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ENVIRONMENTAL

JOINT PERMIT APPLICATION
LOUDOUN CENTER
LOUDUN COUNTY, VIRGINIA

TNT PROJECT NO.: 1165

PREPARED FOR

ZEBRA VENTURES LLC

SEPTEMBER 1, 2023

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WP4 - JPA CHECKLIST

9 VAC 25-690-60

	Submission Requirements	Material Location in JPA
1.	The applicant's name, mailing address, telephone number and, if applicable, fax number	8
2.	The authorized agent's (if applicable) name, mailing address, telephone number, if applicable, fax number and email address	8
3.	The existing VWP permit number (if applicable)	N/A
4.	The name of the project, narrative description of project purpose, and a description of the activity in surface waters	7 & 8
5.	The name of the water body or water bodies or receiving stream, as applicable	7
6.	The hydrologic unit code (HUC) for the project area	7
7.	The name of the city or county where the project is located	7
8.	Latitude and longitude (to the nearest second) from a central location within the project limits	7
9.	A detailed location map (e.g., a United States Geologic Survey topographic quadrangle map) of the project area, including the project boundary. The map shall be of sufficient detail such that the site may be easily located for site inspection	Appendix I
10.	(Reserved)	N/A
11.	Project plan view. Plan view sketches shall include, at a minimum, north arrow, scale, existing structures, existing contours, proposed contours (if available), limit of surface water areas, direction of flow, ordinary high water, impact limits, and location and dimension of all proposed structures in impact areas. In addition, cross-sectional or profile sketches with the above information may be required to detail impact areas.	Appendix IX
12.	Dredge material management plan (for dredging projects only) including plan and cross-section view drawings of the disposal or dewatering area, the dimensions and design of the proposed berm and spillway, and the capacity of the proposed disposal or dewatering site	N/A
13.	Surface water impact information (wetlands, streams, or open water) for both permanent and temporary impacts, including a description of the impact, the areal extent of the impact (areas of wetland in square feet and acres; area of stream, length of stream, and average width); the location (latitude and longitude at the center of the impact, or at the center of each impact for linear projects); and the types of surface waters impact (open water; wetlands according to the Cowardin classification or similar terminology; or perennial and non perennial for streams).	8
14.	Functional values assessment for impacts to wetlands greater than one acre which shall consist of a summary of field observations of the existing wetland functions and values and an assessment of the impact that the project will have on these functions and values. The following parameters and functions shall be directly addressed: surrounding land uses and cover types; nutrient, sediment, and pollutant trapping; flood control and flood storage capacity; erosion control and shoreline stabilization; groundwater recharge and discharge; aquatic and wildlife habitat; and unique or critical habitats.	N/A
15.	A description of the specific on-site measures considered and taken during project design and development both to avoid and minimize impacts to surface waters to the maximum extent practicable.	Appendix IV

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WP4 - JPA CHECKLIST

9 VAC 25-690-60

Submission Requirements	Material Location in JPA
16. A conceptual plan for the intended compensation for unavoidable impacts, including:	Appendix V
a. For wetlands :A conceptual compensatory mitigation plan shall include:	N/A
(1) the goals and objectives in terms of replacement of wetland acreage and function;	N/A
(2) a detailed location map (e.g. a United States Geologic Survey topographic quadrangle map), including latitude and longitude (to the nearest second) at the center of the site;	N/A
(3) a description of the surrounding land use;	N/A
(4) a hydrologic analysis, including a draft water budget based on expected monthly inputs and outputs which will project water level elevations for a typical year, a dry year, and a wet year; groundwater elevation data, if available, or the proposed location of groundwater monitoring wells to collect these data;	N/A
(5) a map for existing surface water areas on the proposed site or sites, including wetland delineation confirmation for existing wetland areas;	N/A
(6) a conceptual grading plan;	N/A
(7) a conceptual planting scheme, including suggested plant species, zonation of each vegetation type proposed; and	N/A
(8) a description of existing soils including general information on topsoil and subsoil conditions, permeability, and the need for soil amendments.	N/A
b. For stream, the conceptual plan shall include:	N/A
(1) the goals and objectives in terms of water quality benefits and replacement of stream functions;	N/A
(2) a detailed location (e.g. a United States Geologic Survey topographic quadrangle map), including the latitude and longitude to the nearest second;	N/A
(3) the proposed stream segment restoration locations, including plan view and cross-section sketches;	N/A
(4) the stream deficiencies that need to be addressed;	N/A
(5) the proposed restoration measures to be employed, including channel measurements, proposed design flows and types of instream structures; and	N/A
(6) reference stream data, if available	N/A
c. Applicants proposing to compensate off-site, including purchase or use of mitigation bank credits, or contribution to an in-lieu fee fund shall submit an evaluation of the feasibility of on-site compensation. If on-site compensation is practicable, applicants shall provide documentation as to why the proposed off-site compensation is ecologically preferable. The evaluation shall include, but not be limited to, the following assessment criteria: water quality benefits, hydrologic source, hydrologic regime, watershed, surface water functions and values, vegetation type, soils, impact acreage, distance from impacts, timing of compensation versus impacts, acquisition, constructability, and cost.	Appendix V
d. Applicants proposing compensation involving contributions to in-lieu fee programs shall state such as the conceptual compensation plan. Written documentation of the willingness of the entity to accept the donation and documentation of how the amount of the contribution was calculated shall be submitted prior to issuance of this general permit authorization.	N/A
e. Applicants proposing compensation involving the purchase or use of mitigation banking credits shall include as their conceptual compensation plan:	Appendix V
(1) The name of the proposed mitigation bank and the HUC in which is located;	Appendix V
(2) The number of credits proposed to be purchased or used; and	Appendix V
(3) Certification from the bank owner of the availability of credits.	Appendix V

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WP4 - JPA CHECKLIST

9 VAC 25-690-60

	Submission Requirements	Material Location in JPA
17.	A delineation map must be provided of the geographic area of a delineated wetland for all wetlands on the site, in accordance with 9 VAC 25-210-45, including the wetlands data sheets. The delineation map shall also include the location of streams, open water, and the approximate limits of Chesapeake Bay Resources Protection Areas (RPAs), as other state or local requirements may apply if the project is located within an RPA. Wetland types shall be noted according to their Cowardin classification or similar terminology. A copy of the USACE delineation confirmation, or other correspondence from the USACE indicating their approval of the wetland boundary, shall be provided at the time of application, or if not available at that time, as soon as it becomes available during the VWP permit review.	Appendix I
18.	A copy of the FEMA flood insurance rate map or FEMA-approved local floodplain map for the project site.	Appendix VI
19.	The appropriate application processing fee for a VWP general permit in accordance with 9 VAC 25-20. The permit application fee for VWP permit authorizations is based on acres only. Therefore, impacts calculated using linear feet of stream bed must be converted to an acreage in order to calculate the total permit application fee.	X
20.	A written disclosure identifying all wetlands, open water, streams, and associated upland buffers within the proposed project or compensation areas that are under a deed restriction, conservation easement, restrictive covenant, or other land use protective instrument (protected areas). Such disclosure shall include the nature of the prohibited activities within the protected areas.	N/A
21.	The following certification: *"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations."*	8b
22.	The registration statement shall be signed in accordance with 9VAC25-210-100. If an agent is acting on behalf of an applicant, the applicant shall submit an authorization of the agent that includes the signatures of both the applicant and the agent.	11 & 12

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Appendices

I	USACE Jurisdictional Determination Letter & Wetland Delineation Report
II	Threatened and Endangered Species Information
III	Phase I Archaeological Report
IV	Avoidance & Minimization Analysis
V	Conceptual Mitigation Plan
VI	FEMA Flood Insurance Map
VII	Cross Sectional Diagram
VIII	8.5”x11” Drawings
IX	Overall Site Development Plan and Wetland Impacts Map

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FOR AGENCY USE ONLY	
	Notes:
JPA# 23-2059	

APPLICANTS

PLEASE PRINT OR TYPE ALL ANSWERS. If a question does not apply to your project, please print N/A (not applicable) in the space provided. ***If additional space is needed, attach extra 8 ½ x 11 inch sheets of paper.***

Check all that apply			
☐ Pre-Construction Notification (PCN) ☐ NWP # _____ ☐ RP # 05 (*For NWPs & RP 05 ONLY - No DEQ-VWP permit writer will be assigned*)	☐ SPGP	☐ DEQ Reapplication Existing permit number: _____	☐ Receiving federal funds Agency providing funding: _____
☐ Regional Permit 17 Checklist (RP-17)			

PREVIOUS ACTIONS RELATED TO THE PROPOSED WORK (Include all federal, state, and local pre application coordination, site visits, previous permits, or applications whether issued, withdrawn, or denied)

Historical information for past permit submittals can be found online with VMRC - https://webapps.mrc.virginia.gov/public/habitat/ - or VIMS - http://ccrm.vims.edu/perms/newpermits.html

Agency	Action / Activity	Permit/Project number, including any non-reporting Nationwide permits previously used (e.g., NWP 13)	Date of Action	If denied, give reason for denial
USACE	Preliminary Jurisdictional Determination	NAO-2018-00997	July 17, 2018	N/A
VDEQ/ USACE	VWP General Permit	WP4-18-1411	November 14, 2018	N/A

1. APPLICANT, AGENT, PROPERTY OWNER, AND CONTRACTOR INFORMATION
The applicant(s) is/are the legal entity to which the permit may be issued (see How to Apply at beginning of form). The applicant(s) can either be the property owner(s) or the person/people/company(ies) that intend(s) to undertake the activity. The agent is the person or company that is representing the applicant(s). If a company, please also provide the company name that is registered with the State Corporation Commission (SCC), or indicate no registration with the SCC.

Legal Name(s) of Applicant(s)			Agent (if applicable)		
Zebra Ventures LLC (Hossein Fateh)			TNT Environmental, Inc. (Kayla Simpson)		
Mailing address 1212 New York Ave. NW Ste. 1000			Mailing address 4455 Brookfield Corporate Dr, Suite 100		
City Washington	State D.C.	ZIP Code 20005	City Chantilly	State VA	ZIP Code 20151
Phone number w/area code 202-607-2300	Fax		Phone number w/area code 703-466-5123	Fax	
Mobile	E-mail notices@cloudhq.com		Mobile	E-mail ksimpson@tntenv.com	
State Corporation Commission Name and ID number (if applicable) Zebra Ventures LLC T0343576			State Corporation Commission Name and ID number (if applicable)		

Certain permits or permit authorizations may be provided via electronic mail. If the applicant wishes to receive their permit via electronic mail, please provide an e-mail address here: pworley@cloudhq.com

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1. APPLICANT, AGENT, PROPERTY OWNER, AND CONTRACTOR INFORMATION (Continued)

Property owner(s) legal name, if different from applicant			Contractor, if known		
Mailing address			Mailing address		
City	State	ZIP code	City	State	ZIP code
Phone number w/area code	Fax		Phone number w/area code	Fax	
Mobile	E-mail		Mobile	E-mail	
State Corporation Commission Name and ID number (if applicable)			State Corporation Commission Name ID number (if applicable)		

2. PROJECT LOCATION INFORMATION

(Attach a copy of a detailed map, such as a USGS topographic map or street map showing the site location and project boundary, so that it may be located for inspection. Include an arrow indicating the north direction. Include the drainage area if the SPGP box is checked on Page 7.)

Street Address (911 address if available) Loudoun County Parkway	City/County/ZIP Code Ashburn, Loudoun County, 20147
Subdivision	Lot/Block/Parcel # 089-48-1925, 089-49-6285, and 089-30-9997

Name of water body(ies) within project boundaries and drainage area (acres or square miles).
Broad Run

Tributary(ies) to: Broad Run
Basin: Potomac River Sub-basin: Middle Potomac-Catoctin
(*Example: Basin: James River Sub-basin: Middle James River*)

Special Standards (based on DEQ Water Quality Standards 9VAC25-260 et seq.): N/A

Project type (check one)
_____ Single user (private, non-commercial, residential)
x Multi-user (community, commercial, industrial, government)
_____ Surface water withdrawal

Latitude and longitude at center of project site (decimal degrees): 39.00611 / -77.47667
(Example: 37.33164/-77.68200)

USGS topographic map name: Sterling Quadrangle

8-digit USGS Hydrologic Unit Code (HUC) for your project site (See http://cfpub.epa.gov/surf/locate/index.cfm): 02070008
If known, indicate the 10-digit and 12-digit USGS HUCs (see http://consapps.dcr.virginia.gov/htdocs/maps/HUExplorer.htm) :
0207000809 020700080903

Name of your project (*Example: Water Creek driveway crossing*) Loudoun Center - Phase II

Is there an access road to the project? ☑ Yes ☐ No. If yes, check all that apply: ☐ public ☑ private ☐ improved ☐ unimproved

Total size of the project area (in acres): 133.22

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2. PROJECT LOCATION INFORMATION (Continued)

Provide driving directions to your site, giving distances from the best and nearest visible landmarks or major intersections:

From Dulles Airport, take VA-267 W to exit 7 for Loudoun County Pkwy. Turn right (north), site is on either side of Loudoun County Pkwy, just north of Shellhorn Road. Site can also be reached from the north along Waxpool Road (VA-625) between Regency Drive and Red Rum Drive.

Does your project site cross boundaries of two or more localities (i.e., cities/counties/towns)? ☐ Yes ☑ No
If so, name those localities:

3. DESCRIPTION OF THE PROJECT, PROJECT PRIMARY AND SECONDARY *PURPOSES*, PROJECT *NEED*, INTENDED USE(S), AND ALTERNATIVES CONSIDERED (Attach additional sheets if necessary)

- The purpose and need must include any new development or expansion of an existing land use and/or proposed future use of residual land.
- Describe the physical alteration of surface waters, including the use of pilings (#, materials), vibratory hammers, explosives, and hydraulic dredging, when applicable, and *whether or not tree clearing will occur* (include the area in square feet and time of year).
- Include a description of alternatives considered and measures taken to avoid or minimize impacts to surface waters, including wetlands, to the maximum extent practicable. Include factors such as, but not limited to, alternative construction technologies, alternative project layout and design, alternative locations, local land use regulations, and existing infrastructure
- For utility crossings, include both alternative routes and alternative construction methodologies considered
- For surface water withdrawals, public surface water supply withdrawals, or projects that will alter in stream flows, include the water supply issues that form the basis of the proposed project.

Refer to Project Description Narrative.

Date of proposed commencement of work (MM/DD/YYYY)	Date of proposed completion of work (MM/DD/YYYY)
January 2025	January 2035
Are you submitting this application at the direction of any state, local, or federal agency? _____Yes _x_____No	Has any work commenced or has any portion of the project for which you are seeking a permit been completed? _x_ Yes _____ No

If you answered "yes" to either question above, give details stating when the work was completed and/or when it commenced, who performed the work, and which agency (if any) directed you to submit this application. In addition, you will need to clearly differentiate between completed work and proposed work on your project drawings.

Phase I of the project including the northern and eastern portions of the project have been previously authorized under permit WP4-18-1411 and have been underway since permit issuance.

Are you aware of any unresolved violations of environmental law or litigation involving the property? _____Yes _X_No
(If yes, please explain)

N/A

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Project Description – Loudoun Center

LOCATION

The project site consists of three (3) parcels of land totaling approximately 133.22 acres located on either side of Loudoun County Parkway, north of Shellhorn Road in Loudoun County, Virginia. The project site is further identified by Loudoun County PINs: 089-48-1925, 089-49-6285, and 089-30-9997. The terrain of the project site consists of gently sloping topography at approximately 230 to 280 feet above mean sea level (MSL) and is within the Broad Run drainage basin. Portions of the site are vacant with development limited to gas easement and associate access road bisecting the property. A gravel parking lot used for construction purposes is currently located in the northern portion of Phase I of the project and tree clearing has occurred in the central and eastern portions of the project site. The remainder of the site is wooded.

PROJECT PURPOSE AND DESIGN

The purpose of the proposed project is the construction of a total of eight (8) two-story datacenter buildings and associated infrastructure to meet the rapidly growing demand for data center space and services in Loudoun County, Virginia. Key industries such as healthcare, banking and government defense and intelligence sectors have dramatically increased the demand for data center facilities in Loudoun County.

The project would also include the construction of a Dominion Power (DP) substation along Shellhorn Drive which would be constructed with Phase II of this project. The project site is zoned as Commercial/Industrial, which is appropriate for the proposed use. There are currently three separate parcels (Loudoun County PINs: 089-48-1925, 089-49-6285, and 089-30-9997) of land within the 133.22-acre project site and the proposed project would retain the lots. The maximum permitted floor area ratio (FAR) is 0.40. As currently designed, the site plans for the two Phases (approved) achieves a 0.38 FAR.

The project would be constructed in three phases. Buildings LC 4 and LC 5, located in the northern portion of the project site, and Building LC 6, located in the southeastern portion of the project site, would be developed during Phase I, which were previously permitted under WP4-18-1411. Buildings LC11, LC12, LC13, and LC14 located in the south-central portion of the project site would be developed during Phase II. The remainder of the site, which includes the two additional two-story datacenter buildings and stormwater management facility in the southwestern portion of the site, will be constructed during Phase III of the project and will be permitted at a future date. Each building would include support facilities for electrical rooms, storage rooms, meeting rooms, break rooms, restrooms, the building lobby, outdoor chiller equipment space, etc. The roofs will accommodate additional equipment storage. Phase II is expected to begin in 2025 and would be complete in early 2035. Phase III schedule is not yet planned. A County transportation project is planned which bifurcates the project site from east to west and will be designed, permitted and constructed by others.

Access to the site is pre-determined by existing Loudoun County and VDOT road construction (existing median breaks in Old Waxpool, Shellhorn and Loudoun County Parkway as well as existing entrance locations that have been set based on minimum intersection spacing requirements along the frontage

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roads) that are also consistent with previous legislative approvals (MCI Worldcom Zoning ZMAP 1998-0003; Greenway Corporate Park ZMAP 2000-0006) that dictate site access locations. Additionally, site access has been carefully coordinated with planned Loudoun County CTP roadway improvements for the construction of new Lockridge West Road and Prentice Road through the subject sites.

MARKET ANALYSIS & PROJECT DEMAND

Loudoun County is the leader in Northern Virginia for data centers with over 75 data center buildings comprising more than 10 million square feet of data center space with more being planned and/or developed. Up to 70 percent of the world's internet traffic flows through Loudoun's data centers each day (*Source: https://biz.loudoun.gov/key-business-sectors/data-centers/*). To meet the existing and future demand on data center infrastructure in the vicinity, additional facilities are needed.

The demand for data center space has never been higher, with Northern Virginia being one of, if not the largest and most in-demand data center market in the world. Over the past few years, this has naturally led to a diminishing supply of appropriately zoned land and has driven industrial land prices to numbers not previously seen.

The healthcare industry, prominent in the DC-Metro region, is placing increased pressure on data center developments and cloud storage availability. Cloud computing is becoming the preferred choice for healthcare back-office applications, backup and disaster recovery, revenue cycle management and patient engagement. Advantages of the cloud can also include, cost savings, scalability, speed, freed up internal storage, a mobilized workforce, and improved user applications.

As healthcare organizations continue to embrace advanced health IT infrastructure technology, the volume of data collected and stored will increase accordingly. Organizations need to ensure their data is stored securely and is accessible to protect patient data. Clinicians must also have access to data where and when they need it for a successful data storage option. As such, proximity to stored data is paramount.

Data center storage space is paramount for the development of 5G streaming services. 5G will be faster, more stable, and more versatile than existing 4G technology, and the new network can both prioritize the different types of data streaming and handle the more than 8.4 billion IoT connected devices. 5G service will aid in the development of immersive gaming, autonomous driving, remote robotic surgery, production-line robotics, and augmented reality (*Source: https://www.forbes.com/sites/danielnewman/2018/08/14/5-emerging-technologies-that-5g-positively-disrupt/#3190d89166b6*). MIT reported that 5G service could open $12.3 trillion in revenue across technology industries (*Source: https://www.technologyreview.com/s/603770/the-5g-economy-how-5g-will-impact-global-industries-the-economy-and-you/*).

PROJECT IMPACTS

An Overall Wetlands Impact Map has been included in Appendix IX and depicts the proposed site plan and jurisdictional wetlands and WOTUS impacts. Based on the proposed site plan provided by Gordon; 0.85-acres (37,159-square feet) of palustrine forested wetland (PFO), 112 linear feet (0.01 acres) of perennial stream (R3), 1,965 linear feet (0.31 acres) of intermittent stream (R4), and 375 linear feet (0.05 acres) of ephemeral stream (R6) will be permanently impacted. Specifically, the permanent impacts will result from the construction of six of the eight proposed datacenter buildings and associated parking lots. The four datacenters (LC11-14) encompass Phase II of the project. These unavoidable impacts to jurisdictional

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wetlands and WOTUS are necessary in order to accomplish project goals. Phase III of the project will include an additional datacenter and the stormwater management facility , which are not included in this permit application and; therefore, will not be further discussed in detail.

As shown on the FEMA Flood Insurance Rate Map included as Appendix VI (Map No. 51107C0263E, Map Revised 2/17/2017), floodplains are not located within Phase II of the project. Floodplains are located in the eastern corner of Phase I.

PRACTICABLE ALTERNATIVES

There are no practicable onsite alternatives to the proposed project. In order for the project purpose to be practicably achieved, the wetlands and streams must be impacted to allow for the construction of the data center buildings, electrical substation, outdoor chiller equipment, parking, stormwater management facilities, and utilities to serve the proposed use. Additionally, because the amount of fill located in the jurisdictional streams has been limited to the minimum necessary to accomplish these requirements, there is no practicable alternative that will allow for the construction of this development within the project boundary with less adverse effects on streams, wetlands, and the aquatic community than the proposed project. The Applicant has considerable investment in the project in its current configuration.

AVOIDANCE AND MINIMIZATION

The applicant, land planners and engineers have worked to avoid impacts on the site to the maximum extent practicable. As discussed in Appendix IV, careful planning of the proposed layout ensured the construction of the development avoids wetlands and streams to the maximum extent available. Impacts for this layout were limited to only those necessary for ground leveling and stabilization associated with the construction of LC11-14. A detailed discussion of project avoidance is provided in Appendix IV.

Minimization is being achieved through the incorporation of appropriate and practicable design measures. The LC11-14 buildings have been designed to route all new, untreated runoff away from wetlands, while ensuring the primary stream system is not dewatered.

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4. PROJECT COSTS

Approximate cost of the entire project, including materials and labor: $ 66,610,000

Approximate cost of only the portion of the project affecting state waters (channelward of mean low water in tidal areas and below ordinary high water mark in nontidal areas): $ 595,000

5. PUBLIC NOTIFICATION (Attach additional sheets if necessary)

Complete information for all property owners adjacent to the project site and across the waterway, if the waterway is less than 500 feet in width. If your project is located within a cove, you will need to provide names and mailing addresses for all property owners within the cove. If you own the adjacent lot, provide the requested information for the first adjacent parcel beyond your property line. Per Army Regulation (AR 25-51) outgoing correspondence must be addressed to a person or business.

Failure to provide this information may result in a delay in the processing of your application by VMRC.

Property owner's name	Mailing address	City	State	ZIP code
See attached sheet below.				

Name of newspaper having general circulation in the area of the project: LoudounNow

Address and phone number (including area code) of newspaper 15 N. King St. Suite 101, Leesburg, VA 20176 P: 703-770-9723

Have adjacent property owners been notified with forms in Appendix A? _____Yes X No (attach copies of distributed forms)

6. THREATENED AND ENDANGERED SPECIES INFORMATION

Please provide any information concerning the potential for your project to impact state and/or federally threatened and endangered species (listed or proposed). Attach correspondence from agencies and/or reference materials that address potential impacts, such as database search results or confirmed waters and wetlands delineation/jurisdictional determination. Include information when applicable regarding the location of the project in Endangered Species Act-designated or -critical habitats. Contact information for the U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration, Virginia Dept. of Game and Inland Fisheries, and the Virginia Dept. of Conservation and Recreation-Division of Natural Heritage can be found on page 4 of this package.

Refer to Appendix

7. HISTORIC RESOURCES INFORMATION

Note: Historic properties include but are not limited to archeological sites, battlefields, Civil War earthworks, graveyards, buildings, bridges, canals, etc. Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the USACE from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the USACE, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant.

Are any historic properties located within or adjacent to the project site? ____ Yes X No _____ Uncertain

If Yes, please provide a map showing the location of the historic property within or adjacent to the project site.

Are there any buildings or structures 50 years old or older located on the project site? ____ Yes X No _____ Uncertain

If Yes, please provide a map showing the location of these buildings or structures on the project site.

Is your project located within a historic district? ____ Yes X No ____ Uncertain

If Yes, please indicate which district: _____

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5. Public Notification Continued.

Property owner's name	Mailing address	City	State	ZIP code
Digital-Me Devin Shafron E LLC	43940 Digital Loudoun Plz. Ste 203	Ashburn	VA	20147
Regency Homeowners Association Inc.	2180 W State Road 434, Ste. 5000	Longwood	FL	32779
Quantum Park LLC	520 Madison Ave Fl. 30	New York	NY	10022
Darab Ventures One LLC	1212 New York Ave Ste. 1000	Washington	D.C.	20005
Loudoun County Board of Supervisors	PO Box 7000 Msc. 01	Leesburg	VA	20177
Van Gogh Ventures LLC	1212 New York Ave NW, Ste. 1000	Washington	D.C.	20005
Digital Loudoun 3 LLC	44274 Round Table Plz. # 262	Ashburn	VA	20147
Boyd Ashburn LLC	1 N Wacker Dr. Ste. 4025	Chicago	IL	60606
Aligned Energy Data Centers IAD Propco LLC	2800 Summit Ave.	Plano	TX	75074
Equinix LLC	1 Lagoon Dr. Fl. 4	Redwood City	CA	94065

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7. HISTORIC RESOURCES INFORMATION (Continued)

Has a survey to locate archeological sites and/or historic structures been carried out on the property?
_x_ Yes ___ No ___ Uncertain

If Yes, please provide the following information: Date of Survey: July 2011

Name of firm: Circa Cultural Resource Management, LLC

Is there a report on file with the Virginia Department of Historic Resources? X Yes ____ No ___Uncertain

Title of Cultural Resources Management (CRM) report: Phase I Cultural Resources Survey of Dupont-Fabros Tract

Was any historic property located? ____ Yes X No __ Uncertain

8. WETLANDS, WATERS, AND DUNES/BEACHES IMPACT INFORMATION

Report each impact site in a separate column. If needed, attach additional sheets using a similar table format. Please ensure that the associated project drawings clearly depict the location and footprint of each numbered impact site. For dredging, mining, and excavating projects, use Section 17.

	Impact site number 1	Impact site number 2	Impact site number 3	Impact site number 4	Impact site number 5
Impact description (use all that apply): F=fill EX=excavation S=Structure T=tidal NT=non-tidal TE=temporary PE=permanent PR=perennial IN=intermittent SB=subaqueous bottom DB=dune/beach IS=hydrologically isolated V=vegetated NV=non-vegetated MC=Mechanized Clearing of PFO (*Example: F, NT, PE, V)*	Refer to Impact Table				
Latitude / Longitude (in decimal degrees)					
Wetland/waters impact area (square feet / acres)					
Dune/beach impact area (square feet)					
Stream dimensions at impact site (length and average width in linear feet, and area in square feet)					
Volume of fill below Mean High Water or Ordinary High Water (cubic yards)					

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8. WETLANDS/WATERS IMPACT INFORMATION (Continued)					
Cowardin classification of impacted wetland/water or geomorphological classification of stream *Example wetland: PFO; Example stream: 'C' channel and if tidal, whether vegetated or non-vegetated wetlands per Section 28.2-1300 of the Code of Virginia*					
Average stream flow at site (flow rate under normal rainfall conditions in cubic feet per second) and method of deriving it (gage, estimate, etc.)					
Contributing drainage area in acres or square miles (*VMRC cannot complete review without this information*)					
DEQ classification of impacted resource(s): Estuarine Class II; Non-tidal waters Class III; Mountainous zone waters Class IV; Stockable trout waters Class V; Natural trout waters Class VI; Wetlands Class VII https://law.lis.virginia.gov	Wetlands Class VII Non-tidal waters Class III				
For DEQ permitting purposes, also submit as part of this section a wetland and waters boundary delineation map – see (3) in the Footnotes section in the form instructions.					
For DEQ permitting purposes, also submit as part of this section a written disclosure of all wetlands, open water, or streams that are located within the proposed project or compensation areas that are also under a deed restriction, conservation easement, restrictive covenant, or other land-use protective instrument.					

9. APPLICANT, AGENT, PROPERTY OWNER, AND CONTRACTOR CERTIFICATIONS

READ ALL OF THE FOLLOWING CAREFULLY BEFORE SIGNING

PRIVACY ACT STATEMENT: The Department of the Army permit program is authorized by Section 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act, and Section 103 of the Marine Protection Research and Sanctuaries Act of 1972. These laws require that individuals obtain permits that authorize structures and work in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters prior to undertaking the activity. Information provided in the Joint Permit Application will be used in the permit review process and is a matter of public record once the application is filed. Disclosure of the requested information is voluntary, but it may not be possible to evaluate the permit application or to issue a permit if the information requested is not provided.

CERTIFICATION: I am hereby applying for permits typically issued by the DEQ, VMRC, USACE, and/or Local Wetlands Boards for the activities I have described herein. I agree to allow the duly authorized representatives of any regulatory or advisory agency to enter upon the premises of the project site at reasonable times to inspect and photograph site conditions, both in reviewing a proposal to issue a permit and after permit issuance to determine compliance with the permit.

In addition, I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

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SUMMARY OF WETLAND AND WATERS IMPACTS																		
Impact #	Impact Type	Impact Description	Average Stream Flow (cfs)	Drainage Area (Sq. Mi.)	PERMANENT IMPACTS											TEMPORARY IMPACTS		
					PFO (SF)	PFO (AC.)	R3 (LF)	R3 (SF)	R3 (AC.)	R4 (LF)	R4 (SF)	R4 (AC.)	R6 (LF)	R6 (SF)	R6 (AC.)	R3 (LF)	R3 (SF)	R3 (AC.)
LC 4																		
1	Building Construction & Supportive Grade	F, NT, PE, V, PFO	-	< 0.1	2,063	0.05	-	-	-	-	-	-	-	-	-	-	-	-
2	Dewatering	NT, PE, SE, V, PFO	-	< 0.1	18,286	0.42	-	-	-	-	-	-	-	-	-	-	-	-
LC 5																		
3	Building Construction & Supportive Grade	F, NT, PE, V, PFO, R3	~ 1	< 0.1	1,786	0.04	-	-	-	592	4,346	0.10	-	-	-	-	-	-
4	Building Construction, Parking Lot Construction & Supportive Grading	F, NT, PE, V, PFO, R3, R4	~ 1	< 0.1	8,097	0.19	112	634	0.01	298	1,722	0.04	-	-	-	-	-	-
5	Parking Lot Construction & Supportive Grading	F, NT, PE, SE, V, PFO, R4	~ 1	< 0.1	224	0.005	-	-	-	41	415	0.01	-	-	-	-	-	-
6	Supportive Grading	F, NT, PE, NV, RE	~ 1	< 0.1	141	0.003	-	-	-	-	-	-	375	2,246	0.05	-	-	-
7	Supportive Grading	F, NT, PE, V, PFO	~ 1	< 0.1	250	0.006	-	-	-	-	-	-	-	-	-	-	-	-
LC 11 - 14																		
8	Supportive Grading	F, NT, PE, V, PFO	~ 1	< 0.1	4,554	0.10	-	-	-	-	-	-	-	-	-	-	-	-
9	Building Construction, Parking Lot Construction & Supportive Grading	F, NT, PE, R4, NV	~ 1	< 0.1	125	0.003	-	-	-	1,034	6,980	0.16	-	-	-	-	-	-
10	Utility Crossing	F, NT, TE, R3, NV	~ 1	~ 0.4	-	-	-	-	-	-	-	-	-	-	-	27	263	0.01
11	Hydrology Change	NT, PE, PFO, V, S	~ 1	~ 0.4	1,513	0.03	-	-	-	-	-	-	-	-	-	-	-	-
12	Hydrology Change	NT, PE, PFO, V, S	~ 1	~ 0.4	120	0.003	-	-	-	-	-	-	-	-	-	-	-	-
Total					**37,159**	**0.85**	**112**	**634**	**0.01**	**1,965**	**13,463**	**0.31**	**375**	**2,246**	**0.05**	**27**	**263**	**0.01**

F - Fill; NT - Nontidal; PE - Permanent; TE - Temporary; R3 - Perennial; R4 - Intermittent; R6 - Ephemeral; PFO - Palustrine Forested; PEM - Palustrine Emergent; NV - Non-vegetated; V - Vegetated; S - Secondary

Total Permanent Impacts to Waters (Linear Feet):	**2,452**	**LF**	**0.14**
Total Permanent Impacts to Waters (Acreage):	**1.23**	**Acres**	**6,312**
Total Permanent Impacts to Waters (Square Feet):	**53,502**	**SF**	
Total Temporary Impacts to Waters (Acreage):	**0.01**	**Acres**	

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9. APPLICANT, AGENT, PROPERTY OWNER, AND CONTRACTOR CERTIFICATIONS (Continued)

Is/Are the Applicant(s) and Owner(s) the same? ☑ *Yes* ☐ *No*

Legal name & title of Applicant Zebra Ventures LLC (Hossein Fateh - Chief Executive)	Second applicant's legal name & title, if applicable
Applicant's signature	Second applicant's signature
Date 08/24/2023	Date
Property owner's legal name, if different from Applicant	Second property owner's legal name, if applicable
Property owner's signature, if different from Applicant	Second property owner's signature
Date	Date

CERTIFICATION OF AUTHORIZATION TO ALLOW AGENT(S) TO ACT ON APPLICANT'S(S') BEHALF (IF APPLICABLE)

I (we), Zebra Ventures LLC (and) _____,
APPLICANT'S LEGAL NAME(S) – *complete the second blank if more than one Applicant*

hereby certify that I (we) have authorized TNT Environmental, Inc. (and) _____
AGENT'S NAME(S) – *complete the second blank if more than one Agent*

to act on my (our) behalf and take all actions necessary to the processing, issuance, and acceptance of this permit and any and all standard and special conditions attached. I (we) hereby certify that the information submitted in this application is true and accurate to the best of my (our) knowledge.

Applicant's signature	Second applicant's signature, if applicable
Date 08/24/2023	Date
Agent's signature and title Kaylin Simpson	Second agent's signature and title, if applicable
Date 9/1/23	Date

CONTRACTOR ACKNOWLEDGEMENT (IF APPLICABLE)

I (we), _____ (and) _____,
APPLICANT'S LEGAL NAME(S) – *complete the second blank if more than one Applicant*

have contracted _____ (and) _____
CONTRACTOR'S NAME(S) – *complete the second blank if more than one Contractor*

to perform the work described in this Joint Permit Application, signed and dated _____.

I (we) will read and abide by all conditions as set forth in all federal, state, and local permits as required for this project. I (we) understand that failure to follow the conditions of the permits may constitute a violation of applicable federal, state, and local statutes and that we will be liable for any civil and/or criminal penalties imposed by these statutes.
In addition, I (we) agree to make available a copy of any permit to any regulatory representative visiting the project site to ensure permit compliance. If I (we) fail to provide the applicable permit upon request, I (we) understand that the representative will have the option of stopping our operation until it has been determined that we have a properly signed and executed permit and are in full compliance with all of the terms and conditions.

Contractor's name or name of firm (printed/typed)	Contractor's or firm's mailing address	
Contractor's signature and title	Contractor's license number	Date
Applicant's signature	Second applicant's signature, if applicable	
Date	Date	

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17. DREDGING, MINING, AND EXCAVATING (Continued)

For mining projects: On separate sheets of paper, explain the operation plans, including: 1) the frequency (e.g., every six weeks), duration (i.e., April through September), and volume (in cubic yards) to be removed per operation; 2) the temporary storage and handling methods of mined material, including the dimensions of the containment berm used for upland disposal of dredged material and the need (or no need) for a liner or impermeable material to prevent the leaching of any identified contaminants into ground water; 3) how equipment will access the mine site; and 4) verification that dredging: a) will not occur in water body segments that are currently on the effective Section 303(d) Total Maximum Daily Load (TMDL) priority list (available at http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/TMDL/TMDLDevelopment/TMDLProgramPriorities.aspx) or that have an approved TMDL; b) will not exacerbate any impairment; and c) will be consistent with any waste load allocation/limit/conditions imposed by an approved TMDL (see, "What's in my backyard" or subsequent spatial files at http://www.deq.virginia.gov/ConnectWithDEQ/VEGIS.aspx to determine the extent of TMDL watersheds and impairment segments).

Have you applied for a permit from the Virginia Department of Mines, Minerals and Energy? _____Yes _____No If Yes: Existing permit number:_____ Date permit issued: _____

Contributing drainage area: _____square miles	Average stream flow at site (flow rate under normal rainfall conditions): _____cfs

18. FILL (not associated with backfilled shoreline structures) AND OTHER STRUCTURES (other than piers and boathouses) IN WETLANDS OR WATERS, OR ON DUNES/BEACHES

Source and composition of fill material (percentage sand, silt, clay, rock):

Onsite VDOT approved fill

Provide documentation (i.e., laboratory results or analytical reports) that *fill* material from *off-site* locations is free of toxics. If not free of toxics, provide documentation of proper disposal (i.e., bill of lading from commercial supplier or disposal site). Documentation is not necessary for fill material obtained from on-site areas.

Explain the purpose of the filling activity and the type of structure to be constructed over the filled area (if any):

To support the proposed grade and infrastructure.

Describe any structure that will be placed in wetlands/waters or on a beach dune and its purpose:

Grading and placement of fill material for supportive grade and construction of Buildings LC 4, LC5, LC11-14 and associated infrastructure.

Will the structure be placed on pilings? ____ Yes x ____ No	Total area occupied by any structure. ~6,980 _____ Square Feet
How far will the structure be placed channelward from the back edge of the dune? N/A _____feet	How far will the structure be placed channelward from the back edge of the beach? N/A _____feet

19. NONTIDAL STREAM CHANNEL MODIFICATIONS FOR RESTORATION OR ENHANCMENT, or TEMPORARY OR PERMANENT RELOCATIONS

If proposed activities are being conducted for the purposes of compensatory mitigation, please attach separate sheets of paper providing all information required by the most recent version of the stream assessment methodology approved by the Norfolk District of the U.S. Army Corps of Engineers and the Virginia Department of Environmental Quality, in lieu of completing the questions below. Required information outlined by the methodology can be found at: http://www.nao.usace.army.mil/Missions/Regulatory/UnifiedStreamMethodology.aspx *or* http://www.deq.virginia.gov/Programs/Water/WetlandsStreams/Mitigation.aspx.

For all projects proposing stream restoration provide a completed Natural Channel Design Review Checklist and Selected Morphological Characteristics form. These forms and the associated manual can be located at: https://www.fws.gov/chesapeakebay/StreamReports/NCD%20Review%20Checklist/Natural%20Channel%20Design%20Checklist%20Doc%20V2%20Final%2011-4-11.pdf

Has the stream restoration project been designed by a local, state, or federal agency? ____ Yes ____ No. If yes, please include the name of the agency here: _____.

Is the agency also providing funding for this project? _____ Yes _____ No

Stream dimensions at impact site (length and average width in linear feet, and area in square feet):
L: _____(feet) AW:_____ (feet) Area:_____ (square feet)

Contributing drainage area: _____acres *or* _____square miles

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APPENDIX C

Chesapeake Bay Preservation Act Information

Please answer the following questions to determine if your project is subject to the requirements of the Bay Act Regulations:

1. Is your project located within Tidewater Virginia? ____Yes X No (See map on page 31) - If the answer is "no", the Bay Act requirements do not apply; if "yes", then please continue to question #2.

2. Please indicate if the project proposes to impact any of the following Resource Protection Area (RPA) features:

   ____ Tidal wetlands,

   ____ Nontidal wetlands connected by surface flow and contiguous to tidal wetlands or water bodies with perennial flow,

   ____ Tidal shores,

   ____ Other lands considered by the local government to meet the provisions of subsection A of 9VAC25-830-80 and to be necessary to protect the quality of state waters (contact the local government for specific information),

   ____ A buffer area not less than 100 feet in width located adjacent to and landward of the components listed above, and along both sides of any water body with perennial flow.

If the answer to question #1 was "yes" and any of the features listed under question #2 will be impacted, compliance with the Chesapeake Bay Preservation Area Designation and Management Regulations is required. **The Chesapeake Bay Preservation Area Designation and Management Regulations** are enforced through locally adopted ordinances based on the Chesapeake Bay Preservation Act (CBPA) program. Compliance with state and local CBPA requirements mandates the submission of a ***Water Quality Impact Assessment (WQIA)*** for the review and approval of the local government. Contact the appropriate local government office to determine if a WQIA is required for the proposed activity(ies).

The individual localities, not the DEQ, USACE, or the Local Wetlands Boards, are responsible for enforcing the CBPA requirements and, therefore, local permits for land disturbance are not issued through this JPA process. **Approval of this wetlands permit does not constitute compliance with the CBPA regulations nor does it guarantee that the local government will grant approval for encroachments into the RPA that may result from this project.**

Notes for all projects in RPAs

Development, redevelopment, construction, land disturbance, or placement of fill within the RPA features listed above requires the approval of the locality and may require an exception or variance from the local Bay Act ordinance. Please contact the appropriate local government to determine the types of development or land uses that are permitted within RPAs.

Pursuant to 9VAC25-830-110, *on-site delineation of the RPA is required for all projects in CBPAs*. Because USGS maps are not always indicative of actual "in-field" conditions, they may not be used to determine the site-specific boundaries of the RPA.

Notes for shoreline erosion control projects in RPAs

Re-establishment of woody vegetation in the buffer will be required by the locality to mitigate for the removal or disturbance of buffer vegetation associated with your proposed project. Please contact the local government to determine the mitigation requirements for impacts to the 100-foot RPA buffer.

Pursuant to 9VAC25-830-140 5 a (4) of the Virginia Administrative Code, shoreline erosion projects are a permitted modification to RPAs provided that the project is based on the "best technical advice" and complies with applicable permit conditions. In accordance with 9VAC25-830-140 1 of the Virginia Administrative Code, the locality will use the information provided in this Appendix, in the project drawings, in this permit application, and as required by the locality, to make a determination that:

1. Any proposed shoreline erosion control measure is necessary and consistent with the nature of the erosion occurring on the site, and the measures have employed the "best available technical advice"
2. Indigenous vegetation will be preserved to the maximum extent practicable
3. Proposed land disturbance has been minimized
4. Appropriate mitigation plantings will provide the required water quality functions of the buffer (9VAC25-830-140 3)
5. The project is consistent with the locality's comprehensive plan
6. Access to the project will be provided with the minimum disturbance necessary.

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APPENDIX I

WETLAND DELINEATION REPORT &
USACE JURISDICTIONAL DETERMINATION LETTER

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ENVIRONMENTAL

WETLAND DELINEATION REPORT
ZEBRA SOUTH
LOUDOUN COUNTY, VIRGINIA

TNT PROJECT NO.: 1165

FOR

CLOUDHQ

MAY 16, 2018

Received by VMRC September 1, 2023 /blh

May 16, 2018

Mr. Pete Hohm
CloudHQ
1212 New York Ave NW, Suite 1000
Washington DC 20002

TNT Project Number: 1165

Reference: Wetland Delineation Report, Zebra South, Loudoun County, Virginia
Latitude: 39° 0' 22" N, Longitude: 77° 28' 36" W

Dear Mr. Hohm:

TNT Environmental, Inc. (TNT) is pleased to present this wetland delineation report for the above-referenced project in general accordance with TNT Proposal Number 1597 dated January 31, 2018. The wetlands and Waters of the U.S. identified during this investigation for the above-referenced project site were originally delineated by Angler Environmental in 2010. The site was issued a Preliminary Jurisdictional Determination (PJD; 2010-1270) on June 23, 2010, which has since expired. In addition, RK&K conducted a delineation of the northern portion of the site in 2017. For the purposes of renewing the expired PJD, TNT has conducted an assessment of the site. Previously delineated areas were evaluated based on the *Corps of Engineers' Wetlands Delineation Manual* (1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains & Piedmont Region.* Field flagging and mapping of approximate wetland and stream boundaries located onsite is a combination of relic Angler Environmental and RK&K data, with updates provided by TNT where appropriate. Based on the field investigation conducted in April 2018 by TNT, jurisdictional Waters of the U.S., including wetlands, located within the study area have changed in some areas since the PJD was issued.

PROJECT SITE DESCRIPTION

The project site consists of three (3) parcels of land totaling approximately 133.22 acres located on either side of Loudoun County Parkway, north of Shellhorn Road in Loudoun County, Virginia (*Figure 1: Project Location Map*). The project site is further identified by Loudoun County PINs: 089-48-1925, 089-49-6285, and 089-30-9997. Based on the site visit, the project site is mostly a wooded with some stream systems throughout site (*Figure 2: USGS Topographic Map*). The site is vacant with development limited to gas easement and associate access road bisecting the property.

SECONDARY INFORMATION REVIEW

Secondary information entails the background research and review of recorded data and/or mapping associated with the project site. Resources reviewed include but are not limited to the following:

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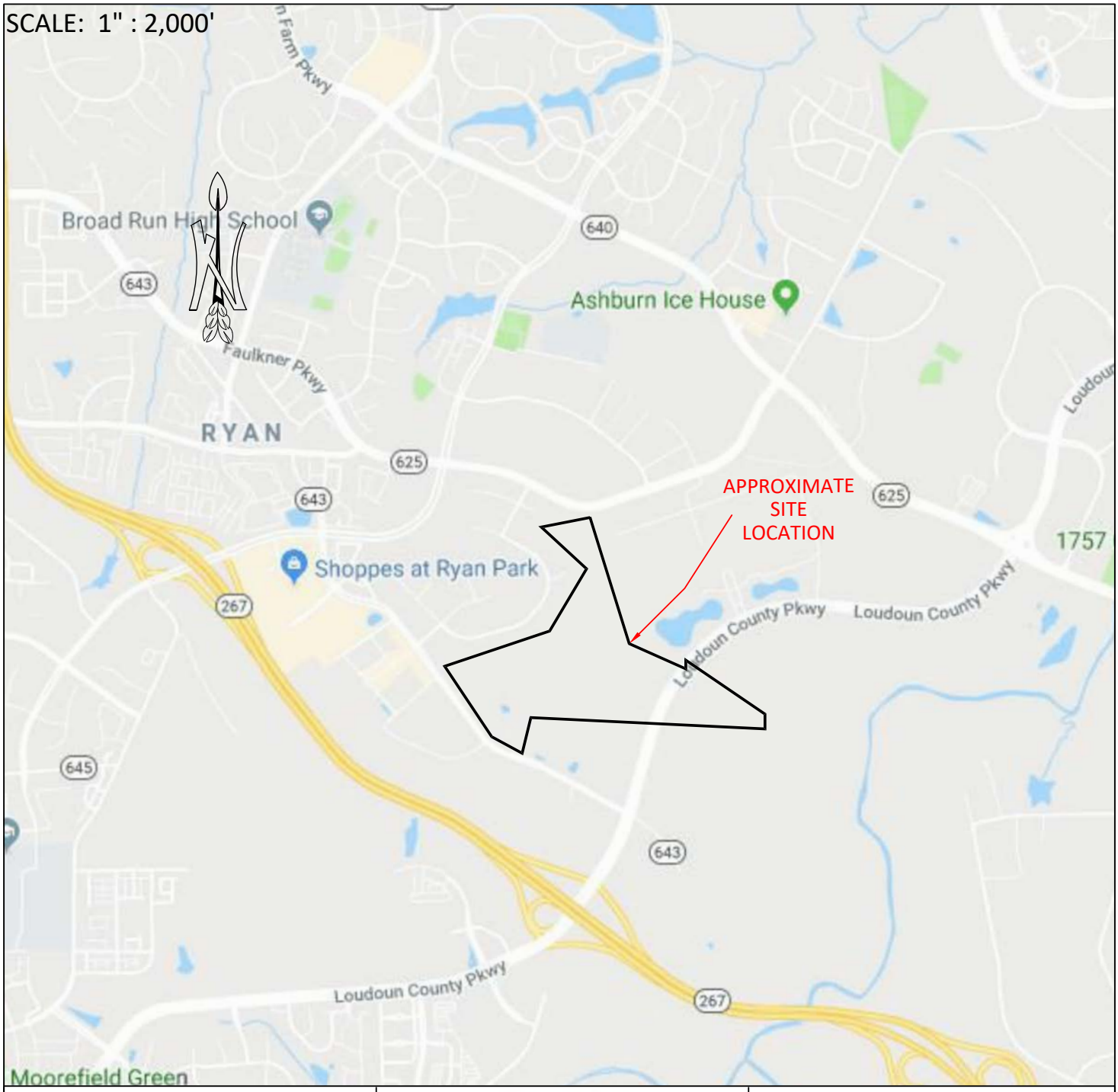

WETLAND DELINEATION MAP ZEBRA SOUTH LOUDOUN COUNTY, VA MAY 2018	ENVIRONMENTAL **13996 PARKEAST CIRCLE** **SUITE 101** **CHANTILLY, VIRGINIA** **20151**	**FIGURE 1** SITE LOCATION MAP SOURCE: GOOGLE MAPS TNT PROJECT NO: 1165

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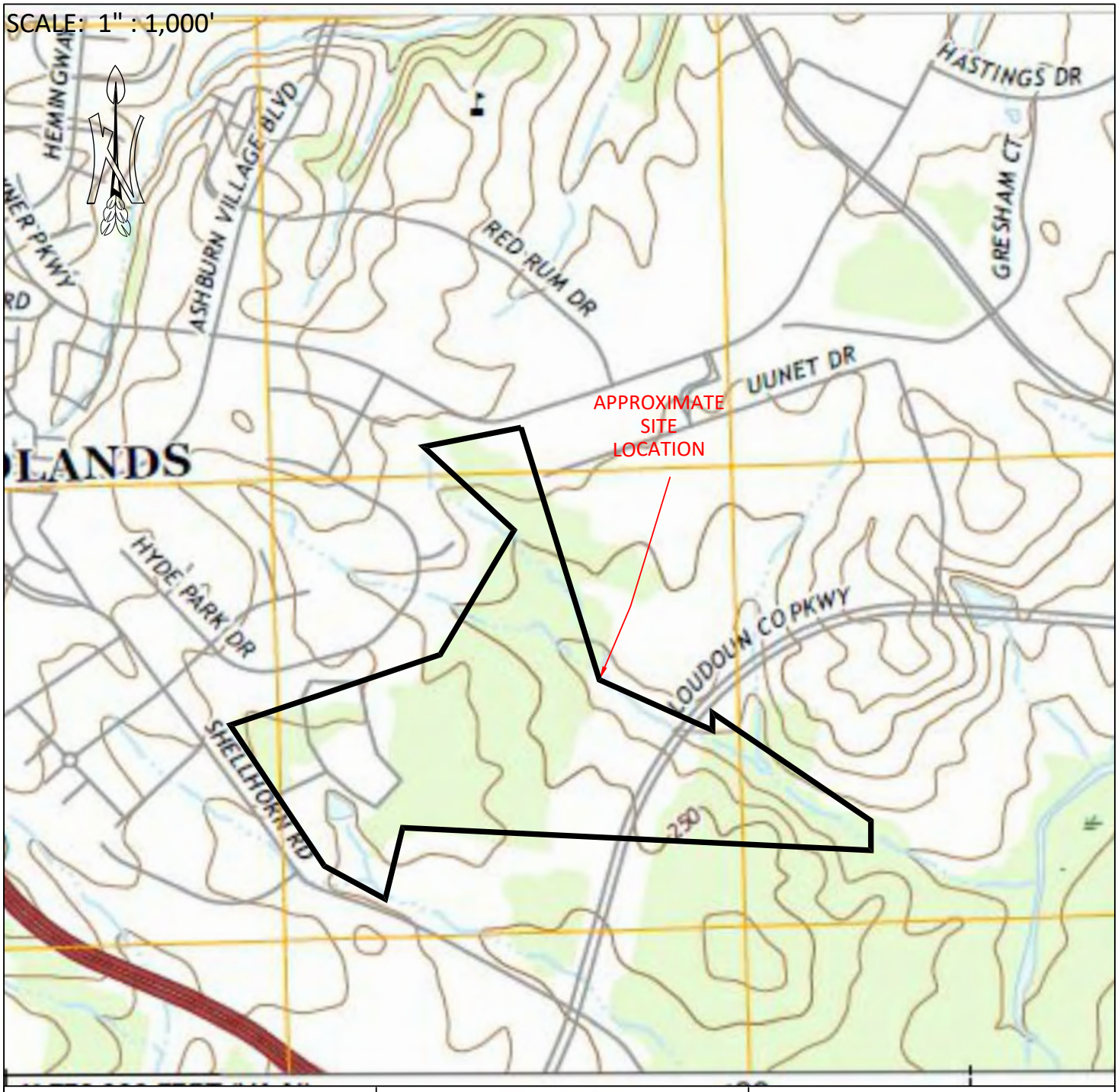

WETLAND DELINEATION REPORT ZEBRA SOUTH LOUDOUN COUNTY, VA MAY 2018	ENVIRONMENTAL **13996 PARKEAST CIRCLE** **SUITE 101** **CHANTILLY, VIRGINIA** **20151**	**FIGURE 2** TOPOGRAPHIC MAP SOURCE: STERLING, VA USGS QUAD MAP (2016) TNT PROJECT NO: 1165

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- U. S. Geological Survey (USGS) Topographic Map, Sterling Quadrangle, 2016
- U. S. Fish and Wildlife Service (USFWS), National Wetlands Inventory (NWI) Online Mapper, http://wetlands.fws.gov/mapper_tool.htm
- Natural Resources Conservation Service (NRCS), Electronic Field Office Technical Guide, Loudoun County Soils, www.nrcs.usda.gov/technical/efotg/
- Available aerial photography and GIS data

The USGS Sterling quadrangle map shows elevations gently sloping uphill from east to west at approximately 230 to 280 feet above mean sea level (MSL). As shown on the USGS Map, the project site drains to Broad Run, which is located approximately one-quarter mile downstream of the eastern most corner of the site. The site is within the Middle Potomac-Catoctin watershed and identified as Hydrologic Unit Code (HUC) 02070008. The NWI map depicts riverine and freshwater pond features within the project site boundaries.

The soil survey indicates that the site is underlain primarily by Dulles (78A), Albano (79A) Ashburn (74), Penn (73B, 73C) and Nestoria channery (77C3) silt loams with lesser amounts of Panorama (71B) and Bowmansville (6A) silt loams. Of the soils series on site, only Albano and Bowmansville are classified by the NRCS as hydric.

FIELD INVESTIGATION & METHODOLOGY

Fieldwork was conducted during April 2018 using the *Corps of Engineers' Wetlands Delineation Manual* (1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: [Eastern Mountains & Piedmont Region*. The USACE Manual and associated Regional Supplement follow three parameters for the identification of wetlands: dominance of hydrophytic vegetation, presence of hydric soils, and hydrologic indicators. All three parameters must be present under normal conditions for an area to be considered a jurisdictional wetland in accordance with Section 404 of the Clean Water Act. Wetlands are then further classified according to the Cowardin System as described in *Classification of Wetlands and Deepwater Habitats of the United States* (1979).

As previously discussed, TNT fieldwork was conducted to review existing conditions relative to those encountered and described in the previously issued wetland delineations. The fieldwork was conducted to evaluate and characterize the soils, vegetation and hydrology, and confirm the boundaries of wetlands or Waters of the U.S. located within the area of investigation. The data sheets used in this investigation are enclosed, along with the Delineation Map showing data point locations and approximate wetland and Waters boundaries. A summary of the attached data sheets is included below in Table 3. Additionally, a photographic log documenting site conditions encountered is enclosed.

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U.S. Fish and Wildlife Service
National Wetlands Inventory

Zebra South

May 7, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

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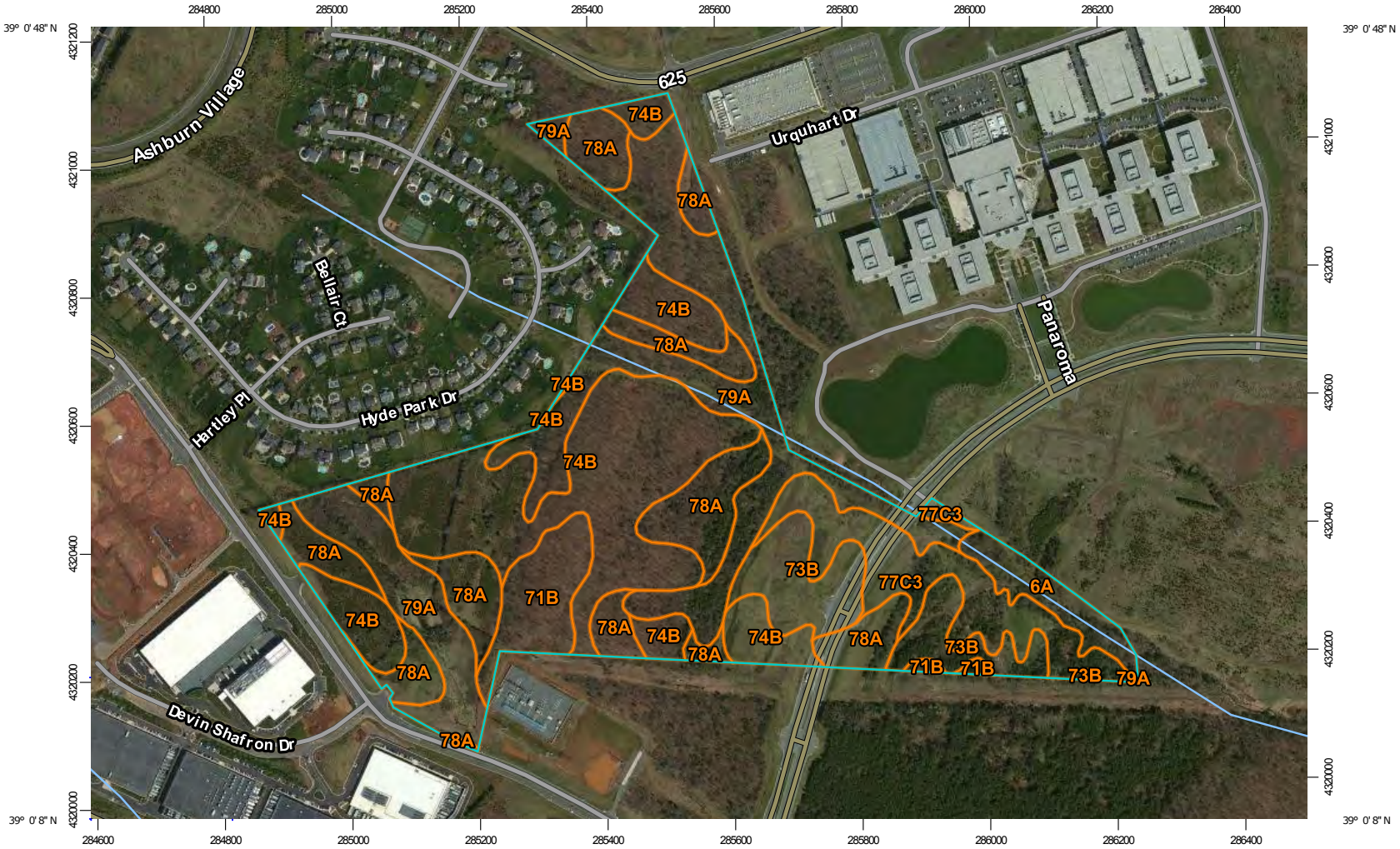
Soil Map—Loudoun County, Virginia
(Zebra South)



Map Scale: 1:8,720 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 400 800 1600 2400

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

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MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Loudoun County, Virginia
Survey Area Data: Version 14, Oct 11, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

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Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
6A	Bowmansville silt loam, 0 to 2 percent slopes, occasionally flooded	4.1	3.3%
71B	Panorama silt loam, 2 to 7 percent slopes	6.5	5.3%
73B	Penn silt loam, 2 to 7 percent slopes	10.3	8.4%
73C	Penn silt loam, 7 to 15 percent slopes	0.1	0.0%
74B	Ashburn silt loam, 0 to 7 percent slopes	36.8	29.8%
77C3	Nestoria channery silt loam, 7 to 15 percent slopes, severely eroded	12.0	9.7%
78A	Dulles silt loam, 0 to 2 percent slopes	23.1	18.7%
79A	Albano silt loam, 0 to 2 percent slopes, frequently flooded	30.7	24.9%
Totals for Area of Interest		**123.6**	**100.0%**

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FINDINGS

Based on our field reconnaissance, TNT has confirmed the presence of wetlands and streams onsite. Wetlands identified on the project site are classified as palustrine emergent (PEM) and palustrine forested (PFO) wetlands. Dominant wetland vegetation is listed below in Table 1. The main source of hydrology for these wetlands include ground water and streams that run west to east through the site, toward Broad Run. The wetlands are underlain primarily by Dulles silt loam, 0 to 2 percent slopes; Bowmansville silt loam, 0 to 2 percent slopes, occasionally flooded; and Albano silt loam, 0 to 2 percent slopes, frequently flooded soils.

