depth of 10 inches and an observed water depth of 8 inches at the time of the site investigation. WUS WL005 is identified on the *National Wetland Inventory Map for Aberdeen, Maryland* (USFWS, 1981-2016) as part of a palustrine, forested, broad-leaved deciduous, temporarily flooded (PFO1A) wetland system. Based on the field investigation, the Cowardin Classification for this system is riverine, lower perennial, unconsolidated bottom, cobble-gravel/sand (R2UB1/2).

More information regarding WUS WL005 can be found in the appendices of this report.

Waterway WL006 (Ephemeral)

Waterway WL006 (Flags WL006-001 to WL006-005A/B) is a nontidal, ephemeral channel that originates within Wetland WL008, southeast of I-95, and conveys flow generally south to its confluence with Carsins Run. Approximately 138 LF of this stream is within the study area. This ephemeral channel had an approximate bankfull width of 2 feet with an average bankfull depth of 4 inches and an observed water depth of less than 1 inch at the time of the site investigation. Waterway WL006 is not identified on the *National Wetland Inventory Map for Aberdeen, Maryland* (USFWS, 1981-2016).

More information regarding Waterway WL006 can be found in the appendices of this report.

3.2.2 Nontidal Wetlands

Wetland WL007 (Flags WL007-001 to WL007-018)

Wetland WL007 is a palustrine, forested, broad-leaved deciduous, temporarily flooded (PFO1A) wetland at the headwaters of WUS WL003, generally east of Ripken Stadium. Approximately 0.365 acre of this wetland is within the study area. Wetland WL007 receives hydrology from overland flow from and outlets in an easterly direction to WUS WL003. This wetland is not identified on the *National Wetland Inventory Map for Aberdeen, Maryland* (USFWS, 1981-2016).

KCI collected information from a sample plot within Wetland WL007 (Plot WL007-WET) in order to properly classify the predominant vegetation, soil characteristics, and hydrologic indicators. Vegetative cover in close proximity to the sample plot is dominated by red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), Japanese stilt grass (*Microstegium vimineum*), multiflora rose (*Rosa multiflora*), and poison ivy (*Toxicodendron radicans*). Sweet gum (*Liquidambar styraciflua*) is also noted within the plot; therefore, sample plot WL007-WET satisfies the hydrophytic vegetation criterion. Hydrologic indicators in the wetland include saturation, water-stained leaves, oxidized rhizospheres on living roots, and drainage patterns.

Soil characteristics within Wetland WL007 are summarized in the following table:

Depth (inches)	Texture	Matrix	Redox Features
0-8	Silt clay loam	10YR 4/2	10YR 2/1, depletions in the matrix 7.5YR 4/4, concentrations in the matrix/pore linings
8-20	Silt clay loam	2.5Y 6/1	10YR 5/2, concentrations in the matrix 10YR 5/8, concentrations in the matrix 10YR 3/2, concentrations in the matrix 7.5YR 4/4, concentrations in the matrix/pore linings
20-24	Clay loam	2.5Y 6/1	10YR 6/8, concentrations in the matrix 10YR 3/2, concentrations in the matrix 10YR 4/4, concentrations in the matrix

Hydric soil indicators were identified within the soil profile; therefore, sample plot WL007-WET satisfies the hydric soils criterion.

In addition to a sample plot within the wetland, one upland data point (UPL-1) was taken in close proximity to Wetland WL007 to classify the surrounding upland area.

Vegetation at UPL-1 consists primarily of white oak (*Quercus alba*), American beech (*Fagus grandifolia*), ironwood (*Carpinus caroliniana*), northern spicebush (*Lindera benzoin*), Japanese honeysuckle (*Lonicera japonica*), poison ivy, and fox grape (*Vitis labrusca*). Other vegetation identified within the sample plot included sweetgum (*Liquidambar styraciflua*), eastern red cedar (*Juniperus virginiana*), black gum (*Nyssa sylvatica*), tulip poplar (*Liriodendron tulipifera*),

meadow garlic (*Allium canadense*), and Japanese stilt grass. Sample plot UPL-1 does not satisfy the hydrophytic vegetation criterion.

Soil characteristics at UPL-1 are summarized in the following table:

Depth (inches)	Texture	Matrix	Redox Features
0-10	Silt loam	10YR 4/4	7.5YR 4/4, concentrations in the matrix
10-24	Silt loam	7.5YR 4/6	10YR 3/3, concentrations in the matrix

Hydric soil indicators were not identified within the soil profile; therefore, sample plot UPL-1 does not satisfy the hydric soils criterion. No wetland hydrologic indicators were present in close proximity to upland sample plot UPL-1. Sample Plot UPL-1 does not satisfy the three mandatory wetland criteria; therefore, this area was classified as upland.

More information regarding the soils, vegetation, and hydrology found within Wetland WL007 and the adjacent upland can be found in the appendices to this report.

Wetland WL008 (Flags WL008-001 to WL008-010)

Wetland WL008 is a palustrine, forested, broad-leaved deciduous, temporarily flooded (PFO1A) southeast of I-95, northeast of WUS WL001. Approximately 0.017 acre of this wetland is within the study area. Wetland WL008 receives hydrology from groundwater and overland flow and outlets in a southerly direction towards Carsins Run. This wetland is identified on the *National Wetland Inventory Map for Aberdeen Maryland* (USFWS, 1981-2016) as a palustrine, forested, broad-leaved deciduous, temporarily flooded (PFO1A) wetland.

KCI collected information from a sample plot within Wetland WL008 (Plot WL008-WET) in order to properly classify the predominant vegetation, soil characteristics, and hydrologic indicators. Vegetative cover in close proximity to the sample plot is dominated by red maple, black gum, American beech, and sedge species (*Carex* species). Other vegetation identified within the sample plot included sweetgum, ironwood, and white oak. Hydrologic indicators in the wetland include saturation and oxidized rhizospheres on living roots.

Soil characteristics within Wetland WL008 are summarized in the following table:

Depth (inches)	Texture	Matrix	Redox Features
0-8	Silt clay loam	10YR 4/1	10YR 4/4, concentrations in the matrix/pore linings 10YR 6/1, concentrations in the matrix
8-12	Silt clay loam	10YR 5/1	10YR 4/1, concentrations in the matrix 10YR 5/6, concentrations in the matrix/pore linings 10YR 6/6, concentrations in the matrix
12+	Refusal due to rock		

Hydric soil indicators were identified within the soil profile; therefore, sample plot WL008-WET satisfies the hydric soils criterion.

In addition to a sample plot within the wetland, one upland data point (UPL-2) was taken in close proximity to Wetland WL008 in order to classify the surrounding upland area. Vegetation at UPL-2 consists primarily of red maple, American beech, sedge species, and Japanese stilt grass. Other vegetation identified within the sample plot included eastern red cedar, black gum, and sweetgum. Sample Plot UPL-2 satisfies the hydrophytic vegetation criterion.

Soil characteristics at UPL-2 are summarized in the following table:

Depth (inches)	Texture	Matrix	Redox Features
0-6	Medium sand	10YR 3/3	10YR 4/4, concentrations in the matrix
6-12	Silt loam	10YR 4/3	N/A
12-20	Silt clay loam	2.5Y 5/4	2.5Y 5/3, concentrations in the matrix 10YR 5/6, concentrations in the matrix 10YR 6/6, concentrations in the matrix 10Y 3/2, concentrations in the matrix

Hydric soil indicators were not identified within the soil profile; therefore, sample plot UPL-2 does not satisfy the hydric soils criterion. Hydrologic indicators identified within the upland plot include saturation. The sample plot satisfies the hydrology criterion. Sample plot UPL-2 satisfies only two of the three mandatory wetland criteria; therefore, this area was classified as upland.

More information regarding the soils, vegetation, and hydrology found within Wetland WL008 and the adjacent upland can be found in the appendices to this report.

3.3 Forest Stand Delineation Results

This section documents forest stand conditions as field delineated on February 6, 2018, within the vicinity of the proposed Carsins Run Stream Restoration project. As part of this effort, KCI reviewed readily available information regarding environmental resources within the study area and conducted an FSD to determine the potential for impacts to forest resources within the study area.

The field investigation performed on February 6, 2018, generally confirmed the information gathered from the literature review performed prior to commencement of fieldwork activities. Specifically, existing land uses, topography, soils, and floodplain locations were generally similar to what is recorded on existing, readily available information for the study area. Additional information concerning the forest stands and natural resources is outlined below and in the appendices to this report.

3.3.1 Forest Stands

Two forest stands were identified onsite. A 1/10 acre fixed plot sampling technique was used to sample forest stand conditions at five points onsite (see Forest Sampling Data Forms in Appendix D). Sample points were chosen randomly within the two identified stands.

Overall, the health of the forest stands was determined to be good with no significant sign of disease or widespread colonization of exotic plant species observed. No rare, threatened, or endangered species were observed.

Forest Stand A

Stand A (Mixed Hardwood) occupies approximately 2.59 acres within the study area and is located northeast of I-95. This early-mid successional deciduous stand is bounded by I-95 to the south, Gilbert Road to the north, Ripken Stadium to the west, and Randolph Drive to the east.

Stand A is dominated by tulip poplar, sweetgum, white oak, pignut hickory (*Carya glabra*), American beech, and red maple in the 12 to 29.9-inch size classes. Ironwood, common greenbrier (*Smilax rotundifolia*), fox grape, northern spicebush, American beech, Japanese barberry (*Berberis thunbergii*), and hawthorn species (*Crataegus* species) are the dominant understory and shrub species. The herbaceous layer is dominated by Japanese honeysuckle, meadow garlic, multiflora rose, and Japanese stilt grass.

Nineteen specimen trees were found during the field survey and are listed in the table below. Each tree was assessed and the health of the trees is listed in the table below.

Specimen Trees			
ID	Species	Size	Condition
SP-2	<i>Quercus rubra</i>	30.0	Good
SP-3	<i>Liriodendron tulipifera</i>	33.0	Good
SP-4	<i>Quercus alba</i>	31.0	Fair
SP-5	<i>Fraxinus pennsylvanica</i>	31.0	Fair
SP-6	<i>Fraxinus pennsylvanica</i>	30.0	Fair
SP-7	<i>Fraxinus pennsylvanica</i>	36.0	Fair
SP-8	<i>Liriodendron tulipifera</i>	30.0	Good
SP-9	<i>Liriodendron tulipifera</i>	31.0	Good
SP-10	<i>Quercus velutina</i>	33.0	Good
SP-11	<i>Quercus rubra</i>	32.0	Good
SP-12	<i>Quercus rubra</i>	33.0	Good
SP-13	<i>Liriodendron tulipifera</i>	31.0	Good
SP-14	<i>Liriodendron tulipifera</i>	32.0	Good
SP-15	<i>Quercus alba</i>	30.0	Fair
SP-16	<i>Fagus grandifolia</i>	30.0	Good
SP-17	<i>Liquidambar styraciflua</i>	33.0	Good
SP-18	<i>Quercus alba</i>	38.0	Poor
SP-19	<i>Liriodendron tulipifera</i>	32.0	Poor
SP-20	<i>Liriodendron tulipifera</i>	46.0	Far

Canopy closure within the stand was estimated at approximately 80% and basal area was determined to be 115 square feet per acre. There was a moderate amount of downed woody

debris and no standing dead trees greater than 20 inches DBH were identified. Litter depth was less than a half inch.

The topography in the stand is moderately sloping to the east and west. Forest Stand A is a high priority retention forest because of its proximity to floodplains, wetlands, and streams, and due to the presence of specimen trees. This is an early-mid successional stand with a low amount of invasive species coverage.

Forest Stand B

Stand B (Tulip Poplar-Maple Forest) occupies approximately 0.60 acre within the study area and is located southeast of I-95. This early successional deciduous stand is bounded by I-95 to the north, Beards Hill Road to the south, Maxa Road to the east, and commercial property to the west.

Stand B is dominated by sweetgum, red maple, black gum, American beech, and tulip poplar in the 12 to 19.9-inch size class. American beech, ironwood, fox grape, red maple, and common greenbrier are the dominant understory and shrub species. The herbaceous layer is dominated by Japanese honeysuckle, meadow garlic, multiflora rose, ironwood, Japanese stilt grass, common greenbrier, Christmas fern (*Polystichum acrostichoides*), and sedge species.

One specimen tree was found during the field survey and is listed in the table below. The tree was assessed and the health of the tree is listed in the table below.

Specimen Trees			
ID	Species	Size	Condition
SP-1	<i>Liriodendron tulipifera</i>	31.0	Good

Canopy closure within the stand was estimated at approximately 80% and basal area was determined to be 100 square feet per acre. There was a moderate amount of downed woody debris and no standing dead trees greater than 12 inches DBH were identified. Litter depth was less than a half inch.

