Environmental Assessment (EA)
for
Northside Development
at OKV

Winchester Regional Airport (OKV)
Winchester, Virginia

DRAFT-V5
June 2025

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1. Introduction/Background

The Winchester Regional Airport Authority (the Authority), owner and operator of the Winchester Regional Airport (OKV), proposes "Northside Development" at OKV. OKV is a general aviation in Winchester, Virginia, in Frederick County. The general extents of the Northside Development area of the airfield are outlined in red in **Figure 1**.

The airport is classified as a "Regional" airport in the National Plan of Integrated Airspace Systems (NPIAS). The Federal Aviation Administration's (FAA) 2023-2027 NPIAS report defines regional airports as those that serve relatively large, metropolitan populations and support regional economies with interstate and some long-distance travel, with high levels of jet and multi-engine activity. The Virginia Department of Aviation (DOAV) classifies OKV as a "Regional Business" airport.

The Authority has expressed its desire to develop the Northside area of the airfield for aeronautical use. While the ultimate use of the development is not yet known, a concept of what the proposed development could look like is included as Figure 2 which is in line with what is conceptually depicted on the approved Airport Layout Plan (ALP), see Figure 3. The study area encompasses approximately 47 acres, which is a conservative study area to include grading limits and stormwater improvements to support the development.

Development of the Northside of the airfield has been a part of the Authority's long term vision since its ALP was initially prepared in 2005. An Environmental Assessment (EA) was prepared in 2008 and a Finding of No Significant Impact (FONSI) was issued by the FAA in October 2008 for "North Side Development"; however, due to lack of funding and other factors, the project did not move forward at that time. The conceptual development plan that was reviewed in the 2008 EA/FONSI is depicted in Figure 4 and the 2008 FONSI is included as **Attachment A**. Due to the age and revised layout of the proposed development from the previous environmental effort, FAA has required that a new EA be prepared.

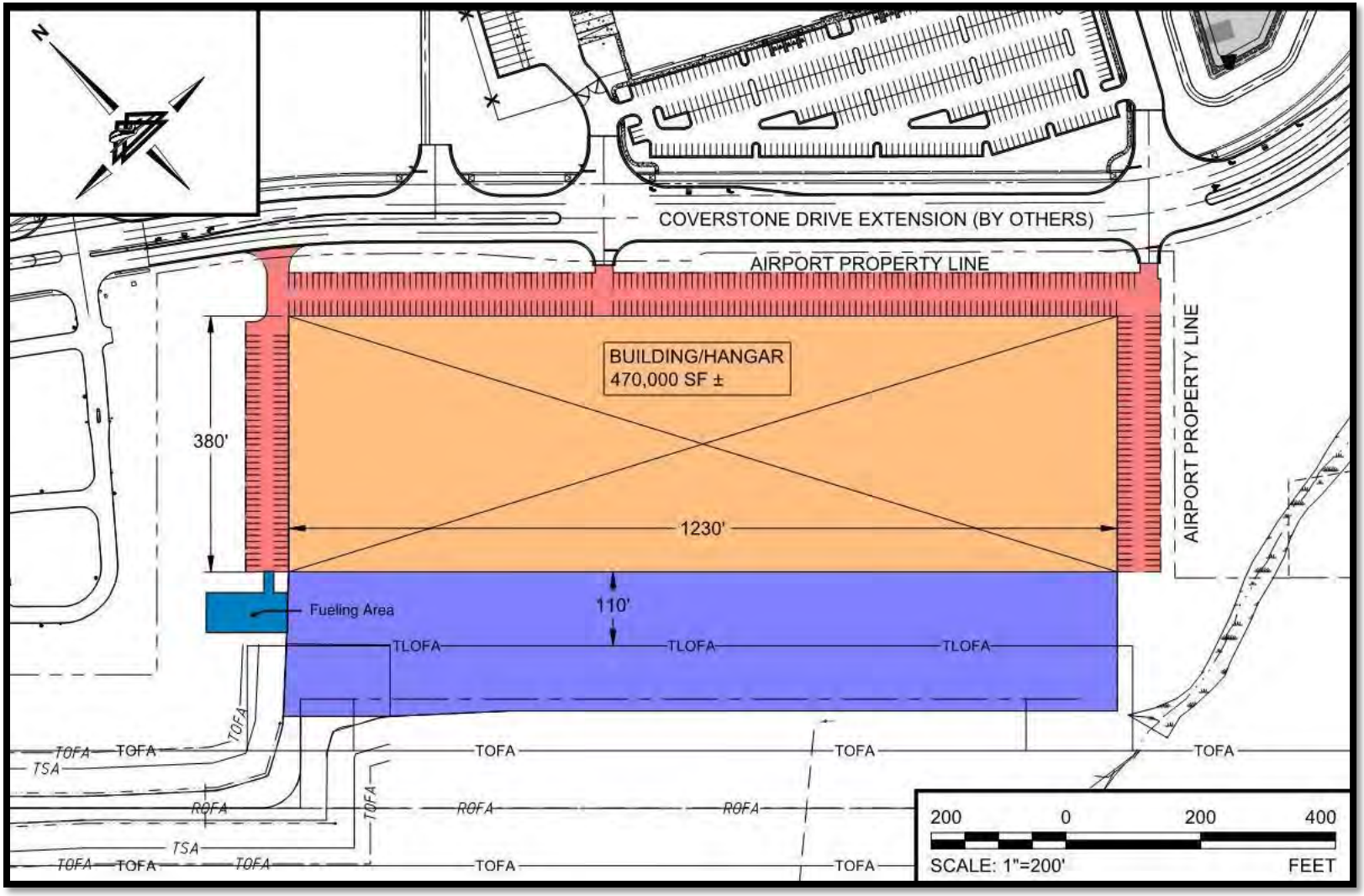
In accordance with 49 US 47107(x) the FAA determined it retains ALP approval authority which is a major Federal action subject to the National Environmental Policy Act (NEPA).

This EA has been prepared in accordance with FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*.

Figure 1: General Extents of Northside Development

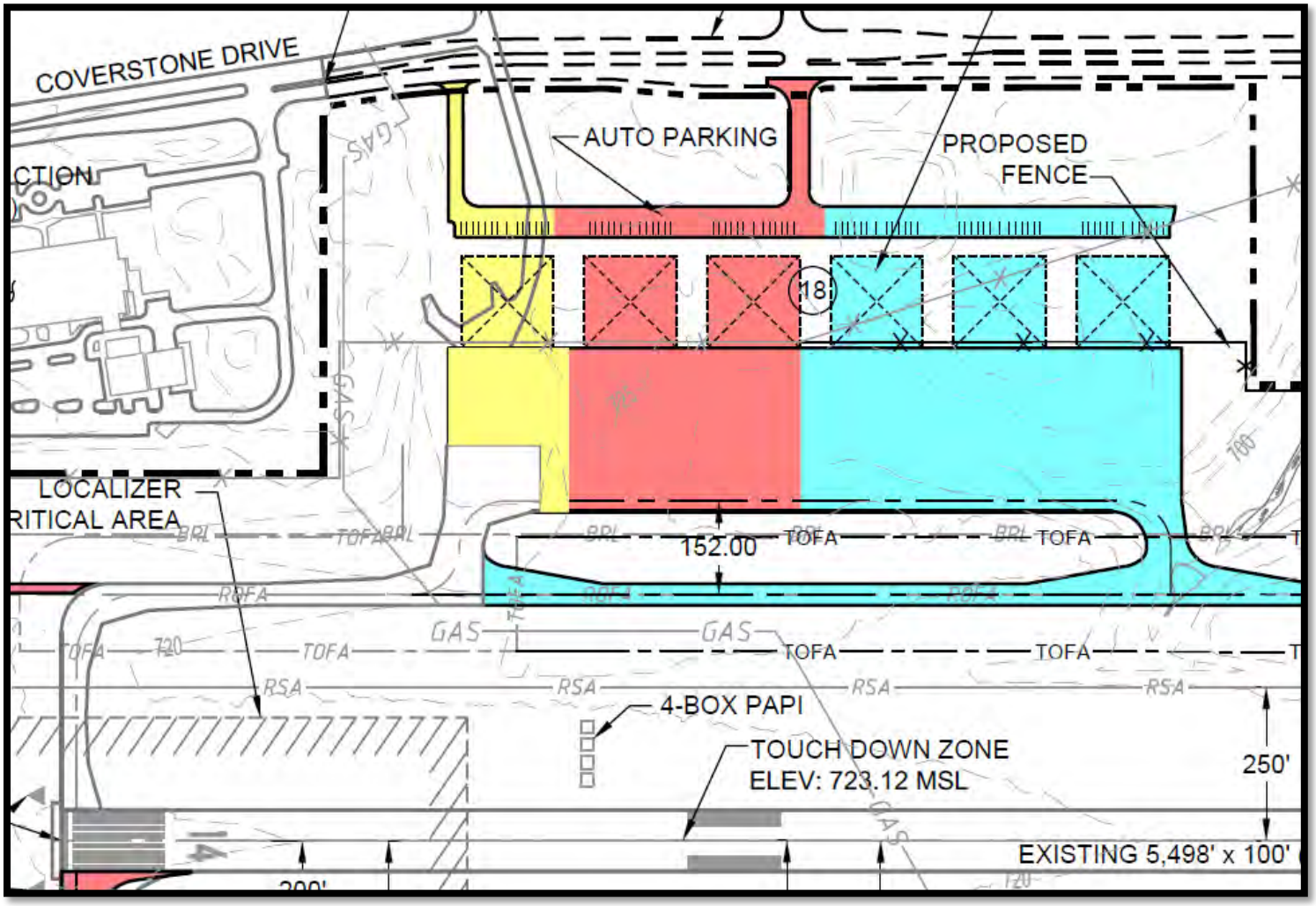
Source: Greenway Engineering

Figure 2: Northside Development Conceptual Layout



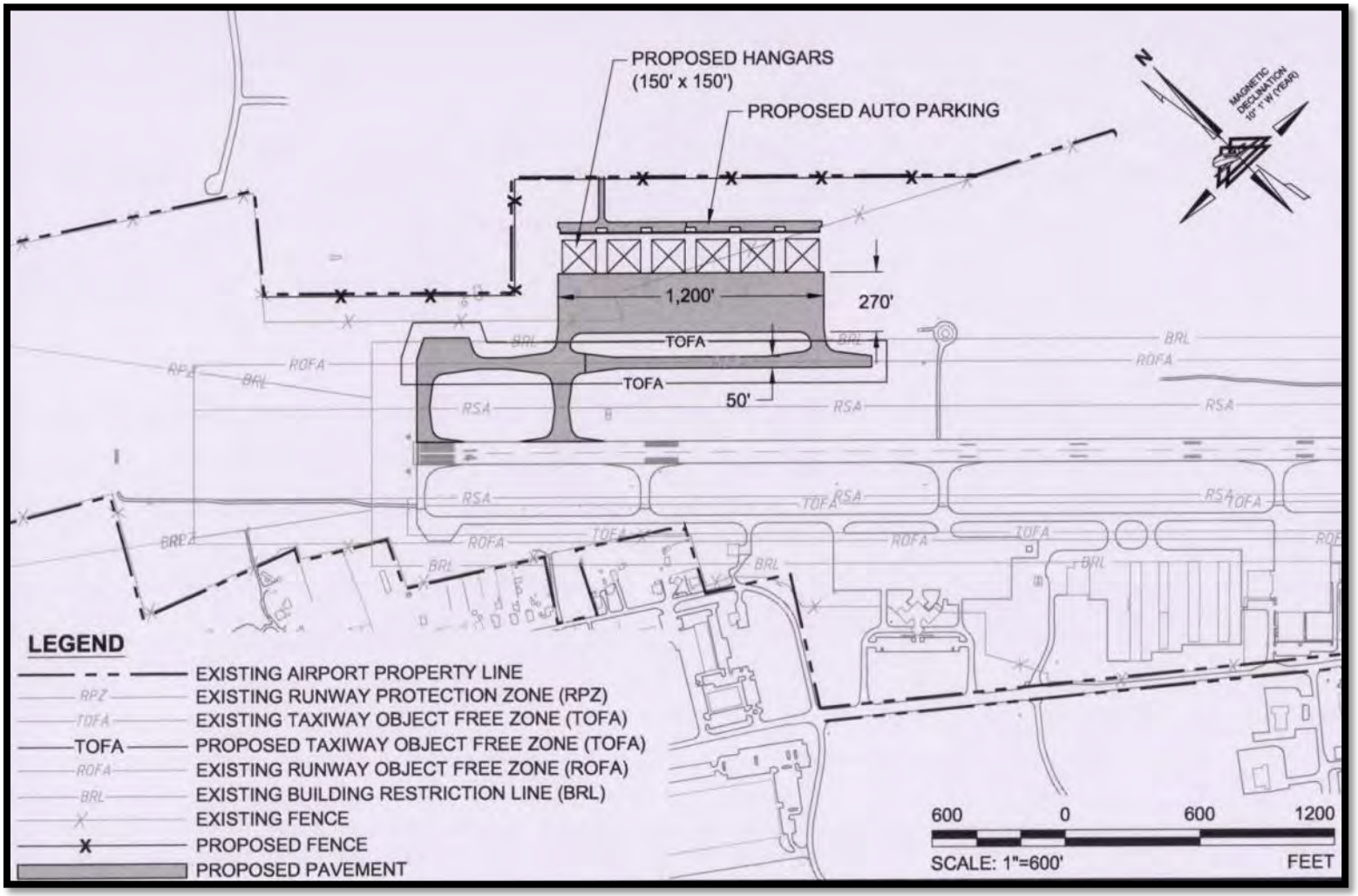
Source: Delta Airport Consultants, Inc

Figure 3: Excerpt from Approved ALP



Source: 2005 ALP for OKV, last revised March 2021

Figure 4: Proposed Project from 2008 EA/FONSI



Source: Delta Airport Consultants, Inc.

2. Proposed Project

The Proposed Project is the development of an aviation-related use in the Northside portion of airport property at OKV. The ultimate future use of the development is not yet known and would depend on the needs of the future tenant. However, for the purposes of this environmental analysis, it is assumed that the proposed Northside Development would accommodate either aircraft manufacturing and final assembly (assumed to be the manufacture of advanced air mobility [AAM]/electric vertical take-off and landing [eVTOL] aircraft), including 200 test flights per year), or aircraft maintenance and/or storage. As a result, the Proposed Project reviewed in this EA includes potential Development Scenario 1 (Aircraft Manufacturing Facility) and potential Development Scenario 2 (Aircraft Storage and/or Maintenance).

Should the facility be used for aircraft manufacturing, it is assumed that the potential future manufacturing facility could be up to 600,000 square feet (sf) in size, with associated apron frontage and automobile parking and access. For the purposes of this environmental review, it is assumed that the use would involve manufacturing, final assembly, and approximately 200 annual test flights, as well apron space, employee parking and access, and truck delivery of parts.

Should the facility be used for hangar storage and/or aircraft maintenance, the types of aircraft to be stored would be of a similar type suitable for the airport today (turboprops and small jets), in addition to the associated automobile parking and access and apron space for the hangars. The concept reviewed under Development Scenario 2 includes 24, 100’ x 100’ hangar buildings, aircraft parking apron, automobile parking, and assumes a total of 7,032 additional, annual operations.

A fuel facility could be installed within the study area, depending on the ultimate future use of the site. While the needs of the future tenant are not yet known, for the purposes of this environmental review, it is assumed that the “fuel facility” would include two, 20,000 gallon tanks of Jet-A fuel; one, 12,000 gallon tank of AvGas (or its unleaded equivalent); and/or two electric aircraft charging facilities, within the area conceptually depicted in Figure 2.

3. Purpose and Need

The Purpose of the Proposed Project (aviation-related development in the Northside of the airfield at OKV) is to maintain economic self-sufficiency, while continuing to serve the aviation community within the region as part of the airport’s role in the national and state airspace systems. The west side of the airfield is practically built out, with the ALP depicting the next phases of development in the Northside area of the airfield.

The Need for Proposed Project is to enhance the airport’s ability to generate revenue and serve the aviation needs of the region. The lack of current development in the Northside of the airfield restricts the airport’s ability to meet these needs.

To facilitate the analysis of the potential development scenarios considered in this EA effort, a project-specific forecasting effort was conducted for the base year (2023) through 2033 (see Figure 5). Annual operations for calendar year 2023 were sourced from OKV’s Virtower Airport Operations Tracking System. Growth rates by aircraft type from the FAA Aerospace Forecast 2023-2033 were then applied to

develop the operations forecast for the No Action alternative, which assumes no construction takes place. The forecasts developed for use in this EA were reviewed and approved by FAA in March 2024 and are included as **Attachment B**, along with the assumptions used and the FAA approval letter. Because construction is anticipated to take place during 2027 and 2028, the forecast prepared for Development Scenario 1 (Aircraft Manufacturing Facility) includes 400 additional annual operations beginning in 2029. The type of aircraft which would be manufactured is not yet known; therefore, the operations were split between single-engine piston aircraft and rotorcraft to best represent the potential types of AAM/eVTOL aircraft which could be manufactured and tested. Four hundred and fifty employees were assumed as a maximum estimate of the building's capacity, accounting for 112,950 annual automobile trips.

To prepare an operations forecast to represent Development Scenario 2 (hangar storage and/or maintenance), it was assumed that 24, 100' x 100' hangars and associated automobile parking are provided within the extents of the Northside Development site. Additional assumptions were made using industry standards and the FAA Aerospace Forecast to estimate that the hangars would represent a maximum (most conservative scenario) of 7,032 additional annual aircraft operations and 7,032 additional automobile trips annually beginning in 2029.

As detailed in **Attachment B**, a second concept for Scenario 2 was considered, which accounted for an additional 3,140 annual operations and 3,140 automobile trips. Because this concept represents a lower, potential build-out (a lower number of additional operations and vehicle trips), "Development Scenario 2" as described in this section was utilized in preparation of the EA as it represents the maximum potential build-out under Scenario 2.

For comparison, the FAA's Terminal Area Forecast (TAF) shows zero growth in operations at OKV during 2023 to 2033, anticipating 43,100 annual operations throughout the planning period. FAA-TAF forecasts are based on time-series analysis and do not take into account potential additional operations caused by individual projects on the airfield.

Figure 5: Project-Specific Forecasts

No Action Alternative

	2023 (base)	2024	2025	2026	Construction 2027	2028	2029	2030	2031	2032	2033
Fixed Wing SE	51,950	51,379	50,813	50,254	49,702	49,155	48,614	48,079	47,551	47,028	46,510
Fixed Wing ME	978	978	978	978	978	978	978	978	978	978	978
Turboprop	1,111	1,119	1,127	1,134	1,142	1,150	1,158	1,167	1,175	1,183	1,191
Turbojet	683	704	726	749	772	796	820	846	872	899	927
Rotorcraft	849	868	887	906	926	947	967	989	1,010	1,033	1,055
Other	416	421	425	430	435	439	444	449	454	459	464
Total	**55,987**	**55,468**	**54,956**	**54,452**	**53,955**	**53,465**	**52,983**	**52,508**	**52,040**	**51,579**	**51,126**

Development Scenario 1 (Aircraft Manufacturing Facility)

	2023 (base)	2024	2025	2026	Construction 2027	2028	2029	2030	2031	2032	2033
Fixed Wing SE	51,950	51,379	50,813	50,254	49,702	49,155	48,814	48,277	47,746	47,221	46,702
Fixed Wing ME	978	978	978	978	978	978	978	978	978	978	978
Turboprop	1,111	1,119	1,127	1,134	1,142	1,150	1,158	1,167	1,175	1,183	1,191
Turbojet	683	704	726	749	772	796	820	846	872	899	927
Rotorcraft	849	868	887	906	926	947	1,167	1,193	1,219	1,246	1,274
Other	416	421	425	430	435	439	444	449	454	459	464
Total	**55,987**	**55,468**	**54,956**	**54,452**	**53,955**	**53,465**	**53,383**	**52,910**	**52,444**	**51,986**	**51,535**

Development Scenario 2 (Aircraft Maintenance and/or Hangar Storage)

	2023 (base)	2024	2025	2026	Construction 2027	2028	2029	2030	2031	2032	2033
Fixed Wing SE	51,950	51,379	50,813	50,254	49,702	49,155	48,614	48,079	47,551	47,028	46,510
Fixed Wing ME	978	978	978	978	978	978	978	978	978	978	978
Turboprop	1,111	1,119	1,127	1,134	1,142	1,150	5,670	5,710	5,750	5,790	5,831
Turbojet	683	704	726	749	772	796	3,340	3,444	3,551	3,661	3,774
Rotorcraft	849	868	887	906	926	947	967	989	1,010	1,033	1,055
Other	416	421	425	430	435	439	444	449	454	459	464
Total	**55,987**	**55,468**	**54,956**	**54,452**	**53,955**	**53,465**	**60,015**	**59,649**	**59,294**	**58,948**	**58,613**

FAA-TAF

	2023 (base)	2024	2025	2026	Construction 2027	2028	2029	2030	2031	2032	2033
Total	**43,100**	**43,100**	**43,100**	**43,100**	**43,100**	**43,100**	**43,100**	**43,100**	**43,100**	**43,100**	**43,100**

Source: Delta Airport Consultants, Inc.

NOTE: Totals may not sum due to rounding.

4. Alternatives

This section compares the No Action and the Build/Proposed Project alternatives.

4.1 No Action Alternative

The No Action alternative serves as a basis for comparing environmental consequences of potential Development Scenarios carried forward for analysis in the EA. Under the No Action alternative, there would be no aviation-related development in the Northside area of OKV. This would prevent the Authority from enhancing the airport's ability to generate revenue to maintain economic self-sufficiency, while continuing to serve the aviation community within the region as part of the national and state airspace systems. Although this alternative does not meet the stated Purpose and Need, it has been carried forward for analysis in accordance with FAA guidance in Order 1050.1F and Order 5050.4, *NEPA Implementing Instructions for Airport Actions.*

4.2 Development Alternative

The Development Alternative assumes that aviation-related development within the Northside area of OKV would occur. This would enable the airport to generate revenue to maintain economic self-sufficiency, while continuing to serve the aviation community within the region as part of the national and state airspace systems. The 47± acre Northside Development site is the next logical area of development on the airfield based on its proximity to the runway and taxiway system and existing automobile access from Coverstone Drive. The south side of the airfield is nearly built out, with insufficient space for the development being proposed in this document. There is not another suitable location on the airfield with the same amount of space, proximity to the runway and taxiway, and automobile access to accommodate aviation-related development of the scale proposed by the Authority.

The ultimate future use of the development is not yet known and would depend on the needs of the future tenant. For the purposes of this environmental analysis, two development scenarios are reviewed under the heading of Development Alternative.

4.2.1 Development Scenario 1

Development Scenario 1 assumes that the Northside Development will involve an Aircraft Manufacturing Facility for AAM/eVTOL aircraft. For the purposes of this environmental review, it is assumed that the use would involve manufacturing, final assembly, and approximately 200 annual test flights, as well apron space, employee parking and access, and truck delivery of parts. Test flights would be conducted in accordance with FAA guidance available at the time that they are conducted, and in accordance with the manufacturer's mission and needs; for the purposes of this analysis, it is assumed that aircraft would follow the flight paths of the existing fleet mix at OKV. Prior to conducting test flights the manufacturer or aircraft operator will need to coordinate with the FAA and obtain approval of new or modified operations specifications, as needed. The conceptual layout of Development Scenario 1 is included as Figure 6 and assumes the following:

- Building (up to 600,000 sf)

- Aircraft apron (35,000± square yards (sy))
- Automobile parking (25,000± sy)
-

4.2.2 Development Scenario 2

Development Scenario 2 assumes that aircraft storage and/or maintenance hangars are constructed within the Northside Development area (see Figure 7). For the purposes of this EA, the Development Scenario 2 includes the following:

- 24, 100' x 100' hangar buildings accommodating up to 48 turboprops and 24 jets
- Aircraft apron (43,000± sy)
- Automobile parking (12,500± sy)

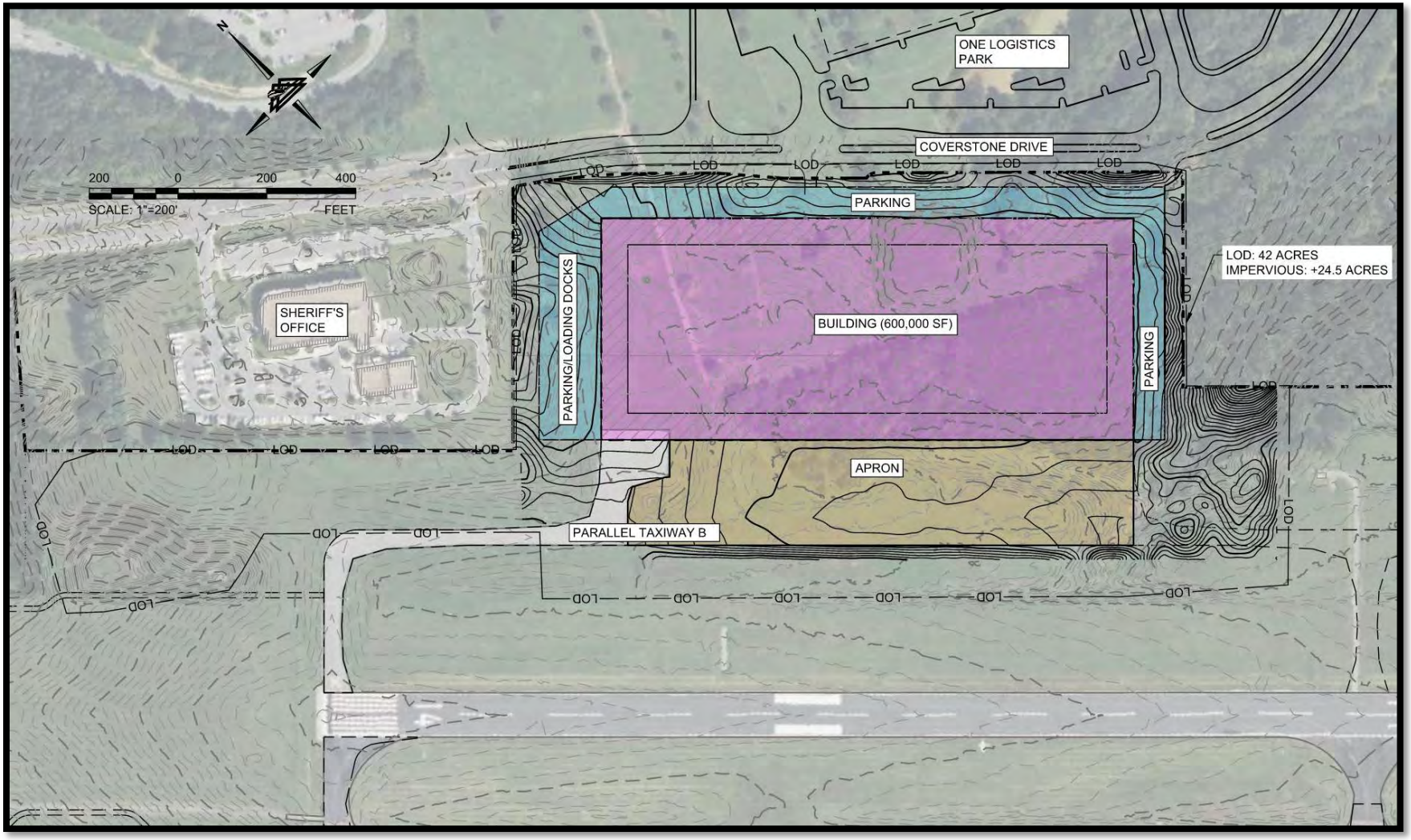
As outlined in **Attachment B**, assumptions for the potential number of additional aircraft operations at OKV resulting from Scenario 2 were developed based on data from the 2023 FAA Aerospace Forecast. This document notes that turboprop aircraft are anticipated to operate approximately 281 hours per year in 2029 (one year past construction completion), and that jets are anticipated to operate 316 hours per year in 2029. Assuming a three-hour trip duration, this equates to approximately 94 and 105 annual operations for turboprops and jets, respectively, for a total, estimated additional operations of 7,032 in 2029 based on the number of aircraft which can be accommodated by the hangars.

It is possible that either Development Scenario could also include a fuel facility, depending on the needs of the future tenant.

Because the Development Alternative, regardless of which Scenario is ultimately selected, enables the Authority to move forward with aviation-related development within the Northside of the airfield, therefore supporting the stated Purpose and Need, it has been selected as the Preferred Alternative.