Field data from both Angler Environmental's 2010 delineation and mapping from RK&K's 2017 delineation was reviewed. Wetland data points were taken at representative wetland locations throughout the site, in and out of areas previously delineated as wetlands. The wetland delineation map enclosed herein represents a compilation of these field delineations along with TNT's interpretation of field indicators of wetlands and Waters of the U.S. based on our site reconnaissance.

Table 1 – Dominant Riparian Buffer and Wetland Vegetation

Common Name	Scientific Name	Wetland Indicator*
Pin Oak	*Quercus palustris*	FACW
American Elm	*Ulmus americana*	FACW
Green Ash	*Fraxinus pennsylvanica*	FACW
Red Maple	*Acer rubrum*	FAC
Black Elderberry	*Sambucus nigra*	FAC
Common Rush	*Juncus effuses*	FACW
Sedge	*Carex spp.*	FAC
Japanese Stiltgrass	*Microstegium vimineum*	FAC

** The indicator status of a species indicates the probability that the species will occur in a wetland, as follows: Obligate Upland (UPL, <1%), Facultative Upland (FACU, 1-33%), Facultative (FAC, 34-66%), Facultative Wetland (FACW, 67-99%), and Obligate Wetland (OBL, >99%) in accordance with the* National List of Plant Species that Occur in Wetlands: National Summary *(2012). NI means no wetland indicator is available.*

The upland areas of the site are dominated by wooded vegetation (listed in Table 2 below).

Table 2 – Dominant Upland Vegetation

Common Name	Scientific Name	Wetland Indicator
Pignut Hickory	*Carya glabra*	FACU
Eastern Redcedar	*Juniperus virginiana*	FACU
White Oak	*Quercus alba*	FACU
Tulip Poplar	*Liriodendron tulipifera*	FACU
Northern Red Oak	*Quercus rubra*	FACU
Japanese Honeysuckle	*Lonicera japonica*	FACU
Amur honeysuckle	*Lonicera maackii*	NI

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Common Greenbrier	*Smilax rotundifolia*	FAC
Multiflora Rose	*Rosa multiflora*	FACU

Table 3 – Data Points Summary

Data Point	Hydrology	Hydrophytic Vegetation	Hydric Soils	Classification
DP-1	No	No	No	Non-Wetland
DP-2	Yes	Yes	No	Non-Wetland
DP-3	Yes	Yes	Yes	PFO-Wetland
DP-4	Yes	Yes	Yes	PFO-Wetland
DP-5	No	No	No	Non-Wetland
DP-6	No	No	No	Non-Wetland
DP-7	Yes	Yes	Yes	PFO-Wetland
DP-8	Yes	Yes	Yes	PEM-Wetland
DP-9	Yes	Yes	Yes	PFO-Wetland
DP-10	Yes	Yes	Yes	PFO-Wetland

**Refer to the enclosed data sheets for more information.*

REGULATORY DISCUSSION

The USACE - Norfolk District and the Virginia Department of Environmental Quality (DEQ) have implemented the State Programmatic General Permit (SPGP) program to streamline the permit process and avoid duplication of agency review. For those projects impacting less than 0.1-acres of non-tidal wetlands and less than 300 linear feet of stream bed a Nationwide permit from the USACE can be obtained for most projects. For those projects impacting greater than 0.1-acres of wetlands and 300-1,500 linear feet of stream bed, a General Permit can be obtained from DEQ. All SPGP permit applications are reviewed by the USACE but the permit authorization comes solely from DEQ. Notification of potential impacts should be filed with DEQ by completing the Joint Permit Application (JPA) form which is submitted to the Virginia Marine Resources Agency (VMRC) and DEQ. Upon receipt the VMRC distributes the JPA to the other resource agencies (USACE, VDEQ, etc.) for review and comment. Compensatory mitigation for unavoidable impacts to non-tidal Waters and wetlands will generally be provided at a ratio of 2:1 for forested wetlands, 1.5:1 for scrub/shrub wetlands, 1:1 for emergent wetlands, and a site-specific ratio based on the Unified Stream Methodology assessment for streams. Mitigation can include: the purchase or use of mitigation bank credits; wetland preservation; preservation of upland buffers; and in-lieu-fee contribution to the Virginia Aquatic Resources Trust Fund.

PROCEEDINGS

With your authorization, we will contact the USACE to schedule a field meeting to conduct a wetlands and Waters boundary confirmation and jurisdictional determination. This process takes an average of three to four weeks depending on the availability of USACE personnel. Once we have determined

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potential impacts we can assist you with permitting options and support to complete the process. In the interim, we recommend further review of state and federal agency records pertaining to Section 7 (Federal Endangered Species Act) and Section 106 (National Historic Preservation Act). These reviews will generally be required to verify compliance for either the Nationwide Permit (NWP) or General Permit conditions.

TNT would like to thank you for the opportunity to provide you with this wetland delineation. We look forward to assisting you further with this project and other environmental concerns you may have. If you have any questions, please feel free to contact us at any time at (703) 466-5123.

Sincerely,

TNT ENVIRONMENTAL, INC.

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WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Zebra South City/County: Loudoun Sampling Date: 4 /5 /2018

Applicant/Owner: CloudHQ State: VA Sampling Point: DP-1

Investigator(s): J. Moore, S. Swartzendruber Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR or MLRA): S148 Lat: 39°00'22" Long: 77°28'36" Datum: WGS 84

Soil Map Unit Name: 79A-Albano NWI classification: None

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 ☐	No ☑	**Is the Sampled Area within a Wetland?** **Yes** ☐ **No** ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:
Datapoint taken with upland forested area.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches):
Water Table Present?	Yes ☐	No ☑	Depth (inches): >18 inches
Saturation Present? (includes capillary fringe)	Yes ☐	No ☑	Depth (inches): > 18 inches

Wetland Hydrology Present? **Yes** ☐ **No** ☑

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

Remarks:
No wetlands hyydrology observed at this datapoint.

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VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: DP-1

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus alba*	30	☑	FACU
2. *Liriodendron tulipifera*	30	☑	FACU
3. *Juniperus virginiana*	30	☑	FACU
4. *Carya glabra*	20	☐	FACU
5.			
6.			
7.			
8.			
50% of total cover: 55 20% of total cover: 22	110 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15' Radius)			
1. *Lonicera maackii*	5	☑	NI
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
50% of total cover: 2.5 20% of total cover: 1	5 = Total Cover		

Herb Stratum (Plot size: 5' Radius)			
1. *Lonicera japonica*	20	☑	FACU
2. *Microstegium vimineum*	2	☐	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
50% of total cover: 11 20% of total cover: 4.4	22 = Total Cover		

Woody Vine Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
5.			
6.			
50% of total cover: 20% of total cover:	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	2	x 3 =	6
FACU species	130	x 4 =	520
UPL species	0	x 5 =	0
Column Totals:	132 (A)		526 (B)

Prevalence Index = B/A = 3.98

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☐ No ☑

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

Nomenclature and indicators from The National Wetland Plant List: 2016 wetland ratings with updates through December 2017; NI species are not used in the Dominance Test Calculation. No woody vine stratum observed at this datapoint. Hydrophytic dominance of vegetation not present.

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SOIL

Sampling Point: DP-1

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

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 5/6	100					Silt Loam	
2-5	7.5YR 4/6	90	5YR 3/4	10	C	M	Silt Loam	
5-18	5YR 4/6	100					Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: 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 Suface (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)
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 148)**
- ☐ Red Parent Material (F21)**(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (Inches): _____

Hydric Soil Present? Yes ☐ **No** ☑

Remarks:

No hydric soil indicators observed at this datapoint.

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WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Zebra South City/County: Loudoun Sampling Date: 4 /5 /2018

Applicant/Owner: CloudHQ State: VA Sampling Point: DP-2

Investigator(s): J. Moore, S. Swartzendruber Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 0-2%

Subregion (LRR or MLRA): S148 Lat: 39°00'22" Long: 77°28'36" Datum: NAD 83

Soil Map Unit Name: 79A-Albano NWI classification: None

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 ☑	No ☐	**Is the Sampled Area within a Wetland?** **Yes** ☐ **No** ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:

Datapoint taken within constructed stormwater swale. Remnant silt fence and stabilization fabric present within constructed swale.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☑ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☑	No ☐	Depth (inches): 1 inch
Water Table Present?	Yes ☑	No ☐	Depth (inches): surface
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): surface

Wetland Hydrology Present? **Yes** ☑ **No** ☐

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

Remarks:

Wetland hydrology observed at this datapoint.

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VEGETATION (Four Strata) - Use scientific names of plants. Sampling Point: DP-2

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
50% of total cover: ____ 20% of total cover: ____	____ = Total Cover		

Sapling/Shrub Stratum (Plot size: 15' Radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
50% of total cover: ____ 20% of total cover: ____	____ = Total Cover		

Herb Stratum (Plot size: 5' Radius)			
1. *Scirpus atrovirens*	20	☑	OBL
2. *Ludwigia alternifolia*	15	☑	FACW
3. *Carex spp.*	15	☑	FAC
4. *Microstegium vimineum*	5	☐	FAC
5. *Juncus effusus*	5	☐	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
50% of total cover: 30 20% of total cover: 12	60 = Total Cover		

Woody Vine Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
5.			
6.			
50% of total cover: ____ 20% of total cover: ____	____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (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 ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

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

Nomenclature and indicators from The National Wetland Plant List: 2016 wetland ratings with updates through December 2017; NI species are not used in the Dominance Test Calculation. No woody vine, sapling/shrub, or tree stratum observed at this datapoint. Hydrophytic dominance of vegetation present.

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SOIL Sampling Point: DP-2

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

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-18	5YR 4/4	100					Clay Loam	fill with gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: 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 Suface (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)
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 148)**
- ☐ Red Parent Material (F21)**(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (Inches): _____

Hydric Soil Present? Yes ☐ **No** ☑

Remarks:

No hydric soil indicators observed at this datapoint.

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WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Zebra South City/County: Loudoun Sampling Date: 4 /5 /2018

Applicant/Owner: CloudHQ State: VA Sampling Point: DP-3

Investigator(s): J. Moore, S. Swartzendruber Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): 0-2%

Subregion (LRR or MLRA): S148 Lat: 39°00'22" Long: 77°28'36" Datum: NAD 83

Soil Map Unit Name: 79A-Albano NWI classification: None

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 ☑	No ☐	**Is the Sampled Area within a Wetland?** **Yes** ☑ **No** ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:
Datapoint taken within PFO wetlands.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☑ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☑	No ☐	Depth (inches): 1 inch
Water Table Present?	Yes ☑	No ☐	Depth (inches): surface
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): surface

Wetland Hydrology Present? **Yes** ☑ **No** ☐

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

Remarks:
Wetland hydrology observed at this datapoint.

Received by VMRC September 1, 2023 /blh

VEGETATION (Four Strata) - Use scientific names of plants. Sampling Point: DP-3

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Carya glabra*	45	☑	FACU
2. *Quercus rubra*	10	☐	FACU
3. *Juniperus virginiana*	10	☐	FACU
4.			
5.			
6.			
7.			
8.			
50% of total cover: 32.5 20% of total cover: 13	65	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' Radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
50% of total cover: 20% of total cover:		= Total Cover	

Herb Stratum (Plot size: 5' Radius)			
1. *Carex spp.*	25	☑	FAC
2. *Juncus effusus*	15	☑	FACW
3. *Lonicera japonica*	10	☐	FACU
4. *Microstegium vimineum*	10	☐	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
50% of total cover: 30 20% of total cover: 12	60	= Total Cover	

Woody Vine Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
5.			
6.			
50% of total cover: 20% of total cover:		= 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: 66.7% (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 ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ☑ **No** ☐

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

Nomenclature and indicators from The National Wetland Plant List: 2016 wetland ratings with updates through December 2017; NI species are not used in the Dominance Test Calculation. No woody vine, or sapling/shrub stratum observed at this datapoint. Hydrophytic dominance of vegetation present.

Received by VMRC September 1, 2023 /blh

SOIL Sampling Point: DP-3

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

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	7.5YR 4/4	80	7.5YR 5/8	20	C	M	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: 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 Suface (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)
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 148)**
- ☑ Red Parent Material (F21)**(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (Inches): _____

Hydric Soil Present? Yes ☑ **No** ☐

Remarks:

Hydric soils observed at this datapoint.

Received by VMRC September 1, 2023 /blh

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Zebra South City/County: Loudoun Sampling Date: 4 /5 /2018

Applicant/Owner: CloudHQ State: VA Sampling Point: DP-4

Investigator(s): J. Moore, S. Swartzendruber Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): 0-2%

Subregion (LRR or MLRA): S148 Lat: 39°00'22" Long: 77°28'36" Datum: NAD 83

Soil Map Unit Name: 79A-Albano NWI classification: None

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 ☑	No ☐	**Is the Sampled Area within a Wetland?** **Yes** ☑ **No** ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:
Datapoint taken with PFO wetlands.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☑	No ☐	Depth (inches): 2 inches
Water Table Present?	Yes ☑	No ☐	Depth (inches): surface
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): surface

Wetland Hydrology Present? **Yes** ☑ **No** ☐

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

Remarks:
Wetland hydrology observed at this datapoint.

Received by VMRC September 1, 2023 /blh

VEGETATION (Four Strata) - Use scientific names of plants. Sampling Point: DP-4

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Fraxinus pennsylvanica*	50	☑	FACW
2. *Carya glabra*	20	☑	FACU
3.			
4.			
5.			
6.			
7.			
8.			
50% of total cover: 35 20% of total cover: 14	70	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' Radius)			
1. *Sambucus nigra*	10	☑	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
50% of total cover: 5 20% of total cover: 2	10	= Total Cover	

Herb Stratum (Plot size: 5' Radius)			
1. *Microstegium vimineum*	95	☑	FAC
2. *Allium canadense*	5	☐	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
50% of total cover: 50 20% of total cover: 20	100	= Total Cover	

Woody Vine Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
5.			
6.			
50% of total cover: 20% of total cover:		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (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 ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

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

Nomenclature and indicators from The National Wetland Plant List: 2016 wetland ratings with updates through December 2017; NI species are not used in the Dominance Test Calculation. No woody vine stratum observed at this datapoint. Hydrophytic dominance of vegetation present.

Received by VMRC September 1, 2023 /blh

SOIL Sampling Point: DP-4

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

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 4/4	100					Silt Loam	
4-18	10YR 6/2	60	10YR 6/8	40	C	M	Sandy Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: 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 Suface (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)
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 148)**
- ☐ Red Parent Material (F21)**(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (Inches): _____

Hydric Soil Present? Yes ☑ **No** ☐

Remarks:

Hydric soil present at this datapoint.

Received by VMRC September 1, 2023 /blh

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Zebra South City/County: Loudoun Sampling Date: 4 /5 /2018

Applicant/Owner: CloudHQ State: VA Sampling Point: DP-5

Investigator(s): J. Moore, S. Swartzendruber Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0-7%

Subregion (LRR or MLRA): S148 Lat: 39°00'22" Long: 77°28'36" Datum: NAD 83

Soil Map Unit Name: 74B - Ashburn NWI classification: None

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 ☐	No ☑	**Is the Sampled Area within a Wetland?** **Yes** ☐ **No** ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:
Datapoint taken within upland oak-hickory forest.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches):
Water Table Present?	Yes ☐	No ☑	Depth (inches): > 12 inches
Saturation Present? (includes capillary fringe)	Yes ☐	No ☑	Depth (inches): >12 inches

Wetland Hydrology Present? **Yes** ☐ **No** ☑

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

Remarks:
No wetland hydrology observed at this datapoint.

Received by VMRC September 1, 2023 /blh

VEGETATION (Four Strata) - Use scientific names of plants. Sampling Point: DP-5

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Carya glabra*	65	☑	FACU
2. *Quercus alba*	35	☑	FACU
3.			
4.			
5.			
6.			
7.			
8.			
50% of total cover: 50 20% of total cover: 20	100 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15' Radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
50% of total cover: 20% of total cover:	= Total Cover		

Herb Stratum (Plot size: 5' Radius)			
1. *Lonicera japonica*	5	☑	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
50% of total cover: 2.5 20% of total cover: 1	5 = Total Cover		

Woody Vine Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
5.			
6.			
50% of total cover: 20% of total cover:	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	105	x 4 =	420
UPL species	0	x 5 =	0
Column Totals:	105 (A)		420 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☐ No ☑

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

Nomenclature and indicators from The National Wetland Plant List: 2016 wetland ratings with updates through December 2017; NI species are not used in the Dominance Test Calculation. No woody vine, or sapling/shrub stratum observed at this datapoint. Hydrophytic dominance of vegetation not present.

Received by VMRC September 1, 2023 /blh

SOIL

Sampling Point: DP-5

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

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 5/6	100					Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: 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 Suface (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)
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 148)**
- ☐ Red Parent Material (F21)**(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (Inches): _____

Hydric Soil Present? Yes ☐ **No** ☑

Remarks:

No hydric soil indicators observed at this datapoint.

Received by VMRC September 1, 2023 /blh

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Zebra South City/County: Loudoun Sampling Date: 4 /5 /2018

Applicant/Owner: CloudHQ State: VA Sampling Point: DP-6

Investigator(s): J. Moore, S. Swartzendruber Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): Concave Slope (%): 0-2%

Subregion (LRR or MLRA): S148 Lat: 39°00'22" Long: 77°28'36" Datum: NAD 83

Soil Map Unit Name: 79A-Albano NWI classification: None

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 ☐	No ☑	**Is the Sampled Area within a Wetland?** **Yes** ☐ **No** ☑
Hydric Soil Present?	Yes ☐	No ☑	
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks:
Datapoint taken within forested upland swale.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches):
Water Table Present?	Yes ☐	No ☑	Depth (inches): > 12 inches
Saturation Present? (includes capillary fringe)	Yes ☐	No ☑	Depth (inches): > 12 inches

Wetland Hydrology Present? **Yes** ☐ **No** ☑

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

Remarks:
Only one secondary wetland indicator observed at this datapoint.

Received by VMRC September 1, 2023 /blh

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: DP-6

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Quercus alba*	30	☑	FACU
2. *Quercus palustris*	30	☑	FACW
3. *Carya glabra*	15	☐	FACU
4. *Juniperus virginiana*	15	☐	FACU
5.			
6.			
7.			
8.			
50% of total cover: 45 20% of total cover: 18	90 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15' Radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
50% of total cover: 20% of total cover:	= Total Cover		

Herb Stratum (Plot size: 5' Radius)			
1. *Microstegium vimineum*	10	☑	FAC
2. *Allium canadense*	10	☑	FACU
3. *Lonicera japonica*	5	☑	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
50% of total cover: 12.5 20% of total cover: 5	25 = Total Cover		

Woody Vine Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
5.			
6.			
50% of total cover: 20% of total cover:	= 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: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	10	x 3 =	30
FACU species	75	x 4 =	300
UPL species	0	x 5 =	0
Column Totals:	115 (A)		390 (B)

Prevalence Index = B/A = 3.39

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☐ No ☑

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

Nomenclature and indicators from The National Wetland Plant List: 2016 wetland ratings with updates through December 2017; NI species are not used in the Dominance Test Calculation. No woody vine or sapling/shrub stratum observed at this datapoint. Hydrophytic dominance of vegetation not present.

Received by VMRC September 1, 2023 /blh

SOIL Sampling Point: DP-6

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

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5YR 5/8	100					Silty Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: 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 Suface (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)
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 148)**
- ☐ Red Parent Material (F21)**(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (Inches): _____

Hydric Soil Present? Yes ☐ **No** ☑

Remarks:

Hydric soils not observed at this datapoint.

Received by VMRC September 1, 2023 /blh

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Zebra South City/County: Loudoun Sampling Date: 4 /5 /2018

Applicant/Owner: CloudHQ State: VA Sampling Point: DP-7

Investigator(s): J. Moore, S. Swartzendruber Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2%

Subregion (LRR or MLRA): S148 Lat: 39°00'22" Long: 77°28'36" Datum: NAD 83

Soil Map Unit Name: 79A-Albano NWI classification: None

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 ☑	No ☐	**Is the Sampled Area within a Wetland?** **Yes** ☑ **No** ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:
Datapoint taken within PFO wetlands.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☑ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches):
Water Table Present?	Yes ☑	No ☐	Depth (inches): surface
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): surface

Wetland Hydrology Present? **Yes** ☑ **No** ☐

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

Remarks:
Wetland hydrology observed at this datapoint.

Received by VMRC September 1, 2023 /blh

VEGETATION (Four Strata) - Use scientific names of plants. Sampling Point: DP-7

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ulmus americana*	15	☑	FACW
2. *Carya glabra*	5	☐	FACU
3.			
4.			
5.			
6.			
7.			
8.			
50% of total cover: 10 20% of total cover: 4	20 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15' Radius)			
1. *Quercus palustris*	5	☑	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
50% of total cover: 2.5 20% of total cover: 1	5 = Total Cover		

Herb Stratum (Plot size: 5' Radius)			
1. *Carex spp.*	45	☑	FAC
2. *Lonicera japonica*	15	☑	FACU
3. *Microstegium vimineum*	5	☐	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
50% of total cover: 32.5 20% of total cover: 13	65 = Total Cover		

Woody Vine Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
5.			
6.			
50% of total cover: 20% of total cover:	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (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 ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

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

Nomenclature and indicators from The National Wetland Plant List: 2016 wetland ratings with updates through December 2017; NI species are not used in the Dominance Test Calculation. No woody vine stratum observed at this datapoint. Hydrophytic dominance of vegetation present. Many dead green ash (Fraxinus pennsylvanica) observed.

Received by VMRC September 1, 2023 /blh

SOIL Sampling Point: DP-7

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

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 6/2	80	10YR 6/8	20	C	M	Silty Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: 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 Suface (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)
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 148)**
- ☐ Red Parent Material (F21)**(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (Inches): _____

Hydric Soil Present? Yes ☑ **No** ☐

Remarks:

Hydric soils observed at this datapoint.

Received by VMRC September 1, 2023 /blh

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Zebra South City/County: Loudoun Sampling Date: 4 /5 /2018

Applicant/Owner: CloudHQ State: VA Sampling Point: DP-8

Investigator(s): J. Moore, S. Swartzendruber Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): 0-2%

Subregion (LRR or MLRA): S148 Lat: 39°00'22" Long: 77°28'36" Datum: NAD 83

Soil Map Unit Name: 78A - Dulles NWI classification: None

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 ☑	No ☐	**Is the Sampled Area within a Wetland?** **Yes** ☑ **No** ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:
Datapoint taken within PEM wetlands.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☑ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☑	No ☐	Depth (inches): 2 inches
Water Table Present?	Yes ☑	No ☐	Depth (inches): surface
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): surface

Wetland Hydrology Present? **Yes** ☑ **No** ☐

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

Remarks:
Wetland hydrology observed at this datapoint.

Received by VMRC September 1, 2023 /blh

VEGETATION (Four Strata) - Use scientific names of plants. Sampling Point: DP-8

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
50% of total cover: ____ 20% of total cover: ____		= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' Radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
50% of total cover: ____ 20% of total cover: ____		= Total Cover	

Herb Stratum (Plot size: 5' Radius)			
1. *Carex spp.*	95	☑	FAC
2. *Asclepias incarnata*	5	☐	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
50% of total cover: 50 20% of total cover: 20	100	= Total Cover	

Woody Vine Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
5.			
6.			
50% of total cover: ____ 20% of total cover: ____		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (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 ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ☑ **No** ☐

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

Nomenclature and indicators from The National Wetland Plant List: 2016 wetland ratings with updates through December 2017; NI species are not used in the Dominance Test Calculation. No woody vine, sapling/shrub, or tree stratum observed at this datapoint. Hydrophytic dominance of vegetation present.

Received by VMRC September 1, 2023 /blh

SOIL

Sampling Point: DP-8

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

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 5/2	85	10YR 4/6	15	C	M	Silty Clay Loam	
6-12	10YR 4/2	95	10YR 6/8	5	C	M	Silty Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: 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 Suface (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)
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 148)**
- ☐ Red Parent Material (F21)**(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (Inches): _____

Hydric Soil Present? Yes ☑ **No** ☐

Remarks:

Hydric soils observed at this datapoint.

Received by VMRC September 1, 2023 /blh

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Zebra South City/County: Loudoun Sampling Date: 4 /5 /2018

Applicant/Owner: CloudHQ State: VA Sampling Point: DP-9

Investigator(s): J. Moore, S. Swartzendruber Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 0-2%

Subregion (LRR or MLRA): S148 Lat: 39°00'22" Long: 77°28'36" Datum: NAD 83

Soil Map Unit Name: 79A-Albano NWI classification: None

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 ☑	No ☐	**Is the Sampled Area within a Wetland?** **Yes** ☑ **No** ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:

Datapoint taken within PFO wetlands.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☑ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches):
Water Table Present?	Yes ☐	No ☑	Depth (inches): > 12 inches
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): Surface

Wetland Hydrology Present? **Yes** ☑ **No** ☐

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

Remarks:

Wetland hydrology observed at this datapoint.

Received by VMRC September 1, 2023 /blh

VEGETATION (Four Strata) - Use scientific names of plants. Sampling Point: DP-9

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer rubrum*	75	☑	FAC
2. *Liquidambar styraciflua*	25	☑	FAC
3.			
4.			
5.			
6.			
7.			
8.			
50% of total cover: 50 20% of total cover: 20	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15' Radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
50% of total cover: 20% of total cover:		= Total Cover	

Herb Stratum (Plot size: 5' Radius)			
1. *Poa sp.*	15	☑	NI
2. *Carex spp.*	5	☐	FAC
3. *Symphyotrichum racemosum*	2	☐	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
50% of total cover: 11 20% of total cover: 4.4	22	= Total Cover	

Woody Vine Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
5.			
6.			
50% of total cover: 20% of total cover:		= 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: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (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 ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

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

Nomenclature and indicators from The National Wetland Plant List: 2016 wetland ratings with updates through December 2017; NI species are not used in the Dominance Test Calculation. No woody vine or sapling/shrub stratum observed at this datapoint. Hydrophytic dominance of vegetation present.

Received by VMRC September 1, 2023 /blh

SOIL Sampling Point: DP-9

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

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	2.5YR 5/4	70	2.5YR 6/6	30	C	M	Silty Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: 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 Suface (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)
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 148)**
- ☑ Red Parent Material (F21)**(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (Inches): _____

Hydric Soil Present? Yes ☑ **No** ☐

Remarks:

Hydric soils observed at this datapoint.

Received by VMRC September 1, 2023 /blh

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Zebra South City/County: Loudoun Sampling Date: 4 /18/2018

Applicant/Owner: CloudHQ State: VA Sampling Point: DP-10

Investigator(s): J. Moore, A. Sareen Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): 0-2%

Subregion (LRR or MLRA): S148 Lat: 39°00'22" Long: 77°28'36" Datum: NAD 83

Soil Map Unit Name: 6A - Bowmansville NWI classification: None

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 ☑	No ☐	**Is the Sampled Area within a Wetland?** **Yes** ☑ **No** ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:
Datapoint taken within PFO wetlands.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☑	Depth (inches):
Water Table Present?	Yes ☐	No ☑	Depth (inches): > 12 inches
Saturation Present? (includes capillary fringe)	Yes ☑	No ☐	Depth (inches): 4 inches

Wetland Hydrology Present? **Yes** ☑ **No** ☐

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

Remarks:
Wetland hydrology observed at this datapoint.

Received by VMRC September 1, 2023 /blh

VEGETATION (Four Strata) - Use scientific names of plants.

Sampling Point: DP-10

Tree Stratum (Plot size: 30' Radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Ulmus americana*	25	☑	FACW
2. *Celtis occidentalis*	25	☑	FACU
3. *Liquidambar styraciflua*	10	☐	FAC
4.			
5.			
6.			
7.			
8.			
50% of total cover: 30 20% of total cover: 12	60	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15' Radius)			
1. *Acer negundo*	15	☑	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
50% of total cover: 7.5 20% of total cover: 3	15	= Total Cover	
Herb Stratum (Plot size: 5' Radius)			
1. *Carex spp.*	15	☑	FAC
2. *Toxicodendron radicans*	5	☐	FAC
3. *Microstegium vimineum*	5	☐	FAC
4. *Lonicera japonica*	2	☐	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
50% of total cover: 13.5 20% of total cover: 5.4	27	= Total Cover	
Woody Vine Stratum (Plot size: 30' Radius)			
1.			
2.			
3.			
4.			
5.			
6.			
50% of total cover: 20% of total cover:		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (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 ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Four Vegetation Strata:

Tree - Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

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

Nomenclature and indicators from The National Wetland Plant List: 2016 wetland ratings with updates through December 2017; NI species are not used in the Dominance Test Calculation. No woody vine stratum observed at this datapoint. Hydrophytic dominance of vegetation present.

Received by VMRC September 1, 2023 /blh

SOIL Sampling Point: DP-10

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

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	5YR 4/4	100					Silty Clay	
4-12	5YR 4/3	80	5YR 5/8	15	C	M	Silty Clay	5% Fe/Mn masses

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: 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 Suface (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)
- ☐ Piedmont Floodplain Soils (F19)**(MLRA 148)**
- ☑ Red Parent Material (F21)**(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (Inches): _____

Hydric Soil Present? Yes ☑ **No** ☐

Remarks:

Hydric soils observed at this datapoint.

Received by VMRC September 1, 2023 /blh

Photograph 1: View to the north showing Datapoint 1 taken within the forested uplands in the northern portion of the site.

Photograph 2: View to the southwest (downstream) showing Datapoint 2 taken within a constructed stormwater swale in the northern portion of the site. No hydric soils observed.

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Photograph 3: View to the north showing Datapoint 3 taken within PFO wetlands in the northern portion of the site.

Photograph 4: View to the south showing Datapoint 4 taken within PFO wetlands in the northern portion of the site.

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Photograph 5: View to the southeast showing Datapoint 5 taken within upland forested area in the northern portion of the site.

Photograph 6: View to the northeast showing Datapoint 6 taken within forested upland swale in the western portion of the site.

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Photograph 7: View to the south showing Datapoint 7 taken within PFO wetlands in the western portion of the site.

Photograph 8: View to the northwest showing Datapoint 8 taken within PEM wetlands in the southwestern portion of the site.

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Photograph 9: View to the northwest showing Datapoint 9 taken within PFO wetlands in the western portion of the site.

Photograph 10: View to the northeast showing Datapoint 10 taken within PFO wetlands in the northeastern portion of the site.

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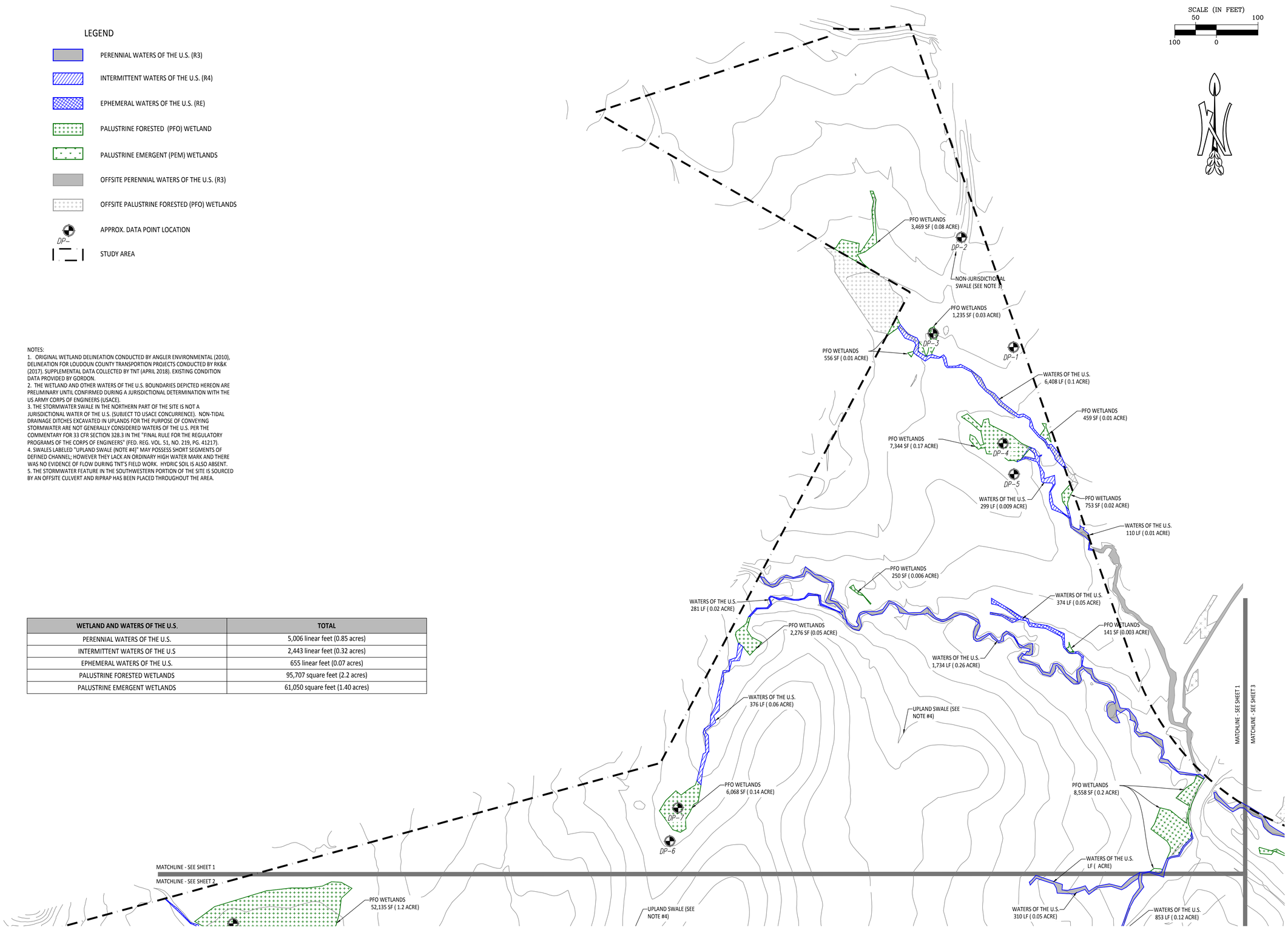
LEGEND

- PERENNIAL WATERS OF THE U.S. (R3)
- INTERMITTENT WATERS OF THE U.S. (R4)
- EPHEMERAL WATERS OF THE U.S. (RE)
- PALUSTRINE FORESTED (PFO) WETLAND
- PALUSTRINE EMERGENT (PEM) WETLANDS
- OFFSITE PERENNIAL WATERS OF THE U.S. (R3)
- OFFSITE PALUSTRINE FORESTED (PFO) WETLANDS
- DP– APPROX. DATA POINT LOCATION
- STUDY AREA

NOTES:
1. ORIGINAL WETLAND DELINEATION CONDUCTED BY ANGLER ENVIRONMENTAL (2010), DELINEATION FOR LOUDOUN COUNTY TRANSPORTION PROJECTS CONDUCTED BY RK&K (2017). SUPPLEMENTAL DATA COLLECTED BY TNT (APRIL 2018). EXISTING CONDITION DATA PROVIDED BY GORDON.
2. THE WETLAND AND OTHER WATERS OF THE U.S. BOUNDARIES DEPICTED HEREON ARE PRELIMINARY UNTIL CONFIRMED DURING A JURISDICTIONAL DETERMINATION WITH THE US ARMY CORPS OF ENGINEERS (USACE).
3. THE STORMWATER SWALE IN THE NORTHERN PART OF THE SITE IS NOT A JURISDICTIONAL WATER OF THE U.S. (SUBJECT TO USACE CONCURRENCE). NON-TIDAL DRAINAGE DITCHES EXCAVATED IN UPLANDS FOR THE PURPOSE OF CONVEYING STORMWATER ARE NOT GENERALLY CONSIDERED WATERS OF THE U.S. PER THE COMMENTARY FOR 33 CFR SECTION 328.3 IN THE "FINAL RULE FOR THE REGULATORY PROGRAMS OF THE CORPS OF ENGINEERS" (FED. REG. VOL. 51, NO. 219, PG. 41217).
4. SWALES LABELED "UPLAND SWALE (NOTE #4)" MAY POSSESS SHORT SEGMENTS OF DEFINED CHANNEL; HOWEVER THEY LACK AN ORDINARY HIGH WATER MARK AND THERE WAS NO EVIDENCE OF FLOW DURING TNT'S FIELD WORK. HYDRIC SOIL IS ALSO ABSENT.
5. THE STORMWATER FEATURE IN THE SOUTHWESTERN PORTION OF THE SITE IS SOURCED BY AN OFFSITE CULVERT AND RIPRAP HAS BEEN PLACED THROUGHOUT THE AREA.

WETLAND AND WATERS OF THE U.S.	TOTAL
PERENNIAL WATERS OF THE U.S.	5,006 linear feet (0.85 acres)
INTERMITTENT WATERS OF THE U.S	2,443 linear feet (0.32 acres)
EPHEMERAL WATERS OF THE U.S.	655 linear feet (0.07 acres)
PALUSTRINE FORESTED WETLANDS	95,707 square feet (2.2 acres)
PALUSTRINE EMERGENT WETLANDS	61,050 square feet (1.40 acres)



ENVIRONMENTAL
13996 Parkeast Circle, Suite 101
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PH: 703-466-5123 WWW.TNTENVIRONMENTALINC.COM

ZEBRA SOUTH

LOUDOUN COUNTY, VA

WETLANDS & WATERS OF THE U.S. MAP

REVISIONS

DATE	COMMENTS
6/21/18	AMS

SHEET 1 OF 3

SCALE: 1" = 100'

PROJECT DATE: MAY 9, 2018

DRAFT: JSM | CHECK: AMS

FILE NUMBER: 1165

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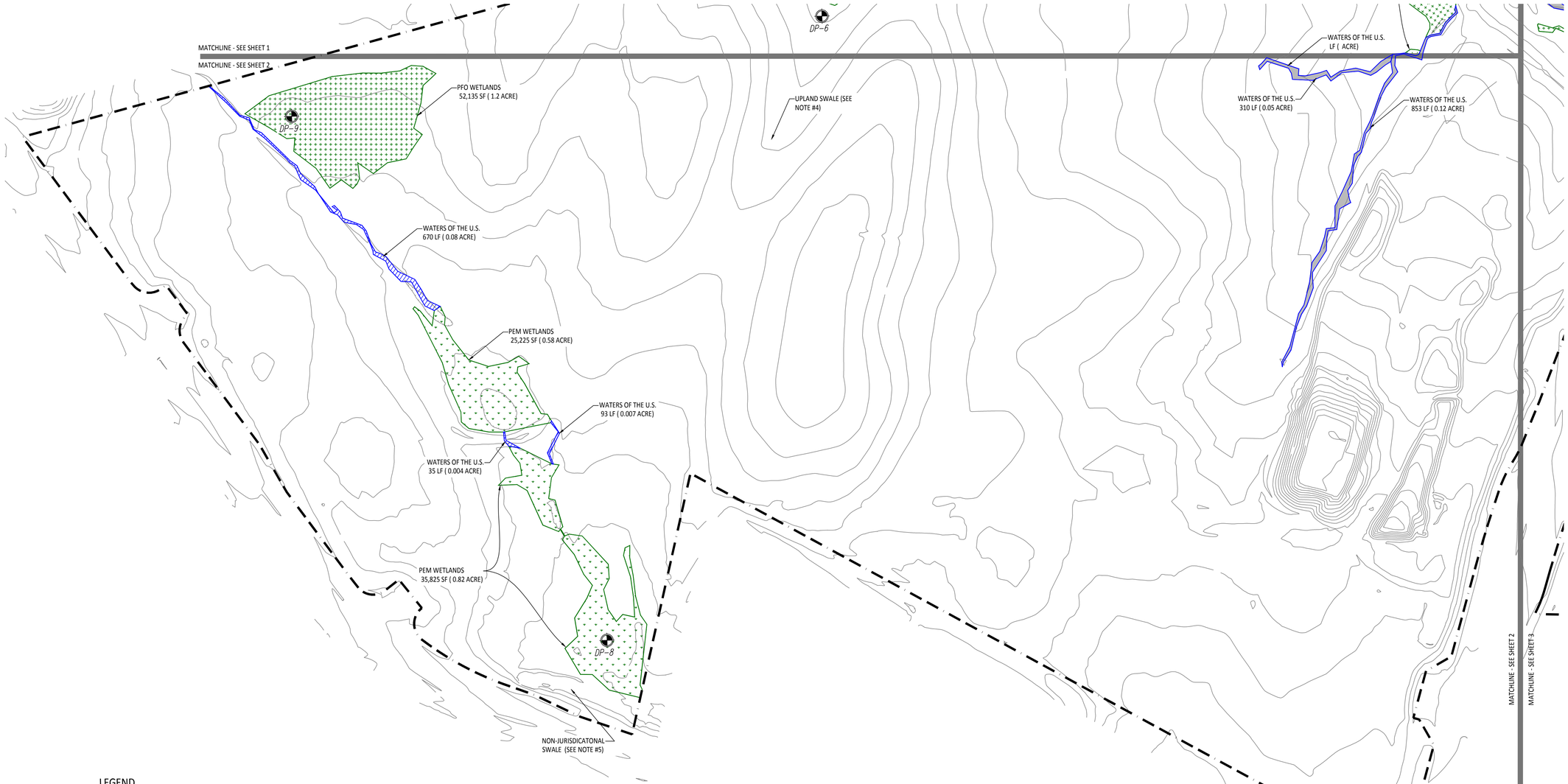

LEGEND

- PERENNIAL WATERS OF THE U.S. (R3)
- INTERMITTENT WATERS OF THE U.S. (R4)
- EPHEMERAL WATERS OF THE U.S. (RE)
- PALUSTRINE FORESTED (PFO) WETLAND
- PALUSTRINE EMERGENT (PEM) WETLANDS
- OFFSITE PERENNIAL WATERS OF THE U.S. (R3)
- OFFSITE PALUSTRINE FORESTED (PFO) WETLANDS
- DP– APPROX. DATA POINT LOCATION
- STUDY AREA

NOTES:
1. ORIGINAL WETLAND DELINEATION CONDUCTED BY ANGLER ENVIRONMENTAL (2010), DELINEATION FOR LOUDOUN COUNTY TRANSPORTION PROJECTS CONDUCTED BY RK&K (2017). SUPPLEMENTAL DATA COLLECTED BY TNT (APRIL 2018). EXISTING CONDITION DATA PROVIDED BY GORDON.
2. THE WETLAND AND OTHER WATERS OF THE U.S. BOUNDARIES DEPICTED HEREON ARE PRELIMINARY UNTIL CONFIRMED DURING A JURISDICTIONAL DETERMINATION WITH THE US ARMY CORPS OF ENGINEERS (USACE).
3. THE STORMWATER SWALE IN THE NORTHERN PART OF THE SITE IS NOT A JURISDICTIONAL WATER OF THE U.S. (SUBJECT TO USACE CONCURRENCE). NON-TIDAL DRAINAGE DITCHES EXCAVATED IN UPLANDS FOR THE PURPOSE OF CONVEYING STORMWATER ARE NOT GENERALLY CONSIDERED WATERS OF THE U.S. PER THE COMMENTARY FOR 33 CFR SECTION 328.3 IN THE "FINAL RULE FOR THE REGULATORY PROGRAMS OF THE CORPS OF ENGINEERS" (FED. REG. VOL. 51, NO. 219, PG. 41217).
4. SWALES LABELED "UPLAND SWALE (NOTE #4)" MAY POSSESS SHORT SEGMENTS OF DEFINED CHANNEL; HOWEVER THEY LACK AN ORDINARY HIGH WATER MARK AND THERE WAS NO EVIDENCE OF FLOW DURING TNT'S FIELD WORK. HYDRIC SOIL IS ALSO ABSENT.
5. THE STORMWATER FEATURE IN THE SOUTHWESTERN PORTION OF THE SITE IS SOURCED BY AN OFFSITE CULVERT AND RIPRAP HAS BEEN PLACED THROUGHOUT THE AREA.

WETLAND AND WATERS OF THE U.S.	TOTAL
PERENNIAL WATERS OF THE U.S.	5,006 linear feet (0.85 acres)
INTERMITTENT WATERS OF THE U.S	2,443 linear feet (0.32 acres)
EPHEMERAL WATERS OF THE U.S.	655 linear feet (0.07 acres)
PALUSTRINE FORESTED WETLANDS	95,707 square feet (2.2 acres)
PALUSTRINE EMERGENT WETLANDS	61,050 square feet (1.40 acres)

SCALE (IN FEET)
50 100
100 0

ENVIRONMENTAL
13996 Parkeast Circle, Suite 101
Chantilly, VA 20151
PH: 703-466-5123 WWW.TNTENVIRONMENTALINC.COM

ZEBRA SOUTH

LOUDOUN COUNTY, VA

WETLANDS & WATERS OF THE U.S. MAP

REVISIONS

DATE	COMMENTS
6/21/18	AMS

SHEET 2 OF 3

SCALE: 1" = 100'

PROJECT DATE: MAY 9, 2018

DRAFT: JSM | CHECK: AMS

FILE NUMBER: 1165

Received by VMRC September 1, 2023 /blh

WETLAND AND WATERS OF THE U.S.	TOTAL
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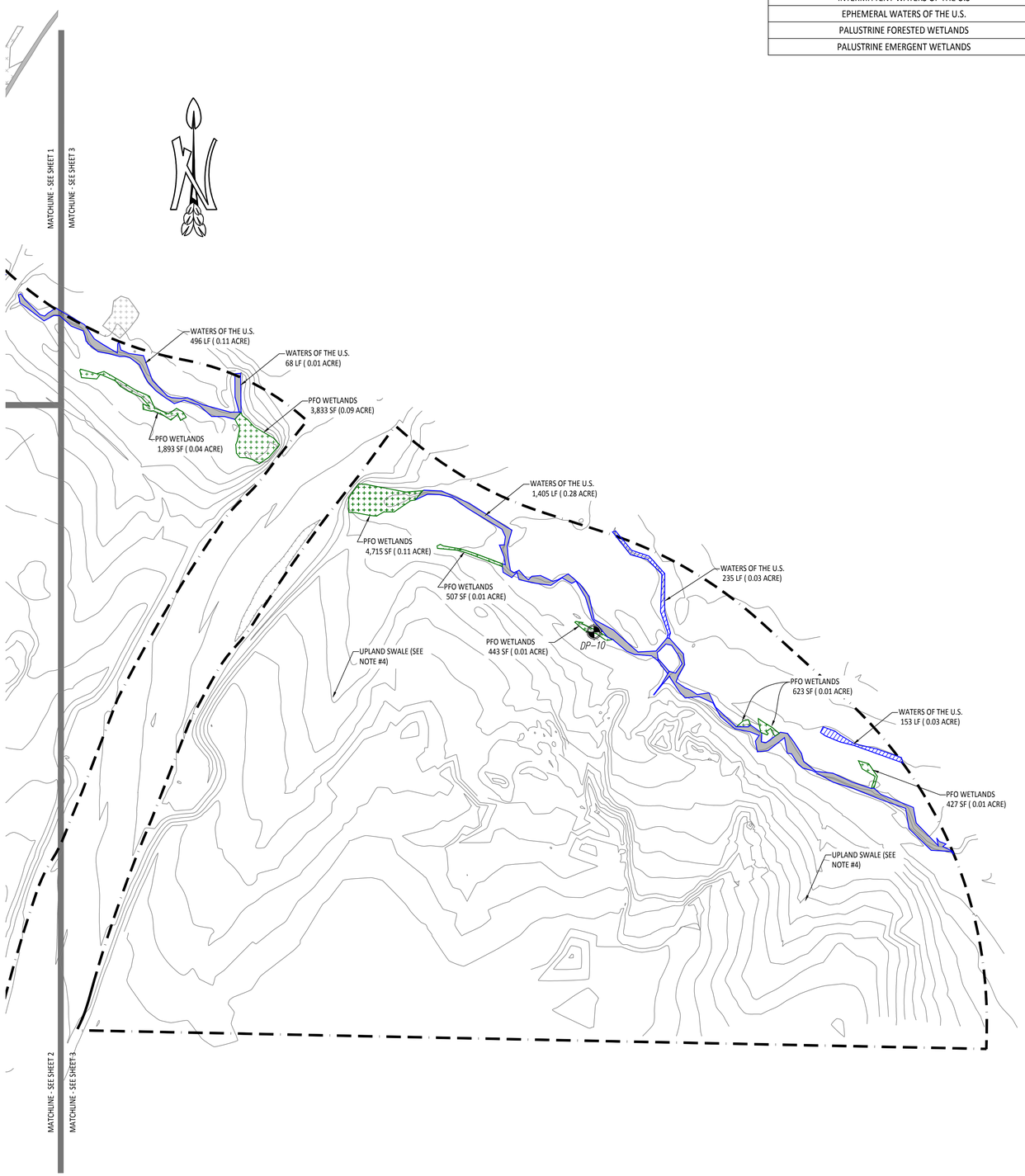

LEGEND

- PERENNIAL WATERS OF THE U.S. (R3)
- INTERMITTENT WATERS OF THE U.S. (R4)
- EPHEMERAL WATERS OF THE U.S. (RE)
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13996 Parkeast Circle, Suite 101
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PH: 703-466-5123 WWW.TNTENVIRONMENTALINC.COM

ZEBRA SOUTH
LOUDOUN COUNTY, VA

WETLANDS & WATERS OF THE U.S. MAP

REVISIONS

DATE	COMMENTS
6/21/18	AMS

SHEET 3 OF 3

SCALE: 1" = 100'

PROJECT DATE: MAY 9, 2018

DRAFT: JSM | CHECK: AMS

FILE NUMBER: 1165

Received by VMRC September 1, 2023 /blh

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: CloudHQ	File Number: 2018-00997	Date: 17 Jul 2018
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
	APPROVED JURISDICTIONAL DETERMINATION	D
X	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

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SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:

U.S. Army Corps of Engineers, Norfolk District
Northern Virginia Field Office (CENAO-WR-RN)
Attn.: Mr. Ronald H. Stouffer, Jr.
18139 Triangle Plaza, Suite 213
Dumfries, VA 22026

703-221-6967 or email ron.h.stouffer@usace.army.mil

If you only have questions regarding the appeal process you may also contact:

United States Army Corps of Engineers
North Atlantic Division (CENAD-PD-OR)
Attn: Mr. James Haggerty, Regulatory Program Manager
301 General Lee Avenue
Fort Hamilton Military Community
Brooklyn, NY 11252
347-370-4663

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15-day notice of any site investigation, and will have the opportunity to participate in all site investigations.

Signature of appellant or agent.	Date:	Telephone number:

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PRELIMINARY JURISDICTIONAL DETERMINATION FORM

BACKGROUND INFORMATION:

A. REPORT SUBMITTAL DATE FOR PRELIMINARY JURISDICTIONAL DETERMINATION (JD): May 31, 2018

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD:

Applicant:
CloudHQ
Attn: Mr. Pete Hohm
1212 New York Avenue, Suite 1000
Washington, DC 20002

Agent:
TNT Environmental Inc.
Attn: Mr. Avi Sareen
13996 Parkeast Circle, Suite 101
Chantilly, Virginia 20151

C. DISTRICT OFFICE: Norfolk District FILE NUMBER: NAO- 2018-00997

FILE NAME: Zebra South

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:

State: VIRGINIA County/parish/borough: Loudoun City: n/a

Center coordinates of site:

Latitude: 39.006111° N Longitude: -77.476667° W

Universal Transverse Mercator: n/a

Name of nearest waterbody: Broad Run

Identify (estimate) amount of waters in the review area:

Non-wetland waters: ± 8004 linear feet

Cowardin Class: R3, R4

Stream Flow: n/a

Wetlands: ± 3.6 acres

Cowardin Class: PFO, PEM

Name of any water bodies on the site that have been identified as Section 10 waters: Tidal: n/a

Non-Tidal: n/a

E. REVIEW PERFORMED FOR SITE EVALUATION:

☐ Office (Desk) Determination Date:
☒ Field Determination Date: June 21, 2018

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative

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appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

3. This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA:

Data reviewed for preliminary JD (check all that apply) - checked items should be included in case file and, where checked and requested, appropriately reference sources below.

☒Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:

☒Data sheets prepared/submitted by or on behalf of the applicant/consultant.

☐Office concurs with data sheets/delineation report.

☐Office does not concur with data sheets/delineation report.

☐Data sheets prepared by the Corps:

☐Corps navigable waters' study:

☐U.S. Geological Survey Hydrologic Atlas:

☐USGS NHD data.

☐USGS 8 and 12 digit HUC maps.

☒U.S. Geological Survey map(s). Cite scale & quad name:

☐USDA Natural Resources Conservation Service Soil Survey.

Citation:

☐National wetlands inventory map(s). Cite name:

☐State/Local wetland inventory map(s):

☐FEMA/FIRM maps:

☐100-year Floodplain Elevation: (National Geodetic Vertical Datum of 1929)

☐ Photographs: ☐Aerial (Name & Date):

Or ☐Other (Name & Date):

☐Previous determination(s):

File no. and date of response letter:

☐Other information (please specify):

Signature
Regulatory Project Manager
(REQUIRED)

Signature of person requesting
Preliminary JD
(REQUIRED, unless obtaining the signature is impracticable)

17 July 2018
Date

Date

Received by VMRC September 1, 2023 /blh

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1096

Reply to Attention of

July 17, 2018

Northern Virginia Regulatory Section
NAO-2018-00997 (Broad Run)

Mr. Pete Hohm
CloudHQ
1212 New York Avenue NW, Suite 1000
Washington, DC 20002

Dear Mr. Hohm:

This letter is in reference to a request on your behalf from TNT Environmental Inc., for a delineation confirmation and jurisdictional determination for waters of the U.S. (including wetlands) for an approximately 133.22-acre study area (PINs: 089481925, 089496285 and 089309997) located on both sides of the Loudoun County Parkway, north of Shellhorn Road in Loudoun County, Virginia. The project is called Zebra South.

The enclosed exhibit, in three (3) sheets, entitled "Wetlands & Waters of the U.S. Map, Zebra South, Loudoun County" dated May 9, 2018, with revisions dated June 21, 2018, provides the locations of waters and/or wetlands on the properties listed above. The basis for this delineation includes application of the Corps' 1987 Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont and the positive indicators of wetland hydrology, hydric soils, and hydrophytic vegetation and the presence of an ordinary high water mark.

Discharges of dredged or fill material, including those associated with mechanized land clearing, into waters and/or wetlands on this site may require a Department of the Army permit and authorization by state and local authorities including a Virginia Water Protection Permit from the Virginia Department of Environmental Quality (DEQ), a permit from the Virginia Marine Resources Commission (VMRC) and/or a permit from your local wetlands board. This letter is a confirmation of the Corps preliminary jurisdiction for the waters and/or wetlands on the subject property and does not authorize any work in these areas. Please obtain all required permits before starting work in the delineated waters/wetland areas.

This is a preliminary jurisdictional determination and is therefore not a legally binding determination regarding whether Corps jurisdiction applies to the waters or wetlands in question. Accordingly, you may either consent to jurisdiction as set out in this preliminary jurisdictional determination and the attachments hereto if you agree with the determination, or you may request and obtain an approved jurisdictional determination. This preliminary jurisdictional determination and associated wetland delineation map may be submitted with a permit application.

Received by VMRC September 1, 2023 /blh

Enclosed is a copy of the “Preliminary Jurisdictional Determination Form”. Please review the document, sign, and return a copy within 30 days of receipt and keep one for your records. This delineation of waters and/or wetlands is valid for a period of five years from the date of this letter unless new information warrants revision prior to the expiration date.

If you have any questions, please contact me at ron.h.stouffer@usace.army.mil or 757-201-7124.

Sincerely,

Ronald H. Stouffer, Jr.
Environmental Scientist
Northern Virginia Regulatory Section

Enclosures

cc: TNT Environmental Inc.

Received by VMRC September 1, 2023 /blh

DEPARTMENT OF THE ARMY
NORFOLK DISTRICT CORPS OF ENGINEERS
FORT NORFOLK 803 FRONT STREET
NORFOLK VIRGINIA 23510-1094

REPLY TO ATTENTION OF

JULY 17, 2018

Supplemental Preapplication Information

Project Number: NAO-2018-00997
Applicant: CloudHQ
Project Location: Loudoun County

1. A search of the Virginia Department of Historic Resources data revealed the following:

   ☐ No known historic properties are located on the property.

   ☒ Known architectural resources are located on the property:

   ☒ Known archaeological resources are located on the property:

   ☒ Known historic resources are located in the vicinity of the property.

NOTE:

1) *The information above is for planning purposes only. In many cases, the property has not been surveyed for historic resources. Undiscovered historic resources may be located on the subject property or adjacent properties and this supplemental information is not intended to satisfy the Corps' requirements under Section 106 of the National Historic Preservation Act (NHPA).*
2) *Prospective permittees should be aware that Section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant.*

2. A search of the data supplied by the U.S. Fish & Wildlife Service, the Virginia Department of Conservation and Recreation and the Virginia Department of Game and Inland Fisheries revealed the following:

   ☐ No known populations of threatened or endangered species are located on or within the vicinity of the subject property.

   ☒ The following federally-listed species may occur within the vicinity of the subject property:
   Northern Long-eared Bat (*Myotis septentrionalis*)

   ☐ The following state-listed (or other) species may occur within the vicinity of the subject property:

   ☐ Known listed species may occur in the vicinity of the subject property:

Please note this information is being provided to you based on the preliminary data you submitted to the Corps relative to project boundaries and project plans. Consequently, these findings and recommendations are subject to change if the project scope changes or new information becomes available and the accuracy of the data.