The topography in the stand is gently sloping to the southeast. Forest Stand B is a high priority retention forest because of its proximity to floodplains, wetlands, and streams, and the presence of specimen trees. This is an early successional stand with a low amount of invasive species coverage.

4 CONCLUSIONS

4.1 Wetlands and Waters of the U.S.

The study area contains two wetlands. Information concerning these wetlands is summarized below, in tabular form and included in the appendices to this report. Refer to Appendix B: Natural Resources Inventory/Forest Stand Delineation Map for the locations of natural resources within the study area.

Wetland System	Cowardin Classification*	Approximate Wetland Area within the Study Area (AC)
Wetland WL007	PFO1A	0.365
Wetland WL008	PFO1A	0.017

* Based on National Wetland Inventory Classification System (Cowardin, et al. 1979).

In addition, six waterways were identified during the field investigation. Information regarding these waterways is summarized below, in tabular form. Refer to Appendix B: Natural Resources Inventory/Forest Stand Delineation Map for the locations of natural resources within the study area.

WUS System	Cowardin Classification*	Approximate Length within Study Area (LF)
WUS WL001	R2UB1/2	1,197
Waterway WL002	Ephemeral	13
WUS WL003	R4SB3/4	928
Waterway WL004	Ephemeral	136
WUS WL005	R2UB1/2	47
Waterway WL006	Ephemeral	138

* Based on National Wetland Inventory Classification System (Cowardin, et al. 1979).

This investigation represents a study of the wetland and waterway resources as observed within the study area during February 2018. Investigations of this type reflect the current state of temporal and variable conditions and require individual professional judgment. This is, therefore, a professional estimate of the wetlands and “waters of the U.S.” located in the study area based on the delineation methodology utilized and the most recent and best-available information for the above mentioned sites. Wetland boundaries, as currently defined for regulatory purposes, can only be verified through a review by the U.S. Army Corps of Engineers and/or the Maryland Department of the Environment in consultation with the U.S. Environmental Protection Agency and U.S. Fish and Wildlife Service.

4.2 Forests

The study area contains two distinct forest stands. Stands A and B are high priority retention stands because of their proximity to floodplains, wetlands, streams, and specimen trees.

This investigation represents a study of the forested areas within the study area as observed during February 2018. Forest Stand Delineations of this type reflect the current state and require individual professional judgment. This is, therefore, a professional estimate of the forests located in the study area based on the delineation methodology utilized and the most recent and best-available information for the above mentioned site.

4.3 Discussion

The Maryland Transportation Authority is proposing stream restoration of approximately 1,500 LF along Carsins Run. Impacts to wetlands or waterways within the proposed project area will require a *Joint Federal/State Application for the Alteration of Any Floodplain, Waterway, Tidal, or Nontidal Wetland in Maryland*. Additionally, forest disturbance will require a forest conservation plan (FCP). Clearing above the established threshold will require forest mitigation in the form of reforestation onsite or off-site or through a fee-in-lieu.

Qualifications of Preparer

Ms. Jennifer Bird, Senior Project Manager with KCI's Natural Resources Management Practice, prepared the Forest Stand Delineation included in this Natural Resources Inventory. Enclosed in Appendix G is a copy of Ms. Bird's confirmation letter from MDNR stating she is a Qualified Professional under Maryland State Forest Conservation regulations, to conduct forest stand delineations and develop forest conservation plans.

5 REFERENCES

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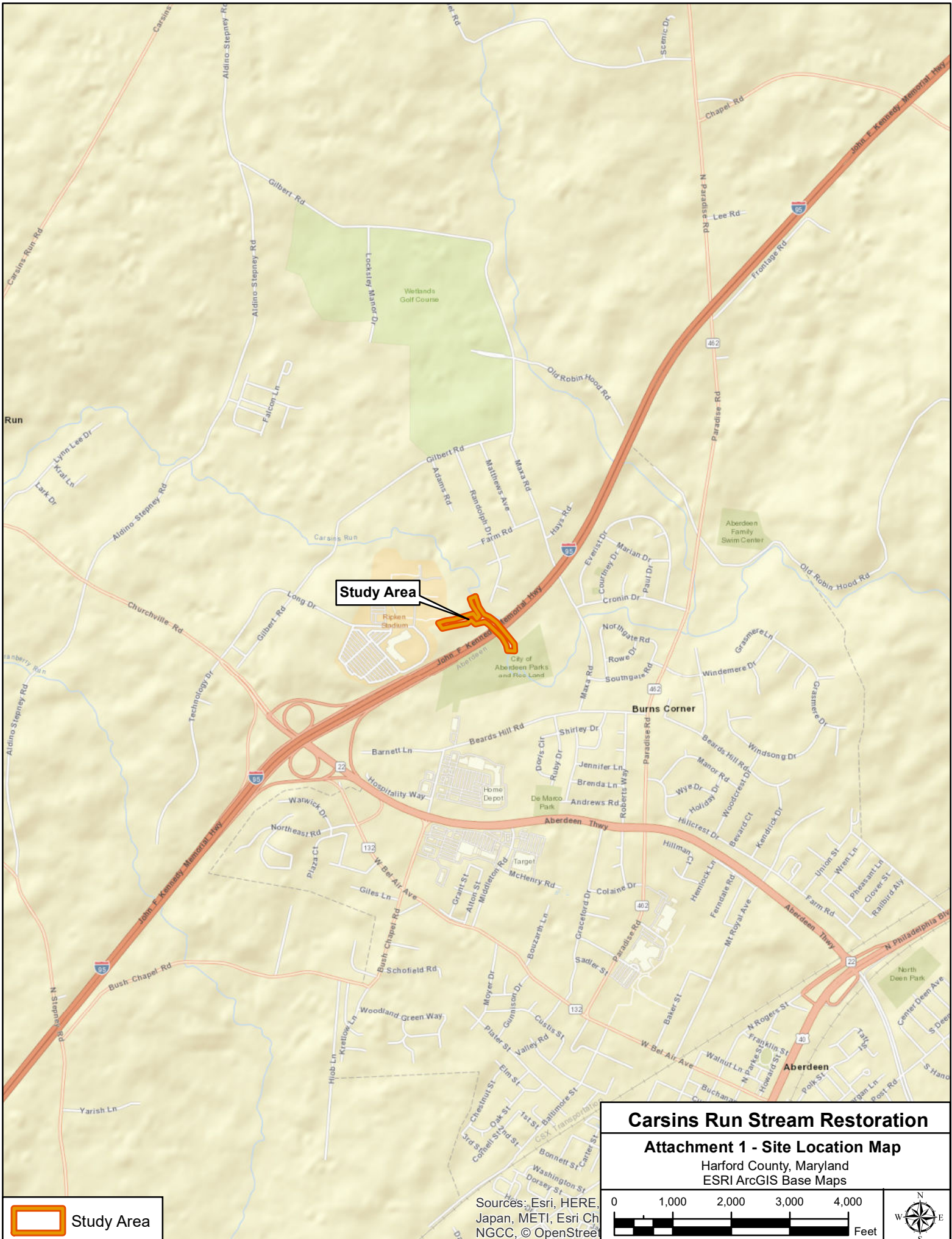
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ATTACHMENT 1

Site Location Map



Study Area

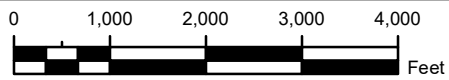
Carsins Run Stream Restoration

Attachment 1 - Site Location Map

Harford County, Maryland
 ESRI ArcGIS Base Maps

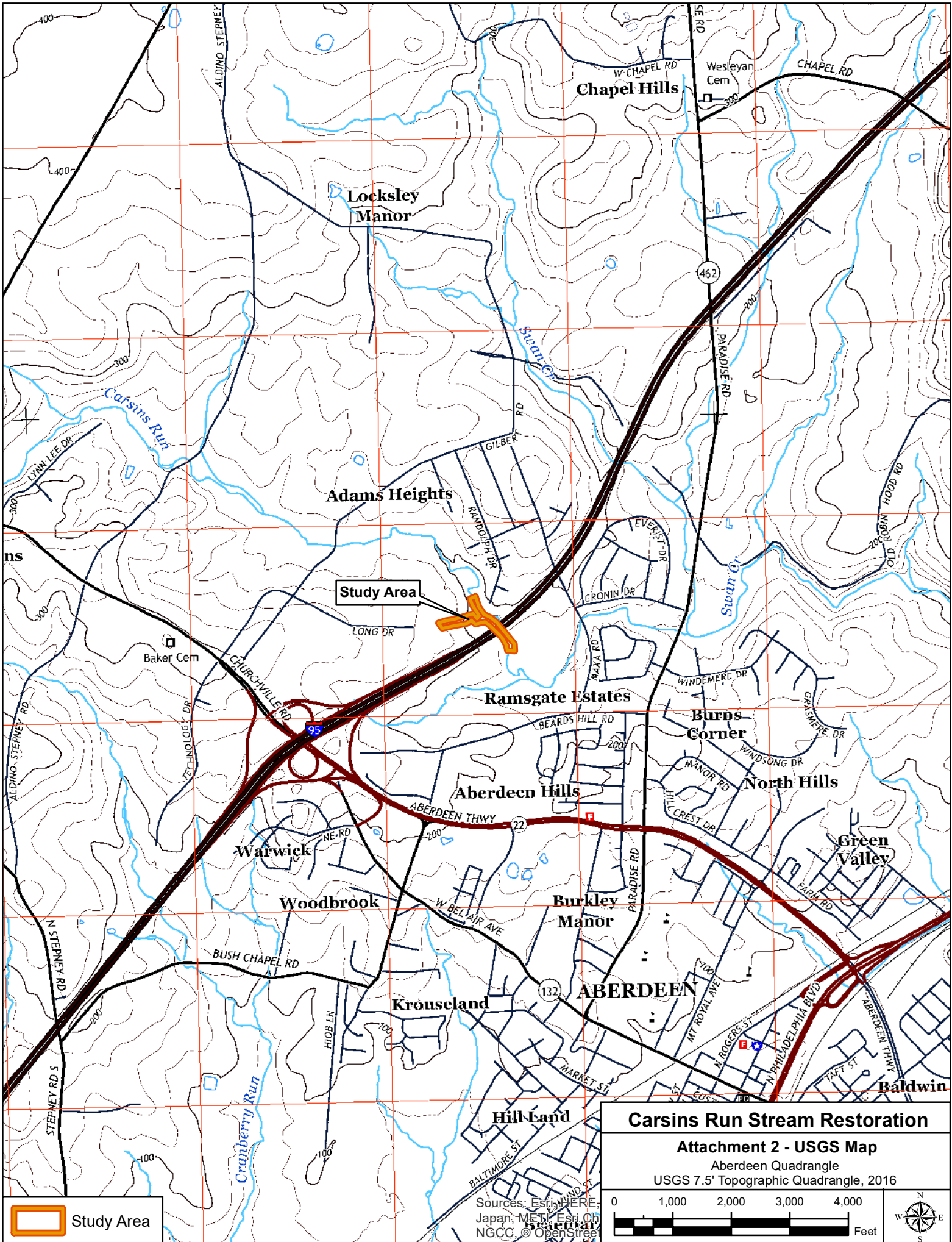
 Study Area

Sources: Esri, HERE, Japan, METI, Esri Ch NGCC, © OpenStreet



ATTACHMENT 2

USGS 7.5' Topographic Map




 Study Area

Carsins Run Stream Restoration
Attachment 2 - USGS Map
 Aberdeen Quadrangle
 USGS 7.5' Topographic Quadrangle, 2016

0 1,000 2,000 3,000 4,000 Feet

Sources: Esri, DeLorme, NAVTEQ, Swisstopo, UTM, Japan, METI, Esri, Ch NGCC, © OpenStreetMap contributors, Swisstopo