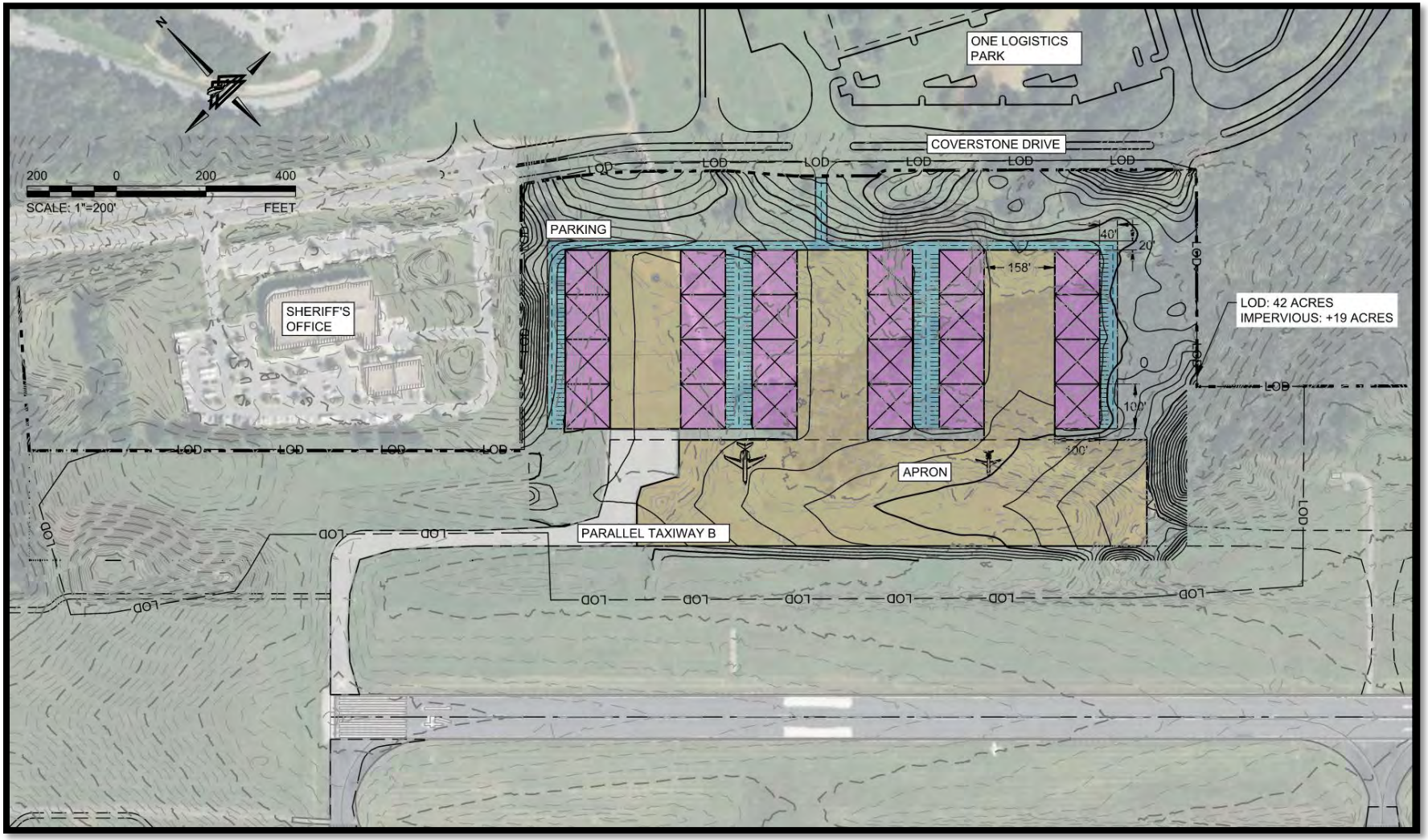
The major federal action requiring preparation of this NEPA document is the FAA's determination that it retains ALP approval authority in accordance with 49 US 47107(x).

Figure 6: Development Scenario 1 (Aircraft Manufacturing Facility)



Source: Delta Airport Consultants, Inc.

Figure 7: Development Scenario 2 (Aircraft Storage and/or Maintenance)



Source: Delta Airport Consultants, Inc.

5. Affected Environment

OKV is an operating, general aviation airport with a robust corporate aviation user base. The airport property is situated in the eastern portion of Frederick County, Virginia, approximately four miles southeast of the City of Winchester. The airport property is situated at an elevation of 726 feet above mean sea level (MSL) and encompasses 380± acres. There is one runway at the airport, Runway 14-32, which is 5,498 feet long and 100 feet wide.

The south and southwest sides of the airfield are nearly built-out. The airport property is zoned Rural Area (RA) and is bordered by lands zoned mostly for industrial and business uses to the west and east. (There are two County-owned parcels zoned as Residential Planned Community Districts east of the airfield; however, these parcels are developed with industrial uses.) To the south, the airport property is generally bordered by parcels zoned RA. North of airport property, parcels are zoned for business uses. See Figure 10.

The 47± acre project site is situated in the northern portion of the airfield, adjacent to the Runway 14 end. The majority of the site is mowed, with approximately eight acres of forested area within the site limits (see Figure 1). A connector taxiway and partial aircraft parking apron were constructed in the 2018-2020 timeframe to provide airfield access to this side of the airfield.

Residential uses are situated approximately one-half mile north of the proposed development site and are separated from the airport property by Millwood Pike/State Route 50; and south of airport property along Bufflick Road/Route 776, which are separated from the proposed development site by the runway and the operating airfield.

This Affected Environment section includes a description of each of the environmental impact categories as listed in FAA Order 1050.1F to establish a "baseline" from which to assess potential impacts.

5.1 Air Quality

Pursuant to the Clean Air Act (CAA), the Environmental Protection Agency (EPA) establishes, enforces, and periodically reviews the National Ambient Air Quality Standards (NAAQS). NAAQS have been established for six common air pollutants, referred to as criteria pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter with a diameter of 10 micrometers or less (PM_{10}), particulate matter (PM) with a diameter of 2.5 micrometers or less ($PM_{2.5}$), and sulfur dioxide (SO_2)- see Table 1. The EPA designates areas as either meeting (attainment) or not meeting (nonattainment) the NAAQS. Once the measured pollutant concentrations in a nonattainment area meet the NAAQS and the additional re-designation requirements in the CAA, the EPA will designate the area as a maintenance area.

The EPA designates Frederick County, where OKV is located, as an attainment area for all NAAQS.

5.1.1 State Implementation Plan (SIP)

The responsibility for designating areas that are in attainment, nonattainment, or maintenance for each of the criteria pollutants was delegated to the states by the EPA. A SIP is a state's detailed description of

the regulations, programs, and measures the state will use to reduce air pollution within the state and to fulfill its responsibilities under the CAA to attain the NAAQS for all criteria air pollutants. To comply with a SIP a federal action must not result in any new violations or worsen any existing violations of the NAAQS, must not delay timely attainment of any standard or any required interim emission reductions or other milestones, and must meet the conditions of general conformity regulations.

5.1.2 General Conformity

The General Conformity Rule was established under CAA Section 176(c)(4) and serves to ensure that any entity of the federal government that engages in, supports, or in any way provides financial support for, licenses/permits, or approves any activity within a nonattainment or maintenance area, to demonstrate that the project conforms to the applicable SIPs before the project is otherwise approved.

Under the General Conformity Rule, project-related emissions of the criteria pollutants are compared to *de minimis* level thresholds. If the emissions exceed the thresholds, a formal Conformity Determination may be required to demonstrate that the project conforms to the applicable SIP. Conversely, if project-related emissions are below the threshold levels, the project is assumed to conform to the SIP.

5.1.3 Aviation Fuel

On October 18, 2023, EPA announced its endangerment finding that emissions of lead from aircraft that operate on leaded fuel cause or contribute to air pollution which may reasonably be anticipated to endanger public health and welfare under the Clean Air Act. The EPA Finding triggers two rulemakings, one by the EPA setting standards for lead emissions from aircraft engines and one by the FAA that will prescribe standards for aircraft engine fuels to meet the EPA's emission standards while maintaining the safety of aircraft operations. While rulemaking is required as a result of EPA's endangerment finding, this finding does not create any immediate changes to the regulatory landscape or impose any mandatory standards under the Clean Air Act or NEPA applicable to airport projects.

While this EPA Finding does not immediately create, restrict or ban the use, sale, distribution, dispensing, and general availability of leaded fuel, nor does it establish any new control measures regarding aircraft lead emissions, the FAA have partnered with aviation stakeholders to achieve a lead-free aviation system by 2030. Congress, in its 2024 FAA Reauthorization Act, prohibits restricting the sale of 100-octane low lead (100LL) aviation gasoline until the earlier of December 31, 2030 or the date the airport makes available unleaded gas authorized by EPA and FAA and meets industry standards or other standard determined by the FAA Administrator.

Table 1: NAAQS

POLLUTANT		PRIMARY/ SECONDARY	AVERAGING TIME	LEVEL
Carbon Monoxide (CO)		Primary	8 hours	9 ppm
			1 hour	35 ppm
Lead (Pb)		Primary and Secondary	Rolling 3-month average	0.15 µg/m^3 (a)
Nitrogen Dioxide (NO_2)		Primary	1 hour	100 ppb
		Primary and Secondary	1 year	53 ppb
Ozone (O_3)		Primary and Secondary	8 hours	0.070 ppm(c)
Particle Pollution (PM)	$PM_{2.5}$	Primary	1 year	9.0 µg/m^3
		Secondary	1 year	15.0 µg/m^3
		Primary and Secondary	24 hours	35 µg/m^3
	PM_{10}	Primary and Secondary	24 hours	150 µg/m^3
Sulfur Dioxide (SO_2)		Primary	1 hour	75 ppb(d)
		Secondary	3 hours	0.5 ppm

Source: EPA, National Ambient Air Quality Standards (NAAQS), 2024

Notes: ppb = parts per billion, ppm = parts per million, and µg/m^3 = micrograms per cubic meter of air

(a) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m^3 as a calendar quarter average) also remain in effect.

(b) The level of the annual NO_2 standards is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

(c) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O_3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.

(d) The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which id designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a State Implementation Plan (SIP) call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its SIP to demonstrate attainment of required NAAQS.

5.2 Biological Resources

The main statutes, executive orders and other guidance concerning biological resources includes:

- The Endangered Species Act (ESA)
- The Bald and Golden Eagle Protection Act
- The Fish and Wildlife Coordination Act and
- The Migratory Bird Act

Section 7 of the ESA requires federal agencies to ensure that a proposed action does not jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of associated habitat. Under the Act, an "endangered" species is defined as any species that is in danger of extinction throughout all, or a significant portion, of its range. A "threatened" species is considered to be any species that is likely to become an endangered species within the foreseeable future.

Biological resources include various types of flora (plants) and fauna (fish, birds, reptiles, amphibians, etc.) as well as lakes, rivers, wetlands, forests, and upland habitats. While the majority of the 47± acre project site is mowed, plant species observed on the site during a wetlands field visit include brush and herbs such as cattails (Typha latifolia), nettles (Solanum carolinense), highbush blackberry (Rubus allegheniensis), and red clover (Trifolium pratense), and trees in the forested area of the site such as juniper (Juniperus virginiana) and white oak (Quercus alba). Upland habitat is present that could support a wide range of common wildlife species in the area, including but not limited to, white-tailed deer, fox, raccoon, groundhog, squirrels, eastern cottontail, skunk, various snakes, bats, birds (including raptors and songbirds), various small rodents such as mice and moles, and invertebrates including various insects and spiders. Aquatic habitats provide watering and foraging areas for mammals such as white-tailed deer, fox, groundhog, eastern cottontail, raccoon, skunk, squirrel and other rodents, bats, birds, reptiles, and amphibians (frogs, toads, and salamanders).

The United States Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) database identifies three federally protected mammals which may occur on or near the project area: the Endangered, Indiana Bat (*Myotis sodalis)*, the Endangered, Northern Long-eared Bat (NLEB) (*Myotis septentrionalis)*, and the Proposed Endangered Tricolored Bat (*Perimyotis subflavus*), although the USFWS NLEB Rangewide Determination Key noted that the project area does not overlap with an area for which USFWS has data to support the presumption that the NLEB is present. The Monarch Butterfly (*Danaus plexippus*), a Candidate species, and eight migratory birds, including the Bald Eagle, were also identified by the IPaC database. There are no critical habitats, wildlife refuges, or fish hatcheries within the project area (see **Attachment C**).

The Virginia Department of Wildlife Resources (DWR) identifies 447 species which could occur within two miles of the project area, including nine state-listed species. These are:

- Northern long-eared bat
- Little brown bat
- Tri-colored bat
- Bewick's Wren (bird)
- Wood Turtle

- Peregrine Falcon
- Loggerhead Shrike (bird)
- Appalachian Grizzled Skipper (butterfly)
- Migrant Loggerhead Shrike (bird)

Wetlands are discussed in **Section 5.14.1**.

5.3 Climate

Primary statutes, regulations, and Executive Orders related to climate include:

- The Clean Air Act (CAA)

According to the FAA Order 1050.1F *Desk Reference*, greenhouse gases (GHGs) are defined as carbon dioxide (CO_2), methane (CH_2), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

GHG is a category of pollutants for which there is global and national concern. The majority of GHG emissions from transportation are CO_2 emissions resulting from the combustion of petroleum-based products, like gasoline, in internal combustion engines. The EPA reports that commercial airplanes and large business jets contribute 10 percent of U.S. transportation emissions, and account for three percent of the nation's total GHG production. Globally, aviation produced 2.4 percent of total CO_2 emissions in 2018.[1] GHG emissions have not been regulated under the CAA as air pollutants. In January 2021, EPA finalized GHG emissions standards that apply to certain new (new type design airplanes or in-production airplanes on or after January 1, 2028) commercial airplanes such as large passenger jets. According to the Virginia Department of Environmental Quality (DEQ), statewide annual average GHG emissions in Virginia between 2016 and 2019 were 141.6 million metric tons carbon dioxide equivalent (CO_2e). In 2020, Virginia's GHG emissions were 72.6 million metric tons of CO2e.

5.4 Coastal Resources

Coastal resources can include islands, transitional, and intertidal areas, salt marshes, wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as fish and wildlife and their respective habitats within these areas. Federal activities involving or affecting coastal resources are governed by the Coastal Barrier Resources Act (CBRA), the Coastal Zone Management Act (CZMA), and Environmental Order (EO) 13089, *Coral Reef Protection*.

Frederick County is not located within Virginia's Coastal Zone.

5.5 Department of Transportation (DOT) Act, Section 4(f)

Statutes and Regulations Related to Section 4(f) Properties include:

- The Land and Water Conservation Fund Act of 1965, and
- U.S. Department of Transportation (DOT) Act – Section 4(f)

[1] *https://www.eesi.org/papers/view/fact-sheet-the-growth-in-greenhouse-gas-emissions-from-commercial-aviation*

Section 4(f) of the U.S. DOT Act of 1966 protects significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites. There are no known public parks, recreation areas, or wildlife refuges on airport property or in the immediate vicinity. A portion of the airport and the on-airport development site is within the Second Winchester Battlefield district (Virginia Department of Historic Resources [DHR] ID 034-5023), also referred to as the Apple Pie Ridge/West Fort Parcel, which has been recommended for listing on the National Register of Historic Places (NRHP).

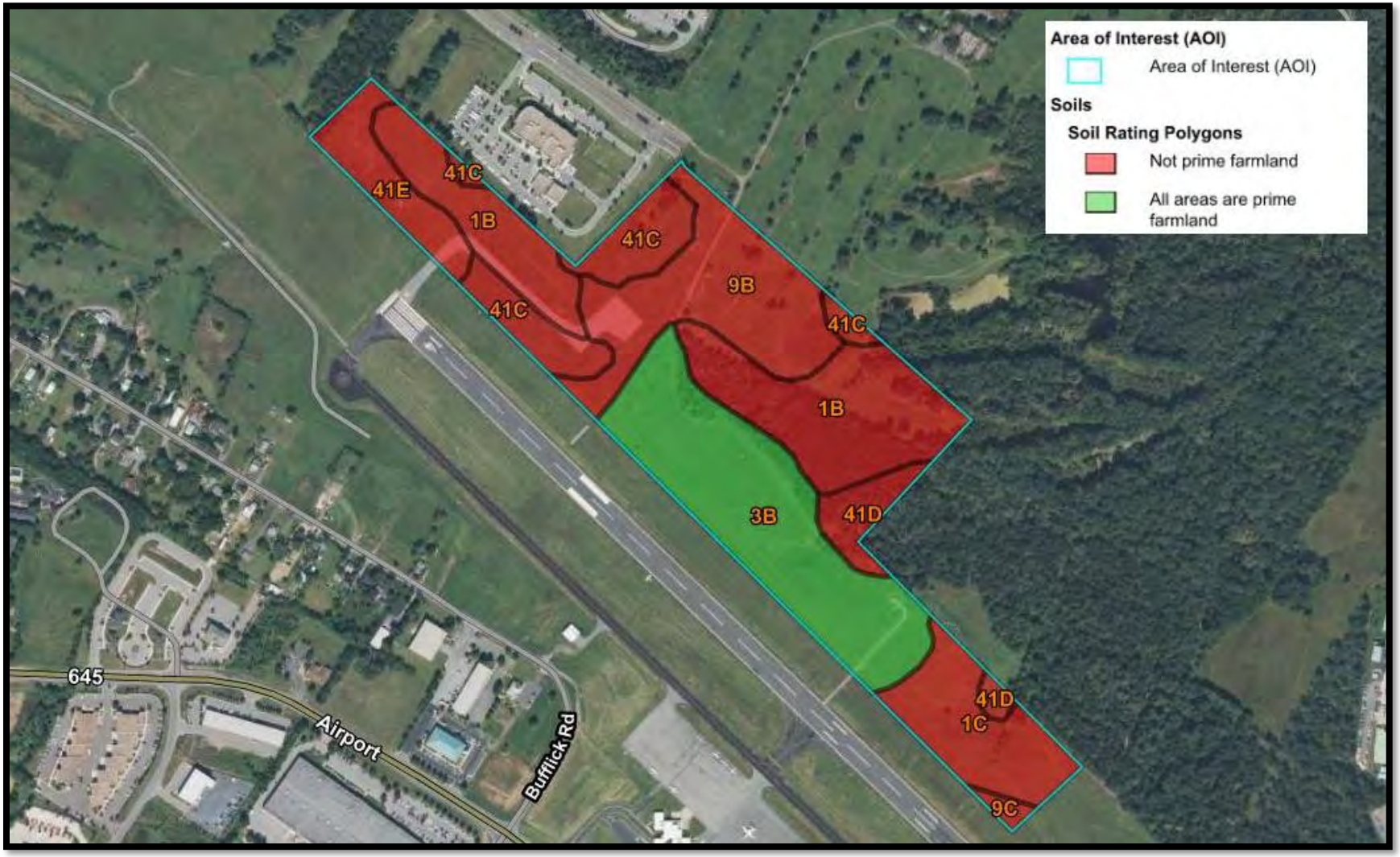
5.6 Farmlands

Farmlands are agricultural areas considered important and protected by federal, state, and local regulations. The Farmland Protection Policy Act (FPPA) regulates federal actions with the potential to convert farmland to non-agricultural uses. Specifically, the Act regulates farmland as prime, unique, or of statewide or local importance. According to FAA Order 1050.1F *Desk Reference*, direct impacts to farmlands typically involve the conversion of farmlands to non-agricultural use.

According to the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), approximately 26 percent of the soils within the project area are classified as Prime Farmland, while the remainder are classified as Not Prime Farmland (see **Figure 8**).

While there are areas of farmland within the project area, the project area does not meet the definition of farmland as contained in the FPPA because it is already located within the existing airport property and dedicated for aeronautical development. Also, although the Frederick County zoning map designates the airport as a Rural Area, the 2021 Comprehensive Plan for Frederick County designates the area surrounding OKV as an Airport Support Area, listing commercial and industrial uses as the primary uses of the land.

Figure 8: Soils Classification within Project Area



Source: USDA NRCS Web Soil Survey

5.7 Hazardous Materials, Solid Waste, and Pollution Prevention

Hazardous materials, solid waste, and pollution prevention are impact categories that include an evaluation of potential waste streams that could be generated by the project, potential hazardous materials either used during construction/operation or encountered at a contaminated site, and potential to interfere with ongoing remediation of a contaminated site.

Specifically, these impact categories include an evaluation of:

- Waste streams that would be generated by a project, potential for the wastes to impact environmental resources, and the impacts on waste handling and disposal facilities that would likely receive the wastes;
- Potential hazardous materials that could be used during construction and operation of a project, and applicable pollution prevention procedures;
- Potential to encounter existing hazardous materials at contaminated sites during construction, operation, and decommissioning of a project; and
- Potential to interfere with any ongoing remediation of existing contaminated sites at the proposed project site or in the immediate vicinity of a project site.

Solid waste, hazardous waste, hazardous substance, hazardous materials, and pollution prevention are defined as follows:

Solid Waste is defined by the implementing regulations of the Resource Conservation and Recovery Act (RCRA) generally as any discarded material that meets specific regulatory requirements and can include such items as refuse and scrap metal, spent materials, chemical by-products, and sludge from industrial and municipal waste and water treatment plants.

Hazardous waste is a type of solid waste defined under the implementing regulations of RCRA. A hazardous waste is a solid waste that possesses at least one of the following four characteristics: ignitibility, corrosivity, reactivity, or toxicity. RCRA imposes stringent requirements on the handling, management, and disposal of hazardous waste, especially in comparison to the requirements for non-hazardous wastes.

Hazardous substance is a term broadly defined under Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). These substances can include any element, compound, mixture, solution, or substance designated as hazardous under Section 102 of CERCLA; any hazardous substance designated under Section 311(b)(2)(A) or any toxic pollutant listed under Section 307(a) of the Clean Water Act (CWA); any hazardous waste under Section 3001 of RCRA; any hazardous air pollutant listed under Section 112 of the CAA; and any imminently hazardous chemical substance or mixture for the EPA Administrator has “taken action under” Section 7 of the Toxic Substances Control Act (TSCA). The definition of the hazardous substances under CERCLA excludes petroleum products, unless specifically listed or designated there under.

Hazardous material is any substance or material that has been determined to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce. The term hazardous material includes both hazardous wastes and hazardous substances, as well as petroleum and natural gas substances and materials.

Pollution prevention refers to methods used to avoid, prevent, or reduce pollutant discharges or emissions through strategies as using fewer toxic inputs, redesigning products, altering manufacturing and maintenance processes, and conserving energy.

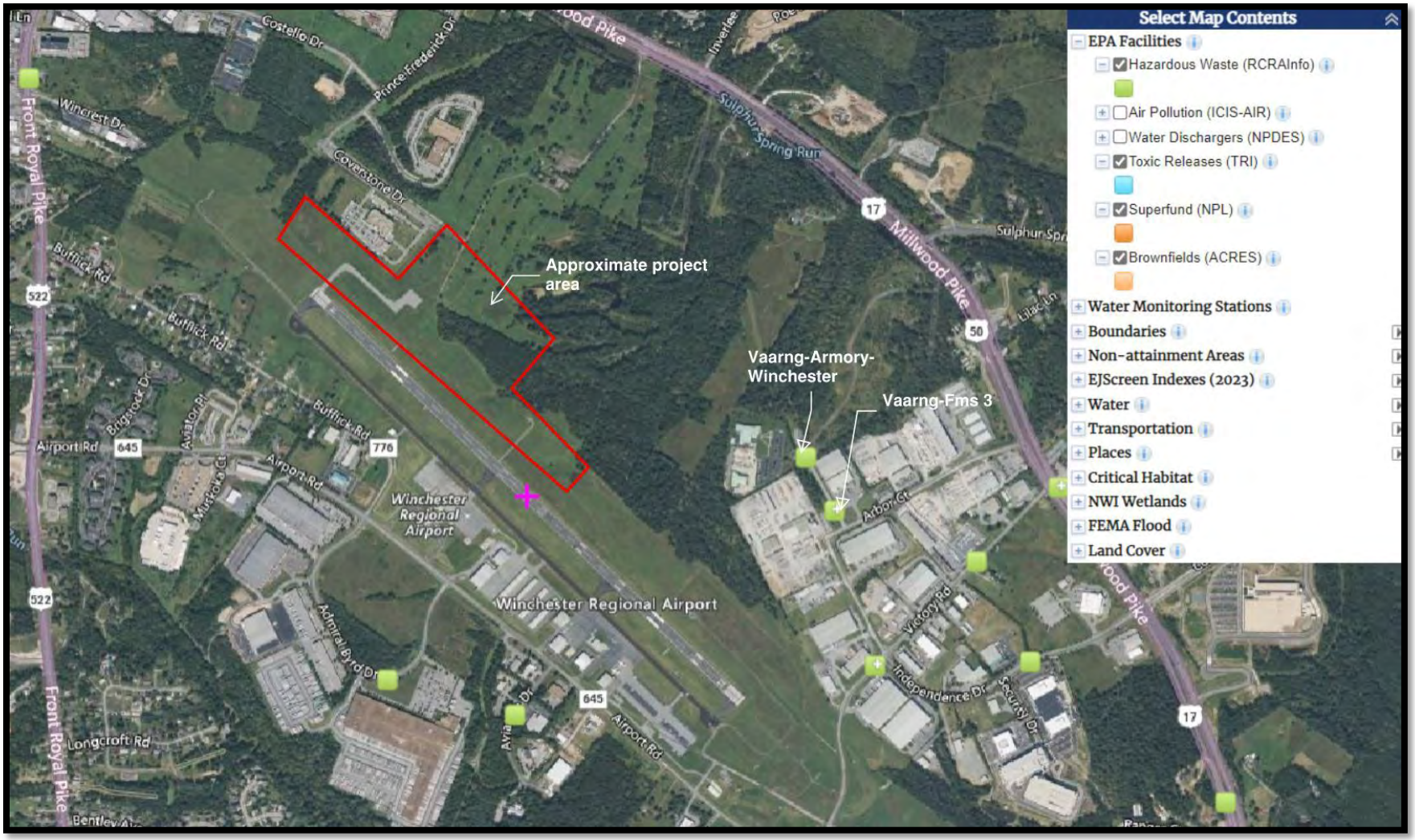
Examples of hazardous substances known to be found at the airport are aircraft and ground equipment fuel. The EPA's 'NEPAssist' website does not identify on-airport hazardous-waste handlers; according to the site, the closest hazardous-waste handlers which report to the EPA are in an industrial park approximately 0.5 mile from the project site and are affiliated with the Virginia National Guard (see Figure 9).

There are no Superfund or Brownfield sites located on or in the vicinity of the airport, and there are no landfills in the airport vicinity. The project does not involve the acquisition of land. The Proposed Project could include the installation of a fuel facility, depending on the ultimate future use of the site. While the needs of the future tenant are not yet known, for the purposes of this environmental review, it is assumed that the "fuel facility" would include two, 20,000 gallon tanks of Jet-A fuel; one, 12,000 gallon tank of AvGas fuel (or its unleaded equivalent); and/or two electric aircraft charging facilities.

Solid waste from airport activities would be disposed of at a certified facility. The Frederick County Landfill, which is approximately four miles northwest of the airport, accepts construction and demolition waste.

The airport maintains a Stormwater Pollution and Prevention Plan (SWPPP), which summarizes potential pollutant sources (such as storage activities and operations that could potentially impact stormwater quality) and contains methods to be employed to control spills and unauthorized releases. The SWPPP notes that the use of materials that may have an adverse effect on the environment should be minimized, and the least toxic chemicals for a particular purpose should be used. The SWPPP is to be updated after construction to account for the new development and associated operations on the airfield. The airport also maintains an Oil Discharge Contingency Plan (ODCP) and requires fuel servicers and fuel servicing vehicles to comply with both the SWPPP and ODCP.

Figure 9: Hazardous Reporting at OKV and the Vicinity



Source: EPA NEPAssist

5.8 Historical, Architectural, Archaeological, and Cultural Resources

Historical, architectural, archaeological, and cultural resources encompass a range of sites, properties, and physical resources relating to human activities, society, and cultural institutions. As stated in the FAA 1050.1 *Desk Reference*, Section 106 of the National Historic Preservation Act (NHPA) is the principal statute concerning such resources. Section 106 requires federal agencies to consider the effects of their undertaking (or action) on properties listed or eligible for listing in the NRHP.

The Proposed Project would occur on airport property. The DHR V-Cris website depicts the Second Winchester Battlefield, also referred to as the Apple Pie Ridge/West Fort Parcel (DHR ID 034-5023), extending over the western portion of airport property, including the western half of the proposed development site. This resource, which has been recommended for listing in the NRHP, encompasses approximately 18,000 acres and was the site of a June 1863 battle during the American Civil War.

In addition to the 47± acre direct area of potential effect (APE), a 165± acre indirect APE was also established to assess potential visual or auditory impacts to historic properties. There are two known resources within the approximately 165 acre indirect APE, one of which (the Apple Pie Ridge/West Fort Parcel) is eligible for listing in the NRHP. See Table 2.

Table 2: DHR Resources within Direct and Indirect APEs

DHR ID	PROPERTY NAME	NRHP ELIGIBILITY RECOMMENDATION
Within Direct APE		
034-5023	Apple Pie Ridge/West Fort Parcel	Eligible
Within Indirect APE		
44FK0488	Camp, temporary	Not Eligible
034-5023	Apple Pie Ridge/West Fort Parcel	Eligible

Source: VCRIS

Four Native American tribes- the Catawba Indian Nation, the Delaware Nation, Oklahoma, the Eastern Shawnee Tribe of Oklahoma, and the Monacan Indian Nation – have expressed interested in Frederick County and letters associated with the proposed undertaking were provided to each of these tribes (see **Attachment D**).

5.9 Land Use

As stated in the FAA Order 1050.1 *Desk Reference*, the compatibility of existing and planned land uses within an aeronautical proposal is usually associated with noise impacts, although other potential impacts of FAA actions may also affect land use compatibility (e.g., disruption of communities, relocation, induced socioeconomic impacts, land uses protected under Section 4(f) of the US DOT Act).

OKV is an operating, general aviation airport. The airport is part of the RA (Rural Areas) zoning district in Frederick County (see Figure 10). The 47± acre project site is situated in the northern portion of the airfield and is bordered by parcels zoned for industrial and business uses. The proposed development would take place on dedicated airport property and would be in line with existing uses on the airfield. There is an Airport Overlay (AP1) District in Frederick County which regulates obstructions to protected airspace in the vicinity of the airport.