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APPENDIX II

THREATENED AND ENDANGERED SPECIES INFORMATION

Received by VMRC September 1, 2023 /blh

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694 Fax: (804) 693-9032

In Reply Refer To: June 27, 2023
Project Code: 2023-0086607
Project Name: 1165 Zebra South (Loudoun Center)

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

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A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Project Code in the header of this

Received by VMRC September 1, 2023 /blh

letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds

Received by VMRC September 1, 2023 /blh

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
(804) 693-6694

Received by VMRC September 1, 2023 /blh

PROJECT SUMMARY

Project Code: 2023-0086607
Project Name: 1165 Zebra South (Loudoun Center)
Project Type: Commercial Development
Project Description: The project site consists of three (3) parcels of land totaling approximately 133.22 acres located on either side of Loudoun County Parkway, north of Shellhorn Road in Loudoun County, Virginia. The project site is further identified by Loudoun County PINs: 089−48−1925, 089−49−6285, and 089−30−9997. Based on the County GIS, the project site is unimproved and mostly wooded. A previous wetland delineation was conducted by others and has since expired. Several wetland and stream systems are located throughout the site.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@39.007429349999995,-77.4778314174039,14z

Counties: Loudoun County, Virginia

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ENDANGERED SPECIES ACT SPECIES

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

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USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

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MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to Jul 31
Black-billed Cuckoo *Coccyzus erythropthalmus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10

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NAME	BREEDING SEASON
Cerulean Warbler *Dendroica cerulea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974	Breeds Apr 28 to Jul 20
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Kentucky Warbler *Oporornis formosus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
King Rail *Rallus elegans* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8936	Breeds May 1 to Sep 5
Prairie Warbler *Dendroica discolor* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Prothonotary Warbler *Protonotaria citrea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird *Euphagus carolinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week

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months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

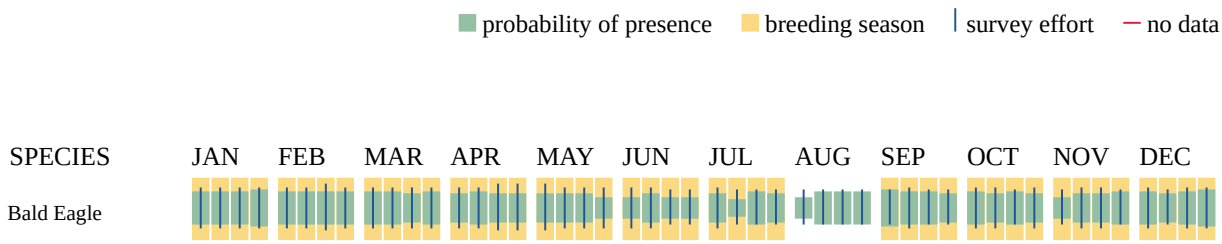
1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



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Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

MIGRATORY BIRDS FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

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Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

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Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of

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certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

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IPAC USER CONTACT INFORMATION

Agency: TNT Environmental, Inc.
Name: Kayla Simpson
Address: 4455 Brookfield Corporate Drive, Suite 100
City: Chantilly
State: VA
Zip: 20151
Email ksimpson@tntenv.com
Phone: 7034665123

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Army Corps of Engineers

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694 Fax: (804) 693-9032

In Reply Refer To: June 02, 2023
Project code: 2023-0086607
Project Name: 1165 Zebra South (Loudoun Center)

Federal Nexus: yes
Federal Action Agency (if applicable): Army Corps of Engineers

Subject: Federal agency coordination under the Endangered Species Act, Section 7 for '1165 Zebra South (Loudoun Center)'

Dear Regena Bronson:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on June 02, 2023, for '1165 Zebra South (Loudoun Center)' (here forward, Project). This project has been assigned Project Code 2023-0086607 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements may not be complete.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into the IPaC must accurately represent the full scope and details of the Project. Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat Rangewide Determination Key (DKey), invalidates this letter.

Determination for the Northern Long-Eared Bat

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Based upon your IPaC submission and a standing analysis completed by the Service, your project has reached the determination of “May Affect, Not Likely to Adversely Affect” the northern long-eared bat. Unless the Service advises you within 15 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that consultation on the Action is complete and no further action is necessary unless either of the following occurs:

- new information reveals effects of the action that may affect the northern long-eared bat in a manner or to an extent not previously considered; or,
- the identified action is subsequently modified in a manner that causes an effect to the northern long-eared bat that was not considered when completing the determination key.

15-Day Review Period

As indicated above, the Service will notify you within 15 calendar days if we determine that this proposed Action does not meet the criteria for a “may affect, not likely to adversely affect” (NLAA) determination for the northern long-eared bat. If we do not notify you within that timeframe, you may proceed with the Action under the terms of the NLAA concurrence provided here. This verification period allows the identified Ecological Services Field Office to apply local knowledge to evaluation of the Action, as we may identify a small subset of actions having impacts that we did not anticipate when developing the key. In such cases, the identified Ecological Services Field Office may request additional information to verify the effects determination reached through the Northern Long-eared Bat DKey.

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination for the northern long-eared bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Monarch Butterfly *Danaus plexippus* Candidate
- Tricolored Bat *Perimyotis subflavus* Proposed Endangered

You may coordinate with our Office to determine whether the Action may affect the species and/or critical habitat listed above. Note that reinitiation of consultation would be necessary if a new species is listed or critical habitat designated that may be affected by the identified action before it is complete.

If you have any questions regarding this letter or need further assistance, please contact the Virginia Ecological Services Field Office and reference Project Code 2023-0086607 associated with this Project.

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Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

1165 Zebra South (Loudoun Center)

2. Description

The following description was provided for the project '1165 Zebra South (Loudoun Center)':

> The project site consists of three (3) parcels of land totaling approximately 133.22 acres located on either side of Loudoun County Parkway, north of Shellhorn Road in Loudoun County, Virginia. The project site is further identified by Loudoun County PINs: 089−48−1925, 089−49−6285, and 089−30−9997. Based on the County GIS, the project site is unimproved and mostly wooded. A previous wetland delineation was conducted by others and has since expired. Several wetland and stream systems are located throughout the site.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@39.007421199999996,-77.47783791163087,14z

DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of “may affect, but not likely to adversely affect” for the Endangered northern long-eared bat (*Myotis septentrionalis*).

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of the northern long-eared bat or any other listed species?

   Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

   No

2. Do you have post-white nose syndrome occurrence data that indicates that northern long-eared bats (NLEB) are likely to be present in the action area?

   Bat occurrence data may include identification of NLEBs in hibernacula, capture of NLEBs, tracking of NLEBs to roost trees, or confirmed acoustic detections. With this question, we are looking for data that, for some reason, may have not yet been made available to U.S. Fish and Wildlife Service.

   No

3. Does any component of the action involve construction or operation of wind turbines?

   Note: For federal actions, answer ‘yes’ if the construction or operation of wind power facilities is either (1) part of the federal action or (2) would not occur but for a federal agency action (federal permit, funding, etc.).

   No

4. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

   Yes

5. Is the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), or Federal Transit Administration (FTA) funding or authorizing the proposed action, in whole or in part?

   No

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6. Are you an employee of the federal action agency or have you been officially designated in writing by the agency as its designated non-federal representative for the purposes of Endangered Species Act Section 7 informal consultation per 50 CFR § 402.08?

   Note: This key may be used for federal actions and for non-federal actions to facilitate section 7 consultation and to help determine whether an incidental take permit may be needed, respectively. This question is for information purposes only.

   No

7. Is the lead federal action agency the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC)? Is the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC) funding or authorizing the proposed action, in whole or in part?

   No

8. Is the lead federal action agency the Federal Energy Regulatory Commission (FERC)?

   No

9. Have you determined that your proposed action will have no effect on the northern long-eared bat? Remember to consider the effects of any activities that would not occur but for the proposed action.

   If you think that the northern long-eared bat may be affected by your project or if you would like assistance in deciding, answer "No" below and continue through the key. If you have determined that the northern long-eared bat does not occur in your project's action area and/or that your project will have no effects whatsoever on the species despite the potential for it to occur in the action area, you may make a "no effect" determination for the northern long-eared bat.

   Note: Federal agencies (or their designated non-federal representatives) must consult with USFWS on federal agency actions that may affect listed species [50 CFR 402.14(a)]. Consultation is not required for actions that will not affect listed species or critical habitat. Therefore, this determination key will not provide a consistency or verification letter for actions that will not affect listed species. If you believe that the northern long-eared bat may be affected by your project or if you would like assistance in deciding, please answer "No" and continue through the key. Remember that this key addresses only effects to the northern long-eared bat. Consultation with USFWS would be required if your action may affect another listed species or critical habitat. The definition of Effects of the Action can be found here: https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions

   No

10. Does the action area contain any caves (or associated sinkholes, fissures, or other karst features), mines, rocky outcroppings, or tunnels that could provide habitat for hibernating northern long-eared bats?

    No

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11. Is suitable summer habitat for the northern long-eared bat present within 1000 feet of project activities?
(If unsure, answer "Yes.")

    Note: If there are trees within the action area that are of a sufficient size to be potential roosts for bats (i.e., live trees and/or snags ≥3 inches (12.7 centimeter) dbh), answer "Yes". If unsure, additional information defining suitable summer habitat for the northern long-eared bat can be found at: https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions

    Yes

12. Will the action cause effects to a bridge?

    No

13. Will the action result in effects to a culvert or tunnel?

    No

14. Does the action include the intentional exclusion of northern long-eared bats from a building or structure?

    Note: Exclusion is conducted to deny bats' entry or reentry into a building. To be effective and to avoid harming bats, it should be done according to established standards. If your action includes bat exclusion and you are unsure whether northern long-eared bats are present, answer "Yes." Answer "No" if there are no signs of bat use in the building/structure. If unsure, contact your local U.S. Fish and Wildlife Services Ecological Services Field Office to help assess whether northern long-eared bats may be present. Contact a Nuisance Wildlife Control Operator (NWCO) for help in how to exclude bats from a structure safely without causing harm to the bats (to find a NWCO certified in bat standards, search the Internet using the search term "National Wildlife Control Operators Association bats"). Also see the White-Nose Syndrome Response Team's guide for bat control in structures

    No

15. Does the action involve removal, modification, or maintenance of a human-made structure (barn, house, or other building) **known or suspected to contain roosting bats?**

    No

16. Will the action cause construction of one or more new roads open to the public?

    For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

    Yes

17. Will any new road go through any area of contiguous forest that is greater than or equal to 10 acres in total extent?

    Note: "Contiguous forest" of 10 acres or more may includes areas where multiple forest patches are separated by less than 1,000 feet of non-forest if the forested patches, added together, comprise at least 10 acres.

    No

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18. Will any new road pass between two patches of contiguous forest that are each greater than or equal to 10 acres in extent and are separated by less than 1,000 feet? Northern long-eared bats may cross a road by flying between forest patches that are up to 1,000 feet apart.

    Note: "Contiguous forest" of 10 acres or more may includes areas where multiple forest patches are separated by less than 1,000 feet of non-forested area if the forested patches, added together, comprise at least 10 acres.

    No

19. Will the action include or cause any construction or other activity that is reasonably certain to increase average daily traffic on one or more existing roads?

    Note: For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.). .

    Yes

20. Will the increased vehicle traffic occur on any road that lies between any two areas of contiguous forest that are each greater than or equal to 10 acres in extent and are separated by less than 1,000 feet? Northern long-eared bats may cross a road by flying between forest patches that are up to 1,000 feet apart.

    Note: "Contiguous forest" of 10 acres or more may includes areas where multiple forest patches are separated by less than 1,000 feet of non-forested area if the forested patches, added together, comprise at least 10 acres.

    No

21. Will the proposed action involve the creation of a new water-borne contaminant source (e.g., leachate pond pits containing chemicals that are not NSF/ANSI 60 compliant)?

    No

22. Will the proposed action involve the creation of a new point source discharge from a facility other than a water treatment plant or storm water system?

    No

23. Will the action include drilling or blasting?

    Yes

24. Will the drilling or blasting affect known or potentially suitable hibernacula, summer habitat, or active year-round habitat (where applicable) for the northern long-eared bat?

    Note: In addition to direct impacts to hibernacula, consider impacts to hydrology or air flow that may impact the suitability of hibernacula. Additional information defining suitable summer habitat for the northern long-eared bat can be found at: https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions

    No

25. Will the action involve military training (e.g., smoke operations, obscurant operations, exploding munitions, artillery fire, range use, helicopter or fixed wing aircraft use)?

    No

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26. Will the proposed action involve the use of herbicides or pesticides other than herbicides (e.g., fungicides, insecticides, or rodenticides)?

    No

27. Will the action include or cause activities that are reasonably certain to cause chronic nighttime noise in suitable summer habitat for the northern long-eared bat? Chronic noise is noise that is continuous or occurs repeatedly again and again for a long time.

    Note: Additional information defining suitable summer habitat for the northern long-eared bat can be found at: https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions

    Yes

28. Will the proposed action result in the cutting or other means of knocking down, bringing down, or trimming of any trees suitable for northern long-eared bat roosting?

    Note: Suitable northern long-eared bat roost trees are live trees and/or snags ≥3 inches dbh that have exfoliating bark, cracks, crevices, and/or cavities.

    Yes

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PROJECT QUESTIONNAIRE

Enter the extent of the action area (in acres) from which trees will be removed - round up to the nearest tenth of an acre. For this question, include the entire area where tree removal will take place, even if some live or dead trees will be left standing.

3

In what extent of the area (in acres) will trees be cut, knocked down, or trimmed during the inactive (hibernation) season for northern long-eared bat? **Note:** Inactive Season dates for spring staging/fall swarming areas can be found here: https://www.fws.gov/media/inactive-season-dates-swarming-and-staging-areas

0

In what extent of the area (in acres) will trees be cut, knocked down, or trimmed during the active (non-hibernation) season for northern long-eared bat? **Note:** Inactive Season dates for spring staging/fall swarming areas can be found here: https://www.fws.gov/media/inactive-season-dates-swarming-and-staging-areas

3

Will all potential northern long-eared bat (NLEB) roost trees (trees ≥3 inches diameter at breast height, dbh) be cut, knocked, or brought down from any portion of the action area greater than or equal to 0.1 acre? If all NLEB roost trees will be removed from multiple areas, select 'Yes' if the cumulative extent of those areas meets or exceeds 0.1 acre.

Yes

Enter the extent of the action area (in acres) from which all potential NLEB roost trees will be removed. If all NLEB roost trees will be removed from multiple areas, entire the total extent of those areas. Round up to the nearest tenth of an acre.

3

For the area from which all potential northern long-eared bat (NLEB) roost trees will be removed, on how many acres (round to the nearest tenth of an acre) will trees be allowed to regrow? Enter '0' if the entire area from which all potential NLEB roost trees are removed will be developed or otherwise converted to non-forest for the foreseeable future.

0

Will any snags (standing dead trees) ≥3 inches dbh be left standing in the area(s) in which all northern long-eared bat roost trees will be cut, knocked down, or otherwise brought down?

No

Will all project activities by completed by April 1, 2024?

No

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IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Regena Bronson
Address: 10300 Spotsylvania Avenue, Suite 230
City: Fredericksburg
State: VA
Zip: 22408
Email regena.d.bronson@usace.army.mil
Phone: 5406929552

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Site Location

39,00,22.0 -77,28,36.0
is **the Search Point**

Show Position Rings
◉ Yes ○ No
1 mile and 1/4 mile at the **Search Point**

Show Search Area
◉ Yes ○ No
2 Search distance miles radius

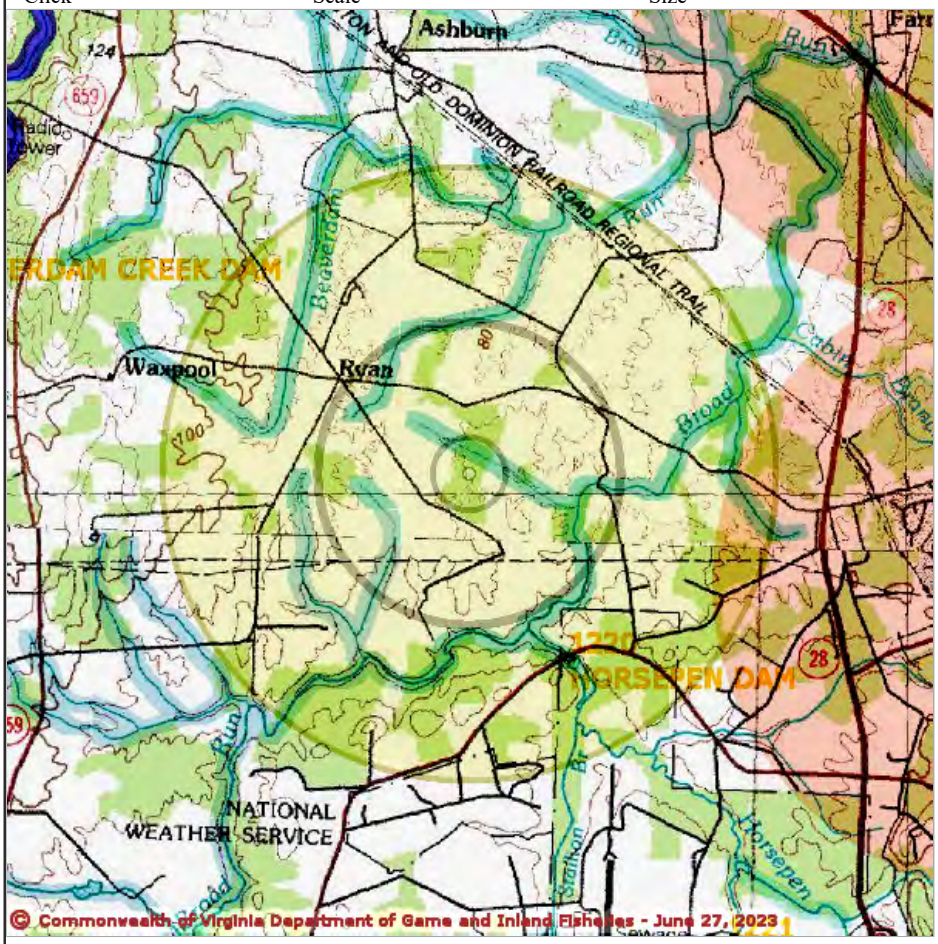
Search Point is at map center

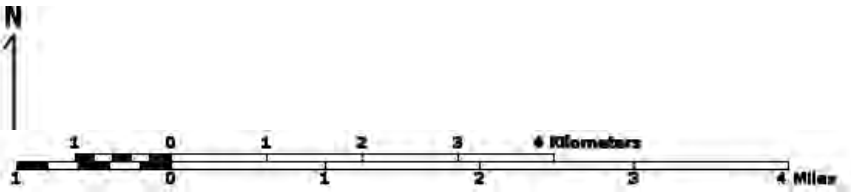
Base Map Choices
Topography

Map Overlay Choices
Current List: Position, Search, BECAR, BAEANests, TEWaters, TierII, Habitat, Trout, Anadromous

Refresh Browser Page

Map Click Pan Id M | Map Scale In Zoom Out | Screen Size Small Size Big | Help





Point of Search 39,00,22.0 -77,28,36.0
Map Location 39,00,22.0 -77,28,36.0

Select **Coordinate System:**
◉ Degrees,Minutes,Seconds Latitude - Longitude
○ Decimal Degrees Latitude - Longitude
○ Meters UTM NAD83 East North Zone
○ Meters UTM NAD27 East North Zone

Base Map source: USGS 1:100,000 topographic maps (see Microsoft terraserver-usa.com for details)

Map projection is UTM Zone 18 NAD 1983 with left 280748 and top 4325173. Pixel size is 16 meters . Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixles. The map display represents 9600 meters east to west by 9600 meters north to south for a total of 92.1 square kilometers. The map display represents 31501 feet east to west by 31501 feet north to south for a total of 35.5

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Map Overlay Legend

T & E Waters

Federal

State

Predicted Habitat WAP Tier I & II

Aquatic

Terrestrial

Trout Waters

Class I - IV

Class V - VI

Anadromous Fish Reach

Confirmed

Potential

Impediment

Position Rings 1 mile and 1/4 mile at the Search Point

2 mile radius Search Area

Bald Eagle Concentration Areas and Roosts

square miles.

Topographic maps and Black and white aerial photography for year 1990+-
are from the United States Department of the Interior, United States Geological Survey.
Color aerial photography aquired 2002 is from Virginia Base Mapping Program, Virginia Geographic Information Network.
Shaded topographic maps are from TOPO! ©2006 National Geographic
http://www.national.geographic.com/topo
All other map products are from the Commonwealth of Virginia Department of Game and Inland Fisheries.

map assembled 2023-06-27 16:41:21 (qa/qc March 21, 2016 12:20 - tn=1508652.0 dist=3218 I)
$poi=39.0061110 -77.4766665

| DGIF | Credits | Disclaimer | Contact vafwis_support@dgif.virginia.gov |Please view our privacy policy |
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VaFWIS Search Report Compiled on 6/27/2023, 4:41:00 PM

Help

Known or likely to occur within a **2 mile radius around point 39.0061110 -77.4766665** in **107 Loudoun County, VA**

View Map of Site Location

511 Known or Likely Species ordered by Status Concern for Conservation (displaying first 32) (32 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name	Confirmed	Database(s)
050022	FEST	Ia	Bat, northern long-eared	Myotis septentrionalis		BOVA
060003	FESE	Ia	Wedgemussel, dwarf	Alasmidonta heterodon		BOVA
060029	FTST	IIa	Lance, yellow	Elliptio lanceolata		BOVA
050020	SE	Ia	Bat, little brown	Myotis lucifugus		BOVA
050027	FPSE	Ia	Bat, tri-colored	Perimyotis subflavus		BOVA
060006	SE	Ib	Floater, brook	Alasmidonta varicosa		BOVA
030062	ST	Ia	Turtle, wood	Glyptemys insculpta	Potential	BOVA,Habitat,HU6
040096	ST	Ia	Falcon, peregrine	Falco peregrinus		BOVA
040293	ST	Ia	Shrike, loggerhead	Lanius ludovicianus		BOVA
040379	ST	Ia	Sparrow, Henslow's	Centronyx henslowii	Potential	BOVA,BBA
100155	ST	Ia	Skipper, Appalachian grizzled	Pyrgus wyandot		HU6
060081	ST	IIa	Floater, green	Lasmigona subviridis		BOVA
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans		BOVA
100079	FC	IIIa	Butterfly, monarch	Danaus plexippus		BOVA
030063	CC	IIIa	Turtle, spotted	Clemmys guttata		BOVA,HU6
030012	CC	IVa	Rattlesnake, timber	Crotalus horridus		BOVA
040092		Ia	Eagle, golden	Aquila chrysaetos		BOVA
040040		Ia	Ibis, glossy	Plegadis falcinellus		HU6
040306		Ia	Warbler, golden-winged	Vermivora chrysoptera		BOVA
100248		Ia	Fritillary, regal	Speyeria idalia idalia		BOVA,HU6
040213		Ic	Owl, northern saw-whet	Aegolius acadicus		BOVA,HU6
040052		IIa	Duck, American black	Anas rubripes		BOVA,HU6
040036		IIa	Night-heron, yellow-crowned	Nyctanassa violacea violacea		BOVA
040181		IIa	Tern, common	Sterna hirundo		HU6

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040320		IIa	Warbler, cerulean	Setophaga cerulea		BOVA,HU6
040140		IIa	Woodcock, American	Scolopax minor		BOVA,HU6
060071		IIa	Lampmussel, yellow	Lampsilis cariosa		BOVA,HU6
040203		IIb	Cuckoo, black-billed	Coccyzus erythropthalmus		BOVA
040105		IIb	Rail, king	Rallus elegans		BOVA
040304		IIc	Warbler, Swainson's	Limnothlypis swainsonii		HU6
100154		IIc	Butterfly, Persius duskywing	Erynnis persius persius		HU6
100166		IIc	Skipper, Dotted	Hesperia attalus slossonae		BOVA,HU6

To view **All 511 species** View 511

*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; CC=Collection Concern

**I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need;
IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need
Virginia Widlife Action Plan Conservation Opportunity Ranking:
a - On the ground management strategies/actions exist and can be feasibly implemented.;
b - On the ground actions or research needs have been identified but cannot feasibly be implemented at this time.;
c - No on the ground actions or research needs have been identified or all identified conservation opportunities have been exhausted.

View Map of All Query Results from All Observation Tables

Bat Colonies or Hibernacula: **Not Known**

Anadromous Fish Use Streams

N/A

Impediments to Fish Passage (1 records)

View Map of All Fish Impediments

ID	Name	River	View Map
1220	HORSEPEN DAM	HORSEPEN RUN	Yes

Colonial Water Bird Survey

N/A

Threatened and Endangered Waters

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N/A

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests

N/A

Species Observations (112 records - displaying first 20)

View Map of All Query Results
Species Observations

obsID	class	Date Observed	Observer	N Species			View Map
				Different Species	Highest TE*	Highest Tier**	
317211	SppObs	Aug 3 2006	Christine Geist	1		III	Yes
317210	SppObs	Aug 2 2006	Christine Geist	1		III	Yes
317209	SppObs	Jul 28 2006	Christine Geist	1		III	Yes
628395	SppObs	Jul 16 2015	Cynthia Hauser	2		IV	Yes
628394	SppObs	Jul 15 2015	Cynthia Hauser	2		IV	Yes
628392	SppObs	Jul 14 2015	Cynthia Hauser	2		IV	Yes
628391	SppObs	Jul 13 2015	Cynthia Hauser	1		IV	Yes
628389	SppObs	Jul 11 2015	Cynthia Hauser	2		IV	Yes
628387	SppObs	Jul 10 2015	Amy Schneider	2		IV	Yes
305243	SppObs	Jul 22 2004	Stevenson, P. H.	5		IV	Yes
305845	SppObs	Jul 22 2004	Stevenson, P. H.	2		IV	Yes
51546	SppObs	Aug 5 1995	Roger B. Clapp, USNM	2		IV	Yes
51542	SppObs	Jul 23 1995	Roger B. Clapp, USNM	1		IV	Yes
51537	SppObs	Jul 22 1995	Roger B. Clapp, USNM	1		IV	Yes
51538	SppObs	Jul 22 1995	Roger B. Clapp, USNM	1		IV	Yes
633330	SppObs	Sep 13 2016	David Parks; Jared Rouchard	1			Yes

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633329	SppObs	Sep 6 2016	David Parks; Jared Rouchard	2			Yes
633328	SppObs	Aug 29 2016	David Parks; Jared Rouchard	1			Yes
633327	SppObs	Aug 22 2016	David Parks; Jared Rouchard	1			Yes
633326	SppObs	Aug 15 2016	David Parks; Eric Omdahl	1			Yes

Displayed 20 Species Observations

Selected 112 Observations View all 112 Species Observations

Habitat Predicted for Aquatic WAP Tier I & II Species (4 Reaches)

View Map Combined Reaches from Below of Habitat Predicted for WAP Tier I & II Aquatic Species

Stream Name	Tier Species		View Map
	Highest TE*	BOVA Code, Status*, Tier**, Common & Scientific Name	
Beaverdam Run (20700081)	ST	030062 ST Ia Turtle, wood Glyptemys insculpta	Yes
Broad Run (20700081)	ST	030062 ST Ia Turtle, wood Glyptemys insculpta	Yes
Horsepen Run (20700081)	ST	030062 ST Ia Turtle, wood Glyptemys insculpta	Yes
tributary (20700081)	ST	030062 ST Ia Turtle, wood Glyptemys insculpta	Yes
tributary (20700081)	ST	030062 ST Ia Turtle, wood Glyptemys insculpta	Yes

Habitat Predicted for Terrestrial WAP Tier I & II Species

N/A

Virginia Breeding Bird Atlas Blocks (4 records)

View Map of All Query Results
Virginia Breeding Bird Atlas Blocks

BBA ID	Atlas Quadrangle Block Name	Breeding Bird Atlas Species			View Map
		Different Species	Highest TE*	Highest Tier**	
50202	Arcola, NE	43		III	Yes
51201	Herndon, NW	47	ST	I	Yes
50216	Leesburg, SE	69		III	Yes
51215	Sterling, SW	6		III	Yes

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Public Holdings:

N/A

Summary of BOVA Species Associated with Cities and Counties of the Commonwealth of Virginia:

FIPS Code	City and County Name	Different Species	Highest TE	Highest Tier
107	Loudoun	438	FESE	I

USGS 7.5' Quadrangles:
Arcola
Leesburg
Herndon
Sterling

USGS NRCS Watersheds in Virginia:

N/A

USGS National 6th Order Watersheds Summary of Wildlife Action Plan Tier I, II, III, and IV Species:

HU6 Code	USGS 6th Order Hydrologic Unit	Different Species	Highest TE	Highest Tier
PL17	Broad Run-Lenah Run	49	ST	I
PL18	Horsepen Run	61	ST	I
PL19	Broad Run-Beaverdam Run	53	ST	I

Compiled on 6/27/2023, 4:41:00 PM I1508652.0 report=all searchType= R dist= 3218 poi= 39.0061110 -77.4766665

PixelSize=64; Anadromous=0.019063; BBA=0.035172; BECAR=0.018154; Bats=0.018488; Buffer=0.061656; County=0.047799; HU6=0.043714; Impediments=0.019676; Init=0.091857; PublicLands=0.020616; Quad=0.025619; SppObs=0.235649; TEWaters=0.023789; TierReaches=0.05136; TierTerrestrial=0.02684; Total=0.913112; Tracking_BOVA=0.188626; Trout=0.019753; huva=0.023072

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Species Conclusions Table

Project Manager: Kayla Simpson	Project Name: Audubon Cove
Date: September 1, 2023	Project Number: 3153-A

Project Description: Residential Development

Species Under the Jurisdiction of FWS:

Species/Resource Name	Habitat/Species Presence in Action Area	ESA Section 7 Determination	Sources of Info	Project Elements that Support Determination
Insert name of species or resource as listed on Official Species List.			#N/A	*Explain which project elements may impact the habitat or individuals of each species and any Avoidance and Minimization Measures being implemented.*
Monarch butterfly (Danaus plexippus)	No critical habitat present	No effect	Adult monarch butterflies are large and conspicuous, with bright orange wings surrounded by a black border and covered with black veins. The black border has a double row of white spots present on the upper side and lower side of forewings and hindwings (Bouseman and Sternburg 2001, p. 222). Adult monarchs are sexually dimorphic, with males having narrower wing venation and scent patches (CEC 2008, p.11; Figure 2). The bright coloring of a monarch serves as a warning to predators that eating them can be toxic (referred to as aposematism). Monarchs in eastern and western North America represent the ancestral origin for the species worldwide. They exhibit long-distance migration and overwinter as adults at forested locations in Mexico and California. These overwintering sites provide protection from the elements (for example, rain, wind, hail, and excessive radiation) and moderate temperatures, as well as nectar and clean water sources located nearby. Adult monarchs feed on nectar from a wide variety of flowers. Reproduction is dependent on the presence of milkweed, the sole food source for larvae. Monarch butterflies are found in 90 total countries, islands, or island groups. Monarch butterflies have become naturalized in most of these locations outside of North America since 1840. The populations outside of eastern and western North America (including southern Florida) do not exhibit long-distance migratory behavior.	On the east coast, the monarch butterfly's habitat is typically open fields and meadows with milkweed. Due to the lack of habitat and nectar sources on site, this species is not expected to be affected by project activities.
Northern long-eared bat (Myotis septentrionalis)	Potential habitat present and no current survey conducted	Not likely to adversely affect	"Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula. They typically use large caves or mines with large passages and entrances; constant temperatures; and high humidity with no air currents. Specific areas where they hibernate have very high humidity, so much so that droplets of water are often seen on their fur. Within hibernacula, surveyors find them in small crevices or cracks, often with only the nose and ears visible. During summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. Males and non-reproductive females may also roost in cooler places, like caves and mines. This bat seems opportunistic in selecting roosts, using tree species based on suitability to retain bark or provide cavities or crevices. It has also been found, rarely, roosting in structures like barns and sheds."	Based upon IPaC submission and a standing analysis (see Appendix D), the subject project is not reasonably certain to cause incidental take of the NLEB; however, the project is expected to have a federal nexus (require wetlands permit); as such the ESA consultation status is incomplete and no project activities should occur until consultation between the Service and the Federal action agency (or designated non-federal representative), is completed.
Tricolored Bat (Perimyotis subflavus)	Potential habitat present and no current survey conducted	Not likely to adversely affect	The tricolored bat is a small insectivorous bat that is distinguished by its unique tricolored fur and often appears yellowish to nearly orange. The once common species is wide ranging across the eastern and central United States and portions of southern Canada, Mexico and Central America. During the winter, tricolored bats are often found in caves and abandoned mines, although in the southern United States, where caves are sparse, tricolored bats are often found roosting in road-associated culverts where they exhibit shorter torpor bouts and forage during warm nights. During the spring, summer, and fall, tricolored bats are found in forested habitats where they roost in trees, primarily among leaves of live or recently dead deciduous hardwood trees, but may also be found in Spanish moss, pine trees, and occasionally human structures.	This Action may affect the tricolored bat; however, any take of this species that may occur incidental to this Action is not currently prohibited.

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APPENDIX III

PHASE I ARCHAEOLOGICAL REPORT

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PHASE I CULTURAL RESOURCES SURVEY OF THE APPROXIMATELY 350-ACRE DUPONT-FABROS DEVELOPMENT TRACT
LOUDOUN COUNTY, VIRGINIA

Prepared For:
Angler Environmental
12811 Randolph Ridge Lane
Manassas, Virginia 20109
703-393-4844

Prepared By:
Amy Humphries, Dawn M. Frost,
and Carol D. Tyrer
Circa~ Cultural Resource Management, LLC
453 McLaws Circle, Suite 3
Williamsburg, Virginia 23185
(757) 220-5023

December 2010
Updated July 2011

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ABSTRACT

In February and March 2010, Angler Environmental contracted Circa~ Cultural Resource Management, LLC (Circa~) to conduct a current condition assessment of the DuPont-Fabros Development project area located in Loudoun County, Virginia. The property consists of 350 acres bordered by commercial development. The assessment looked at the existing conditions of the tract and noted that roughly ½ of the tract had been impacted by past land use—construction, utility and road right-of-ways, or razing of structures. The assessment noted that with the exception of Area 1, the other four areas of the project area had the potential to contain the possibility of intact subsurface resources associated with Native Americans or with historic occupation outside of the areas that had been impacted. Based on the landforms, soil types, distance from water, the Native American resources would probably be small, single-use campsites that date from the Archaic to Woodland periods. The historic period sites would probably small farmsteads with associated outbuildings dating from the 18th through the early 20th century.

In the fall of 2010, Angler Environmental contracted Circa~ to conduct a Phase I cultural resources survey of the approximately 175 acres within the overall 350-acre DuPont-Fabros Development tract in Loudoun County, Virginia. The purpose of this Phase I cultural resources survey was to identify and record all cultural resources within the project area prior to development of the site. Circa~ investigators anticipated the discovery of new Native American and historic sites during the survey of the project tract. The background research had shown that there were sites recorded around the project tract on similar landforms and soils and Circa~ investigators were expecting new discoveries that could add to this previous work and the historical and archaeological record of the region. New and previously recorded sites and components were anticipated to be in general, small Native American camps and temporary camps featuring mostly lithic scatters and historic sites including farmsteads and dwellings dating to periods as early as the early 19th century through the 20th century. This survey resulted in the identification of no isolated finds, one new architectural resource, and four archaeological locations.

VDHR #44LD1601 appears to have been used circa post 1920s and is a dump located on the edge of an abandoned road. The artifacts were concentrated on the surface and no cultural layers or features were noted during shovel testing. Given the absence of cultural layers or features, Circa~ recommends that this site offers no further research potential, and is not eligible for listing in the National Register. No further archaeological testing of this site is recommended. VDHR #44LD1602 represents the faint traces of an old dirt road, probably for farm use. The road was in use during the early 20th century as the nearby dump dates to that period. This road does not meet the eligibility requirements for listing on the National Register of Historic Places and Circa~ recommends no further work for this location. VDHR #44LD1603 appears to have been used circa post 1920s and represents a demolished house located at the end of an elevated farm road. The 20th century artifacts were concentrated on the surface and no cultural layers or features were noted during shovel testing. The subsoil was evident just

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beneath the grass mat. The house has been demolished sometime after 2002, and it appears from the rutting and from the shovel testing that heavy equipment was used to tear down the structure. Given the absence of cultural layers or features, Circa~ recommends that this site offers no further research potential, and is not eligible for listing in the National Register. No further archaeological testing of this site is recommended. VDHR #053-6295 is vacant and in a deteriorated state. All of the buildings except one are ruins, thus greatly reducing any integrity they once possessed. The complex does not appear to possess any unique characteristics that would separate it from other early to mid 20th century farmstead in Loudoun County. The design and workmanship appear undistinguished and the construction materials appear common (Criteria C). A preliminary review of historical records including various maps and historic contexts for Loudoun County does not indicate significant contributions with events (Criteria A) or persons (Criteria B) associated with the property. Considering this, the farmstead does not appear to be potentially eligible for the National Register of Historic Places under Criteria A, B, or C. Circa~ recommends no further survey work on this resource.

At the conclusion of the Phase I survey and a review of the project tract, it appears as if Areas 3 and 5 have been impacted by past agricultural activities with the topsoil being completely eroded by past agricultural activities with a thick mat of grass and/or thick stand of cedars now covering the subsoil. In addition, the landforms with potential to contain Native American resources along the creeks in Areas 3 and 4 have been impacted by the location of a gravity sewer line along the edge of the stream banks. Shovel testing within the level areas within Areas 2 and 4 reveled intact relic plowzones without any artifacts. A review of historic maps and the deed research show that these areas were interior fields on the overall larger farms. These areas out of all of the project area are a greater distance from water. Taking all of this into consideration along with the results of the Phase I survey, Circa~ recommends no further work for the project area.

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INTRODUCTION

In February and March 2010, Circa~ Cultural Resource Management, LLC (Circa~) conducted a current condition assessment of the DuPont-Fabros Development project area located in Loudoun County, Virginia (Figures 1 and 2). The property consists of 350 acres bordered by commercial development. The assessment looked at the existing conditions of the tract and noted that roughly ½ of the tract had been impacted by past land use—construction, utility and road right-of-ways, or razing of structures. The assessment noted that with the exception of Area 1, the other four areas of the project area had the potential to contain the possibility of intact subsurface resources associated with Native Americans or with historic occupation outside of the areas that had been impacted. Based on the landforms, soil types, distance from water, the Native American resources would probably be small, single-use campsites that date from the Archaic to Woodland periods. The historic period sites would probably small farmsteads with associated outbuildings dating from the 18th through the early 20th century.

In the fall of 2010, Circa~ conducted a Phase I cultural resources survey of the Dupont-Fabros Development tract in Loudoun County, Virginia. The project area is currently a mix of wooded and open grassy areas. The property consists of 350 acres bordered by commercial development. The Phase I survey was completed on the portion of the tract that had no obvious disturbance. The oversize maps in the appendix in the back show the areas that were reviewed.

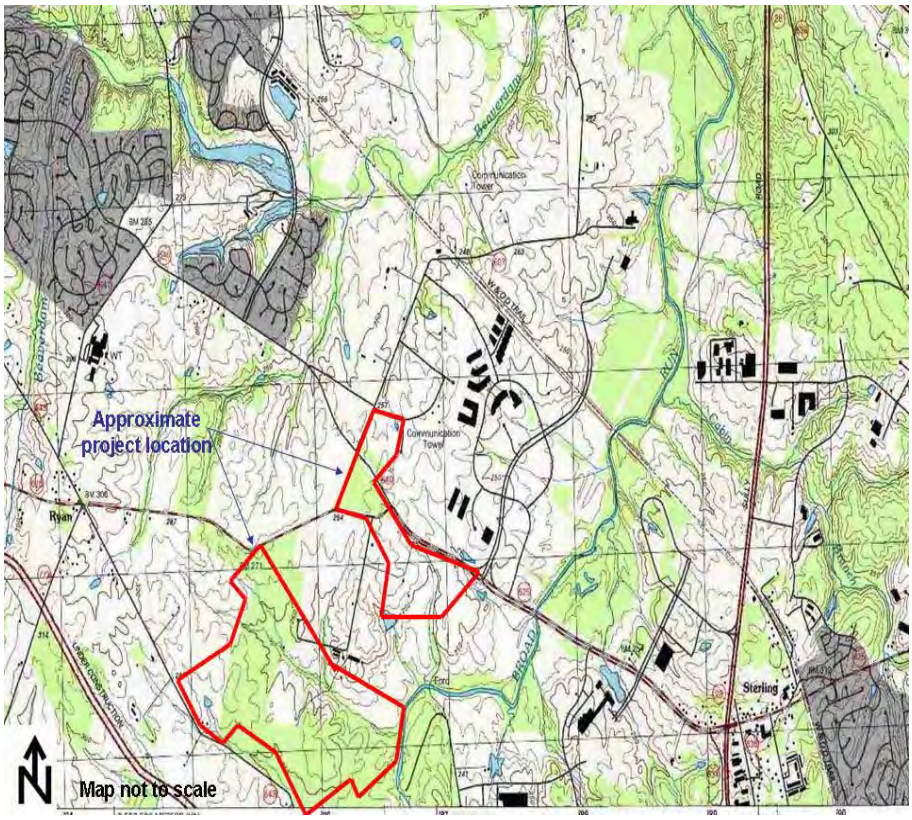

Figure 1. Approximate project location, Sterling USGS quad, VA topo.

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Figure 2. Approximate project location shown on aerial from Google earth.

The investigation was carried out in compliance with Section 106 of the National Historic Preservation Act of 1966 (as amended) and conducted in accordance with the Secretary of the Interior's *Standards and Guidelines for Archaeological Documentation* and the *Guidelines for Preparing Archaeological Resource Management Reports* of the Virginia Department of Historic Resources (VDHR). The report describes fieldwork results and makes recommendations for further work.

This report contains a description of the project area's physical and environmental setting, an outline of meaningful historical contexts for the property, a general research design that summarizes field methods, previous research in the area, and expected results, and finally, the survey results are described, the findings reviewed, and recommendations explained. Field notes, artifacts, and other project records are presently being curated in Circa~'s office in Williamsburg, Virginia. It is anticipated that all of these materials will eventually be transferred to VDHR in Richmond, Virginia following the conclusion of the project.

At Circa~, Carol D. Tyrer served as Project Manager for the project. Amy Humphries served as the Field Director/Principal Investigator for the project, who was assisted in the field by Charlie Rutledge and John Soles, Field Archaeologists. Dawn M. Frost served as the Architectural Historian for the project and completed the architectural survey and

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historic context. Amy Humphries, Dawn M. Frost, and Carol D. Tyrer prepared the report. The successful completion of the Phase I survey for the proposed development was made possible by the contribution of many individuals. In particular, Paul Petera with Angler Environmental ensured that project information and maps were always available for the study.

ENVIRONMENTAL BACKGROUND

The primary reasons for incorporating environmental studies into archaeological projects are: to learn of possible environmental constraints or lack of constraints; to determine the presence or absence of critical resources that might have influenced site distribution, etc; and to discover environmental factors -- erosion, deposition, subsidence, and historic land use patterns -- that might influence the integrity of archaeological sites once they have formed. Keeping these objectives in mind, a brief environmental summary of the project area is provided below.

The DuPont-Fabros tract is located in the piedmont lowland region. Elevations across the tract range from 220 feet to 280 feet above mean sea level (AMSL). No surface waters are located within the tract. Much of the project area is overgrown fields in a secondary growth cedar forest with a thick undergrowth of brambles, with some areas covered in overgrown sedges and grasses, or in the western area of the tract a mature hardwood and softwood forest. The site can be accessed via Loudoun County Parkway and Waxpool Road.

Soils

At least 10 different soil types and soil type variants exist within the DuPont-Fabros project area. These soil types and variants include Dulles silt loam, Ashburn site loam, Albano silt loam, Penn silt loam with various slopes, Panorama silt loam, Nestorian channery silt loam, Rowland silt loam, Manassas silt loam, and Bowmansville silt loam (Natural Resources Conservation Service [NRCS] 2010). Each of these types and variants are described below including references to drainage, hunting and gathering potential, and horticultural and agricultural productivity potential. Further, conclusions regarding the suitability of each for historic and Native American occupation and archaeological site probability are also explained.

Soils maps and associated data provide an analysis of soil types within a geographic area. Despite comprehensive and detailed coverage of most areas by soils surveyors, researchers often miss microenvironments due to their small footprints. Unfortunately, resource-rich microenvironments were often common sites of cultural activity. As such, this analysis of archaeological potential is a “best-guess” using the best available data.

Well-drained, agriculturally- and horticulturally-productive soils proximal to transportation corridors were the best choices for historic period occupation. Secondary areas, such as those containing wet soils and acid soils, after improvement such as drainage and liming, also may have also been suitable choices for historic occupation.

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No navigable waterways exist within the project area, thus water travel is not a factor in the site probability analysis of this tract.

Areas of wet soils may have been attractive to Native American cultures. In these areas, edible herbaceous plant species may have been gathered and faunal species browsing these areas may have been hunted with success. Well-drained soils proximal to these resource-rich areas may have made adequate hunting and gathering campsites where the hunted and gathered resources were processed. These sites would have left an observable archaeological footprint. Little archaeological evidence would be located within the wet areas, the immediate locale of resource procurement.

Areas containing gravelly soils may have been especially attractive to stone tool-manufacturing Native American cultures but the level of attraction may have depended on the type and quality of the gravels available in these locations. Well-drained soils proximal to quarry-able, gravel-rich areas would have made adequate lithic material procurement campsites but in this case, archaeological materials may be located at both the campsites and the quarry sites.

Soils Identified Within the Project Area

Dulles silt loam, 0% to 2% slopes (78A) is the primary soil identified within the project area covering approximately 28% of the northern portion of the project tract (Figure 3). Ashburn silt loam, 0% to 7% slopes (74B) is identified within the northern, southern, and western portions of the project area covering approximately 25% of the project tract. Albano silt loam, 0% to 2% slopes (79A) is identified within the northern, northwestern, and southeastern portion of the project area covering approximately 20% of the project tract. Penn silt loam, 2% to 7% slopes (73B) is identified within the northeastern, eastern, and central portions of the project area covering approximately 11% of the project tract. Penn silt loam, 7% to 15% slopes (73C) is identified within the southeast portion of the project area covering approximately 5% of the project tract. Panorama silt loam, 2% to 7% slopes (71B) is identified within the western portion of the project area covering approximately 5% of the project tract. Nestorian channery silt loam, 7% to 15% slopes (77C3) is identified within the central portion of the project area covering approximately 3% of the project tract. Rowland silt loam, 0% to 2% slopes (5A) is identified within the southern portion of the project area covering approximately 1% of the project tract. Manassas silt loam, 0% to 7% slopes (14B) is identified within the southwestern portion of the project area covering approximately 1% of the project tract. Bowmansville silt loam, 0% to 2% slopes (6A) is identified within the southern and central portions of the project area covering approximately less than 1% of the project tract.

Dulles Silt Loam

Dulles silt loam soil is a deep, moderately-well- and somewhat-poorly-drained soil formed partly in slope creep and partly in residuum from red, Triassic, and Jurassic interbedded fine-grain sandstone, siltstones, and shales in the Culpeper Basin of the Northern Piedmont plateau. These soils occur primarily on broad, nearly-level uplands and concave lowlands. Solum thickness ranges from 22 inches to 48 inches and depth to

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dense weathered bedrock ranges between 40 inches and 60 inches in this very strongly to moderately acid soil. Most of this soil is cleared for cropland, hay, and pasture. Native vegetation includes primarily northern red oak, hickory, Virginia pine, shortleaf pine, and red maple (NRCS 2010).

Figure 3. Project area soil map, from NRCS website.

Ashburn Silt Loam

Ashburn silt loam soil is a moderately-deep, moderately-well-drained, moderately-permeable soil formed in reworked alluvium and the underlying Triassic siltstone, fine-grained sandstone, and shale residuum found on broad, convex interfluves in the Culpeper Basin of the Northern Piedmont (NRCS 2010). Solum thickness ranges from 18 inches to 40 inches and depth to bedrock ranges from 20 inches to 40 inches in this strongly acid to moderately acid soil. Some pedons with paralithic material may not reach a lithic contact within 80 inches. This soil features a medium surface runoff. This soil can support row crops, hay, and residential development. Where wooded, the soil can support northern red oak and Virginia pine.

Albano Silt Loam

Albano silt loam soil is a deep, level to nearly-level, poorly-drained, slowly-permeable soil formed in local alluvium over residuum of the Triassic age on the Northern Piedmont uplands. Solum thickness ranges between 20 inches and 40 inches and depth to hard bedrock ranges between 40 inches and 60 inches in this very strongly to moderately acid soil. Rock fragments of sandstone, shale, or siltstone make up 0% to 10% of the solum.

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Cleared areas of this soil are used for growing pastures and hay. Reeds are common on un-drained cleared areas and ground cover consists of grasses and sedges. Wooded areas can support pin oak, willow oak, elm, blackgum, and box elder (NRCS 2010).

Penn Silt Loam
Penn silt loam soil is a moderately-deep, well-drained soil formed in residuum weathered from non-calcareous reddish shale, siltstone, and fine-grained sandstone normally of the Triassic age (NRCS 2010). This soil is found on nearly-level to steep, moderately-dissected uplands. Solum thickness ranges from 17 inches to 34 inches with depth to bedrock ranging from 20 inches to 40 inches in this extremely acid to strongly acid soil. Where present, depth to paralithic material ranges from 20 inches to 40 inches. This soil features a moderate to very rapid surface runoff. Approximately 75% of this soil is cleared and used for rotation cropland. The remainder is in mixed hardwood woodlands dominated by oak.

Panorama Silt Loam
Panorama silt loam soil is a deep, well-drained, moderately-permeable soil formed predominantly in residuum from red, Triassic, and Jurassic interbedded siltstones and fine-grained sandstones of the Culpeper Basin in the Piedmont plateau. Solum ranges from 30 inches to 60 inches with depth to soft bedrock ranging from 40 inches to 60 inches and depth to hard bedrock over 60 inches in this very strongly acid to strongly acid soil. Most of this soil is cleared and used for row or hay crops. The remainder is in woodlands, which are dominated by northern red oak and Virginia pine (NRCS 2010).

Nestoria Complex
Nestoria complex soil is a shallow, well-drained, moderately-permeable soil formed in material weathered from Triassic and Jurassic red beds of siltstone and fine-grain sandstone. This soil is mostly found on sideslopes in dissected landscapes of the Culpeper Basin of the northern part of the Piedmont plateau. Bedrock is located between 20 inches and 40 inches below ground in the very strongly to medium acid soil. Most of this soil is in forest or pasture and native vegetation associated with this soil include oak and hickory forests (NRCS 2010).

Rowland Silt Loam
Rowland silt loam soil is a very-deep, moderately-well- to somewhat-poorly-drained soil formed in alluvial sediments weathered from red and brown shale, sandstone, and conglomerate (NRCS 2010). This soil is very strongly to slightly acid and is mostly cleared and in pasture or cropland. Wooded areas support a mixed hardwood forest.

Manassas Silt Loam
Manassas silt loam soil is a very-deep, moderately-well- to well-drained, moderately- to moderately-rapidly-permeable soil formed in colluvial and residual material derived from shale, siltstone, and conglomerate in the Piedmont province (NRCS 2010). This soil is found on footslopes, colluvial fans, along drainageways, and in narrow saddles of the Triassic lowlands in the Piedmont province. The solum thickness ranges from 30 inches to 60 inches and depth to hard bedrock is over 60 inches in this very strongly acid to

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strongly acid soil. The soil features a slow to medium surface runoff. Most of this soil is cleared and used for cultivated crops including corn, small grain, hay, and pasture. Wooded areas can support oak, hickory, yellow poplar, sweet gum, dogwood, and walnut.

Bowmansville Silt Loam
Bowmansville silt loam soil is a very-deep, poorly- to somewhat-poorly-drained soil that formed in recent alluvial deposits derived from upland soil material weathered from dolerite or basalt (NRCS 2010). This soil is found on floodplains of the Coastal Plain. Solum thickness ranges from 18 inches to 59 inches and the depth to bedrock is over 72 inches with depth to strongly contrasting stratified sand and gravel over 40 inches in this strongly acid to slightly acid soil. Some pedons have thin layers of sand, silt, clay, or gravel within 60 inches. This soil also features very high to high surface runoff. Approximately 60% of this soil is in pasture. Where wooded, this soil can support mixed hardwood tree species.

RESEARCH STRATEGYAND METHODOLOGY

Research Strategy
The survey was designed to identify all cultural resources present in the project area and to obtain sufficient information to make recommendations about the further research potential of each resource based on potential eligibility to the National Register of Historic Places. To accomplish this, both documentary research and archaeological field testing was performed at a level in compliance with the *Secretary of the Interior's Standards* (Department of the Interior 1983, 48 FR 44720-44723), as well as VDHR guidelines for Phase I archaeological surveys. Moreover, the field survey was conducted in compliance with statutes regarding the impact of undertakings on historic properties as summarized by the Advisory Council on Historic Preservation (36 CFR 800 [1986]). To meet Advisory Council on Historic Preservation standards, a Phase I archaeological survey must be conducted in "a reasonable and good faith effort to identify historic properties that may be affected by the undertaking" (36 CFR 800.4). The Phase I survey was performed and documented at a level that meets or exceeds these standards.

A cultural resource is gauged to be significant if at least one of four National Register of Historic Places criteria can be applied to it:

A. Associated with significant events in the broad patterns of national history;
B. Associated with the lives of persons significant in our past;
C. Representative of a type, period, or method of construction, or the work of a master; and
D. Capable of yielding important information about the past.

Typically, Criterion D applies to archaeological sites. In order to be capable of yielding important information about the past, generally a site must possess artifacts, soil strata, structural remains, or other cultural features that make it possible to test historical hypotheses, corroborate and amplify currently available information, or reconstruct the sequence of the local archaeological record.

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Methods

Archival Research

Archival research commenced with the examination of cartographic and historic works that are on file online with the Library of Congress, the Colonial Williamsburg Rockefeller Library, VDHR, the Library of Virginia, and Loudoun County. Efforts were made to determine whether historic road right-of-ways passed close to the project area and whether subsurface cultural deposits were likely to be present. Data accumulated during the course of previous archival research on historic sites throughout the region also were examined.

Architectural Field Methods

Field survey of all historic structures was conducted according to VDHR's survey procedures. A VDHR site form was completed for each structure or complex 50 years of age or older, and at least one black and white one photograph taken.

Archaeological Field Methods

Prior to subsurface testing, the entire project area was visually inspected via pedestrian survey and all aboveground evidence of cultural activity noted and recorded. Shovel tests, approximately one-foot in diameter, were excavated at 50-foot intervals. In addition, shovel test intervals were reduced to 25-foot intervals around positives and isolated positive shovel tests. Waterlogged areas, or portions of the project area with slopes in excess of 15%, were carefully examined for cultural material, but were not subjected to subsurface testing. All shovel tests were excavated according to natural levels to sterile subsoil, and all soils screened through ¼-inch wire mesh. Profiles were recorded for representative shovel tests and soil color recorded in accordance with the Munsell classification system. All positive shovel tests were recorded on standard field forms and all cultural material retained with the exception of modern late 20th century artifacts.

Laboratory Methods

Once removed from the field, all archaeological data and specimens were transported to Circa~'s laboratory for processing and analysis. Prior to washing, artifacts from a given provenience were first emptied into a screened basket and sorted. Items determined to be unstable will be either dry brushed or in some cases not washed and re-bagged with the appropriate provenience information. These items may include unstable organic objects, such as wood or other plant material, leather, bone, fabric, metal requiring immediate conservation, and overglaze painted delftware, and other soft-bodied ceramics such as some local wares. Stable objects will be washed with a soft brush and edges of ceramics and glass will be thoroughly cleaned to aid in the identification of body type and mending. Items will be then placed by provenience on a drying rack.

In a given provenience, artifacts were sorted first by material and checked for mends. Stylistic attributes were described with current terminology and recorded by count into a database for analysis. Nondiagnostic artifacts with like attributes will be grouped together - i.e., clear, amber, etc. bottle body glass fragments, unrecognizable nail

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fragments, corroded metal fragments, and aqua window glass. Diagnostic artifacts were sorted and grouped together based on type or ware and/or vessel or function.

CULTURAL BACKGROUND

The following section provides the prehistoric and historic background information necessary to assessing the archaeological potential of the proposed project area. Previous investigations in the general vicinity of the project area are outlined, while specific documents and resources employed in this survey are discussed.

Historic Context

Native American Sites Context

Virginia's Native American cultural chronology, like that of the rest of the Middle Atlantic region, is divided into three major periods, Paleoindian, Archaic, and Woodland, with the differences defined largely on changes in subsistence practices, settlement patterns, and types of material remains found. The three main periods reflect major changes, while "Early", "Middle", and "Late" subperiods reflect less dramatic, though still significant changes.

Paleoindian Period (Prior to 10,000 B.C.)

The Paleoindian occupation in Virginia began some time before 10,000 B.C. This period is alternately referred to as the time of the "Big Game Hunting" tradition, due to a presumed heavy reliance on now extinct species of Pleistocene megafauna as a food source. However, it should be stressed that no site in eastern North America has been found to contain remains of extinct Pleistocene megafauna in association with Paleoindian artifacts; therefore, a heavy emphasis on this association is questionable. It is apparent from excavations that smaller mammals, as well as fish and a variety of plant foods, were consumed during this period. Social organization probably consisted of loosely structured, highly mobile bands that hunted a wide but defined territory. Small temporary campsites located along and between river drainages represent the majority of known Paleoindian sites in Virginia. Base campsites are relatively rare in Virginia and are usually associated with lithic procurement activities. Two of the most important Paleoindian sites are the Thunderbird Site in the Shenandoah Valley and the Williamson Site in south-central Virginia. Excavations at these sites revealed specialized areas for the reduction of cobbles and the production of projectile points and other tools. Diagnostic artifacts indicative of the Paleoindian period include finely crafted, fluted projectile points. Knapped from jasper or chert, these projectile points exhibit a remarkable uniformity of style and have been found throughout most of North America.

There are no previously recorded Paleoindian sites within the project tract and none have been identified within one mile of the project area. It is unlikely that sites associated with Paleoindian occupation exist within the project area.

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Archaic Period (8,000 B.C. to 1,000 B.C.)
The beginning of the Archaic period generally coincides with the end of the Pleistocene epoch, marked in the region by a climatic shift from a moist, cool period to a warmer dryer climate. Vegetation also changed at this time from a largely boreal forest setting to a mixed conifer deciduous forest.

Archaic populations, like their Paleoindian predecessors, are thought to have organized into bands. A simplified model of hunter-gatherer settlement assumes that societies were primarily characterized by a band-level social organization (Jochim 1976). At this level of society, the process of acquiring food throughout the year required a settlement system involving at least seasonal movements, corresponding to the seasonal availability of the plants and animals. Settlement during the Archaic period probably involved the occupation of relatively large regions by single band-sized groups, living in base camps. During the course of a year, a group may have dispersed and merged as necessary for resource procurement, creating smaller microband units, possibly consisting of no more than a single family.