ATTACHMENT 3

Soils Map

ATTACHMENT 4



National Wetlands Inventory (NWI) Map

ATTACHMENT 5

Q3 Flood Map



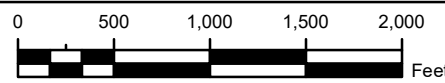
Study Area

-  Study Area
-  FEMA 100-Year Floodplain

Carsins Run Stream Restoration

Attachment 5 - Q3 Flood Map

Federal Emergency Management Agency
Q3 Flood Data for Harford County, Maryland



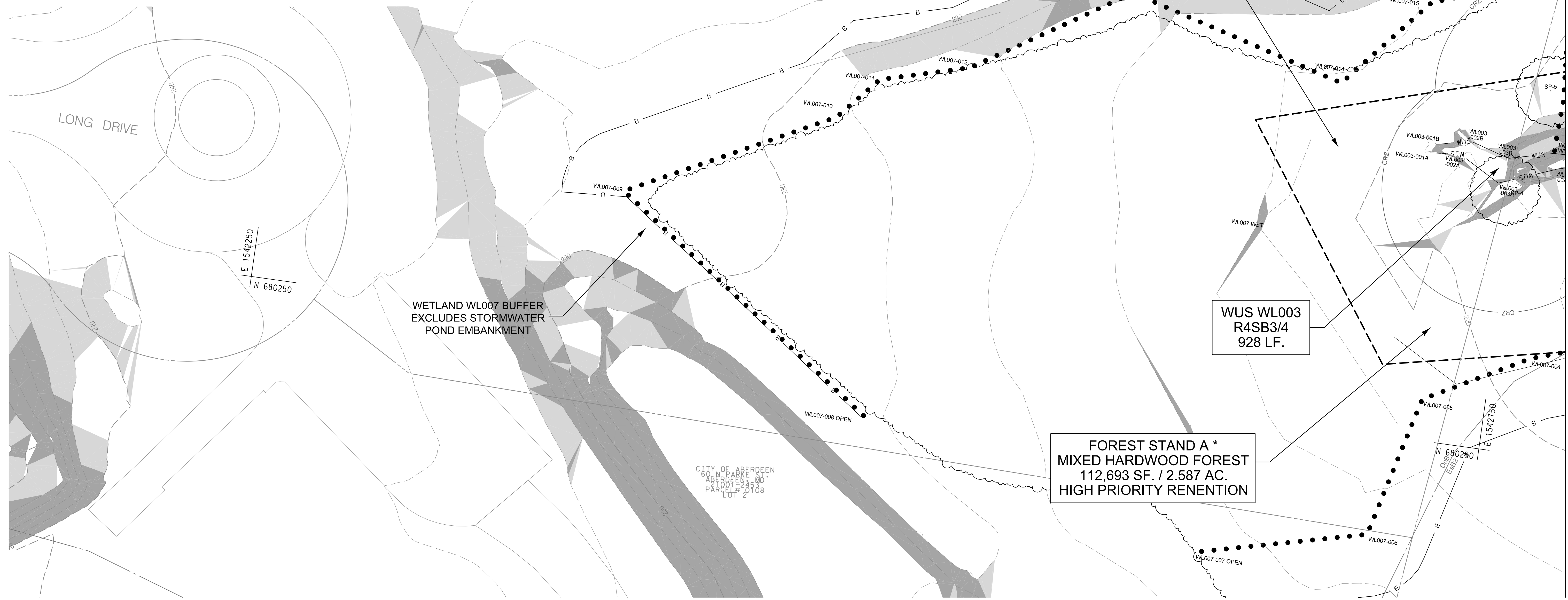
Source: Esri, DigitalGlobe, GeoEye, USDA, USGS, AeroG

APPENDIX A

Natural Resources Inventory/Forest Stand Delineation Map

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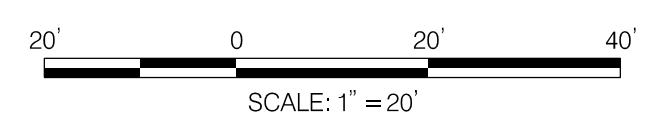
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-X-X-X-	EX. FENCE		SLOPES 25% OR GREATER
~~~~~	EX. WOODS LINE	GhB	SOILS LINE
	EX. TREE	GUB	WETLAND/UPLAND SAMPLE PLOT
	EX. MANHOLE	x UPL-1	FOREST STAND SAMPLE PLOT
	EX. UTILITY POLE	x A-2	FOREST STAND SAMPLE PLOT
---	PROPERTY LINE	CRZ	SPECIMEN TREE
---	STUDY AREA BOUNDARY	SP-1	SPECIMEN TREE
---	WATERS OF THE U.S.		
---	WATERS OF THE U.S. EPHEMERAL		
.....	EX. NON-TIDAL WETLAND		
.....	25' WETLAND BUFFER		
.....	75' STREAM BUFFER		



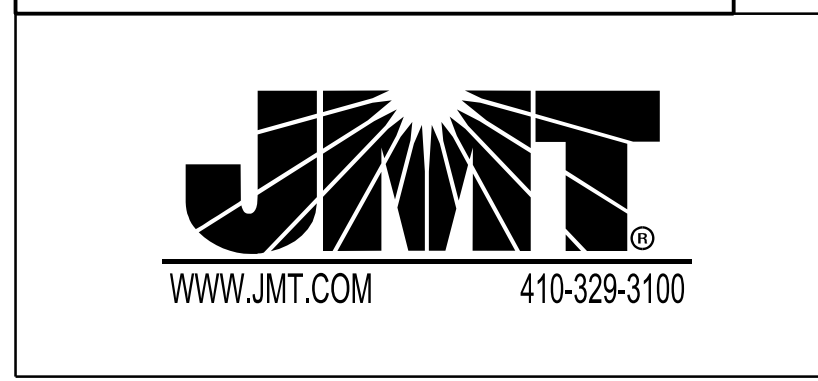
THIS PLAN WAS PREPARED BY:  
 JENNIFER BIRD  
 KCI TECHNOLOGIES  
 MDNR QUALIFIED PROFESSIONAL  
 STATUS  
 (SEPTEMBER 2011)

*Jennifer K. Bird*  
 SIGNATURE

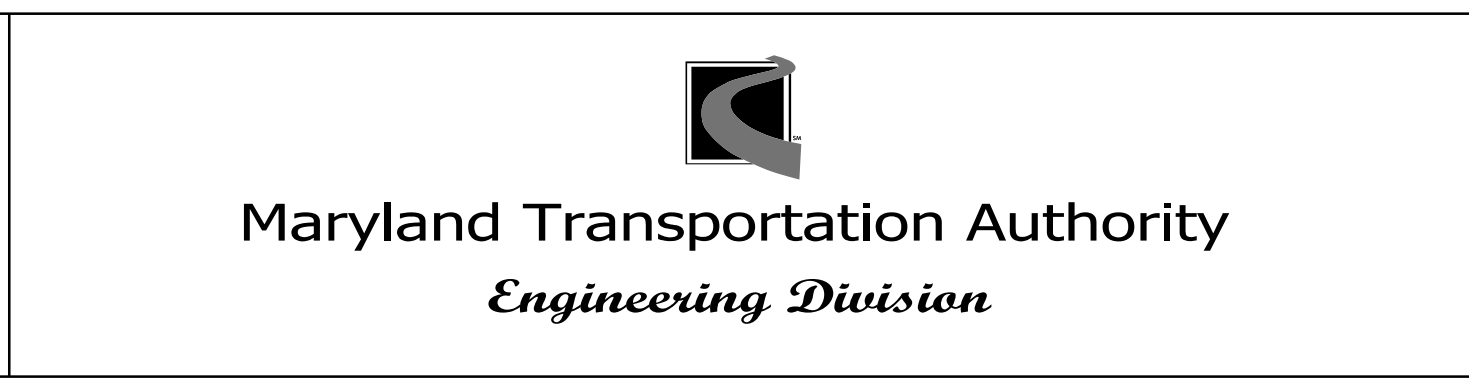
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 DATE



HORIZONTAL DATUM NAD 83/91  
 VERTICAL DATUM NAVD 88



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ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**JOHN F. KENNEDY MEMORIAL HIGHWAY  
 I-95 ETL NORTHBOUND EXTENSION  
 CARSENS RUN STREAM MITIGATION PLANS  
 APPENDIX A: NATURAL RESOURCES INVENTORY  
 - FOREST STAND DELINEATION MAP**

DESIGNED BY _____ DRAWN BY _____ CHECKED BY _____  
 CONST. REVIEW BY _____ DATE FEBRUARY 2018 SCALE 1" = 20'

CONTRACT NO.  
 AE 2796-000-001/6

DRAWING NO.  
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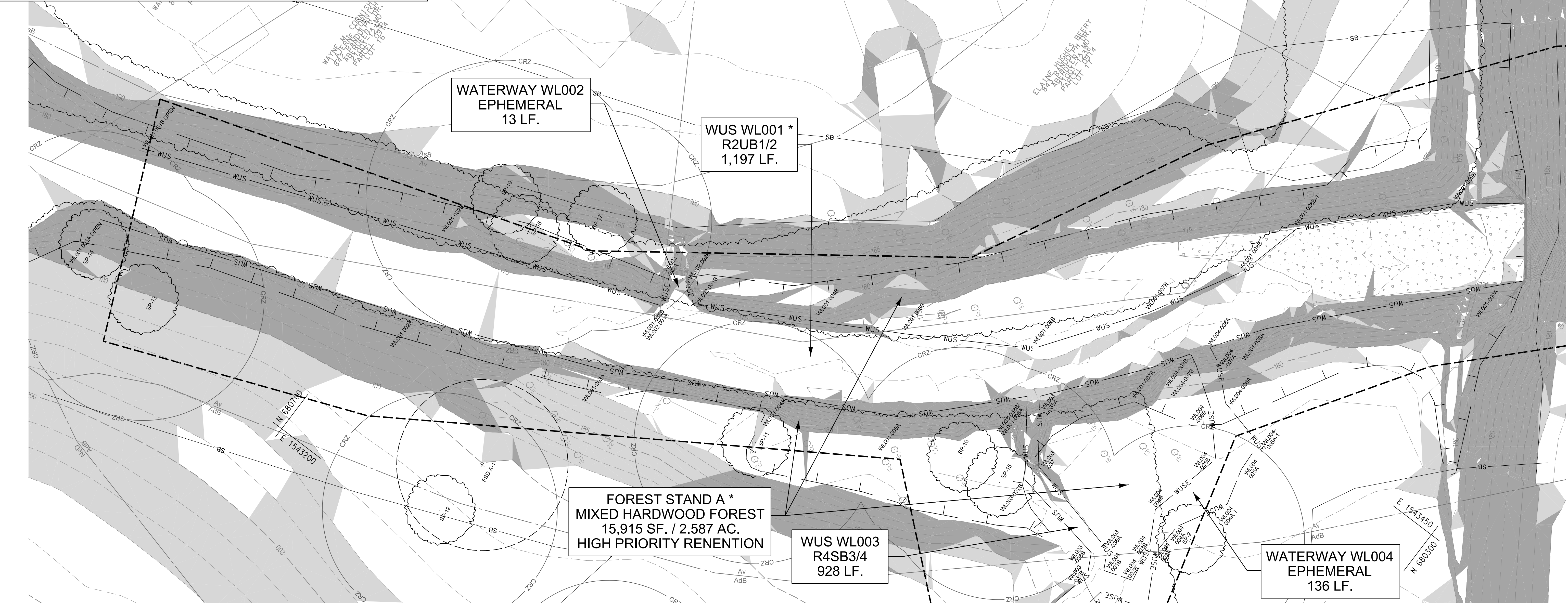
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 2 OF 5





**LEGEND**

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X-----X-----X	EX. FENCE	[Dark Shaded Box]	SLOPES 25% OR GREATER
-----	EX. WOODS LINE	GhB	SOILS LINE
(Tree Symbol)	EX. TREE	GuB	WETLAND/UPLAND SAMPLE PLOT
(Manhole Symbol)	EX. MANHOLE	x UPL-1	FOREST STAND SAMPLE PLOT
(Utility Pole Symbol)	EX. UTILITY POLE	x A-2	SPECIMEN TREE
-----	PROPERTY LINE	(CRZ Circle)	
-----	STUDY AREA BOUNDARY	(SP-1 Circle)	
-----	WATERS OF THE U.S.		
-----	WATERS OF THE U.S. EPHEMERAL		
(Dotted Line)	EX. NON-TIDAL WETLAND		
(Dashed Line)	25' WETLAND BUFFER		
(Thick Dashed Line)	75' STREAM BUFFER		

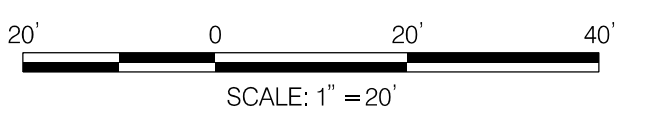


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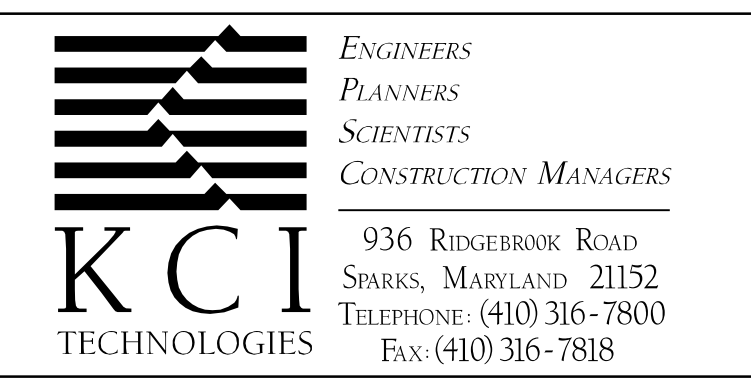
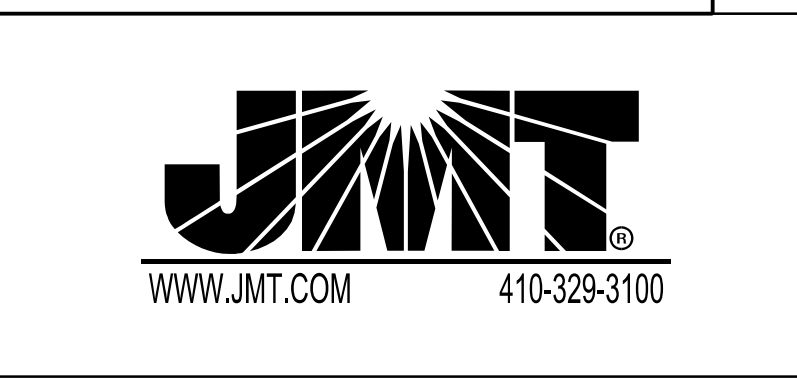
*Jennifer K. Bird*  
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FEBRUARY 2018  
 DATE

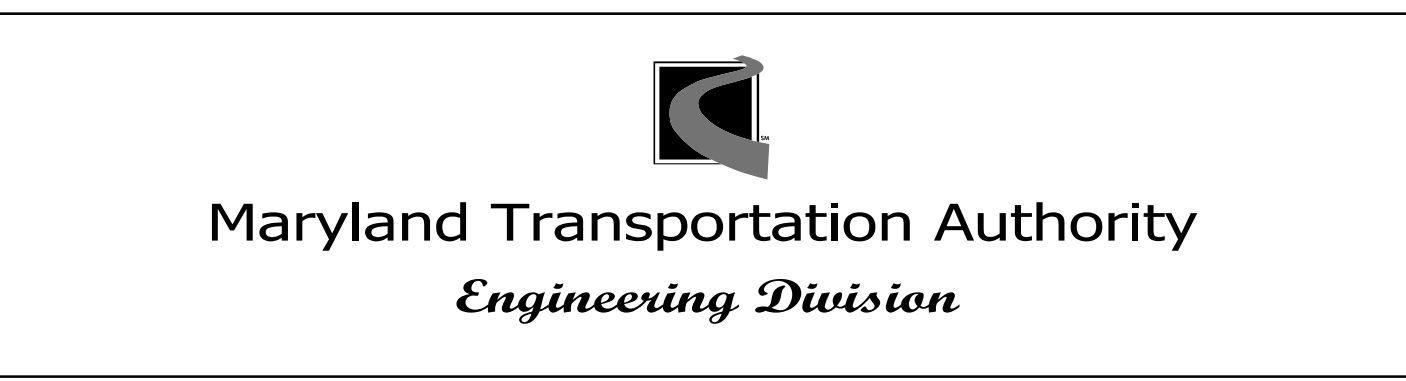
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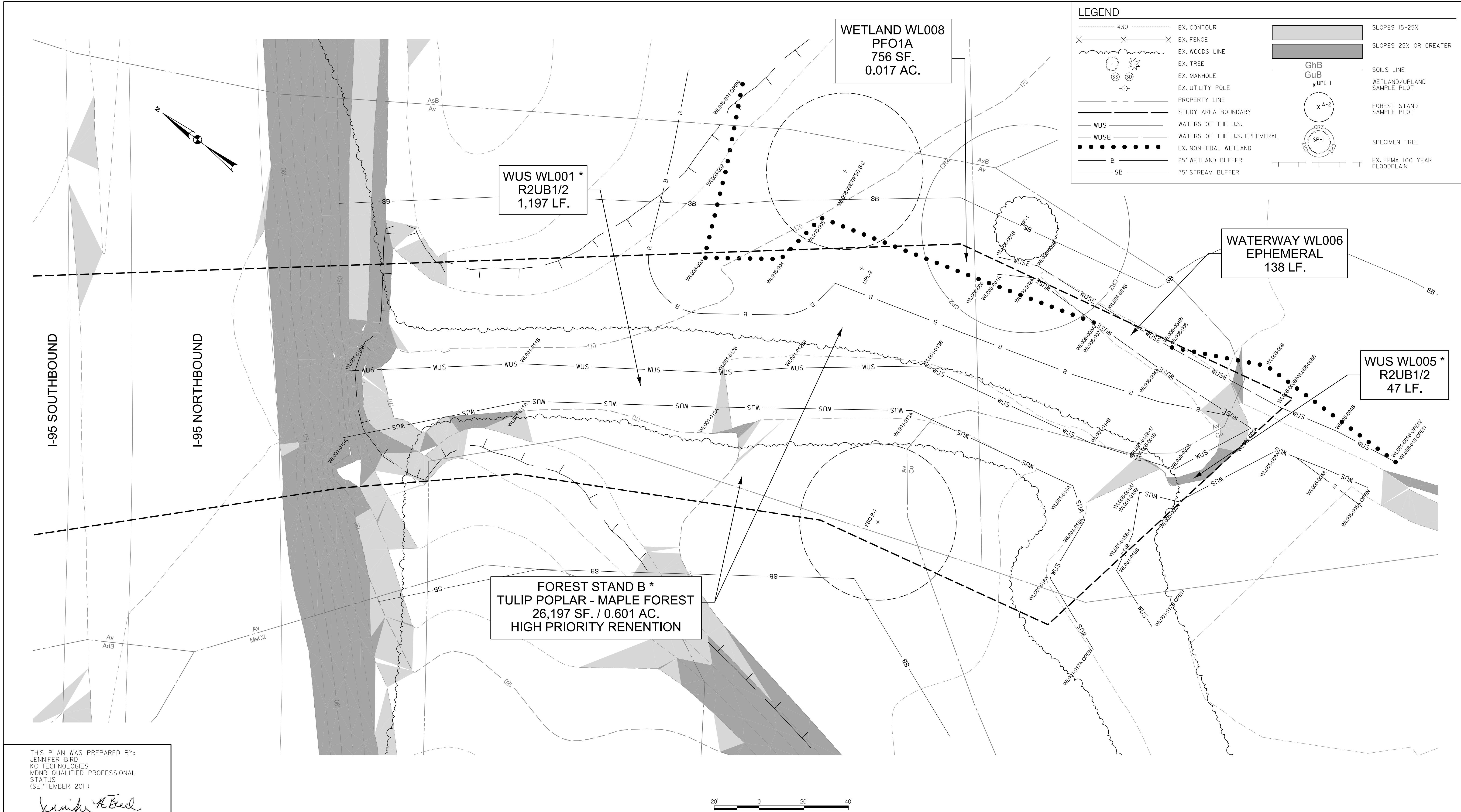


ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

**JOHN F. KENNEDY MEMORIAL HIGHWAY  
 I-95 ETL NORTHBOUND EXTENSION  
 CARSENS RUN STREAM MITIGATION PLANS  
 APPENDIX A: NATURAL RESOURCES INVENTORY  
 - FOREST STAND DELINEATION MAP**

DESIGNED BY _____ DRAWN BY _____ CHECKED BY _____  
 CONST. REVIEW BY _____ DATE FEBRUARY 2018 SCALE 1" = 20'

CONTRACT NO.  
 AE 2796-000-001/6  
 DRAWING NO.  
**NRI-03**  
 SHEET NO.  
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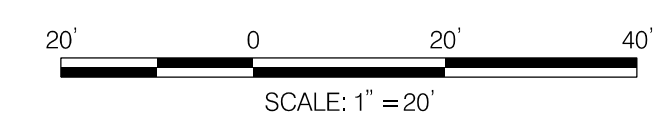


LEGEND	
..... 430 .....	EX. CONTOUR
X-----X-----X	EX. FENCE
~~~~~	EX. WOODS LINE
(Tree symbol)	EX. TREE
(Manhole symbol)	EX. MANHOLE
(Utility pole symbol)	EX. UTILITY POLE
-----	PROPERTY LINE
-----	STUDY AREA BOUNDARY
-----	WATERS OF THE U.S.
-----	WATERS OF THE U.S. EPHEMERAL
(Dotted line)	EX. NON-TIDAL WETLAND
(Dashed line)	25' WETLAND BUFFER
(Solid line)	75' STREAM BUFFER
(Shaded area)	SLOPES 15-25%
(Dark shaded area)	SLOPES 25% OR GREATER
(Line)	SOILS LINE
(Circle with 'x')	WETLAND/UPLAND SAMPLE PLOT
(Circle with 'x A-2')	FOREST STAND SAMPLE PLOT
(Circle with 'SP-1')	SPECIMEN TREE
(Dashed line)	EX. FEMA 100 YEAR FLOODPLAIN