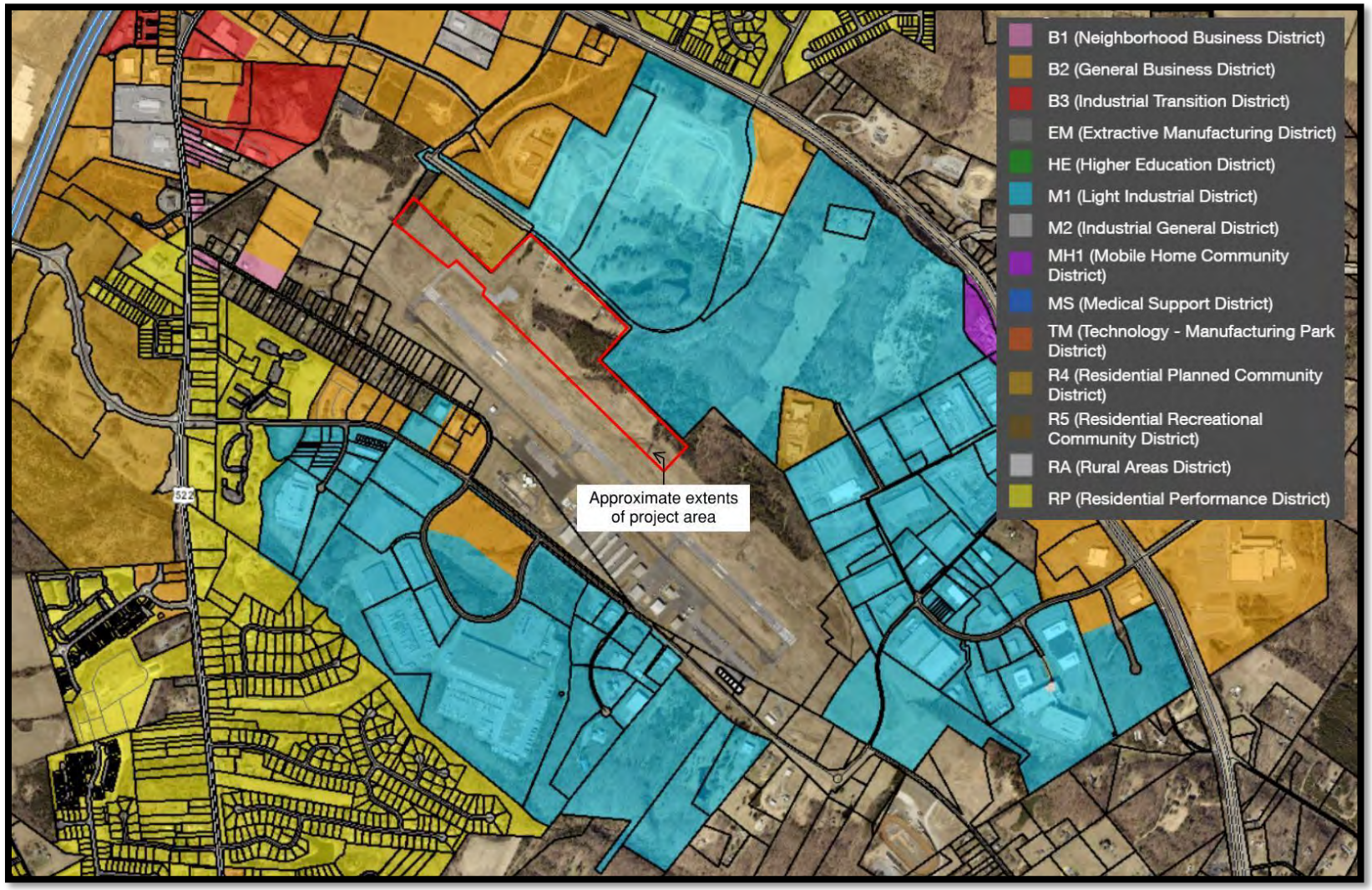
Residential uses are situated approximately one-half mile north of the proposed development site and are separated from the airport property by Millwood Pike/State Route 50. Other residential uses are situated south of airport property along Bufflick Road/Route 776, which are separated from the proposed development site by the runway and the operating airfield. The airport Authority owns much of the land west of the project site, including many of the residential parcels along Bufflick Road (see Figure 11).

The RA zoning designation in Frederick County is intended to preserve large, open parcels of land, tree cover, scenic views, sensitive environmental areas and prime agricultural and locally significant soils. The regulations provide for a variation in lot size at a density of no more than one unit per five acres. The Winchester Regional Airport is a permitted use under this zoning designation, as are single-family dwellings, mobile homes, fire stations, government services offices and the Frederick County sanitary landfill. As of spring 2024, airport management advises that the County is working to develop a more specific zoning designation that is more suitable for airport operations.

The zoning designations that border the airport include M1 (Light Industrial) and B2 (General Business). These zoning designations allow for light manufacturing, heavy commercial, and a variety of business, office, and service uses.

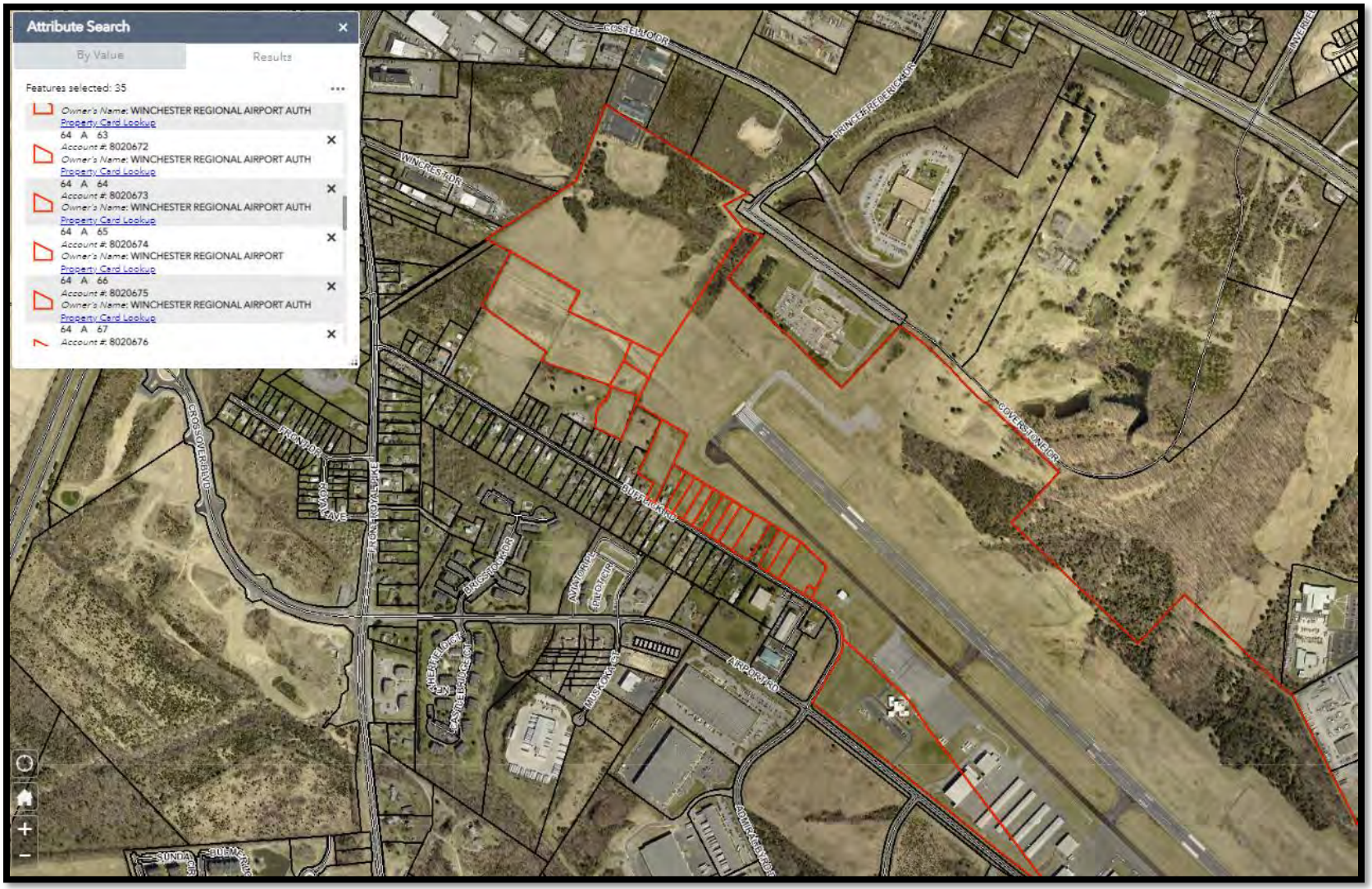
The Frederick County *2035 Comprehensive Plan,* which was finalized in 2021, establishes an Airport Support Area around the airfield, within which business and industrial uses should be the primary land uses and within which further residential rezonings will be prohibited, to protect the airport land use (see Figure 12) The Plan notes that the airport Support Area was established to ensure the feasibility of continued airport use and future airport expansion.

Figure 10: Zoning On and Around the OKV Project Site



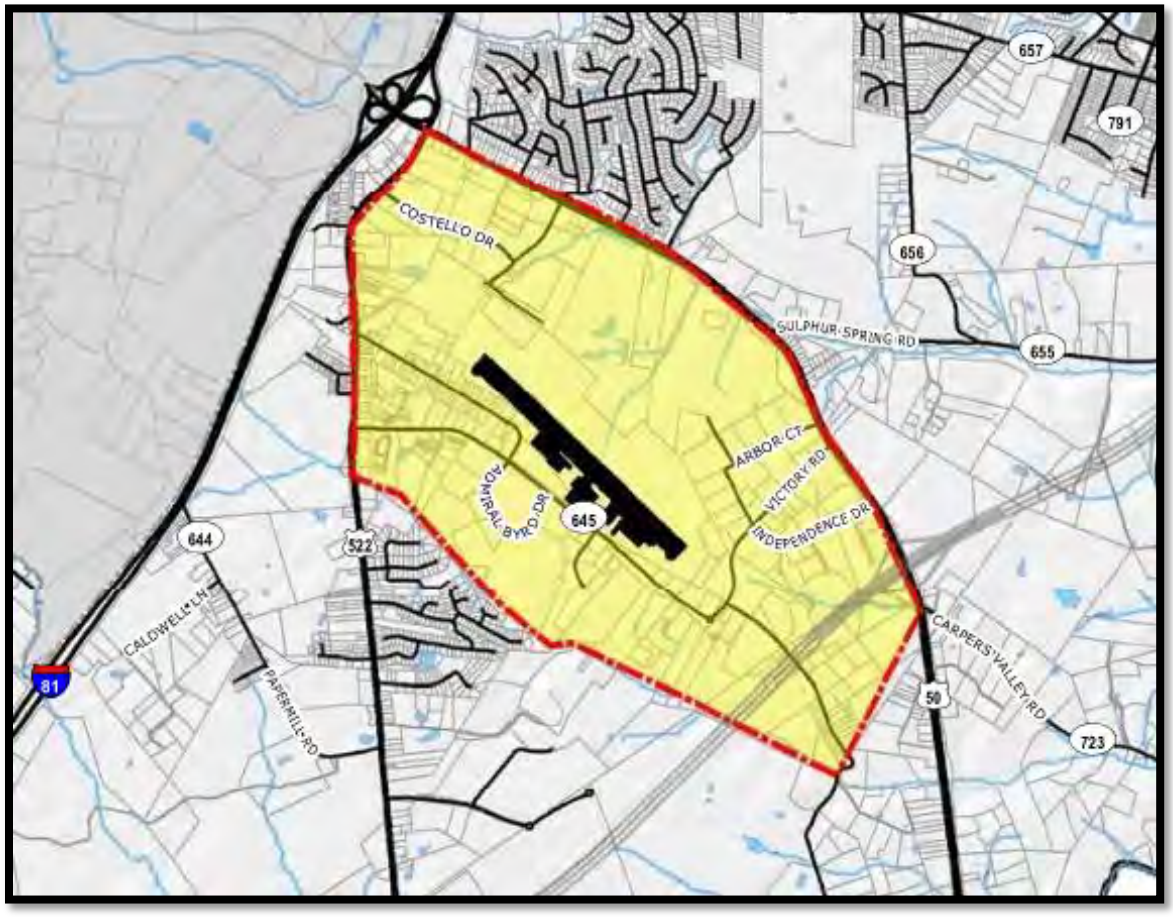
Source: Frederick County Online Planning Access Terminal

Figure 11: Adjacent Parcels in the Airport Vicinity Owned by the Airport Authority



Source: Frederick County Parcel Mapper

Figure 12: Airport Support Area



Source: Frederick County 2035 Comprehensive Plan

As of spring 2024, the first phase of a multi-phase industrial development, One Logistics Park, was under construction adjacent to airport property and across Coverstone Drive from the Northside Development site (see Figure 13 for concept exhibit). This adjacent parcel was rezoned in 2021 from residential use to industrial use, which is more compatible with airport operations. As part of the rezoning approvals, the County has required the developers to extend Coverstone Drive to Millwood Pike to serve as an urban four-lane divided collector road with turn lanes.

Figure 13: One Logistics Park Development Adjacent to OKV

Source: One Logistics Park, Colliers

5.10 Natural Resources and Energy Supply

Natural resources and energy supply provide an evaluation of a project's consumption of natural resources (such as water, petroleum for asphalt, stone for aggregate, wood, etc.) and use of energy supplies (such as coal for electricity, natural gas for heating, and fuel for aircraft or other ground vehicles). As stated in the FAA 1050.1 *Desk Reference*, it is the policy of the FAA consistent with NEPA, to encourage the development of FAA facilities that exemplify the highest standards of design, including sustainability principles.

Statutes and Executive Orders related to Natural Resources and Energy Supply include:

- The Energy Independence Act
- The Energy Policy Act, and
- Executive Order 13834, Efficient Federal Operations

Natural gas at OKV is provided by Washington Gas. Electrical power to OKV is supplied by Rappahannock Electric Cooperative. There is a fuel farm on the airfield which offers both AvGas and Jet-A fuels.

5.11 Noise and Noise-Compatible Land Use

The FAA 1050.1 *Desk Reference* states that noise is often the predominant aviation environmental concern of the public, and that the compatibility of existing and planned land uses with proposed aviation actions is usually determined in relation to the level of aircraft noise. The relevant guidance includes:

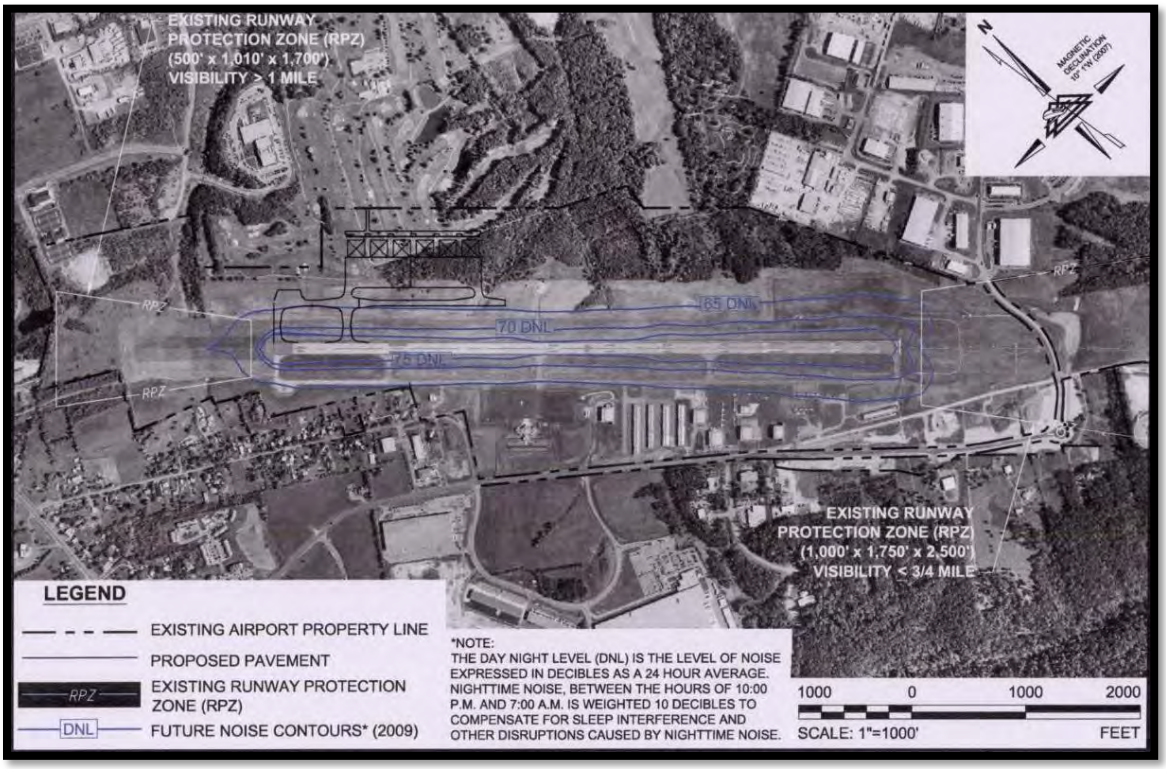
- The Noise Control Act of 1972 (42 U.S.C. §§4901-4918)
- Aviation Safety and Noise Abatement Act of 1979 (49 U.S.C. §47501 et seq.)
- Airport and Airway Improvement Act of 1982 (49 U.S.C. §47101 et seq.)
- Airport Noise and Capacity Act of 1990 (49 U.S.C. §§47521-47534, §§106(g), 47523-47527)
- Airport Noise Compatibility Planning (14 CFR Part 150)

For aviation noise analyses, the FAA has determined that the cumulative noise energy exposure of individuals to noise resulting from aviation activities must be established in terms of Day Night Average Sound Level (DNL), which is the primary noise metric used by FAA. Generally, the FAA considers DNL 75 and higher to be incompatible with most land uses, while below DNL 65 is compatible with most land uses. Above 65 DNL, noise sensitive land uses (such as residential, schools, churches, and hospitals) are noncompatible.

As noted previously, the study area is within airport property and is bordered by industrial and general business uses, which are generally compatible land uses with an operating airport, and Coverstone Drive. The nearest residential uses are approximately one-half mile from the site and are separated from the airport property by four lanes of traffic on Highway 17/Millwood Pike. Other residential uses are situated south of airport property along Bufflick Road/Route 776, which are separated from the proposed development by the runway and the operating airfield. The Airport Authority owns much of the land west of the project site, including many of the residential parcels along Bufflick Road (see Figure 11).

Noise contours were generated for the proposed development project during preparation of the 2008 EA mentioned in Section 1. The analysis was based on the total operations from the 2005 ALP Update, but with a modified fleet mix for the future 2009 contours reflecting the anticipated new based aircraft. As depicted in Figure 14, the 2008 EA concluded that although aircraft noise levels are expected to increase slightly after the development is complete, the future DNL 65 dB noise contours remain on airport property and no noise impacts are anticipated. The FAA issued a FONSI for this project in October 2008.

Figure 14: Future Noise Contours from 2008 EA



Source: Delta Airport Consultants, Inc.

5.12 Socioeconomics and Children's Environmental Health and Safety Risks

Socioeconomics is an umbrella term used to describe potential impacts on the human environment such as population, employment, housing, and public services, with special attention given to the potential disproportionate impacts of a proposed project to children.

The primary statute related to Socioeconomic Impacts is the Uniform Relocation and Real Property Acquisitions Policy Act of 1970.

The Executive Order noted in the FAA Order 1050.1 *Desk Reference* which is related to Children's Health and Safety Risks is Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks.*

The project would take place on dedicated airport property and does not involve land acquisition or direct impacts to off-airport property.

5.12.1 One-mile around OKV

There are no childcare centers within the immediate vicinity of the airport. According to a desktop search, the nearest childcare centers are Tot Spot Winchester, an over four mile drive northeast of the airport, and TLC Day Care Center and Eukarya King's Cubs, both of which are located in the City of Winchester, north of Interstate 81 and over 3.5 miles from the airport.

A desktop search did not identify schools within the immediate vicinity of the airport. The closest school identified is Evendale Elementary School, which is more than two miles south of the project site.

5.13 Visual Effects

As stated in FAA Order 1050.1 *Desk Reference*, visual effects deal broadly with the extent to which the proposed action or alternative(s) would either: 1) produce light emissions that create annoyance or interfere with activities; or 2) contrast with, or detract from, the visual resources and/or the visual character of the existing environment.

Visual effects are broken into two categories: *Light Emissions* and *Visual Resources and Character.* As an operating, general aviation airport, OKV is a fully lighted facility providing 24-hour per day services. As mentioned previously, the area surrounding airport property is characterized by business and industrial land uses.

Residential uses are situated approximately one-half mile north of the proposed development site and are separated from the airport property by Millwood Pike/State Route 50; other residential uses are situated south of airport property along Bufflick Road/Route 776, which are separated from the proposed development by the runway and the operating airfield. The Airport Authority owns much of the land west of the project site, including many of the residential parcels along Bufflick Road (see Figure 11).

The proposed on-airport development is in line with the existing visual character of the area, especially considering the ongoing One Logistics Park development immediately adjacent to airport property. The northern and western portions of airport property, including a portion of the project site, is within the Second Winchester Battlefield district (DHR ID 034-5023) which has been recommended for listing in the NRHP.

5.14 Water Resources

Water resources include surface water, groundwater, floodplains, wetlands, and wild and scenic rivers. Water resources are important in providing drinking water and in supporting recreation, transportation and commerce, industry, agriculture, and aquatic ecosystems.

5.14.1 Wetlands

According to the FAA Order 1050.1F *Desk Reference*, the CWA defines the term wetlands as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions." Wetlands provide

many benefits to the human, biological, and hydrological environment, including habitat for fish and wildlife, water quality improvement, flood storage, and opportunities for recreation.

In addition to the CWA, the relevant regulatory guidance includes:

- Fish and Wildlife Coordination Act (16 U.S.C. §661-667d)
- EO 11990, *Protection of Wetlands*
- DOT Order 5660.1A, *Preservation of the National's Wetlands*

A wetlands survey and delineation were conducted in November 2023 as part of this environmental effort, within the approximately 47 acre project area. A Preliminary Jurisdictional Determination (PJD) was issued by the United States Army Corps of Engineers (USACE) in June 2024. The full wetlands report and PJD are included as **Attachment E**.

Two wetlands (Wetlands A and B) and two stream channels (Streams A and B) were delineated within the project area (see Table 3). Both wetlands are classified as Palustrine Emergent (PEM).

Table 3: Waters Classification and Size within Project Area

Water Feature	Classification	Size
Wetland A	PEM	0.15 acres
Wetland B	PEM	0.17 acres
Stream A	Intermittent	261 LF
Stream B	Intermittent	473 LF

Source: Greenway Engineering

Both Wetlands A and B are connected to intermittent streams; Streams A and B appear to both be intermittent channels. Stream A has Wetland A connected and above where the stream channel starts. Stream B starts at a culvert pipe outfall that appears to drain under the runway. Wetland B also drains into Stream B (see Figure 15).

5.14.2 Floodplains

The FAA 1050.1 *Desk Reference* defines floodplains as lowland areas adjoining inland and coastal waters which are periodically inundated by flood waters, including flood-prone areas of offshore islands.

Statutes, Regulations, Executive Orders, and other requirements related to the protection of floodplains include:

- The National Insurance Flood Act,
- Executive Order 11988, *Floodplain Management*,
- DOT Order 5650.2, *Floodplain, and Management and Protection*

Federal Emergency Management Agency (FEMA) flood map 51069C0219E, effective 01/29/2021, confirms that the full study area is outside of the mapped floodplain limits (see Figure 16).

Figure 15: Delineated Wetlands and Streams (2023)

Source: Greenway Engineering

Figure 16: FEMA Floodplains in Vicinity of OKV

Source: FEMA

5.14.3 Surface Waters

Surface waters include streams, rivers, lakes, ponds, estuaries, and oceans. As noted in the FAA Order 1050.1 *Desk Reference*, the CWA establishes the basic structure for regulating the discharge of pollutants into waters of the United States. The sections of the CWA relating to waters of the United States are Section 303(d), Section 404, Section 401, and Section 402, which establishes the National Pollutant Discharge Elimination System (NPDES) permit program.

The project site is located within an approximately 47 acre area within the Conococheague-Opequeon watershed area identified by Hydrologic Unit Code (HUC) 02070004.

The airport maintains an airport-wide Spill Prevention, Control, and Countermeasure (SPCC) Plan and an Oil Discharge Contingency Plan (ODCP), which outline appropriate contingency and cleanup measures in the event of a release of regulated substance such as fuel, to protect surface waters.

Specific to the Proposed Project, the preliminary engineering effort associated with this EA identified the separate drainage areas within the site itself as well as existing drainage basins and stormwater management facilities to understand existing conditions; preliminary grading conducted during the preliminary engineering effort was then used to delineate the size of future drainage basins to compare with what is currently on site (see **Attachment F**).

The wetlands and stream delineation conducted during this EA identified two streams within the Northside Development area (see **Figure 15).** As noted in Table 3, there are approximately 734 LF of stream within the project boundaries.

5.14.4 Groundwater

Groundwater is surface water that is stored between sand, clay, and rock formations, and includes aquifers, geologic layers which store and transmit groundwater to wells, springs, and other water sources. Federal activities affecting groundwater are primarily governed by the Safe Drinking Water Act (SDWA).

The airport property is not located within a Sole Source Aquifer Region as designated by EPA and there are no wells on or near the project area.

Water and sewer service is provided to OKV by Frederick Water.

The Proposed Project involves ground disturbance, construction, and the addition of impervious surface, all of which could impact groundwater.

5.14.5 Wild and Scenic Rivers

Wild and Scenic Rivers are those rivers having remarkable scenic, recreational, geologic, fish, wildlife, historic, or cultural value as defined by the Wild and Scenic Rivers Act. As noted in the FAA Order 1050.1 *Desk Reference*, if the FAA is taking an action that would physically impact resources covered by the Wild and Scenic Rivers Act, there may be consultation requirements under the Act.

Virginia has approximately 49,350 miles of river, but no federally designated Wild and Scenic Rivers. There are no state-designated Scenic Rivers in Frederick County.

6. Environmental Consequences

This section examines the environmental categories listed in FAA Order 1050.1F *Environmental Impacts: Policies and Procedures*. The reasonably foreseeable environmental consequences of the Proposed Project (Development Concept) and No Action alternatives are discussed.

6.1 Air Quality

FAA Order 1050.1F establishes the significance thresholds for air quality impacts. An impact may be deemed significant if the Proposed Project causes pollutant concentrations to exceed one or more of the NAAQS, for any time period analyzed, or increases the frequency or severity of any existing violations.

The airport is located in Frederick County, Virginia which is an attainment area for NAAQS. As the project is located within an attainment area, development at OKV is not subject to further demonstrating general conformity with the Virginia SIP to be eligible for federal funding and approval. For disclosure purposes under NEPA, a construction emissions inventory was prepared to provide a general estimate of construction emissions associated with the Proposed Project. An emissions analysis was also conducted to estimate operational emissions based on the two potential scenarios for the future use of the proposed development. Construction of the Proposed Project is anticipated to occur over a two-year period, during 2027 and 2028. The full Air Quality and Climate Analysis Technical Report, which outlines assumptions and methodology, is included as **Attachment G**.

6.1.1 Construction Activity

The construction associated with the Proposed Project would result in short-term changes in air emissions from sources such as exhaust from nonroad construction equipment and on-road vehicles delivering supplies and construction workers to the site. Additionally, fugitive dust emissions were considered, including from site preparation and land clearing and evaporative emissions from the application of asphalt paving.

Estimates of construction-related emissions were developed for the Proposed Project using guidance from the FAA Aviation Emissions and Air Quality Handbook and associated US EPA guidance, and emission factors for both road and non-road sources from the EPA's Motor Vehicle Emission Simulator (MOVES4) program. For the purposes of the construction emissions analysis, the development items included in the analysis include an up to 600,000 sf building with associated 225,000 sf (25,000 sy) parking area; approximately 315,000 sf (35,000 sy) of asphalt parking apron; and three new fuel tanks, and assume 4,000 offsite trips to bring fill material to the site. The two potential electric aircraft chargers were not considered significant enough project components to include in the construction emissions analysis.

6.1.1.1 Significance Thresholds

Because Frederick County is located in an attainment area for NAAQS, there are not de minimis thresholds established to determine if impacts would be deemed significant. De minimis thresholds for a maintenance area were used for comparison purposes, to determine whether the temporary

construction emissions would exceed the NAAQS thresholds. As displayed in Table 4, the construction emissions would not exceed de minimis thresholds for either construction year and no significant air quality impacts are anticipated from construction activities.

Table 4: Total Construction Emissions Compared to De Minimis Thresholds

YEAR	RELEVANT CRITERIA POLLUTANT EMISSIONS (TONS PER YEAR)						
	CO Note 1	VOC	NOx	SO_2 Note 1	PM_{10} Note 1	$PM_{2.5}$ Note 1	Lead Note 2
2027							
Total Emissions of Construction	14.05	1.08	1.67	0.02	0.65	0.07	0.0
US EPA *de minimis* Threshold	***100***	***100***	***100***	***100***	***100***	***100***	***25***
Emissions below* de minimis *thresholds?	***Yes***	***Yes***	***Yes***	***Yes***	***Yes***	***Yes***	***Yes***
2028							
Total Emissions of Construction	13.51	1.06	1.51	0.02	0.64	0.06	0.0
US EPA *de minimis* Threshold	***100***	***100***	***100***	***100***	***100***	***100***	***25***
Emissions below* de minimis *thresholds?	***Yes***	***Yes***	***Yes***	***Yes***	***Yes***	***Yes***	***Yes***

Source: HMMH, 2024

Notes
1. Since pollutants are designated attainment by US EPA, no *de minimis* thresholds exist. The maintenance area designation *de minimis* thresholds were used to determine significance under NEPA.
2. Pb emissions for construction emissions were not estimated since the fuel use for these sources is gasoline and diesel which do not contain lead.

6.1.2 Operational Activity

Implementation of the Proposed Project alternatives would increase the number of aircraft operations and vehicle trips compared to the No Action alternative, regardless of the future use of the site. Operational emissions encompass a range of activities contributing to emissions, including aircraft operations, ground-based aviation-related emissions (from taxiing, auxiliary power units (APUs), and ground support equipment (GSE), and roadway and parking emissions from additional vehicle trips.

Airport operational emissions inventories were developed using FAA-approved methodology and models for evaluating aircraft emissions under NEPA for the future opening year (2029) for those

activities associated with the two Proposed Project build scenarios. The FAA's Aviation Environmental Design Tool (AEDT) was used to estimate emissions.

As mentioned previously, in October 2023, EPA issued a final determination (Finding) that emissions of lead from aircraft that operate on leaded fuel (such as AvGas) cause or contribute to air pollution which may reasonably be anticipated to endanger public health and welfare under the Clean Air Act. While this EPA Finding does not immediately create, restrict or ban the use, sale, distribution, dispensing, and general availability of leaded fuel, nor does it establish any new control measures regarding aircraft lead emissions, the FAA have partnered with aviation stakeholders to launch the "Eliminate Aviation Gasoline Lead Emissions (EAGLE) initiative, which has a goal to eliminate leaded aviation fuels in piston-engine aircraft safely by the end of 2030. Congress, in its 2024 FAA Reauthorization Act, prohibits restricting the sale of 100-octane low lead (100LL) aviation gasoline until the earlier of December 31, 2030 or the date the airport makes available unleaded gas authorized by EPA and FAA and meets industry standards or other standards determined by the FAA Administrator.