Archaic subsistence in the region relied primarily on hunting and gathering. However, unlike their forebears, they probably relied more heavily on hunting smaller animals, gathering plant foods, and harvesting aquatic resources. This shift in subsistence may be overemphasized since the extinction of larger animal species generally occurred prior to this time. Scholars suggest that the use of floral and faunal resources reached optimal diversity during the Early Archaic subperiod.

The development of more specialized resource procurement activities as well as the technology to accomplish these activities can characterize the Archaic period. Researchers now believe that these differences in the material culture reflect larger, more localized populations and changes in methods of food procurement and processing. Corner notching became a common characteristic of projectile points at the beginning of the Archaic period, suggesting changes in hafting technology and possibly the invention of the atlatl. The Archaic period also marks the beginning of ground stone technology, with the occurrence of ground atlatl weights. New tool categories developed during the Late Archaic subperiod include chipped- and ground-stone celts, ground-stone net sinkers, pestles, pecked stones, mullers, and bowls carved from steatite. Basketry and wooden containers may have been common toward the end of the Late Archaic subperiod.

Marked increases in population density and decreased mobility characterize the Late Archaic subperiod in eastern North America (4,000 B.C.–1,000 B.C.). Because population growth necessitated a larger and more predictable food supply, agriculture probably originated in the Middle Atlantic region during this period. Yarnell (1976), for example, writes that sunflower, sumpweed, and possibly goosefoot may have been cultivated as early as 2,000 B.C.

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Previously identified Archaic sites and Archaic site components are common within a one-mile radius of the project tract. Given this, it is highly possible that Archaic period sites, probably small campsites, may be discovered within the tract.

Woodland Period (1,000 B.C. to A.D. 1600)

The growing dependence on horticulture and sedentary villages gradually replaced the band level of social organization during the Woodland period. The appearance of ceramics in the archaeological record generally defined the beginning of the Woodland period (1,000 B.C.-500 B.C.). Although there are still many undefined localized ceramic traditions, archaeologists can distinguish different cultural traits such as manufacturing techniques, tempering agents, clays, and stylistic attributes. Early Woodland ceramic wares, in general, were crudely fashioned. Rectangular or oval, they resembled the earlier carved steatite vessels. Also characteristic of the Early Woodland subperiod is the increased complexity of and emphasis on the ceremonial aspects of life, especially those concerned with the burial of the dead.

An important technological innovation during the Early Woodland subperiod was the bow and arrow, an invention leading to smaller and more varied projectile point styles. The fish weir was probably also first used during this subperiod.

By the Late Woodland subperiod (A.D. 900-1600), agriculture had assumed a role of major importance in the Native American subsistence system. Diagnostic artifacts of this subperiod include several triangular-shaped projectile point styles. During this subperiod, aboriginal groups in Virginia appear to have developed greater intercultural contact with inhabitants of other regions, including the Mississippian cultures to the south and west. The Iroquois Confederacy became a more important political force to the north, and their influence began to spread throughout much of the Middle Atlantic region. By the end of the Late Woodland subperiod, European trade goods such as pipes and beads also began to appear.

The development of agriculture, from its origin in the Archaic period to its dominance as a means of food procurement in the Late Woodland subperiod, represents a major change in the Native American subsistence economy, criteria for site location, placement of structures, and settlement patterns. These early farmers preferred a riverine environment with fertile floodplain soils. Most likely, as dependence on agriculture increased, the Late Woodland Indians would have stayed near their cultivated fields to safeguard their crops and, therefore, would have experienced a more sedentary existence than their predecessors.

Villages dating to this period usually ranged from 10 to over 50 structures. Outer villages were placed within a circular palisade near their crops, an arrangement suggesting a rise in intergroup conflict. Drawings and journals of early European explorers describing Indian villages indicate that houses were constructed of a circular framework of flexible wood poles set in the ground, lashed together and covered with thatch or bark mats. Burial sites of the period were often situated in village trash pits or ossuaries. Such historical accounts are consistent with data obtained from archaeological excavations of

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Late Woodland village sites. Excavations revealed other structures such as drying and storage racks, storage pits, community buildings for group functions, and centrally located hearths for cooking and heating.

With the development of a more sedentary settlement-subsistence system culminating in the Woodland period, permanent habitation sites gradually replaced base camp habitation sites more characteristic of the previous hunter-gatherer adaptation. It can be inferred that a series of specialized activity sites were established in the day-to-day procurement of food and other resources (i.e., short-term camps, quarries, butchering locations, re-tooling locations) associated with the band and the microband base camps as well as later permanent settlements. Locations used partially or largely for ceremonial purposes were also present in the Woodland period, usually in association with habitation sites.

According to Gardner (1982), large base camps, hamlets, and villages were located on low terraces adjacent to rivers. Small seasonal campsites located along streams represent short-term hunting, fishing, and gathering forays into the interior. Limited artifact concentrations, as well as sparse lithic and ceramic scatters characterize these campsites. During previous investigations in the region, the most common site types have been specialized activity sites for short-term resource procurement or associated activities. Their representation in the archaeological record is often spatially small with relatively sparse artifacts. It is also very common for sites in this region to be partially obscured by sediments or heavy vegetation. For these reasons, a relatively intense inspection system is necessary to locate and evaluate the cultural resources in any given area.

Previously recorded Woodland sites and Woodland site components are common within a one mile radius of the project tract. Given this, it is highly possible that Woodland period sites, probably small campsites, may be discovered within the tract.

Historic Context

Settlement to Society (1607-1750)

Virginia's Northern Neck is situated between the Potomac and Rappahannock rivers and fronts on the Chesapeake Bay. Captain Vincente Gonzalez and Juan Menendez-Marques, Spanish explorers who set out in search of Sir Walter Raleigh's colonists, most likely visited the edge of the region in 1588. In 1606, Captain John Smith ventured into the Potomac River and discovered that Indian villages lined its banks. Later, he depicted them on his well-known map of Virginia (Lewis and Loomie 1953, Smith 1606 [Figure 4]). The Virginia colonists, who in 1610 desperately needed corn, began trading with the Natives of the Northern Neck, a practice that continued for many years (Smith 1910).

English settlement in the southerly portion of the Potomac River valley was initiated during the early 1640s, but it was not until nearly a century later that colonists in substantial numbers began moving into the Northern Neck's upper reaches and interior (Wheeler 1972, Nugent 1969-1979). The land within the Northern Neck of Virginia was part of a proprietary territory that the exiled King Charles II allocated to seven of his

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loyal supporters in 1649. He continued to uphold this grant when the monarchy was restored.

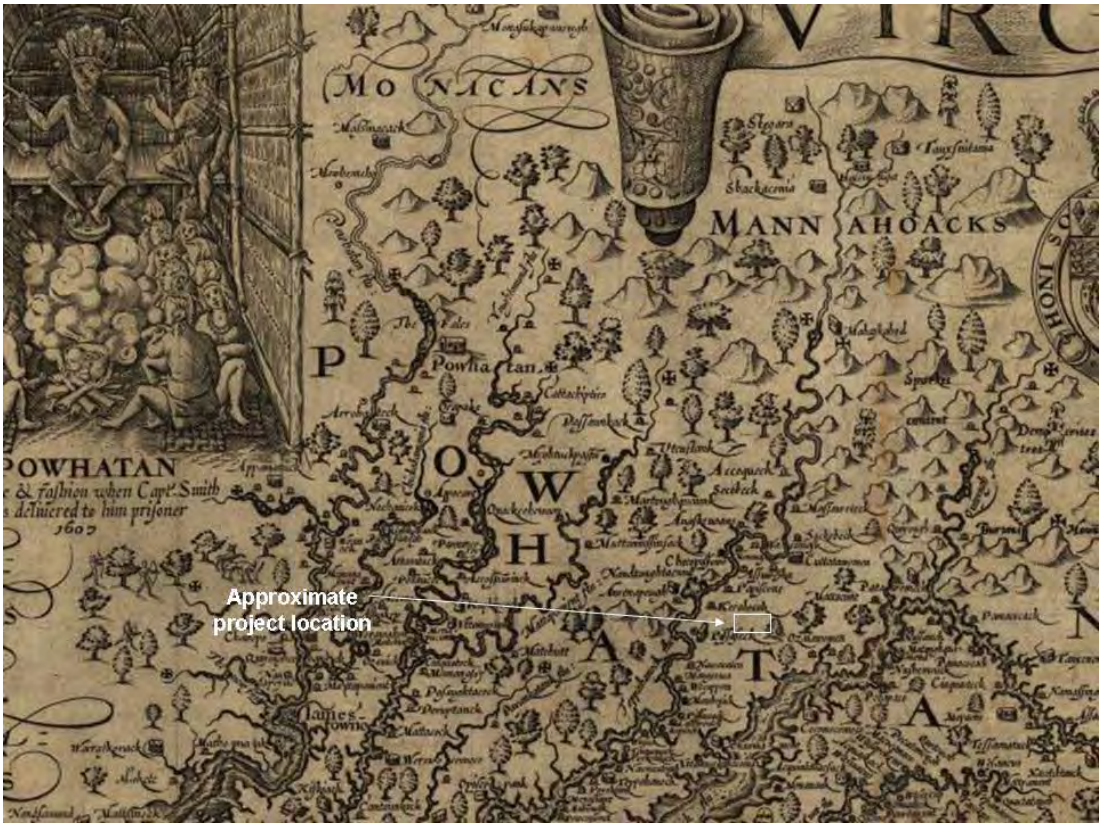

Figure 4. Detail of *Virginia discovered and discribed* by Captayn John Smith, 1606.

In 1651, Robert Turney acquired 2,109 acres at the mouth of the Occoquan River in what would become Fairfax County (Loudoun County's predecessor). By 1655, settlers had claimed all land on the northwestern shore of the Occoquan, inland to its falls. In 1669, Charles II reaffirmed the Northern Neck grant by means of a 21-year lease but he excluded three of its seven original proprietors. Later, when one of the excluded men's heirs protested, six of the seven men's shares were reinstated. John Lord Culpeper, whose interest in the Northern Neck had been restored, eventually purchased the shares of four fellow lessees. In 1688, his heir, Thomas Lord Culpeper, received the final grant to the Northern Neck. Later, the Northern Neck Proprietary passed to Thomas Lord Fairfax through his marriage to Culpeper's daughter and heir (Gentry 1981).

Tracts of land within the Northern Neck proprietary were allocated to prospective grantees by means of purchase warrants that specified the size and location of the acreage for which application was being made. After a survey was performed, a legal land grant was prepared and issued. The office of the Northern Neck Proprietary continued to dispense land until after the American Revolution and the death of Lord Fairfax. The Fairfax family's interest in these Virginia lands, which was the subject of heated controversy after the Revolutionary War, was terminated in 1808, when the last surviving Fairfax heir sold off his residual interest in the region. Despite the fact that the Northern

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Neck was a proprietary territory, those who resided within its boundaries fell beneath the purview of Virginia law (Gentry 1981).

Most of the men who claimed literally thousands of acres on the Virginia frontier were members of the planter elite who were heavily involved in the Colony's commerce and trade and in its political affairs. Their plantations were massive and, according to contemporary accounts, resembled small villages. However, interspersed with these great plantations were those of lesser size belonging to persons of more modest means (Billings et al. 1986). The development and maturation of the Colony and its governmental systems coincided with an increase in the stratification of Virginia society as a whole, with the result that those in its upper ranks, both socially and economically, were in possession of many important advantages. The Governor and Council appointed County officials as well as lesser functionaries, all of whom received income from performing their governmental duties.

During this time, members of the House of Burgesses, though elected, were drawn from the upper ranks of society, further enhancing their own influence. Family, political, and social connections among the Colony's leaders guaranteed their participation in the governmental establishment. Politics also permeated the affairs of the church, to which official interest was linked, so that the same men who functioned as burgesses or county officials (such as justices, naval officers, or sheriffs) usually served as parish vestrymen. As members of an elite class these Virginians mingled together socially as well as commercially. Meanwhile, those at the lower end of the socioeconomic scale, such as enslaved blacks and landless freedmen, had little opportunity for personal advancement (Billings et al. 1986).

During the late 17th and early 18th centuries, slave labor cleared sizeable tracts of Northern Neck land to accommodate the mass production of tobacco. Early on, Virginia planters learned that the soil type they favored for the production of sweet scented tobacco (the most marketable and therefore the most valuable species of the weed) occurred along the banks of the Rappahannock and Potomac rivers and their tributaries. Therefore, it was during the mid to late 17th century that the plantation economy, which characterized the Northern Neck for the next century and a half, became well established (Billings et al. 1986). By 1670, planters were dispersed along the shoreline of the Potomac and Rappahannock rivers and the lesser streams that extended into the region's interior. This rapid increase in the population of the Northern Neck led to subdivision of land, which led to the formation of several new counties and parishes.

As settlement spread inland, tensions increased between the colonists and the Indians, resulting in sporadic outbreaks of violence. In 1676, Governor William Berkeley responded to the plight of frontier families by building forts at nine sites on the heads of the Colony's principal rivers. On the Potomac, the government constructed a fort on Mussell Creek in Stafford County. In 1679, military garrisons replaced these forts, although the garrisons were erected at only four sites. In contrast to the forts of 1676, which the colonists likened to mousetraps, these garrisons were to serve as a base from which armed horsemen could roam through the countryside, maintaining a watch over the

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frontiers. The garrison on the Potomac was to be built near Occoquan. In 1683, the garrisons were discontinued as the population of Virginia's Indians had declined significantly (McCartney 1985, Henning 1809-1823, Nugent 1969-1979).

Robert "King" Carter of Corotoman, an extremely wealthy and powerful man during this period, was highly critical of the way the Northern Neck Proprietary was managed. Becoming irritated with the Proprietors' agents' refusal to grant him a parcel of escheat land in Lancaster County, Carter used his position as chair of the Virginia Assembly's Committee of Propositions and Grievances to encourage the Northern Neck's inhabitants to protest against the Proprietary land allocation policy. In 1695, he filed a report in which he alleged that the Proprietors' agents failed to monitor whether the land grants they allocated to patentees were "seated" or settled upon. He alleged that "a man may hold 50,000 or more acres of land by a secure title, and that without so much as actually seating or building upon it" (Harrison 1964).

In 1702, when Robert Carter himself became an agent of the Proprietary, almost without exception, he turned his personal land acquisitions into working plantations; however, by 1723, when he began his second term as agent, he had modified his views on the necessity of seating land promptly. In spring 1724, Carter surveyed and set aside for his heirs' grants that totaled 89,937 acres. These vast properties included the Bull Run tract (41,660 acres that extended across the upper waters of Bull Run) and the Lower Bull Run tract (8,989 acres that straddled the lower waters of Bull Run). As soon as settlement extended beyond Difficult Run, Robert Carter began laying claim to additional land (Harrison 1964). The records in Robert Carter's land book, a bound volume in which he and his heirs sporadically noted who leased their land, the quantity of acreage let to a specific renter, the amount of the lessee's annual rent, and whether or not his acreage had been surveyed, reflects the spread of settlement in the region (Carter 1760-1815).

In 1742, Fairfax County was created out of part of Prince William County (Billings et al. 1986, Virginia State Library 1965). Demographic data from church records, which contain the tithables in Fairfax County's two parishes, shed considerable light on the settlement and development of the territory that became Loudoun County. In 1749, the eastern part of Fairfax County was included in Truro Parish, whereas the western part (which in 1757 became Loudoun County) comprised Cameron Parish. Archival records show that Truro Parish in 1749 had 1,240 tithables with 2,728 whites and 1,116 blacks, or a total population of 3,844. Cameron Parish, in contrast, had only 707 tithes; its population, which totaled 2,191, consisted of 1,555 whites and 636 blacks. Thus, the western part of Fairfax County, which eventually became Loudoun County, was sparsely populated compared to the eastern part. Netherton et al. determined that in 1749 only 36% of the people in Fairfax County lived north or west of Difficult Run, the line between Truro and Cameron Parishes. They concluded that these data were predictable, given the early settlers' tendency to establish homesteads on the banks of rivers and navigable streams, moving inland at a much slower rate (Netherton et al. 1978).

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Colony to Nation (1750-1789)

The early 1750s produced rapid growth in Fairfax County's population, for between 1750 and 1756, population increased almost 40%. Although new thoroughfares were built in the eastern part of the County, where Alexandria became increasingly more important as a center of commerce and trade, new roadways also were laid out in what eventually became Loudoun County (Netherton et al. 1991).

In 1756, the year before Loudoun County was created, the total population of Fairfax County was 7,628 persons, with 3,345 (or 44%) living north and west of Difficult Run. The majority of the area's citizens lived close to the Potomac (Netherton et al. 1991). As the population grew, settlement expanded westward and new roads were built. When Joshua Fry and Peter Jefferson prepared their map of Virginia in 1751, they indicated that a thoroughfare extended on an east-west axis through what was then western Fairfax County (the right-of-way of Route 7), below which was another roughly parallel road (the right-of-way of Route 50 [Figure 5]). Both modern highways appear to follow much the same right-of-ways used by their forerunners during the 18th century. Neither Fry and Jefferson (1751) nor John Henry, who mapped Virginia in 1770, indicated development in or close to the project area. During the fourth quarter of the 18th century, the Potomac Path still comprised the main route that extended up the lower side of the Potomac River toward Alexandria. The old Carolina Road entered the County at the northern end of the Bull Run ridge.

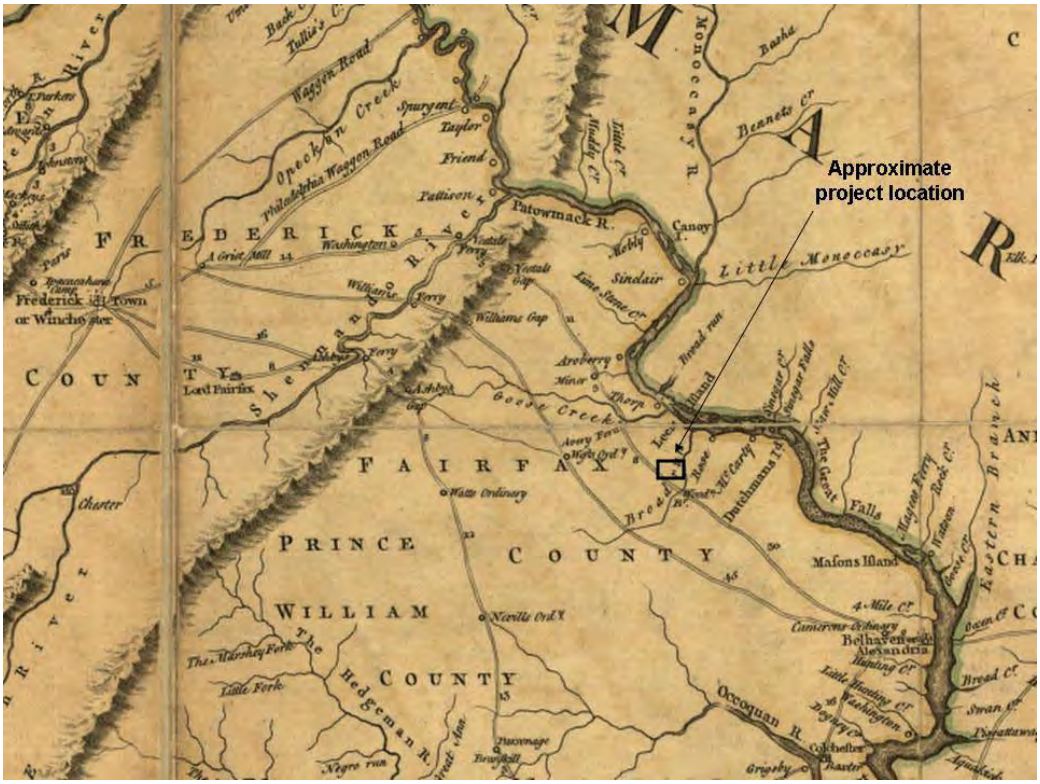

Figure 5. Detail of *A map of the most inhabited part of Virginia containing the whole province of Maryland with part of Pensilvania, New Jersey and North Carolina*. Drawn by Joshua Fry & Peter Jefferson in 1751.

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Loudoun County was formed in 1757 from the western portion of Fairfax County and Leesburg became Loudoun's county seat. The new County's local ecclesiastical unit was Cameron Parish, which covered all of Loudoun's bounds (Netherton et al. 1978, Virginia State Library 1965).

Early National Period (1789-1830)

By the close of the 18th century, Loudoun County and its predecessor, Fairfax, changed significantly. Colchester and Alexandria became well established towns and the region's population tripled. Agricultural and commercial development flourished. By the end of the century, however, long-term cultivation of tobacco depleted the County's soils and the region began a period of decline (Netherton et al. 1978).

Historical maps made during the early 19th century demonstrate that by that time inland transportation had improved considerably. In 1807, when Bishop James Madison prepared a map of Virginia, he indicated that the County's main east-west transportation corridors were configured much as they had been during the second and third quarters of the 18th century, but he also showed that several major public roads emanated from Leesburg, the Loudoun County seat (Madison 1807). Shown prominently in the eastern part of Loudoun County was the community known as Gum Spring and the Little River Turnpike (Route 50's forerunner) and Centreville Road (now Route 620). Madison's successor, Herman Boye (1825), indicated that as time went on, Loudoun County's road system became considerably more complex. He indicated that new roads had been built although no development is noted within the project area (Figure 6). By 1827, two stagecoaches a week were running between Alexandria and the Orange County courthouse (Netherton et al. 1991).

Figure 6. Detail of *A map of the state of Virginia, constructed in conformity to law from the late surveys authorized by the legislature and other original and authentic documents* by Herman Böÿe, 1825.

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Antebellum Period (1830-1860)

Throughout the first half of the 19th century, agriculture comprised the economic mainstay of Loudoun County. Its inland inhabitants needed roads and transportation corridors so they could transport their crops to urban markets and buy manufactured goods they needed (Works Progress Administration [WPA] 1941). In 1832, the Goose Creek and Little River Navigation Company was organized to construct a lock-and-dam towpath navigation for canal boats from the Potomac River up Goose Creek and Little River. Work began on the canal in 1849 but stopped in 1854 because of railroad competition. Four years earlier, in 1850, the General Assembly chartered the Manassas Gap Railroad Company and authorized it to build a rail line that connected with the Orange and Alexandria Railroad. The coming of the railroad provided another important mode of transportation to those who lived in Loudoun County's interior. By 1851, construction was underway and within a year Manassas Gap trains were running regularly (Harrison 1964).

Civil War (1861-1865)

Early in the Civil War, Union troops congregated near Centreville and Manassas, but did not move into all of Loudoun County (Robertson 1991). Even so, Loudoun as a whole was of recognized strategic importance and military cartographers prepared several maps that showed the layout of its roads and railroads, which would have been used during combat or in moving troops and supplies (Figures 7 and 8). Many of these maps indicate development around the project area, with possible development associated with the Taylor family within the project area.

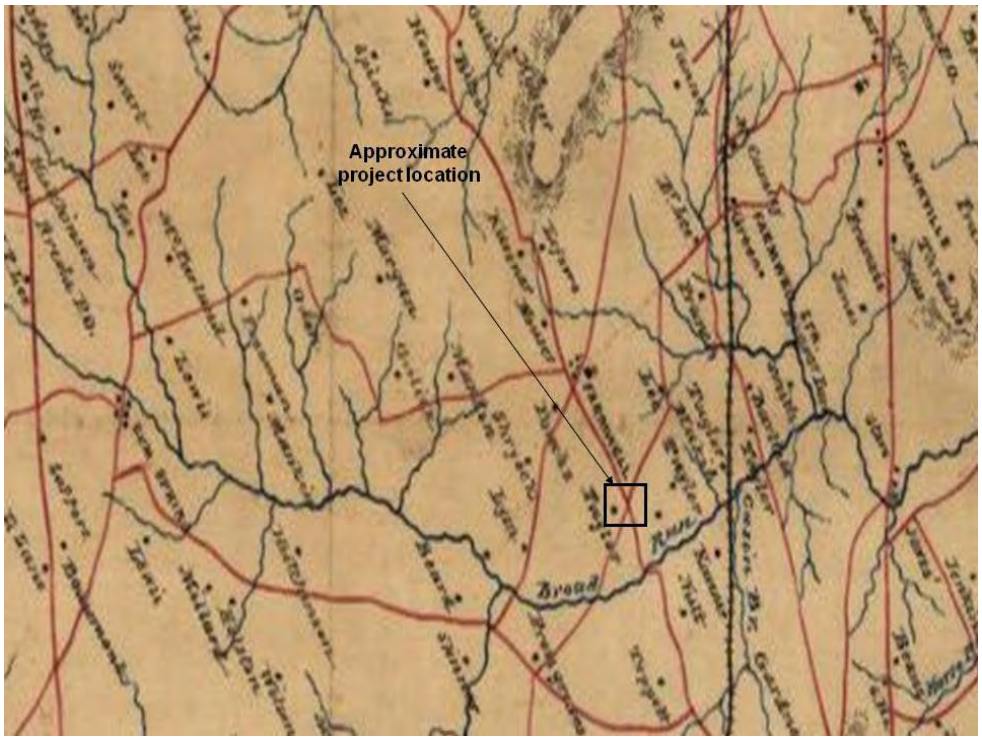

Figure 7. Detail of *Map of Fauquier & Loudon [sic] co's. Va.* by order of Lt. Col. Wm. P. Smith Chf. Eng'r. Topogl. Office A.N.V.; copied by A. S. Barrows Ass't Eng'r. 1863.

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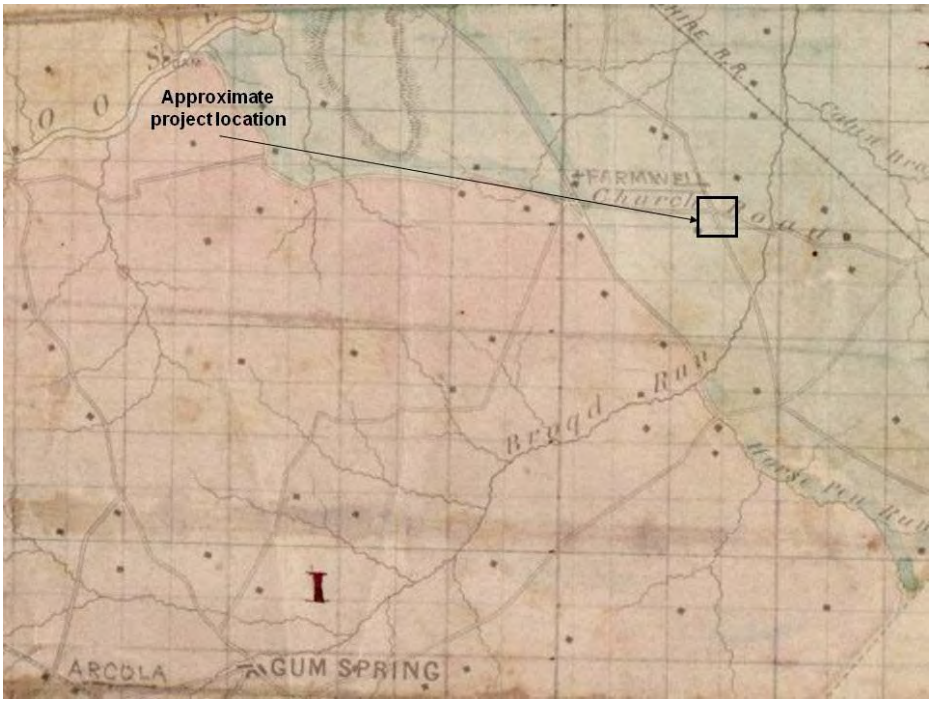

Figure 8. Detail of *Loudoun County, Virginia* [186-?].

Reconstruction and Growth (1865-1917)

The end of the Civil War and the onset of the Reconstruction brought many changes to Loudoun County and Virginia as a whole, which comprised a military district. The demise of slavery as a legalized institution forced Virginia farmers to draw upon hired labor and sharecroppers, some of whom were ex slaves that chose to remain near their former homes. Many of region's buildings had been seriously damaged or destroyed during the war, leaving whole families displaced or destitute. Land formerly farmed and now abandoned quickly grew up in thickets of weeds and briars that had to be cleared before being cultivated. In addition, thousands of Virginia men lost their lives in battle or received permanently disabling wounds, such as the loss of a limb. As most of these former Confederate soldiers were rural men of working age, their elimination from the agricultural work force crippled the farm economy. Many rural families began raising less labor-intensive crops, such as vegetables and fruits that could be sold in urban markets, or they became more heavily involved in animal husbandry (McCartney 1988).

The Constitutional Convention of 1867-1868, which produced the so-called Underwood Constitution, established a complete reorganization of government. At that time, the newly formed county boards of supervisors became the administrative unit of local government. The creation of a system of public education, which mandated support and attendance, also stemmed from the Constitutional Convention.

In 1872, the Alexandria and Washington Railroad was extended southward from Washington while the Richmond, Frederick, and Potomac Railroad was built northward; the two rail lines converged at Quantico Creek and formed a network that connected Richmond with Washington. This was vitally important to the region's economy (WPA 1941).

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World War I to World War II (1917-1945)

The advent of the 20th century brought a number of significant changes to those who lived in rural Loudoun County. Gasoline-powered tractors that were both faster and more efficient replaced steam- and horse-powered farming equipment. Likewise, trucks and automobiles replaced horse-drawn vehicles, which in turn necessitated road improvements. As animal-propelled vehicles became less common, tracts of land formerly used to raise livestock feed were re-planted in crops intended for human consumption. Rural electrification and telephone service, the paving of roads, and the establishment of rural mail service further broadened the horizons of those who lived in rural Loudoun County. In the 1920s, the United States Post Office Department mapped several counties including Loudoun County. By then, the communities known as Gum Spring, Arcola, and Pleasant Valley were well defined and the roads that passed through them continued to be important thoroughfares (United States Post Office Department 1925 [Figure 9]). This map also shows development within the project area.

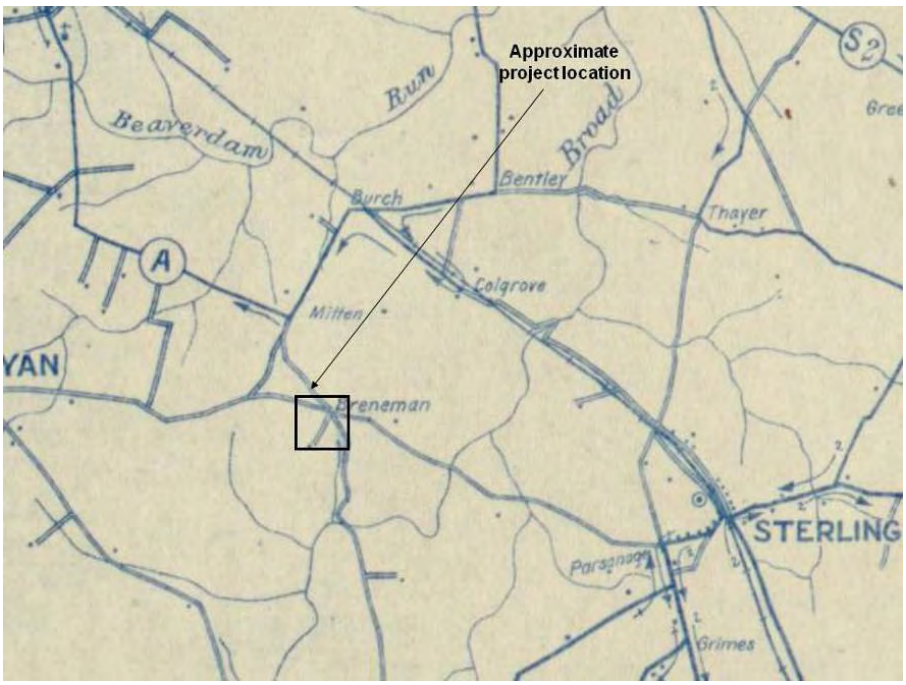

Figure 9. Detail of *Rural delivery routes, Loudoun County, Virginia* Post Office Department, Division of Topography 1925.

The New Dominion (1945 to present)

Growth in the metropolitan Washington area slowly but surely brought an influx of development to Loudoun County, as adjacent Fairfax County became a bedroom community to many of those who worked in the federal government or supportive industries. It was during the postwar period that the region's agricultural traditions began to yield to urbanization and land values escalated. In 1962, the Dulles International Airport was constructed on 12,500 acres, two thirds of which were in Loudoun County. Over 750 tracts of land reportedly were involved in the total acquisition of the property on which it was constructed. President John F. Kennedy dedicated the airport in 1962, which was named after former Secretary of State John Foster Dulles (Netherton et al.

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1991). Today, the countryside of Loudoun County contains small and large subdivisions, community service centers, commercial development, and other facilities that are important to those who reside in the area.

Property History

The DuPont Fabros property can be traced through Loudoun County deeds from the present to 1898 (Tables 1 - 4). Prior to 1898, Levi Hanford owned a portion of the property. Four companies currently own the seven parcels that make up the DuPont Fabros parcel. They include Catapult Ventures, LLC, Zebra Ventures, LLC, Van Gogh Ventures, LLC, and Vizsla Ventures, LLC. It appears from deed records that the parcels were sold to various tenants on the property throughout the 20th century.

Catapult Ventures, LLC.

Catapult Ventures, LLC owns one parcel within the DuPont Fabros property (Table 1). In 1989, Centennial Ashburn Business Park Associates, LP owned the property and entered into a trust with Keystone Financial and Service Corporation, a trustee of the Providence Savings and Loan Association and the Board of Supervisors for Loudoun County. Prior to 1989, it is unclear who owned this parcel. In 1993, Centennial sold the property to B.O.B. Title XXVI, Inc. At the time, the property contained 17 lots and a stormwater management area. The parcel that fell within the DuPont Fabros property was noted as Lot 11. In 1996, B.O.B. Title XXVI, Inc. sold all 17 lots to the Highland Developers, LLC, who retained the lots for two years before selling to the Ashburn Corporation Center, L.C. They retained the lots until 1999 when they sold to the current owners Catapult Ventures, LLC.

Zebra Ventures, LLC.

Zebra Ventures, LLC owns four parcels within the DuPont Fabros property (Table 2). Prior to 1898, Levi Hanford owned these parcels. In March 1898, Hanford sold the property to Charles B. Hanford. In 1901, Charles Hanford, acting as a trustee sold the property to Levi Hanford, Nancy E. Summers, Annie E. Summers, Sarah J. Summers, and Martha R. Summers. By the 1930s the property became part of a chancery suit, Laura S. Painter vs. Linden Dulany Summers, et. al. The outcome of the case required Luca D. Phillips, appointed Special Commissioner for the suit, to sell the property, which he did to Charles W. and Alma B. Fague. The Fagues retained the property until 1941 when they sold to Mary E. Ackman. She retained the property for five years. In 1946 she sold the property, noted as having improvements, to George H. Page.

The Page family retained the property until the 1970s. In 1970, the property once again became part of a chancery suit, George H. Page vs. the Chesapeake and Ohio Railway Company et. al. The Court appointed Samuel D. Engle Special Commissioner for the case and the property was awarded to George Page. Two years later, the Pages divided the property in half and sold half to Aster and Sandra M. McDaniel and half to George and Mary Stitt. Both families had been tenants living on the property since at least the late 1960s. The property remained two parcels when the the Stitts sold to Montie W. and Pearl Gibson, Jr. in 1973 and the McDaniels sold to Mark A. Simmons in 1975. The property became a single parcel again in 2004 when the Gibsons and Mark Simmons sold

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to Kevin O'Connor and Timothy Dennis. That same year, O'Connor and Dennis sold the property to another tenants living on the property Gilani and Rizwana Aftab. They retained the property until 2007 when they sold to Zebra Ventures, LLC.

Van Gogh Ventures, LLC.
Van Gogh Ventures, LLC owns one parcel within the DuPont Fabros property (Table 3). Prior to 1992, the same corporation that owned the Catapult Ventures, LLC-owned parcel, owned this parcel. In 1992, Bles South Associates (part of the part of Ashburn Corporation Center, L. C) and Minalter, Inc. sold the property to the United States of America acting by and through the Administrator of the General Services. They sold the property to Ashburn Crossing, LLC in March 2009 and by the end of the year the property was in foreclosure, and Van Gogh Ventures, LLC bought the parcel.

Vizsla Ventures, LLC.
Vizsla Ventures, LLC owns one parcel within the DuPont Fabros property (Table 4). Prior to 1965, Joseph K. and Agnes Copeland owned this parcel. In October 1965, they sold the parcel to Sidney Greenfeld and Aaron M. Levine, tenants living on the parcel at the time. The men retained the property until 1986 when they sold to Dulles-Berry Limited Partnership. They retained the property until 2006 when they sold to the current owners.

Table 1. Deed Research for DuPont Fabros Property GPIN #061-46-7942

Grantor	Grantee	Instrument #	Book/Page	Date
Catapult Ventures, LLC	Catapult Ventures, LLC	200808260052102		8/4/2008
Ashburn Corporation Center, L.C.	Catapult Ventures, LLC		1715/2012	9/23/1999
Highland Developers, LLC	Ashburn Corporate Center, L.C.		1557/1510	3/5/1998
B.O.B. Title XXVI. Inc.	Highland Developers, LLC		1413/611	1/30/1996
Centennial Ashburn Business Park Associates, L.P.	B.O.B. Title XXVI, Inc.		1252/297	9/14/1993

Table 2. Deed Research for DuPont Fabros Property GPIN #061-36-2081, #061-28-5606, #089-30-9997, and #089-49-6285

Grantor	Grantee	Instrument #	Book/Page	Date
A. Gilani and Rizwana Aftab	Zebra Ventures, LLC	200706290049230		6/29/2007
Timothy Dennis and Kevin O'Connor	A. Gilani and Rizwana Aftab	200412200135801		12/16/2004
Montie W. and Pearl E. Gibson, Jr. and Mark A. Simmons	Kevin O'Connor and Timothy Dennis	200405260052936		5/24/2004
Aster and Sandra M. McDaniel	Mark A. Simmons		623/270	8/6/1975
George F. and Mary Walker Stitt	Montie W. and Pearl Gibson, Jr.		588/30	11/27/1973
George H. and Kate L. Page	Aster and Sandra M. McDaniel (1/2) and George F. and Mary Walker Stitt (1/2)		565/168	12/27/1972

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Grantor	Grantee	Instrument #	Book/Page	Date
Samuel D. Engle, Jr., Special Commissioner	George Page		520/124	10/5/1970
Mary E. Ackman	George H. Page		12E/274	3/20/1946
Charles W. and Alma F. Fague	Mary E. Ackman		11M/338	9/10/1941
Lucas D. Phillips, Special Commissioner *	Charles W. and Alma F. Fague		10W/301	2/4/1937
Charles B. Hanford and J. Whitney Bennett, trustees	Levi Hanford, Nancy E. Summers, Annie E. Summers, Sarah J. Summers, and Martha R. Summers		7U/51	1/7/1901
Levi Hanford	Charles B. Hanford		7P/212	3/29/1898

* Note : This is the result of Chancery Suit Laura S. Painter vs. Linden Dulany Summers, et. al.

Table 3. Deed Research for DuPont Fabros Property GPIN #089-48-1925

Grantor	Grantee	Instrument #	Book/Page	Date
Foreclosed	Van Gogh Ventures, LLC			2009
United States of America acting by and through the Administrator of the General Services	Ashburn Crossing, LLC	200904280025726		3/19/2009
Bles South Associates and Minalter, Inc. (part of Ashburn Corporation Center, L. C.) *	United States of America		1157/194	3/4/1992

Table 4. Deed Research for DuPont Fabros Property GPIN #062-36-1210

Grantor	Grantee	Instrument #	Book/Page	Date
Dulles-Berry Limited Partnership	Vizsla Ventures, LLC	200609070077211		9/7/2006
Harold R. Evans, trustee	Dulles-Berry Limited Partnership		938/685	4/10/1987
Sidney Greenfeld and Aaron M. Levine	Harold R. Evans, trustee		931/1684	10/27/1986
Joseph K. and Agnes Copeland	Sidney Greenfeld and Aaron M. Levine		453/389	10/11/1965

PREVIOUSLY RECORDED CULTURAL RESOURCES

Circa~ performed an archival search for the DuPont-Fabros tract using the Virginia Department of Historic Resources (VDHR) online Data Sharing System (DSS) on February 25, 2010 and updated the search on October 16, 2010. This research was completed to determine if historic resources exist within the project area boundaries. The search identified 70 archaeological and 18 architectural resources within a one-mile radius of the project area boundaries. Table 5 lists all of the resources within one mile of the project area boundaries. Figure 10 shows the approximate project area boundaries (yellow outlined area) and resources within close proximity. Of the resources identified, two archaeological and one architectural resource were identified within the project area. These resources are shaded on Table 5 and a brief description of each resource follows Table 5.

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Table 5. Resources Within a One-Mile Radius of Project Area Boundaries.

VDHR Survey Number	Date of resource	Description of resource	Survey Information	Recommendation
Archaeological Resources				
44LD0027	Middle Archaic Woodland	Interior floodplain site, 656 feet by 656 feet	Phase I survey 11/19/77 and 4/19/79	None made
44LD0110	No date	Indeterminate site, 984 feet by 328 feet	Phase I survey 6/26/79	None made
44LD0111	Early Archaic	Indeterminate site, 984 feet by 328 feet	Phase I survey 5/23/79	None made
44LD0137	Archaic	Temporary camp and lithic scatter, 656 feet by 492 feet	Phase I survey 11/26/79	None made
44LD0138	Native American Historic	Temporary camp and lithic scatter, 492 feet y 328 feet	Phase I survey 11/26/79	None made
44LD0139	Native American	Temporary camp and lithic scatter, 164 feet by 164 feet	Phase I survey 11/26/79	None made
44LD0140	Native American 19th century 20th century	Temporary camp, lithic scatter, single dwelling, and barn, 656 feet by 656 feet	Phase I survey 11/30/79	None made
44LD0141	Woodland	Temporary camp and surface scatter, 328 feet by 164 feet	Phase I survey 11/19/80	None made
44LD0142	Native American	Temporary camp and surface scatter, 492 feet by 328 feet	Phase I survey 4/5/81	None made
44LD0143	Late Woodland	Temporary camp and surface scatter, 328 feet by 656 feet	Phase I survey 11/19/79	None made
44LD0144	No date	Temporary camp and surface scatter, 656 feet by 328 feet	Phase I survey 11/19/79	None made
44LD0147	Native American	Temporary camp and surface scatter, 328 feet by 328 feet	Phase I survey 11/17/79	None made
44LD0149	Native American	Temporary camp and surface scatter, 328 feet by 328 feet	Phase I survey 11/21/79	None made
44LD0150	Native American	Temporary camp and surface scatter, 328 feet by 492 feet	Phase I survey 11/21/79	None made
44LD0154	No date	Temporary camp and surface scatter, 164 feet by 492 feet	Phase I survey 9/28/80	None made
44LD0377	Native American	Indeterminate site, 164 feet by 164 feet	Phase I survey 10/19/87	None made
44LD0378	Native American 19th century	Farmstead and indeterminate Native American site, 574 feet by 246 feet	Phase I survey 10/19/87	None made
44LD0380	Native American 20th century	Indeterminate site, 154 feet by 82 feet	Phase I survey 11/4/87	None made
44LD0381	Middle Archaic	Indeterminate site, 410 feet by 246 feet	Phase I survey 10/24/87	None made
44LD0382	Native American	Indeterminate site, 410 feet by 246 feet	Phase I survey 10/25/87	None made
44LD0383	Native American	Indeterminate site, 164 feet by 164 feet	Phase I survey 10/25/87	None made
44LD0391	Middle Archaic Late Archaic	Indeterminate site, 82 feet by 82 feet	Phase I survey 10/7/87	None made
44LD0407	No date	Single dwelling, 225 feet by 225 feet	Phase I survey 5/88	None made
44LD0408	Native American	Indeterminate site , 164 feet by 361 feet	Phase I survey 5/88	None made

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VDHR Survey Number	Date of resource	Description of resource	Survey Information	Recommendation
44LD0409	Native American	Small transient camp, possible single component site, 82 feet by 33 feet	Phase I survey 5/88	No further work
44LD0441	Native American	Temporary camp, 49 feet by 66 feet	Phase I survey 7/19/89	None made
44LD0442	Historic	Domestic site, 820 feet by 131 feet	Phase I survey 7/19/82	None made
44LD0443	Native American	Temporary camp, 39 feet by 10 feet	Phase I survey 7/22/89	None made
44LD0444	19th century 20th century	Indeterminate site, 10 feet by 26 feet	Phase I survey 7/22/89	None made
44LD0445	Native American	Temporary camp, 197 feet by 197 feet	Phase I survey 7/24/89	None made
44LD0446	No date	Temporary camp, 131 feet by 197 feet	Phase I survey 7/24/89	None made
44LD0447	19th century 20th century	Farmstead, 164 feet by 738 feet	Phase I survey 7/24/89 and 1/5/07	None made
44LD0448	20th century	Outbuilding, 20 feet by 20 feet	Phase I survey 7/27/89	None made
44LD0449	Historic	Farmstead, 246 feet by 98 feet	Phase I survey 7/27/89	None made
44LD0451	Native American 19th century	Temporary camp and trash scatter, 738 feet by 328 feet	Phase I survey 7/29/89	None made
44LD0457	No date	Temporary camp and lithic scatter, 98 feet by 98 feet	Phase I survey 8/1/89 and 1/1/07	None made
44LD0472	Late Archaic	Indeterminate site, 75 feet by 50 feet	Phase I survey 3/90	None made
44LD0473	19th century	Indeterminate site	Phase I survey 5/90	None made
44LD0474	Late Archaic Early Woodland 19th century 20th century	Domestic site, 328 feet by 164 feet	Phase I survey 3/90	None made
44LD0510	19th century 20th century	Single dwelling, 25 feet by 100 feet	Phase I survey 2/94	VDHR determined not eligible 4/26/94
44LD0511	20th century	Trash scatter, 80 feet by 80 feet	Phase I survey 2/94	VDHR determined not eligible 4/26/94
44LD0537	Native American	Temporary camp and lithic scatter, 50 feet by 50 feet	Phase I survey 4/96	None made
44LD0644	No date	Single dwelling, 250 feet by 200 feet	No information	None made
44LD0645	Native American	Light density lithic scatter	No information	None made
44LD0646 See also 053-0021	20th century	Farmstead, 200 feet by 200 feet	No information	None made
44LD0843	19th century	Single dwelling, 100 feet by 200 feet	Phase I survey 1/02	None made
44LD0844	19th century 20th century	Single dwelling, 170 feet by 400 feet	Phase I survey 3/02	None made
44LD0845	19th century 20th century	Trash scatter, 25 feet by 25 feet	Phase I survey 3/02	None made

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VDHR Survey Number	Date of resource	Description of resource	Survey Information	Recommendation
44LD0852	19th century 20th century	Single dwelling and five outbuildings, 120 feet by 320 feet	Phase I survey 1/02	VDHR determined not eligible 6/22/09
44LD0967	19th century 20th century	Single dwelling, 240 feet by 500 feet	Phase I survey 12/02	None made
44LD0994	20th century	Agricultural site, 200 feet by 500 feet	Phase I survey 1/10/03	None made
44LD1167	20th century	Farmstead, 200 feet by 300 feet	Phase I survey 9/04	None made
44LD1240 See also 053-1100	19th century 20th century	Trash scatter, 96 feet by 63 feet	Phase I survey 12/04	VDHR determined not eligible 5/5/06
44LD1242	19th century 20th century	Farmstead, 100 feet by 100 feet	Phase I survey 1/20/05	None made
44LD1243	20th century	Farmstead, 350 feet by 400 feet	Phase I survey 1/18/05	None made
44LD1244	Late Archaic 18th century 19th century	Temporary camp and trash scatter, 100 feet by 250 feet	Phase I survey 1/4/04	None made
44LD1245	20th century	Farmstead, 150 feet by 175 feet	Phase I survey 1/13/05	None made
44LD1246/ 44LD1467	20th century	Farmstead, 350 feet by 200 feet, site actually exists within the boundaries of 44LD1467	Phase I survey 1/18/05	None made
44LD1309	19th century 20th century	Single dwelling, 40 feet by 140 feet	Phase I survey 8/16/05	None made
44LD1311	19th century 20th century	Single dwelling, 130 feet by 200 feet	Phase I survey 8/16/05	None made
44LD1312	Middle Archaic 19th century	Large foundation, 100 feet by 100 feet	Phase I survey 8/16/05	None made
44LD1313	19th century 20th century	Single dwelling, 50 feet by 150 feet	Phase I survey 8/16/05	None made
44LD1314	19th century 20th century	Single dwelling, 300 feet by 150 feet	Phase I survey 8/16/05	None made
44LD1315	19th century 20th century	Single dwelling, 10 feet by 25 feet	Phase I survey 8/16/05	None made
44LD1340	Native American	Lithic scatter, 225 feet by 225 feet	Phase I survey 12/05	None made
44LD1343	Native American 20th century	Trash scatter, 429 feet by 184 feet	Phase I survey 1/10/06	None made
44LD1435	19th century 20th century	Farmstead, 350 feet by 400 feet	Phase I survey 10/06 Phase II survey 12/06	None made
44LD1436	18th century 19th century 20th century	Outbuilding and road, 140 feet by 165 feet	Phase I survey 10/06	None made
44LD1456	Native American	Lithic scatter, 180 feet by 165 feet	Phase I survey 1/07	None made
44LD1467	19th century 20th century	Farmstead, 200 feet by 285 feet	Phase I survey 4/07	Recommended not eligible 4/07

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VDHR Survey Number	Date of resource	Description of resource	Survey Information	Recommendation
Architectural Resources				
053-0008	ca. 1962	Dulles International airport	Phase II survey 12/88	Federal determination of eligibility 3/28/78
053-0021 See also 44LD0646	ca. 1910	Lyons Farmstead, location on north side of Route 643, site includes one single dwelling and garage and there is an associated cemetery (off project area)	Phase I survey 1/88	Reported demolished 2005
053-0022	ca. 1870	House, located on southwest side of Route 643, site includes one single dwelling and one shed	Phase I survey 1/88	Reported demolished 2000
053-0023 See also 44LD0852	ca. 1900	House, 22017 Shellhorn Road, site includes one single dwelling, two sheds, three barns, and one silo	Phase I survey 1/88	None made
053-0024	ca. 1870	House, located along Route 772, site includes one single dwelling and four outbuildings	Phase I survey 1/88 and 11/07	VDHR determined not eligible 12/26/07
053-0025	ca. 1900	House, located along Route 775, site includes one single dwelling, three sheds, and one chicken house	Phase I survey 1988	VDHR determined not eligible 6/13/94 and 12/26/07
053-0026	ca. 1900	House, located along Route 643, site includes one single dwelling and one garage	Phase I survey 1988	None made
053-0027	ca. 1870	House, located along Route 643	Phase I survey 1988 and 11/07	VDHR determined not eligible 12/26/07 Reported demolished 12/07
053-0276	ca. 1855	Washington and Old Dominion Railroad Historic District aka Alexandria, Loudoun, and Hampshire Railroad aka Washington and Old Dominion Railroad Regional Park	Phase I survey 1/19/99, 6/06, 2/08, and 11/20/08 National Register nomination 7/25/00	VDHR determined eligible 2/4/99
053-1095	ca. 1900	House, located along Route 772	Phase I survey 6/6/88 and 11/07	VDHR determined not eligible 12/26/07 Reported demolished 12/07
053-1096	ca. 1870	House, located along Route 789, site includes one single dwelling, one barn, one silo, and five outbuildings	Phase I survey 1988	Reported demolished no date
053-1098	ca. 1870	Allder House, located along Route 772	Phase I survey 6/6/88 and 11/07	VDHR determined not eligible 12/26/07 Reported demolished 12/07
053-1099	ca. 1870	House, located along Route 772, site includes one single dwelling, three outbuildings, and one barn	Phase I survey 6/6/88 and 11/07	VDHR determined not eligible 12/26/07 Reported demolished 12/07

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VDHR Survey Number	Date of resource	Description of resource	Survey Information	Recommendation
053-1100 See also 44LD1240	ca. 1910	Cockerille Farm, 22426 Lockridge Road, site includes one single dwelling and 21 outbuildings	Phase I survey 6/6/88 and 12/04 Phase II survey 11/1/05	VDHR determined not eligible 4/20/06
053-1103	ca. 1930	Dairy ruins, located along Route 607	Phase I survey 1989	None made
053-5506	ca. 1890	House, 43951 Farmwell Road, site includes one single dwelling and one garage	Phase I survey 9/1/03	Recommended not eligible 9/1/03
053-6062 See also 44LD1167	ca. post 1880	Airline Hall Property aka The Croson Place, located adjacent to Ryan Road, site includes one isnlge dwelling, one foundation, and two sheds	Phase I survey 9/04	None made
053-6074/ 053-0021	ca. 1909	Lyon's Cemetery	Phase I survey 1/11/05	None made

Resources Identified Within the Project Area

VDHR #44LD0409

VDHR #44LD0409 is identified as a Native American small transient camp, possibly a single component, site measuring approximately 82 feet by 33 feet or 2,706 square feet. WAPORA completed a Phase I survey of the site in May 1988 for the Dulles Toll Road Extension Alignment P and noted that most of the artifacts were found in piles of earth resulting from clearing of a small dirt road. WAPORA shovel tested the areas around these piles and only one shovel test was positive. WAPORA recommended that the site was not eligible for listing on the National register of Historic Places.

VDHR #44LD0646/053-0021

VDHR #44LD0646 is identified as a 20th century farmstead measuring approximately 200 feet by 200 feet or 40,000 square feet. Thunderbird Archaeological Association completed a Phase I survey of the site at an unknown date. This survey included 14 shovel tests placed near a standing structure. Of those, eight shovel tests contained artifacts from the early to late 20th century. The standing structure was given the VDHR architectural number 053-0021 (see description below).

VDHR #053-0021 is identified as the ca. 1910 Lyon's Farmstead located on the north side of Route 643. A Phase I survey of the site was conducted in January 1988 and noted one single dwelling and one garage. In 2005, the buildings were reported demolished. In addition to the buildings, the survey also noted an associated cemetery across Route 643 from the farmstead placing the cemetery outside the current project area. The cemetery was given the VDHR architectural number 053-6074.

VDHR #44LD0147

On the VDHR DSS map, this resource is shown close to the project area. However, this site is located just to the east of the project area along the Area 3 border within the Loudon County Parkway.

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VDHR #44LD0149 and 44LD0150

On the VDHR DSS map, these two resources are shown close to the project area. However, these sites are located just to the northwest of the project border and outside of the Area 5 in the open field.

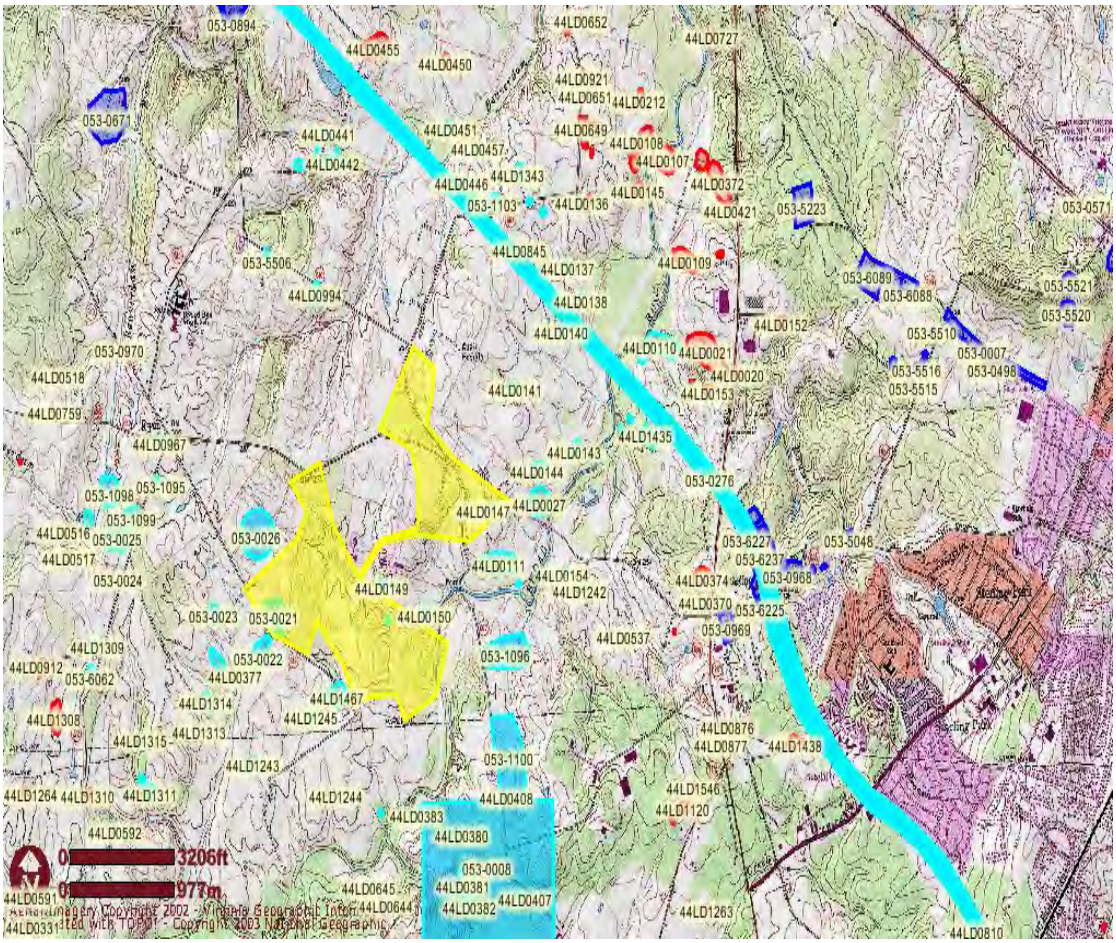

Figure 10. Previously identified historic resources within a one-mile radius of the project location.

Archaeological Potential

Native American Site Potential

Thirty-nine previously recorded Native American archaeological sites are located within one mile of the project area (Table 6 and Figure 11). Of these sites, one dates to the Archaic period; one dates to the Early Archaic subperiod; one dates to the Middle Archaic subperiod; one dates to the Middle Archaic subperiod and the Late Archaic subperiod; one dates to the Middle Archaic subperiod and the Woodland period; one dates to the Middle Archaic subperiod and the 19th century; one dates to the Late Archaic subperiod; one dates to the Late Archaic subperiod, Early Woodland subperiod, 19th century and 20th century; one dates to the Late Archaic subperiod, 18th century, and 19th century; one dates to the Woodland period; one dates to the Late Woodland period; two date to the general Native American period and the 19th century; one dates to the general

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Native American period, 19th century, and 20th century; two date to the general Native American period and 20th century; 17 date to the general Native American period; one dates to the general Native American period and the general historic period; and five have no date associated with them.

The Archaic period site (44LD0137) is classified as a temporary camp and lithic scatter. Lithic artifacts recovered from this site include grooved metavolcanic axe fragments, one stemmed point, and various quartz flakes. No Native American ceramic artifacts are noted as being recovered from this site. No soil information or specific location information is provided for this site. This site is approximately 322,752 square feet or 7.40 acres.