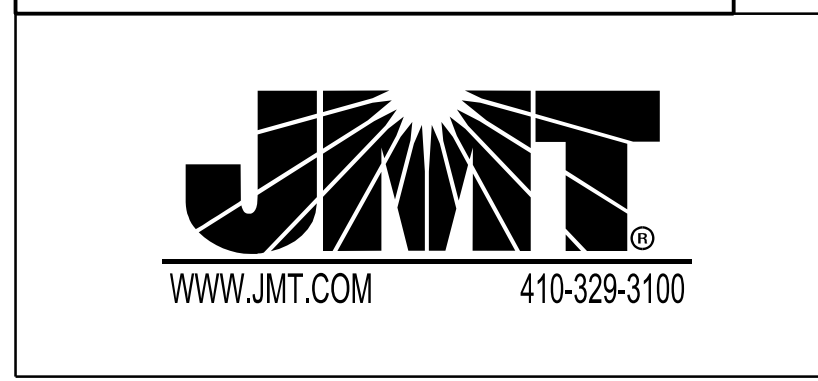
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 JENNIFER BIRD
 KCI TECHNOLOGIES
 MDRR QUALIFIED PROFESSIONAL
 STATUS
 (SEPTEMBER 2011)

Jennifer K. Bird
 SIGNATURE

FEBRUARY 2018
 DATE



HORIZONTAL DATUM NAD 83/91
 VERTICAL DATUM NAVD 88



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Maryland Transportation Authority
 Engineering Division

ADDENDUMS & REVISIONS			
NO.	DESCRIPTION	BY	DATE

JOHN F. KENNEDY MEMORIAL HIGHWAY
I-95 ETL NORTHBOUND EXTENSION
CARSINS RUN STREAM MITIGATION PLANS
APPENDIX A: NATURAL RESOURCES INVENTORY
- FOREST STAND DELINEATION MAP

DESIGNED BY _____	DRAWN BY _____	CHECKED BY _____
CONST. REVIEW BY _____	DATE FEBRUARY 2018	SCALE 1" = 20'

CONTRACT NO.
 AE 2796-000-001/6

DRAWING NO.
NRI-04

SHEET NO.
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APPENDIX B

Data Point Forms: Wetland Determination and Stream Features

**Stream Features
Field Sheet**

Date: 2/5/18

Project Site: Carsins Run Stream Restoration

Stream # WL001

Observers: KM, AW

Stream Flow: Perennial Intermittent Ephemeral
Gradient: 2%

Morphology:

Average Bankful Width 12' Average Bankfull Depth 1' Average Water Depth: 6"

Has stream morphometry been altered? Describe type and degree: The channel is culverted under I-95, and is concrete lined directly upstream of the I-95 culvert.

Habitat and Pollutants:

Substrate:

Bedrock Gravel/Sand Silt
 Sand Cobble/Gravel Clay

Habitat Complexity:

Riffle/Pools Undercut banks
 Tree Roots Woody Debris

Bank Erosion: Severe Moderate Minor

Describe: Some banks are sheer with close to a 90 degree drop in some areas

Silt Deposition: Severe Moderate Minor

Riparian Zone:

Right Bank: Forested Vegetated Developed Maintained

Notes: Adjacent to upland riparian forest.

Slope: 2%

Left Bank: Forested Vegetated Developed Maintained

Notes: Adjacent to upland riparian forest.