As of the date that this document was prepared (fall-winter 2024), EPA/FAA regulatory proposals have not been released and a replacement for 100LL that has been authorized by FAA for use in "nearly all" piston-engine aircraft and engine models, as specified by the 2024 FAA Reauthorization Act, has not yet been identified. The Winchester Regional Airport Authority is aware of the opportunity to reduce lead emissions and to demonstrate leadership in addressing environmental challenges and fully intends to comply with national, state, and local regulations, as applicable, once an acceptable substitute has been identified and certified by FAA. The Authority does offer 100LL for sale and is able to continue to do so in accordance with Section 770 of the 2024 FAA Reauthorization Act. See letter from the Airport Authority in **Attachment G**.

6.1.2.1 Development Scenario 1, Aircraft Manufacturing Facility

Development Scenario 1 assumes that a proposed, up to 600,000 square foot facility would be used to manufacture AAM and/or eVTOL-type aircraft including manufacturing, final assembly, and test flights. The facility would provide employee parking and access, and access for trucks to deliver aircraft parts for assembly. Two hundred annual test flights (400 annual operations) and 450 employees are assumed, representing 112,950 annual automobile trips. The future user is not yet known; for the purposes of this analysis, it is assumed that aircraft to be tested would use the existing procedures at the airport.

6.1.2.2 Development Scenario 2, Aircraft Storage and/or Maintenance

Development Scenario 2 assumes that the future use of the Northside Development effort is aircraft storage and/or maintenance. While the actual facility layout would depend on the needs of the future tenant, for the purposes of this analysis, it is assumed that the layout would include 24, 100' x 100' hangars plus associated automobile parking spaces and apron space. For the purposes of this analysis, it is assumed that all aircraft stored in the hangars would be new tenants which are not currently based at OKV, and that the new users would use the existing procedures at the airport. Based on the size of the hangars, they are estimated to accommodate a maximum of 48 turboprops and 24 jets.

While it is difficult to predict the number of future operations associated with new hangars, the FAA Aerospace Forecast 2023-2043 notes that in 2029, jet aircraft are anticipated to operate approximately 316 hours per year on average and turboprop aircraft are anticipated to operate approximately 281

hours per year. Assuming a three-hour average trip duration, this amounts to approximately 105 annual operations per jet and 94 annual operations for turboprops. It is assumed that each of the proposed 100' x 100' hangars could house two turboprops and one jet each, meaning that in the most conservative scenario, the hangars could account for an additional 7,032 annual operations at OKV (4,512 annual turbojet operations and 2,520 annual jet operations). This represents around 16 percent of current total operations at OKV, according to the most recent FAA 5010-1 Master Record. Assuming two round-trips per departure (pilot and passengers), 7,032 annual automobile trips were assumed for this scenario. It is assumed that the hangars would be occupied by 2029, which is the year after construction is anticipated to be completed.

These assumptions were used as inputs for the operations emissions inventory.

6.1.2.3 Significance Thresholds

While no de minimis air quality thresholds are established for attainment areas, for comparison purposes, the results of the analysis are compared to de minimis thresholds for maintenance areas (see Table 5). The comparison shows that no de minimis thresholds would be exceeded as a result of operations for either of the development scenarios proposed as the Development Alternative /Proposed Project in the Northside Development site. The output file is included in **Attachment G**.

Table 5: 2029 Opening Year Operational Emissions Inventory for Development Scenarios

YEAR [Note 1]	RELEVANT CRITERIA POLLUTANT EMISSIONS (TONS PER YEAR)						
	CO	VOC	NOx	SO_2	PM_{10}	$PM_{2.5}$	Lead
2029 Dev't Scenario 1 and GAV/Parking	**20.41**	**0.46**	**0.32**	**0.01**	**0.01**	**0.01**	**0.004**
EPA *de minimis* Threshold	100	100	100	100	100	100	25
Emissions below *de minimis* thresholds?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
2029 Dev't Scenario 2 and GAV/Parking	**43.44**	**6.34**	**3.81**	**0.73**	**0.23**	**0.23**	**0.00**
EPA *de minimis* Threshold	100	100	100	100	100	100	25
Emissions below *de minimis* thresholds?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

Source: HMMH
Note: A/C = aircraft; N/A = not applicable; GAV = ground access vehicle

1. Proposed Alternatives totals include both aircraft and GAV/parking emissions.

- **No Action**: As it does not involve construction or the operation of additional development, the No Action alternative would not create adverse impacts to air quality. While the FAA-TAF does not forecast an increase in operations at OKV, it is possible that the airport could experience an increase in operations during this timeframe that is not related to the Proposed Project.
- **Build/Proposed Project**: In consideration of the above, including the minimal increase in emissions from both construction and operational activity compared to NAAQS de minimis thresholds and the fact that the County is currently in attainment for NAAQS, *no significant air quality impacts are anticipated from the construction or operation of the Proposed Project, regardless of the future use.*

6.2 Biological Resources

FAA Order 1050.1F notes that a significant impact to biological resources would occur when the USFWS or the National Marine Fisheries Service determines that the action would be likely to jeopardize the continued existence of a federally-listed threatened or endangered species or would result in the destruction or adverse modification of federally-designated critical habitat. The FAA has not established a significance threshold for non-listed species.

In addition to the significance threshold, the FAA Order provides additional factors to consider, including:

- A long-term or permanent loss of unlisted plant or wildlife species (e.g., extirpation of the species from a large project area)
- Adverse impacts to special status species (e.g., state species of concern, species proposed for listing, migratory birds, bald and golden eagles) or their habitats
- Substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats or their populations

- Adverse impacts on a species' reproductive success rates, natural mortality rates, non-natural mortality (e.g., road kills and hunting) or ability to sustain the minimum population levels required for population maintenance

The USFWS IPaC database identified three federally protected mammals which may occur on or near the project area: the Endangered, Indiana Bat (*Myotis sodalis)*, the Endangered, Northern Long-eared Bat (NLEB), (*Myotis septentrionalis)*, and the Proposed Endangered Tricolored Bat (*Perimyotis subflavus*). The Monarch Butterfly, a Candidate species, and eight migratory birds, including the Bald Eagle, were also identified by the IPaC database. The Virginia DWR identifies 447 species which could occur within two miles of the project area, including nine state-listed species. There are no critical habitats, wildlife refuges, or fish hatcheries within the project area (see **Attachment C**).

The project area does not intersect with known hibernacula or the protective buffers associated with the Tricolored and Little Brown Bats, nor is it within known summer habitat or the protective buffers associated with hibernacula of the NLEB (see **Attachment C**). The USFWS NLEB Rangewide Determination Key noted that the project area does not overlap with an area for which USFWS has data to support the presumption that the NLEB is present.

The online NLEB Rangewide Determination Key on the IPaC website resulted in a "May Affect- Not Likely to Adversely Affect" (MANLAA) determination. This is the same determination received by the agency during scoping of this project in March 2023. The consistency letter dated 06/03/2024 and included in **Attachment C** advises that if the agency does not note within 15 days that the determination is incorrect, then the action is not likely to result in unauthorized take of the NLEB and no further coordination/consultation regarding the NLEB would be required as long as there are no changes with the project or updates on listed species.

There are approximately eight acres of forested area within the 47± acre project area which could be cleared for the ultimate development. However, based on habitat descriptions for the Indiana Bat and Tricolored Bat, the project area does not appear to include suitable habitat for these species. The current condition of the project area (a mostly mowed site on a developed and operating, general aviation airport) and the lack of milkweed present suggests that it is unlikely that the Monarch Butterfly would be found on the project site. According to the Center for Conservation Biology (CCB) mapper, the closest documented bald eagle nest is over three miles from the airport property. A coordination package with these "no effect" conclusions for the Indiana and Tricolored bats and the Monarch Butterfly was submitted to USFWS in May 2024 (see **Attachment C**).

Current USFWS mitigation guidance for the three species of bats discussed above is a recommendation for a time-of-year restriction on tree clearing from April 1 through November 14. The agency released draft, new guidance related to the NLEB in April 2024 which suggests that the time of year restriction could be shortened to cover only the pup season (May 15-July 31). The time of year restrictions for the Indiana Bat have traditionally been similar to those for the NLEB. Updated coordination would occur with USFWS to confirm the appropriate mitigation measures when the project is being designed.

- **No Action:** As it does not involve construction, the No Action alternative would not create adverse impacts to biological resources.

- **Build/Proposed Project**: In consideration of the discussion above, *no adverse impacts to biological resources are anticipated from the construction of the Proposed Project regardless of the future use.*

Wetlands are discussed in **Section 6.14.1.**

6.3 Climate

Greenhouse gas (GHG) is a category of pollutants for which there is global and national concern. Of the six GHGs named by the EPA (carbon dioxide [CO_2], methane, nitrous oxide [N_2O], hydrofluorocarbons, per-fluorocarbons, and sulfur hexafluoride), aircraft engines emit CO_2 and N_2O. GHG emissions have not been regulated under the CAA as air pollutants. In January 2021, EPA finalized GHG emissions standards that apply to certain new (new type design airplanes or in-production airplanes on or after January 1, 2028) commercial airplanes such as large passenger jets. As mentioned previously, the DEQ reports that statewide average GHG emissions in Virginia between 2016 and 2019 were 141.6 million metric tons of CO_2e. In 2020, Virginia's GHG emissions were 72.6 million metric tons of CO_2e.

While there are no significance thresholds established for climate impacts, for disclosure purposes, an analysis of emissions of CO_2, CH_4, N_2O was prepared for both construction and operations scenarios (see Table 6). The full Air Quality and Climate Analysis Technical Report, which outlines assumptions and methodology, is included as **Attachment G**.

Table 6: GHG Emissions Associated with Construction and Operations for the Development Concepts

YEAR	GHG (METRIC TONS/YEAR)			CO_2e (metric tons/year) Notes 2, 3
	CO_2	CH_4	N_2O	
Construction Note 1				
2027	3,513	0.033	0.020	3,519
2028	3,497	0.030	0.020	3,502
Operational				
2029 Dev't Scenario 1	36	0.029	0.0005	37
2029 Dev't Scenario 2	1,342	<0.001	0.0420	1,354
GAV/Parking	1,100	0.031	0.006	1,103

Source: HMMH, 2024

Notes

1. *Construction emissions derived from ACEIT and MOVES.*
2. *Global Warming Potential (GWP) values derived from the Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report were used in the calculations of CO_2e.*
3. *Emissions presented in the table include the GWP for each pollutant.*

- **No Action**: As it does not involve construction, the No Action alternative would not create adverse climate impacts as a result of airport development.
- **Build/Proposed Project**: While the project would result in an increase in GHG emissions during construction, the emissions would be short-term and temporary in nature, and would not be

substantial on a state, national, or global scale. The conservative-case inputs used in the analysis are discussed in Section 6.1, and include an estimated 400 additional aircraft operations for Development Scenario 1 and an estimated 7,032 additional operations for Development Scenario 2 . Based on the insignificant percentage of statewide, nationwide, or global GHG emissions posed by the project's construction and operations, even using conservative assumptions, *no significant, adverse climate impacts are anticipated as a result of the Proposed Project, regardless of the future use.*

6.4 Coastal Resources

As Frederick County is not located within the Virginia Coastal Zone, a consistency determination is not required and *no adverse impacts are anticipated to coastal resources by either the No Action alternative, or the 2024 Build/Proposed Project.*

6.5 Department of Transportation, Section 4(f) Resources

FAA Order 1050.1F establishes the significance thresholds for Section 4(f) Resources. An impact may be deemed significant if the Proposed Project involves more than a minimal physical use of a Section 4(f) resource or constitutes a "constructive use" based on an FAA determination that the aviation project would substantially impair the Section 4(f) resource.

Resources that are protected by Section 4(f) are publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance; and publicly or privately-owned land from an historic site of national, state, or local significance. Substantial impairment occurs when the activities, features, or attributes of the resources that contribute to its significance or enjoyment are substantially diminished.

There are no known public parks, recreation areas, or wildlife refuges on airport property or in the immediate vicinity. As mentioned previously, a portion of the airport and the on-airport development site is within the Second Winchester Battlefield district, also referred to as the Apple Pie Ridge/West Fort Parcel, which has been recommended for listing in the NRHP. Coordination was conducted with the DHR during this environmental effort which resulted in a "Conditional No Adverse Effect" recommendation, with the following agency comment:

With the condition that design drawings and/or more concrete plans are provided to DHR and the scope remain the same, it is DHR's recommendation that there will be no adverse effects to the National Register of Historic Places (NRHP) and Virginia Landmarks Register (VLR)-eligible Apple Pie Ridge (DHR ID #034-5023) – see **Attachment D**.

- **No Action**: As it does not involve construction, the No Action alternative would not impact Section 4(f) resources.
- **Build/Proposed Project**: In consideration of the Conditional No Adverse Effect determination issued by the DHR and with the assumption that the scope remains the same and design drawings and/or more concrete plans are provided to DHR at the appropriate time, *no significant impacts to Section 4(f) resources are anticipated as a result of the Proposed Project. In accordance with Section 4(f) of the DOT Act of 1966 (49 U.S.C. §303, FAA has made a de minimis*

*impact determination based on the DHR's recommendation of no adverse effect (see **Attachment D**).*

6.6 Farmlands

The FPPA regulates federal actions with the potential to convert farmland to non-agricultural uses. FAA Order 1050.1F establishes the significance thresholds for farmlands. A significant impact would occur when: The total combined score on Form AD-1006, "*Farmland Conversion Impact Rating*," ranges between 200 and 260 points. Factors to consider include if the Proposed Project has the potential to convert important farmlands, such as pastureland, cropland, and forest considered to be prime, unique, or statewide or locally important land, to non-agricultural uses.

While there are areas of prime farmland within the project area (see Figure 8), the airport property does not meet the definition of farmland as contained in the FPPA because it is already dedicated for aeronautical development. The project does not involve the acquisition of lands or the conversion of farmland to non-agricultural uses.

- **No Action**: As it does not involve construction or the conversion of farmland to non-agricultural uses, the No Action alternative would not impact farmlands.
- **Build/Proposed Project**: The area where the Proposed Project would be constructed is on a site which is committed to airport use. *No impacts to farmlands, including conversion of farmlands, are anticipated as a result of the construction of the Proposed Project, regardless of the future use.*

6.7 Hazardous Materials, Solid Waste, and Pollution Prevention

The FAA has not established a significance threshold for Hazardous Materials, Solid Waste, and Pollution Prevention. Factors to consider include whether the Proposed Project may have the potential to:

- Violate applicable federal, state, tribal, or local laws or regulations regarding hazardous materials and/or solid waste management;
- Involve a contaminated site (including but not limited to a site listed on the National Priorities List (NPL);
- Produce an appreciably different quantity or type of hazardous waste;
- Generate an appreciably different quantity or type of solid waste or use a different method of collection or disposal and/or would exceed local capacity; or
- Adversely affect human health and the environment

There are no Superfund or Brownfield sites located on or in the vicinity of the airport, and there are no landfills in the airport vicinity. There are also no landfills in the project vicinity. Every effort is to be made to recycle materials; however, this will ultimately be the decision of the contractor who is awarded the construction contract under competitive bid. Very little construction and demolition (C&D) waste is anticipated because the majority of the Proposed Project involves new construction.

As mentioned previously, Development Scenario 1 is assumed to represent an additional, 400 annual aircraft operations at OKV (200 annual test flights), and Development Scenario 2 is assumed to

represent an estimated, additional 7,032 annual aircraft operations at OKV. The additional operations are not anticipated to add a significant amount of solid waste, hazardous materials, or pollution to the current levels at the airfield.

- **No Action**: As it does not involve construction, the No Action alternative would not involve or impact hazardous resources or create significant amounts of solid waste or pollution.
- **Build/Proposed Project**: The area where the Proposed Project would be constructed is previously disturbed and is on dedicated airport property. There is no anticipation of hazardous waste used or generated during the project. Construction waste and debris would be generated during development, which is typical of any construction project. Solid waste, including construction and land clearing debris generated from this project, would be property disposed of at a permitted solid waste acceptance facility, or recycled if possible. Every effort is to be made to recycle materials; however, this will ultimately be the decision of the contractor who is awarded the construction contract under competitive bid. Very little C&D waste is anticipated because the majority of the Proposed Project involves new construction. A project-specific SWPPP would be prepared by the contractor which would detail methods to control spills and other unauthorized releases during construction and project implementation. The existing SWPPP would also be updated to include the new construction and its anticipated, associated pollutants discharged. *There is no anticipated impact to or from hazardous materials as a result of the construction of the Proposed Project. The construction is not anticipated to create a significant amount of solid waste or pollution that could not be accommodated by local disposal sites. As mentioned previously, Development Scenario 1 is assumed to represent an additional, 400 annual aircraft operations at OKV (200 annual test flights), and Development Scenario 2 is assumed to represent an estimated, additional 7,032 annual aircraft operations at OKV. The additional operations are not anticipated to add a significant amount of solid waste, hazardous materials, or pollution to the current levels at the airfield.*

6.8 Historical, Architectural, Archaeological and Cultural Resources

The FAA has not established a significance threshold for Historical, Architectural, Archaeological, and Cultural Resources. A factor to consider includes, but is not limited to, situations in which the proposed action or alternative(s) would result in a finding of Adverse Effect through the Section 106 process.

As mentioned previously, a portion of the airport and the on-airport development site is within the Second Winchester Battlefield district, also referred to as the Apple Pie Ridge/West Fort Parcel, which has been recommended for listing in the NRHP. The other resources identified within the project viewshed did not require further analysis and are not eligible for listing in the NRHP. Coordination was conducted with the DHR during this environmental effort which resulted in a "Conditional No Adverse Effect" recommendation, with the following agency comment:

With the condition that design drawings and/or more concrete plans are provided to DHR and the scope remain the same, it is DHR's recommendation that there will be no adverse effects to the National Register of Historic Places (NRHP) and Virginia Landmarks Register (VLR)-eligible Apple Pie Ridge (DHR ID #034-5023) – see **Attachment D**.

Letters were mailed by FAA to the four Native American tribes which have expressed an interest in Frederick County- the Catawba Indian Nation, the Delaware Nation, Oklahoma, the Eastern Shawnee

Tribe of Oklahoma, and the Monacan Indian Nation (see **Attachment D**). The Catawba Indian Nation responded that it has no immediate concerns about the project but requested to be notified if Native American artifacts and/or human remains are located during the ground disturbance phase of the project.

- **No Action**: As it does not involve construction, the No Action alternative would not impact historical, architectural, archaeological or cultural resources.
- **Build/Proposed Project**: In consideration of the Airport Authority's commitment to adhere to the DHR's review comments provided during agency coordination, *no adverse impacts to historical, architectural, archaeological or cultural resources are anticipated as a result of the 2024 Proposed Project regardless of the future use.*

6.9 Land Use

The FAA has not established a significance threshold for Land Use, and the determination that significant impacts exist in the land use category normally depend on the significance of other impact categories, such as noise.

OKV is an operating, general aviation airport. The airport is part of the RA (Rural Areas) zoning district in Frederick County (see Figure 10). There is an Airport Overlay (AP1) District in Frederick County which regulates obstructions to protected airspace in the vicinity of the airport.

The 47± acre project site is situated in the northern portion of the airfield adjacent to off-airport industrial and commercial uses such as the Frederick County Fire and Rescue and the One Logistics Park development which is currently under construction, and Coverstone Drive. The proposed Northside Development would take place on dedicated airport property and would be in line with existing uses on the airfield and in the area. The Comprehensive Plan for Frederick County designates the area surrounding OKV as an Airport Support Area, listing commercial and industrial uses as the primary uses of the land.

The zoning designations that border the airport include M1 (Light Industrial) and B2 (General Business). These zoning designations allow for light manufacturing, heavy commercial, and a variety of business, office, and service uses.

Noise is discussed in Section 6.11.

- **No Action**: As it does not involve construction or land acquisition, the No Action alternative would not have land use impacts.
- **Build/Proposed Project**: The construction of the Proposed Project is in line with the permitted uses of the local zoning ordinance and does not involve land acquisition. *No adverse land use impacts are anticipated as a result of the construction of the Proposed Project regardless of the future use.*

6.10 Natural Resources and Energy Supply

The FAA has not established a significance threshold for Natural Resources and Energy Supply. Factors to consider may include whether the Proposed Project would have the potential to cause demand to exceed available or future supplies of these resources.

The proposed Northside Development would require energy and natural resources (electric, water, and telecommunications) regardless of the future use of the site, which are anticipated to be served by the existing utilities at or adjacent to the airport which would be extended to the project site.

Depending on the ultimate future use of the site, the facility could include two, 20,000 gallon tanks of Jet-A fuel; one, 12,000 gallon tank of AvGas or its unleaded equivalent; and/or two electric aircraft charging stations. Airport Cooperative Research Panel (ACRP) Report 236, *Preparing Your Airport for Electric Aircraft and Hydrogen Technologies*, reports that smaller all-electric general aviation aircraft, such as those likely to operate and charge at OKV in the short term, can be charged in about 45 minutes with 40 to 60 kilowatt (kW) chargers. Two aircraft charging simultaneously would have an electric demand of approximately 80 to 120 kW. This additional electricity requirement is not anticipated to require the airport to upgrade its main electrical connection to the greater power grid, and the required infrastructure modifications are anticipated to be the installation of the charging stations and associated power distribution and management systems. However, should small commuter electric aircraft begin to eventually operate within the United States and at OKV, the energy needs for charging may require upgrades to the additional electrical capacity at the airport. This would likely occur in the mid- to long-term (beyond the next five years).

If the ultimate development involves a large manufacturing facility, it is possible that the electricity required for the building would require upgrades to the airport's current electrical capacity. Informal discussions with Rappahannock Electrical Cooperative suggest that there is adequate, additional electrical power for this type of facility as well as potential upgrades associated with small commuter electric aircraft.

- **No Action**: As it does not involve construction, the No Action alternative would not require significant natural resources or energy supply.
- **Build/Proposed Project**: The Proposed Project includes the construction of either an up to 600,000 sf maintenance building with associated automobile parking and access and apron frontage; or up to 24 aircraft storage hangars plus associated apron frontage, taxilanes/taxiway; automotive parking and access roads; security fence; and a potential fuel facility. The construction would require natural resources such as asphalt, water and aggregate; however, these materials are not in short supply. The development would also require energy during construction and operation, such as electricity and fuel for construction and ground vehicles. The conservative assumptions made during this environmental review assume that all new aircraft tenants would be new tenants to the airport, which would likely cause fuel demand to increase; however, fuel demand is not anticipated to increase beyond what the airport can reasonably provide. It is possible that the future use may require upgrades to the existing electrical supply on the airfield, and it is anticipated that the additional supply would be available if and when it becomes necessary. *No significant, adverse impacts to natural resources or energy supply are anticipated as a result of the construction or operation of the Proposed Project.*

6.11 Noise and Noise-Compatible Land Use

FAA Order 1050.1F establishes the thresholds for significant Noise and Noise-Compatible Land Use impacts. An impact may be deemed significant if, when compared to the No Action alternative for the same timeframe, the Proposed Project would increase noise by DNL 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase.

As noted previously, the airport property is located within an RA zoning designation and is bordered by business and industrial land uses which are generally considered to be compatible with airport operations. Residential uses are situated approximately one-half mile north of the proposed development site and are separated from the airport property by industrial and commercial development and four lanes of traffic (Millwood Pike/State Route 50). Other residential uses are situated south of airport property along Bufflick Road/Route 776, which are separated from the proposed development site by the runway and the operating airfield. The Airport Authority owns much of the land west of the project site, including many of the residential parcels along Bufflick Road (see Figure 11).

A noise screening was conducted for both build scenarios using FAA's Area Equivalent Method (AEM) spreadsheet to estimate the additional noise impacts which could occur from the proposed development. For Development Scenario 1, although the approved forecast assumes 200 test flights (400 annual operations) associated with the potential manufacturing facility, for the purposes of the noise screening, 800 annual operations were added. Since the type of AAM to be manufactured is unknown (whether fixed wing or rotor) two different types were added as a conservative measure. There are currently no type-certified AAM aircraft in the United States; therefore, representative aircraft were selected as inputs in the noise screening analysis. The Robinson R44 was selected as the representative helicopter type, and a generic single engine fixed propeller aircraft similar to a small Cessna aircraft was selected as the representative fixed-wing aircraft. As the future type of AAM is unknown, it was assumed that the AAM aircraft would operate in the same flight paths and from the same locations as aircraft currently operating at OKV. See **Attachment H** for the full AEM Noise Modeling Memo.

For Development Scenario 2, the assumptions used in the project-specific forecast (see **Attachment B**) include an additional 7,032 annual aircraft operations flown by up to 24 turbojets and up to 48 turboprop aircraft. Representative aircraft for the analysis were selected from OKV's Virtower Airport Operations Tracking System records (see **Attachment H** for detailed inputs and methodology).
FAA guidance notes that if the AEM calculations indicate that the action would result in less than a 17 percent (approximately a DNL 1dB) increase in the DNL 65 dB contour area, there would be no significant impact over noise sensitive areas and no further noise analysis would be required. The inputs used in the analysis represent the most conservative scenarios described above. The analysis estimates an increase in the 65 DNL noise contour at OKV of approximately 0.4473 percent as a result of Development Scenario 1 (Aircraft Manufacturing Facility), and an increase in the DNL 65 dB noise contour of approximately 11.28% as a result of Development Scenario 2 (Aircraft Storage and/or Maintenance). Both of these are well below the 17% threshold which would require additional noise analysis. See Table 7 and **Attachment H**.

Table 7: AEM Contour Areas for 2029

ALTERNATIVE	DNL (DBA)	NO ACTION AREA (SQ. MI.)	PROPOSED PROJECT (DEV'T ALTERNATIVE) AREA (SQ. MI.)	PERCENT CHANGE IN AREA
Development Scenario 1	65	0.1319	0.1325	0.4473%
Development Scenario 2	65	0.1319	0.1467	11.28%

Source: HMMH, 2024

Noise impacts as a result of construction would be temporary. According to the AEM Noise Modeling Memo included as **Attachment H**, typically construction noise does not cause noise exceedance thresholds beyond 500 feet from the source to the receiver (residence or similar) for standard construction activities such as those planned for this project (i.e., grading and paving). Based on a sound dissipation rate of 6 dB per doubling of distance, construction equipment would generate a noise of 80 dBA at a distance of 100 feet, 74 dBA at a distance of 200 feet, and so on. At 800 feet, the level would be estimated to be 62 dBA, below the level of speech interference. The closest occupied residence from the construction site is approximately 1,500 feet away, suggesting that significant construction noise impacts are not anticipated.

As with any construction project that occurs within the County, this project must adhere to the Frederick County Code of Ordinances. The County noise ordinance (Chapter 118 of the Code of Ordinances) includes noise prohibitions from 9 pm to 6 am within certain zoning designations, but not for the RA zoning designation where the airport is located. If the sound level exceeds what is allowed by the locality, the contractor has options to reduce noise levels such as turning off idling equipment, installing temporary or portable acoustic barriers around stationary construction noise sources, and locating stationary construction equipment as far from noise sensitive properties as is possible.

While the project has not yet been designed, it is likely that construction would take place during daylight hours, including construction vehicle trips. Construction is anticipated to take place during 2027 and 2028. By that time, it is anticipated that the extension to Coverstone Drive would be constructed (see **Figure 2**). This would provide a dedicated entrance to the Northside Development site for construction vehicles and for future users of the site.

Construction vehicles could access the project site from Interstate 81 and could arrive from the north using State Route 50/Millwood Pike or from the south using Interstate 81 or State Route 522/Front Royal Pike. This would temporarily increase the total daily traffic on these roads. According to the Virginia Department of Transportation (VDOT), the average daily traffic volume of Interstate 81 is 53,000 vehicles; Millwood Pike is 17,000 vehicles; and Front Royal Pike is 14,000 vehicles.

The number of construction workers on the site is anticipated to vary by project phase. For example, site prep (clearing, grading) would require workers to operate heavy equipment for grading such as bulldozers, road graders, and haul trucks. The utility installation and building erection phases would require workers with a different skill sets, as would road, apron, and automobile parking establishment and final site stabilization and landscaping. The full build-out of the Northside Development is

anticipated to take two years, with individual projects moving forward based on airport priority and funding availability, among other factors, meaning that the number of workers making trips to the site at any one time is highly variable. However, for the purposes of this environmental analysis, in a "most conservative" scenario where the project is constructed at once, there could be as many as 858 trips to the site at a time, which would include employee commutes and material deliveries. The Federal Highway Administration's *Noise Fundamentals, Highway Traffic Noise Analysis and Abatement Policy and Guidance* notes that a doubling of noise sources (i.e., vehicles) would increase traffic noise levels by approximately 3dB, which the guidance reports is normally the smallest change that humans can detect without specifically listening for a change. The closest residential uses in this area are north of Millwood Pike. Based on the existing ADT of this road, the estimated additional 858 trips represents only a five percent increase and would not be considered a significant change in the noise environment.

As described in Section 4.2, Development Scenario 1 represents an estimated, additional 112,950 automobile trips when the facility is operating, and Development Scenario 2 represents an estimated, additional 7,032 annual automobile trips by users of the hangars. Based on the surrounding land uses, which are industrial in nature, the additional automobile trips are not anticipated to significantly change the noise environment.

A review of the noise levels of electric aircraft was conducted as part of this EA effort (see **Attachment I**). As of spring 2024, there are no electric aircraft which have been type-certified by the FAA and are available for public/civilian use. However, the research review suggests that electric aircraft are significantly quieter than traditional aircraft, based in part to their ability to turn propellers slower than traditional aircraft and to climb faster, as well as their lack of engine.