The Early Archaic subperiod site (44LD0111) is classified as an indeterminate site. Lithic artifacts recovered from this site include eight quartz side-notched points, one rhyolite side-notched point, one quartzite side-notched blunt-end scraper, six quartz notched-stem points, one rhyolite notched stem point, one small serrated quartz notched base point, three quartz ovoid base points, two laccolite quartz points, three quartz parallel side-stemmed points, two rhyolite parallel side-stemmed points, one metabasalt parallel side-stemmed point, one quartz point fragment, 11 rhyolite point fragments, one laccolite quartzite blade, one large rhyolite contracting stem blade, one metabasalt blade fragment, four quartz biface fragments, 10 small quartz spalls, 15 quartz flakes, 27 rhyolite flakes, two metabasalt flakes, 12 quartzite flakes, two rhyolite end scrapers, one rhyolite perform, two side-battered sandstone hammerstones, and one quartzite sidescraper. No Native American ceramic artifacts are noted as being recovered from this site. No soil information or site specific location information is provided for this site. The site is approximately 322,752 square feet or 7.40 acres.

The Middle Archaic subperiod site (44LD0381) is classified as an indeterminate site. Lithic artifacts recovered from this site include quartz flakes, quartzite flakes, rhyolite flakes, one argillite flake, jasper flakes, one granite abrader, one Stanley/Kanawha chert, one quartzite Morrow Mountain projectile point, at least one quartz and chert shatter, four bifaces, and two core fragments. No Native American ceramic artifacts are noted as being recovered from this site. No soil information or site specific location information is provided for this site. The site is approximately 100,860 square feet or 2.31 acres.

The Middle Archaic subperiod and Late Archaic subperiod site (44LD0391) is classified as an indeterminate site. Lithic artifacts recovered from this site include one Halifax white quartz small shallowly-side-notched point with a straight base and edge ground blade, two large stemmed pointed with flaring concave bases, at least one shatter, various flakes, and one fire-cracked rock. No Native American ceramic artifacts are noted as being recovered from this site. No soil information or specific location information is provided for this site. The site is approximately 6,724 square feet or 0.15 acres.

The Middle Archaic subperiod and Woodland period site (44LD0027) is classified as an interior floodplain site. Lithic artifacts recovered from this site include three quartz serrated sidescrapers, one quartz notched-stemmed blade, one rhyolite pointed stem

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blade, one quartz laccolite blade, one quartz large ovoid base blade, 24 rhyolite flakes, one argillite flake, one chert flake, 18 quartz flakes, one quartz piece, one argillite biface, one quartz Halifax point base, one quartz biface base, six quartz notched-stemmed points, one quartzite notched-stemmed point, six quartz side-notched points, two rhyolite side-notched points, one chert side-notched point, five quartz ovoid base points, one metabasalt parallel-sided stemmed point, one quartz contracting stem point, one quartzite laccolite point, two rhyolite laccolite points, two quartz triangular points, one rhyolite triangular point, one small quartz-notched base point, five quartz point fragments, one rhyolite point fragment, one quartzite point fragment, one metabasalt point fragment, four quartzite flakes, one center-pitted sandstone hammerstone, and two side-battered sandstone hammerstone. No Native American ceramic artifacts are noted as being recovered from this site. No soil information, site specific location information, or site size is provided for this site.

The Middle Archaic subperiod and 19th century site (44LD1312) is classified as a large foundation. Lithic artifacts recovered from this site include one quartz biface fragment, one shell fragment, one banded rhyolite point, and one quartz mid-stage biface. No Native American ceramic artifacts are noted as being recovered from this site. No soil information is provided for this site. This site is situated approximately 275 feet AMSL on a terrace near a tributary of Broad Run and is approximately 10,000 square feet or 0.22 acres.

The Late Archaic subperiod site (44LD0472) is classified as an indeterminate site. Lithic artifacts recovered from this site include Savannah River points and Holmes points. No Native American ceramic artifacts are noted as being recovered from this site. No soil information or site specific location information is provided for this site. The site is approximately 3,750 square feet or 0.08 acres.

The Late Archaic subperiod, Early Woodland subperiod, 19th century, and 20th century site (44LD0474) is classified as a domestic site. Lithic artifacts recovered from this site include Bare Island points, Holmes points, and Savannah River points. No Native American ceramic artifacts are noted as being recovered from this site. No soil information or site specific location information is provided for this site. The site is approximately 53,792 square feet or 1.23 acres.

The Late Archaic subperiod, 18th century, and 19th century site (44LD1244) is classified as a temporary camp and trash scatter site. Lithic artifacts recovered from this site include one proximal end of a quartz biface fragment. No Native American ceramic artifacts are noted as being recovered from this site. This site is situated within Ashburn silt loam soils and is located approximately 258 feet AMSL on a ridge near an unnamed tributary of Broad Run. The site is approximately 25,000 square feet or 0.57 acres.

The Woodland period site (44LD0141) is classified as a temporary camp and surface scatter. Lithic artifacts recovered from this site include six various lithics, two quartz points with slightly contracting stems, one quartz triangular point, and one rhyolite bifurcated-based point. No Native American ceramic artifacts are noted as being

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recovered from this site. No soil information or site specific location information is provided for this site. The site is approximately 53,792 square feet or 1.23 acres.

The Late Woodland subperiod site (44LD0143) is classified as a temporary camp and surface scatter. Lithic artifacts recovered from this site include 48 various lithics, quartz flakes, rhyolite flakes, quartz ovoid bases, and chert triangular points. No Native American ceramic artifacts are noted as being recovered from this site. No soil information or site specific location information is provided for this site. The site is approximately 215,168 square feet or 4.93 acres.

Of the two general Native American period and 19th century sites, one is classified as an indeterminate Native American site and a farmstead (44LD0378) and one is classified as a temporary camp and trash scatter (44LD0451). Lithic artifacts recovered from these sites include 25 various lithics, 25 quartz shatters, five quartz flake fragments, one chert flake fragment, one quartz core, and one biface. No Native American ceramic artifacts are noted as being recovered from these sites. No soil information is provided for either site. One site is noted as being situated on the crest of a knoll (44LD0451). Site sizes range between 141,204 square feet or 3.24 acres and 242,064 square feet or 5.55 acres.

The general Native American, 19th century, and 20th century site (44LD0140) is classified as a temporary camp, lithic scatter, single dwelling, and barn. Lithic artifacts recovered from this site include 30 various lithics including one stemmed point. No Native American ceramic artifacts are noted as being recovered from this site. No soil information or site specific location information is provided for this site. The site is approximately 430,336 square feet or 9.87 acres.

Of the two general Native American period and 20th century sites, one is classified as an indeterminate Native American site (44LD0380) and one is classified as a trash scatter (44LD1343). Lithic artifacts recovered from these sites include nine shatters, one tertiary flake fragment, one utilized flake fragment, three biface fragments, one fire-cracked rock, one quartz early to mid stage biface fragment, and two quartz flakes. No Native American ceramic artifacts are noted as being recovered from these sites. No soil information is provided for either site. One site is noted as being situated approximately 266 feet AMSL (44LD1343). Site sizes range between 12,628 square feet or 0.28 acres and 78,936 square feet or 1.81 acres.

Of the general Native American period sites, two are classified as a temporary camp and lithic scatter (44LD0139 and 44LD0537), four are classified as a temporary camp and surface scatter (44LD0142, 44LD0147, 44LD0149, and 44LD0150), three are classified as lithic scatters (44LD0645, 44LD1340, and 44LD1456), one is classified as a small transient camp (44LD0409), three are classified as temporary camps (44LD0441, 44LD0443, and 44LD0445), and four are classified as indeterminate sites (44LD0377, 44LD0382, 44LD0383, and 44LD0408). Lithic artifacts recovered from these sites include 52 various lithics, one rhyolite stemmed point basal fragment, two quartz stemmed points, two projectile points, one distal projectile point fragment, rhyolite quartz flakes, at least 20 quartz flakes, at least two chert flakes, one secondary quartz flake,

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seven tertiary flakes, one fine-grained chert tertiary flake, one unifacially retouched gray shale flake, two rhyolite middle stage flakes, two quartzite flake fragments, one rhyolite flake fragment, 22 flake fragments, 10 quartz shatter fragments, three chert shatter, 21 shatter fragments, two quartz bifaces, three biface fragments, one core, one quartz core fragment, one hematite core fragment, two core fragments, six quartz fragments, and four fire-cracked rock. No Native American ceramic artifacts are noted as being recovered at any of the sites. Of the sites that provided soil information, one is situated within Penn silt loam soils (44LD1340) and one is situated within Nestoria channery silt loam (44LD1456). One site is noted as being situated approximately 225 feet AMSL on a secondary terrace near Broad Run (44LD1340) and one site is noted as being situated approximately 245 feet AMSL on a ridge approximately 180 feet from Broad Run. Site sizes range between approximately 390 square feet or 0.01 acres and 161,376 square feet or 3.70 acres.

The general Native American period and general historic period site is classified as a temporary camp and lithic scatter. Lithic artifacts recovered from this site include two stemmed points and various lithic sherds. No Native American ceramic artifacts are noted as being recovered from this site. No soil information or specific location information is provided for this site. The site is approximately 161,376 square feet or 3.70 acres.

Of the sites with no associated date, one is classified as an indeterminate site (44LD0110), two are classified as a temporary camp and surface scatter (44LD0144 and 44LD0154), one is classified as a temporary camp and lithic scatter (44LD0457), and one is classified as a temporary camp (44LD0446). Lithic artifacts recovered from these sites include 29 various lithics, 21 various flakes, quartz flakes, one gray shale flake, one quartz unifacially retouched flake, one gray shale unifacially retouched flake, two gray tertiary flakes, biface fragments, one cobble, two quartz fragments, and one red chert uniface, nine ovoid base points, three quartz contracting stem points, two quartz side-notched points, one quartzite side-notched point, one quartzite corner-notched point, one rhyolite stemmed point, one quartz stemmed point, one rhyolite triangular point, six quartz point fragments, one quartzite point fragment, three quartz blade fragments, one large chert blade fragment, one large metabasalt parallel-sided stemmed blade, one serrated quartzite blade fragment, 30 rhyolite flakes, one chert flake, one metabasalt pointed chopper, one rhyolite core/scraper, 12 quartzite flakes, three quartz cores, and 21 quartz flakes. No Native American ceramic artifacts are noted as being recovered at any of the sites. Of the sites that provided soil information, one is situated within Bermudian silt loam soils (44LD0154). No site specific location information is provided for any of the sites. Site sizes range between approximately 9,604 square feet or 0.22 acres and 215,168 square feet or 4.93 acres.

Given the project area's vicinity and the fact that all of the previously identified sites for which there is soil information fall within at least one or more of the project area soils, the possibility of finding Native American resources is considered moderate. One previously identified general Native American period resources were found within the project area and two were recorded just on the edge of the tract. These sites were

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recorded has having been disturbed by development. Given this information, it is possible that a Native American site, most like a temporary camp and/or lithic or surface scatter could be found within the project area boundaries along the edges of the streams as long as the area contains the landforms where habitation can occur. Given the previously identified sites, this site would most likely date to the general Native American period or be a multi-component site and would range in size from under one acre to less than 10 acres. Judging from the previously identified sites, if a site was found within the project area, it would probably not contain many Native American ceramic artifacts.

However, the similar landforms within the project tract where Native American resources would be likely have been impacted by the construction of utilitites-sewer and water lines are located along the edges of the small streams that run through the property.

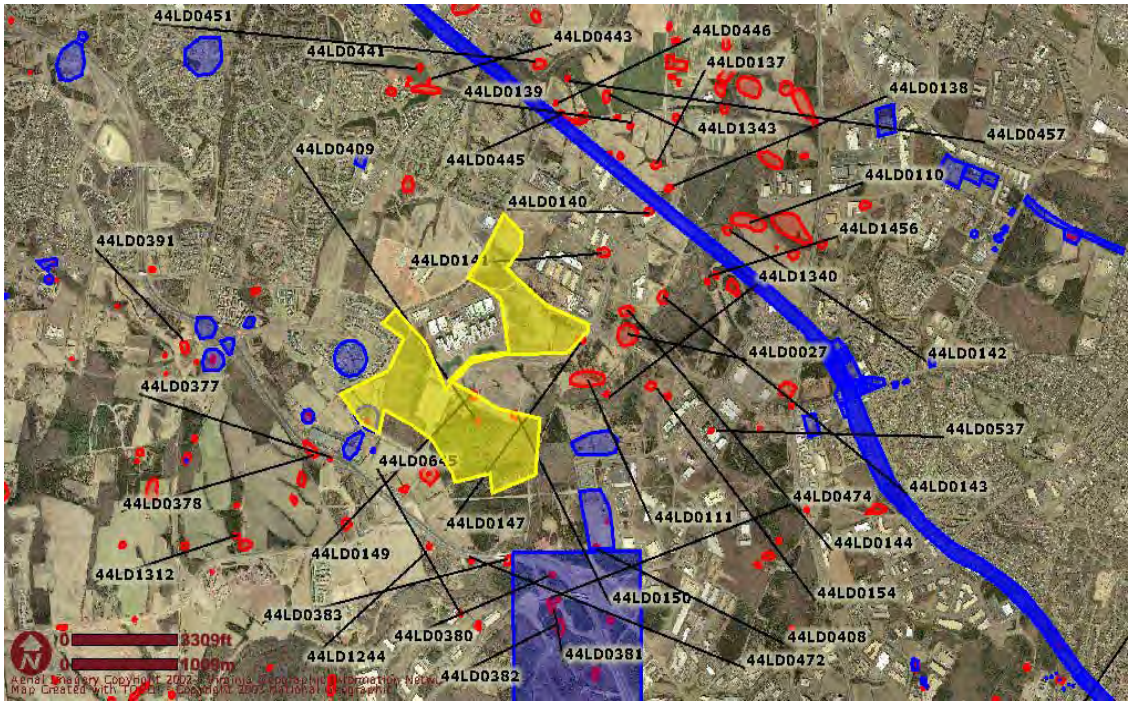

Figure 11. Previously identified Native American resources within one mile of the project area.

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Table 6. Previously Identified Native American Archaeological Sites Within One Mile of the Project Area.

Site Number	Site Chronology	Site Type	Native American Lithic Artifacts	Native American Ceramic Artifacts	Site Size	Soil Type	Additional Site Information
44LD0027	Middle Archaic Woodland	Interior floodplain site	Two rhyolite flakes, one argillite flake, one chert flake, seven quartz flakes, 11 quartz flakes, 22 rhyolite flakes, four quartzite flakes, one argillite biface, one quartz biface base, six notched-stemmed quartz points, one quartzite notched-stemmed point, six quartz side-notched points, two rhyolite side-notched points, one chert side-notched point, one metabasalt parallel-sided stemmed point, one quartz contracting stem point, one quartzite laccolite points, two rhyolite laccolite point, two quartz triangular points, one rhyolite triangular point, five quartz point fragments, one rhyolite point fragment, one quartzite point fragment, one metabasalt point fragment, one quartz Halifax point base, five quartz ovoid base points, one quartz small notched base point, one quartz piece, one quartz large ovoid base blade, one quartz laccolite blade, one quartz notched-stemmed blade, one rhyolite large pointed stem blade, three quartz serrated sidescrapers, one center-pitted sandstone hammerstone, two side-battered sandstone hammerstones	None listed	656 feet by 656 feet 430,336 square feet 9.87 acres	None listed Ashburn silt loam	None listed

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Site Number	Site Chronology	Site Type	Native American Lithic Artifacts	Native American Ceramic Artifacts	Site Size	Soil Type	Additional Site Information
44LD0110	No date	Indeterminate site	Nine quartz ovoid base points, three quartz contracting stem points, two quartz side-notched points, one quartzite side-notched point, one rhyolite side-notched point, one rhyolite serrated stubby barbed point, one chert stubby barbed point, one quartzite corner-notched point, one rhyolite stemmed point, one quartz stemmed point, one rhyolite large triangular point, six quartz point fragments, one quartzite point fragment, three quartz blade fragments, one large chert blade fragment, one large metabasalt parallel-sided stemmed blade, one serrated quartzite blade fragment, 30 rhyolite flakes, one chert flake, one metabasalt pointed chopper, one rhyolite core/scraper 12 quartzite flakes, three quartz cores, 21 quartz flakes	None listed	984 feet by 328 feet 322,752 square feet 7.40 acres	None listed Rowland silt loam	None listed
44LD0111	Early Archaic	Indeterminate site	Eight quartz side-notched points, one rhyolite side-notched point, six quartz notched-stem points, one rhyolite notched-stem points, one small serrated quartz notched-base point, three quartz ovoid base points, two laccolite quartz points, three quartz parallel-sided stemmed points, two rhyolite parallel-sided stemmed points, one metabasalt parallel-sided stemmed points, one quartz point fragment, 11 rhyolite point fragments, one quartzite side-	None listed	984 feet by 328 feet 322,752 square feet 7.40 acres	None listed Penn silt loam	None listed

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Site Number	Site Chronology	Site Type	Native American Lithic Artifacts	Native American Ceramic Artifacts	Site Size	Soil Type	Additional Site Information
			notched blunt-endscraper, two rhyolite endscrapers, one laccolite quartzite blade, one large rhyolite contracting stem blade, four quartz blade fragments, one quartz contracting stem blade, one metabasalt blade fragment, four quartz biface fragments, 10 small quartz spalls, 15 quartz flakes, 27 rhyolite flakes two metabasalt flakes, 12 quartzite flakes, one rhyolite perform, two side-battered sandstone hammerstones, one quartzite sidescraper				
44LD0137	Archaic	Temporary camp and lithic scatter	Grooved metavolcanic axe fragments, one stemmed point, various quartz flakes	None listed	656 feet by 492 feet 322,752 square feet 7.40 acres	None listed Ashburn silt loam	None listed
44LD0138	Native American Historic	Temporary camp and lithic scatter	Seven lithics, two stemmed points, various sherds	None listed	492 feet by 328 feet 161,376 square feet 3.70 acres	None listed Dulles silt loam	None listed
44LD0139	Native American	Temporary camp and lithic scatter	Three various lithics, one rhyolite stemmed point basal fragment	None listed	164 feet by 164 feet 26,896 square feet 0.61 acres	None listed Ashburn silt loam	None listed
44LD0140	Native American 19th century 20th century	Temporary camp, lithic scatter, single dwelling, and barn	30 various lithics, one stemmed point	None listed	656 feet by 656 feet 430,336 square feet 9.87 acres	None listed Albano silt loam	None listed
44LD0141	Woodland	Temporary camp and surface scatter	Six various lithics, two quartz points with slightly contracting stems, one quartz triangular point, one bifurcated-based Rhyolite point	None listed	328 feet by 164 feet 53,792 square feet 1.23 acres	None listed Penn silt loam	None listed

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Site Number	Site Chronology	Site Type	Native American Lithic Artifacts	Native American Ceramic Artifacts	Site Size	Soil Type	Additional Site Information
44LD0142	Native American	Temporary camp, surface scatter	Quartz, chert, and rhyolite flakes	None listed	492 feet by 328 feet 161,376 square feet 3.70 acres	None listed Dulles silt loam	None listed
44LD0143	Late Woodland	Temporary camp and surface scatter	48 various lithics, large scatter of quartz and rhyolite flakes, one quartz ovoid base, one chert triangular point	None listed	328 feet by 656 feet 215,168 square feet 4.93 acres	None listed Rowland silt loam	None listed
44LD0144	No date	Temporary camp and surface scatter	Five various lithics, quartz flakes, biface fragments	None listed	656 feet by 328 feet 215,168 square feet 4.93 acres	None listed Dulles silt loam	None listed
44LD0147	Native American	Temporary camp and surface scatter	36 various lithics, one quartz stemmed point	None listed	328 feet by 328 feet 107,584 square feet 2.46 acres	None listed Dulles silt loam	None listed
44LD0149	Native American	Temporary camp and surface scatter	Eight various lithics, one quartz stemmed point	None listed	328 feet by 328 feet 107,584 square feet 2.46 acres	None listed Penn silt loam	All artifacts were found on the surface
44LD0150	Native American	Temporary camp and surface scatter	Five various lithics, quartz flakes, rhyolite and quartz flakes	None listed	328 feet by 492 feet 161,376 square feet 3.70 acres	None listed Bowmansville silt loam	All artifacts were found on the surface with a tiny scatter of rhyolite and quartz flakes found on the bottom near Broad Run
44LD0154	No date	Temporary camp and surface scatter	24 various lithics	None listed	164 feet by 492 feet 80,688 square feet 1.85 acres	Bermudian silt loam	None listed
44LD0377	Native American	Indeterminate site	Two quartz flake fragments	None listed	164 feet by 164 feet 26,896 square feet 0.61 acres	None listed Penn silt loam	None listed

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Site Number	Site Chronology	Site Type	Native American Lithic Artifacts	Native American Ceramic Artifacts	Site Size	Soil Type	Additional Site Information
44LD0378	Native American 19th century	Indeterminate Native American Site, farmstead	25 quartz shatters, five quartz flake fragments, one chert flake fragment, one quartz core, one biface	None listed	574 feet by 246 feet 141,204 square feet 3.24 acres	None listed Penn silt loam	None listed
44LD0380	Native American 20th century	Indeterminate site	Nine shatters, one tertiary flake fragment, one utilized flake, three biface fragments, one fire-cracked rock	None listed	154 feet by 82 feet 12,628 square feet 0.28 acres	None listed Ashburn silt loam	None listed
44LD0381	Middle Archaic	Indeterminate site	Quartz flakes, quartzite flakes, rhyolite flakes, argillite flakes, jasper flakes, one granite abrader, one Stanley/Kanawha chert, one quartzite Morrow Mountain projectile point, one quartz and chert shatter, four bifaces, two core fragments	None listed	410 feet by 246 feet 100,860 square feet 2.31 acres	None listed Dulles silt loam	None listed
44LD0382	Native American	Indeterminate site	18 shatters, 14 flake fragments, three tertiary flakes, three biface fragments, two projectile points, one core	None listed	410 feet by 246 feet 100,860 square feet 2.31 acres	None listed Dulles silt loam	None listed
44LD0383	Native American	Indeterminate site	Two quartz shatters, one quartz flake, one chert flake, one secondary quartz flake	None listed	164 feet by 164 feet 26,896 square feet 0.61 acres	None listed Ashburn silt loam	None listed
44LD0391	Middle Archaic Late Archaic	Indeterminate site	One Halifax white quartz small shallowly side-notched point with a straight base and blade edge ground, two large stemmed pointed with flaring concave base, one shatter, various flakes, one fire-cracked rock	None listed	82 feet by 82 feet 6,724 square feet 0.15 acres	None listed Penn silt loam	None listed
44LD0408	Native American	Indeterminate site	One quartz biface, one quartz core fragment, one quartz shatter, various flakes, one hematite fragment	None listed	164 feet by 361 feet 59,204 square feet 1.35 acres	None listed Penn silt loam	None listed

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Site Number	Site Chronology	Site Type	Native American Lithic Artifacts	Native American Ceramic Artifacts	Site Size	Soil Type	Additional Site Information
44LD0409	Native American	Small transient camp, possible single component	None listed	None listed	82 feet by 33 feet 2,706 square feet 0.06 acres	None listed Penn silt loam	Most artifacts were found in piles of earth resulting from clearing of a small dirt road
44LD0441	Native American	Temporary camp	Four tertiary flakes, one shatter fragment, two core fragments	None listed	49 feet by 66 feet 3,234 square feet 0.07 acres	None listed Dulles silt loam	None listed
44LD0443	Native American	Temporary camp	Three quartz flakes	None listed	39 feet by 10 feet 390 square feet 0.01 acres	None listed Penn silt loam	None listed
44LD0445	Native American	Temporary camp	Six quartz fragments, 12 quartz flakes, one fine-grained chert tertiary flake, one unifacially retouched gray shale flake	None listed	197 feet by 197 feet 38,809 square feet 0.89 acres	None listed Panorama silt loam	None listed
44LD0446	No date	Temporary camp	One cobble, 11 flakes, two gray tertiary flakes, one gray shale flake two quartz fragments, one red chert uniface	None listed	131 feet by 197 feet 25,807 square feet 0.59 acres	None listed Panorama silt loam	None listed
44LD0451	Native American 19th century	Temporary camp and trash scatter	25 lithics	None listed	738 feet by 328 feet 242,064 square feet 5.55 acres	None listed Ashburn silt loam	Site is situated on a crest of a knoll
44LD0457	No date	Temporary camp and lithic scatter	10 flakes, one unifacially retouched quartz flake, one unifacially retouched gray shale flake, two fragments	None listed	98 feet by 98 feet 9,604 square feet 0.22 acres	None listed Ashburn silt loam	None listed
44LD0472	Late Archaic	Indeterminate site	Various lithics including Savannah River points, Holmes points, and lack waxen	None listed	75 feet by 50 feet 3,750 square feet 0.08 acres	None listed Dulles silt loam	None listed
44LD0474	Late Archaic Early Woodland 19th century 20th century	Domestic site	Bare Island points, Holmes points, Savannah River points	None listed	328 feet by 164 feet 53,792 square feet 1.23 acres	None listed Dulles silt loam	None listed

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Site Number	Site Chronology	Site Type	Native American Lithic Artifacts	Native American Ceramic Artifacts	Site Size	Soil Type	Additional Site Information
44LD0537	Native American	Temporary camp and lithic scatter	One quartz point, two quartz flakes	None listed	50 feet by 50 feet 2,500 square feet 0.05 acres	None listed Ashburn silt loam	None listed
44LD0645	Native America	Lithic scatter	Light density of lithics	None listed	None listed	None listed Dulles silt loam	None listed
44LD1244	Late Archaic 18th century 19th century	Temporary camp and trash scatter	One proximal end of a quartz biface fragment	None listed	100 feet by 250 feet 25,000 square feet 0.57 acres	Ashburn silt loam	Site is situated approximately 258 feet AMSL on a ridge approximately 340 feet from a unnamed tributary of Broad Run
44LD1312	Middle Archaic 19th century	Large foundation	One quartz biface fragment, one banded rhyolite point, one quartz mid-stage biface	None listed	100 feet by 100 feet 10,000 square feet 0.22 acres	None listed Ashburn silt loam	Site is situated approximately 275 feet AMSL on a terrace near an unnamed tributary of Broad Run
44LD1340	Native American	Lithic scatter	One distal projectile point fragment, eight flakes, two shatters, four fire-cracked rock	None listed	225 feet by 225 feet 50,625 square feet 1.16 acres	Penn silt loam	Site is situated approximately 225 feet AMSL on a second terrace approximately 100 feet from Broad Run
44LD1343	Native American 20th century	Trash scatter	One quartz early to mid stage biface fragment, two quartz flakes,	None listed	429 feet by 184 feet 78,936 square feet 1.81 acres	None listed Dulles silt loam	Site is situated approximately 266 feet AMSL

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Site Number	Site Chronology	Site Type	Native American Lithic Artifacts	Native American Ceramic Artifacts	Site Size	Soil Type	Additional Site Information
44LD1456	Native American	Lithic scatter	One quartz biface, two quartz flake fragments, seven quartz shatter, two rhyolite middle stage flakes, one rhyolite flake fragments, three chert shatter	None listed	180 feet by 165 feet 29,700 square feet 0.68 acres	Nestoria channery silt loam	Site is situated approximately 245 feet AMSL on a ridge approximately 180 feet from Broad Run

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Historic Site Potential

Forty previously recorded historic archaeological sites are located within one mile of the project area (Table 8 and Figure 12). Of these sites, one dates to the Middle Archaic subperiod and the 19th century; one dates to the Late Archaic subperiod, Early Woodland subperiod, 19th century, and 20th century; one dates to the Late Archaic subperiod, 18th century, and 19th century; two date to the general Native American period and the 19th century; one dates to the general Native American period, 19th century, and 20th century; two date to the general Native American period and the 20th century; one dates to the general Native American period and the general historic period; one dates to the 18th century, 19th century, and 20th century; two date to the 19th century; 16 date to the 19th century and 20th century; eight date to the 20th century; two date to the general historic period; and two have no dates associated with them.

The Middle Archaic subperiod and 19th century site (44LD1312) is classified as a large foundation. Historic ceramic artifacts recovered from this site include 53 whiteware sherd, 21 ironstone sherds, seven redware sherds, three refined white earthenware sherds, two yellowware sherds, four hard paste porcelain sherds, one gray bodied coarse stoneware sherd, one buff bodied coarse stoneware sherd, and one creamware sherd. Other historic artifacts recovered from this site include nine amber bottle glass fragments, 13 very pale aqua glass fragments, one white milk glass button, one leather fragment, one lime soda window glass fragment, one rubber fragment, two blue bottle glass fragments, 26 clear glass fragments, two white milk glass canning jar lid liners, one brass furniture decoration, one tin can base, two plastic fragments, 20 white milk glass fragments, five clear manganese bottle glass fragments, one pale green glass fragment, one unidentified metal fragment, two olive amber bottle glass fragments, one shell fragment, one green glass tableware fragment, one metal toy gun part, one plastic button, five wire nails, one unidentified lead fragment, one metal strap fragment, one unidentified nail fragment, and one unidentified brass fragment. This site is situated approximately 275 feet AMSL on a terrace near an unnamed tributary of Broad Run. The site is approximately 10,000 square feet or 0.22 acres.

The Late Archaic subperiod, Early Woodland subperiod, 19th century, and 20th century site (44LD0474) is classified as a domestic site. Historic ceramic artifacts recovered from this site include various ceramics. Other historic artifacts recovered from this site include auto safety glass. No soil information or site specific location information is provided for this site. The site is approximately 53,792 square feet or 1.23 acres.

The Late Archaic subperiod, 18th century, and 19th century site (44LD1244) is classified as a temporary camp and trash scatter site. Historic ceramic artifacts recovered from this site include pearlware sherds, creamware sherds, and lusterware sherds. Other historic artifacts recovered from this site include aqua vessel glass fragments and one 4/64-inch bore English ball clay pipe stem fragment. This site is situated within Ashburn silt loam soils and is located approximately 258 feet AMSL on a ridge near an unnamed tributary of Broad Run. The site is approximately 25,000 square feet or 0.57 acres.

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Of the two general Native American period and 19th century sites, one is classified as an indeterminate Native American site and a farmstead (44LD0378) and one is classified as a temporary camp and trash scatter (44LD0451). Historic ceramic artifacts recovered from these sites include two stoneware sherds, two redware sherds, and one whiteware sherd. Other historic artifacts recovered from this site include one horseshoe and 200 glass fragments. No soil information is provided for either site. One site is noted as being situated on the crest of a knoll (44LD0451). Site sizes range between 141,204 square feet or 3.24 acres and 242,064 square feet or 5.55 acres.

The general Native American, 19th century, and 20th century site (44LD0140) is classified as a temporary camp, lithic scatter, single dwelling, and barn. Historic ceramic artifacts recovered from this site include various pottery sherds. No other historic artifacts are noted as being recovered from this site. No soil information or site specific location information is provided for this site. The site is approximately 430,336 square feet or 9.87 acres.

Of the two general Native American period and 20th century sites, one is classified as an indeterminate Native American site (44LD0380) and one is classified as a trash scatter (44LD1343). Historic ceramic artifacts recovered from these sites include seven whiteware sherds, five glazed porcelain sherds, one ironstone sherd, three refined earthenware sherds, one redware sherd, one stoneware sherd, and one Bristol slipped sherd. Other historic artifacts recovered from these sites include one glass thermometer fragment, two Ball blue aqua bottle/jar fragments, eight plastic fragments, four 7-Up green bottle glass fragments, six amber bottle glass fragments, one white milk glass fragment, 14 clear bottle/jar glass fragments, one amber bottle base fragment, one screw, one clear mirrored fragment, 10 unidentified clear fragments, and one terra cotta pipe fragment. No soil information is provided for either site. One site is noted as being situated approximately 266 feet AMSL (44LD1343). Site sizes range between 12,628 square feet or 0.28 acres and 78,936 square feet or 1.81 acres.

The general Native American period and general historic period site (44LD0138) is classified as a temporary camp and lithic scatter. No historic ceramic artifacts were noted as being recovered from this site. Other historic artifacts recovered from this site include brick fragments. No soil information or specific location information was provided for this site. This site is 161,376 square feet or 3.70 acres.

The 18th, 19th, and 20th century site (44LD1436) is classified as an out building and road. Historic ceramic artifacts recovered from this site include one white salt glaze stoneware sherd. Other historic artifacts recovered from this site include one lime soda window glass fragment, four nails, one spike, four wrought nails, two cut nails, two wire nails, 18 wire fragments, eight metal fragments, one bullet, and one cast iron fragment. This site is situated within Nestoria gravelly silt loam. The site sits approximately 240 feet AMSL on a ridge finger approximately 75 feet from an unnamed tributary of Broad Run. The site is approximately 23,100 square feet or 0.53 acres.

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Of the two 19th century sites, one is classified as an indeterminate site (44LD0473) and one is classified as a single dwelling (44LD0843). Historic ceramic artifacts recovered from these sites include two whiteware with blue decoration sherds, one whiteware with green hand painted design sherd, six pearlware sherds, one pearlware polychrome hand-painted sherd, one refined white earthenware sherd, and one creamware sherd. Other historic artifacts recovered from these sites include three lime soda windowpane glass fragments, one olive amber liquor bottle glass fragment, one amber cylindrical bottle glass fragment, one olive amber black liquor bottle glass fragment, one pale green cylindrical bottle glass fragment, one cut nail fragment, one wrought nail fragment, and approximately 10.7 grams of mortar fragments. No soil information is provided for either site. One site is noted as being situated approximately 263 feet AMSL on a ridgetop near a tributary of Broad Run (44LD0843). Only one site provided size information and noted the site as 20,000 square feet or 0.45 acres (44LD0843).

Of the 16 19th and 20th century sites, four are classified as a farmstead (44LD0447, 44LD1242, 44LD1435, and 44LD1467), nine are classified as a single dwelling (44LD0510, 44LD0844, 44LD0852, 44LD0967, 44LD1309, 44LD1311, 44LD1313, 44LD1314, and 44LD1315), two are classified as a trash scatter (44LD0845 and 44LD1240), and one is classified as an indeterminate site (44LD0444). Historic ceramic artifacts recovered from these sites include various decalcomania, at least 189 whiteware sherds, two pearlware sherds, 15 redware sherds, one gray bodied coarse stoneware spall, 22 refined earthenware sherds, 14 manganese sherds, 23 ironstone sherds, 37 porcelain sherds, and 25 stoneware sherds . Other historic artifacts recovered from these sites include one stoneware Pamplin style pipe bowl fragment, three bright green lightweight bottle glass fragments, 222 lime soda windowpane glass fragments, 22 olive amber cylindrical bottle glass fragments, 11 potash windowpane glass fragments, 114 clear glass fragments, 383 unidentified clear glass fragments, 38 clear tableware curved glass fragments, four unidentified clear heated and melted glass fragments, 219 automatic machine-produced bottle glass fragments, one solarized container glass fragments, 389 bottle glass fragments, one bottle contact mold glass fragment, 11 aqua glass fragments, three pale green glass fragments, eight plate glass fragments, 11 duraglass fragments, 28 clear manganese bottle glass fragments, 13 chilled iron mold bottle glass fragments, one unidentified windowpane glass fragments, 22 safety glass fragments, seven sheet glass fragments, one milk jar glass fragments, two Ball blue glass jar fragments, two unidentified green spall, one silver plated spoon, four canning jar lid liner fragments, 525 wire nails, 139 cut nails, 202 machine-head cut nails, one wrought nail, three cut finishing nails, six cut nail fragments, 15 wire nail fragments, 271 unidentified nail fragments, 13 spikes, 110 wire fragments, 267 sheet metal fragments, 19 unidentified brass fragments, seven bullets, various coal fragments, 23 black plastic fragments, three white plastic fragments, one blue molded plastic fragment, six plastic button, one shotgun shell, various Portland cement fragments, approximately 50.1 grams of mortar fragments, approximately 183.3 grams of brick fragments, 28 bone fragments, two ferrous metal barbed wire fragments, three ferrous metal buckle fragments, three ferrous metal wire fragments, seven chimney lamp fragments, 21 unidentified ferrous metal fragments, one ferrous metal eye, three metal horseshoe fragment, one aluminum pull tab, four aluminum fragments, 11 asbestos fragments, three carbon battery rod fragment, one

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rubber fragment, two shell fragments, one lead alloy escutcheon, one charcoal fragment, one slag fragment, one spoon fragment, 14 terra cotta sherds, and one screw. Of the sites that provided soil information, one is situated within Nestoria gravelly silt loam soils (44LD1242) and two are situated with Ashburn silt loam soils (44LD1435 and 44LD1467). The sites are situated between approximately 254 feet and 320 feet AMSL and most are located on ridges, ridge tops, ridge toes, knolls, or hillocks. The sites are located near a tributary of Broad Run, Beaverdam Run, and Elklick Run. Site sizes range between approximately 250 square feet or 0.01 acres and 140,000 square feet or 3.21 acres.

Of the eight 20th century sites, one is classified as an outbuilding (44LD0448), one is classified as a trash scatter (44LD0511), five are classified as farmsteads (44LD0646, 44LD1167, 44LD1243, 44LD1245, and 44LD1246), and one is classified as an agricultural site (44LD0994). Historic ceramic artifacts recovered from these sites include five ironstone sherds, four American stoneware sherds, nine whiteware sherds, one burned hand-painted whiteware sherd, one blue transfer printed whiteware sherd, one redware flower pot, and one green-edged refined earthenware sherd. Other historic artifacts recovered from these sites include tin-plated steel roofing material, nine wire nails, one cut nail, one nail fragment, three machine-cut nails, one nail fragment, 14 bottle glass fragments, five glass tableware fragments, two colorless glass fragments, one olive vessel glass fragment, one cobalt blue vessel glass fragment, two aqua glass vessel fragments, one manganese tinted glass fragment, four lime soda windowpane glass fragments, one unidentified glass fragments, two amber bottle glass fragments, one stoneware drain tile sherd, one rubber mason jar seal, four bone fragments, one silver plated butter knife, three porcelain bathroom tile sherd, one marble, one porcelain doll's arm, three aluminum pull tab, one bicycle chain fragment, one brick fragment, one ferrous cooking pan handle, one vinyl fragment, two plastic bullet, one ferrous harrowing disc, one wire fragment, one plastic fluorescent light cover, one ceramic insulator fragment, four unidentified ferrous fragments, one cut fieldstone fragment, one leather fragment, eight plastic fragments, one copper alloy nut, and one terra cotta fragment. Of the sites that provided soil information, one is situated within Albano silt loam soils (44LD1246), one is situated with Ashburn silt loam soils (44LD1245), and one is situated with Penn silt loam soils (44LD1243). The sites are situated between approximately 256 feet and 320 feet AMSL and most are located on ridges, ridge fingers, or sideslopes. The sites are located near tributaries of Broad Run and Beaverdam Run. Site sizes range between approximately 400 square feet or 0.01 acres and 140,000 square feet or 3.21 acres.

Of the two general historic period sites one is classified as a domestic site (44LD0422) and one is classified as a farmstead (44LD0449). No historic ceramic artifacts are noted as being recovered from this site. Other historic artifacts recovered from this site include one square nail. No soil information or site specific location information is provided for this site. Site sizes range between is approximately 24,108 square feet or 0.55 acres and 107,420 square feet or 2.46 acres.

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Of the two sites with no associated date, both are classified as single dwellings (44LD0407 and 44LD0644). Historic ceramic artifacts recovered from these sites include whiteware sherds and porcelain sherds. Other historic artifacts recovered from these sites include wire nails, unidentified nail fragments, brick fragments, mortar fragments, cement fragments, windowpane glass fragments, and bottle glass fragments. No soil information is provided for either site. One site is situated approximately 270 feet AMSL approximately 1,000 feet from Broad Run (44LD0644). Site sizes range between 50,000 square feet or 1.14 acres and 50,625 square feet or 1.16 acres.

Given the project area's close proximity to Broad Run and the fact that all of the previously identified sites for which there is soil information fall within at least one or more of the project area soils, the possibility of finding historic resources is considered moderate. One previously identified 20th century resource was found within the project area. Given this information, it is possible that a historic period site, most like a single dwelling or farmstead could be found within the project area boundaries. Given the previously identified sites, this site would most likely date to the 19th and/or 20th century or a multi-component site and would range in size from under one acre to less than 10 acres. Judging from the previously identified sites, if a site was found within the project area, it would probably contain both historic ceramic artifacts and other artifacts such as glass, nails, and brick.

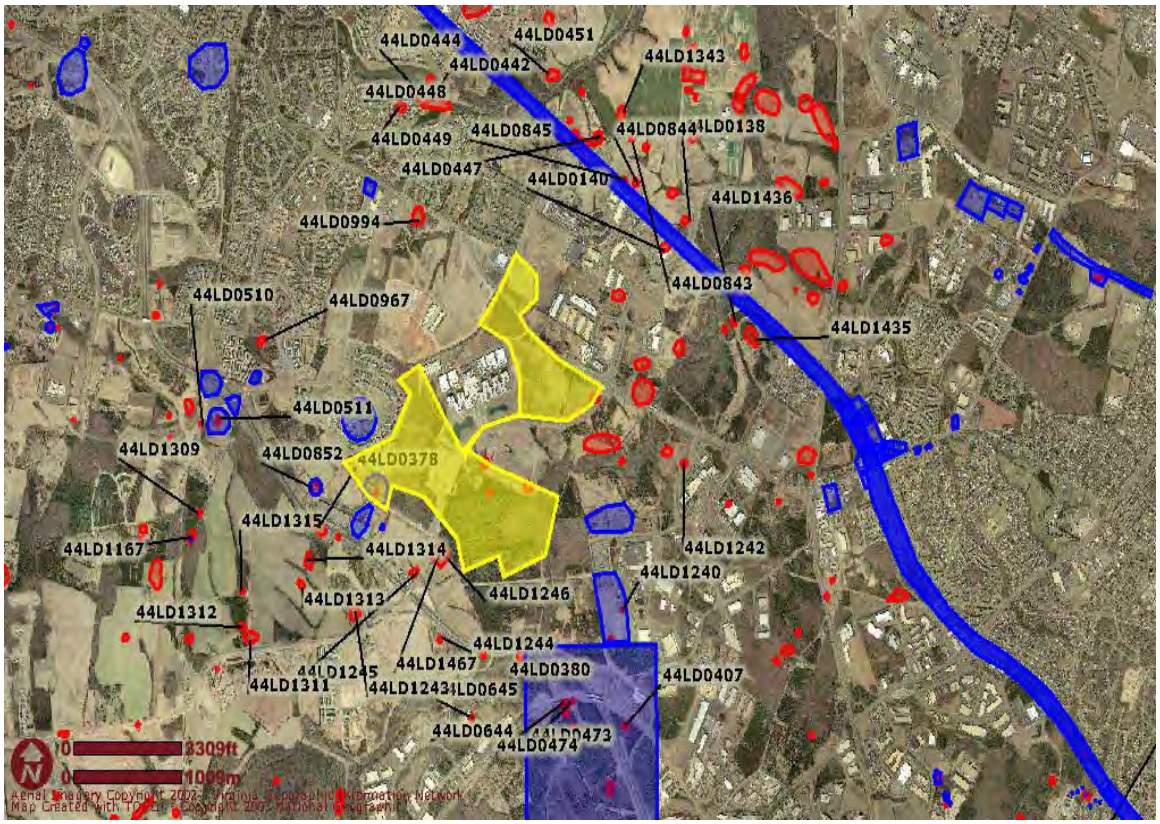

Figure 12. Previously identified historic resources within one mile of the project area.

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Table 7. Previously Identified Historic Archaeological Sites Within One Mile of the Project Area.

Site Number	Site Chronology	Site Type	Historic Ceramic Artifacts	Other Historic Artifacts	Site Size	Soil Type	Additional Site Information
44LD0138	Native American Historic	Temporary camp and lithic scatter	None listed	Brick fragments	492 feet by 325 feet 161,376 square feet 3.70 acres	None listed Dulles silt loam	None listed
44LD0140	Native American 19th century 20th century	Temporary camp, lithic scatter, single dwelling, and barn	Pottery sherds	None listed	656 feet by 656 feet 430,336 square feet 9.87 acres	None listed Albano silt loam	None listed
44LD0378	Native American 19th century	Indeterminate Native American Site and farmstead	Two stoneware sherds, two redware sherds, one whiteware sherd	One horseshoe	574 feet by 246 feet 141,204 square feet 3.24 acres	None listed Penn silt loam	None listed
44LD0380	Native American 20th century	Indeterminate site	One whiteware sherd, one glazed porcelain sherd	None listed	154 feet by 82 feet 12,628 square feet 0.28 acres	None listed Ashburn silt loam	None listed
44LD0407	No date	Single dwelling	None listed	None listed	225 feet by 225 feet 50,625 square feet 1.16 acres	None listed Rowland silt loam	None listed
44LD0442	Historic	Domestic site	None listed	One square nail	820 feet by 131 feet 107,420 square feet 2.46 acres	None listed Nestoria channery silt loam	None listed
44LD0444	19th century 20th century	Indeterminate site	None listed	None listed	10 feet by 26 feet 260 square feet 0.01 acres	None listed Penn silt loam	None listed

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Site Number	Site Chronology	Site Type	Historic Ceramic Artifacts	Other Historic Artifacts	Site Size	Soil Type	Additional Site Information
44LD447	19th century 20th century	Farmstead	Decalcomania, whiteware,	Bright green lightweight bottle glass, automatic machine-produced bottle glass, one silver plated spoon, one canning jar lid liner, solarized container glass, wire nails, coal, black plastic, plastic button, Portland cement	164 feet by 738 feet 121,032 square feet 2.77 acres	None listed Ashburn silt loam	None listed
44LD0448	20th century	Outbuilding	None listed	Tin plated steel roofing, wire nails	20 feet by 20 feet 400 square feet 0.01 acres	None listed Dulles silt loam	None listed
44LD0449	Historic	Farmstead	None listed	None listed	246 feet by 98 feet 24,108 square feet 0.55 acres	None listed Albano silt loam	None listed
44LD0451	Native American 19th century	Temporary camp and trash scatter	Various ceramic fragments	Various glass fragments	738 feet by 328 feet 242,064 square feet 5.55 acres	None listed Ashburn silt loam	Site is situated on a crest of a knoll
44LD0473	19th century	Indeterminate site	Various ceramic fragments	Various architectural material	None listed	None listed Dulles silt loam	None listed
44LD0474	Late Archaic Early Woodland 19th century 20th century	Domestic site	Various ceramic fragments	Auto safety glass	328 feet by 164 feet 53,792 square feet 1.23 acres	None listed Dulles silt loam	None listed
44LD0510	19th century 20th century	Single dwelling	One American stoneware sherd, one ironstone sherd	Vessel glass fragments, one window glass fragment, one lid liner	25 feet by 100 feet 2,500 square feet 0.05 acres	None listed Penn silt loam	None listed
44LD0511	20th century	Trash scatter	Five ironstone sherds, four American stoneware sherds	One bottle glass fragment	80 feet by 80 feet 6,400 square feet 1.46 acres	None listed Ashburn silt loam	None listed

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Site Number	Site Chronology	Site Type	Historic Ceramic Artifacts	Other Historic Artifacts	Site Size	Soil Type	Additional Site Information
44LD0644	No date	Single dwelling	Whiteware, porcelain	Wire nails, unidentified nail fragments, brick, mortar, cement, windowpane glass fragments, bottle glass fragments	250 feet by 200 feet 50,000 square feet 1.14 acres	None listed Dulles silt loam	Site is situated approximately 270 feet AMSL approximately 1,000 feet from Broad Run
44LD0645 See also 053-0021	20th century	Farmstead	None listed	None listed	200 feet by 200 feet 40,000 square feet 0.91 acres	None listed Dulles silt loam	Site is situated approximately 265 feet AMSL approximately 200 feet from Springhead
44LD0843	19th century	Single dwelling	Two whiteware sherds with blue decoration, one whiteware sherd with green hand painted decoration, six pearlware sherds, one refined white earthenware sherd, one creamware sherd, one pearlware sherd polychrome hand painted	Three lime soda windowpane glass fragments, one olive amber liquor bottle glass fragments degraded, two cut nail fragments, one amber cylindrical bottle fragments, one olive amber black glass cylindrical liquor bottle fragments, one pale green cylindrical bottle glass fragments, one wrought nail fragment, approximately 10.7 grams of mortar	100 feet by 200 feet 20,000 square feet 0.45 acres	None listed Ashburn silt loam	Site is situated approximately 263 feet AMSL on a ridgetop approximately 600 feet from a tributary of Broad Run
44LD0844	19th century 20th century	Single dwelling	Three whiteware sherds, two pearlware sherds, one redware sherd, one gray bodied coarse earthenware spall,	One unidentified nail fragment, three lime soda windowpane glass fragments, two olive amber cylindrical bottle glass fragments, 11 potash windowpane glass fragments, one clear glass fragments, two unidentified clear glass fragments, two cut nail fragments, approximately 183.3 grams of brick, one clear tableware curved glass	170 feet by 400 feet 68,000 square feet 1.56 acres	None listed Ashburn silt loam	Site is situated approximately 258 feet AMSL on a ridge top approximately 450 feet from a tributary of Broad Run

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Site Number	Site Chronology	Site Type	Historic Ceramic Artifacts	Other Historic Artifacts	Site Size	Soil Type	Additional Site Information
				fragments, four unidentified clear glass fragments heat and melted, three headless cut nails, two cut finishing nails, two cut nail fragments machine-headed, two cut nail fragments with unidentified heads, 13 wire nails, one brass and red plastic 12-guage shotgun shell, two ferrous metal buckle fragments, one unidentified ferrous metal fragment, one aqua glass fragment melted, one pale green glass fragment melted, one clear glass fragment melted, one cut nail with machine head, one cut finishing nail, three ferrous metal wire fragments, two ferrous metal barbed wire fragments, and approximately 50.1 grams of mortar			
44LD0845	19th century 20th century	Trash scatter	One whiteware sherd	Two post 1910 bottle glass sherds	25 feet by 25 feet 625 feet 0.01 acres	None listed Ashburn silt loam	Site is situated approximately 264 feet AMSL on a knoll approximately 800 feet from a tributary of Broad Run
44LD0852	19th century 20th century	Single dwelling and five outbuildings	Various ceramic sherds	Various glass fragments and nails	120 feet by 320 feet 38,400 square feet 0.88 acres	None listed Ashburn silt loam	Site is situated approximately 295 feet AMSL on a ridgetop approximately 300 feet from Elklick Run

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Site Number	Site Chronology	Site Type	Historic Ceramic Artifacts	Other Historic Artifacts	Site Size	Soil Type	Additional Site Information
44LD0967	19th century 20th century	Single dwelling	12 whiteware sherds, two ironstone sherds, one porcelain sherd, two stoneware sherds, one redware sherd, 10 manganese sherds,	Six contact mold bottle glass fragments, six chilled iron mold bottle glass fragments, three post 1898 bottle glass fragments, one post 1910 bottle glass fragment, one modern bottle glass fragment, three unidentified bottle glass fragments, one canning jar fragment, 21 lime soda windowpane glass fragments, one unidentified windowpane glass fragment, six unidentified glass fragments, six unidentified ferrous metal fragments, two unidentified nail fragments, one ferrous metal eye	240 feet by 500 feet 120,000 square feet 2.75 acres	None listed Penn silt loam	Site is situated approximately 307 feet AMSL on a ridge approximately 1,500 feet from Beaverdam Run
44LD0994	20th century	Agricultural site	One whiteware sherd	One stoneware drain tile sherd, one porcelain bathroom tile sherd, one post 1927 marble, one contact mold bottle glass fragments, four post 1910 bottle glass fragments, one unidentified bottle glass fragment, five tableware glass fragments, four lime soda windowpane glass fragments, one unidentified glass fragment, one aluminum pull tab, one bicycle chain fragment, nine wire nails, one bolt or nail fragment, one vinyl fragment, one plastic bullet	200 feet by 500 feet 100,000 square feet 2.29 acres	None listed Panorama silt loam	Site is situated approximately 265 feet AMSL on a ridge finger approximately 300 feet from a tributary of Beaverdam Run

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Site Number	Site Chronology	Site Type	Historic Ceramic Artifacts	Other Historic Artifacts	Site Size	Soil Type	Additional Site Information
44LD1167	20th century	Farmstead	Seven plain whiteware sherds, one blue transfer printed whiteware sherd, one redware flower pot	Aqua container glass fragments, clear container glass fragments, brown container glass fragments, one manganese tinted glass fragment, one porcelain doll's arm, three metal fragments, one leather fragment, three machine cut nails, one nail fragment, one rubber mason jay seal, four bone fragments, one silver plated butter knife, eight plastic fragments, five bottle glass fragments, two floor tile fragments, two aluminum pull tabs, one .22 caliber shell, one copper alloy nut	200 feet by 300 feet 60,000 square feet 1.37 acres	None listed Dulles silt loam	Site is situated approximately 320 feet AMSL on a sideslope approximately 400 feet from an unnamed tributary of Broad Run
44LD1240 See also 053-1100	19th century 20th century	Trash scatter	Two buff bodied coarse stoneware sherds, one ironstone sherds, two whiteware sherds	Three clear manganese glass fragments, four aqua colored glass fragments, one clear glass fragment	96 feet by 63 feet 6,048 square feet 0.13 acres	None listed Dulles silt loam	Site is situated approximately 265 feet AMSL on a ridge toe approximately 136 feet from a tributary of Broad Run
44LD1242	19th century 20th century	Farmstead	One transfer print whiteware sherd, one gray salt glazed stoneware sherd	One machine-manufactured bottle glass fragment	100 feet by 100 feet 10,000 square feet 0.22 acres	Nestoria gravelly silt loam	Site is situated approximately 254 feet AMSL on a hillock approximately 1,200 feet from Broad Run

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Site Number	Site Chronology	Site Type	Historic Ceramic Artifacts	Other Historic Artifacts	Site Size	Soil Type	Additional Site Information
44LD1243	20th century	Farmstead	None listed	Ferrous harrowing disc, colorless glass fragments, olive vessel glass fragments, wire fragments, wire nails, cut nails, amber bottle glass fragments, plastic fluorescent light cover, ceramic insulator fragment	350 feet by 400 feet 140,000 square feet 3.21 acres	Penn silt loam	Site is situated approximately 256 feet AMSL on a ridge finger approximately 520 feet from a unnamed tributary of Broad Run
44LD1244	Late Archaic 18th century 19th century	Temporary camp and trash scatter	Pearlware sherds, creamware sherds lusterware sherds	Aqua vessel glass fragments, 4/64-inch bore English ball clay pipe stem fragment	100 feet by 250 feet 25,000 square feet 0.57 acres	Ashburn silt loam	Site is situated approximately 258 feet AMSL on a ridge approximately 340 feet from a unnamed tributary of Broad Run
44LD1245	20th century	Farmstead	Whiteware sherds	Cut nails, wire nails, ferrous cooking pan handle, colorless flat and vessel glass fragments, unidentified ferrous fragments	150 feet by 175 feet 26,250 square feet 0.60 acres	Ashburn silt loam	Site is situated approximately 268 feet AMSL on a ridge approximately 1,120 feet from an unnamed tributary of Broad Run
44LD1246 See also 44LD1467	20th century	Farmstead	Green-edged refined earthenware sherds, burned hand painted whiteware sherds	Brick fragments, colorless flat glass fragments, cobalt blue vessel glass, cut fieldstone fragments, green aqua and colorless vessel glass fragments, terra cotta fragments	350 feet by 200 feet 70,000 square feet 1.60 acres	Albano silt loam	Site is situated approximately 260 feet AMSL on a ridge approximately 60 feet from an unnamed tributary of Broad Run

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Site Number	Site Chronology	Site Type	Historic Ceramic Artifacts	Other Historic Artifacts	Site Size	Soil Type	Additional Site Information
44LD1309	19th century 20th century	Single dwelling	11 whiteware sherds, one whiteware base sherd, one gray bodied stoneware sherd, one gray bodied stoneware spall, two unglazed redware sherds, one refined white earthenware sherd,	Two clear glass fragments, 23 clear bottle glass fragments, one clear square bottle glass fragment, three brick fragments, 14 unidentified clear glass fragments, one lid liner, three white plastic fragments, one milk jar fragment, two Ball blue glass jar fragments, two very pale green bottle glass fragments, six lime soda window glass fragments, one aluminum pull tab, one possible nail fragment, 13 amber bottle glass fragments, four plastic fragments, one blue molded plastic fragment, five aqua bottle glass fragments, one lead alloy escutcheon, one wire nail fragment, one charcoal fragment, three clear manganese bottle glass fragments	40 feet by 140 feet 5,600 square feet 0.12 acres	None listed Dulles silt loam	Site is situated approximately 320 feet AMSL near an unnamed tributary of Broad Run
44LD1311	19th century 20th century	Single dwelling	Three whiteware sherds, one hard paste porcelain sherd	Seven amber bottle glass fragments, 31 clear glass fragments, four cut nail fragments, three wire fragments, 15 wire nail fragments, two bone fragments, one slag fragment, three lime soda window glass fragments, 10 plastic fragments, one aqua bottle glass fragment, two unidentified green spall, two	130 feet by 200 feet 26,000 square feet 0.59 acres	None listed Ashburn silt loam	Site is situated approximately 280 feet AMSL near Broad Run

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Site Number	Site Chronology	Site Type	Historic Ceramic Artifacts	Other Historic Artifacts	Site Size	Soil Type	Additional Site Information
				green bottle glass fragments, one metal horseshoe fragment, five unidentified metal fragments, two unidentified nail fragments, two wire nails, four mortar fragments			
44LD1312	Middle Archaic 19th century	Large foundation	53 whiteware sherds, 21 ironstone sherds, seven redware sherds, three refined white earthenware sherds, two yellowware sherds, four hard paste porcelain sherds, one gray bodied coarse stoneware sherd, one buff bodied coarse stoneware sherd, one creamware sherd	Nine amber bottle glass fragments, 13 very pale aqua fragments, one white milk glass button, one leather fragment, one lime soda window glass fragments, one rubber fragment, two blue bottle glass fragments, 26 clear glass fragments, two white milk glass canning jar lid liners, one brass furniture decoration, one tin can base, two plastic fragments, 20 white milk glass fragments, five clear manganese bottle glass fragments, one pale green glass fragment, one unidentified metal fragment, two olive amber bottle glass fragments, one shell fragment, one green glass tableware fragment, one metal toy gun part, one plastic button, five wire nails, one unidentified lead fragment, one metal strap fragment, one unidentified nail fragment, one unidentified brass fragment	100 feet by 100 feet 10,000 square feet 0.22 acres	None listed Ashburn silt loam	Site is situated approximately 275 feet AMSL on a terrace near an unnamed tributary of Broad Run

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Site Number	Site Chronology	Site Type	Historic Ceramic Artifacts	Other Historic Artifacts	Site Size	Soil Type	Additional Site Information
44LD1313	19th century 20th century	Single dwelling	None listed	Glass fragments, metal fragments, nails, one bone fragment, one modern plastic fragment	50 feet by 150 feet 7,500 square feet 0.17 acres	None listed Albano silt loam	Site is situated approximately 280 feet AMSL on a ridge
44LD1314	19th century 20th century	Single dwelling	Various ceramic sherds	Cut nails, wire nails, glass fragments, modern plastic fragments, one stoneware Pamplin style pipe bowl fragment	300 feet by 150 feet 45,000 square feet 1.03 acres	None listed Albano silt loam	Site is situated approximately 295 feet AMSL
44LD1315	19th century 20th century	Single dwelling	One redware sherd with red glazed interior and unglazed exterior, one whiteware sherd undecorated base fragment	One unidentified clear glass fragment, four lime soda windowpane glass fragments, seven clear cylindrical bottle or tableware glass fragments rim/lip, five clear cylindrical bottle glass fragments with molded ridges and possible blown pattern mold, 28 clear cylindrical bottle jar glass fragments from an automatic bottle machine, 14 unidentified clear glass fragments, one cut nail fragment, eight unidentified wire or wire nail fragments	10 feet by 25 feet 250 square feet 0.01 acres	None listed Albano silt loam	Site is situated approximately 290 feet AMSL
44LD1343	Native American 20th century	Trash scatter	Two whiteware sherds with blue transfer printed rim, one hard paste porcelain sherd undecorated, one whiteware sherd undecorated rim stained, two whiteware sherds undecorated and stained, one hard paste porcelain sherd	Four 7-Up green cylindrical bottle glass fragments, six amber cylindrical bottle glass fragments, one amber base glass fragment, 14 clear cylindrical bottle/jar glass fragments with two pressed ridges, one clear mirror fragment, 10 unidentified clear glass fragments, eight plastic fragments, one Phillips head	429 feet by 184 feet 78,936 square feet 1.81 acres	None listed Dulles silt loam	Site is situated approximately 266 feet AMSL

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Site Number	Site Chronology	Site Type	Historic Ceramic Artifacts	Other Historic Artifacts	Site Size	Soil Type	Additional Site Information
			with red overglazed hand painted rim, three refined white earthenware sherds undecorated and green decoration and stain, one ironstone sherd undecorated handle, one redware sherd with brown glazed interior and exterior, one whiteware sherd with flower blue rim, one buff bodied stoneware sherd, one Bristol slipped exterior sherd with brown glazed interior stained, one hard paste porcelain sherd with blue transfer printed rim, one opaque porcelain sherd undecorated base	threaded screw, two Ball blue aqua cylindrical bottle/jar glass fragment, one glass thermometer fragment, one white milk glass cylindrical canning jar lid liner fragment, one terra cotta pipe fragment			
44LD1435	19th century 20th century	Farmstead	152 whiteware sherds, 17 ironstone sherds, 20 refined white earthenware sherds, four soft paste porcelain sherds, 28 hard paste porcelain sherds, two opaque porcelain sherds, 16 stoneware sherds, 10 redware sherds, one unidentified ceramic sherd,	14 terra cotta fragments, 365 bottle glass fragments, one bottle glass contact mold fragment, 25 clear manganese bottle glass fragments, 13 chilled iron mold bottle glass fragments, 191 automatic bottle machine bottle glass fragments, 28 glass tableware fragments, one clear manganese glass tableware fragment, six buttons, 184 lime	350 feet by 400 feet 140,000 square feet 3.21 acres	Ashburn silt loam	Site is situated approximately 250 feet AMSL on a ridge finger approximately 25 feet from an unnamed tributary of Broad Run

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Site Number	Site Chronology	Site Type	Historic Ceramic Artifacts	Other Historic Artifacts	Site Size	Soil Type	Additional Site Information
				soda window glass fragments, seven chimney lamp fragments, five plate glass fragments, 338 unidentified glass fragments, one wrought nail, 126 cut nails, 202 machine-head cut nails, 475 wire nails, 264 unidentified nails, 13 spikes, 55 metal fragments, one buckle, seven bullets, two horseshoe fragments, one spoon, 110 wire fragments, 267 sheet metal fragments, 19 unidentified brass fragments, 23 bone fragments, 66 brick fragments, five leather fragments, two battery rods, five plastic fragments, three shingle fragments, 40 slag fragments			
44LD1436	18th century 19th century 20th century	Outbuilding and road	One white salt glaze stoneware sherd	One lime soda window glass fragment, four nails, one spike, four wrought nails, two cut nails, two wire nails, 18 wire fragments, eight metal fragments, one bullet, one cast iron fragment	140 feet by 165 feet 23,100 square feet 0.53 acres	Nestoria gravelly silt loam	Site is situated approximately 240 feet AMSL on a ridge finger approximately 75 feet from an unnamed tributary of Broad Run
44LD1467	19th century 20th century	Farmstead	One refined earthenware sherd, one hard paste porcelain sherd, one stoneware sherd, one ironstone sherd, one whiteware sherd	36 bottle glass fragments, 11 duraglass bottle fragments, 10 unidentified glass fragments, 23 wire nails, one unidentified nail, seven unidentified ferrous metal fragments, two bone fragments, one tableware glass fragments, three plate glass	200 feet by 285 feet 57,000 square feet 1.30 acres	Ashburn silt loam	Site is situated approximately 255 feet AMSL on a ridge approximately 60 feet from an unnamed tributary of Broad Run

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Site Number	Site Chronology	Site Type	Historic Ceramic Artifacts	Other Historic Artifacts	Site Size	Soil Type	Additional Site Information
				fragments, 22 safety glass fragments, seven sheet glass fragments, 12 unidentified glass fragments, one unidentified clear manganese glass fragments, four aluminum fragments, two cut nails, two cut nails with machine heads, one unidentified nail, 11 asbestos fragments, one carbon battery rod, nine plastic fragments, one rubber fragment, two shell fragments, one screw			

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RESULTS

The purpose of the field survey is to provide specific information concerning the location, nature, and distribution of archaeological resources within the permit areas. Based on VDHR guidelines, Circa~ uses two types of designations for the grouping of archaeological resources: isolated finds and sites. An isolated find is defined when a limited number of artifacts are recovered from the ground surface or from shovel testing. This event may be either a casual or single-episode discard such as a projectile point or a bottle break or may be a small collection of artifacts related to various time periods, such as a projectile point from the Woodland period and a bottle fragment from the 20th century. An archaeological site is defined as a grouping of artifacts that date to specific periods and that reveal the location of human activity and land use.