Slope: 5%

Cowardin (1979) Stream Classification: R2UB1/2

Stream Features

Field Sheet

Date: 2/5/18

Project Site: Carsins Run Stream Restoration

Stream # WL002

Observers: AW, KM

Stream Flow: Perennial Intermittent Ephemeral

Gradient: 1%

Morphology:

Average Bankful Width 4' Average Bankfull Depth 4" Average Water Depth: 1"

Has stream morphometry been altered? Describe type and degree: A stormwater outfall outlets into the channel.

Habitat and Pollutants:

Substrate:

Bedrock Gravel/Sand Silt

Sand Cobble/Gravel Clay

Habitat Complexity:

Riffle/Pools Undercut banks

Tree Roots Woody Debris

Bank Erosion: Severe Moderate Minor

Describe: A low gradient channel, with minimal erosion, that is fed by an upstream outfall.

Silt Deposition: Severe Moderate Minor

Riparian Zone:

Right Bank: Forested Vegetated Developed Maintained

Notes: Adjacent to upland riparian forest.

Slope: 2%

Left Bank: Forested Vegetated Developed Maintained

Notes: Adjacent to upland riparian forest.

Slope: 2%

Cowardin (1979) Stream Classification: N/A

**Stream Features
Field Sheet**

Date: 2/5/18
Observers: AW, KM

Project Site: Carsins Run Stream Restoration **Stream #** WL003

Stream Flow: _____ Perennial X Intermittent _____ Ephemeral
Gradient: _____ 4%

Morphology:

Average Bankful Width 2' Average Bankfull Depth 1' Average Water Depth: 2"

Has stream morphometry been altered? Describe type and degree: Not within project area. WUS
WL003 originates at Wetland WL007.

Habitat and Pollutants:

Substrate:

_____ Bedrock X Gravel/Sand X Silt
 X Sand X Cobble/Gravel _____ Clay

Habitat Complexity:

 X Riffle/Pools _____ Undercut banks
_____ Tree Roots X Woody Debris

Bank Erosion: _____ Severe X Moderate _____ Minor

Describe: Some sheer banks and areas of incision.

Silt Deposition: _____ Severe _____ Moderate X Minor

Riparian Zone:

Right Bank: X Forested _____ Vegetated _____ Developed _____ Maintained

Notes: Adjacent to upland riparian forest.

Slope: 3%

Left Bank: X Forested _____ Vegetated _____ Developed _____ Maintained

Notes: Adjacent to upland riparian forest.

Slope: 3%

Cowardin (1979) Stream Classification: R4SB3/4

Stream Features

Field Sheet

Date: 2/5/18

Project Site: Carsins Run Stream Restoration

Stream # WL004

Observers: AW, KM

Stream Flow: _____ Perennial _____ Intermittent Ephemeral

Gradient: _____ 1%

Morphology:

Average Bankful Width _____ 1.5' Average Bankfull Depth _____ 4" Average Water Depth: _____ <0.5"

Has stream morphometry been altered? Describe type and degree: _____ Not within project area. The channel originates as overflow from WUS WL003, and outlets into WUS WL001.

Habitat and Pollutants:

Substrate:

_____ Bedrock Gravel/Sand Silt

Sand _____ Cobble/Gravel _____ Clay

Habitat Complexity:

Riffle/Pools _____ Undercut banks

_____ Tree Roots Woody Debris

Bank Erosion: _____ Severe _____ Moderate Minor

Describe: _____ This is a low gradient overflow channel from WUS WL003.

Silt Deposition: _____ Severe _____ Moderate Minor

Riparian Zone:

Right Bank: Forested _____ Vegetated _____ Developed _____ Maintained

Notes: _____ Adjacent to upland riparian forest.

Slope: _____ 2%

Left Bank: Forested _____ Vegetated _____ Developed _____ Maintained

Notes: _____ Adjacent to upland riparian forest and WUS WL003.

Slope: _____ 1%

Cowardin (1979) Stream Classification: _____ N/A

**Stream Features
Field Sheet**

Date: 2/5/18
Observers: AW, KM

Project Site: Carsins Run Stream Restoration **Stream #** WL005

Stream Flow: _____ Perennial X Intermittent _____ Ephemeral
Gradient: _____ 2%

Morphology:

Average Bankful Width 15' Average Bankfull Depth 10" Average Water Depth: 8"

Has stream morphometry been altered? Describe type and degree: Not within the project area.
The originates at its confluence with WUS WL001 and flows outside of the project area.

Habitat and Pollutants:

Substrate:

_____ Bedrock X Gravel/Sand _____ Silt
 X Sand X Cobble/Gravel _____ Clay

Habitat Complexity:

X Riffle/Pools X Undercut banks
 X Tree Roots X Woody Debris

Bank Erosion: _____ Severe X Moderate _____ Minor

Describe: Some banks are undercut and beginning to erode.

Silt Deposition: _____ Severe _____ Moderate X Minor

Riparian Zone:

Right Bank: X Forested _____ Vegetated _____ Developed _____ Maintained

Notes: Adjacent to upland riparian forest

Slope: 3%

Left Bank. X Forested _____ Vegetated _____ Developed _____ Maintained

Notes: Adjacent to upland riparian forest

Slope: 1%

Cowardin (1979) Stream Classification: R4SB3/4

**Stream Features
Field Sheet**

Date: 2/5/18
Observers: AW, KM

Project Site: Carsins Run

Stream # WL006

Stream Flow: _____ Perennial _____ Intermittent X Ephemeral
Gradient: _____ 1%

Morphology:

Average Bankful Width 2' Average Bankfull Depth 4" Average Water Depth: <1"

Has stream morphometry been altered? Describe type and degree: Not within the project area.
 WUS WL006 originates at Wetland WL008, and outlets into WUS WL005.

Habitat and Pollutants:

Substrate:

_____ Bedrock X Gravel/Sand _____ Silt
 X Sand _____ Cobble/Gravel _____ Clay

Habitat Complexity:

_____ Riffle/Pools _____ Undercut banks
_____ Tree Roots _____ Woody Debris

Bank Erosion: _____ Severe _____ Moderate X Minor

Describe: This is a natural channel that has formed in Wetland WL008.

Silt Deposition: _____ Severe _____ Moderate X Minor

Riparian Zone:

Right Bank: X Forested _____ Vegetated _____ Developed _____ Maintained

Notes: Adjacent to upland riparian forest.

Slope: 1%

Left Bank. X Forested X Vegetated _____ Developed _____ Maintained

Notes: Adjacent to Wetland WL008

Slope: 1%

Cowardin (1979) Stream Classification: N/A

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Carsins Run Stream Restoration City/County: Harford Sampling Date: 2/6/18
 Applicant/Owner: Maryland Transportation Authority State: MD Sampling Point: WL007-V
 Investigator(s): AW, BD Section, Township, Range: Aberdeen
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 1
 Subregion (LRR or MLRA): MLRA 148 Lat: 39.531739 Long: -76.183367 Datum: NAD 83
 Soil Map Unit Name: Delanco silt loam, 3-8% slopes (DcB) NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: The sample plot satisfies the three mandatory wetland criteria; therefore, this area is classified as a palustrine, forested, broad-leaved deciduous, temporarily flooded (PFO1A) wetland. The wetland is located adjacent to the Ripken Stadium complex and outlets into WUS WL003. A stormwater management (SWM) pond is located above the wetland. Standing water is present throughout the wetland. Rain has occurred within the past 48 hours.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <u>N/A</u> Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>1"</u> Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>surfa</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks: The sample plot satisfies the wetland hydrology criterion. Surface water is present throughout the wetland; however, no surface water was present near the wetland sample plot.	

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: WL007-WET

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30ft radius</u>)				
1. <u>Acer rubrum</u>	<u>50</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Fraxinus pennsylvanica</u>	<u>20</u>	<u>Y</u>	<u>FAC+</u>	
3. <u>Liquidambar styraciflua</u>	<u>10</u>	<u>N</u>	<u>FAC</u>	
4. _____				
5. _____				
6. _____				
	<u>80</u> = Total Cover			
	50% of total cover: <u>40</u>		20% of total cover: <u>16</u>	
Sapling Stratum (Plot size: <u>15ft radius</u>)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
	<u>0</u> = Total Cover			
	50% of total cover: <u>0</u>		20% of total cover: <u>0</u>	
Shrub Stratum (Plot size: <u>15ft radius</u>)				
1. <u>Rosa multiflora</u>	<u>15</u>	<u>Y</u>	<u>FACU</u>	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
	<u>15</u> = Total Cover			
	50% of total cover: <u>7.5</u>		20% of total cover: <u>3</u>	
Herb Stratum (Plot size: <u>5ft radius</u>)				
1. <u>Microstegium vimineum</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
	<u>40</u> = Total Cover			
	50% of total cover: <u>20</u>		20% of total cover: <u>8</u>	
Woody Vine Stratum (Plot size: <u>30ft radius</u>)				
1. <u>Toxicodendron radicans</u>	<u>2</u>	<u>Y</u>	<u>FAC</u>	
2. _____				
3. _____				
4. _____				
5. _____				
	<u>2</u> = Total Cover			
	50% of total cover: <u>1</u>		20% of total cover: <u>0.4</u>	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80 (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

The sample plot satisfies the hydrophytic vegetation criterion.

SOIL

Sampling Point: WL007 

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10YR 4/2	70	10YR 2/1	10	D	M	sicl	organic matter
			7.5YR 4/4	20	C	M/PL		
8-20	2.5Y 6/1	40	10YR 5/2	25	C	M	sicl	
			10YR 5/8	15	C	M		
			10YR 3/2	5	C	M		
			7.5YR 4/4	15	C	M/PL		
20-24	2.5Y 6/1	50	10YR 6/8	25	C	M	cl	
			10YR 3/2	10	C	M		
			10YR 4/4	15	C	M		

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) (**LRR N**)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) (**LRR N, MLRA 147, 148**)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- Thin Dark Surface (S9) (**MLRA 147, 148**)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) (**LRR N, MLRA 136**)
- Umbric Surface (F13) (**MLRA 136, 122**)
- Piedmont Floodplain Soils (F19) (**MLRA 148**)
- Red Parent Material (F21) (**MLRA 127, 147**)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (**MLRA 147**)
- Coast Prairie Redox (A16) (**MLRA 147, 148**)
- Piedmont Floodplain Soils (F19) (**MLRA 136, 147**)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks: The sample plot satisfies the hydric soils criterion.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Carsins Run Stream Restoration City/County: Harford Sampling Date: 2/6/18
 Applicant/Owner: Maryland Transportation Authority State: MD Sampling Point: WL008-V
 Investigator(s): AW/BD Section, Township, Range: Aberdeen
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 1
 Subregion (LRR or MLRA): MLRA 148 Lat: 39.531255 Long: -76.178877 Datum: NAD 83
 Soil Map Unit Name: Aldino very stony silt loam, 0-8% slopes (AsB) NWI classification: PFO1A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: The sample plot satisfies all three mandatory wetland criteria; therefore, this areas is classified as a palustrine, forested, broad-leaved deciduous, temporarily flooded (PFO1A) wetland. The sample plot is located downstream of Interstate 95 on the left bank of WUS WL001. Rock and cobble are present throughout the wetland.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>10"</u> Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>Surfa</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks: The sample plot satisfies the wetland hydrology criterion.	

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: WL008-WET

Tree Stratum (Plot size: <u>30ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Liquidambar styraciflua</u>	<u>10</u>	<u>N</u>	<u>FAC</u>
2. <u>Carpinus caroliniana</u>	<u>5</u>	<u>N</u>	<u>FAC</u>
3. <u>Fagus grandifolia</u>	<u>10</u>	<u>N</u>	<u>FACU</u>
4. <u>Acer rubrum</u>	<u>35</u>	<u>Y</u>	<u>FAC</u>
5. <u>Nyssa sylvatica</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>
6. <u>Quercus alba</u>	<u>15</u>	<u>N</u>	<u>FACU</u>
	<u>95</u> = Total Cover		

50% of total cover: 47.5 20% of total cover: 19

Sapling Stratum (Plot size: <u>15ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Fagus grandifolia</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
	<u>10</u> = Total Cover		

50% of total cover: 5 20% of total cover: 2

Shrub Stratum (Plot size: <u>15ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
	<u>0</u> = Total Cover		

50% of total cover: 0 20% of total cover: 0

Herb Stratum (Plot size: <u>5ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Carex species</u>	<u>10</u>	<u>Y</u>	<u>NI</u>
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
	<u>10</u> = Total Cover		

50% of total cover: 5 20% of total cover: 2

Woody Vine Stratum (Plot size: <u>30ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
	<u>0</u> = Total Cover		

50% of total cover: 0 20% of total cover: 0

Tree Stratum (Plot size: <u>30ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
	<u>0</u> = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)
 The sample plot satisfies the hydrophytic vegetation.