- No Action: As it does not involve construction, the No Action alternative would not have noise impacts associated with new development. Although the FAA-TAF outlined in Figure 5 does not anticipate additional operations at OKV in the future, it is likely that aircraft operations and associated automobile trips would increase as a result of organic growth of the user base at OKV, not associated with a specific development project. However, based on the surrounding land uses and the County's intended use of the airport property, any additional operations are not anticipated to represent an incompatible land use.
- Build/Proposed Project: Noise impacts from construction would be temporary and would not impact residential areas based on distance from the project area. Neither of the development scenarios would increase the 65 DNL noise contour by an amount considered to be significant by FAA Order 1050.1F. Based on the surrounding land uses, which are industrial in nature, the additional automobile trips are not anticipated to significantly change the noise environment. Therefore, no significant noise impacts are anticipated as a result of the Proposed Project.

6.12 Socioeconomics and Children's Health and Safety Risks

The FAA has provided factors to consider when analyzing potential impacts but has not established a significance threshold for socioeconomics or children's environmental health and safety risks. Factors to consider when evaluating potential socioeconomic impacts include if the action would have the potential to:

- Induce substantial economic growth in an area, directly or indirectly
- Disrupt or divide the physical arrangement of an established community
- Cause extensive relocation when sufficient replacement housing is unavailable
- Cause extensive relocation of community businesses that would cause severe economic hardship for affected communities
- Disrupt local traffic patterns and substantially reduce the levels of service roads serving an airport and its surrounding communities
- Produce a substantial change in the community tax base

A factor to consider when evaluating potential impacts to children's health and safety is whether the action would have the potential to lead to a disproportionate health or safety risk to children.

It is possible that the development could spur socioeconomic growth during construction and operation of the future facility, including by providing construction or manufacturing jobs or increasing the local tax base. The extent to which the project could positively impact the surrounding community would depend on the ultimate, future use of the site.

As with any construction project, there would be temporary traffic impacts during construction and operation, which are discussed in Section 6.11. However, the closest residents to the site are approximately 1,500 feet from the site and separated from the project by the operating airfield. Other residential uses are separated from the site by industrial uses and multiple lanes of traffic. As also discussed in Section 6.11, the conservatively estimated 858 potential, additional trips associated with construction represent only a five percent increase in current traffic levels over the construction duration.

As described in Section 4.2, Development Scenario 1 represents an estimated, additional 112,950 automobile trips when the facility is operating, and Development Scenario 2 represents an estimated, additional 7,032 annual automobile trips by users of the hangars. Depending on the ultimate future use of the site, the access point from Coverstone Drive may need to be modified, and road and signal improvements and/or additional entrances may be required. As described in the PER in **Attachment F**, the required road improvements will not be known until the ultimate building use is determined and real data can be collected. Once the ultimate building use is established, and design progresses, the Proposed Project will be coordinated with the county to determine any required modifications to Coverstone Drive.

- **No Action:** As it does not involve construction, the No Action alternative would not have socioeconomic impacts, including the positive socioeconomic impacts of the jobs associated with construction.
- **Build/Proposed Project:** The Proposed Project would be constructed on airport property and does not involve land acquisition or the relocation of businesses or residences. The project area is not in significant proximity to schools or childcare facilities. Traffic impacts from construction would be temporary; depending on the future use of the site, there would be operational impacts in the form of additional automobile trips which may require modifications to Coverstone Drive. While the one-mile radius of the project area identifies children under 18, the project area is surrounded by commercial and industrial development and will not impact this population. The community could

experience a temporary increase in jobs and tax base due to construction. *It is reasonable to conclude that there would not be significant adverse environmental impacts from the project that are predominantly borne by this population.*

6.13 Visual Effects

Visual effects are broken into two categories: *Light Emissions* and *Visual Resources and Character.* The FAA has not established a significance threshold for visual effects (including light emissions). Factors to consider are the degree to which the Proposed Project would have the potential to:

- Create annoyance or interfere with normal activities from light emissions;
- Affect the visual character of the area due to the light emissions, including the importance, uniqueness, and aesthetic value of the affected visual resources.
- Affect the nature of the visual character of the area, including the importance, uniqueness, and aesthetic value of the affected visual resources;
- Contrast with the visual resources and/or visual character in the study area; and
- Block or obstruct the views of visual resources, including whether these resources would still be visible from other locations.

As mentioned previously, the area surrounding airport property is characterized by commercial and industrial land uses; the land to the east of the airport property is forested. The closest residential uses are separated from the site by roads, commercial and industrial development, and/or the operating and developed airfield.

6.13.1 Light Emissions

As an operating, general aviation airport, OKV is a fully lighted facility providing 24-hour per day services. The commercial and industrial uses in the vicinity of the airport are already subject to the existing lights associated with the operation of the airport. Lighting would be installed for the proposed development regardless of the future use, including in automobile parking lots and on the exterior of buildings.

During the design phase and in accordance with Section 165-201.07, *Outdoor Lighting*, of the Frederick County zoning ordinance, the photometric layout prepared for each project would take into account light-sensitive land uses such as residences and implement mitigation measures such as aiming or shielding to avoid producing glare onto adjacent properties or road rights-of-way.

6.13.2 Visual Resources and Character

The existing visual character of the project site is an open, grassy field within an operating airport to the south, including a runway, parallel taxiway, and airport terminal building. To the north, the existing visual character of the project site includes the Frederick County Fire and Rescue complex, Coverstone Drive, and the One Logistics Park industrial development, which is under construction as of spring 2024. Residential uses are situated approximately one-half mile north of the proposed development site and are separated from the airport property by Millwood Pike/State Route 50; other residential uses are situated south of airport property along Bufflick Road/Route 776, which are separated from the proposed development by the runway and the operating airfield. The Airport Authority owns much of

the land west of the project site, including many of the residential parcels along Bufflick Road (see Figure 11).

A portion of the airport and the Northside Development site is included within the approximately 18,000 acre Second Winchester Battlefield district, also referred to as the Apple Pie Ridge/West Fort Parcel, which has been recommended for listing in the NRHP. Coordination was conducted with the DHR during this environmental effort which resulted in a "Conditional No Adverse Effect" recommendation, with the following agency comment:

With the condition that design drawings and/or more concrete plans are provided to DHR and the scope remain the same, it is DHR's recommendation that there will be no adverse effects to the National Register of Historic Places (NRHP) and Virginia Landmarks Register (VLR)-eligible Apple Pie Ridge (DHR ID #034-5023) – see **Attachment D**.

- **No Action**: As it does not involve construction, the No Action alternative would not cause visual impacts.

- **Build/Proposed Project**: The construction of the Proposed Project would take place on an operating airfield with existing lighting and is in line with surrounding on-airport development and the visual character of an operating airport and the surrounding commercial and industrial development. It is possible that a residence south of the airport along Bufflick Road could see the development; however, the viewshed of these residences is already an operating airfield as well as the Frederick County Fire and Rescue and development associated with the One Logistics Park industrial development. If Development Scenario 1 is ultimately developed, AAM aircraft would be visible during test flights to and from the airport. However, as it is assumed that these aircraft would follow the flight paths of the existing fleet mix at OKV, the general public is already visually exposed to aircraft of an assumed similar size and operation as the anticipated AAM aircraft. Development Scenario 2 will entail additional aircraft similar to the existing fleet mix. *Given the existing, industrial visual character of the location and the proximity of the residences to an operating, general aviation airport as well as the Airport Authority's commitment to adhere to the DHR's review comments provided during agency coordination, the additional visual impacts from the proposed development is not anticipated to be significant.*

Figure 17: View of Residences along Bufflick Road from the Project Site (facing south)

Source: Delta Airport Consultants, Inc.

6.14 Water Resources

6.14.1 Wetlands

FAA Order 1050.1F establishes the significance thresholds for wetlands impacts. A significant impact would occur when the action would:

- Adversely affect a wetland's function to protect the quality or quantity of municipal water supplies, including surface waters and sole source and other aquifers;
- Substantially alter the hydrology needed to sustain the affected wetland system's values and functions or those of a wetland to which it is connected;
- Substantially reduce the affected wetland's ability to retain floodwaters or storm runoff, thereby threatening public health, safety, or welfare;

- Adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected or surrounding wetlands;
- Promote development of secondary activities or services that would cause the circumstances listed above to occur; or
- Be inconsistent with applicable state wetland strategies.

A wetlands survey and delineation were conducted in November 2023 as part of this environmental effort, within the approximately 47 acre project area, and a PJD was issued by the USACE in June 2024. The full wetlands report and PJD are included as **Attachment E**. Because the construction is not anticipated to begin until 2027, a pre-application meeting with permitting agencies would be held at the start of the design phase.

Two wetlands (Wetlands A and B) and two stream channels (Streams A and B) were delineated within the project area (see Table 3). Both wetlands are classified as Palustrine Emergent (PEM).

Based on the preliminary analysis conducted as part of this EA effort, the grading associated with the proposed development would require that Wetland A and Stream A be graded and filled. This represents an impact of approximately 0.15 acres of wetland and approximately 261 feet of stream (see Figure 18) which are expected to correspond to a State Programmatic General Permit (SPGP) and a state general permit (WP1). The level of permit required would be confirmed by the permitting agencies during the design phase.

Compensatory mitigation for the loss of aquatic resources is generally required for impacts that exceed 0.10 acre. The current wetland mitigation ratio for PEM wetlands is 1:1, suggesting that 0.15 acres of wetland credits would be required. Stream mitigation credits are based on stream assessments using the Unified Stream Methodology (USM). An assumption of 1.3:1 stream ratio was used to calculate potential credits needed for the approximately 261 LF of stream impacts, which would require approximately 340 stream credits. These estimates will vary based on agency approval, stream assessment, credit cost and availability at the time that permitting and mitigation takes place.

The primary sources of compensatory mitigation accepted by the USACE and The Department of Environmental Quality (DEQ) are listed below, in order of agency preference:

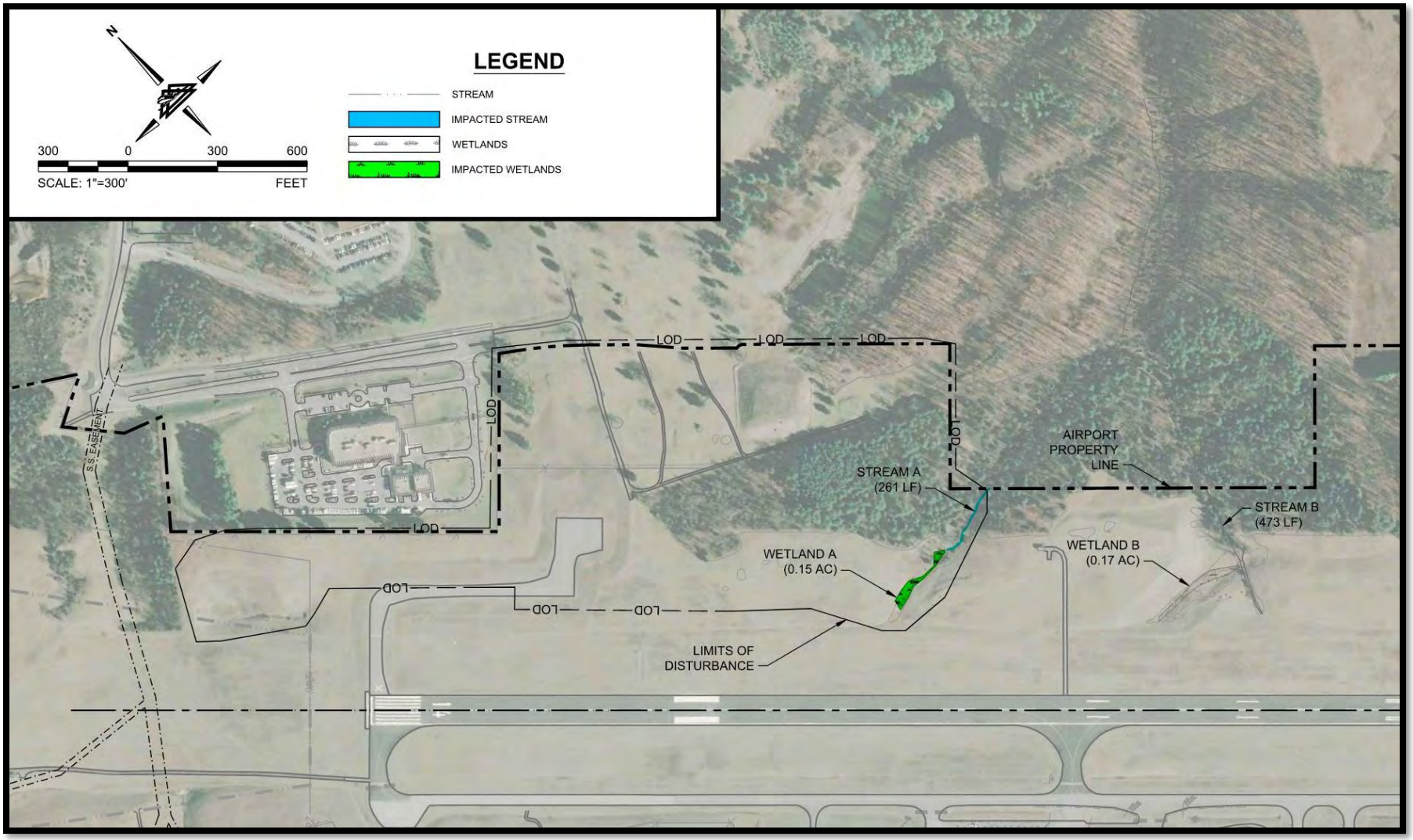
- purchasing credits from an authorized mitigation bank
- participation in an in-lieu fee program (which involves funds paid to a governmental or non-governmental natural resource management organization to restore, establish, enhance, and/or preserve resources on an applicant's behalf)
- Permittee Responsible Mitigation (PRM) (which involves construction and monitoring of wetland resources by the applicant itself)

As of spring 2024, according to the USACE's Regulatory In-Lieu Fee and Bank Information Tracking System (RIBITS), there are no mitigation credits (including pending credits) listed for the Hydrologic Unit Code (HUC-8) watershed where the project would take place. Should wetland and stream credits be unavailable as the project moves forward, mitigation options would include federal and/or state in-lieu

fee programs and PRM. These would be refined in coordination with the permitting agencies in a compensatory mitigation plan prepared during the design and permitting phase.

- **No Action**: As it does not involve construction, the No Action alternative would not impact wetlands.
- **Build/Proposed Project**: Based on the PER effort, the 2024 Proposed Project would impact approximately 0.15 acres of wetlands and approximately 261 LF of stream. Impacts would be mitigated in accordance with agency guidance when the design phase begins (anticipated 2026). In consideration of these factors and with the commitment to secure the appropriate state and federal permits before construction, *no significant, adverse impacts to wetlands that cannot be mitigated are anticipated as a result of the Proposed Projects regardless of the future use.*

Figure 18: Estimated Wetland and Stream Impacts, 2024 Proposed Project



Source: Greenway Engineering, Delta Airport Consultants, Inc..

6.14.2 Floodplains

FAA Order 1050.1F establishes the significance thresholds for floodplain impacts to be if the Proposed Project "would cause notable adverse impacts on natural and beneficial floodplain values."

Federal Emergency Management Agency (FEMA) flood map 51069C0219E, effective 01/29/2021, confirms that the full study area is outside of the mapped floodplain limits (see Figure 16).
No impacts to floodplains are anticipated as a result of either the No Action or the Build/Proposed Project alternatives.

6.14.3 Surface Waters

FAA Order 1050.1F establishes the significance thresholds for surface water impacts, including whether the action would:

- Exceed water quality standards established by Federal, state, local, and tribal regulatory agencies; or
- Contaminate public drinking water supply such that public health may be adversely affected.

Factors to consider with the Proposed Project include:

- Adversely affect natural and beneficial water resource values to a degree that substantially diminishes or destroys such values;
- Adversely affect surface waters such that the beneficial uses and values of such waters are appreciably diminished or can no longer be maintained and such impairment cannot be avoided or satisfactorily mitigated; or
- Present difficulties based on water quality impacts when obtaining a permit or authorization.

According to the PER (see **Attachment F**), the most conservative development scenario (Development Scenario 1, Aircraft Manufacturing Facility) could add approximately 26 acres of impervious surface when fully built-out. This estimate of additional impervious surface assumes that the potential fuel facility is also constructed.

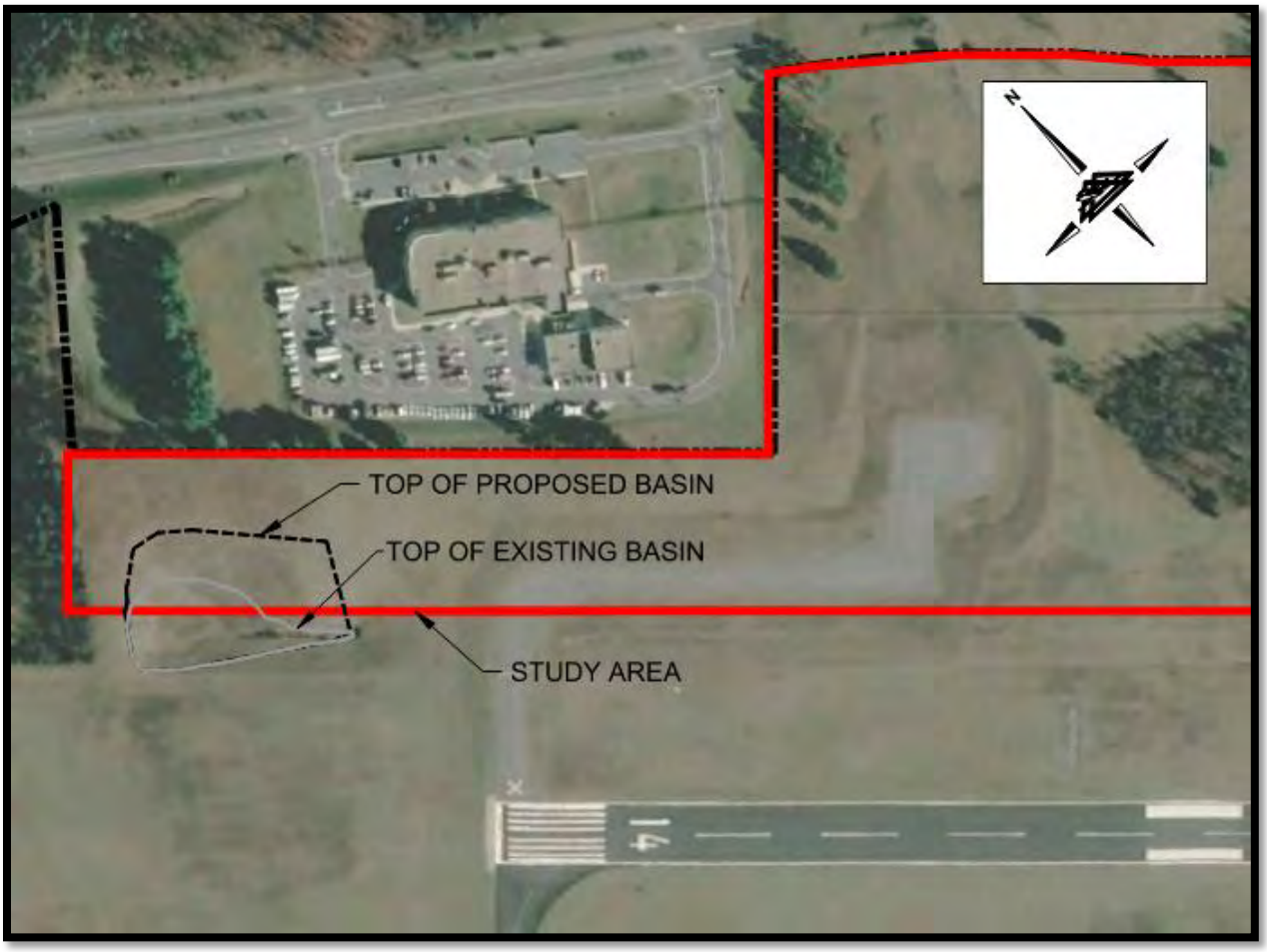
Chapter 143 of the Virginia Code requires a stormwater management plan for all new construction. The regulations provide requirements for water quality and water quantity controls for the 1-, 2-, and 10-year storm events for water quality treatment, channel protection and flood control.

A Virginia Pollutant Discharge Elimination System (VPDES) VAR-10 permit would be secured before construction begins. The preparation of a project-specific Stormwater Pollution and Prevention Plan (SWPPP) and erosion and sediment control plan is part of the VAR-10 permit application.

A stormwater analysis was conducted during the PER effort to review existing stormwater drainage features and to determine the location and rough size of future catchment areas to ensure sufficient space is reserved for required stormwater controls. There is an existing basin on the site north of the Runway 14 end (see Figure 19), and it is anticipated that the site would be developed so that the majority of stormwater is directed into this basin. This results in a significant increase in drainage area and in peak inflows. To manage this increase, the basin's storage volume will need to be significantly

increased from approximately 5,400 cubic yards (cy) to approximately 19,000 cy, based on the assumptions made during development of the preliminary engineering analysis (see **Attachment F**).

Figure 19: Existing and Proposed Basin



Source: Delta Airport Consultants, Inc.

Due to the size of the "most conservative" Development Concept reviewed (Aircraft Manufacturing Facility), erosion and sediment control will be a significant portion of the design process for the project, and could prove challenging. The preliminary engineering analysis produced a conceptual layout of erosion and sediment control measures (see Figure 20 and **Attachment F**). Due to large drainage areas, it is assumed that sediment basins will be the primary perimeter control measure used. Diversion dikes, silt rock, inlet protection and silt fence are anticipated to supplement the basins. Four new basins are depicted along Coverstone Drive on airport property, to take into account the additional potential runoff caused by the One Logistics Park development. The sediment basin on the south side of the project area is proposed to be enlarged. A sediment trap, silt fence, diversion dikes, and a rock filter outlet are also proposed.

The project would impact an estimated 261 LF of stream. As previously stated, an assumption of 1.3:1 stream ratio was used to calculate potential credits needed for the approximately 261 LF of stream

impacts, which would require approximately 340 stream credits. These estimates will vary based on agency approval, stream assessment, credit cost and availability at the time that permitting and mitigation takes place. Mitigation options for stream impacts will be coordinated with the permitting agencies in a compensatory mitigation plan prepared during the design and permitting phase. Based on the current lack of available credits within the watershed, it is assumed that mitigation options would include federal and/or state in-lieu fee programs and PRM.

In addition to mitigation for impacts to wetlands and streams, the site will require approximately 20 pounds per acre per year of phosphorous reduction, according to the analysis conducted during the preliminary engineering effort (see **Attachment F**). The Virginia Stormwater Management Handbook provides guidance on several different BMPs that can be used to address the required load reduction resulting from development. Airports are limited in the types of BMPs that can be used to those do not attract animals. Acceptable BMPs include vegetated roof, permeable pavement, and infiltration. Based on limited BMP options, it is anticipated that impacts will be mitigated by purchasing nutrient credits from the state.

Through the implementation of BMPs such as proper erosion control and reseeding, adherence to the guidelines set forth in the National Pollution Discharge Elimination System (NPDES) program during construction, and the development and/or expansion of new or existing stormwater facilities (e.g., basins and culverts), and compliance with permit requirements, significant impacts to surface waters are not anticipated as a result of the Proposed Project.

- **No Action**: As it does not involve construction, the No Action alternative would not impact surface waters.
- **Build/Proposed Project**: In consideration of the above mitigation measures, implementation of BMPs, and of the proper mitigation for the approximately 261 LF of impacted stream to be finalized during state and federal permitting processes during the design phase, *no significant impacts to surface waters are anticipated regardless of the future use.*

6.14.4 Groundwater

FAA Order 1050.1F establishes the significance thresholds for groundwater impacts, including whether the action would:

- Exceed groundwater quality standards established by Federal, state, local, and tribal regulatory agencies; or
- Contaminate an aquifer used for public water supply such that public health may be impacted.

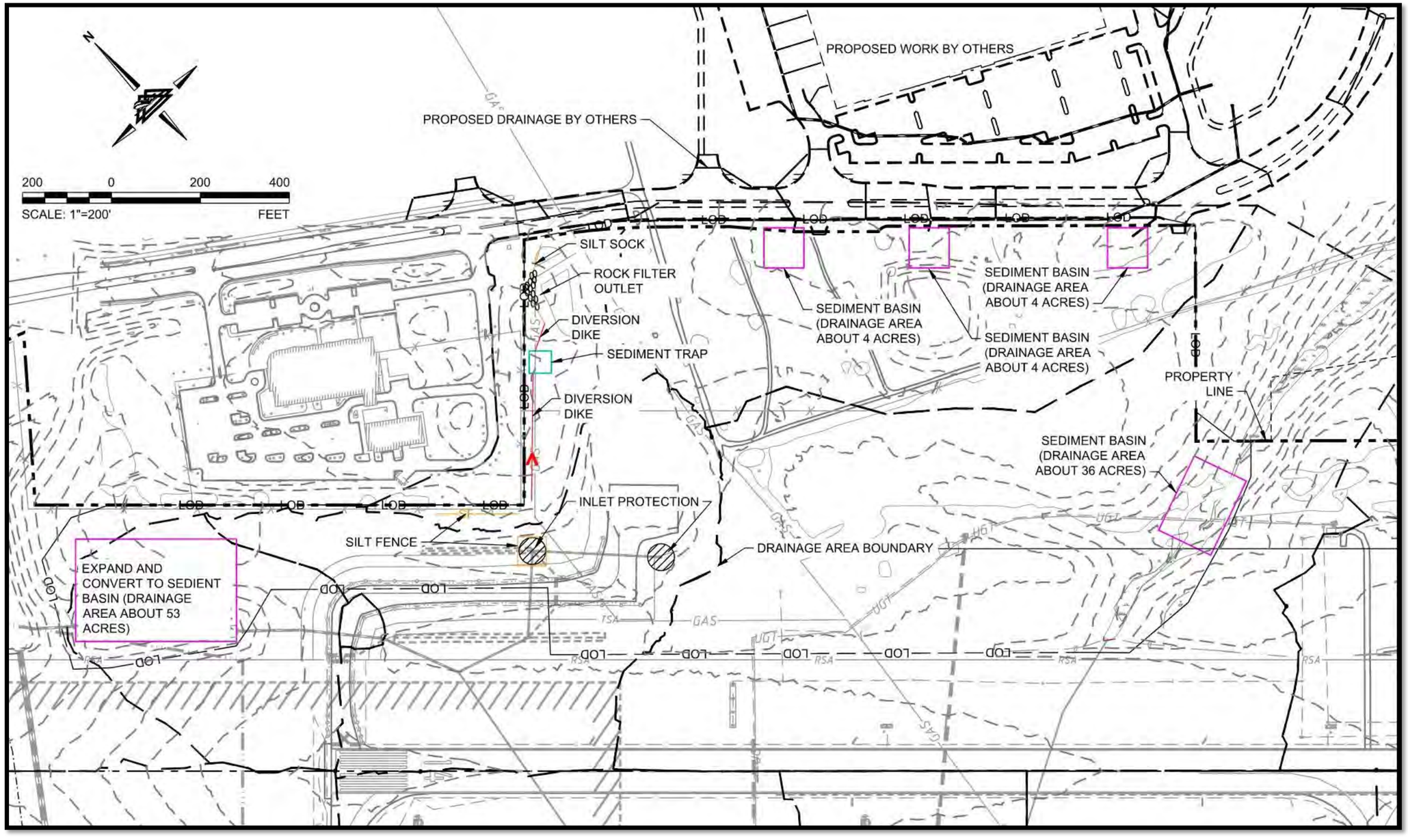
Factors to consider with the Proposed Project include:

- Adversely affect natural and beneficial groundwater values to a degree that substantially diminishes or destroys such values;
- Adversely affect groundwater quantities such that the beneficial uses and values of such groundwater are appreciably diminished or can no longer be maintained and such impairment cannot be avoided or satisfactorily mitigated; or
- Present difficulties based on water quality impacts when obtaining a permit or authorization.

As mentioned previously, the 2024 Proposed Project has the potential to increase the impervious surface within the Northside Development by approximately 26 acres. However, the stormwater analysis conducted during the PER effort would ensure that stormwater is captured within basins that will eventually drain into the water table regardless of the future use.

- **No Action**: As it does not involve construction, the No Action alternative would not impact groundwater.
- **Build/Proposed Project**: The BMP mitigation measures referenced in Section 6.14.3 and the expansion of the existing stormwater basin, plus the lack of sole source aquifers in the project area, suggest that the project would not create *significant impacts to groundwater.*

Figure 20: Conceptual Erosion and Sediment Control



Source: Delta Airport Consultants, Inc.

6.14.5 Wild and Scenic Rivers

The FAA has not established a significance threshold for Wild and Scenic Rivers.

There are no federally designated Wild and Scenic rivers in Virginia nor state-designated rivers in the vicinity of the project area. *No adverse impacts to Wild and Scenic rivers are anticipated as a result of the No Action alternative or of the Build/Proposed Project alternative.*

6.15 Reasonably Foreseeable Effects

The most notable ongoing project in recent years is the design and construction of a new terminal building at OKV. Construction of the terminal building was completed in winter 2025 and the existing terminal building was demolished in summer 2024.

As part of the new terminal project, the terminal apron at OKV is also under reconstruction, which was completed in November 2024.

Taxiway A is currently being realigned to meet FAA design standards associated with runway-taxiway separation. Design was completed in spring 2024 and construction is anticipated in spring/summer 2025.

These projects have been environmentally reviewed with various environmental findings issued by FAA.

Upcoming projects at OKV in the next five years include land and easement acquisition, a runway rehabilitation, and an Airport Master Plan Update. The existing fuel facility is proposed for improvement in 2026 or 2027 to meet DEQ and/or EPA requirements. As an operating facility, OKV also regularly undergoes administrative and maintenance-related projects which are not specifically discussed in this section.

The existing Civil Air Patrol (CAP) hangar is proposed to be relocated with the existing building being demolished. This effort is proposed for 2026.