Survey Results

This report combines the results of the Current Conditions assessment and the Phase I survey. The project area is divided into five areas by existing paved roads. A review of aerial photography from 1989 to 2007 shows how the project area and the surrounding region has changed and developed over the past 20 years (Figure 13 – 19). The area was originally shown as either farmlands, pasture, or wooded. Development around the project area begins to show on photography in 2002. In addition, the open fields begin to show more trees indicating that the areas are no longer under cultivation. The project map with the shovel test and site locations is in Appendix A.

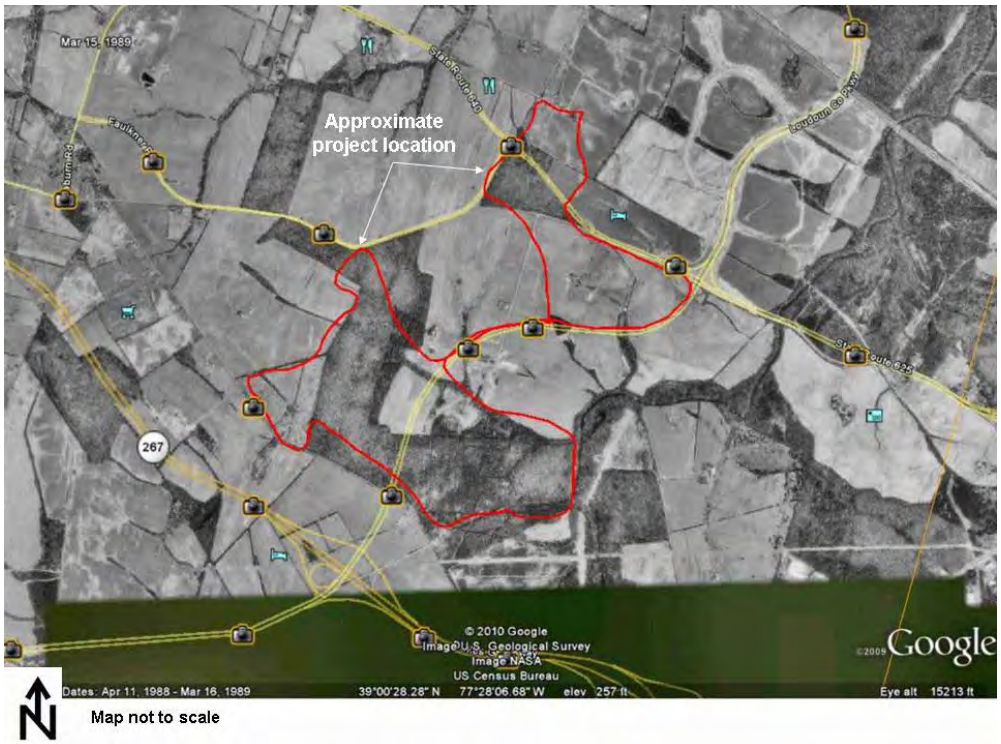

Figure 13. Detail of 1989 aerial, from Google earth.

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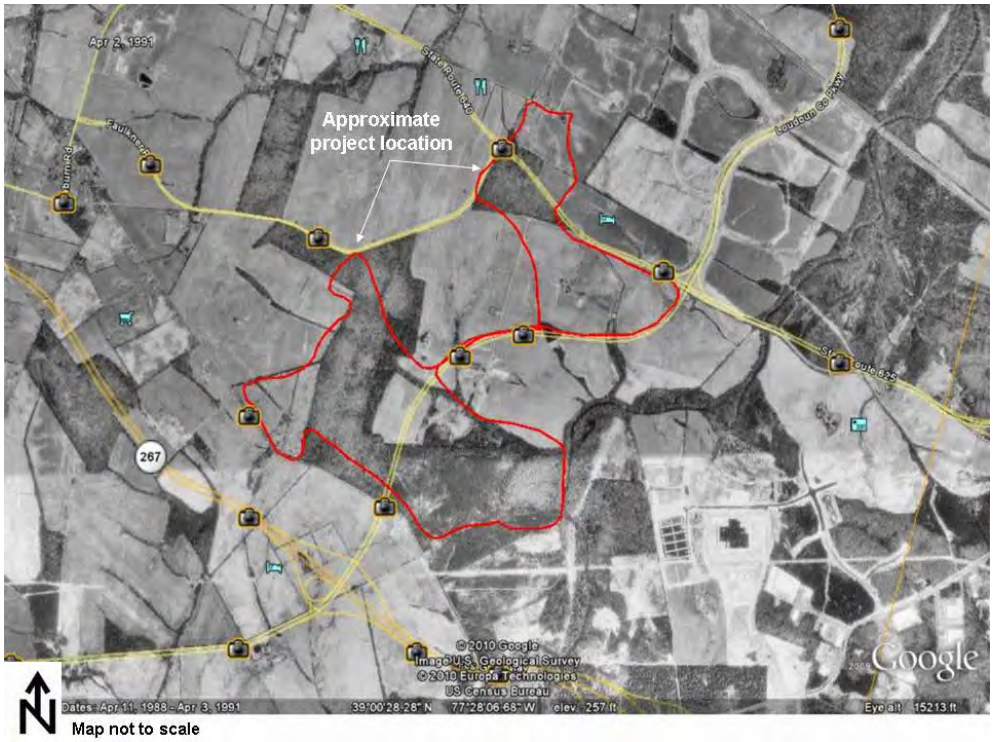

Figure 14. Detail of 1991 aerial, from Google earth.

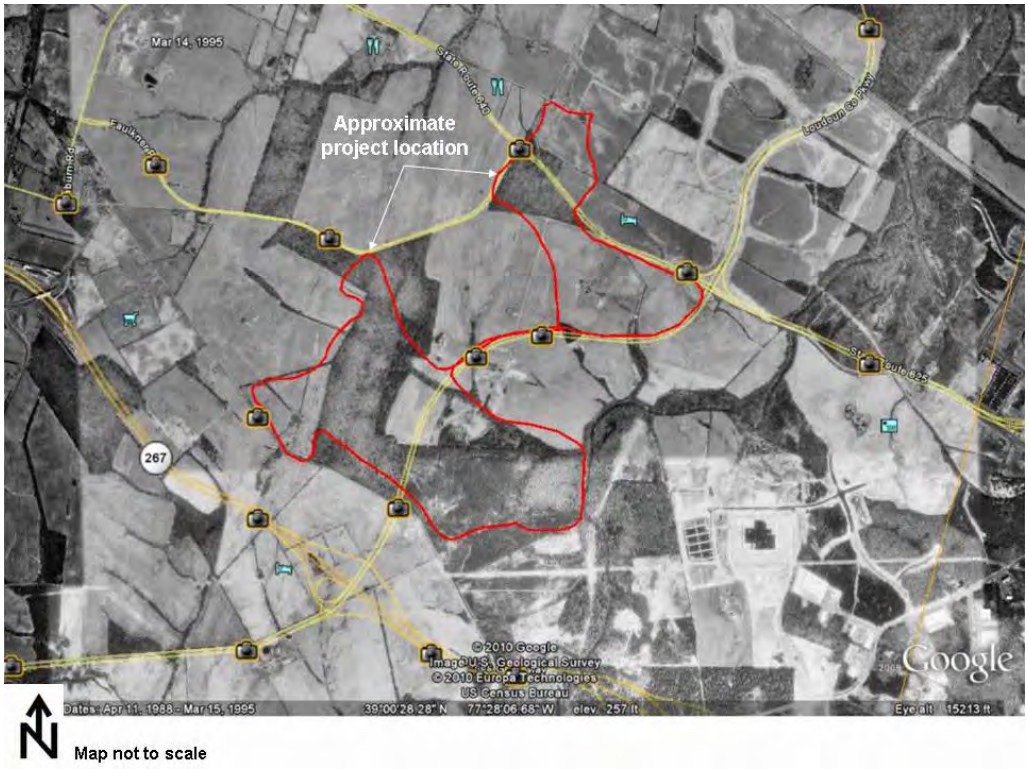

Figure 15. Detail of 1995 aerial, from Google earth.

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Figure 16. Detail of 2002 aerial from Google earth.

Figure 17. Detail of 2003 aerial from Google earth.

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Figure 18. Detail of 2006 aerial, from Google earth.

Figure 19. Detail of 2007 aerial, from Google earth.

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Area 1

Area 1 is located north of Waxpool Road, east of Smith Switch Road, south of Hastings Road, and east of an unnamed road. Area 1 has been heavily impacted by previous land use with utility easements along the western and southern edges of the tract, and a utility easement that runs roughly northwest to southeast across the project tract. In addition, several large stockpiles of construction debris, landscaping trees and shrubs, and soil are mounded on the eastern and northern section of the tract. Earthen landscaping mounds are also evident along the western, northern, and eastern sections of the tract. Subsoil is evident on the ground surface in the center of the tract. One small section of hardwoods and softwoods were evident along Waxpool Road; however, this area had water ponded on the surface during the previous and current survey. Plates 1 through 4 represent Area 1.

It is Circa~'s opinion that the soil integrity in this area has been completely destroyed by past land use. No shovel tests were placed within this area. No further archaeological survey work is recommended for this area.

Plate 1. View of Area 1, utility easements, view looking south.

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Plate 2. View of the interior section of Area 1, looking west.

Plate 3. View of the interior section of Area 1, looking west.

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Plate 4. View of stockpiled soil in Area 1, looking southwest.

Area 2

Area 2 is located south and east of Waxpool Road. Area 2 is a level landform covered in a fairly mature and open hardwood and softwood forest. Two archaeological sites were recorded within Area 2 (Figure 20). The traces of an old dirt road run roughly north to south across the northern section of the tract. An early to mid 20th century trash dump with aqua Mason jars and other trash is located on the eastern side of the road. Just to the north of this dump is an area where there were numerous metal-detecting holes excavated. The holes looked to have been excavated sometime in the summer or fall. Area 2 does not appear to have been impacted much by past land use, with disturbances limited to the western and northern edge of the tract where utility and road construction occurred. Plates 5 through 9 represent Area 2.

Circa~ excavated 360 shovel tests across this area. The grid was offset from the road to avoid areas where Miss Utility had marked underground lines. All of the shovel tests were negative. Figure 21 illustrates representative shovel test profiles. Shovel testing revealed two soil strata overlying subsoil. With only minor variation in thickness and expression of horizons, there is typically little difference between profiles recorded in the shovel tests excavated across the area. The strata represent differences in color and, in some cases, textures, and are mainly the product of post-depositional color enhancement and other effects of soil formation that is continually taking place in these more-or-less stabilized forested deposits.

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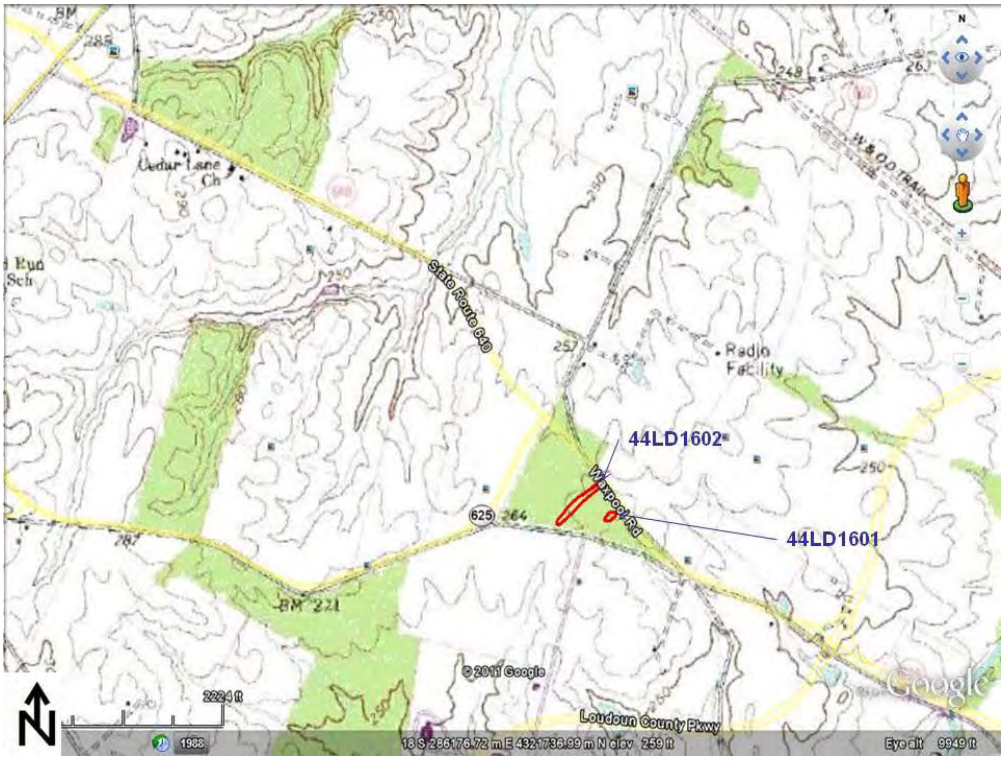

Figure 20. Map showing location of archaeological sites in Area 2.

Plate 5. View of Site 2, old road in Area 2, looking northwest.

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Plate 6. View of Site 1, trash dump, in Area 2, looking west.

Plate 7. View of area where metal-detecting holes were evident in Area 2, looking southwest.

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Plate 8. View of road and utility disturbance on eastern side of Area 2, looking east.

Plate 9. View of road and utility disturbance on western side of Area 2, looking north.

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Stratum A, lying under an inch or two of recent forest leaf mold and humified organic matter, is a dark, plowed topsoil or "A" horizon. This horizon has developed naturally from the accumulation of organic materials, additives from farming such as lime, manure, etc. and the activities of plants, animals, insects, bacteria, etc. in a plowed turbulent environment. Stratum A consisted of a dark red (2.5YR 3/6) loam and ranged in depth from 0.16 feet to 0.39 feet thick. The underlying plowed horizon, Stratum B, was a very uniform red (2.5YR 4/6) loam clay across the area and generally only varied in terms of overall thickness ranging from 0.68 feet to 1.09 feet; however, shovel test profiles on or near the slightly higher center of the area generally showed an overall redder hue. Its lower boundary was generally gradual and typically a gradation to the underlying horizon rather than an abrupt break. In addition, in some shovel tests this horizon could be subdivided based on minor color gradations, for example, a one-chip lowering or increasing of value or chroma on Munsell readings. Subsoil consisted of a red (2.5YR 4/6) wet dense clay.

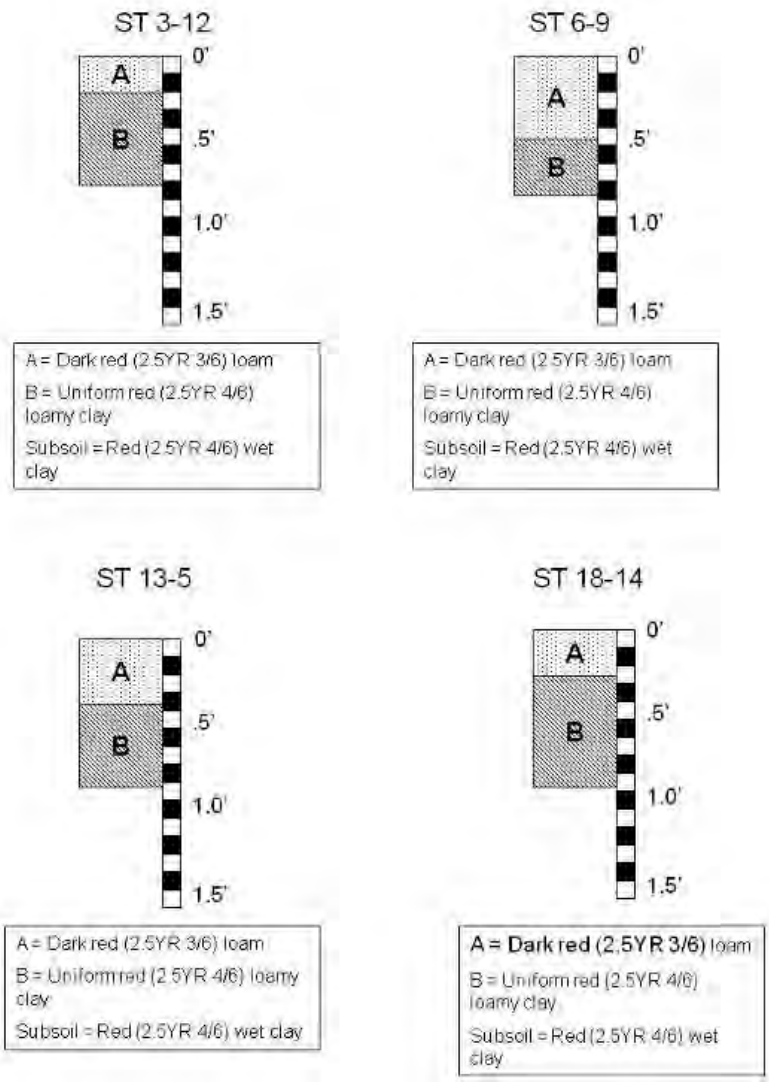

Figure 21. Representative shovel test profiles for Area 2.

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VDHR #44LD1601, Dump
This site is located on a broad upland terrace at the northwestern edge of the project tract, near Waxpool Road. The site is fairly level and is situated in an open hardwood and softwood forest with an understory of hollies, ferns, and blueberry bushes. Elevation is 265 feet AMSL and the landform drains to the southeast towards the lowlands.

The site was recorded by the surface scatter of artifacts located on the northern side of an old dirt road. Eighteen shovel tests were placed across the area where the dump was noted; all were negative. The Phase I shovel tests and surface scatter indicated artifacts concentrated within an area measuring approximately 50 feet north to south by 125 feet east to west. The site borders were defined by the concentration of artifacts on the surface and by negative shovel tests to the north, south, east, and west. Shovel test profiles revealed two soil strata above sterile subsoil. Stratum A, approximately 0.19 feet thick, consisted of a medium brown silty loam root mat. Stratum B, 0.52 feet thick, consisted of yellowish brown sandy clay. Subsoil consisted of yellowish orange compact clay.

This site consisted of a dump with a few broken bottles that date to the early 20th century. The area also had several new beer cans strewn about and it appeared as if several items had been removed and then discarded in another location within the dump. Aqua and clear mason jars, amber beer bottles, a tube from either a radio or a television, and a plastic and metal microscope were noted on the ground surface. The dump was not extensive and appeared to reflect one or possibly two dumping episodes. There was no metal evident, and it could be possible that individuals were collecting metal for resale purposes. This scrapping activity could also account for what appears to be metal-detecting holes located to the southeast of the site.

This site appears to have been used circa post 1920s and is a dump located on the edge of an abandoned road. The artifacts were concentrated on the surface and no cultural layers or features were noted during shovel testing. Given the absence of cultural layers or features, Circa~ recommends that this site offers no further research potential, and is not eligible for listing in the National Register. No further archaeological testing of this site is recommended.

VDHR #44LD1602, Road
This site is located on a broad upland terrace at the northwestern section of the project tract, near Waxpool Road. The site is fairly level and is situated in an open hardwood and softwood forest with an understory of hollies, ferns, and blueberry bushes. Elevation is 265 feet AMSL and the landform drains to the southeast towards the lowlands.

The site was recorded by faint impression of the road trace. Twenty-one shovel tests were placed along the length of the road; all were negative. The Phase I shovel tests and surface impression identified the site borders. Shovel test profiles revealed two soil strata above sterile subsoil. Stratum A, approximately 0.21 feet thick, consisted of a medium brown silty loam root mat. Stratum B, 0.56 feet thick, consisted of yellowish brown sandy clay. Subsoil consisted of yellowish orange compact clay.

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The faint traces of an old dirt road, probably for farm use, runs 600 feet northwest to southeast across the area. The road did not see much traffic or use as its depression was very faint, roughly one inch to two inches below the present surrounding grade. The road was in use during the early 20th century as the dump dates to that period. This road does not meet the eligibility requirements for listing on the National Register of Historic Places and no further work is recommended for this location.

Area 3

Area 3 is located south of Waxpool Road and west of Loudoun County Parkway. Area 3 consists of rolling hills with a high level knoll where it is evident that a house and possibly a barn once stood. Twentieth century domestic- and farm-related trash is strewn in this area. An elevated farm lane runs north to south from Waxpool Road through the overgrown fields and terminates in a grove of old trees. The sideslopes and tops of the rolling hills are overgrown in thick cedars and tall sedges. The farm fields in the center of this area are low and wet with water ponded on the ground surface. The top of the knoll near the intersection of Waxpool Road and Loudoun County Parkway has been disturbed, as subsoil is evident on the ground surface. The ground vegetation is this area is also minimal. A sewer line runs along the edge of a small stream beginning at Loudoun County Parkway and continuing north to Waxpool Road. Roughly ½ of Area 3 does appear to have been impacted by past land use, with disturbances recorded along the western, northern, and southern edges of the tract where utility and road construction occurred and the top of the knoll where subsoil is evident on the ground surface. In addition, the sideslopes and the low wet fields would have low potential for containing archaeological resources. The northern section of the tract was heavily rutted. Two archaeological sites were recorded within Area 2 (Figure 22). Plates 10 through 15 represent Area 3.

Circa~'s excavation grid planned for 525 shovel tests across this area. Of these, 484 were excavated and 41 were skipped due to wet areas or disturbance. All of the shovel tests were negative. Figure 23 illustrates representative shovel test profiles. Shovel testing revealed one soil strata overlying subsoil. Stratum A, lying under an inch or two of grass mat, is a dark, relic plowed topsoil or "A" horizon. This horizon has developed naturally from the accumulation of organic materials, additives from farming such as lime, manure, etc. and the activities of plants, animals, insects, bacteria, etc. in a plowed turbulent environment. Stratum A consisted of a dark red (2.5YR 3/6) loam and ranged in depth from 0.09 feet to 0.69 feet thick. Subsoil consisted of a red (2.5YR 4/6) wet dense clay.

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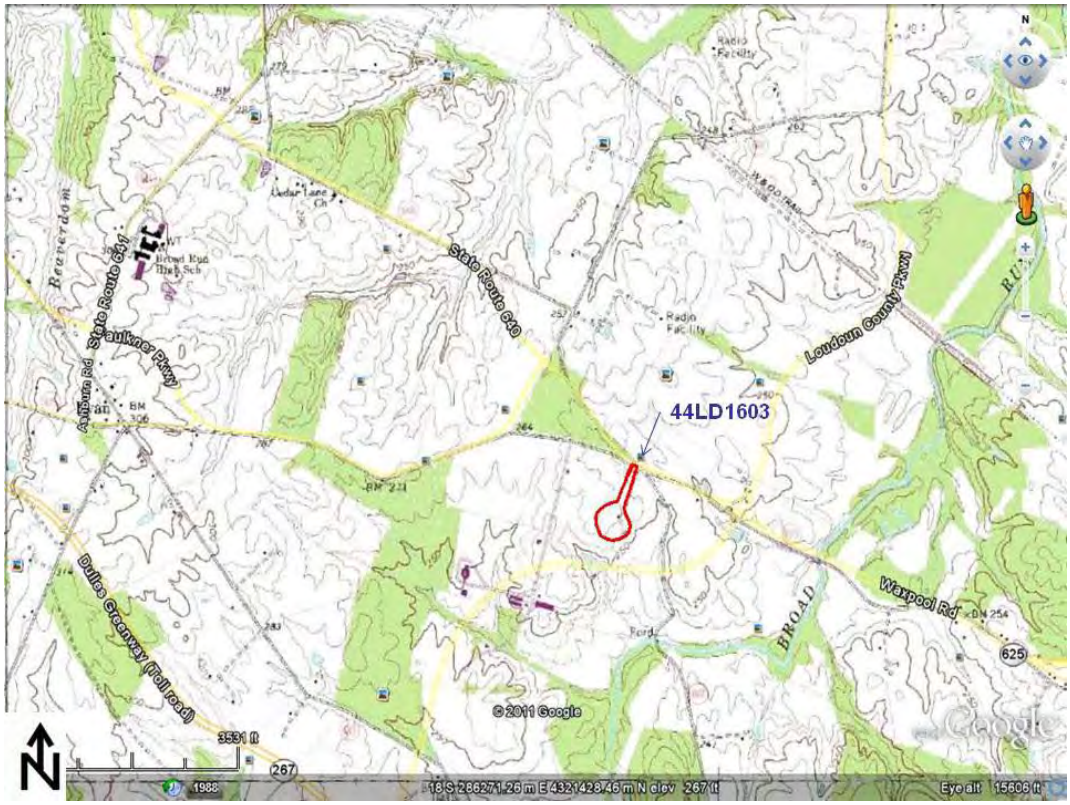

Figure 22. Map showing location of archaeological site in Area 3.

Plate 10. View of stream and slopes in Area 3, note grove of trees where house once stood, looking southwest.

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Plate 11. View of house location in Area 3, looking west.

Plate 12. View of the old farm road in Area 3, looking north.

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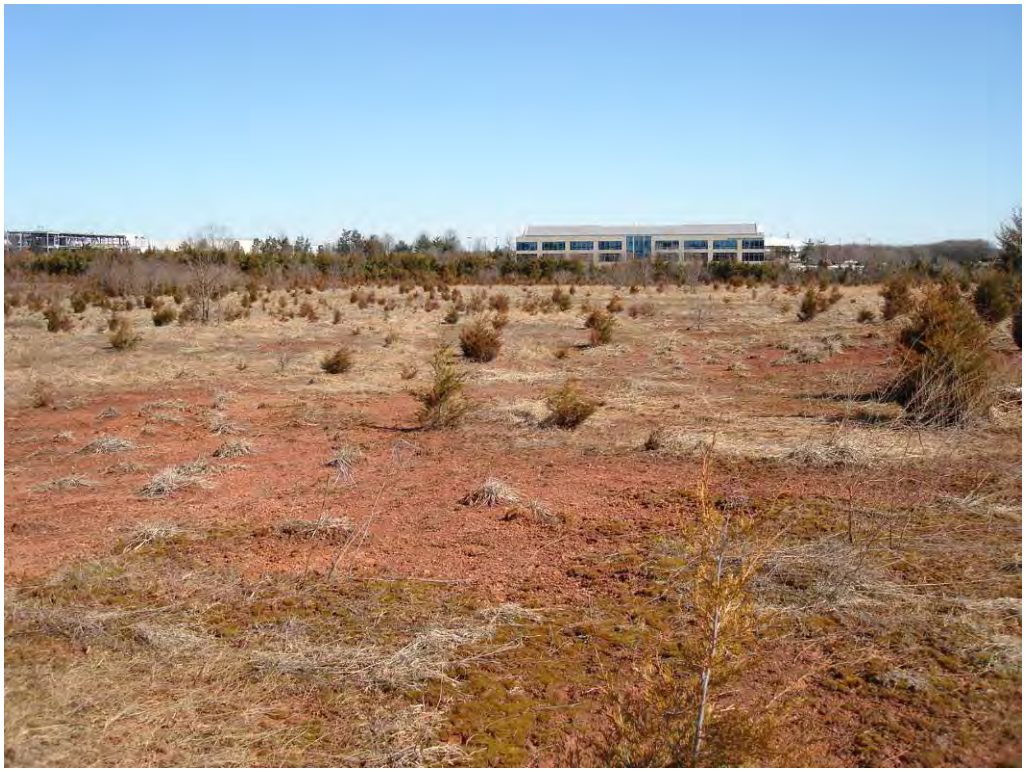

Plate 13. View of top of knoll, note subsoil on ground surface of Area 3, looking north.

Plate.14 View of pipeline easement in Area 3, looking northwest.

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Plate 15. View of low area with ponded water in Area 3, looking northwest.

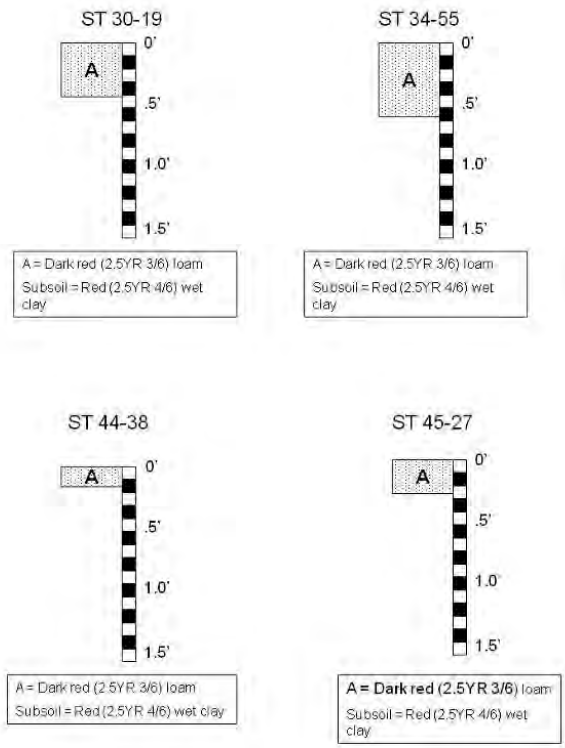

Figure 23. Representative shovel test profiles for Area 3.

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VDHR #44LD1603
An old elevated farm road leads from Waxpool Road southwest to the top of the knoll where it is evident that a structure or structures once stood. The area is wooded with cedars and mature oaks. This site is located on the edge of a broad upland terrace, south of Waxpool Road, near the southern edge of the project tract. The site is fairly level and is situated in an open hardwood and softwood forest with an understory of hollies, ferns, and blueberry bushes. Elevation is 275 feet AMSL and the landform drains to the north towards the lowlands.

The site was recorded by the surface scatter of artifacts including metal, brick, wood, and fencing and some domesticated plants located on the top of the knoll. Ninety-six shovel tests were placed across the area where the metal was strewn. With the exception of metal fragments, all were negative. The metal fragments consisted of tractor and machine parts, barbed wire, and iron pipe fragments. The Phase I shovel tests and surface scatter indicated artifacts concentrated within an area measuring approximately 1,100 feet north to south by 500 feet east to west. The site borders were defined by the concentration of artifacts on the surface, the landform, and by negative shovel tests to the north, south, east, and west.

Circa~ went back to this site location to see if the metal-detector would pick up any additional features associated with the 20th century house or a possibly early house belonging to the Taylors. Circa~ staff did not notice any previous metal-detecting activities from relic hunters in the area.

Using Fisher Model #1266-XB Deep Search all-metal metal detectors, Circa~ archaeologists slowly walked along the top of the knoll overlapping from south to north and from west to east. As the archaeologists walked along the corridor, they slowly swung the head of the metal detector perpendicular with each transect being walked. Each time the metal detector alerted the archaeologist to the presence of a ground surface or sub-ground surface metallic object, a non-metallic pin flag was placed on the suspect location. After total transect completion, each suspect area and the ground surface immediately surrounding the suspect area were again metal detected for additional hits. Following the completion of this procedure, each suspect area was excavated using a round shovel and/or trowel and all soils were screened through ¼-inch hardware cloth until artifacts were recovered. All excavated soils and all areas surrounding the excavation were continually surveyed using the metal detector until the unit registered no alerts as to the presence of metallic artifacts at which point, at that location the metal detector survey was concluded.

Modern metal trash was evident strewn about the site. Metal fencing, pipes, and farm equipment interfered with the signal in several locations. The buried metal-detecting hits consisted of electrical wire, foil, tin cans, a galvanized bucket, metal fence posts, wire nails, a screwdriver with a plastic handle embossed Craftsman, barbed wire, and old car and tractor parts. None of the metal-detecting excavations showed a deep soil profile and the metal was sometimes buried completely or was sometimes protruding from the ground.

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Shovel tests in this area revealed the clay soil just under the grass mat. There are some abandoned farm equipment, fencing, boards, and other modern debris scatted around the area. According to aerial photographs, it appears that the house was razed sometime prior to 2002. Although no photos were available of the house, aerial photos show that the complex consisted of one house with one barn approximately 300 feet southeast of the dwelling and one barn approximately 200 feet northwest of the dwelling. One of the barns appears to be located out of the project tract and the other barn is located within an area that had been previously disturbed. Historic mapping, particularly the 1853 Yardley Taylor map, indicates the name Taylor is possibly associated with this area (Figure 24). A review of the aerial mapping shows that the location of the crossroads shown on the old map may have been located to the east of the farm road, near where the sewer line utility is located. However, it is impossible to tell exactly where the dwelling shown on this map is located. If the house shown on the 1853 map was located within Area 3, it was most likely demolished prior to when the 20th century house was constructed. It is also possible that the house could have been within the area now developed with Loudoun County Parkway, or within the new construction just to the west of Area 3. No evidence of this earlier house was found during the course of the Phase I survey.

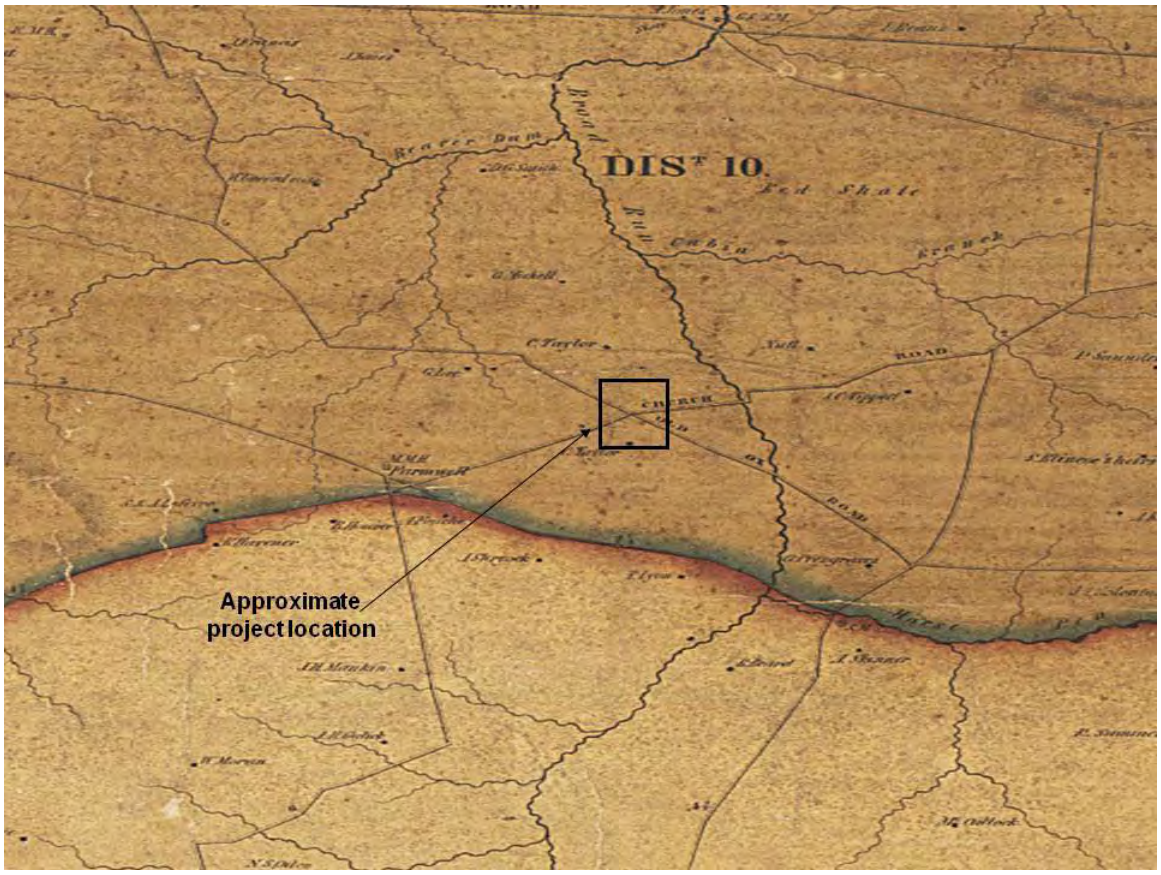

Figure 24. Detail of Map of Loudoun County, by Yardley Taylor, 1853.

This site appears to have been used circa post 1920s and represents a demolished house located at the end of an elevated farm road. The artifacts were concentrated on the surface and no cultural layers or features were noted during shovel testing. The subsoil

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was evident just beneath the grass mat. The house has been demolished sometime after 2002, and it appears from the rutting and from the shovel testing that heavy equipment was used to tear down the structure. Given the absence of cultural layers or features, Circa~ recommends that this site offers no further research potential, and is not eligible for listing in the National Register. No further archaeological testing of this site is recommended.

Area 4

Area 4 is located north of Shellhorn Road and west of Loudoun County Parkway. Area 4 consists of rolling hills with moderately steep side slopes with low bottomlands.

VDHR # 44LD0646/053-0021

It is evident that a house and possibly a barn once stood along Shellhorn Road. This structure was identified as Site 44LD0646, a 20th century farmstead measuring approximately 200 feet by 200 feet. Thunderbird Archaeological Association completed a Phase I survey of this area. Their survey included the excavation of 14 shovel tests placed near the standing structure. Of those, eight shovel tests contained artifacts from the early to late 20th century. The standing structure was given the VDHR architectural number 053-0021. The structure was identified as the ca. 1910 Lyon's Farmstead located on the north side of Route 643. A Phase I survey of the site was conducted in January 1988 and noted one single dwelling and one garage. In 2005, the buildings were reported demolished. In addition to the buildings, the survey also noted an associated cemetery across Route 643 from the farmstead placing the cemetery outside the current project area. The cemetery was given the VDHR architectural number 053-6074.

Twentieth century domestic and farm-related trash is strewn in the area identified as 44LD0646. The house and barn have been demolished as noted in 2005. The sideslopes and tops of the rolling hills are overgrown in cedars and tall sedges in the western section of Area 4. The central portion of the project area is covered in a fairly mature hardwood and softwood forest. The top of the knoll near Loudoun County Parkway is currently being used as a place to stockpile dirt. A sewer line runs along the northern edge of Area 4 on the southern side of a small stream beginning at Loudoun County Parkway and continuing northwest to Waxpool Road. The wooded portion of Area 4 does not appear to have been impacted much by past land use, with disturbances limited to the western, northern, and southern edges of the tract where utility and road construction occurred and the area where a powerline crosses and the soil is stockpiled. However, the sideslopes and the low wet fields would have low potential for containing archaeological resources. Plates 16 through 19 represent Area 4.

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Plate 16. Site 44LD0646 area, showing structures demolished in Area 4, view looking northeast.

Plate 17. View showing power line easement and portion of dirt stockpiled in Area 4, looking northwest.

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Plate 18. View of sewer line right-of-way in Area 4, looking west.

Plate 19. View of woods in Area 4, looking northwest.

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Circa~'s excavation grid planned for 993 shovel tests across this area. Of these, 790 were dug and 203 were skipped due to wet areas, disturbed soil evident on the ground surface, and utilities. All of the shovel tests were negative with the exception of a few that contained modern trash along the edge of the tract to the west along the road. Figure 25 illustrates representative shovel test profiles. Shovel testing revealed two soil strata overlying subsoil. With only minor variation in thickness and expression of horizons, there is typically little difference between profiles recorded in the shovel tests excavated across the high flat area in the woods. The strata represent differences in color and, in some cases, textures, and are mainly the product of post-depositional color enhancement and other effects of soil formation that is continually taking place in these more-or-less stabilized forested deposits.

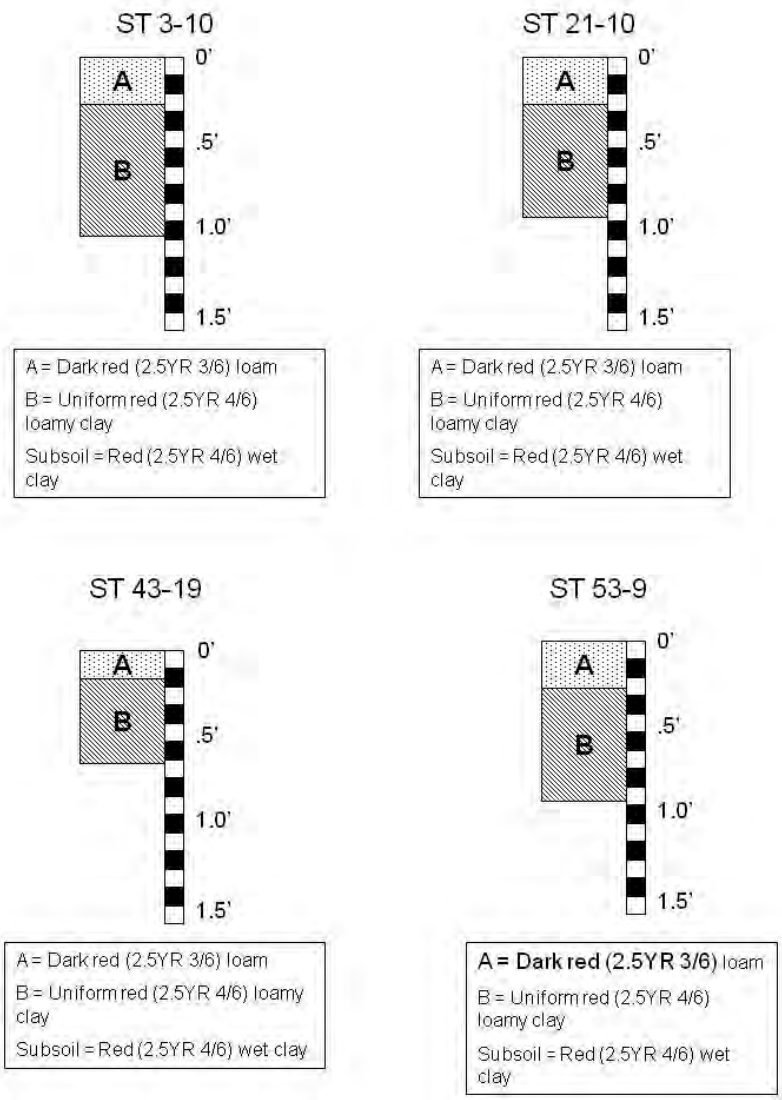

Figure 25. Representative shovel test profiles for Area 4.

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Stratum A, lying under an inch or two of recent forest leaf mold and humified organic matter, is a dark, plowed topsoil or "A" horizon. This horizon has developed naturally from the accumulation of organic materials, additives from farming such as lime, manure, etc. and the activities of plants, animals, insects, bacteria, etc. in a plowed turbulent environment. Stratum A consisted of a dark red (2.5YR 3/6) loam and ranged in depth from 0.12 feet to 0.24 feet thick.

The underlying plowed horizon, Stratum B, was a very uniform red (2.5 YR 4/6) loam clay across the area and generally only varied in terms of overall thickness ranging from 0.69 feet to 1.19 feet; however, shovel test profiles on or near the slightly higher center of the area generally showed an overall redder hue. Its lower boundary was generally gradual and more typically a gradation to the underlying horizon rather than an abrupt break. In addition, in some shovel tests this horizon could be subdivided based on minor color gradations, for example, a one-chip lowering or increasing of value or chroma on Munsell readings. Subsoil consisted of a red (2.5YR 4/6) wet clay.

No resources were recorded in Area 4.

Area 5

Area 5 is located north of Shellhorn Road and east of Loudoun County Parkway. Area 5 consists of rolling hills with moderately steep side slopes with low bottomlands. The sideslopes and tops of the rolling hills are overgrown in a dense grove of cedars that is quite difficult to maneuver through. A utility easement runs in the low land just to the north of Shellhorn Road. The wooded portion of Area 5 did not originally appear to have been impacted much by past land use, with disturbances limited to the western, northern, and southern edges of the tract where utility and road construction occurred, the area where a power line crosses, and an area where grading has taken place. However, the side slopes and the low wet areas would have low potential for containing archaeological resources. One architectural site was recorded within Area 5 (Figure 26). Plates 20 through 26 represent Area 5.

VDHR # 44LD0409

One previously identified archaeological site was located on the northeastern section of the project tract. Site 44LD0409 was identified as a Native American small transient campsite measuring approximately 82 feet by 33 feet. WAPORA completed a Phase I survey of the site in May 1988 for the Dulles Toll Road Extension Alignment P and noted that most of the artifacts were found in piles of earth resulting from clearing of a small dirt road. WAPORA shovel tested the areas around these piles and only one shovel test was positive. WAPORA recommended no further work for this resource. The area of the site was revisited during this survey, however, it appears as if more ground disturbance has occurred in this area and the subsoil is exposed on the ground surface.

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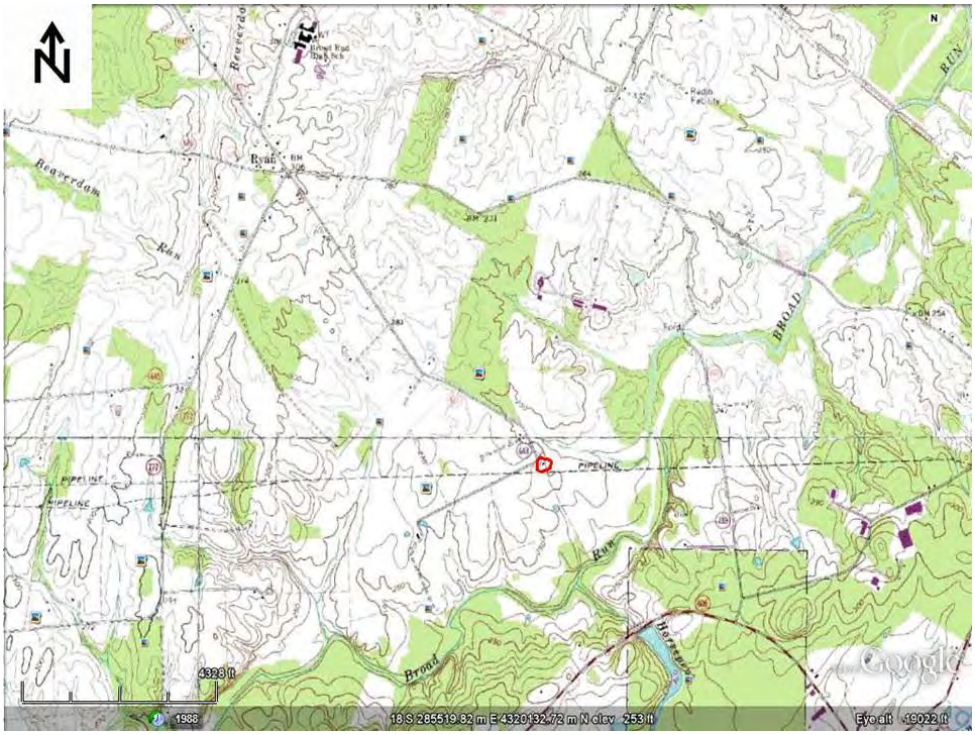

Figure 26. Map showing location of architectural site in Area 5.

VDHR #053-6295

A wood-frame barn and concrete-block pump house still stand along Shellhorn Road in the southeastern section of the project tract. The barn is part of a complex that is located just outside of the project tract. The complex consists of other wood-frame outbuildings and the burned ruins of the main dwelling. Twentieth century domestic- and farm-related trash is strewn in this area.

Plate 20. View of barn ruins in Area 5, looking northeast.

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Plate 21. View of pump house in Area 5, looking northwest.

Plate 22. View of debris in Area 5, looking west.

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Plate 23. View of wood-frame outbuilding just outside Area 5, looking northeast.

Plate 24. View of shed ruins and the burned main dwelling just outside Area 5, looking east.

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Plate 25. View of burned main dwelling just outside of Area 5, looking east.

Plate 26. View of power line easement in Area 5, looking east.

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Circa~'s excavation grid planned for 1,052 shovel tests across this area. No shovel tests were skipped and all of the shovel tests were negative. Figure 27 illustrates representative shovel test profiles. Shovel testing revealed one eroded soil strata overlying subsoil. Stratum A, lying under an inch or two of root mat, is a dark, relic plowed topsoil or "A" horizon. This horizon has developed naturally from the accumulation of organic materials, additives from farming such as lime, manure, etc. and the activities of plants, animals, insects, bacteria, etc. in a plowed turbulent environment. Stratum A consisted of a dark red (2.5YR 3/6) loam and ranged in depth from 0.09 feet to 0.69 feet thick. Subsoil consisted of a red (2.5YR 4/6) wet clay.

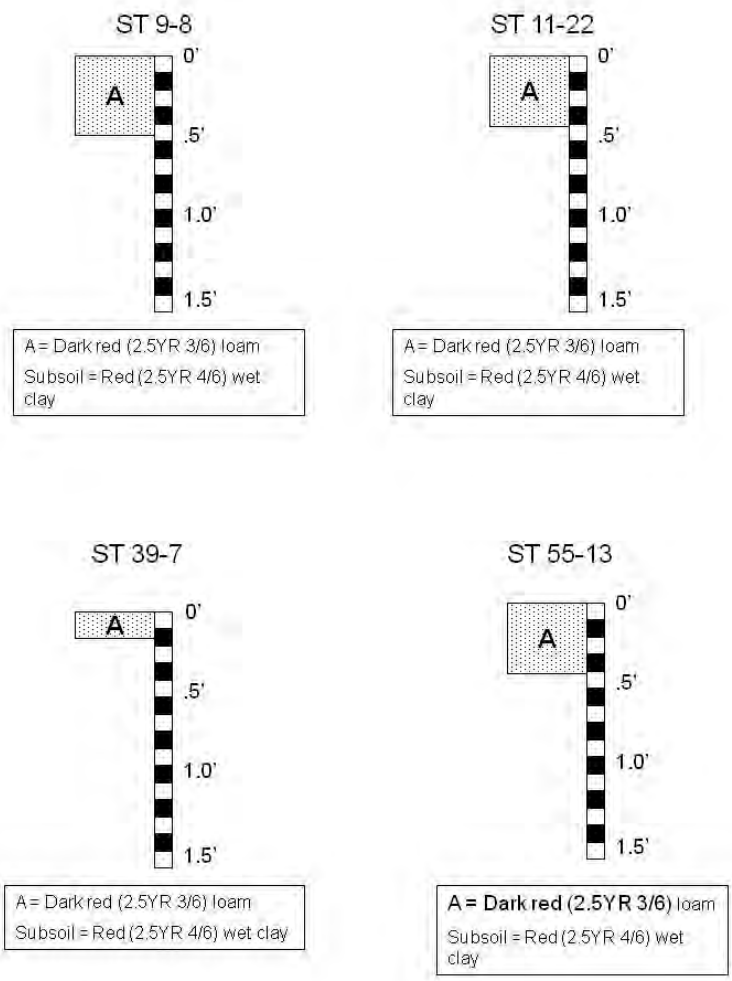

Figure 27. Representative shovel test profiles for Area 5.

No resources, beyond the house site located just off the project border near Shellhorn Road were recorded in Area 5. Of note was that a cash register was found near Transect 7 Shovel Test 22. The cash register was fairly new and showed signs of being broken into. A few coins, mostly pennies and nickels, were strewn on the ground around the find. The local police were contacted and they took the register and coins back to their office.

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Architectural Resources
There are no structures greater than 45 years of age in the area immediately surrounding or on the project area.

CONCLUSIONS AND RECOMMENDATIONS

Initially, Circa~ investigators anticipated the discovery of new Native American and historic sites during the survey of the project tract. The background research had shown that there were sites recorded around the project tract on similar landforms and soils and Circa~ investigators were expecting new discoveries that could add to this previous work and the historical and archaeological record of the region. New and previously recorded sites and components were anticipated to be in general, small Native American camps and temporary camps featuring mostly lithic scatters and historic sites including farmsteads and dwellings dating to periods as early as the early 19th century through the 20th century.

At the conclusion of the Phase I survey and a review of the project tract, it appears as if Areas 3 and 5 have been impacted by past agricultural activities with the topsoil being completely eroded by past agricultural activities with a thick mat of grass and/or thick stand of cedars now covering the subsoil. In addition, the landforms with potential to contain Native American resources along the creek in Areas 3 and 4, has been impacted by the location of gravity sewer lines along the edges of the stream banks. Shovel testing within the level areas within Areas 2 and 4, reveled intact relic plowzones without any artifacts. A review of historic maps and the deed research show that these areas where interior fields on the overall larger farms. These areas out of all of the project area are a greater distance from water. Taking all of this into consideration coupled with the Phase I survey efforts, Circa~ recommends no further work for the project area.

Archaeological Resources

VDHR #44LD1601
This site appears to have been used circa post 1920s and is a dump located on the edge of an abandoned road. The artifacts were concentrated on the surface and no cultural layers or features were noted during shovel testing. Given the absence of cultural layers or features, Circa~ recommends that this site offers no further research potential, and is not eligible for listing in the National Register. No further archaeological testing of this site is recommended.

VDHR #44LD1602
This site represents the faint traces of an old dirt road, probably for farm use, that runs 600 feet northwest to southeast across the area. The road did not see much traffic or use as its depression was very faint, roughly one inch to two inches below the present surrounding grade. The road was in use during the early 20th century as the nearby dump dates to that period. This road does not meet the eligibility requirements for listing on the National Register of Historic Places and Circa~ recommends no further work for this location.

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VDHR #44LD1603

This site appears to have been used circa post 1920s and represents a demolished house located at the end of an elevated farm road. The artifacts were concentrated on the surface and no cultural layers or features were noted during shovel testing. The subsoil was evident just beneath the grass mat. The house has been demolished sometime after 2002, and it appears from the rutting and from the shovel testing that heavy equipment was used to tear down the structure. Given the absence of cultural layers or features, Circa~ recommends that this site offers no further research potential, and is not eligible for listing in the National Register. No further archaeological testing of this site is recommended.