SOIL

Sampling Point: WL008

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10YR 4/1	85	10YR 4/4	10	C	M/PL	sicl	
			10YR 6/1	5	C	M		
8-12	10YR 5/1	55	10YR 4/1	10	D	M	sicl	
			10YR 5/6	15	C	M/PL		
			10YR 6/6	20	C	M		
12+	---	--	---	--	--	--	--	Refusal

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) (LRR N)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) (MLRA 147, 148)
- Thin Dark Surface (S9) (MLRA 147, 148)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) (LRR N, MLRA 136)
- Umbric Surface (F13) (MLRA 136, 122)
- Piedmont Floodplain Soils (F19) (MLRA 148)
- Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (MLRA 147)
- Coast Prairie Redox (A16) (MLRA 147, 148)
- Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock
 Depth (inches): 12+

Hydric Soil Present? Yes No

Remarks: The sample plot satisfies the hydric soils criterion. Refusal occurred at 12 inches due to the presence of rock and cobble throughout the wetland.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Carsins Run Stream Restoration City/County: Harford Sampling Date: 2/6/18
 Applicant/Owner: Maryland Transportation Authority State: MD Sampling Point: UPL-1
 Investigator(s): AW, BD Section, Township, Range: Aberdeen
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 1
 Subregion (LRR or MLRA): MLRA 148 Lat: 39.531805 Long: -76.181951 Datum: NAD 83
 Soil Map Unit Name: Aldino silt loam, 3-8% slopes (AdB) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation Soil or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation Soil or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: The sample plot does not satisfy the three mandatory wetland criteria; therefore, this area is classified as upland. The sample plot is located on a hillslope within Forest Stand Delineation Sample Plot FSD A-3. Rain has occurred within the past 48 hours.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
--	--

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 The sample plot does not satisfy the hydrology criterion.

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: UPL-1

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30ft radius</u>)				
1. <u>Liquidambar styraciflua</u>	<u>15</u>	<u>N</u>	<u>FAC</u>	
2. <u>Quercus alba</u>	<u>40</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Fagus grandifolia</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
4. <u>Juniperus virginiana</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
5. <u>Nyssa sylvatica</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
6. <u>Liriodendron tulipifera</u>	<u>10</u>	<u>N</u>	<u>FACU</u>	
	<u>95</u> = Total Cover			
	50% of total cover: <u>47.5</u>		20% of total cover: <u>19</u>	
Sapling Stratum (Plot size: <u>15ft radius</u>)				
1. <u>Carpinus caroliniana</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
	<u>5</u> = Total Cover			
	50% of total cover: <u>2.5</u>		20% of total cover: <u>1</u>	
Shrub Stratum (Plot size: <u>15ft radius</u>)				
1. <u>Lindera benzoin</u>	<u>15</u>	<u>Y</u>	<u>FAC</u>	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
	<u>15</u> = Total Cover			
	50% of total cover: <u>7.5</u>		20% of total cover: <u>3</u>	
Herb Stratum (Plot size: <u>5ft radius</u>)				
1. <u>Lonicera japonica</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Allium canadense</u>	<u>2</u>	<u>N</u>	<u>FACU</u>	
3. <u>Microstegium vimineum</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
	<u>17</u> = Total Cover			
	50% of total cover: <u>8.5</u>		20% of total cover: <u>3.4</u>	
Woody Vine Stratum (Plot size: <u>30ft radius</u>)				
1. <u>Toxicodendron radicans</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Vitis labrusca</u>	<u>5</u>	<u>Y</u>	<u>FACU</u>	
3. _____				
4. _____				
5. _____				
	<u>10</u> = Total Cover			
	50% of total cover: <u>5</u>		20% of total cover: <u>2</u>	
Dominance Test worksheet:				
Number of Dominant Species That Are OBL, FACW, or FAC:		<u>3</u>	(A)	
Total Number of Dominant Species Across All Strata:		<u>7</u>	(B)	
Percent of Dominant Species That Are OBL, FACW, or FAC:		<u>43</u>	(A/B)	
Prevalence Index worksheet:				
Total % Cover of:		Multiply by:		
OBL species	<u>0</u>	x 1 =	<u>0</u>	
FACW species	<u>0</u>	x 2 =	<u>0</u>	
FAC species	<u>50</u>	x 3 =	<u>150</u>	
FACU species	<u>92</u>	x 4 =	<u>368</u>	
UPL species	<u>0</u>	x 5 =	<u>0</u>	
Column Totals:	<u>142</u>	(A)	<u>518</u>	(B)
Prevalence Index = B/A = <u>3.65</u>				
Hydrophytic Vegetation Indicators:				
<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation				
<input type="checkbox"/> 2 - Dominance Test is >50%				
<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹				
<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)				
<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)				
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Definitions of Five Vegetation Strata:				
Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).				
Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.				
Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.				
Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.				
Woody vine – All woody vines, regardless of height.				
Hydrophytic Vegetation Present?				
Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	
Remarks: (Include photo numbers here or on a separate sheet.)				
The sample plot does not satisfy the hydrophytic vegetation criterion.				

SOIL

Sampling Point: UPL-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-10	10YR 4/4	70	7.5YR 4/4	30	C	M	sil	
10-24	7.5YR 4/6	70	10YR 3/3	30	C	M	sil	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)	
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
 Type: N/A
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks: The sample plot does not satisfy the hydric soils criterion.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Carsins Run Stream Restoration City/County: Harford Sampling Date: 2/6/18
 Applicant/Owner: Maryland Transportation Authority State: MD Sampling Point: UPL-2
 Investigator(s): AW, BD Section, Township, Range: Aberdeen
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 1
 Subregion (LRR or MLRA): MLRA 148 Lat: 39.531114 Long: -76.179001 Datum: NAD 83
 Soil Map Unit Name: Aldino very stony silt loam, 0-8% slopes (AsB) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: The sample plot satisfies only two of the three mandatory wetland criteria; therefore, the area is classified as upland. The sample plot is located on the floodplain adjacent to WUS WL001, Wetland WL008, and a fence line. Rain has occurred within the past 48 hours.	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>8"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
--	--

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 The sample plot satisfies the hydrology criterion. No water table is associated with the zone of saturation.

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: UPL-2

Tree Stratum (Plot size: <u>30ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>
2. <u>Juniperus virginiana</u>	<u>5</u>	<u>N</u>	<u>FACU</u>
3. <u>Nyssa sylvatica</u>	<u>5</u>	<u>N</u>	<u>FAC</u>
4. <u>Liquidambar styraciflua</u>	<u>35</u>	<u>N</u>	<u>FAC</u>
5. <u>Fagus grandifolia</u>	<u>10</u>	<u>N</u>	<u>FACU</u>
6. _____	_____	_____	_____
<u>95</u> = Total Cover			
50% of total cover: <u>47.5</u> 20% of total cover: <u>19</u>			
Sapling Stratum (Plot size: <u>15ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Fagus grandifolia</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
<u>10</u> = Total Cover			
50% of total cover: <u>5</u> 20% of total cover: <u>2</u>			
Shrub Stratum (Plot size: <u>15ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
<u>0</u> = Total Cover			
50% of total cover: <u>0</u> 20% of total cover: <u>0</u>			
Herb Stratum (Plot size: <u>5ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Carex species</u>	<u>15</u>	<u>Y</u>	<u>NI</u>
2. <u>Microstegium vimineum</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
<u>20</u> = Total Cover			
50% of total cover: <u>10</u> 20% of total cover: <u>4</u>			
Woody Vine Stratum (Plot size: <u>30ft radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
<u>0</u> = Total Cover			
50% of total cover: <u>0</u> 20% of total cover: <u>0</u>			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by:

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
 - 2 - Dominance Test is >50%
 - 3 - Prevalence Index is ≤3.0¹
 - 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 - Problematic Hydrophytic Vegetation¹ (Explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)
 The sample plot satisfies the hydrophytic vegetation criterion.

SOIL

Sampling Point: UPL-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 3/3	80	10YR 4/4	20	C	M	ms	
6-12	10YR 4/3	100	---	--	C	M	sil	with fine sand
12-20	2.5Y 5/4	45	2.5Y 5/3	20	C	M	sicl	
			10YR 5/6	15	C	M		
			10YR 6/6	15	C	M		
			10YR 3/2	5	D	M		

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) (LRR N)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) (MLRA 147, 148)
- Thin Dark Surface (S9) (MLRA 147, 148)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) (LRR N, MLRA 136)
- Umbric Surface (F13) (MLRA 136, 122)
- Piedmont Floodplain Soils (F19) (MLRA 148)
- Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) (MLRA 147)
- Coast Prairie Redox (A16) (MLRA 147, 148)
- Piedmont Floodplain Soils (F19) (MLRA 136, 147)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: N/A
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks: The sample plot does not satisfy the hydric soils criterion.

APPENDIX C

Forest Sampling Data Sheets and Forest Summary Datasheets

Property: Carsins Run Stream Restoration

Prepared By: AW, BD

Stand #: A

Plot #: 2

Plot Size: 1/10 Acre

Date: 2/6/2018

Basal Area in sf/acre: 105	Size Class of trees >20' height within sample plot															Total
	# of Trees 2-5.9" dbh			# of Trees 6-11.9" dbh			# of Trees 12-19.9" dbh			# of Trees 20-29.9" dbh			# of Trees > 30" dbh			
Tree Species	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Total
<i>Carpinus caroliniana</i>			2													2
<i>Prunus serotina</i>			1													1
<i>Liriodendron tulipifera</i>										1						1
<i>Liquidambar styraciflua</i>							2									2
<i>Celtis occidentalis</i>			1													1
<i>Carya glabra</i>							1									1
<i>Quercus alba</i>						1				1						2
																0
																0
																0
																0
																0
Total Number of Trees per Size Class	4			1			3			2			0			10
Number & Size of Standing Dead Trees																0
List of Common Understory Species 3' - 20': <i>Crataegus</i> species, <i>Fagus grandifolia</i> , <i>Lindera benzoin</i>	% of Canopy Closure						Percent of Invasive Cover per Plot (All Layers): 5%	Plot Successional Stage: Early-Mid								
	<i>C</i>	<i>N</i>	<i>E</i>	<i>S</i>	<i>W</i>	<i>Total</i>										
	80	90	85	90	95	88										
List of Herbaceous Species 0' - 3': <i>Allium canadensis</i> , <i>Lonicera japonica</i>	% Understory Cover 3' - 20'															
	<i>C</i>	<i>N</i>	<i>E</i>	<i>S</i>	<i>W</i>	<i>Total</i>										
	20	5	25	30	10	18										
	% of Herbaceous Cover 0' - 3'															
	<i>C</i>	<i>N</i>	<i>E</i>	<i>S</i>	<i>W</i>	<i>Total</i>										
	2	2	5	2	0	2.2										

Comments
The sample plot is located generally northwest of I-95 and is located on the left bank of WUS WL003. Rock is present within the sample plot, and there is a minimal amount of downed woody debris present. Approximately 1/2" of leaf litter is present within the forest stand sample plot.

Property: Carsins Run Stream Restoration

Prepared By: AW, BD

Stand #: A

Plot #: 3

Plot Size: 1/10 Acre

Date: 2/6/2018

Basal Area in sf/acre: 120	Size Class of trees >20' height within sample plot															Total
	# of Trees 2-5.9" dbh			# of Trees 6-11.9" dbh			# of Trees 12-19.9" dbh			# of Trees 20-29.9" dbh			# of Trees > 30" dbh			
Tree Species	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Total
<i>Liriodendron tulipifera</i>			1			1	2									4
<i>Fagus grandifolia</i>			3													3
<i>Liquidambar styraciflua</i>							3									3
<i>Prunus serotina</i>			1													1
<i>Quercus alba</i>							2									2
<i>Juniperus virginiana</i>			1													1
<i>Carya glabra</i>										1						1
<i>Nyssa sylvatica</i>			2													2
<i>Carpinus caroliniana</i>			2													2
																0
																0
																0
Total Number of Trees per Size Class	10			1			7			1			0			19
Number & Size of Standing Dead Trees	1			1												2
List of Common Understory Species 3' - 20': <i>Carpinus caroliniana, Linder benzoin, Smilax rotundifolia, Vitis labrusca</i>				% of Canopy Closure						Percent of Invasive Cover per Plot (All Layers):			Plot Successional Stage:			
				<i>C</i>	<i>N</i>	<i>E</i>	<i>S</i>	<i>W</i>	<i>Total</i>							
				80	60	60	60	80	68							
				% Understory Cover 3' - 20'												
List of Herbaceous Species 0' - 3': <i>Allium canadense, Lonicera japonica, Microstegium vimineum, Rosa multiflora</i>				<i>C</i>	<i>N</i>	<i>E</i>	<i>S</i>	<i>W</i>	<i>Total</i>	15%			Early			
				0	10	15	15	10	10							
				% of Herbaceous Cover 0' - 3'												
				<i>C</i>	<i>N</i>	<i>E</i>	<i>S</i>	<i>W</i>	<i>Total</i>							
				2	5	2	10	10	5.8							

Comments
 The forest stand sample plot is located generally northwest of I-95, and is on the right bank of WUS WL003. The forest stand plot is surrounded by upland riparian forest. There is approximately 1/2" of leaf litter, and a moderate amount of downed woody debris present within the plot. There is a minimal amount of understory and herbaceous coverage within the sample plot.