One Logistics Park is an industrial development adjacent to the airport property and in Frederick County. Airport Management reports that this development has secured the necessary local permits and approvals, and Phase I of construction is underway as of spring 2024. The Frederick County 2022-2027 Capital Improvement Plan accessed online lists the following, proposed projects on the airfield:

- New Airport Terminal (discussed above)
- Taxiway A Relocation (discussed above)
- North Side Site Prep and North Side Access Road (pertains to this proposed development)
- Acquire Land/Easements and Runway Protection Zone (RPZ) Land Services (as previously mentioned)
- Fuel Storage Facility Renovation (discussed above)

The 2022-2027 Capital Improvement Plan lists the following, proposed projects in the vicinity of the proposed project site:

- Sheriff's Office, 8-Bay Steel Building for Large Vehicles
- Bridge Replacement and Capacity Improvements to Exist 313 from Interstate 81

It is not anticipated that these projects would contribute to the capacity for environmental impacts related to the proposed development at OKV. Typically travelers from Interstate 81 access the airport via Exit 212.

Projects on a federally-obligated airfield must be environmentally reviewed in accordance with FAA requirements and an environmental finding should be issued by FAA before construction can begin.

Considering recent past projects and proposed projects at OKV, the projects are not expected to have the capacity for environmental impacts that were/are not able to be mitigated, and that the collective group of projects is not anticipated to result in the significant environmental impacts that cannot be mitigated.

7. Mitigation and Permits

7.1 Historic and Cultural Resources

The lead federal agency shall follow the procedures in 36 CFR 800.13[b] for post-review discoveries if potential historic properties are discovered or if unanticipated effects on known historic properties are found after the agency has completed Section 106 consultation for the undertaking.

Coordination was conducted with the DHR during this environmental effort which resulted in a "Conditional No Adverse Effect" recommendation, with the following agency comment:

With the condition that design drawings and/or more concrete plans are provided to DHR and the scope remain the same, it is DHR's recommendation that there will be no adverse effects to the National Register of Historic Places (NRHP) and Virginia Landmarks Register (VLR)-eligible Apple Pie Ridge (DHR ID #034-5023) – see **Attachment D**. As design for the proposed undertaking progresses, the design efforts will be coordinated with DHR.

7.2 Human Remains

If human remains, funerary objects, sacred ceremonial objects or objects of national or tribal patrimony are discovered on state, county, municipal, or private lands, either through archaeological excavation or during construction of the Proposed Project, and no Burial Agreement is in place the Airport Sponsor shall require the person in charge to immediately cease within a 100-foot radius of the discovery, take steps to protect the discovery, and immediatley notify local police, coroner, and FAA. The FAA will notify the State Historic Preservation Office (SHPO)/Tribal Historic Presevation Office (THPO) and Tribes that have expressed an interest in this area if the remains are determined to be archaeological in nature.

7.3 Native American Tribes

Letters were mailed by FAA to the four Native American tribes which have expressed an interest in Frederick County; the Catawba Indian Nation responded that it has no immediate concerns about the project but requested to be notified if Native American artifacts and/or human remains are located during the ground disturbance phase of the project (see **Attachment D**). Should additional responses be received before construction begins, every effort is to be made to accommodate the tribes' requests.

7.4 Visual Effects

During the design phase and in accordance with Section 165-201.07, *Outdoor Lighting*, of the Frederick County zoning ordinance, the photometric layout prepared for each project would take into account light-sensitive land uses such as residences and implement mitigation measures such as aiming or shielding to avoid producing glare onto adjacent properties or road rights-of-way.

7.5 Biological Resources

As described in Section 6.2, the online project review identified three federally protected mammals which may occur on or near the project area: the Endangered, Indiana Bat (*Myotis sodalis)*, the Endangered, NLEB, (*Myotis septentrionalis)*, and the Proposed Endangered Tricolored Bat (*Perimyotis subflavus*). The Monarch Butterfly, a Candidate species, and eight migratory birds, including the Bald

Eagle, were also identified by the IPaC database. The Virginia DWR identifies 447 species which could occur within two miles of the project area, including nine state-listed species.

The online NLEB Rangewide Determination Key on the IPaC website resulted in a "May Affect- Not Likely to Adversely Affect" (MANLAA) determination. This is the same determination received by the agency during scoping of this project in March 2023. The consistency letter dated 06/03/2024 and included in **Attachment C** advises that if the agency does not note within 15 days that the determination is incorrect, then the action is not likely to result in unauthorized take of the NLEB and no further coordination/consultation regarding the NLEB would be required as long as there are no changes with the project or updates on listed species.

Current USFWS mitigation guidance for the three species of bats discussed above is a recommendation for a time-of-year restriction on tree clearing from April 1 through November 14. The agency released draft, new guidance related to the NLEB in April 2024 which suggests that the time of year restriction could be shortened to cover only the pup season (May 15-July 31). The time of year restrictions for the Indiana Bat have traditionally been similar to those for the NLEB. Updated coordination would occur with USFWS to confirm the appropriate mitigation measures when the project is being designed.

7.6 Hazardous Materials, Solid Waste, and Pollution Prevention

The Airport's Stormwater Pollution and Prevention Plan (SWPPP) would be updated once development is complete.

7.7 Socioeconomics and Children's Health and Safety Risks

Depending on the ultimate future use of the site, the access point from Coverstone Drive may need to be modified, and road and signal improvements and/or additional entrances may be required.

Coordination with Frederick County will be conducted as design progresses to incorporate any potential modifications to Coverstone Drive.

7.8 Wetlands and Streams

As noted previously, based on the preliminary analysis conducted as part of this EA effort, the grading associated with the proposed development would require an impact of approximately 0.15 acres of wetland and approximately 261 feet of stream which are expected to correspond to a State Programmatic General Permit (SPGP) and a state general permit (WP1). The level of permit required would be confirmed by the permitting agencies during the design phase.

Compensatory mitigation for the loss of aquatic resources is generally required for impacts that exceed 0.10 acre. The current wetland mitigation ratio for PEM wetlands is 1:1, suggesting that 0.15 acres of wetland credits would be required. An assumption of 1.3:1 stream ratio was used to calculate potential credits needed for the approximately 261 LF of stream impacts, which would require approximately 340 stream credits. These estimates will vary based on agency approval, stream assessment, and required mitigation amount as determined by permitting agencies at the time that permitting and mitigation takes place. Should wetland and stream credits be unavailable as the project moves forward, mitigation options would include federal and/or state in-lieu fee programs and PRM. These would be refined in

coordination with the permitting agencies in a compensatory mitigation plan prepared during the design and permitting phase.

Mitigation for phosphorous is anticipated at approximately 20 pounds per acre, per year of phosphorous reduction. Mitigation is typically completed by purchasing nutrient credits from the state.

The acquisition of permits for the Proposed Project is to occur prior to construction. These are anticipated to include a VPDES VAR-10 permit, which includes a project-specific Stormwater Pollution and Prevention Plan (SWPPP) and erosion and sediment control plan. As mentioned previously, the airport-wide SWPPP would also be updated after construction is complete. A stormwater management plan is anticipated to be required by the locality.

7.9 Air Quality

The Winchester Regional Airport Authority is aware of the opportunity to reduce lead emissions from aircraft by replacing AvGas with a suitable unleaded alternative once an acceptable substitute has been identified and certified by FAA. As stated previously, the FAA have partnered with aviation stakeholders to launch the "Eliminate Aviation Gasoline Lead Emissions" (EAGLE) initiative, which has a goal to eliminate leaded aviation fuels in piston-engine aircraft safely by the end of 2030. Congress, in its 2024 FAA Reauthorization Act, prohibits restricting the sale of 100-octane low lead (100LL) aviation gasoline until the earlier of December 31, 2030 or the date the airport makes available unleaded gas authorized by EPA and FAA and meets industry standards or other standards determined by the FAA Administrator.

8. List of Preparers

Winchester Regional Airport
Nick Sabo, A.A.E., Airport Director

Delta Airport Consultants, Inc.
Mary Ashburn Pearson, AICP: Responsible for overall document preparation
Adam Switzer, P.E.: Responsible for preliminary engineering oversight
Delta Airport Consultants, Inc.: Technical Support

Sub Consultant Subject Experts
Harris, Miller, Miller, and Hanson – Noise and Emissions modeling
Greenway Engineering – Wetland and Stream delineation

9. List of Agencies and Persons Consulted, and Agency Review Response

Coordination was undertaken with the following review agencies during preparation of the EA, either as part of the scoping memo or as separate, individual coordination efforts:

FAA
DOAV
DHR
USFWS
USACE
DEQ
DWR

Upon approval of the draft document by FAA, the draft document is to be made available to the public and various review agencies via the Virginia DEQ State Clearinghouse. The draft document is also to be made available to the general public for a 30-day review and comment period both on the airport's website and in hard copy format at the airport terminal building and the Handley Library in the City of Winchester. Public and review agency comments are to be addressed as appropriate in the final document and included in **Attachment J**. Upon issuance of a finding by FAA, the final document and finding are to be made available for a 30-day public review period.

Attachment A

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
FINDING OF NO SIGNIFICANT IMPACT

Winchester Regional Airport
Winchester, Frederick County, Virginia

North Side Development

1. **Introduction.** This document is a Finding of No Significant Impact on the environment as a result of improvements proposed by the Winchester Regional Airport Authority, owner and operator of Winchester Regional Airport (OKV). The proposed project includes entrance/exit taxiways, partial parallel taxiway, holding apron, apron, conventional hangars and associated auto parking all located on the north side of OKV.

   The Federal Aviation Administration (FAA) must comply with the National Environmental Policy Act of 1969 (NEPA) before being able to take the federal action of further processing of an application for Federal assistance in funding various airport development and for approval of the Airport Layout Plan (ALP) that depicts the proposed airport development projects. Approval of the ALP is authorized by the Airport and Airway Improvement Act of 1982, as amended (Public Laws 97-248 and 100-223).

2. **Project Purpose and Need.** The purpose of the proposed project is to expand airport facilities, on the north side of the airport, to accommodate the future growth of Group III aircraft and meet FAA design standards.

3. **Proposed Project.** The following is a listing of the various components of the proposed project to develop the north side of the airport:

   - Construct a partial parallel taxiway and entrance/exit taxiways.
   - Construct holding apron.
   - Construct six conventional hangars and associated auto parking.
   - Relocate airport fencing.

4. **Reasonable Alternatives Considered.** As described in the Environmental Assessment (EA), the alternative courses of action evaluated include: (1) Proposed Action (2) No Action. The proposed project includes entrance/exit taxiways, partial parallel taxiway, holding apron, apron, conventional hangars and associated auto parking all located on the north side of the airport.

5. **Assessment.** The attached EA addresses the effect of the proposed project on the quality of the human and natural environment, and is made a part of this finding. The following impact analysis highlights the more through analysis presented in the Final EA prepared in August 2008.

   Wetlands: The proposed action will result in the loss of approximately 0.5 acres of delineated stream and wetlands. A Joint Permit Application will be filed with the DEQ and U.S. Army Corps of Engineers for review and approval.

6. **Public Participation.** The Draft EA was made available to the public from August 27, 2008 to September 27, 2008. No comments were received on the Draft EA.

7. **Mitigation Measures.** The FAA will require that Winchester Regional Airport Authority implement the following mitigation measures, if they decide to pursue the proposed project:

   1. A Stormwater Management Plan and Erosion and Sediment Control Plan, utilizing Best Management Practices will be developed to control impacts to water quality due to erosion and sedimentation during the project construction.

   2. Approximately 0.5 acres of wetlands will be impacted. A Joint Permit Application will be filed with the DEQ and U.S. Army Corps of Engineers for review and approval.

3. Construction contract provisions shall contain the provisions of FAA AC 150/5370-10A, *Standards for Specifying Construction of Airports* item P-156, temporary air, water pollution, soil erosion and siltation control and FAA AC 150/5320-5B, *Airport Drainage.*

4. All necessary permits for construction of the proposed project shall be obtained prior to construction.

8. Finding of No Significant Impact

I have carefully and thoroughly considered the facts contained in the attached EA. Based on that information I find that the proposed Federal action is consistent with existing national environmental policies and objectives as set forth in section 101(a) of the National Environmental Policy Act of 1969 (NEPA). I also find the proposed Federal Action, with the required mitigation referenced above will not significantly affect the quality of the human environment or otherwise include any condition requiring consultation pursuant to section 102 (2)(C) of NEPA. As a result, FAA will not prepare an EIS for this action.

APPROVED:

Terry J. Page, Manager
Washington Airports District Office

10/6/08
Date

DISAPPROVED:

Terry J. Page, Manager
Washington Airports District Office

Date

Attachment B

U. S. Department
Of Transportation

**Federal Aviation
Administration**

WASHINGTON AIRPORTS DISTRICT OFFICE
13873 Park Center Road, Suite 490 S
Herndon, Virginia 20171
Telephone: 703/487-3980
Fax: 703/487-3982

March 7, 2024

VIA EMAIL to nsabo@flyokv.com

Mr. Nicholas Sabo, A.A.E.
Executive Director
Winchester Regional Airport
491 Airport Road
Winchester, VA 22602

Re: Winchester Regional Airport
Environmental Assessment for Northside Development
Baseline Aviation Activity Forecast (Calendar Year 2023)
Federal Aviation Administration Review

Dear Mr. Sabo:

The Federal Aviation Administration (FAA) received the January 2024 Forecast Assumptions associated with the Environmental Assessment for the Northside Development project at Winchester Reginal Airport (OKV). Delta Airport Consultants submitted the forecast with a March 1, 2024 email requesting FAA review. In support of the forecast, you also provided raw data from OKV's Virtower Airport Operations Tracking System for calendar year (CY) 2023.

The forecasts and supporting data were reviewed by the FAA's Washington Airports District Office. The FAA concurs with the January 2024 forecast of aircraft operations for use in the Environmental Assessment for the Northside Development project at OKV subject to the following conditions:

- The FAA finds the Baseline CY 2023 forecast operations from Virtower consistent with the CY 2023 operations from the FAA's Traffic Flow Management System Counts (TFMSC).

- The FAA finds the Baseline aviation activity forecast growth rates consistent with the FAA's FY 2022 Terminal Area Forecast (TAF) 5-year and 10-year forecast periods.

- This forecast was prepared at the same time as the evolving impacts of the COVID-19 public health emergency. Forecast approval is based on the methodology, data and conclusions at the time the document was prepared. However, consideration of the impacts of the COVID-19 public health emergency on aviation activity is warranted to acknowledge the reduced confidence in growth projections using currently-available data.

- FAA concurrence with this forecast does not constitute justification for future projects. Justification for future projects will be made based on activity levels at the time the project is requested for development. Documentation of actual activity levels meeting planning activity levels will be necessary to justify Airport Improvement Program (AIP) funding for eligible projects.

Should you have any questions please do not hesitate to contact me at 703.487.3973 or chad.carper@faa.gov.

Sincerely,

Chad Carper Date: 2024.03.07 10:29:10 -05'00'

Chad Carper
Engineer, Washington Airports District Office

Encl: January 2024 Forecast Assumptions (3 pages)

ec: Susan Stafford, FAA BEK-ADO
Eleanor Scorcia, FAA AEA-610
Scott Denny, DOAV
Mary Ashburn Pearson, Delta

FORECAST ASSUMPTIONS IN SUPPORT OF ENVIRONMENTAL ASSESSMENT FOR NORTHSIDE DEVELOPMENT AT OKV

Winchester Regional Airport (OKV)
Winchester, Virginia

Delta Project No. 22081
January 2024

1. **Operations – No Action Alternative**
    a. Annual operations and by aircraft type provided by OKV ADS-B data for calendar year 2023
    b. Growth rates by aircraft type sourced from FAA Aerospace Forecast 2023-2033 and applied to each aircraft category. Forecast extended to 2033, which is five years from the end of construction. Construction is assumed to occur in 2027 and 2028.

2. **Operations – Scenario 1 (AAM/eVTOL manufacture and 200 annual test flights/400 annual operations)**
    a. Began with No Action alternative forecast
    b. Manually added 200 annual single-engine piston and 200 annual rotorcraft operations in 2029 (first year after construction complete)
    c. Assuming 3% of test flights occur at night, based on current GA usage at OKV
    d. Automobile trips- assuming 1,000-sf of warehouse space per employee and assuming 75% of the building is warehouse space, there would be 450 employees at maximum ("worst case") capacity. Assuming one round-trip per employee, 450 daily or *450 x 251 working days per year* = 112,950 annual automobile trips.

3. **Operations- Scenario 2 (Aircraft Maintenance/Hangar Storage)**
    a. Began with No Action alternative forecast
    b. Prepared estimated additional operations resulting from the two "Build" concepts prepared during Delta project 23051. Assuming "worst case" that all aircraft stored in hangars are new to OKV and are not currently based and operating there.
        i. Concept 1 (24, 100' x 100' hangars) plus parking
            1. Assume a 100' x 100' hangar can accommodate 2 turboprops and one jet
            2. Therefore, full build-out can accommodate 48 turboprops and 24 jets
            3. From 2023 FAA Aerospace Forecast, turboprops will operate approximately 281 hours per year in 2029, which is one year past construction completion. Assuming a three-hour trip duration, this equates to around 94 annual operations per turboprop.
            4. From 2023 FAA Aerospace Forecast, jets will operate 316 hours per year in 2029, which equates to approximately 105 annual operations with a three-hour trip duration.

5. Using these assumptions, Concept 1 represents an additional 7,032 annual operations at OKV beginning in 2029.

   (48 turboprops x 94 annual ops) + (24 jets x 105 annual ops)

6. Assuming two round-trip auto trips per departure (pilot and passengers), so 7,032 annual auto trips.

ii. Concept 2 (Four, 200' x 200' hangars and four, 100' x 100' hangars, plus parking)
   1. Assume a 200' x 200' hangar can accommodate 3 turboprops and 2 jets
   2. Therefore, full build-out can accommodate 20 turboprops and 12 jets
   3. Using FAA Aerospace assumptions on annual operations, Concept 2 represents an additional 3,140 annual operations at OKV beginning in 2029.

(20 turboprops x 94 annual ops) + (12 jets x 105 annual ops)

4. Two round-trip automobile trips per departure, so 3,140 auto trips

iii. Because Concept 1 is the "worst case", will use these assumptions for the air and noise analysis for Scenario 2.

Mary Ashburn Pearson

From: Mary Ashburn Pearson
Sent: Tuesday, June 11, 2024 11:01 AM
To: Chad.Carper@faa.gov
Cc: nsabo@flyokv.com; Adam D. Switzer; Vicki J. Matteson; Scott.Denny@doav.virginia.gov; Susan.Stafford@faa.gov; 'eleanor.scorcia@faa.gov'
Subject: FW: FAA REVIEW: January 2024 Forecast RE: 22018 OKV - EA for Northside Development
Attachments: FAA Review - OKV January 2024 Operations Forecast for Northside Development EA.pdf

All,

We are finalizing the dra E.A. for the Northside Development at OKV. We no ced that the forecast generated for development Scenario 2 (see a ached) does not reflect the most conserva ve/worst case opera ons counts. Instead of assuming an addi onal 3,140 annual opera ons beginning in 2029 as a result of the avia on-related development, the forecast should account for a "worst case" of 7,032 addi onal opera ons. This is spelled out in the a ached "Forecast Assump ons" memo.

The "worst case" total opera ons in 2029 for Development Scenario 2 should be 60,015, not 56,123. We have used the correct/worst case assump ons in the emissions analyses conducted in support of the EA, and are also sending this email to document the correc on.

This does not impact the "base" forecast prepared for use in this EA effort.

Scenario 2, Aircraft maintenance and/or hangar storage -see White Paper for assumptions made

					Construction		
	2023 (base)	2024	2025	2026	2027	2028	2029
Fixed Wing SE	51,950	51,379	50,813	50,254	49,702	49,155	48,61
Fixed Wing ME	978	978	978	978	978	978	97
Turboprop	1,111	1,119	1,127	1,134	1,142	1,150	3,03
Turbojet	683	704	726	749	772	796	2,08
Rotorcraft	849	868	887	906	926	947	96
Other	416	421	425	430	435	439	44
Total	**55,987**	**55,468**	**54,956**	**54,452**	**53,955**	**53,465**	**56,12**

Thank you,

Mary Ashburn

Mary Ashburn Pearson, AICP
Project Manager
DELTA AIRPORT CONSULTANTS, INC.
P. 804.955.4556 | WWW.DELTAAIRPORT.COM

From: Carper, Chad (FAA) <Chad.Carper@faa.gov>
Sent: Thursday, March 7, 2024 10:35 AM

To: Nicholas Sabo <nsabo@flyokv.com>
Cc: Adam D. Switzer <aswitzer@deltaairport.com>; Vicki J. Matteson <VMatteson@deltaairport.com>; scott.denny@doav.virginia.gov; Stafford, Susan (FAA) <Susan.Stafford@faa.gov>; Scorcia, Eleanor (FAA) <eleanor.scorcia@faa.gov>; Mary-Ashburn Pearson (MAPearson@deltaairport.com) <MAPearson@deltaairport.com>
Subject: FAA REVIEW: January 2024 Forecast RE: 22018 OKV - EA for Northside Development

Good Morning Nick – Please find a ached FAA's concurrence to use the January 2024 forecast, prepared by Delta Airport Consultants, in the Environmental Assessment for the Northside Development project at Winchester Regional Airport, VA (OKV).

Should you have any ques ons, please do not hesitate to contact me.

Sincerely,
Chad

Chad Carper
Engineer
FAA - Washington Airports District Office
703.487.3973 chad.carper@faa.gov

From: Mary Ashburn Pearson <mapearson@deltaairport.com>
Sent: Friday, March 1, 2024 5:03 PM
To: Stafford, Susan (FAA) <Susan.Stafford@faa.gov>
Cc: Carper, Chad (FAA) <Chad.Carper@faa.gov>; nsabo@flyokv.com; Adam D. Switzer <aswitzer@deltaairport.com>; Vicki J. Matteson <VMatteson@deltaairport.com>; scott.denny@doav.virginia.gov
Subject: RE: 22018 OKV - EA for Northside Development

CAUTION: This email originated from outside of the Federal Aviation Administration (FAA). Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Good a ernoon Susan,

We are moving forward with the EA for Northside Development at OKV, including reques ng that our sub, HMMH, ini ate the noise, emissions, and GHG analysis. Before doing so, we would like to give FAA the opportunity to review and comment on the forecast and assump ons that will be used as inputs. Please see a ached.

Thank you,

Mary Ashburn

Mary Ashburn Pearson, AICP
Project Manager
DELTA AIRPORT CONSULTANTS, INC.
P. 804.955.4556 | WWW.DELTAAIRPORT.COM

From: Stafford, Susan (FAA) <Susan.Stafford@faa.gov>
Sent: Thursday, November 30, 2023 10:09 AM
To: Mary Ashburn Pearson <mapearson@deltaairport.com>
Cc: Carper, Chad (FAA) <Chad.Carper@faa.gov>; nsabo@flyokv.com; Adam D. Switzer <aswitzer@deltaairport.com>;

Attachment C

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Virginia Field Office
6669 Short Lane
Gloucester, VA 23061

Date: May 2024

Self-Certification Letter

Project Name: OKV Airport - North Side Development

Dear Applicant:

Thank you for using the U.S. Fish and Wildlife Service (Service) Virginia Ecological Services online project review process. By submitting this letter, in conjunction with your project review package to our office for review, you are certifying that you have completed the online project review process for the project named above in accordance with all instructions provided, using the best available information to reach your determinations. From the date of receipt, our office has 60 days (50 CFR § 402.13(c)(2)) to review your project package. If we do not concur with the Section 7 determination(s) provided or if we have any questions/concerns regarding the information provided, you will be contacted. If you are not contacted during the 60-day review period, this letter and your project review package, complete the review of your project in accordance with the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended (ESA). This letter also provides information for your project review under the National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C.4321-4347, 83 Stat. 852), as amended. A copy of this letter and the project review package must be submitted to this office for this self-certification letter to be valid. This letter and the project review package will be maintained in our records.

The ESA Section 7 Determination Table in the enclosed project review package summarizes your ESA analyses and determinations. These analyses resulted in a “no effect” and/or a “may affect, not likely to adversely affect” determination for proposed/listed species and/or proposed/designated critical habitat.

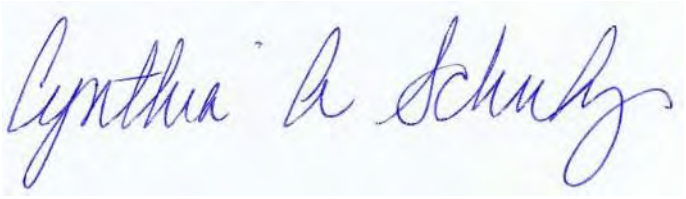
The use of the online project review process in strict accordance with the instructions provided as documented in the enclosed project review package resulted in reaching the appropriate determinations. Therefore, we concur with the not likely to adversely affect determination(s) for proposed/listed species and proposed/designated critical habitat provided in the ESA Section 7 Determination Table.

Should project plans change, surveys expire, or information on the distribution or status of proposed/listed species and/or proposed/designated critical habitat become available/change, this letter is no longer valid and you must submit an updated project package.

Note that under 50 CFR 402.12(e) of the regulations implementing Section 7 of the ESA, the accuracy of official species lists 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.

Information about the online project review process including instructions and use, species information, and other information regarding project reviews within Virginia is available on our website (https://www.fws.gov/office/virginia-ecological-services/virginia-field-office-online-review-process). If you have any questions, please contact Troy Andersen of this office at (804) 728-0695.

Sincerely,



Cindy Schulz
Field Supervisor
Virginia Ecological Services

Enclosures - project review package

Endangered Species Act (ESA) Section 7 Determination Table

Project Name: OKV North Side Development

Date: May 2024

Consultation Code:

Species / Resource Name *Insert name of species or resource as listed on Official Species List.*	Habitat/Species Presence in Action Area *Indicate if suitable habitat and species are present in the Action Area (see examples in Step 5).*	Sources of Info *Explain what info suitable habitat/species presence is based on.*	ESA Section 7 Determination *Using reasoning and decision tables in Step 5, select determination for each species (e.g. no effect, not likely to adversely affect, or likely to adversely affect).*	Project Elements that Support Determination *Explain which project elements may impact the habitat or individuals of each species and any Avoidance and Minimization Measures being implemented.*
Indiana Bat	*No suitable habitat present*	*Internet research, including United States Fish and Wildlife Service website*	*No effect*	During winter Indiana bats hibernate in caves; during summer they roost under the peeling bark of dead and dying trees. They eat a variety of flying insects found along rivers or lakes and in uplands. While it is possible that there are individual dead or dying trees within the project area, in general these are live trees. No caves, rivers or lakes are on or near the project area. Project area does not intersect with hibernaculum buffers. Project area on operating airfield in heavily developed industrial area of County.
NLEB	Dkey	NLAA	May Affect, NLAA (05/22/2024)	
Tricolored Bat	No suitable habitat present	Internet research, including FWS website	No effect	During winter Tricolored bats found in caves and mines or culverts; rest of year, found in forested habitats especially near

				edges of water, preferring trees such as oak, maple, eastern cottonwood, and American tulip tree. No caves, mines, or bodies of water on or hear project area. Project area does not intersect with hibernaculum buffers. Project area on operating airfield in heavily developed industrial area of County.
Monarch Butterfly	No suitable habitat present		No effect	Project area is mowed field or forest with no milkweed present
Critical Habitat not present		VAFO CH Map Tool		

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

In Reply Refer To: 06/03/2024 11:57:10 UTC
Project code: 2024-0020272
Project Name: OKV North Side Development

Federal Nexus: yes
Federal Action Agency (if applicable): Federal Aviation Administration

Subject: Federal agency coordination under the Endangered Species Act, Section 7 for 'OKV North Side Development'

Dear susan stafford:

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 03, 2024, for 'OKV North Side Development' (here forward, Project). This project has been assigned Project Code 2024-0020272 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 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. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid.***

Determination for the Northern Long-Eared Bat

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" for the northern long-eared bat. **Note that this applies only to the northern long-eared bat and not to any other species or critical habitat, if any, that may be affected by your project.** 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:

- Indiana Bat *Myotis sodalis* Endangered
- 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 2024-0020272 associated with this Project.

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

1. Name

OKV North Side Development

2. Description

The following description was provided for the project 'OKV North Side Development':

> Construct an up to 600,000-sf hangar with associated apron space, auto access and parking, and a potential fuel facility on airport property.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@39.1473037,-78.14629965192017,14z

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. The action area does not overlap with an area for which U.S. Fish and Wildlife Service currently has data to support the presumption that the northern long-eared bat is present. Are you aware of other 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 NLEB acoustic detections. Data on captures, roost tree use, and acoustic detections should post-date the year when white-nose syndrome was detected in the relevant state. 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

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. [Semantic] Is the action area located within 0.5 miles of a known northern long-eared bat hibernaculum?

    Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    Automatically answered
    No

11. 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

12. 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

13. Will the action cause effects to a bridge?

    No

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

    No

15. 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

16. 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

17. Will the action directly or indirectly cause construction of one or more new roads that are open to the public?

    Note: The answer may be yes when a publicly accessible road either (1) is constructed as part of the proposed action or (2) would not occur but for the proposed action (i.e., the road construction is facilitated by the proposed action but is not an explicit component of the project).

    Yes

18. 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

19. 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

20. 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

21. 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

22. 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

23. 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

24. Will the action include drilling or blasting?

    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

26. Will the proposed action involve the use of herbicide or other pesticides (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

    No

28. Does the action include, or is it reasonably certain to cause, the use of artificial lighting within 1000 feet of suitable northern long-eared bat roosting habitat?

    Note: Additional information defining suitable roosting 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

29. Will the action use only downward-facing, full cut-off lens lights (with same intensity or less for replacement lighting)
    when installing new or replacing existing permanent lights? Or for those transportation agencies using the Backlight, Uplight, Glare (BUG) system developed by the Illuminating Engineering Society, will all three ratings (backlight, uplight, and glare) be as close to zero as is possible, with a priority of "uplight" of 0?

    Yes

30. Will the action direct any temporary lighting away from suitable northern long-eared bat roosting habitat during the active season?

    Note: Active season dates for northern long-eared bat can be found here: https://www.fws.gov/media/inactive-season-dates-swarming-and-staging-areas.

    Yes

31. Will the action include tree cutting or other means of knocking down or bringing down trees, tree topping, or tree trimming?