Architectural Resources

VDHR #053-6295

This complex is vacant and in a deteriorated state. All of the buildings except one are ruins, thus greatly reducing any integrity they once possessed. The complex does not appear to possess any unique characteristics that would separate it from other early to mid 20th century farmstead in Loudoun County. The design and workmanship appear undistinguished and the construction materials appear common (Criteria C). A preliminary review of historical records including various maps and historic contexts for Loudoun County does not indicate significant contributions with events (Criteria A) or persons (Criteria B) associated with the property. Considering this, the farmstead does not appear to be potentially eligible for the National Register of Historic Places under Criteria A, B, or C. Circa~ recommends no further survey work on this resource.

Table 8. Summary of identified resources and recommendations

Site	Type	National Register Eligibility	Recommendation
44LD0409	Native American transient campsite	No	Previously recommended no further work, Circa~ concurs
44LD0646/ 053-0021	20th century farmstead	No	Previously recommended no further work, Circa~ concurs
44LD1601	20th century dump	No	No further work
44LD1602	20th century road	No	No further work
44LD1603	20th century house site	No	No further work
053-6295	20th century barn	No	No further work

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APPENDIX IV

AVOIDANCE & MINIMIZATION ANALYSIS

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Avoidance & Minimization – Loudoun Center

PROJECT PURPOSE AND NEED

The purpose of the proposed project is the construction of a total of eight (8) two-story datacenter buildings and associated infrastructure to meet the rapidly growing demand for data center space and services in Loudoun County, Virginia. Key industries such as healthcare, banking and government defense and intelligence sectors have dramatically increased the demand for data center facilities in Loudoun County.

The project would also include the construction of a Dominion Power (DP) substation along Shellhorn Drive which would be constructed with Phase II of this project. The project site is zoned as Commercial/Industrial, which is appropriate for the proposed use. There are currently three separate parcels (Loudoun County PINs: 089-48-1925, 089-49-6285, and 089-30-9997) of land within the 133.22-acre project site and the proposed project would retain the lots. The maximum permitted floor area ratio (FAR) is 0.40. As currently designed, the site plans for the two Phases (approved) achieves a 0.38 FAR.

The project would be constructed in three phases. Buildings LC 4 and LC 5, located in the northern portion of the project site, and Building LC 6, located in the southeastern portion of the project site, would be developed during Phase I. Buildings LC11, LC12, LC13, and LC14 located in the south-central portion of the project site would be developed during Phase II. The remainder of the site, which includes the two additional two-story datacenter buildings and the stormwater management facility, will be constructed during Phase III of the project. Each building would include support facilities for electrical rooms, storage rooms, meeting rooms, break rooms, restrooms, the building lobby, outdoor chiller equipment space, etc. The roofs will accommodate additional equipment storage. Phase II is expected to begin in 2025 and would be complete in early 2035. Phase III schedule is not yet planned and will be permitted at a future date.

Access to the site is pre-determined by existing Loudoun County and VDOT road construction (existing median breaks in Old Waxpool, Shellhorn and Loudoun County Parkway as well as existing entrance locations that have been set based on minimum intersection spacing requirements along the frontage roads) that are also consistent with previous legislative approvals (MCI Worldcom Zoning ZMAP 1998-0003; Greenway Corporate Park ZMAP 2000-0006) that dictate site access locations. Additionally, site access has been carefully coordinated with planned Loudoun County CTP roadway improvements for the construction of new Lockridge West Road and Prentice Road through the subject sites.

MARKET ANALYSIS & PROJECT DEMAND

This data center site is located in the largest data center market in the world, Loudoun County, because of the robust infrastructure (power and fiber) available to the tenant at the capabilities they require to support their business. Loudoun County is the leader in Northern Virginia for data centers with nearly 100 data center buildings comprising more than 18 million square feet of data center space with millions more being planned and/or developed. Nearly 61% percent of the world's internet traffic flows through Northern Virginia's data centers each day (*Source: https://wtop.com/business-finance/2021/03/northern-*

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virginia-remains-king-of-data-centers/). To meet the existing and future demand on data center infrastructure in the vicinity, additional facilities are needed.

The demand for data center space has never been higher, with Northern Virginia being one of, if not the largest and most in-demand data center market in the world. Over the past few years, this has naturally led to a diminishing supply of appropriately zoned land and has driven industrial land prices to numbers not previously seen.

In addition, the applicant's and subsequently their tenant's businesses need support facilities in the proximity of other currently operated facilities, as it is essential to their operations and support staff to make it financially viable. To further elaborate, each of tenant's datacenters are located within specific communications zones that the tenant uses.

The healthcare industry, prominent in the DC-Metro region, is placing increased pressure on data center developments and cloud storage availability. Cloud computing is becoming the preferred choice for healthcare back-office applications, backup and disaster recovery, revenue cycle management and patient engagement. Advantages of the cloud can also include, cost savings, scalability, speed, freed up internal storage, a mobilized workforce, and improved user applications.

As healthcare organizations continue to embrace advanced health IT infrastructure technology, the volume of data collected and stored will increase accordingly. Organizations need to ensure their data is stored securely and is accessible to protect patient data. Clinicians must also have access to data where and when they need it for a successful data storage option. As such, proximity to stored data is paramount.

Data center storage space is paramount for the development of 5G streaming services. 5G will be faster, more stable, and more versatile than existing 4G technology, and the new network can both prioritize the different types of data streaming and handle the more than 8.4 billion IoT connected devices. 5G service will aid in the development of immersive gaming, autonomous driving, remote robotic surgery, production-line robotics, and augmented reality (*Source: https://www.forbes.com/sites/danielnewman/2018/08/14/5-emerging-technologies-that-5g-positively-disrupt/#3190d89166b6*). MIT reported that 5G service could open $12.3 trillion in revenue across technology industries (*Source: https://www.technologyreview.com/s/603770/the-5g-economy-how-5g-will-impact-global-industries-the-economy-and-you/*).

LEAST ENVIRONMENTALLY DAMAGING PRACTICABLE ALTERNATIVE DISCUSSION

Pursuant to the *Memorandum of Agreement between the Environmental Protection Agency and Department of the Army Concerning the Determination of Mitigation under the Clean Water Act Section 404(b)(1) Guidelines* and the Virginia Water Protection Permit regulations (9 VAC 25-210-90.C and 9 VAC 25-210-115), applicants for state permits to impact waters of the State must demonstrate that impacts to these waters have been avoided and minimized to the maximum extent practicable. Under the Section 404 (b)(1) Guidelines (40 CFR §§ 230.1-230.80) for non-water dependent uses, the applicant must demonstrate that the proposed project is the Least Environmentally Damaging Practicable Alternative (LEDPA) by demonstrating that all "appropriate and practicable" steps to avoid and minimize impacts on the project site have been taken.

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The concept of practicability is an important component of the impact avoidance, minimization, and mitigation requirements of the U.S. Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (COE), and Virginia Department of Environmental Quality (DEQ). The term "practicable" appears numerous times in the Virginia Water Protection Permit regulations, EPA's Section 404(b)(1) Guidelines, and the *Memorandum of Agreement between the Environmental Protection Agency and Department of the Army Concerning the Determination of Mitigation under the Clean Water Act Section 404 (b)(1) Guidelines.* This term is defined identically in the Virginia Water Protection Permit regulation (9 VAC 25-210-10) and EPA's Section 404 (b)(1) Guidelines (40 CFR §§ 230.1-230.80) as "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes." The COE's wetlands regulations (33 CFR §§ 320-331) also recognized economic issues as one of the criteria to be considered in determining whether the COE should issue a permit, and these regulations state that the practicability of alternatives to accomplish the objective of the proposed project must be considered in permit decisions (33 CFR § 320.4(a)(1)). Thus, economic interests and the purpose of a proposed project may be taken into account when analyzing project alternatives and determining the Least Environmentally Damaging Practicable Alternative (LEDPA).

In order for the project purpose to be practicably achieved, the wetlands and streams must be impacted to allow for the construction of the four datacenter buildings, their associated required infrastructure and supportive grading, stormwater management, and parking areas necessary to serve the proposed usage. Given the location of the project site and because the amount of fill located in jurisdictional wetlands and streams has been limited to the minimum necessary to accomplish these requirements, there is no practicable alternative that will allow for the construction of this development within the project boundary with less adverse effects of streams, wetlands, and the aquatic community than the proposed project.

ONSITE ALTERNATIVE ANALYSIS

The Applicant, land planners and engineers have worked to avoid and minimize impacts on the site to the maximum extent practicable. The layout of the proposed development was placed in the only location feasible to suit the proposed usage. Due to the size of the project area and development constraints, as discussed below, no practicable alternatives exist for the planned development. The four buildings will also be bound on the north side by the construction of a Loudoun Countywide Transportation Plan (CTP) roadway known as Prentice Drive, to be designed, built, and permitted by Loudoun County, that further limits the development potential of the sites.

FINANCIAL ANALYSIS DISCUSSION

It should be noted that there exists a distinction between profitability and financial feasibility or economic viability. Profitability simply means that revenue generated by the project is greater than the sum of all expenses of the project. Financial feasibility and economic viability are the ideas that the project will be able to attract lenders and investors. It is therefore possible that the project could be simultaneously profitable but also financially infeasible or economically unviable. Any alternative that renders the project non-viable is not a true alternative. The discussion in the JPA relates to the financial feasibility and economic viability of the project as it relates to changes to the planned square footage.

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In order to pursue the acquisition and development of this site, the developer must have a plan and budget that results in an acceptable return on investment within a five-year period. This involves estimating certain costs to acquire the land, engineer and permit the site, construct the project within the guidelines laid out by the County as well as project interim revenue and the final sales value of the completed site. Any further reduction in building size reduces the value of the development and the developer's ability to serve their customers. At this proposed campus, this impact would be magnified twelvefold - on three levels of 4 buildings. It is estimated that even a less than 10% reduction in building footprint would reduce the campus value by more than $1 billion over its lifetime. Considering the highly competitive data center landscape, this reduction in campus value and ability to serve customers is not feasible.

Entrance Relocation

Entrance siting cannot be relocated as access to the site is pre-determined by existing VDOT road construction (existing median breaks in Loudoun County Parkway as well as existing entrance locations that have been set based on minimum intersection spacing requirements along the frontage roads) that are also consistent with previous legislative approvals (MCI Worldcom Zoning ZMAP 1998-0003) that dictate site access locations. Additionally, the site access has been carefully coordinated with planned Loudoun County CTP roadway improvements for the construction of new Prentice Road through the subject site, to be designed, built, and permitted by Loudoun County.

Parking

Parking has been established based on typical data center operations for the applicant's long history of delivering data centers in this market. Parking has also been established based on local Loudoun County parking requirements for the use. While the ultimate needs of the tenant may allow for modest reductions in parking for individual buildings, the reductions would not be significant enough to allow for wetlands avoidance. Parking for data centers is a fraction of similar warehouse/industrial/office uses. A minimum level of parking is required not only for future tenants, but for building maintenance/equipment updates, non-tenant employees, and swing parking for shift changes. The average parking provided/proposed for the 8 approved buildings results in less than 75 spaces per building. Structured parking is not realistic for such a small parking requirement. Parking also cannot be consolidated into a single structure as parking is needed adjacent to each building including to meet ADA requirements and as consolidated parking would be too great of a walk to reach all the buildings.

A reduction in parking would not generate fewer impacts. The proposed buildings cannot be made significantly smaller. In order to avoid impacts to the wetlands and stream, several of the proposed buildings would have to be removed entirely or redesigned for nearly half their current size which would not be adequate to serve potential customers and would increase the overall per square foot development costs. Buildings that size would be too small and inefficient to compete in the marketplace. Further, many of the wetlands within the proposed development area will ultimately be cut off with the future Prentice Drive construction.

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Building Size and Location

The location relies on proximity to the previously permitted data centers and constitutes a second phase of ongoing development. The proposed buildings have been optimized to provide customers with the most efficient and flexible layouts possible and are based on customer projections. The sites can be developed up to a maximum of 1.0 FAR. The site can achieve nearly the entire allowable 1.0 FAR despite the required roadway dedications, stormwater management ponds, and floodplain avoidance that must be accommodated. While the buildings are currently speculative, they are based on recently completed buildings on nearby campuses and the applicant is working with potential customers to reach a leasing agreement. The project is not contingent upon a signed lease and would move forward to construction regardless.

Multi-Level Buildings

All four buildings are proposed as three-story buildings that approach the maximum height permitted in Loudoun County at nearly 100' tall. Additionally, the ventilation and structural requirements for data centers of this size any taller begin to significantly reduce usable square footage on lower levels, thereby wiping out the net gained floor space on higher floors. Therefore, there is no ability to go taller to eliminate/reduce footprint sizes on any of the buildings.

Stormwater Management

LC11-14 will be served by a combination of underground facilities and manufactured treatment devices as well as a wet pond to be located on the north side of Prentice Drive in an area that is otherwise undevelopable for data center buildings due to its proximity to minor floodplain. The buildable land area south of Prentice Drive has been maximized for building construction, and there are no alternative SWM locations that would help with building wetlands avoidance.

It is not feasible to build multiple small BMPs through the development to reduce the overall footprint. BMP is being met on site via a combination of the surface pond shown on the north side of Prentice Drive and the purchase of nutrient credits. The BMP Pond as proposed is not in an area that requires wetlands impacts. Additionally, removing the BMP pond that has its own surface area, would result in the need for underground detention and multiple manufactured treatment devices adjacent to each building. The volume of the pond would need to be replaced in footprint/size underground. The rest of the development south of Prentice Drive is nearly 100% encumbered with buildings and the required utilities, duct banks, easements, and landscaping. As there is no additional room for such underground detention/MTD's (and it would cost significantly more), building footprints would need to shrink to accommodate this. The BMP plan as shown is the most efficient from a land use perspective.

Water Reuse Availability

The proposed project is currently approved with water re-use in mind. Loudoun County Water has reuse infrastructure mains in place to serve these sites. Sites further away from this location do not have access to Loudoun Water's reclaimed water system which makes them less desirable. Loudoun Water already has reused infrastructure mains in place to serve these sites.

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NO-BUILD ALTERNATIVE ANALYSIS

Development of the existing site, consistent with available infrastructure and services is a reasonably expected occurrence in the foreseeable future, even if the project were not approved. As such, although no impacts would occur to wetlands or WOTUS for the No-Build Alternative, it is reasonable to project future development on site. In such case, as the approved plans has already limited, to the best extent possible, the amount of fill to be located in the jurisdictional streams and wetlands, it is unlikely that any future proposed development will allow for less adverse effects on streams, wetlands, and the aquatic community than the proposed project.

OFFSITE ALTERNATIVE ANALYSIS

The subject property is located in the heart of Data Center Alley, with the most critical and dense fiber optic lines running directly along the property frontage on Loudoun County Parkway. The site is also extremely close to the MAE East Internet Exchange Point, providing the best latency available in the world. The site is also bound along the southern boundary with existing overhead high voltage transmission lines and an existing substation.

Adjacent parcels within the same area are either insufficient to accommodate project needs or are owned by competitors who are not likely to sell or lease space within their development to this applicant. Therefore, there are no practicable offsite alternatives for the proposed location of the project. An evaluation of nearby properties for possible acquisition and development potential for data centers has been conducted. Please see the attached regional property map for properties proximate to critical fiber and power utility sources within land use areas designated for data centers within Loudoun County's comprehensive plan. As noted below, many of the surrounding properties are zoned for data centers and are either built-out or are under construction. Despite the number of data center properties in the vicinity, the need for additional local data center capacity is not currently being met with these existing projects combined with the proposed data center campus.

1. Loudoun Center South (Subject Property)
2. Ashburn Corporate Center - This property is owned by Digital Realty and is built out with 100% data centers already. No additional development potential exists on the property.
3. Loudoun Center - This property is co-owned by Iskandar Ventures LLC, Jamshid Ventures LLC, Kaveh Ventures LLC and Lohrasp Ventures LLC and is zoned for data centers. The property is planned for three (3) data centers, two (2) of which are fully built out and the third is currently under construction.
4. Dulles Berry - This property is owned by Vizsla Ventures LLC. This property is zoned for data centers up to 1.0 FAR with buildings under construction.
5. Quantum Park / Verizon Campus / Customs - This property is owned by American Real Estate Partners and has been developed for a corporate campus previously 100% occupied by Verizon. The current owners are retro-fitting the property with expansions to house the new Custom and Border Protection headquarters. Additional data center development is underway by Aligned Data Centers and Equinix.

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6. Dominion Substation - This property is owned and developed for Power substation(s). The property is bisected by floodplain and the unbuilt portion is too small to accommodate a data center.
7. Dominion Substation – This property is owned by Digital Realty and leased to Dominion with a built power substation. The unbuilt area of the property is fully encumbered by floodplain.
8. Digital Realty - This property assemblage is owned and 100% developed with existing data centers. There is no additional development potential available.
9. TAB/Antigone Property - This assemblage of properties is owned by Sentinel and STACK Infrastructure for data center development which is currently under construction at the maximum allowable FAR.
10. West Dulles - This property is owned by QTS and is currently under development for 100% data center use.
11. Digital Realty - This property is owned by Digital Realty and is under construction for 100% data center uses. No additional land is available for sale or for data center development by anyone other than Digital Realty.
12. USPS - This property is owned by the Federal Government and houses the USPS distribution facility.
13. QTS – This property is owned by QTS and is currently under development for 100% data center use.
14. Loudoun County - This property is owned by Loudoun County Board of Supervisors and is almost entirely encumbered by floodplain. There is no viable option for data centers on this property.

Properties south of the Dulles Greenway: these properties are outside of "Data Center Alley" and are under development/construction for transit oriented mixed-use developments with no potential for data center development. Dulles Airport/MWAA also owns a large land area south of the TAB property that is also unfit for a datacenter.

SUMMARY OF ALTERNATIVES

Based on a review of both on and offsite alternatives, the Preferred Plan represents the Least Environmentally Damaging Practicable Alternative (LEDPA) as detailed below.

IMPACTS TO WETLANDS & WATERS OF THE U.S. DISCUSSION

The proposed impacts consist of general site grading for the construction of the proposed datacenter buildings and their associated required infrastructure which is necessary to serve the proposed usage. There are twelve (12) impact areas, eleven (11) permanent and one (1) temporary.

Impact #1, which is permanent, will result from filling 0.05-acres (2,063-square feet) of palustrine forested (PFO) wetland associated with the construction of the proposed LC4 building and supportive grade. The permanent impacts proposed in this area due to the grading and placement of fill material. A portion of this impact is associated with the proffer-required 6' berm along the western property boundary. This impact is necessary in order to accomplish project goals and to provide sufficient space for the equipment

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needed to run the proposed facility as well as provide the proffered set-back berm between the datacenter complex and the adjacent residential development.

Impact #2, which is permanent, will result from altering the upgradient hydrology of 0.42-acres (18,286-square feet) PFO wetland associated with secondary impacts from the proposed construction of LC4 addressed above in Impact #1. The permanent impacts proposed in this area are due to removing the upstream source of water and isolating the feature from any downstream drainage. Per our pre-application meeting on April 6, 2018, DEQ has noted that the applicant should consider this to be a secondary impact due to fragmentation.

Impact #3, which is permanent, will result from filling 0.04 acres (1,786-square feet) of PFO wetland and 592 linear feet (4,346 square feet) of intermittent stream (R4) associated with the construction of the proposed LC5 building and supportive grade. The permanent impacts proposed in this area are due to the grading and placement of fill material for a portion of the proposed building. This impact is necessary in order to accomplish project goals to serve the potential tenant/user requirement, as well as provide the proffered set-back berm between the datacenter complex and the adjacent residential development.

Impact #4, which is permanent, will result from filling 0.19 acres (8,097-square feet) of PFO wetland, 112 linear feet (634 square feet) of perennial stream (R3), and 298 linear feet (1,722 square feet) of intermittent stream (R4) associated with the construction of the proposed LC5 building, parking lot, and supportive grade. The permanent impacts proposed in this area are due to the grading and placement of fill material for a portion of the proposed building, loading area, and required parking to support its use. This impact is necessary in order to accomplish project goals and to provide sufficient parking and access to serve the potential tenant/user requirement, as well as provide the proffered set-back berm between the datacenter complex and the adjacent residential development.

Impact #5, which is permanent, will result from filling 0.005-acres (224-square feet) of PFO wetland and 41 linear feet (415-square feet) of intermittent stream (R4) associated with the construction of the proposed LC5 parking lot and supportive grade. The secondary impacts proposed in this area are due to the grading and placement of fill material for a portion of the lot and will result in a loss of hydrology serving this area. This impact is necessary in order to accomplish project goals and to provide sufficient parking to serve the potential tenant/user requirement, as well as provide the proffered set-back berm between the datacenter complex and the adjacent residential development.

Impact #6, which is permanent, will result from filling 0.003-acres (141-square feet) of PFO wetland and 375 linear feet (2,246-square feet) of ephemeral stream (R6) associated with the construction of the proposed stormwater management facility located adjacent to LC 5. The permanent impacts proposed in this area are due to grading and stormwater management. This impact is necessary in order to accomplish project goals and to meet set-back requirements. A point analysis (Study Point B) has been conducted by the design engineers which shows the pre- and post-construction hydrology to the receiving stream.

Impact #7, which is permanent, will result from filling 0.006-acres (250-square feet) of PFO wetland associated with the construction of the proposed stormwater management facility located adjacent to LC

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5. The permanent impacts proposed in this area are due to grading and stormwater management. This impact is necessary in order to accomplish project goals and to meet set-back requirements.

Impact #8, which is permanent, will result from filling 0.1-acres (4,554-square feet) of PFO wetland associated with the construction of supportive grade for the proposed LC11 building. The impact is necessary to accomplish project goals.

Impact #9, which is permanent will result from filling 0.003-acres (125-square feet) of PFO wetland and 1,034 linear feet (6,980 square feet) of intermittent stream (R4) associated with the construction of the proposed LC14 building and associated parking and supportive grading. This impact is necessary to accomplish project goals.

Impact #10, which is temporary will result from the use of 27 linear feet (263-square feet) of perennial stream (R3) for underground utility crossing. This area will be returned to pre-construction contours once the utility has been installed.

Impact #11, which is a secondary permanent impact, will result from an above gradient hydrology change caused by grading to support the proposed building. The resulting impact will equal 0.03-acres (1,513-square feet) of PFO wetland. The impact is necessary to accomplish project goals.

Impact #12, which is a secondary permanent impact, will result from an above gradient hydrology change. The resulting impact will equal 0.003-acres (120-square feet) of PFO wetland. The impact is necessary to accomplish project goals.

Due to the location and extent of streams onsite, the permanent impacts to 0.85-acres (37,159-square feet) of palustrine forested wetland (PFO), 112 linear feet (0.01 acres) of perennial (R3) stream, 1,965 linear feet (0.31 acres) of intermittent (R4) stream, 375 linear feet (0.05 acres) of ephemeral (R6) stream and temporary impacts to 27 linear feet (0.01 acres) of perennial stream (R3) proposed in this JPA are unavoidable.

CONCLUSION

In pursuing the proposed project site, the Applicant has implemented all practicable efforts to minimize unavoidable impacts to jurisdictional areas. It is a plan that this Applicant believes will be attractive to current and future users and investors and the residents of Loudoun County. This option also offers a sufficient tax revenue stream to the residents of Loudoun County without the burden to transportation, schools and neighborhoods due to the extremely low number of occupants. The Applicant, land planners and engineers have been diligent in their attempts to avoid and minimize impacts on the site to the maximum extent reasonably practicable. As outlined above, the layout of the proposed development was placed in the only location feasible to suit the proposed usage. Due to the size of the project area, development constraints, availability of utilities and greater environmental impacts for alternative sites or lack of available sites within the vicinity of available utilities, no practicable alternatives exist for the planned development.

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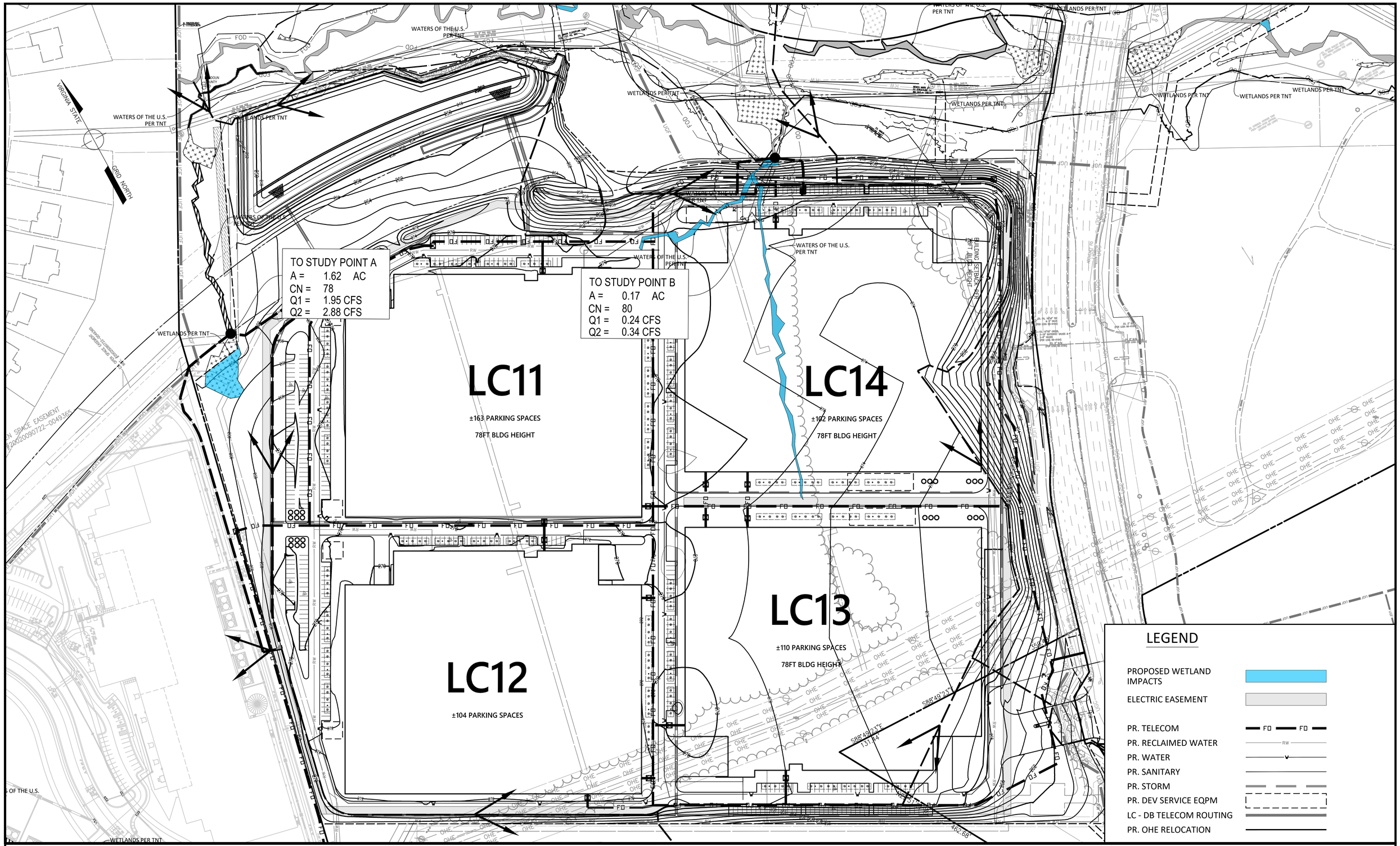

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ZEBRA WEST - WETLANDS IMPACTS

POST DEVELOPMENT HYDROLOGY EXHIBIT
SCALE: 1" = 80'
AUGUST 30, 2023

80 40 0 80 160 320
GRAPHICAL SCALE: 1" = 80'

EXHIBIT 2835-1706-0008
CADD: 2835-1706-EXHIBITS
DRAWN BY: C. SCHEEPERS
SHEET 1 OF 1

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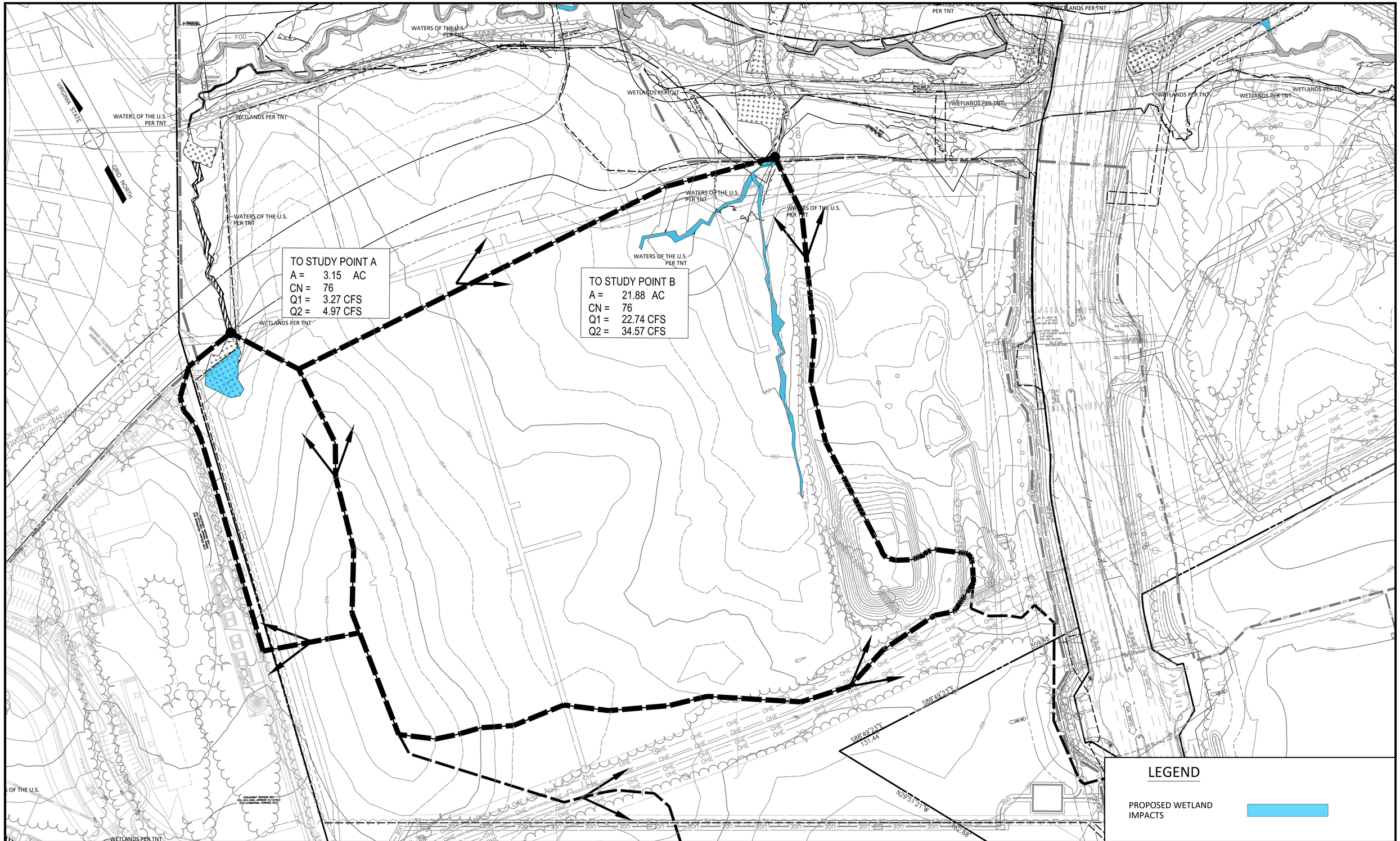

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ZEBRA WEST - WETLANDS IMPACTS

PRE-DEVELOPMENT HYDROLOGY EXHIBIT
SCALE: 1" = 80'
AUGUST 30, 2023

80 40 0 80 160 320
GRAPHICAL SCALE: 1" = 80'

EXHIBIT 2835-1706-0009
CADD: 2835-1706-EXHIBITS
DRAWN BY: C. SCHEEPERS
SHEET 1 OF 1

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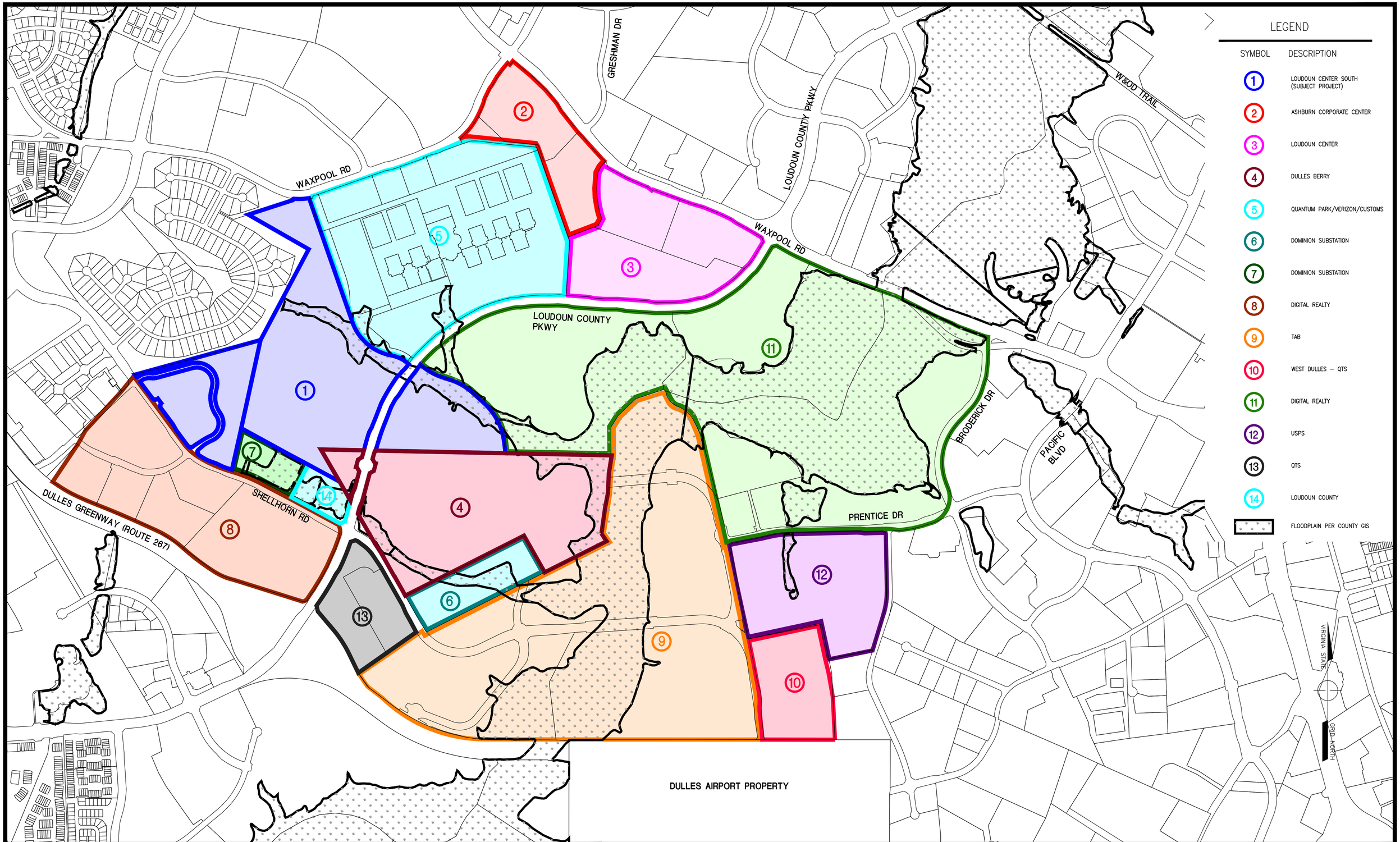

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LOUDOUN METRO

ALTERNATIVES ANALYSIS

SCALE: 1" = 500'

JULY 7, 2023

500 250 0 500 1000 1500

GRAPHICAL SCALE: 1" = 500'

EXHIBIT 2835-0706-ALT-ANALYSIS
CADD: 2835-0706-EXHIBITS
DRAWN BY: A. BEISNER
SHEET 1 OF 1

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APPENDIX V

CONCEPTUAL MITIGATION PLAN

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Conceptual Mitigation Plan

Compensatory mitigation has already been provided for Impacts 1-7 which were authorized under WP4-18-1411. Bills of sale were previously provided to DEQ. The compensatory mitigation requirement below represents that which is required to satisfy Phase II (Impacts 8-12) of the project and does not include Phase III as discussed elsewhere in the application.

The Applicant proposes to make payment to a U.S. Army Corps of Engineers and Virginia Department of Environmental Quality approved wetland mitigation bank to compensate for the permanent impacts to 0.14-acres (6,312-square feet) of palustrine forested wetland (PFO).

Wetland Compensation Requirements (Phase II)

Cowardin Classification	Impact (Acres)	Compensation Ratio	Compensation Requirement (credits)
PFO	0.14	2:1	0.28
Total	0.14		**0.28**

The proposed project will result in permanent impacts to 1,034 linear feet (0.16 acres) of intermittent stream (R4). The Applicant proposes to compensate for the permanent impacts though the purchase of **1,344** credits from a U.S. Army Corps of Engineers and Virginia Department of Environmental Quality approved stream mitigation bank prior to the commencement of construction to offset the loss of 1,034 -linear feet of stream.

Stream Compensation Requirements (Phase II)

Impact Number/SAR	Cowardin Classification	Impact (Linear feet)	Reach Condition Index (from USM Forms, attached)	Compensation Requirement (credits)
9/SAR1	R4	1,034	1.3	1,344
	Total	**1,034**		**1,344**

It is the opinion of TNT that there will be no net loss of functions and values and the proposed mitigation will fully compensate for the impacts to wetlands and Waters of the U.S. proposed in this JPA. All mitigation for Phase 1 has been satisfied and there are no changes to those impacts.

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Stream Assessment Form (Form 1)

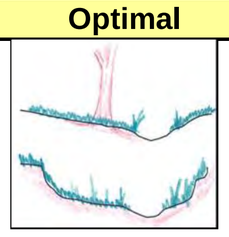
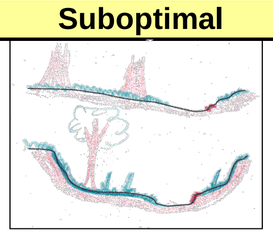
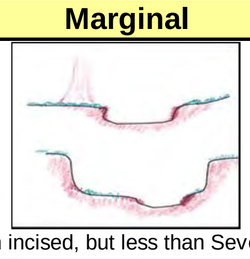
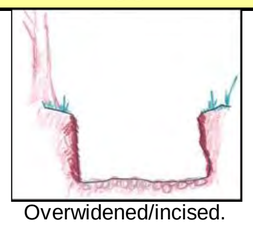
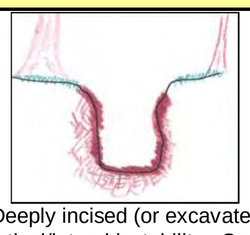
Unified Stream Methodology for use in Virginia

For use in wadeable channels classified as intermittent or perennial

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact/SAR length	Impact Factor
1165	Loudoun Center	Loudoun	R4	02070008	8/18/23	1	1034	1.00

Name(s) of Evaluator(s)	Stream Name and Information
Kayla Simpson	Impact # 9

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

	Conditional Category					
	Optimal	Suboptimal	Marginal	Poor	Severe	
Channel Condition	 Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable point bars/bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid-channel bars, and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	 Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches, or newly developed floodplains along portions of the reach. Transient sediment covers 10-40% of the stream bottom.	 Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may bevertical or undercut. AND/OR 40-60% of stream is covered by sediment. Sediment may be temporary/transient, contribute instability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.	 Overwidened/incised. Vertically/laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-80% of banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. AND/OR 60-80% of the stream is covered by sediment. Sediment is temporary/transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	 Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average rooting depth, majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. Greater than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.	CI
Score	3	2.4	2	1.6	1	2.0
NOTES>>						

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

	Conditional Category							NOTES>>
	Optimal	Suboptimal		Marginal		Poor		
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and a non-maintained understory. Wetlands located within the riparian areas.	**High Suboptimal:** Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	**Low Suboptimal:** Riparian areas with tree stratum (dbh > 3 inches) present, with > 30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	**High Marginal:** Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	**Low Marginal:** Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	**High Poor:** Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	**Low Poor:** Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
		High	Low	High	Low	High	Low	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	

1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.
2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.
3. Enter the % Riparian Area and Score for each riparian category in the blocks below.

Ensure the sums of % Riparian Blocks equal 100

Right Bank	% Riparian Area>	100%						100%	
	Score >	1.5							
									CI= (Sum % RA * Scores*0.01)/2
Left Bank	% Riparian Area>	100%						100%	Rt Bank CI > 1.50 — CI
	Score >	1.5							Lt Bank CI > 1.50 — 1.50

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle poole complexes, stable features.

	Conditional Category				
	Optimal	Suboptimal	Marginal	Poor	NOTES>>
Instream Habitat/ Available Cover	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	CI
Score	1.5	1.2	0.9	0.5	1.50

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Stream Impact Assessment Form Page 2

Project #	Applicant	Locality	Cowardin Class.	HUC	Date	Data Point	SAR length	Impact Factor
1165	CloudHQ	Loudoun	R4	02070008	8/18/23	SAR 1	1034	1

4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock

NOTES>>

	Conditional Category						
	Negligible	Minor		Moderate		Severe	
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.	
SCORE	**1.5**	**1.3**	**1.1**	**0.9**	**0.7**	**0.5**	**1.50**

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: **The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.**

THE REACH CONDITION INDEX (RCI) >>	**1.30**
RCI= (Sum of all CI's)/5	
COMPENSATION REQUIREMENT (CR) >>	**1344**
CR = RCI X LF X IF	

INSERT PHOTOS:

DESCRIBE PROPOSED IMPACT:

Data Center Building

Received by VMRC September 1, 2023 /blh

Commonwealth Mitigation, Inc.
18267 Channel Ridge Ct. Leesburg, VA 20176
(571) 233-5830 Fax (703) 997-4444

August 25, 2023

Mr. Avi Sareen
TNT Environmental, Inc.
4455 Brookfield Corporate Drive, Suite 100
Chantilly, Virginia 20151

RE: Loudoun Center Phase II Wetland and Streams Availability

Dear Mr. Sareen,

This letter is to confirm the availability of approved wetlands and stream credits from the Rock Hedge Wetland and Stream Mitigation Bank and Tail Race Wetland and Stream Mitigation Bank. Both mitigation banks have been authorized to transfer credits in the service area in which your project lies. 0.22 Wetland credits and 1,344 stream credits are available that will meet your credit need for the Loudoun Center Phase II project.

These credits are available in accordance with our Mitigation Banking Instruments (Rock Hedge dated July 30, 2009, Tail Race dated January 6, 2021).

If I can be of further assistance, please feel free to contact me.

Sincerely,

David M. Jordan, P.E.
Manager

Received by VMRC September 1, 2023 /blh

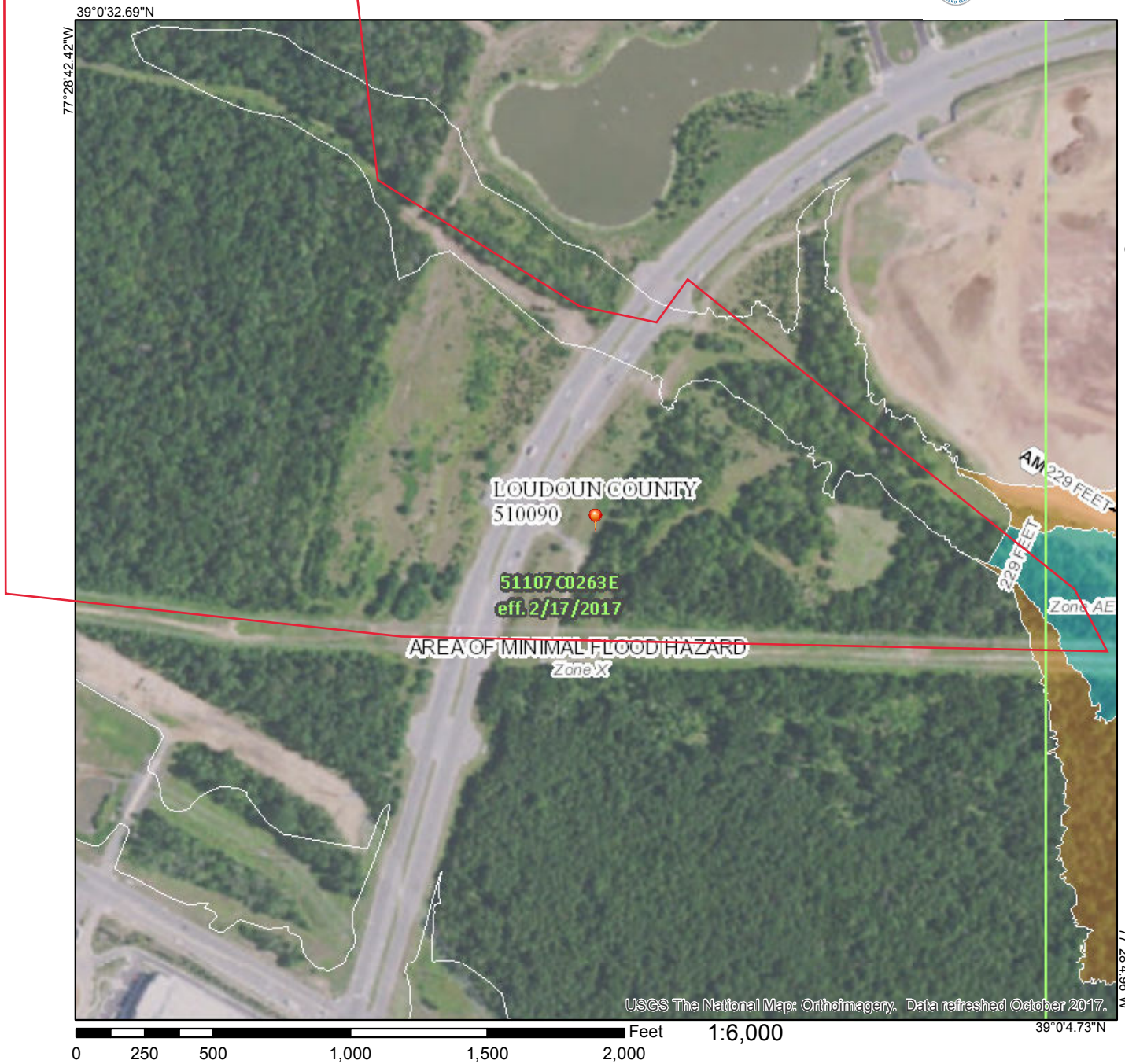
APPENDIX VI

FEMA FLOOD INSURANCE MAP

Received by VMRC September 1, 2023 /blh

National Flood Hazard Layer FIRMette

FEMA



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- B 20.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/24/2018 at 6:12:00 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

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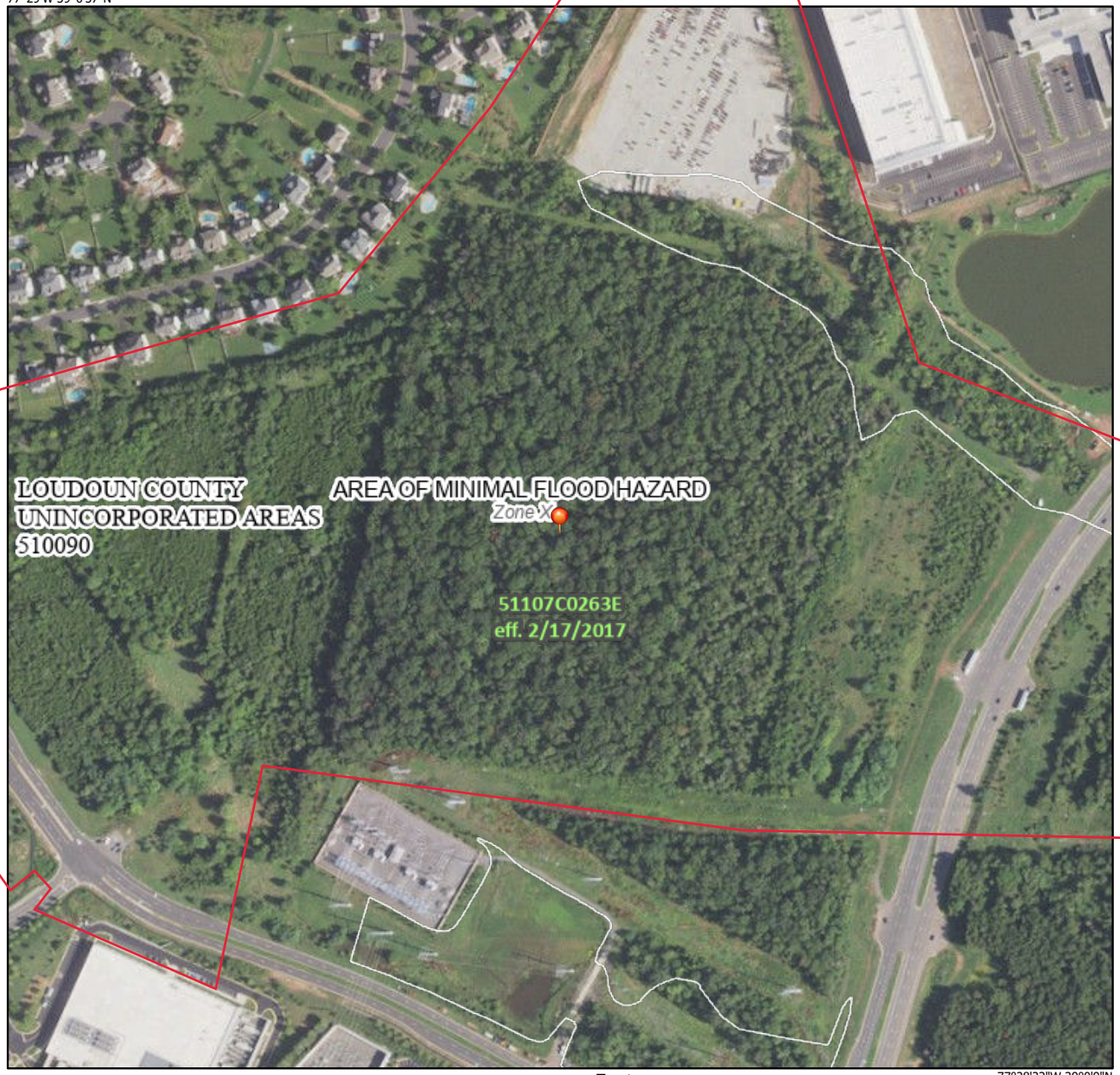
National Flood Hazard Layer FIRMette

FEMA

77°29'W 39°0'37"N



77°28'22"W 39°0'9"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

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- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/22/2023 at 4:46 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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Received by VMRC September 1, 2023 /blh

39°1'59.21"N
77°30'0.50"W

77°28'7.01"W
38°59'53.39"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
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GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- B 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- 8 Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can beordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by USDA, Farm Service Agency (FSA). This information was derived from NAIP, dated April 11, 2018.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on **7/24/2018 6:14:59 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at https://www.fema.gov/media-library/assets/documents/118418

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date.