Property: Carsins Run Stream Restoration

Prepared By: AW, BD

Stand #: B

Plot #: 1

Plot Size: 1/10 Acre

Date: 2/6/2018

Basal Area in sf/acre: 130	Size Class of trees >20' height within sample plot																	
	Tree Species			# of Trees 2-5.9" dbh			# of Trees 6-11.9" dbh			# of Trees 12-19.9" dbh			# of Trees 20-29.9" dbh			# of Trees > 30" dbh		
Crown Position	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Total		
<i>Liriodendron tulipifera</i>			1		1		6			1						9		
<i>Liquidambar styraciflua</i>			1	2	3											6		
<i>Fagus grandifolia</i>			9													9		
<i>Acer rubrum</i>					2											2		
<i>Nyssa sylvatica</i>			5													5		
<i>Carpinus caroliniana</i>			5													5		
<i>Ulmus rubra</i>			1													1		
																0		
																0		
																0		
																0		
																0		
Total Number of Trees per Size Class	22			8			6			1			0			37		
Number & Size of Standing Dead Trees	1			1												2		
List of Common Understory Species 3' - 20': <i>Carpinus caroliniana, Fagus grandifolia, Vitis labrusca</i>				% of Canopy Closure						Percent of Invasive Cover per Plot (All Layers): 20%			Plot Successional Stage: Early					
				<i>C</i>	<i>N</i>	<i>E</i>	<i>S</i>	<i>W</i>	<i>Total</i>									
				85	90	0	90	95	72									
				% Understory Cover 3' - 20'														
				<i>C</i>	<i>N</i>	<i>E</i>	<i>S</i>	<i>W</i>	<i>Total</i>									
				2	0	5	0	0	1.4									
List of Herbaceous Species 0' - 3': <i>Allium canadense, Carex</i> species, <i>Lonicera japonica, Polystichum acrostichoides, Rosa multiflora, Smilax rotundifolia</i>				% of Herbaceous Cover 0' - 3'														
				<i>C</i>	<i>N</i>	<i>E</i>	<i>S</i>	<i>W</i>	<i>Total</i>									
				10	2	45	5	30	18.4									

Comments
The sample plot is located generally southeast of I-95, and is located on the right bank of WUS WL001 and WUS WL005. Rock and a moderate amount of downed woody debris and herbaceous cover is present within the sample plot. There is an approximately 1/2" of leaf litter present within the sample plot.

Property: Carsins Run Stream Restoration

Prepared By: AW, BD

Stand #: B

Plot #: 2

Plot Size: 1/10 Acre

Date: 2/6/2018

Basal Area in sf/acre: 70	Size Class of trees >20' height within sample plot															Total
	# of Trees 2-5.9" dbh			# of Trees 6-11.9" dbh			# of Trees 12-19.9" dbh			# of Trees 20-29.9" dbh			# of Trees > 30" dbh			
Tree Species	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Dom	CoD	Other	Total
<i>Fagus grandifolia</i>		1	4													5
<i>Liquidambar styraciflua</i>				3												3
<i>Acer rubrum</i>			3	2	2		1									8
<i>Quercus alba</i>			1													1
<i>Nyssa sylvatica</i>			3	1												4
<i>Carpinus caroliniana</i>			5													5
																0
																0
																0
																0
																0
																0
Total Number of Trees per Size Class	17			8			1			0			0			26
Number & Size of Standing Dead Trees																0
List of Common Understory Species 3' - 20': <i>Acer rubrum, Carpinus caroliniana, Fagus grandifolia, Smilax rotundifolia</i>				% of Canopy Closure						Percent of Invasive Cover per Plot (All Layers): 10%			Plot Successional Stage: Early			
				<i>C</i>	<i>N</i>	<i>E</i>	<i>S</i>	<i>W</i>	<i>Total</i>							
				95	90	90	95	95	93							
				% Understory Cover 3' - 20'												
				<i>C</i>	<i>N</i>	<i>E</i>	<i>S</i>	<i>W</i>	<i>Total</i>							
				0	5	2	0	0	1.4							
List of Herbaceous Species 0' - 3': <i>Carex species, Microstegium vimineum, Smilax rotundifolia</i>				% of Herbaceous Cover 0' - 3'												
				<i>C</i>	<i>N</i>	<i>E</i>	<i>S</i>	<i>W</i>	<i>Total</i>							
				20	2	2	20	10	10.8							

Comments
The sample plot is located southeast of I-95, on the left bank of WUS WL001, and within Wetland WL008. The sample plot is located within the existing fence line. A moderate amount of downed woody debris is present. There is a minimal amount of understory and herbaceous cover present within the sample plot. Approximately 1/2" of leaf litter is present within the sample plot.

Property Name: Carsins Run Stream Restoration	
Location: Aberdeen, Harford County, MD	
Prepared By: AW, BD	Date: 2/6/18
Stand Variable	Stand A
1. Dominant/Codominant species	Dominant: <i>Acer rubrum</i> , <i>Carya glabra</i> , <i>Fagus grandifolia</i> , <i>Liriodendron tulipifera</i> , <i>Liquidambar styraciflua</i> , <i>Quercus alba</i>
2. Successional stage	Early-Mid
3. Basal area in square feet per acre	115
4. Size class of dominant species	12-19.9", 20-29.9"
5. Percent of canopy closure	82.3%
6. Number of tree species per acre	11
7. Common understory species per acre	<i>Berberis thunbergii</i> , <i>Carpinus caroliniana</i> , <i>Crataegus</i> species, <i>Fagus grandifolia</i> , <i>Lindera benzoin</i> , <i>Smilax rotundifolia</i> , <i>Vitis labrusca</i>
8. Percent of understory cover 3' to 10' tall	13.3%
9. Number of woody plants species 3' to 20' tall	7
10. Common herbaceous species 0' to 3' tall	<i>Allium canadense</i> , <i>Lonicera japonica</i> , <i>Microstegium vimineum</i> , <i>Rosa multiflora</i>
11. Percent of herbaceous and woody plant cover 0' to 3' tall	2.9%
12. List of major invasive plant species and percent cover	<i>Berberis thunbergii</i> , <i>Lonicera japonica</i> , <i>Microstegium vimineum</i> , <i>Rosa multiflora</i> - 10%
13. Number of standing dead trees 6" dbh or greater	2
14. Comments	The forest stand is located generally northwest of I-95. There is a moderate amount of downed woody debris present. A majority of the specimen trees are located within this forest stand. There is a moderate amount of understory and invasive species coverage. Additionally, there is a minimal amount of herbaceous coverage.
Forest Stand Summary Worksheet	
Sheet 4 of 7	

Property Name: Carsins Run Stream Restoration	
Location: Aberdeen, Harford County, MD	
Prepared By: AW, BD	Date: 2/6/18
Stand Variable	Stand B
1. Dominant/Codominant species	Dominant: <i>Acer rubrum</i> , <i>Liquidambar styraciflua</i> , <i>Liriodendron tulipifera</i> , <i>Nyssa sylvatica</i> CoDominant: <i>Fagus grandifolia</i>
2. Successional stage	Early
3. Basal area in square feet per acre	100
4. Size class of dominant species	6-11.9", 12-19.9", 20-29.9"
5. Percent of canopy closure	82.5%
6. Number of tree species per acre	8
7. Common understory species per acre	<i>Acer rubrum</i> , <i>Carpinus caroliniana</i> , <i>Fagus grandifolia</i> , <i>Smilax rotundifolia</i> , <i>Vitis labrusca</i>
8. Percent of understory cover 3' to 10' tall	1.4%
9. Number of woody plants species 3' to 20' tall	5
10. Common herbaceous species 0' to 3' tall	<i>Allium canadense</i> , <i>Carex</i> species, <i>Carpinus caroliniana</i> , <i>Lonicera japonica</i> , <i>Microstegium vimineum</i> , <i>Polystichum acrostichoides</i> , <i>Rosa multiflora</i> , <i>Smilax rotundifolia</i>
11. Percent of herbaceous and woody plant cover 0' to 3' tall	14.6%
12. List of major invasive plant species and percent cover	<i>Lonicera japonica</i> , <i>Microstegium vimineum</i> , <i>Rosa multiflora</i> , – 15%
13. Number of standing dead trees 6" dbh or greater	1
14. Comments	Forest Stand B is located southeast of I-95. This early successional stand has a moderate amount of herbaceous and invasive species coverage. There is a minimal amount of understory coverage present. There is a moderate amount of downed woody debris present.
Forest Stand Summary Worksheet	
Sheet 7 of 7	

APPENDIX D

Representative Site Photographs

Photographic Record

KCI Technologies, Inc.

Agency: Maryland Transportation Authority
Project: Carsins Run Stream Restoration
Project No. – 22145228.36



Photographer: K. Myers
Date: 2/5/18
Frame No. 1
Direction: North
Comments: View of WUS
WL001 facing upstream from
flag WL001-002



Photographer: K. Myers
Date: 2/5/18
Frame No. 2
Direction: North
Comments: View of WUS
WL001 facing upstream between
flags WL001-008 and WL001-
009.

Photographic Record

KCI Technologies, Inc.

Agency: Maryland Transportation Authority
Project: Carsins Run Stream Restoration
Project No. – 22145228.36



Photographer: K. Myers
Date: 2/5/18
Frame No. 3
Direction: North
Comments: View of WUS
WL001 facing upstream from
flag WL001-011.



Photographer: K. Myers
Date: 2/5/18
Frame No. 4
Direction: Southeast
Comments: View of WUS
WL001 facing downstream from
flag WL001-011.

Photographic Record

KCI Technologies, Inc.

Agency: Maryland Transportation Authority
Project: Carsins Run Stream Restoration
Project No. – 22145228.36



Photographer: K. Myers
Date: 2/5/18
Frame No. 5
Direction: Northeast
Comments: View of Waterway
WL002 facing upstream from
flag WL002-002.



Photographer: K. Myers
Date: 2/5/18
Frame No. 6
Direction: West
Comments: View of WUS
WL003 facing upstream from
flag WL003-003.

Photographic Record

KCI Technologies, Inc.

Agency: Maryland Transportation Authority
Project: Carsins Run Stream Restoration
Project No. – 22145228.36



Photographer: K. Myers
Date: 2/5/18
Frame No. 7
Direction: West
Comments: View of Waterway
WL003 facing upstream from
flag WL003-007.



Photographer: K. Myers
Date: 2/5/18
Frame No. 8
Direction: East
Comments: View of WUS
WL003 facing downstream from
flag WL003-032.

Photographic Record

KCI Technologies, Inc.

Agency: Maryland Transportation Authority
Project: Carsins Run Stream Restoration
Project No. – 22145228.36



Photographer: K. Myers
Date: 2/5/18
Frame No. 9
Direction: East
Comments: View of Waterway
WL003 facing downstream from
flag WL003-037.



Photographer: K. Myers
Date: 2/5/18
Frame No. 10
Direction: West
Comments: View of WUS
WL003 facing upstream from
flag WL003-038.

Photographic Record

KCI Technologies, Inc.

Agency: Maryland Transportation Authority
Project: Carsins Run Stream Restoration
Project No. – 22145228.36



Photographer: K. Myers
Date: 2/5/18
Frame No. 11
Direction: Northwest
Comments: View of Waterway
WL004 facing upstream from
flag WL004-002.



Photographer: K. Myers
Date: 2/5/18
Frame No. 12
Direction: Southeast
Comments: View of Waterway
WL004 facing downstream from
flag WL004-002.

Photographic Record

KCI Technologies, Inc.

Agency: Maryland Transportation Authority
Project: Carsins Run Stream Restoration
Project No. – 22145228.36



Photographer: K. Myers
Date: 2/5/18
Frame No. 13
Direction: South
Comments: View of WUS
WL001 facing upstream from
flag WL001-017.