    Yes

32. Has a presence/probable absence summer bat survey targeting the northern long-eared bat following the Service's Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines been conducted within the project area? If unsure, answer "No."

    No

33. Does the action include emergency cutting or trimming of hazard trees in order to remove an imminent threat to human safety or property? See hazard tree note at the bottom of the key for text that will be added to response letters

    Note: A "hazard tree" is a tree that is an immediate threat to lives, public health and safety, or improved property and has a diameter breast height of six inches or greater.

    No

34. Are any of the trees proposed for cutting or other means of knocking down, bringing down, topping, or trimming suitable for northern long-eared bat roosting (i.e., live trees and/or snags ≥3 inches dbh that have exfoliating bark, cracks, crevices, and/or cavities)?

    Yes

35. [Semantic] Does your project intersect a known sensitive area for the northern long-eared bat?

    Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your state agency or USFWS field office

    Automatically answered
    No

36. Will all tree cutting/trimming or other knocking or bringing down of trees be restricted to the inactive season for the northern long-eared bat?

    Note: Inactive Season dates for summer habitat outside of staging and swarming areas can be found here: https://www.fws.gov/media/inactive-season-dates-swarming-and-staging-areas.

    No

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.

8

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

8

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

8

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.

8

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 November 30, 2024?

No

IPAC USER CONTACT INFORMATION

Agency: Federal Aviation Administration
Name: susan stafford
Address: 176 Airport Circle
City: Beaver
State: WV
Zip: 25813
Email susan.stafford@faa.gov
Phone: 6099165793

You have indicated that your project falls under or receives funding through the following special project authorities:

- BIPARTISAN INFRASTRUCTURE LAW (BIL) (OTHER)

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

In Reply Refer To: 05/22/2024 13:35:42 UTC
Project code: 2024-0020272
Project Name: OKV North Side Development

Federal Nexus: yes
Federal Action Agency (if applicable): Federal Aviation Administration

Subject: Technical assistance for 'OKV North Side Development'

Dear Mary Pearson:

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 May 22, 2024, for 'OKV North Side Development' (here forward, Project). This project has been assigned Project Code 2024-0020272 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements are not 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 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. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid.***

Determination for the Northern Long-Eared Bat

Based upon your IPaC submission and a standing analysis, your project is not reasonably certain to cause incidental take of 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 the Action is not likely to result in unauthorized take of the northern long-eared bat.

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:

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

You may coordinate with our Office to determine whether the Action may cause prohibited take of the animal species listed above. Note that if a new species is listed that may be affected by the identified action before it is complete, additional review is recommended to ensure compliance with the Endangered Species Act.

Next Step

Consultation with the Service is necessary. The project has a federal nexus (e.g., Federal funds, permit, etc.), but you are not the federal action agency or its designated (in writing) non-federal representative. Therefore, 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.

As the federal agency or designated non-federal representative deems appropriate, they should submit their determination of effects to the Service by doing the following.

1. Log into IPaC using an agency email account and click on My Projects, click "Search by record locator" to find this Project using **901-143741344**. (Alternatively, the originator of the project in IPaC can add the agency representative to the project by using the Add Member button on the project home page.)
2. Review the answers to the Northern Long-eared Bat Range-wide Determination Key to ensure that they are accurate.
3. Click on Review/Finalize to convert the ‘not likely to adversely affect’ consistency letter to a concurrence letter. Download the concurrence letter for your files if needed.

If no changes occur with the Project or there are no updates on listed species, no further consultation/coordination for this project is required for the northern long-eared bat. However, the Service recommends that project proponents re-evaluate the Project in IPaC if: 1) the scope, timing, duration, or location of the Project changes (includes any project changes or amendments); 2) new information reveals the Project may impact (positively or negatively) federally listed species or designated critical habitat; or 3) a new species is listed, or critical habitat designated. If any of the above conditions occurs, additional coordination with the Service should take place before project implements any changes which are final or commits additional resources.

If you have any questions regarding this letter or need further assistance, please contact the Virginia Ecological Services Field Office and reference Project Code 2024-0020272 associated with this Project.

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

1. Name

OKV North Side Development

2. Description

The following description was provided for the project 'OKV North Side Development':

> Construct an up to 600,000-sf hangar with associated apron space, auto access and parking, and a potential fuel facility on airport property.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@39.1473037,-78.14629965192017,14z

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. The action area does not overlap with an area for which U.S. Fish and Wildlife Service currently has data to support the presumption that the northern long-eared bat is present. Are you aware of other 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 NLEB acoustic detections. Data on captures, roost tree use, and acoustic detections should post-date the year when white-nose syndrome was detected in the relevant state. 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

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. [Semantic] Is the action area located within 0.5 miles of a known northern long-eared bat hibernaculum?

    Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    Automatically answered
    No

11. 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

12. 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

13. Will the action cause effects to a bridge?

    No

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

    No

15. 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

16. 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

17. Will the action directly or indirectly cause construction of one or more new roads that are open to the public?

    Note: The answer may be yes when a publicly accessible road either (1) is constructed as part of the proposed action or (2) would not occur but for the proposed action (i.e., the road construction is facilitated by the proposed action but is not an explicit component of the project).

    Yes

18. 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

19. 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

20. 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

21. 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

22. 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

23. 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

24. Will the action include drilling or blasting?

    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

26. Will the proposed action involve the use of herbicide or other pesticides (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

    No

28. Does the action include, or is it reasonably certain to cause, the use of artificial lighting within 1000 feet of suitable northern long-eared bat roosting habitat?

    Note: Additional information defining suitable roosting 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

29. Will the action use only downward-facing, full cut-off lens lights (with same intensity or less for replacement lighting)
    when installing new or replacing existing permanent lights? Or for those transportation agencies using the Backlight, Uplight, Glare (BUG) system developed by the Illuminating Engineering Society, will all three ratings (backlight, uplight, and glare) be as close to zero as is possible, with a priority of "uplight" of 0?

    Yes

30. Will the action direct any temporary lighting away from suitable northern long-eared bat roosting habitat during the active season?

    Note: Active season dates for northern long-eared bat can be found here: https://www.fws.gov/media/inactive-season-dates-swarming-and-staging-areas.

    Yes

31. Will the action include tree cutting or other means of knocking down or bringing down trees, tree topping, or tree trimming?

    Yes

32. Has a presence/probable absence summer bat survey targeting the northern long-eared bat following the Service's Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines been conducted within the project area? If unsure, answer "No."

    No

33. Does the action include emergency cutting or trimming of hazard trees in order to remove an imminent threat to human safety or property? See hazard tree note at the bottom of the key for text that will be added to response letters

    Note: A "hazard tree" is a tree that is an immediate threat to lives, public health and safety, or improved property and has a diameter breast height of six inches or greater.

    No

34. Are any of the trees proposed for cutting or other means of knocking down, bringing down, topping, or trimming suitable for northern long-eared bat roosting (i.e., live trees and/or snags ≥3 inches dbh that have exfoliating bark, cracks, crevices, and/or cavities)?

    Yes

35. [Semantic] Does your project intersect a known sensitive area for the northern long-eared bat?

    Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your state agency or USFWS field office

    Automatically answered
    No

36. Will all tree cutting/trimming or other knocking or bringing down of trees be restricted to the inactive season for the northern long-eared bat?

    Note: Inactive Season dates for summer habitat outside of staging and swarming areas can be found here: https://www.fws.gov/media/inactive-season-dates-swarming-and-staging-areas.

    No

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.

8

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

8

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

8

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.

8

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 November 30, 2024?

No

IPAC USER CONTACT INFORMATION

Agency: Delta Airport Consultants, Inc
Name: Mary Pearson
Address: 2700 Polo Parkway
Address Line 2: Delta Airport Consultants, Inc.
City: Richmond
State: VA
Zip: 23113
Email mapearson@deltaairport.com
Phone: 8049554556

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Aviation Administration

You have indicated that your project falls under or receives funding through the following special project authorities:

- BIPARTISAN INFRASTRUCTURE LAW (BIL) (OTHER)

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

In Reply Refer To: 05/22/2024 13:13:19 UTC
Project Code: 2024-0020272
Project Name: OKV North Side Development

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 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 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.

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:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.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/program/migratory-bird-permit/what-we-do.

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/library/collections/threats-birds.

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/partner/council-conservation-migratory-birds.

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

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
- Bald & Golden Eagles
- Migratory Birds

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

PROJECT SUMMARY

Project Code: 2024-0020272
Project Name: OKV North Side Development
Project Type: Airport - New Construction
Project Description: Construct an up to 600,000-sf hangar with associated apron space, auto access and parking, and a potential fuel facility on airport property.
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@39.1473037,-78.14629965192017,14z

Counties: Frederick County, Virginia

ENDANGERED SPECIES ACT SPECIES

There is a total of 4 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. Note that 2 of these species should be considered only under certain conditions.

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.

---

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
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: ▪ This species only needs to be considered if the project includes wind turbine operations. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: ▪ This species only needs to be considered if the project includes wind turbine operations. 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.

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.

BALD & GOLDEN EAGLES

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

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

---

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

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below 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. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 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 "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

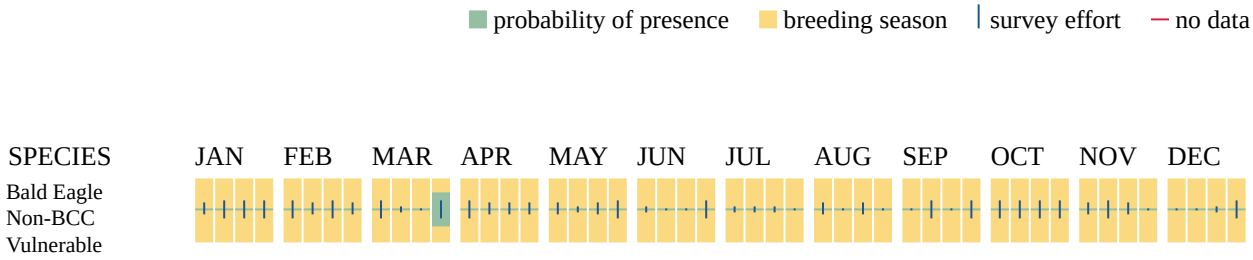
Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)

A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- 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
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

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[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

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)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below 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. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Aug 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
Black-capped Chickadee *Poecile atricapillus practicus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/10645	Breeds Apr 10 to Jul 31
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Prairie Warbler *Setophaga discolor* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9513	Breeds May 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. https://ecos.fws.gov/ecp/species/9398	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 https://ecos.fws.gov/ecp/species/9478	Breeds elsewhere
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9431	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 "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

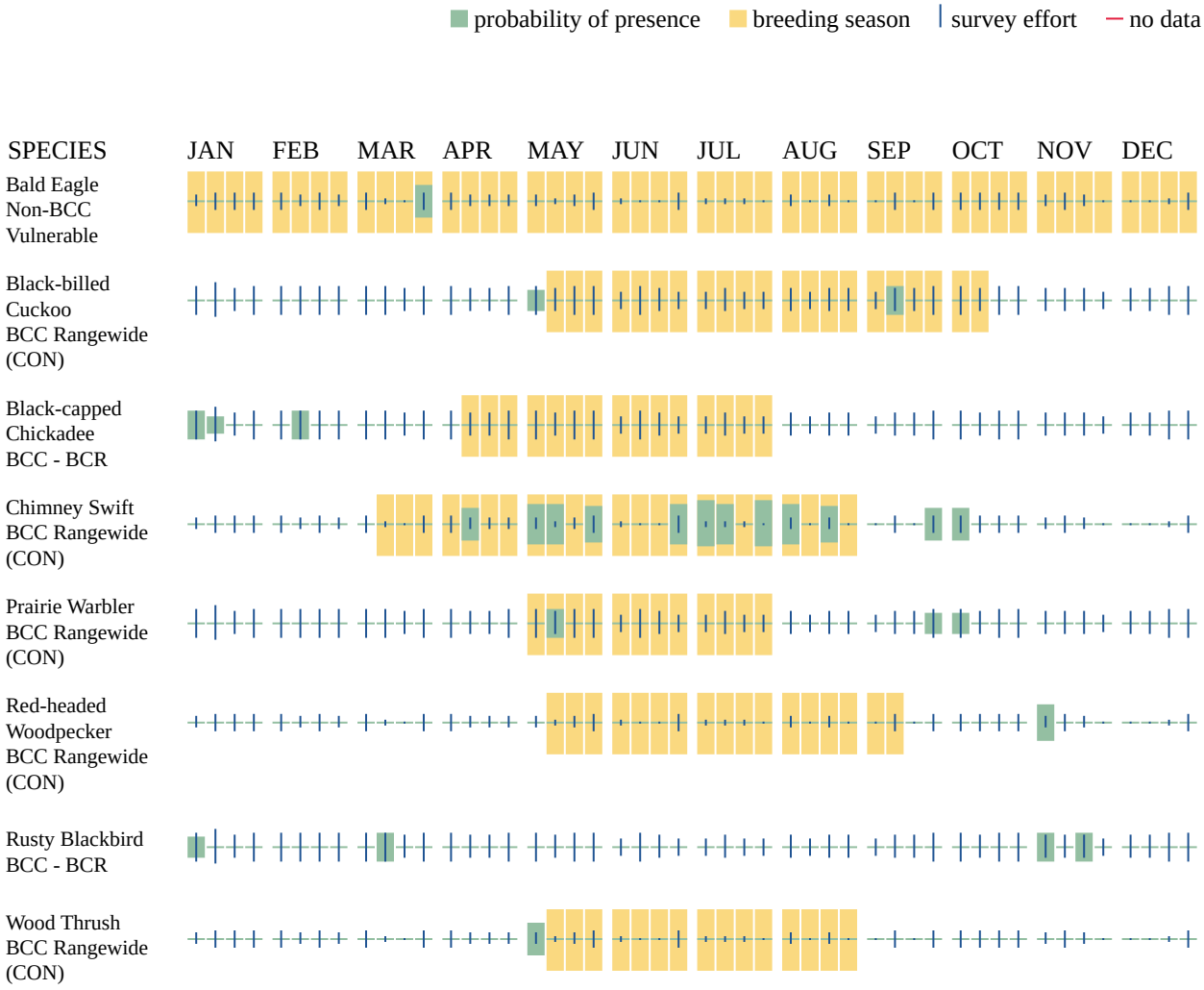
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

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



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- 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
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

IPAC USER CONTACT INFORMATION

Agency: Delta Airport Consultants, Inc
Name: Mary Pearson
Address: 2700 Polo Parkway
Address Line 2: Delta Airport Consultants, Inc.
City: Richmond
State: VA
Zip: 23113
Email mapearson@deltaairport.com
Phone: 8049554556

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Aviation Administration

You have indicated that your project falls under or receives funding through the following special project authorities:

- BIPARTISAN INFRASTRUCTURE LAW (BIL) (OTHER)

Virginia Department of Wildlife Resources

5/22/2024 9:37:41 AM

Fish and Wildlife Information Service

VaFWIS Initial Project Assessment Report Compiled on 5/22/2024, 9:37:41 AM

Help

Known or likely to occur within a **2 mile radius around point Winchester Municipal Airport Airport Frederick (at 39,08,36.3 -78,08,40.0)** in **069 Frederick County, 840 Winchester City, VA**

View Map of Site Location

447 Known or Likely Species ordered by Status Concern for Conservation (displaying first 20) (19 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
050020	SE	Ia	Bat, little brown	Myotis lucifugus		BOVA
050027	FPSE	Ia	Bat, tri-colored	Perimyotis subflavus		BOVA
040267	SE		Wren, Bewick's	Thryomanes bewickii		BOVA
030062	ST	Ia	Turtle, wood	Glyptemys insculpta		BOVA,Habitat
040096	ST	Ia	Falcon, peregrine	Falco peregrinus		BOVA
040293	ST	Ia	Shrike, loggerhead	Lanius ludovicianus		BOVA
100155	ST	Ia	Skipper, Appalachian grizzled	Pyrgus wyandot		BOVA
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans		BOVA
100079	FC	IIIa	Butterfly, monarch	Danaus plexippus		BOVA
030012	CC	IVa	Rattlesnake, timber	Crotalus horridus		BOVA
040306		Ia	Warbler, golden-winged	Vermivora chrysoptera		BOVA
050024		Ia	Myotis, eastern small-footed	Myotis leibii		BOVA
100248		Ia	Fritillary, regal	Speyeria idalia idalia		BOVA
040052		IIa	Duck, American black	Anas rubripes		BOVA
040320		IIa	Warbler, cerulean	Setophaga cerulea		BOVA
040140		IIa	Woodcock, American	Scolopax minor		BOVA
040203		IIb	Cuckoo, black-billed	Coccyzus erythropthalmus		BOVA
100256		IIc	Crescent, tawny	Phyciodes batesii batesii		BOVA
010131		IIIa	Eel, American	Anguilla rostrata		BOVA

To view **All 447 species** View 447

*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 Wildlife 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.

Bat Colonies or Hibernacula: **Not Known**

Anadromous Fish Use Streams

N/A

Colonial Water Bird Survey

N/A

Threatened and Endangered Waters

N/A

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests

N/A

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				
Abrams Creek (20700041)	ST	030062	ST	Ia	Turtle, wood / Glyptemys insculpta	Yes
Buffalo Lick Run (20700041)	ST	030062	ST	Ia	Turtle, wood / Glyptemys insculpta	Yes
Sulphur Spring Run (20700041)	ST	030062	ST	Ia	Turtle, wood / Glyptemys insculpta	Yes
tributary (20700041)	ST	030062	ST	Ia	Turtle, wood / Glyptemys insculpta	Yes
tributary (20700041)	ST	030062	ST	Ia	Turtle, wood / Glyptemys insculpta	Yes

Habitat Predicted for Terrestrial WAP Tier I & II Species

N/A

Public Holdings:

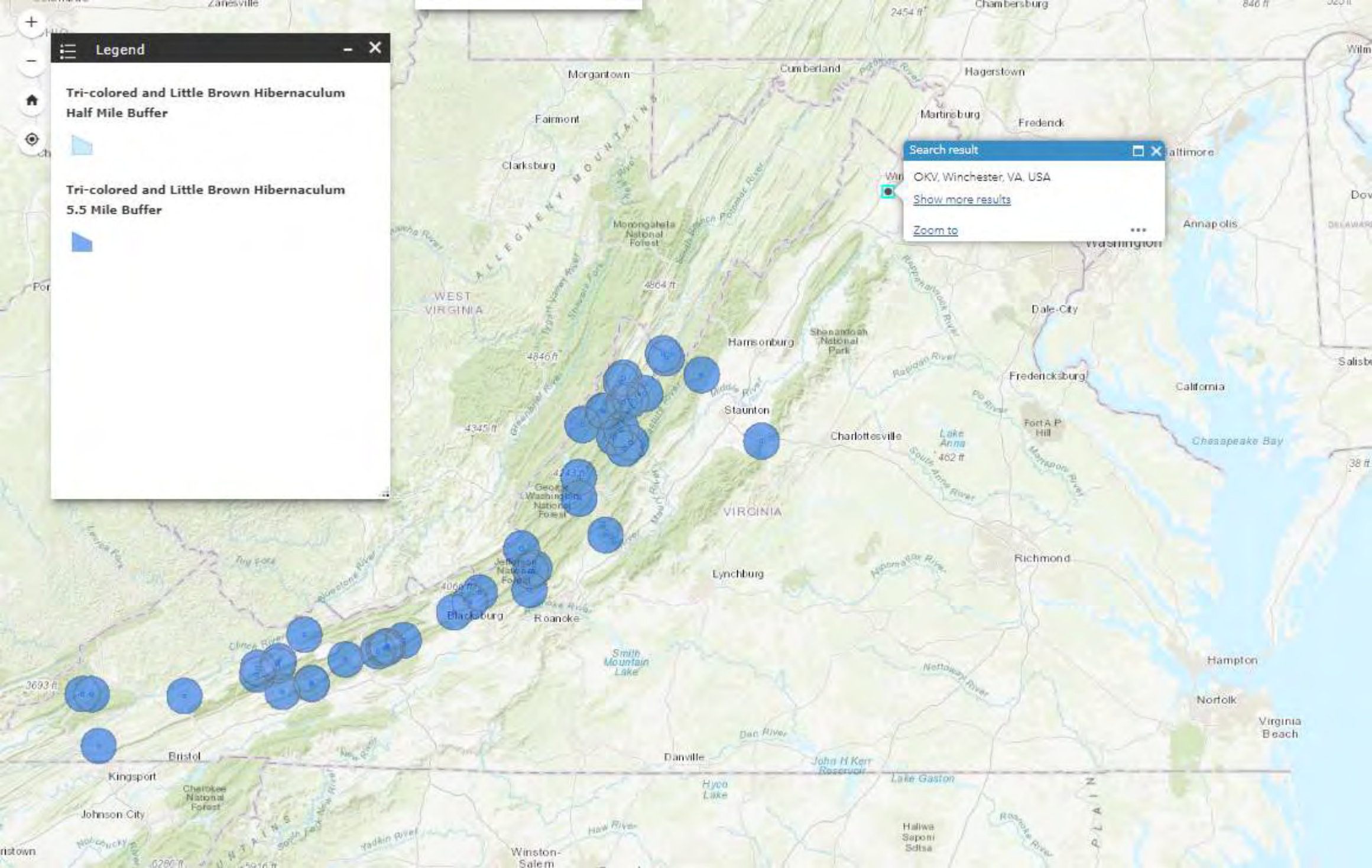
N/A

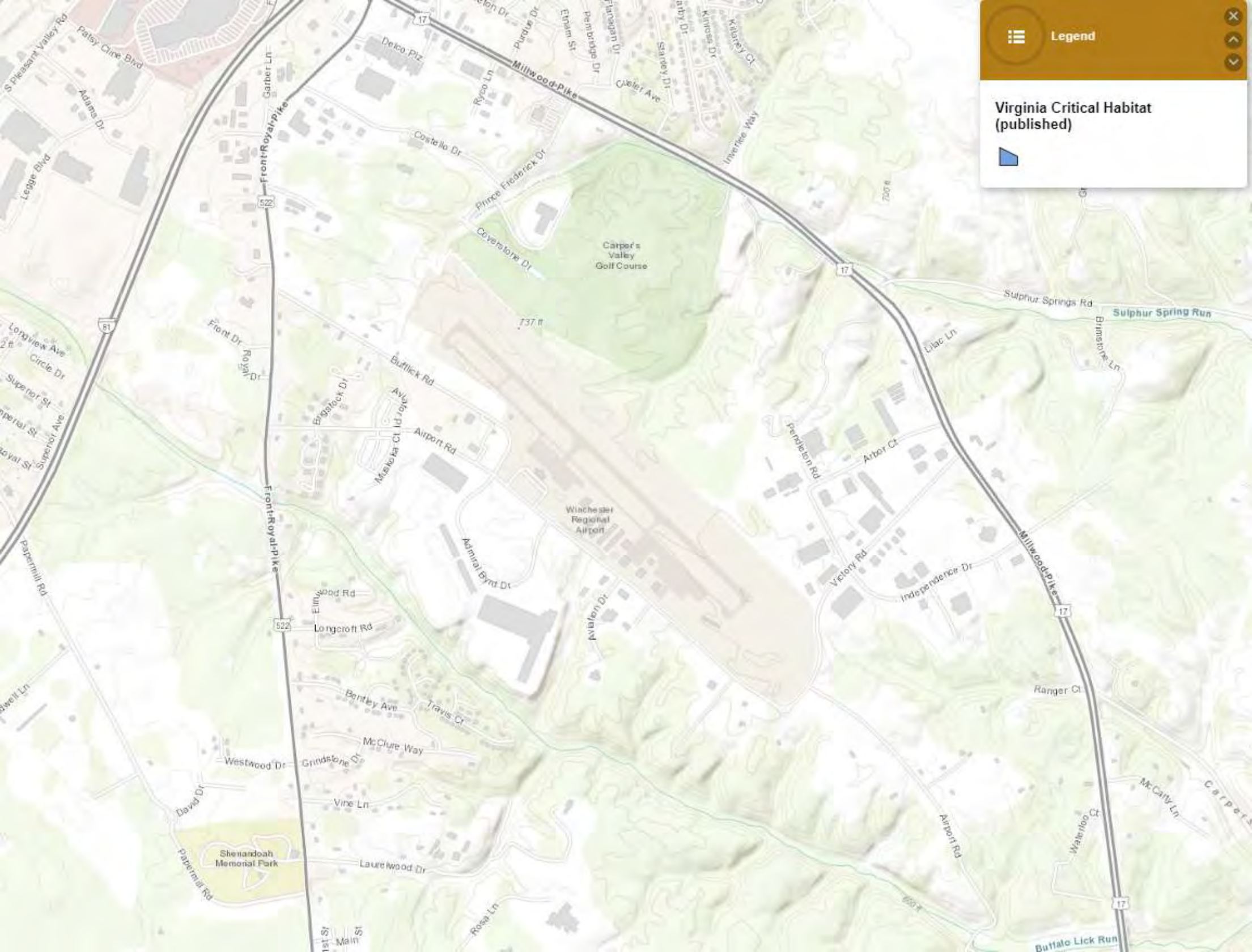
Compiled on 5/22/2024, 9:37:41 AM I2136429.0 reportv=IPA searchType= R dist= 3218.688 pos= 39.08,-36.3 -78.08,40.0

PrecSize=64; Anadromous=0.017144; BECAR=0.01701; Bats=0.016984; BufEar=0.067681 County=0.053017; Impediments=0.016975; Inir=0.008557; PublicLands=0.018011; SppObs=0.206004; TEWaters=0.019429; TierReaches=0.042207; TierTerrestrial=0.023896; Total=0.72869; Tracking_BOVA=0.175603; Trout=0.02032

audit no. 2136429 5/22/2024 9:37:41 AM Virginia Fish and Wildlife Information Service

© 1998-2024 Commonwealth of Virginia Department of Wildlife Resources


Legend
Tri-colored and Little Brown Hibernaculum
Half Mile Buffer
Tri-colored and Little Brown Hibernaculum
5.5 Mile Buffer
Search result
OKV, Winchester, VA, USA
Show more results
Zoom to
Morgantown
Cumberland
Hagerstown
Fairmont
Martinsburg
Frederick
Clarksburg
Annapolis
Washington
Dale City
WEST VIRGINIA
Harrisonburg
Shenandoah National Park
Fredericksburg
California
Staunton
Charlottesville
Fort A P Hill
Chesapeake Bay
VIRGINIA
Richmond
Lynchburg
Blacksburg
Roanoke
Hampton
Norfolk
Virginia Beach
Bristol
Kingsport
Johnson City
Danville
Winston-Salem
Smith Mountain Lake
John H Kerr Reservoir
Lake Gaston
Hyco Lake
Lake Anna
Monongahela National Forest
George Washington National Forest
Jefferson National Forest
Cherokee National Forest
ALLEGHENY MOUNTAINS
BLUE RIDGE MOUNTAINS