SCALE

N

Map Projection:
GCS, Geodetic Reference System 1980;
Vertical Datum: NAVD88
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map please see the Flood Insurance Study(FIS) Report for your community at https://msc.fema.gov

1 inch = 500 feet **1:6,000**

0 250 500 1,000 1,500 2,000 Feet

0 50 100 200 300 400 Meters

FEMA
National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

LOUDOUN COUNTY, VIRGINIA AND INCORPORATED AREAS

PANEL **263** OF **2982**

Panel Contains:

COMMUNITY	NUMBER	PANEL
LOUDOUN COUNTY VIRGINIA	510090	0263

MAP NUMBER
51107C0263E
EFFECTIVE DATE
02/17/2017

Received by VMRC September 1, 2023 /blh

APPENDIX VII

CROSS SECTIONAL DIAGRAMS

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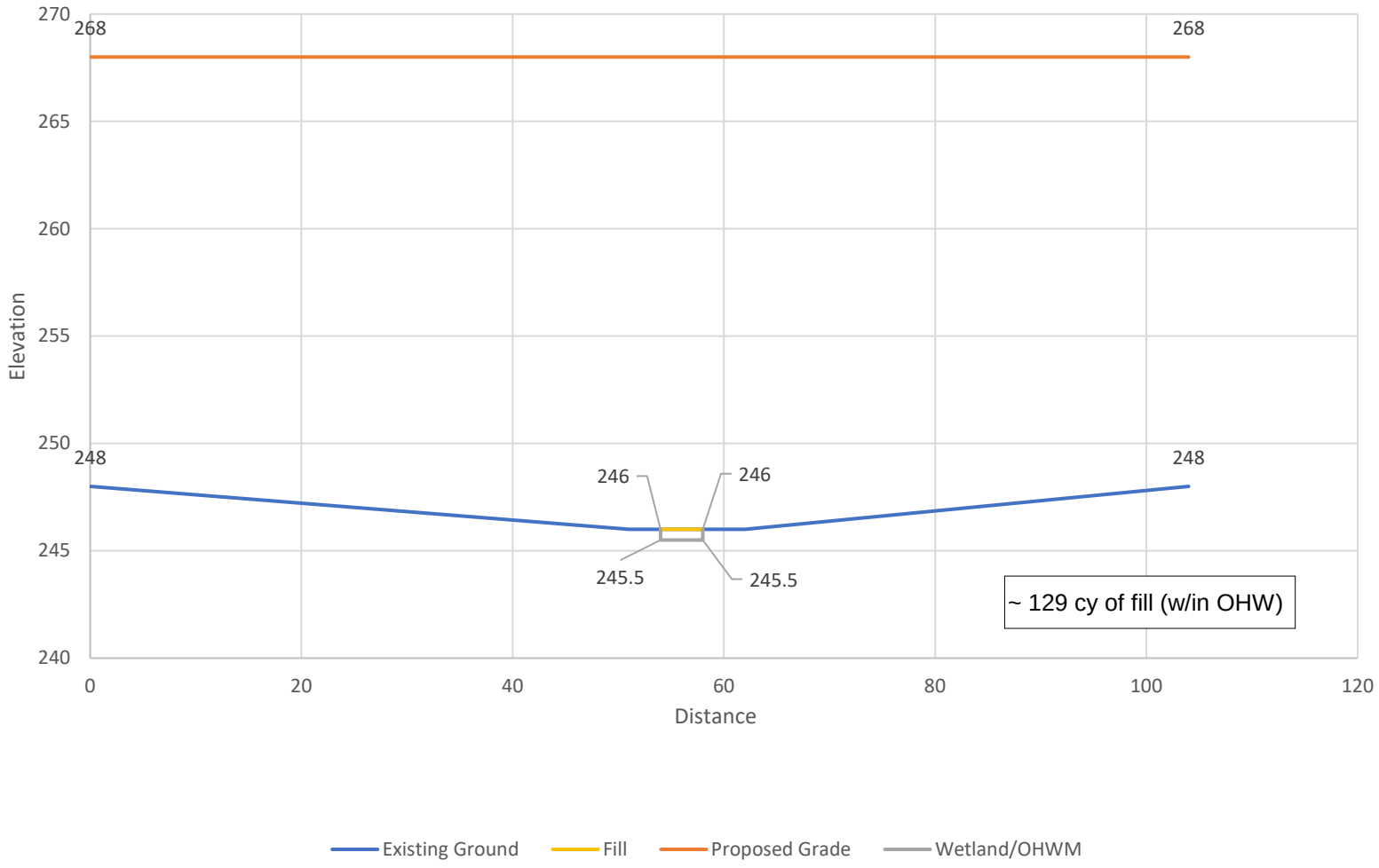
X-sec @ A-A'

Type: R4 Channel

Reference to: Impact Area 9



TNT ENVIRONMENTAL, INC.
4455 BROOKFIELD CORPORATE DRIVE, SUITE 100
CHANTILLY, VA 20151

LOUDOUN CENTER PHASE II
LOUDOUN COUNTY, VIRGINIA
SEPTEMBER 2023

JOINT PERMIT APPLICATION
APPENDIX VII
TNT PROJECT NO.: 1165

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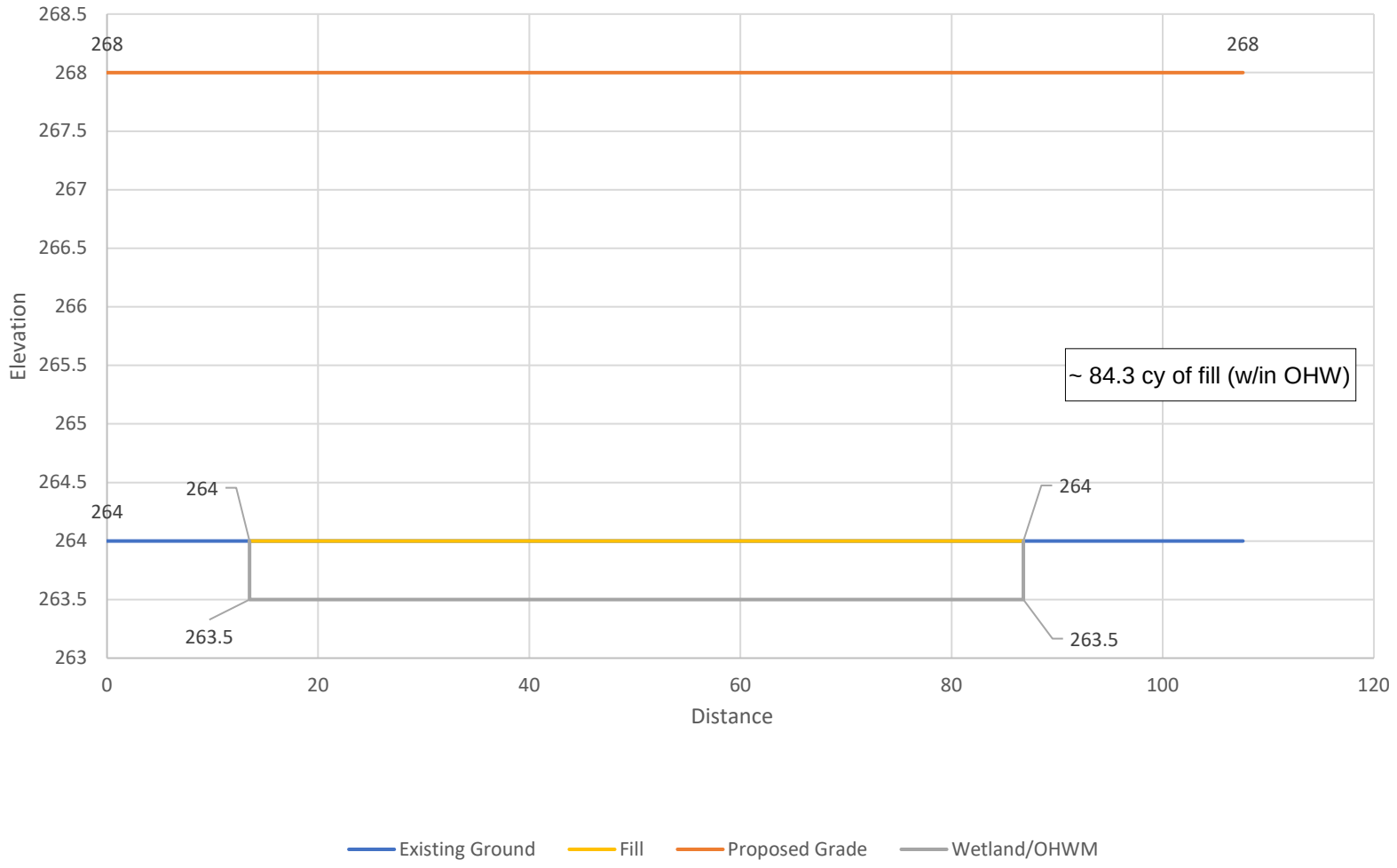
X-sec @ B-B'

Type: PFO Wetlands

Reference to: Impact Area 8



TNT ENVIRONMENTAL, INC.
4455 BROOKFIELD CORPORATE DRIVE, SUITE 100
CHANTILLY, VA 20151

LOUDOUN CENTER PHASE II
LOUDOUN COUNTY, VIRGINIA
SEPTEMBER 2023

JOINT PERMIT APPLICATION
APPENDIX VII
TNT PROJECT NO.: 1165

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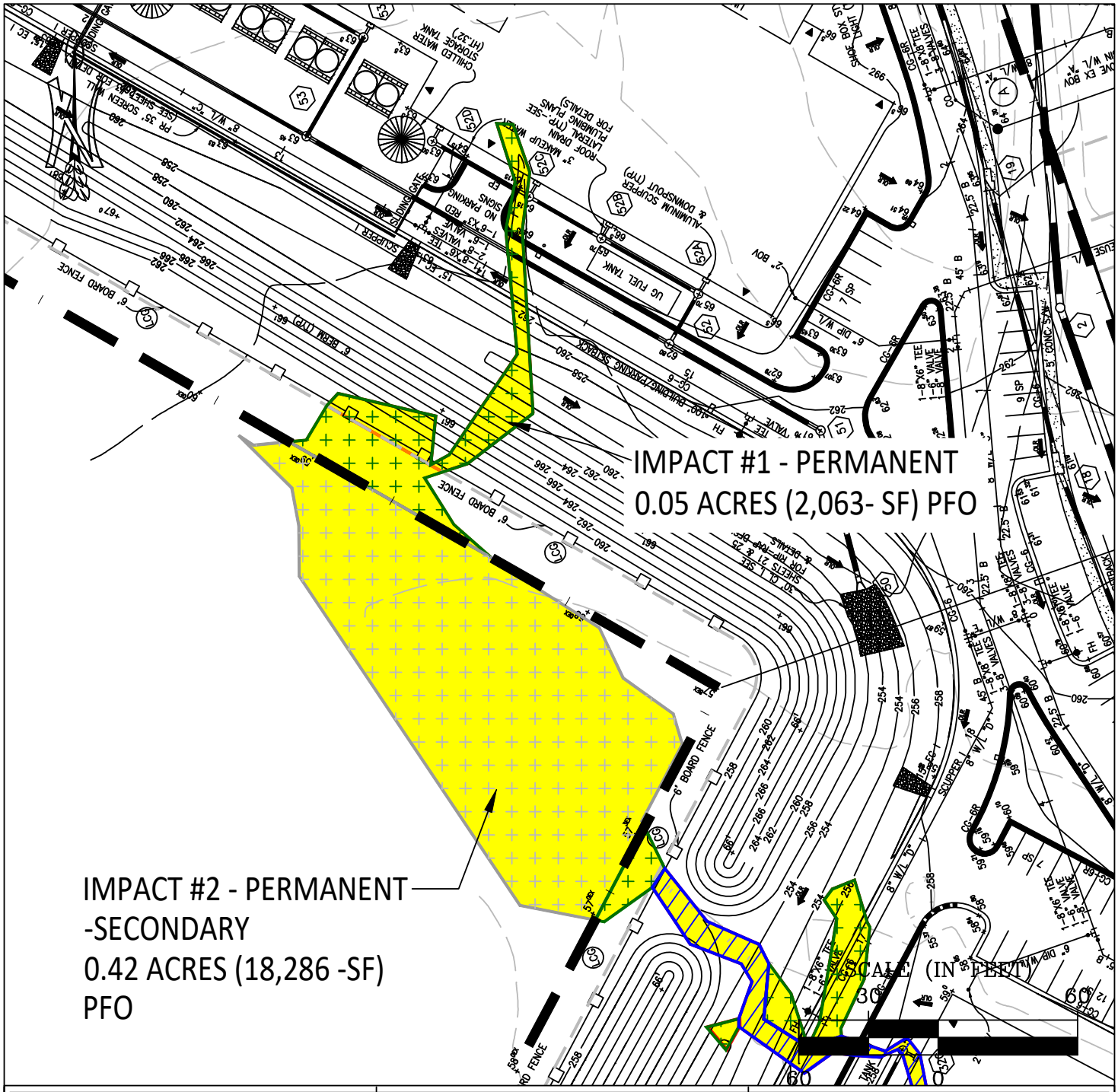
APPENDIX VIII

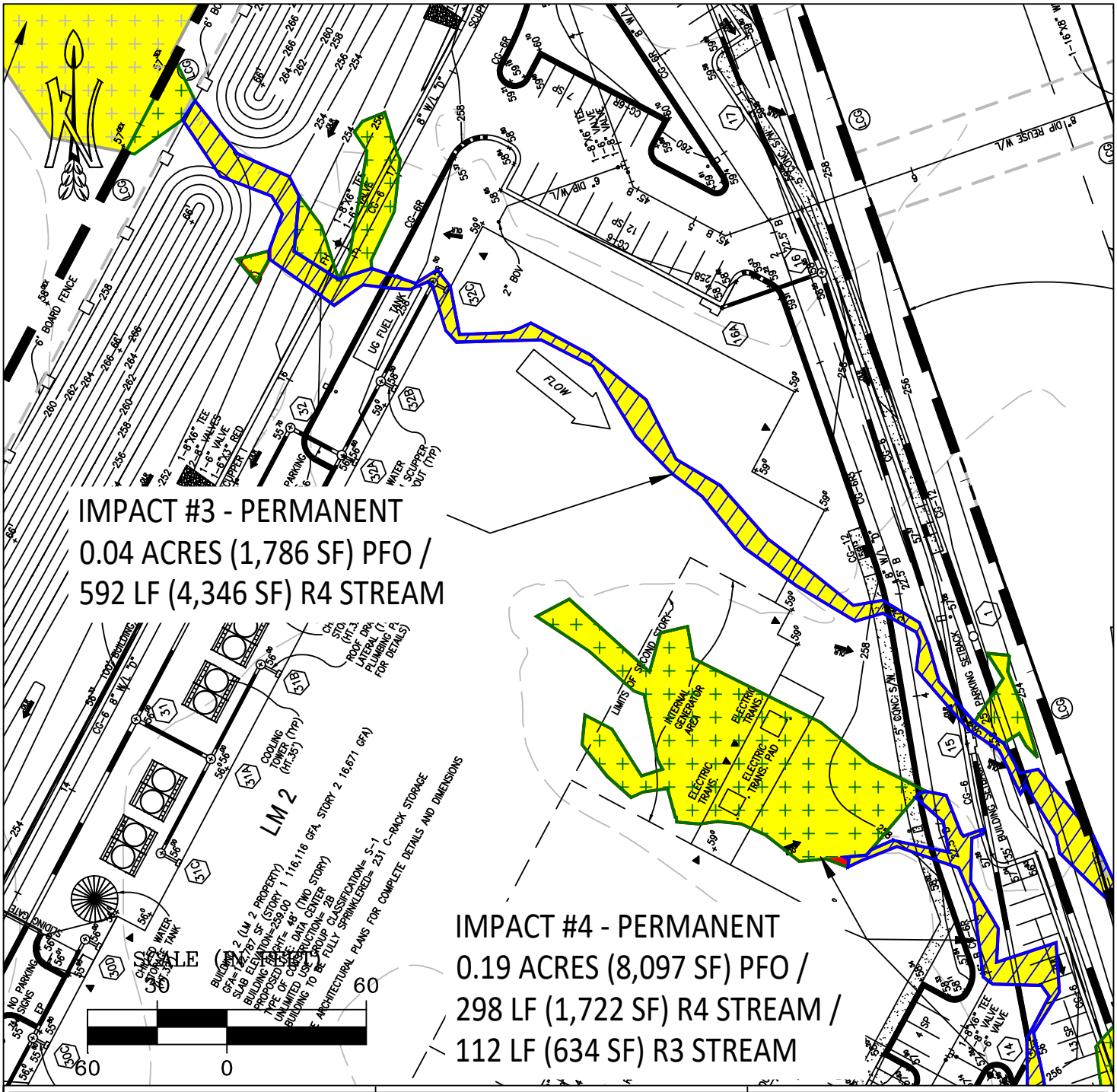
8.5 X 11" DRAWINGS

Received by VMRC September 1, 2023 /blh



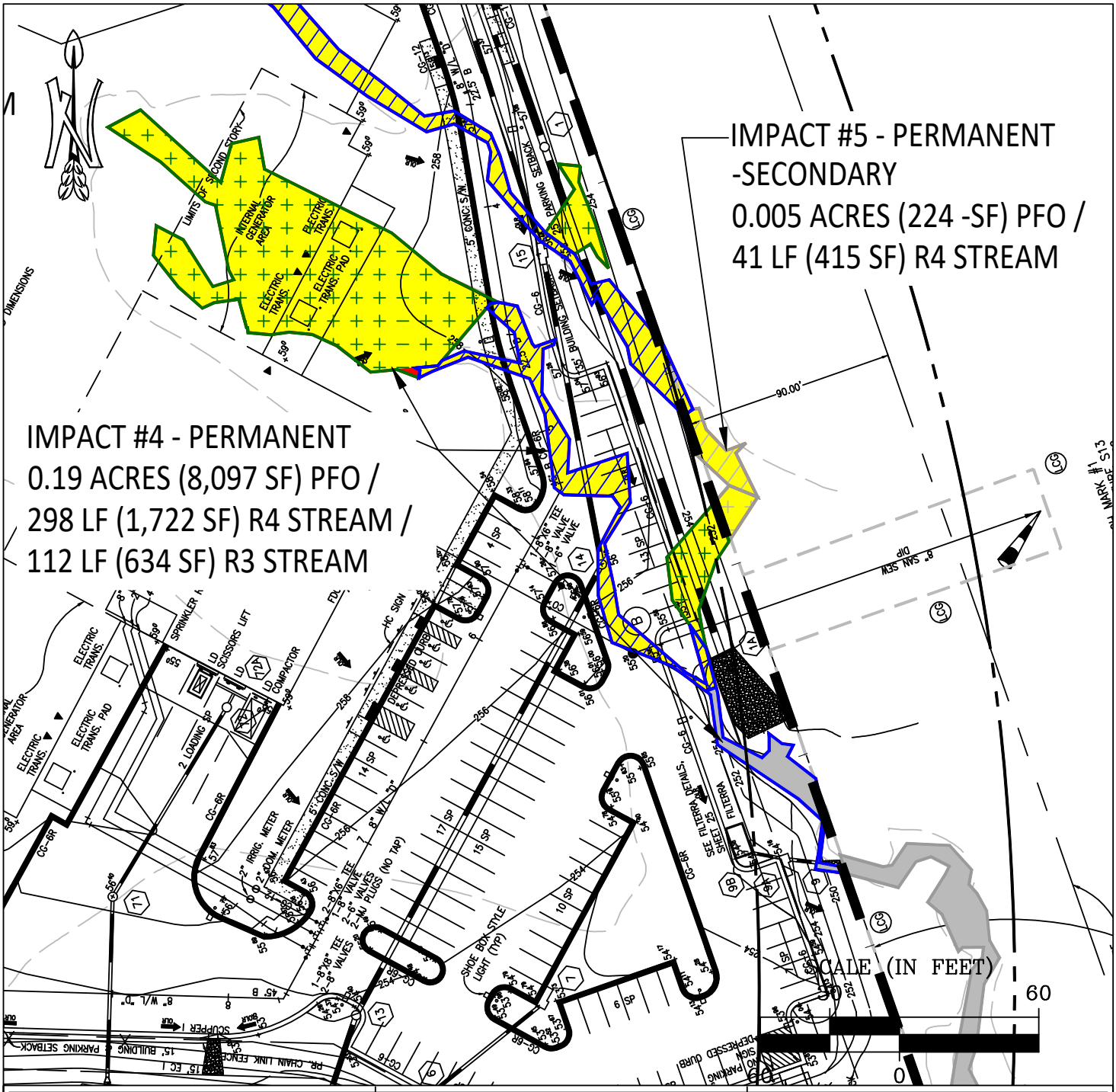
JOINT PERMIT APPLICATION		**PLAN VIEW**
LOUDOUN CENTER PHASE II	ENVIRONMENTAL	IMPACTS #1 AND #2
LOUDOUN COUNTY, VA	**4455 BROOKFIELD CORPORATE DRIVE, SUITE 100 CHANTILLY, VIRGINIA 20151**	PFO WETLANDS
SEPTEMBER 2023		TNT PROJECT NO: 1165

Received by VMRC September 1, 2023 /blh



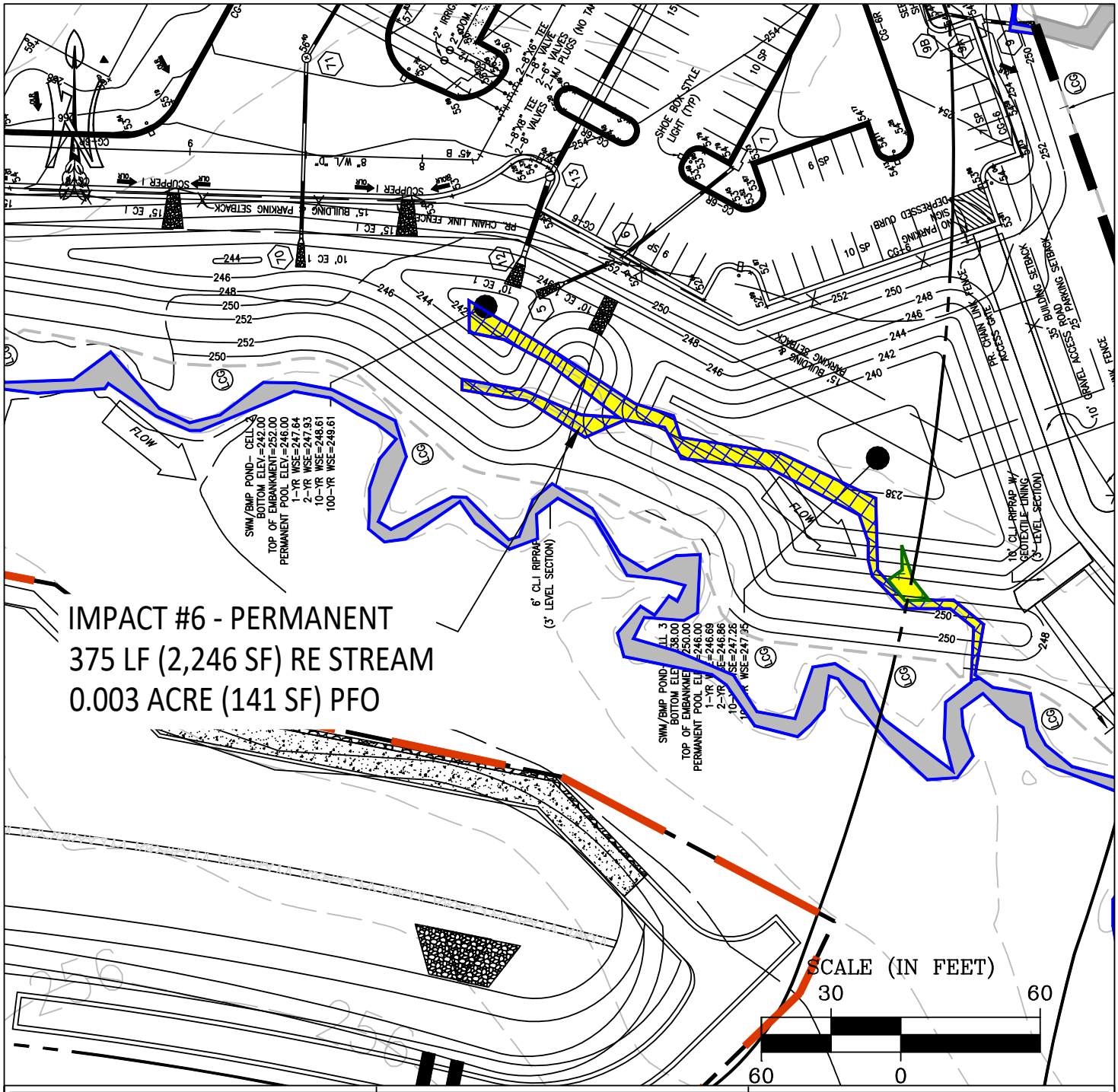
JOINT PERMIT APPLICATION LOUDOUN CENTER PHASE II LOUDOUN COUNTY, VA SEPTEMBER 2023	ENVIRONMENTAL **4455 BROOKFIELD CORPORATE DRIVE,** **SUITE 100** **CHANTILLY, VIRGINIA 20151**	**PLAN VIEW** IMPACTS #3 AND #4 PFO WETLANDS, PERENNIAL & INTERMITTENT STREAM TNT PROJECT NO: 1165

Received by VMRC September 1, 2023 /blh



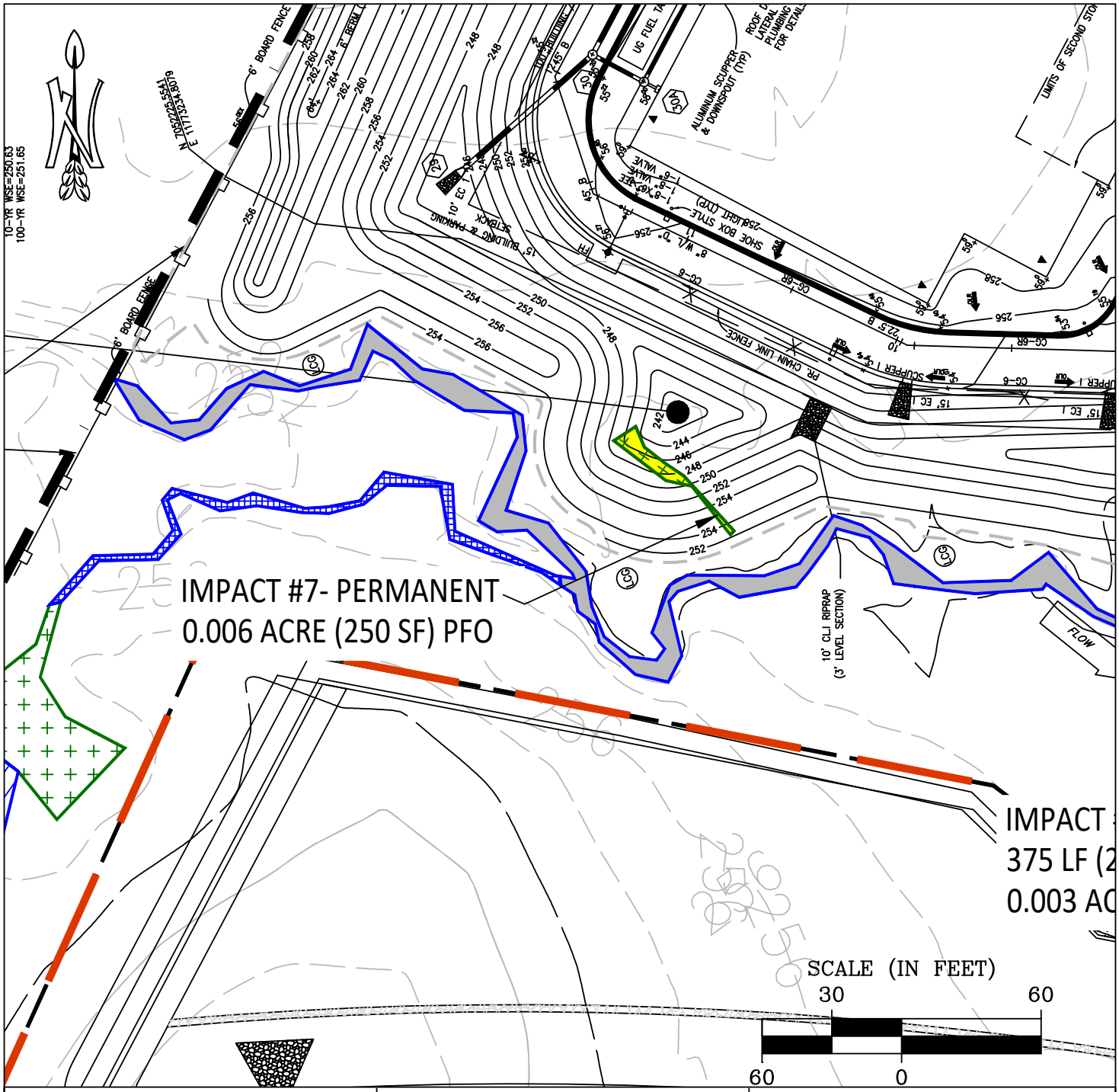
JOINT PERMIT APPLICATION LOUDOUN CENTER PHASE II LOUDOUN COUNTY, VA SEPTEMBER 2023	ENVIRONMENTAL **4455 BROOKFIELD CORPORATE DRIVE,** **SUITE 100** **CHANTILLY, VIRGINIA 20151**	**PLAN VIEW** IMPACTS #3 & #4 (CONTINUED) & #5 PFO WETLANDS, PERENNIAL & INTERMITTENT STREAM TNT PROJECT NO: 1165

Received by VMRC September 1, 2023 /blh



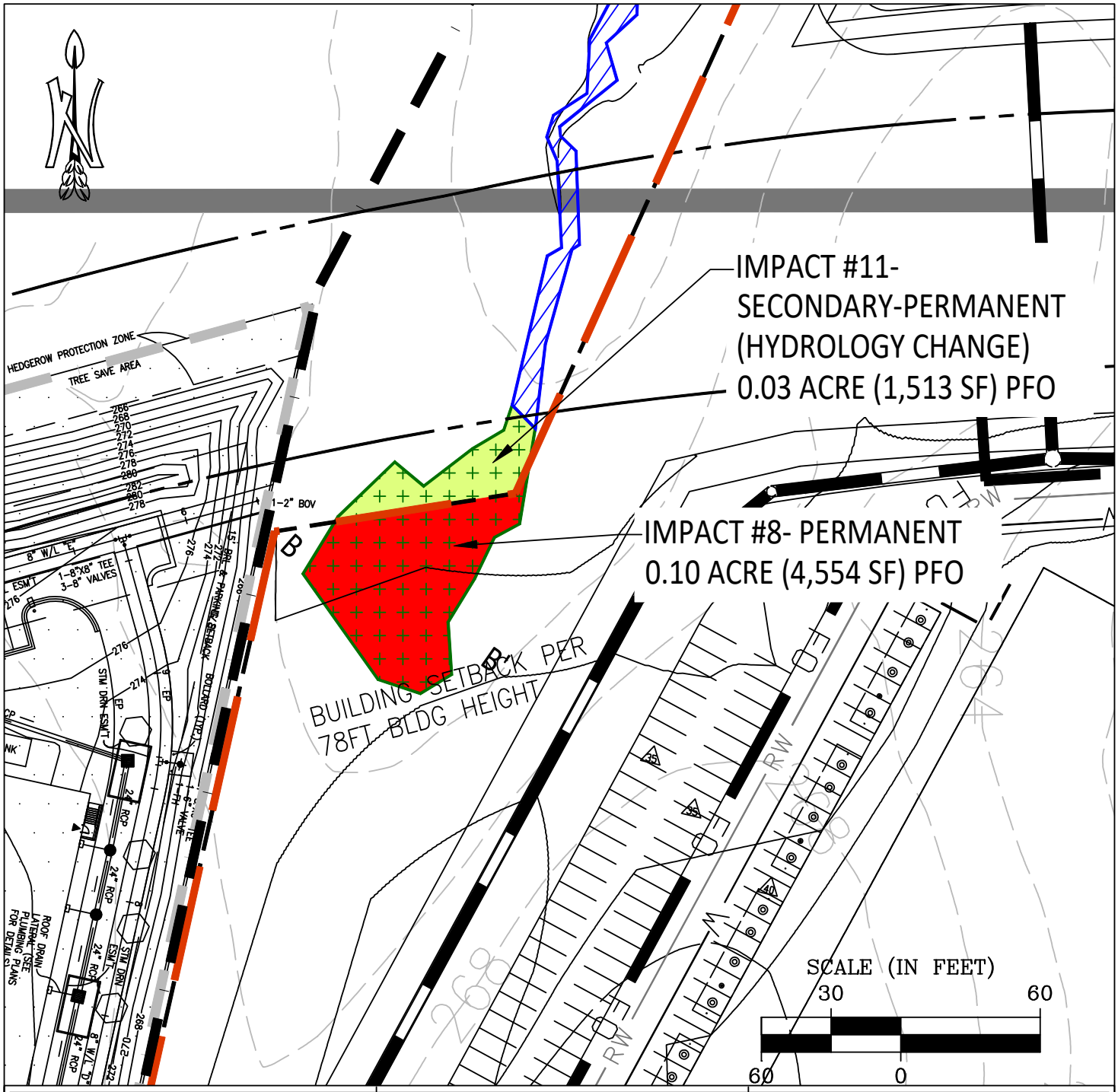
JOINT PERMIT APPLICATION	ENVIRONMENTAL	**PLAN VIEW**
LOUDOUN CENTER PHASE II		IMPACTS #6
LOUDOUN COUNTY, VA	**4455 BROOKFIELD CORPORATE DRIVE, SUITE 100 CHANTILLY, VIRGINIA 20151**	EPHEMERAL STREAMS
SEPTEMBER 2023		TNT PROJECT NO: 1165

Received by VMRC September 1, 2023 /blh



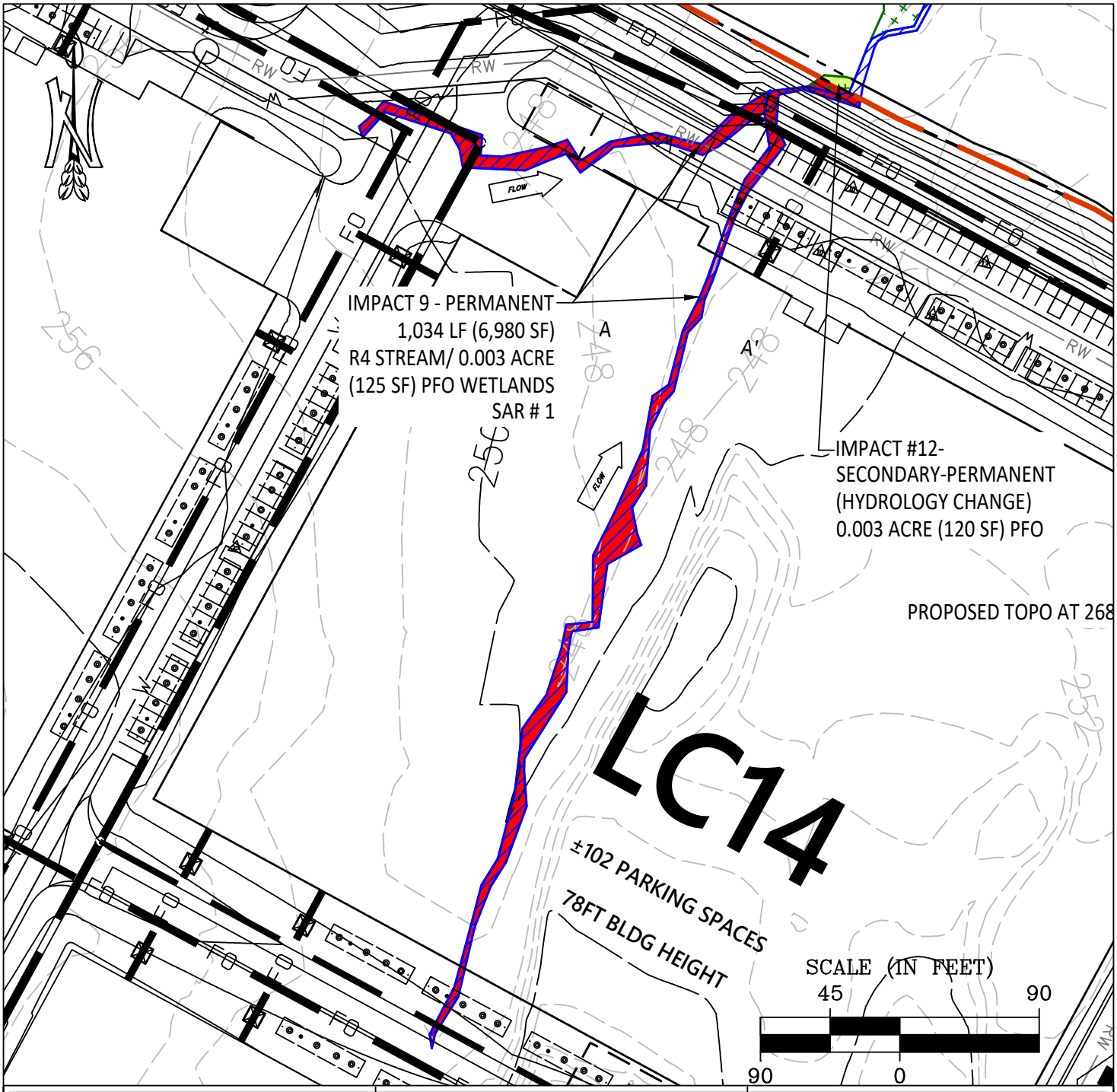
JOINT PERMIT APPLICATION LOUDOUN CENTER PHASE II LOUDOUN COUNTY, VA SEPTEMBER 2023	ENVIRONMENTAL **4455 BROOKFIELD CORPORATE DRIVE,** **SUITE 100** **CHANTILLY, VIRGINIA 20151**	**PLAN VIEW** IMPACTS #7 PFO WETLANDS TNT PROJECT NO: 1165

Received by VMRC September 1, 2023 /blh



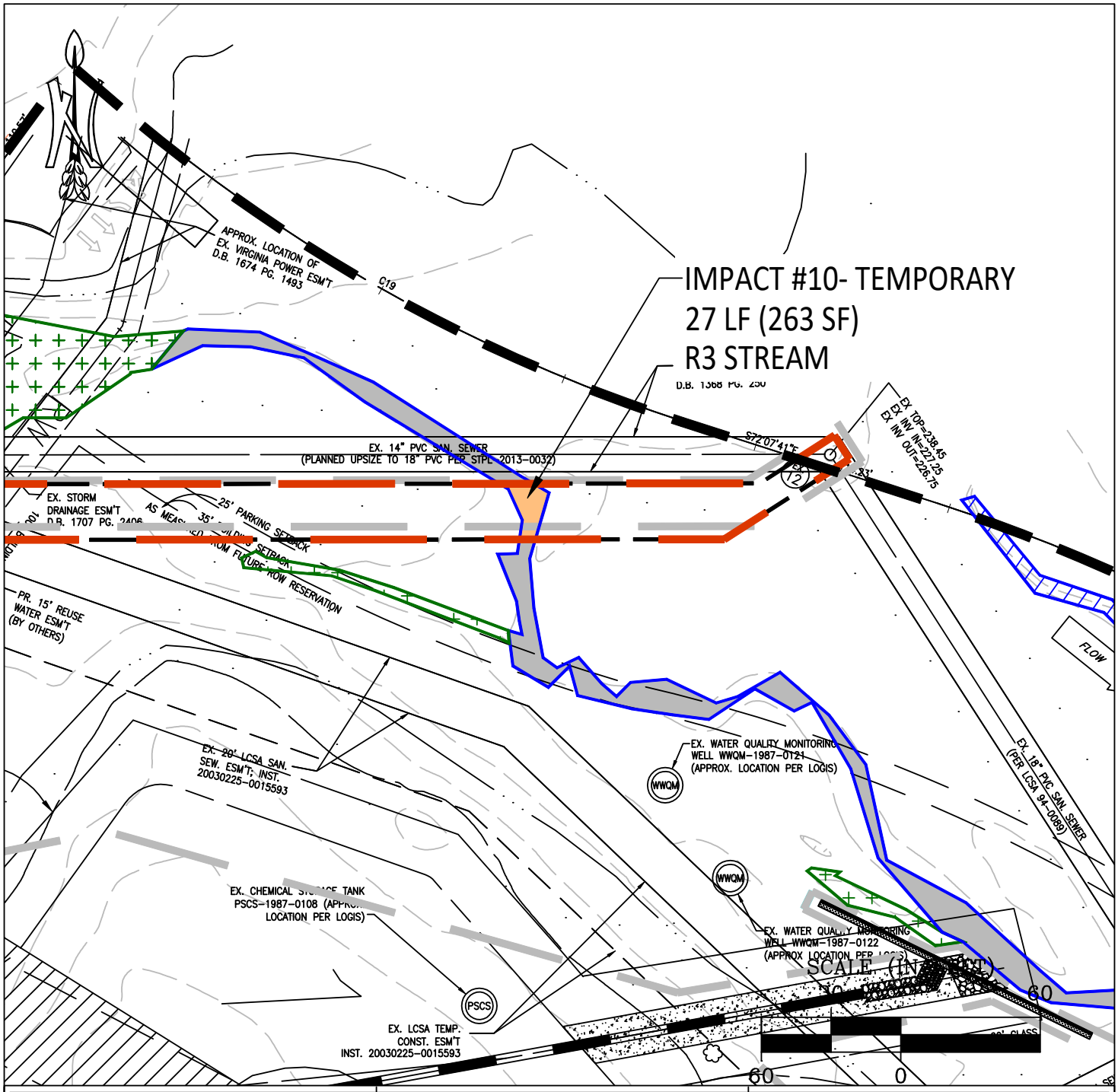
JOINT PERMIT APPLICATION LOUDOUN CENTER PHASE II LOUDOUN COUNTY, VA SEPTEMBER 2023	ENVIRONMENTAL **4455 BROOKFIELD CORPORATE DRIVE,** **SUITE 100** **CHANTILLY, VIRGINIA 20151**	**PLAN VIEW** IMPACTS #8 & #11 PFO WETLANDS TNT PROJECT NO: 1165

Received by VMRC September 1, 2023 /blh



JOINT PERMIT APPLICATION LOUDOUN CENTER PHASE II LOUDOUN COUNTY, VA SEPTEMBER 2023	ENVIRONMENTAL **4455 BROOKFIELD CORPORATE DRIVE,** **SUITE 100** **CHANTILLY, VIRGINIA 20151**	**PLAN VIEW** IMPACTS #9 & #12 INTERMITTENT STREAMS & PFO WETLANDS TNT PROJECT NO: 1165

Received by VMRC September 1, 2023 /blh



JOINT PERMIT APPLICATION LOUDOUN CENTER PHASE II LOUDOUN COUNTY, VA SEPTEMBER 2023	ENVIRONMENTAL **4455 BROOKFIELD CORPORATE DRIVE,** **SUITE 100** **CHANTILLY, VIRGINIA 20151**	**PLAN VIEW** IMPACTS #10 PERENNIAL STREAM TNT PROJECT NO: 1165

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APPENDIX IX

OVERALL SITE DEVELOPMENT PLAN AND WETLAND IMPACT MAP

Received by VMRC September 1, 2023 /blh

LEGEND

- PERENNIAL WATERS OF THE U.S. (R3)
- INTERMITTENT WATERS OF THE U.S. (R4)
- EPHEMERAL WATERS OF THE U.S. (RE)
- PALUSTRINE FORESTED (PFO) WETLAND
- PALUSTRINE EMERGENT (PEM) WETLANDS
- OFFSITE PERENNIAL WATERS OF THE U.S. (R3)
- OFFSITE PALUSTRINE FORESTED (PFO) WETLANDS
- STUDY AREA
- PHASE III STUDY AREA
- LIMITS OF CLEARING AND GRADING
- PERMANENT IMPACTS
- SECONDARY-PERMANENT IMPACTS (HYDROLOGY CHANGE)
- IMPACTS PREVIOUSLY PERMITED UNDER WP4-18-1411
- TEMPORARY IMPACTS (TO BE RESTORED TO PRE-CONSTRUCTION CONDITIONS)

NOTES:

1. ORIGINAL WETLAND DELINEATION CONDUCTED BY ANGLER ENVIRONMENTAL (2010), DELINEATION FOR LOUDOUN COUNTY TRANSPORTATION PROJECTS CONDUCTED BY RK&K (2017). SUPPLEMENTAL DATA COLLECTED BY TNT ENVIRONMENTAL, INC. IN APRIL 2018.

2. THE WETLAND AND OTHER WATERS OF THE U.S. BOUNDARIES DEPICTED HEREON WERE CONFIRMED DURING A JURISDICTIONAL DETERMINATION WITH THE US ARMY CORPS OF ENGINEERS (USACE) (NAO-2018-00997), DATED JULY 17, 2018.

3. EXISTING AND PROPOSED DEVELOPMENT PROVIDED BY GORDON, 2023.

4. IMPACTS 1-7 WERE PREVIOUSLY PERMITTED UNDER WP4-18-1411, DATED NOVEMBER 14, 2018.

Total Permanent Impacts to Waters (Linear Feet):	**2,452**	**LF**
Total Permanent Impacts to Waters (Acreage):	**1.23**	**Acres**
Total Permanent Impacts to Waters (Square Feet):	**53,502**	**SF**
Total Temporary Impacts to Waters (Acreage):	**0.01**	**Acres**

SUMMARY OF WETLAND AND WATERS IMPACTS

Impact #	Impact Type	Impact Description	Average Stream Flow (cfs)	Drainage Area (Sq. Mi.)	PERMANENT IMPACTS											TEMPORARY IMPACTS		
					PFO (SF)	PFO (AC.)	R3 (LF)	R3 (SF)	R3 (AC.)	R4 (LF)	R4 (SF)	R4 (AC.)	R6 (LF)	R6 (SF)	R6 (AC.)	R3 (LF)	R3 (SF)	R3 (AC.)
LC 4																		
1	Building Construction & Supportive Grade	F, NT, PE, V, PFO	-	< 0.1	2,063	0.05	-	-	-	-	-	-	-	-	-	-	-	-
2	Dewatering	NT, PE, SE, V, PFO	-	< 0.1	18,286	0.42	-	-	-	-	-	-	-	-	-	-	-	-
LC 5																		
3	Building Construction & Supportive Grade	F, NT, PE, V, PFO, R3	~ 1	< 0.1	1,786	0.04	-	-	-	592	4,346	0.10	-	-	-	-	-	-
4	Building Construction, Parking Lot Construction & Supportive Grading	F, NT, PE, V, PFO, R3, R4	~ 1	< 0.1	8,097	0.19	112	634	0.01	298	1,722	0.04	-	-	-	-	-	-
5	Parking Lot Construction & Supportive Grading	F, NT, PE, SE, V, PFO, R4	~ 1	< 0.1	224	0.005	-	-	-	41	415	0.01	-	-	-	-	-	-
6	Supportive Grading	F, NT, PE, NV, RE	~ 1	< 0.1	141	0.003	-	-	-	-	-	-	375	2,246	0.05	-	-	-
7	Supportive Grading	F, NT, PE, V, PFO	~ 1	< 0.1	250	0.006	-	-	-	-	-	-	-	-	-	-	-	-
LC 11 - 14																		
8	Supportive Grading	F, NT, PE, V, PFO	~ 1	< 0.1	4,554	0.10	-	-	-	-	-	-	-	-	-	-	-	-
9	Building Construction, Parking Lot Construction & Supportive Grading	F, NT, PE, R4, NV	~ 1	< 0.1	125	0.003	-	-	-	1,034	6,980	0.16	-	-	-	-	-	-
10	Utility Crossing	F, NT, TE, R3, NV	~ 1	~ 0.4	-	-	-	-	-	-	-	-	-	-	-	27	263	0.01
11	Hydrology Change	NT, PE, PFO, V, S	~ 1	~ 0.4	1,513	0.03	-	-	-	-	-	-	-	-	-	-	-	-
12	Hydrology Change	NT, PE, PFO, V, S	~ 1	~ 0.4	120	0.003	-	-	-	-	-	-	-	-	-	-	-	-
Total					**37,159**	**0.85**	**112**	**634**	**0.01**	**1,965**	**13,463**	**0.31**	**375**	**2,246**	**0.05**	**27**	**263**	**0.01**

F - Fill; NT - Nontidal; PE - Permanent; TE - Temporary; R3 - Perennial; R4 - Intermittent; R6 - Ephemeral; PFO - Palustrine Forested; PEM - Palustrine Emergent; NV - Non-vegetated; V - Vegetated; S - Secondary

ENVIRONMENTAL
4455 Brookfield Corporate Drive, Suite 100
Chantilly, VA 20151
PH: 703-466-5123 WWW.TNTENVIRONMENTALINC.COM

LOUDOUN CENTER
FUTURE PHASE II

LOUDOUN COUNTY, VA

IMPACTS TO WETLANDS & WOTUS MAP

REVISIONS

DATE	COMMENTS

SHEET 1 OF 4

SCALE: 1" = 100'

PROJECT DATE: 9/1/23

DRAFT: KES | CHECK: AMS

FILE NUMBER: 1165

Received by VMRC September 1, 2023 /blh

LEGEND

- PERENNIAL WATERS OF THE U.S. (R3)
- INTERMITTENT WATERS OF THE U.S. (R4)
- EPHEMERAL WATERS OF THE U.S. (RE)
- PALUSTRINE FORESTED (PFO) WETLAND
- PALUSTRINE EMERGENT (PEM) WETLANDS
- OFFSITE PERENNIAL WATERS OF THE U.S. (R3)
- OFFSITE PALUSTRINE FORESTED (PFO) WETLANDS
- STUDY AREA
- PHASE III STUDY AREA
- LIMITS OF CLEARING AND GRADING
- PERMANENT IMPACTS
- SECONDARY-PERMANENT IMPACTS (HYDROLOGY CHANGE)
- IMPACTS PREVIOUSLY PERMITED UNDER WP4-18-1411
- TEMPORARY IMPACTS (TO BE RESTORED TO PRE-CONSTRUCTION CONDITIONS)

NOTES:

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2. THE WETLAND AND OTHER WATERS OF THE U.S. BOUNDARIES DEPICTED HEREON WERE CONFIRMED DURING A JURISDICTIONAL DETERMINATION WITH THE US ARMY CORPS OF ENGINEERS (USACE) (NAO-2018-00997), DATED JULY 17, 2018.

3. EXISTING AND PROPOSED DEVELOPMENT PROVIDED BY GORDON, 2023.

4. IMPACTS 1-7 WERE PREVIOUSLY PERMITTED UNDER WP4-18-1411, DATED NOVEMBER 14, 2018.

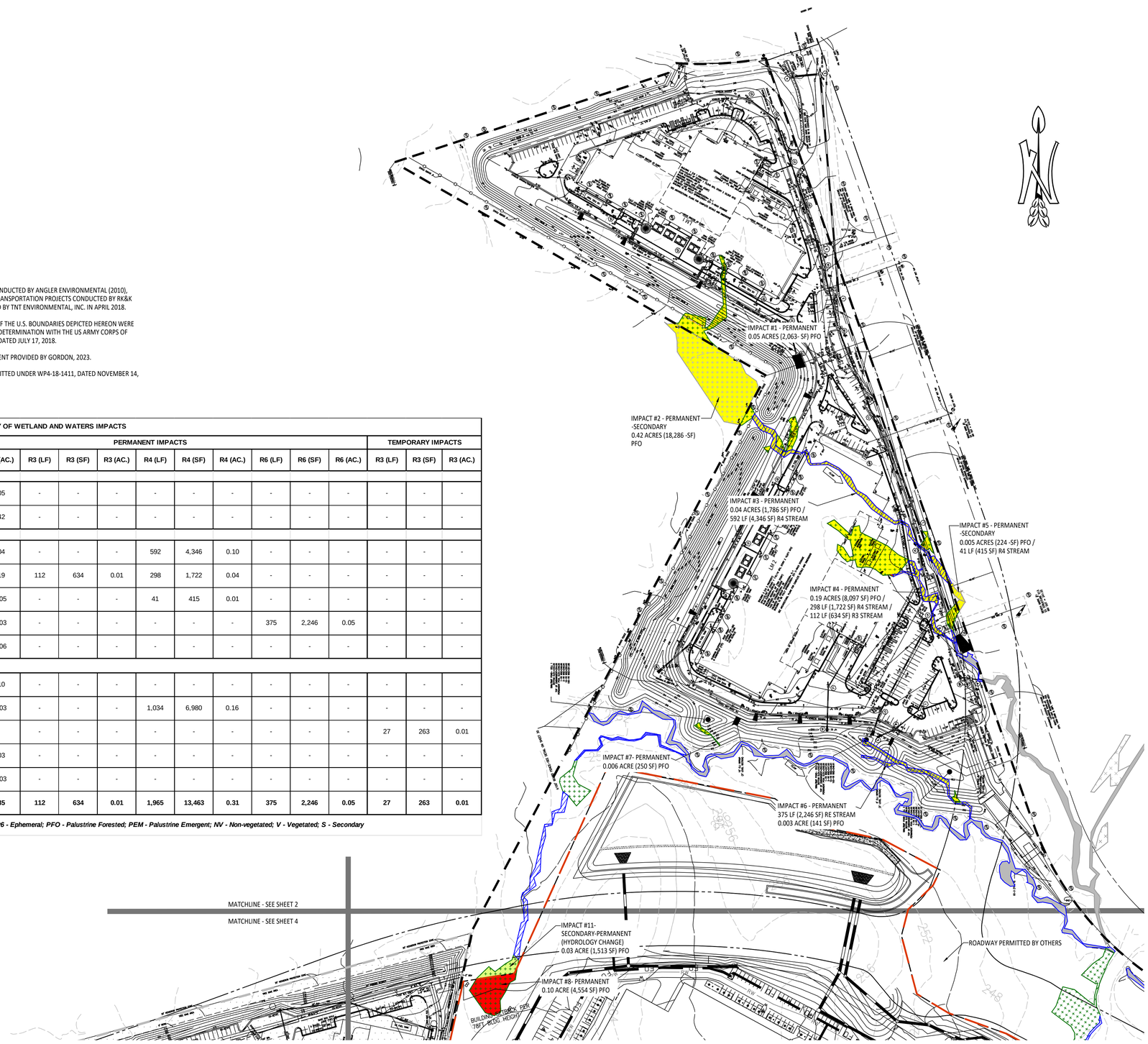
SUMMARY OF WETLAND AND WATERS IMPACTS

Impact #	Impact Type	Impact Description	Average Stream Flow (cfs)	Drainage Area (Sq. Mi.)	PERMANENT IMPACTS											TEMPORARY IMPACTS		
					PFO (SF)	PFO (AC.)	R3 (LF)	R3 (SF)	R3 (AC.)	R4 (LF)	R4 (SF)	R4 (AC.)	R6 (LF)	R6 (SF)	R6 (AC.)	R3 (LF)	R3 (SF)	R3 (AC.)
LC 4																		
1	Building Construction & Supportive Grade	F, NT, PE, V, PFO	-	< 0.1	2,063	0.05	-	-	-	-	-	-	-	-	-	-	-	-
2	Dewatering	NT, PE, SE, V, PFO	-	< 0.1	18,286	0.42	-	-	-	-	-	-	-	-	-	-	-	-
LC 5																		
3	Building Construction & Supportive Grade	F, NT, PE, V, PFO, R3	~ 1	< 0.1	1,786	0.04	-	-	-	592	4,346	0.10	-	-	-	-	-	-
4	Building Construction, Parking Lot Construction & Supportive Grading	F, NT, PE, V, PFO, R3, R4	~ 1	< 0.1	8,097	0.19	112	634	0.01	298	1,722	0.04	-	-	-	-	-	-
5	Parking Lot Construction & Supportive Grading	F, NT, PE, SE, V, PFO, R4	~ 1	< 0.1	224	0.005	-	-	-	41	415	0.01	-	-	-	-	-	-
6	Supportive Grading	F, NT, PE, NV, RE	~ 1	< 0.1	141	0.003	-	-	-	-	-	-	375	2,246	0.05	-	-	-
7	Supportive Grading	F, NT, PE, V, PFO	~ 1	< 0.1	250	0.006	-	-	-	-	-	-	-	-	-	-	-	-
LC 11 - 14																		
8	Supportive Grading	F, NT, PE, V, PFO	~ 1	< 0.1	4,554	0.10	-	-	-	-	-	-	-	-	-	-	-	-
9	Building Construction, Parking Lot Construction & Supportive Grading	F, NT, PE, R4, NV	~ 1	< 0.1	125	0.003	-	-	-	1,034	6,980	0.16	-	-	-	-	-	-
10	Utility Crossing	F, NT, TE, R3, NV	~ 1	~ 0.4	-	-	-	-	-	-	-	-	-	-	-	27	263	0.01
11	Hydrology Change	NT, PE, PFO, V, S	~ 1	~ 0.4	1,513	0.03	-	-	-	-	-	-	-	-	-	-	-	-
12	Hydrology Change	NT, PE, PFO, V, S	~ 1	~ 0.4	120	0.003	-	-	-	-	-	-	-	-	-	-	-	-
Total					**37,159**	**0.85**	**112**	**634**	**0.01**	**1,965**	**13,463**	**0.31**	**375**	**2,246**	**0.05**	**27**	**263**	**0.01**

F - Fill; NT - Nontidal; PE - Permanent; TE - Temporary; R3 - Perennial; R4 - Intermittent; R6 - Ephemeral; PFO - Palustrine Forested; PEM - Palustrine Emergent; NV - Non-vegetated; V - Vegetated; S - Secondary

Total Permanent Impacts to Waters (Linear Feet):	**2,452**	**LF**
Total Permanent Impacts to Waters (Acreage):	**1.23**	**Acres**
Total Permanent Impacts to Waters (Square Feet):	**53,502**	**SF**
Total Temporary Impacts to Waters (Acreage):	**0.01**	**Acres**

SCALE (IN FEET)
50 100
100 0



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LOUDOUN CENTER
PHASE I – LC4 & LC5
LOUDOUN COUNTY, VA

IMPACTS TO WETLANDS & WOTUS MAP

REVISIONS

DATE	COMMENTS

SHEET 2 OF 4

SCALE: 1" = 100'

PROJECT DATE: 9/1/23

DRAFT: KES | CHECK: AMS

FILE NUMBER: 1165

Received by VMRC September 1, 2023 /blh

SUMMARY OF WETLAND AND WATERS IMPACTS

Impact #	Impact Type	Impact Description	Average Stream Flow (cfs)	Drainage Area (Sq. Mi.)	PERMANENT IMPACTS											TEMPORARY IMPACTS		
					PFO (SF)	PFO (AC.)	R3 (LF)	R3 (SF)	R3 (AC.)	R4 (LF)	R4 (SF)	R4 (AC.)	R6 (LF)	R6 (SF)	R6 (AC.)	R3 (LF)	R3 (SF)	R3 (AC.)
LC 4																		
1	Building Construction & Supportive Grade	F, NT, PE, V, PFO	-	< 0.1	2,063	0.05	-	-	-	-	-	-	-	-	-	-	-	-
2	Dewatering	NT, PE, SE, V, PFO	-	< 0.1	18,286	0.42	-	-	-	-	-	-	-	-	-	-	-	-
LC 5																		
3	Building Construction & Supportive Grade	F, NT, PE, V, PFO, R3	~ 1	< 0.1	1,786	0.04	-	-	-	592	4,346	0.10	-	-	-	-	-	-
4	Building Construction, Parking Lot Construction & Supportive Grading	F, NT, PE, V, PFO, R3, R4	~ 1	< 0.1	8,097	0.19	112	634	0.01	298	1,722	0.04	-	-	-	-	-	-
5	Parking Lot Construction & Supportive Grading	F, NT, PE, SE, V, PFO, R4	~ 1	< 0.1	224	0.005	-	-	-	41	415	0.01	-	-	-	-	-	-
6	Supportive Grading	F, NT, PE, NV, RE	~ 1	< 0.1	141	0.003	-	-	-	-	-	-	375	2,246	0.05	-	-	-
7	Supportive Grading	F, NT, PE, V, PFO	~ 1	< 0.1	250	0.006	-	-	-	-	-	-	-	-	-	-	-	-
LC 11 - 14																		
8	Supportive Grading	F, NT, PE, V, PFO	~ 1	< 0.1	4,554	0.10	-	-	-	-	-	-	-	-	-	-	-	-
9	Building Construction, Parking Lot Construction & Supportive Grading	F, NT, PE, R4, NV	~ 1	< 0.1	125	0.003	-	-	-	1,034	6,980	0.16	-	-	-	-	-	-
10	Utility Crossing	F, NT, TE, R3, NV	~ 1	~ 0.4	-	-	-	-	-	-	-	-	-	-	-	27	263	0.01
11	Hydrology Change	NT, PE, PFO, V, S	~ 1	~ 0.4	1,513	0.03	-	-	-	-	-	-	-	-	-	-	-	-
12	Hydrology Change	NT, PE, PFO, V, S	~ 1	~ 0.4	120	0.003	-	-	-	-	-	-	-	-	-	-	-	-
Total					**37,159**	**0.85**	**112**	**634**	**0.01**	**1,965**	**13,463**	**0.31**	**375**	**2,246**	**0.05**	**27**	**263**	**0.01**

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LEGEND

- PERENNIAL WATERS OF THE U.S. (R3)
- INTERMITTENT WATERS OF THE U.S. (R4)
- EPHEMERAL WATERS OF THE U.S. (RE)
- PALUSTRINE FORESTED (PFO) WETLAND
- PALUSTRINE EMERGENT (PEM) WETLANDS
- OFFSITE PERENNIAL WATERS OF THE U.S. (R3)
- OFFSITE PALUSTRINE FORESTED (PFO) WETLANDS
- STUDY AREA
- PHASE III STUDY AREA
- LIMITS OF CLEARING AND GRADING
- PERMANENT IMPACTS
- SECONDARY-PERMANENT IMPACTS (HYDROLOGY CHANGE)
- IMPACTS PREVIOUSLY PERMITED UNDER WP4-18-1411
- TEMPORARY IMPACTS (TO BE RESTORED TO PRE-CONSTRUCTION CONDITIONS)

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Total Permanent Impacts to Waters (Acreage):	**1.23**	**Acres**
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NOTES:

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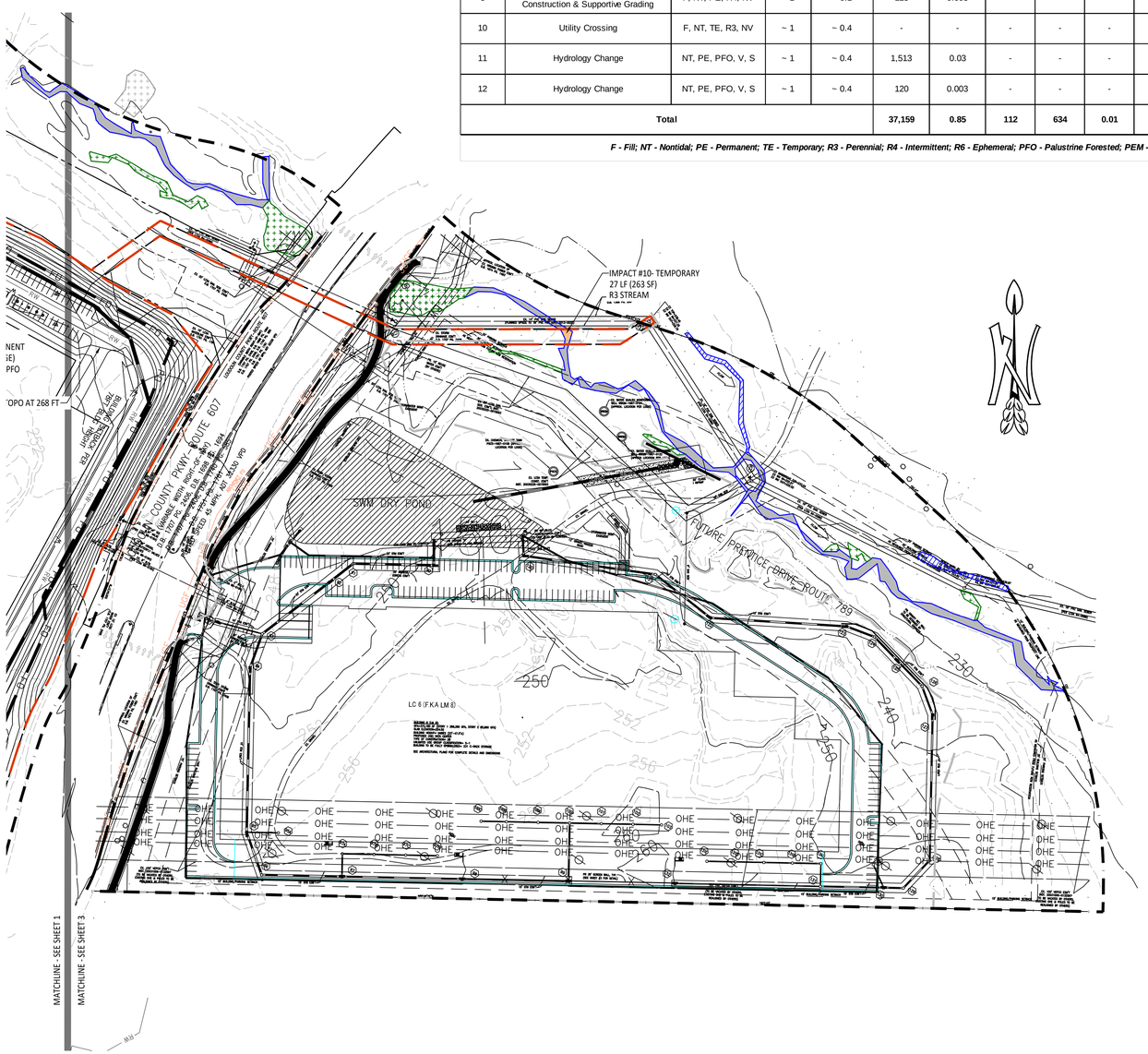

SCALE (IN FEET)
50 100
100 0

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PHASE I – LC 6
LOUDOUN COUNTY, VA

IMPACTS TO WETLANDS & WOTUS MAP

REVISIONS

DATE	COMMENTS
9/18/18 JSM	
5/30/23 KES	

SHEET 3 OF 4

SCALE: 1" = 100'

PROJECT DATE: 9/1/23

DRAFT: KES | CHECK: AMS

FILE NUMBER: 1165

Received by VMRC September 1, 2023 /blh

LEGEND

- PERENNIAL WATERS OF THE U.S. (R3)
- INTERMITTENT WATERS OF THE U.S. (R4)
- EPHEMERAL WATERS OF THE U.S. (RE)
- PALUSTRINE FORESTED (PFO) WETLAND
- PALUSTRINE EMERGENT (PEM) WETLANDS
- OFFSITE PERENNIAL WATERS OF THE U.S. (R3)
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FUTURE PHASE III
LOUDOUN COUNTY, VA

IMPACTS TO WETLANDS & WOTUS MAP

REVISIONS

DATE	COMMENTS

SHEET 4 OF 4

SCALE: 1" = 100'

PROJECT DATE: 9/1/23

DRAFT: KES | CHECK: AMS

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Received by VMRC September 1, 2023 /blh