Photographer: K. Myers
Date: 2/5/18
Frame No. 14
Direction: North
Comments: View of WUS
WL005 facing downstream from
flag WL005-004.

Photographic Record

KCI Technologies, Inc.

Agency: Maryland Transportation Authority
Project: Carsins Run Stream Restoration
Project No. – 22145228.36



Photographer: K. Myers
Date: 2/5/18
Frame No. 15
Direction: South
Comments: View of WUS
WL001 facing upstream from
flag WL001-017.



Photographer: K. Myers
Date: 2/5/18
Frame No. 16
Direction: North
Comments: View of Waterway
WL006 facing upstream from
flag WL006-003.

Photographic Record

KCI Technologies, Inc.

Agency: Maryland Transportation Authority
Project: Carsins Run Stream Restoration
Project No. – 22145228.36



Photographer: K. Myers
Date: 2/5/18
Frame No. 17
Direction: South
Comments: View of Waterway
WL006 facing downstream from
flag WL006-006.



Photographer: A. Wagoner
Date: 2/6/18
Frame No. 18
Direction: Northwest
Comments: View of Wetland
Sample Plot WL007-WET
towards Ripken Stadium
complex

Photographic Record

KCI Technologies, Inc.

Agency: Maryland Transportation Authority
Project: Carsins Run Stream Restoration
Project No. – 22145228.36



Photographer: A. Wagoner
Date: 2/6/18
Frame No. 19
Direction: N/A
Comments: View of Wetland
Sample Plot WL007-WET soils.



Photographer: A. Wagoner
Date: 2/6/18
Frame No. 20
Direction: South
Comments: View of Wetland
Sample Plot WL008-WET.

Photographic Record

KCI Technologies, Inc.

Agency: Maryland Transportation Authority
Project: Carsins Run Stream Restoration
Project No. – 22145228.36



Photographer: A. Wagoner
Date: 2/6/18
Frame No. 21
Direction: N/A
Comments: View of Wetland
Sample Plot WL008-WET soils.



Photographer: A. Wagoner
Date: 2/6/18
Frame No. 22
Direction: North
Comments: View of Upland
Sample Plot UPL-1.

Photographic Record

KCI Technologies, Inc.

Agency: Maryland Transportation Authority
Project: Carsins Run Stream Restoration
Project No. – 22145228.36



Photographer: A. Wagoner
Date: 2/6/18
Frame No. 23
Direction: N/A
Comments: View of Upland
Sample Plot UPL-1 soils.



Photographer: A. Wagoner
Date: 2/6/18
Frame No. 24
Direction: Southwest
Comments: View of Upland
Sample Plot UPL-2.

Photographic Record

KCI Technologies, Inc.

Agency: Maryland Transportation Authority
Project: Carsins Run Stream Restoration
Project No. – 22145228.36



Photographer: A. Wagoner
Date: 2/6/18
Frame No. 25
Direction: N/A
Comments: View of Upland
Sample Plot UPL-2 soils.



Photographer: A. Wagoner
Date: 2/6/18
Frame No. 26
Direction: West
Comments: View of Forest Stand
Delineation Sample Plot FSD A-
1 from center.

Photographic Record

KCI Technologies, Inc.

Agency: Maryland Transportation Authority
Project: Carsins Run Stream Restoration
Project No. – 22145228.36



Photographer: A. Wagoner
Date: 2/6/18
Frame No. 27
Direction: East
Comments: View of Forest Stand
Delineation Sample Plot FSD A-
2 from center.



Photographer: A. Wagoner
Date: 2/6/18
Frame No. 28
Direction: East
Comments: View of Forest Stand
Delineation Sample Plot FSD A-
3 from center.

Photographic Record

KCI Technologies, Inc.

Agency: Maryland Transportation Authority
Project: Carsins Run Stream Restoration
Project No. – 22145228.36



Photographer: A. Wagoner
Date: 2/6/18
Frame No. 29
Direction: North
Comments: View of Forest Stand
Delineation Sample Plot FSD B-
1 from center.



Photographer: A. Wagoner
Date: 2/6/18
Frame No. 30
Direction: North
Comments: View of Forest Stand
Delineation Sample Plot FSD B-
2 from center.

APPENDIX E

Natural Resource, Historic and Cultural Review Correspondence



United States Department of the Interior
 U.S. Fish & Wildlife Service
 Chesapeake Bay Field Office
 177 Admiral Cochrane Drive
 Annapolis, MD 21401
 410/573 4575



Online Certification Letter

Today's date:

Project:

Dear Applicant for online certification:


Thank you for using the U.S. Fish and Wildlife Service (Service) Chesapeake Bay Field Office online project review process. By printing this letter in conjunction with your project review package, you are certifying that you have completed the online project review process for the referenced project in accordance with all instructions provided, using the best available information to reach your conclusions. This letter, and the enclosed project review package, completes the review of your project in accordance with the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended (ESA). This letter also provides information for your project review under the National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321-4347, 83 Stat. 852), as amended. A copy of this letter and the project review package must be submitted to this office for this certification to be valid. This letter and the project review package will be maintained in our records.

Based on this information and in accordance with section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), we certify that except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the project area. Therefore, no Biological Assessment or further section 7 consultation with the U.S. Fish and Wildlife Service is required. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

This response relates only to federally protected threatened or endangered species under our jurisdiction. For additional information on threatened or endangered species in Maryland, you should contact the Maryland Wildlife and Heritage Division at (410) 260-8573. For information in Delaware you should contact the Delaware Division of Fish and Wildlife, Wildlife Species Conservation and Research Program at (302) 735-8658. For information in the District of Columbia, you should contact the National Park Service at (202) 339-8309.

The U.S. Fish and Wildlife Service also works with other Federal agencies and states to minimize loss of wetlands, reduce impacts to fish and migratory birds, including bald eagles, and restore habitat for wildlife. Information on these conservation issues and how

development projects can avoid affecting these resources can be found on our website (www.fws.gov/chesapeakebay)

We appreciate the opportunity to provide information relative to fish and wildlife issues, and thank you for your interest in these resources. If you have any questions or need further assistance, please contact Chesapeake Bay Field Office Threatened and Endangered Species program at (410) 573-4527 .

Sincerely,

Genevieve LaRouche
Field Supervisor



Maryland
Transportation
Authority

Larry Hogan
Governor

Boyd K. Rutherford
Lt. Governor

Pete K. Rahn
Chairman

Katherine Bays Armstrong
Peter J. Basso
Dontae Carroll
William H. Cox, Jr.
William C. Ensor, III
W. Lee Gaines, Jr.
Mario J. Gangemi, P.E.
John von Paris

Kevin C. Reigrut
Executive Director

300 Authority Drive
Baltimore MD 21222-2200
410-537-7500
410-537-7803 (fax)
711 (MD Relay)
1-888-754-0098

e-mail: mdta@mdta.maryland.gov

www.mdta.maryland.gov

February 8, 2018

Mr. Tony Redman
Maryland Department of Natural Resources
Environmental Review Program, ERP
Tawes State Office Building C-3
580 Taylor Avenue
Annapolis, Maryland 21401

RE: Maryland Transportation Authority (MDTA)
I-95 Express Toll Lanes Northbound Extension
Carsins Run Stream Restoration
MDTA Tracking # KH-3009
Aberdeen, Harford County, Maryland
Fisheries Information Request

Dear Mr. Redman:

The Maryland Transportation Authority is considering stream restoration along an approximately 500 linear foot segment of Carsins Run (upstream and downstream of I-95) and an intermittent tributary to Carsins Run that originates at a wetland, upstream of I-95 and northeast of Ripken Stadium. Stream restoration efforts would serve as compensatory mitigation for unavoidable impacts incurred during construction of the I-95 Express Toll Lanes Northbound Extension project. A map of the project location has been included for your reference.

We request any information concerning resident fish and anadromous fish or additional water quality considerations within the study area. Please include the MDTA tracking information listed in the subject line above in all future correspondence. If you have questions regarding this request or require additional information to complete your review, please contact me at wpines@mdta.state.md.us or (410) 931-0808.

Sincerely,

William N. Pines, P.E.
Director of Project Development

Enclosure

Cc:
JMT: Leyla Lange, Michael Rothenheber
KCI: Jennifer Bird
CDM Smith: David Greenwood



Maryland
Transportation
Authority

Larry Hogan
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John von Paris

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410-537-7803 (fax)
711 (MD Relay)
1-888-754-0098

e-mail: mdta@mdta.maryland.gov

www.mdta.maryland.gov

February 8, 2018

Ms. Lori Byrne, Environmental Review Division
Maryland Department of Natural Resources
Wildlife and Heritage Service
Tawes State Office Building E-1
580 Taylor Avenue
Annapolis, Maryland 21401

RE: Maryland Transportation Authority (MDTA)
I-95 Express Toll Lanes Northbound Extension
Carsins Run Stream Restoration
MDTA Tracking # KH-3009
Aberdeen, Harford County, Maryland
Threatened and Endangered Species and Unique Habitat Information
Request

Dear Ms. Byrne:

The Maryland Transportation Authority is considering stream restoration along an approximately 500 linear foot segment of Carsins Run (upstream and downstream of I-95) and an intermittent tributary to Carsins Run that originates at a wetland, upstream of I-95 and northeast of Ripken Stadium. Stream restoration efforts would serve as compensatory mitigation for unavoidable impacts incurred during construction of the I-95 Express Toll Lanes Northbound Extension project. A map of the project location has been included for your reference.

We request any information concerning federally or state-listed rare, threatened or endangered species and unique habitat that may occur in the study area. Please include the MDTA tracking information listed in the subject line above in all future correspondence. If you have questions regarding this request or require additional information to complete your review, please contact me at wpines@mdta.state.md.us or (410) 931-0808.

Sincerely,

William N. Pines, P.E.
Director of Project Development

Enclosure

Cc:
JMT: Leyla Lange, Michael Rothenheber
KCI: Jennifer Bird
CDM Smith: David Greenwood



Maryland
Transportation
Authority

Larry Hogan
Governor

Boyd K. Rutherford
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Mario J. Gangemi, P.E.
John von Paris

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Executive Director

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410-537-7803 (fax)
711 (MD Relay)
1-888-754-0098

e-mail: mdta@mdta.maryland.gov

www.mdta.maryland.gov

February 8, 2018

Ms. Elizabeth Hughes
State Historic Preservation Officer
Maryland Historic Trust
100 Community Place, 3rd floor
Crownsville, MD 21032-2023

Attention: Ms. Beth Cole

RE: Maryland Transportation Authority (MDTA)
I-95 Express Toll Lanes Northbound Extension
Carsins Run Stream Restoration
MDTA Tracking # KH-3009
Aberdeen, Harford County, Maryland
Historic Properties and Archeological Resources Information Request

Dear Ms. Hughes:

The Maryland Transportation Authority is considering stream restoration along an approximately 500 linear foot segment of Carsins Run (upstream and downstream of I-95) and an intermittent tributary to Carsins Run that originates at a wetland, upstream of I-95 and northeast of Ripken Stadium. Stream restoration efforts would serve as compensatory mitigation for unavoidable impacts incurred during construction of the I-95 Express Toll Lanes Northbound Extension project. A map of the project location has been included for your reference.

We request any information concerning historic or archeological resources within the vicinity of the study area. Please include the MDTA tracking information listed in the subject line above in all future correspondence. If you have questions regarding this request or require additional information to complete your review, please contact me at wpines@mdta.state.md.us or (410) 931-0808.

Sincerely,

William N. Pines, P.E.
Director of Project Development

Enclosure

Cc:
JMT: Leyla Lange, Michael Rothenheber
KCI: Jennifer Bird
CDM Smith: David Greenwood

APPENDIX F

Qualification of Preparer



Martin O'Malley, Governor
Anthony G. Brown, Lt. Governor
John R. Griffin, Secretary
Joseph P. Gill, Deputy Secretary

September 6, 2011

Jennifer Bird
1717 Dogwood Dr.
Frederick, MD 21701

Dear Ms. Bird:

The Maryland Department of Natural Resources has reviewed your application for qualified professional status for the purpose of developing Forest Stand Delineations and Forest Conservation Plans. We are happy to inform you that you meet the requirements of COMAR 08.19.06.01 for qualified professional status.

Your name will be included on a list of qualified professionals to be sent to the jurisdictions with authority to review Forest Stand Delineations and Forest Conservation Plans.

Participation by professionals like you is key to successful implementation of the Forest Conservation Act. Thank you for submitting your application.

Sincerely,

Steven W. Koehn
Director/State Forester