Legend
Virginia Critical Habitat (published)
Millwood Pike
Front Royal Pike
Airport Rd
Admiral Byrd Dr
Winchester Regional Airport
Carper's Valley Golf Course
Sulphur Springs Rd
Sulphur Spring Run
Longcroft Rd
Bentley Ave
Travis Ct
McClure Way
Westwood Dr
Grindstone Dr
Vine Ln
Laurelwood Dr
Shenandoah Memorial Park
Papermill Rd
Bufflick Rd
Front Dr
Royal Dr
Costello Dr
Prince Frederick Dr
Coverstone Dr
Patsy Cline Blvd
S Pleasant Valley Rd
Adams Dr
Ledge Blvd
Longview Ave
Circle Dr
Superior St
Superior Ave
Garber Ln
Delco Plz
Ryco Ln
Purdue Dr
Elmira St
Pembridge Dr
Flanagan Dr
Stanley Dr
Kilkenny Ct
Kinross Dr
Juliet Ave
Inverlee Way
Lilac Ln
Ginestine Ln
Pendleton Rd
Arbor Ct
Victory Rd
Independence Dr
Ayleton Dr
Elmwood Rd
Bagstock Dr
Aylor Pl
Meadow Ct
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Waterloo Ct
Rosa Ln
Main St
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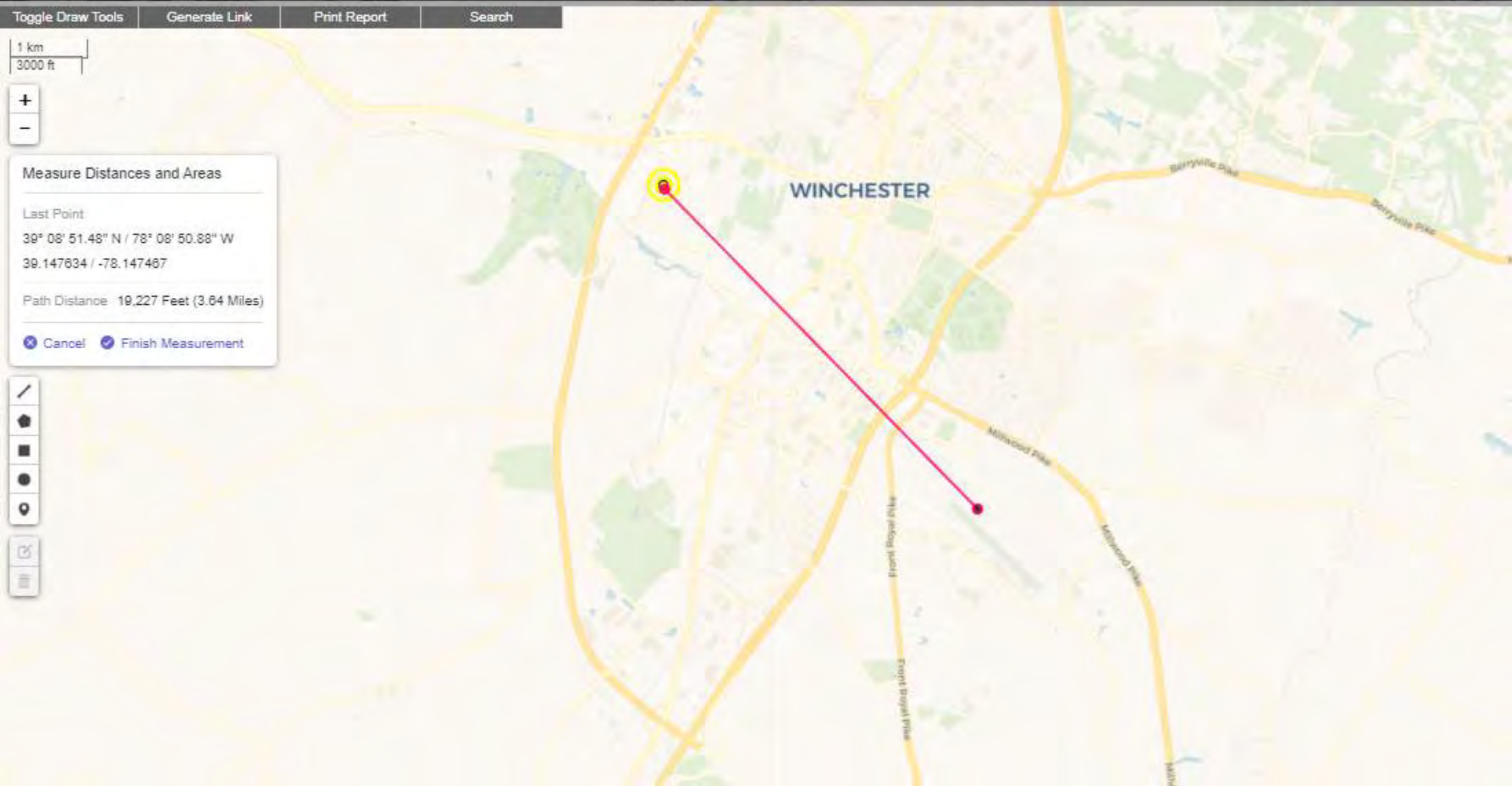
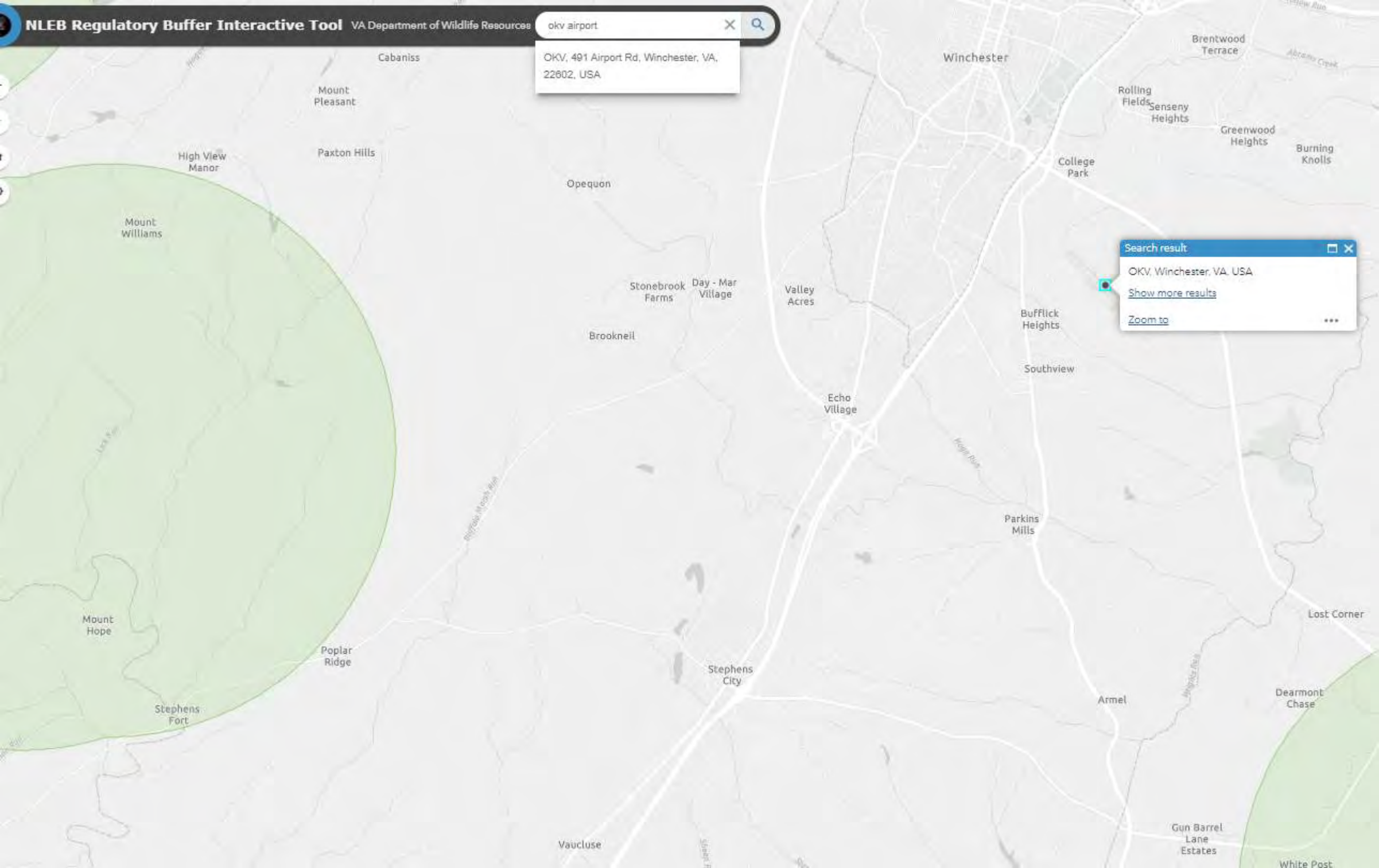
700 ft
650 ft
81
17
522


Toggle Draw Tools
Generate Link
Print Report
Search
1 km
3000 ft
Measure Distances and Areas
Last Point
39° 08' 51.48" N / 78° 08' 50.88" W
39.147634 / -78.147467
Path Distance 19,227 Feet (3.64 Miles)
Cancel
Finish Measurement
WINCHESTER
Berryville Pike
Millwood Pike
Front Royal Pike


NLEB Regulatory Buffer Interactive Tool
VA Department of Wildlife Resources
okv airport
OKV, 491 Airport Rd, Winchester, VA, 22602, USA
Search result
OKV, Winchester, VA, USA
Show more results
Zoom to
Winchester
Brentwood Terrace
Rolling Fields
Senseny Heights
Greenwood Heights
Burning Knolls
College Park
Cabaniss
Mount Pleasant
Paxton Hills
High View Manor
Opequon
Mount Williams
Stonebrook Farms
Day - Mar Village
Valley Acres
Brookneil
Bufflick Heights
Southview
Echo Village
Parkins Mills
Lost Corner
Mount Hope
Poplar Ridge
Stephens City
Stephens Fort
Armel
Dearmont Chase
Vaucluse
Gun Barrel Lane Estates
White Post

Attachment D

Mary Ashburn Pearson

From: Birge-wilson, Adrienne (DHR) <Adrienne.Birge-Wilson@dhr.virginia.gov>
Sent: Thursday, December 19, 2024 11:26 AM
To: Stafford, Susan (FAA)
Cc: Mary Ashburn Pearson
Subject: RE: Winchester Regional Airport (OKV) Northside Development (DHR File No. 2023-5463)

Susan- Thank you for notifying DHR of the FAA's intent to make a Section 4(f) *de minimis* impact determination based on the determination of no adverse effect (NAE). DHR affirms our previous NAE opinion noted in the emails below which was conditioned on design drawings and/or more concrete plans being provided to DHR and the scope remaining the same. We do not oppose the FAA's 4(f) *de minimis* impact determination.

V/R,

Adrienne Birge-Wilson
Acting Director | Review and Compliance Division
Department of Historic Resources
Email adrienne.birge-wilson@dhr.virginia.gov
Phone 804-482-6092

From: Stafford, Susan (FAA) <Susan.Stafford@faa.gov>
Sent: Thursday, December 19, 2024 11:06 AM
To: Birge-wilson, Adrienne (DHR) <Adrienne.Birge-Wilson@dhr.virginia.gov>
Cc: Mary Ashburn Pearson <mapearson@deltaairport.com>
Subject: RE: Winchester Regional Airport (OKV) Northside Development (DHR File No. 2023-5463)

Adrienne,

On February 1, 2024 the FAA received a no adverse effect recommendation for the Winchester Regional Airport (OKV) Northside Development project (DHR File No. 2023-5463) associated with NRHP and VLR eligible Apple Pie Ridge (DHR ID #034-5023). This was conditioned on design drawings and/or more concrete plans provided to DHR and the scope remain the same (see below). As part of the proposed undertaking, in accordance with Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. § 303), the FAA intends to make a *de minimis* impact determination based on a determination of no adverse effect.

Thank you,

Susan B. Stafford
Environmental Protection Specialist
Beckley Airports Field Office
176 Airport Circle, Rm 101
Beaver, WV 25813
609-916-5793

From: Birge-wilson, Adrienne (DHR) <Adrienne.Birge-Wilson@dhr.virginia.gov>
Sent: Thursday, February 1, 2024 3:58 PM
To: Stafford, Susan (FAA) <Susan.Stafford@faa.gov>
Subject: RE: Winchester Regional Airport (OKV) Northside Development (DHR File No. 2023-5463)

Susan- Our ePIX system has been creating issues with some folks' firewalls. Thank you for letting me know. I will let our IT know as well. DHR recommends a Conditional No Adverse Effect.

Our comments are as follows:
With the condition that design drawings and/or more concrete plans are to DHR are provided and the scope remain the same, it is DHR's recommendation that there will be no adverse effects to the National Register of Historic Places (NRHP) and Virginia Landmarks Register (VLR)- eligible Apple Pie Ridge (DHR ID #034-5023).

V/R,

Adrienne Birge-Wilson
Architectural Historian | Review and Compliance Division
Department of Historic Resources
Email adrienne.birge-wilson@dhr.virginia.gov
Phone 804-482-6092

Mary Ashburn Pearson

From: Stafford, Susan (FAA) <Susan.Stafford@faa.gov>
Sent: Friday, February 2, 2024 7:14 AM
To: Mary Ashburn Pearson
Cc: Vicki J. Matteson
Subject: FW: Winchester Regional Airport (OKV) Northside Development (DHR File No. 2023-5463)

Mary Ashburn,

Below is DHR's response to the OKV Northside Development Project.

Thank you,

Susan B. Stafford
Environmental Protection Specialist
Beckley Airports Field Office
176 Airport Circle, Rm 101
Beaver, WV 25813
304-252-6216 x 130

From: Birge-wilson, Adrienne (DHR) <Adrienne.Birge-Wilson@dhr.virginia.gov>
Sent: Thursday, February 1, 2024 3:58 PM
To: Stafford, Susan (FAA) <Susan.Stafford@faa.gov>
Subject: RE: Winchester Regional Airport (OKV) Northside Development (DHR File No. 2023-5463)

Susan- Our ePIX system has been creating issues with some folks' firewalls. Thank you for letting me know. I will let our IT know as well. DHR recommends a Conditional No Adverse Effect.

Our comments are as follows:
With the condition that design drawings and/or more concrete plans are to DHR are provided and the scope remain the same, it is DHR's recommendation that there will be no adverse effects to the National Register of Historic Places (NRHP) and Virginia Landmarks Register (VLR)- eligible Apple Pie Ridge (DHR ID #034-5023).

V/R,

Adrienne Birge-Wilson
Architectural Historian | Review and Compliance Division
Department of Historic Resources
Email adrienne.birge-wilson@dhr.virginia.gov
Phone 804-482-6092

From: Stafford, Susan (FAA) <Susan.Stafford@faa.gov>
Sent: Thursday, February 1, 2024 2:55 PM
To: Birge-wilson, Adrienne (DHR) <Adrienne.Birge-Wilson@dhr.virginia.gov>
Subject: Winchester Regional Airport (OKV) Northside Development (DHR File No. 2023-5463)

Adrienne,

I was curious if you have any updates on the OKV Northside Development Project (DHR File No. 2023-5436). We haven't received a response to date. It was entered into the system on 12/04/2023.

Thank you,

Susan B. Stafford
Environmental Protection Specialist
Beckley Airports Field Office
176 Airport Circle, Rm 101
Beaver, WV 25813
304-252-6216 x 130

Project Description- Northside Development at OKV

The Proposed Undertaking is the construction of a building/aircraft hangar up to 600,000-square feet (sf) in size with associated apron frontage and automobile parking and access in the northern (Northside) portion of airport property. Because the future use is not yet known, the development is depicted and described conceptually.

The proposed project could accommodate an aeronautical use such as aircraft manufacturing and final assembly, charter services, or aircraft maintenance and/or storage. A fuel facility could be constructed to serve the needs of the future tenant. Depending on the needs of the future tenant, the "fuel" could include above-ground tanks of Jet-A, Av-Gas (or its unleaded equivalent), and/or electric aircraft chargers; the fuel facility area is conceptually depicted on Figure 1. The Proposed Undertaking and the 50± acre study area are depicted in Figure 1. The study area is more expansive than the area proposed for development to account for grading and stormwater management needs. The study area is depicted in Figure 2 over an aerial image. Based on preliminary estimates before the design phase has begun, the assumed depths of disturbance for the undertaking are a maximum of 12 feet.

Figure 1: Conceptual Proposed Undertaking and Study Area

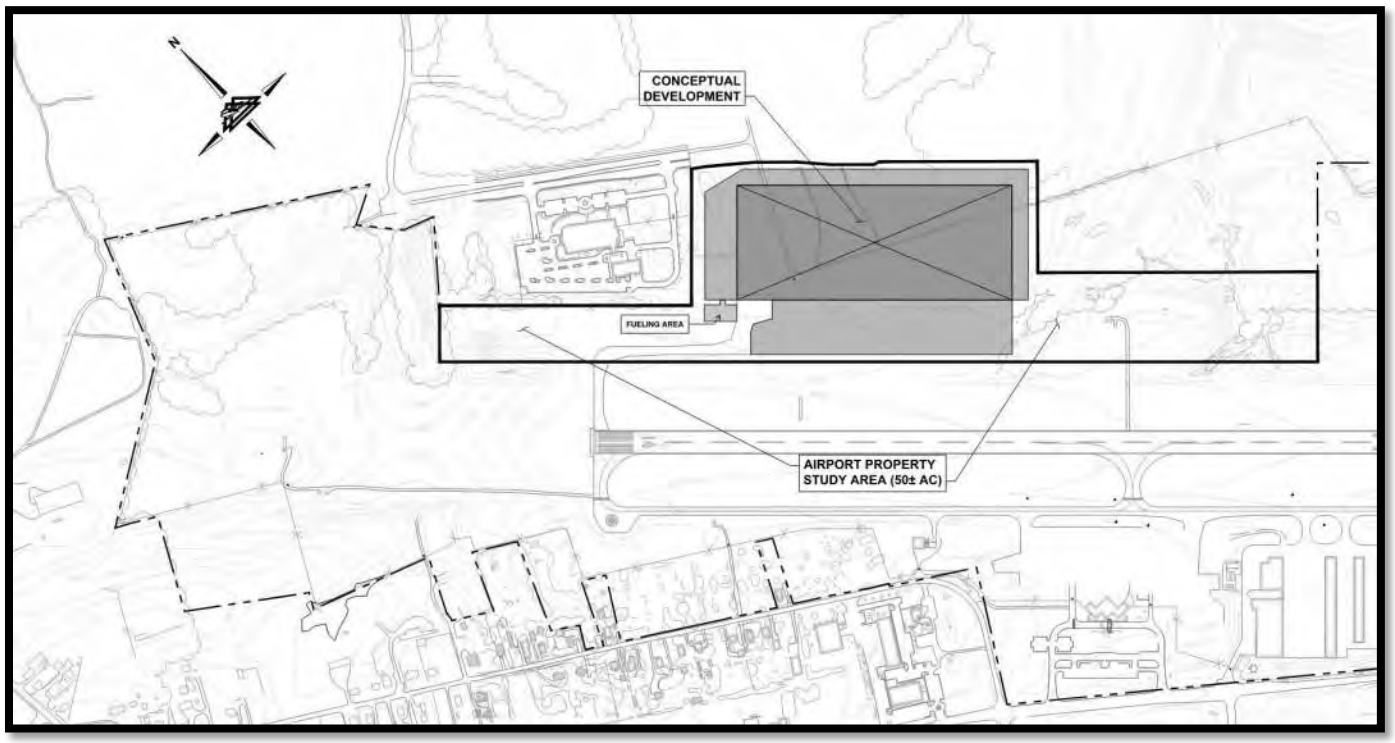


Figure 2: Study Area

Existing Land Use

OKV is a general aviation airport in Frederick County, Virginia which has been operating since the 1930s. No known historic, architectural, or cultural resources which are listed on the National Register of Historic Places (NRHP) exist on airport property. No known national or state parks, forests or refuges are located within the airport limits. Land uses to the north and east of the airport are agricultural and industrial. There is a row of residences northwest of the airport along Bufflick Road, and the Airport Authority has acquired several of these residences to remove the incompatible land use adjacent to the airport.

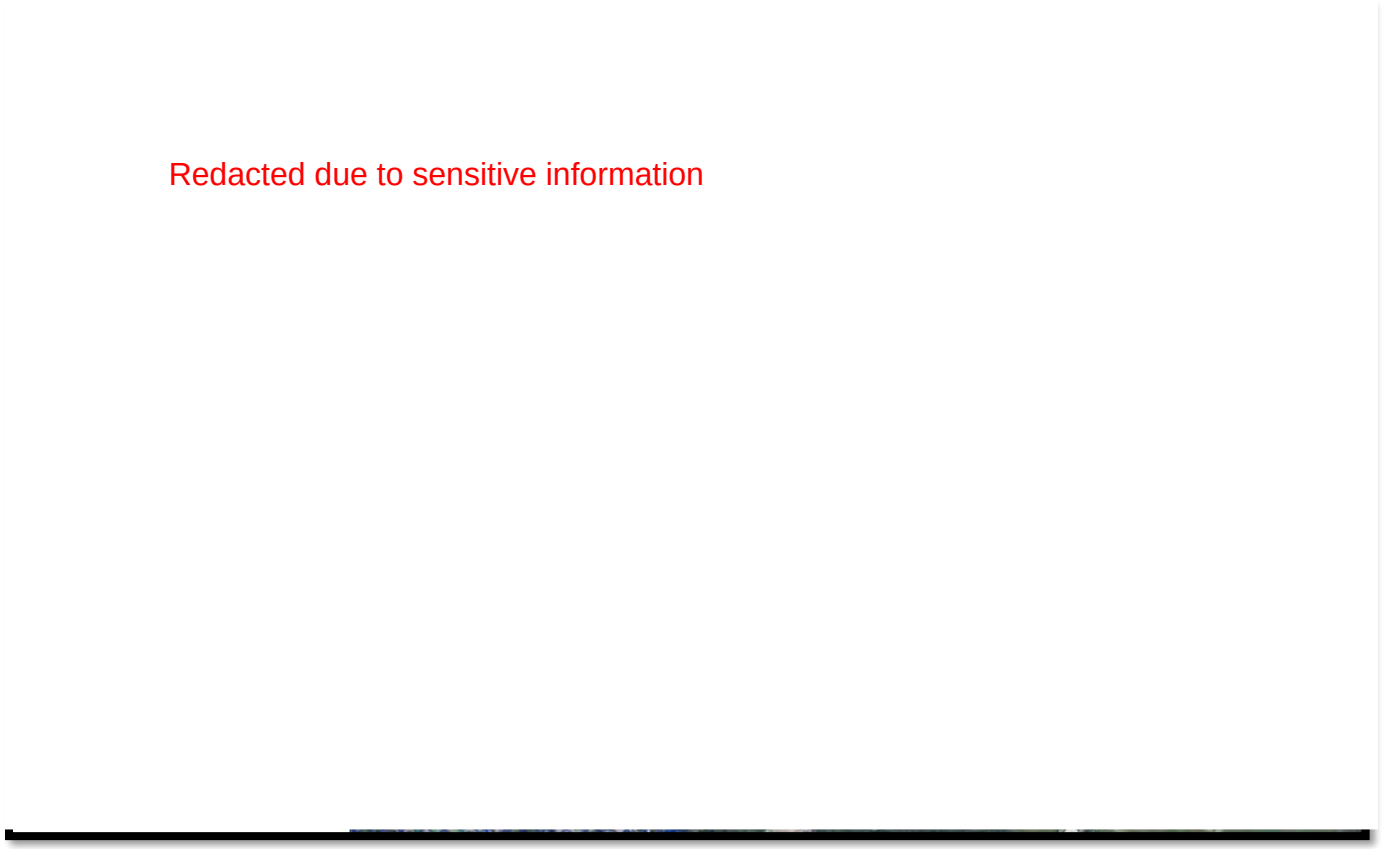
The Virginia Department of Historic Resources (DHR) V-Cris website depicts the boundary of the Second Winchester Battlefield (DHR ID 034-5023) within the direct APE, which is defined as the 50± acre study area, overlapping the northwestern portion of airport property and bisects the study area (see Table 1 and Figure 3). The Second Winchester Battlefield is the site of a June 1863 battle during the American Civil War and the resource has been recommended for listing on the NRHP.

The 50± acre project area has not been field surveyed, although previous coordination with DHR for other airport development on and within this site resulted in "no affect" determinations (DHR Project Number 2007-1433, see Attachment 1). The prior project included a different hangar and apron configuration within the same footprint as the current project. According to the V-Cris site, Phase 1 Cultural Resources surveys have been conducted directly adjacent to the project site, as well as in the vicinity of the project site and airport property (see green hatches in Figure 3). These surveys include the following:

<u>Conducted directly adjacent to the project site</u>:
2022 Phase 1A Archaeological Study, DOVE, FK-175
1988 Phase 1 Archeological Reconnaissance, BROWNING, FK-016

<u>Conducted in the vicinity of the project site</u>:
1993 Phase 1 Archaeological Survey, LBG, FK-027
2017 Phase 1 Archeological Survey, STANTEC, FK-141
2002 Cultural Resources Survey of Proposed I-81 Widening and Expansion, WMCAR, FK-060

Figure 3: Direct APE with Known Resources



The known DHR resources in the direct and indirect APEs are described in Table 1 and depicted in Figure 5. These are off-airport and there are no plans to physically impact these resources.

Table 1: DHR Resources in Direct and Indirect APEs

Within Direct APE		
Resource	**Description**	**NHRP Eligibility**
034-5023	Apple Pie Ridge/West Fort Parcel	Eligible
Within Indirect APE		
Resource	**Description**	**NHRP Eligibility**
44FK0488	Camp, temporary	Not Eligible
034-5023	Apple Pie Ridge/West Fort Parcel	Eligible

The indirect APE (depicted in cyan in Figure 5) encompasses approximately 165 acres which has been conservatively estimated to take into account adjacent residences who may be able to see the proposed development from their back yards. The Airport Authority owns many residences along this strip. The residences within the indirect APE which are not owned by the Airport are detailed in Table 2 and Figure 2 with photographs provided in sections below. These residences range from 0.45 miles to 0.3 miles from the project site.

The indirect APE also includes DHR Resource 44FK0488 which is approximately 600 feet from the project site and which has been determined to be Not Eligible for listing on the NRHP, although it appears that construction has already occurred over the resource.

Figure 4: Direct APE

Figure 5: Direct and Indirect APEs

Table 2: Residences within Indirect APE

Residences			
Street Address	**Year Built**	**Remarks**	**Distance from Project Site (approximate, miles)**
203 Bufflick Road	1956		0.45
215 Bufflick Road	1955		0.45
223 Bufflick Road	1942	Portion proposed for acquisition by Authority	0.45
233 Bufflick Road	1963		0.45
243 Bufflick Road	1951		0.45
259 Bufflick Road	1941		0.45
265 Bufflick Road	No data		0.45
269 Bufflick Road	1988	No photo provided due to age	0.4
275 and 277 Bufflick Road	1932		0.4
287 Bufflick Road	1941		0.3
299 Bufflick Road	1956		0.3
317 Bufflick Road	1956	Proposed for acquisition by Authority	0.3
391 Bufflick Road	1950	Proposed for acquisition by Authority	0.3

Modifications to Landscape

On the Winchester USGS quadrangle map, Route 50 in the vicinity of the airport (which runs north of the runway) remains in the same place today as recorded on the USGS map; Bufflick Road (which runs southwest of the runway) has been slightly realigned. The runway orientation and size does not appear to be 'markedly different' than what is shown on the USGS maps; not surprisingly, new development exists south of the runway opposite Bufflick Road which has been built since the USGS quadrangle map was drawn. Based on historic aerial imagery, areas of the direct APE have been previously disturbed, although the precise depths of grading cannot be determined via the images (which are included below).

Figure 6: Direct and Indirect APEs with 'Winchester' Quad Map

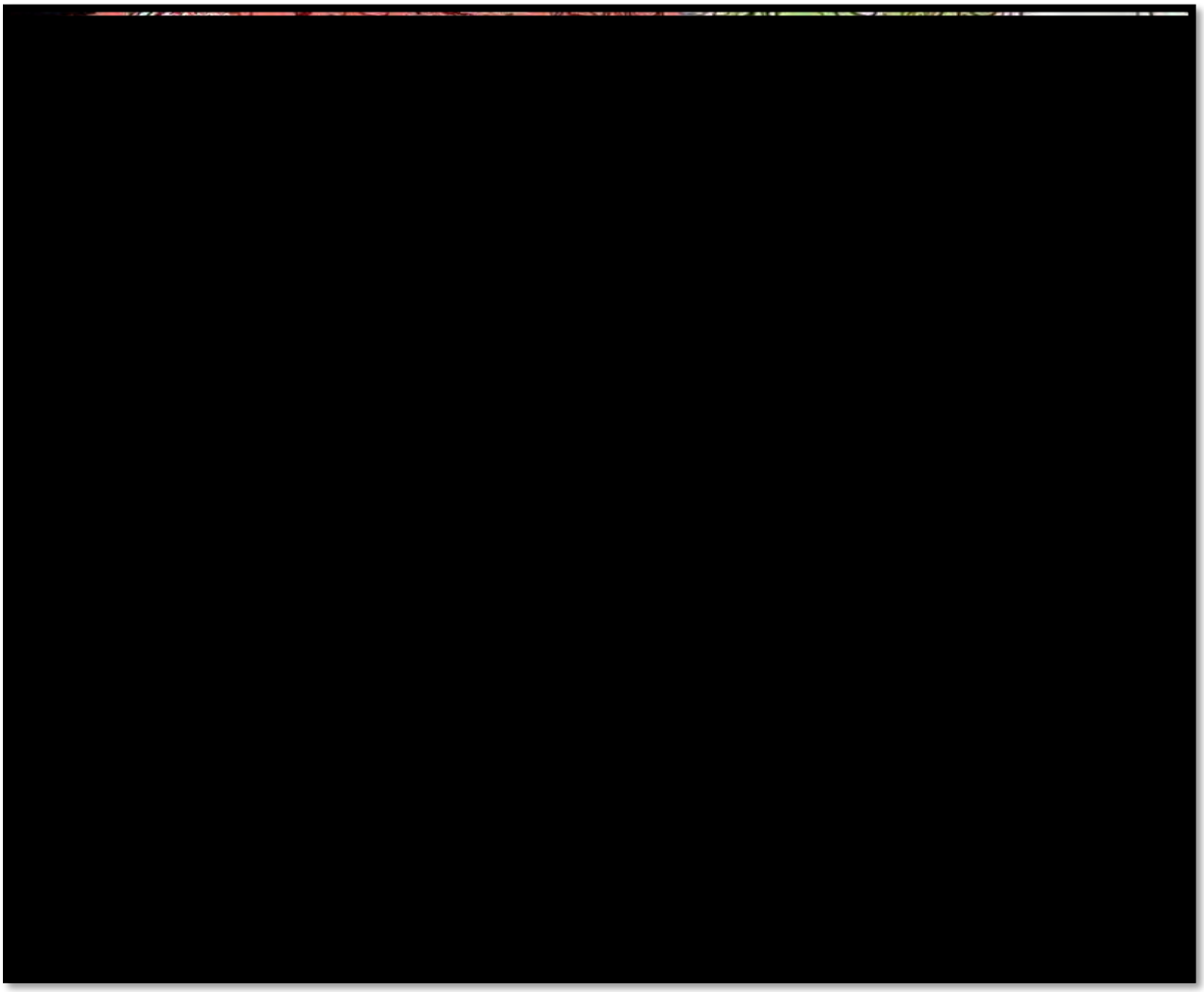


Figure 7: Study Area (2006)

Figure 8: Study Area (2011)

Figure 9: Study Area (2017)

Figure 10: Study Area (2023)

Photos of Residences within Indirect APE (which face away from project site)

Figure 11: 203 Bufflick Road (1956)

Figure 12: 215 Bufflick Road (1955)

Figure 13: 223 Bufflick Road (1942)

Figure 14: 233 Bufflick Road (1963)

Figure 15: 243 Bufflick Road (1951)

Figure 16: 259 Bufflick Road (1941)

Figure 17: 265 Bufflick Road (no data on age)

Figure 18: 275 and 277 Bufflick Road (1932)

Figure 19: 287 Bufflick Road (1941)

Figure 20: 299 Bufflick Road (1956)

Figure 21: 317 Bufflick Road (1956)

Figure 22: 391 Bufflick Road (1950)

Project Review Application Form

This application must be completed for all projects that will be federally funded, licensed, or permitted, or that are subject to state review. Please allow 30 days from receipt for the review of a project. All information must be completed before review of a project can begin and incomplete forms will be returned for completion.

I. GENERAL PROJECT INFORMATION

1. Has this project been previously reviewed by DHR? YES X NO ___ **DHR File #** 2007-1433

2. Project Name North Side Dev't at Winchester Regional Airport (OKV)

3. Project Location

Winchester		Frederick
City	Town	County

4. Specify Federal and State agencies involved in project (providing funding, assistance, license or permit). Refer to the list of agencies and abbreviations in the instructions.

Lead Federal Agency Federal Aviation Administration

Other Federal Agency

State Agency Virginia Department of Aviation

5. Lead Agency Contact Information

Contact Person Susan Stafford

Mailing Address Beckley Airports Field 176 Airport Circle, Room 101, Beaver WV 25813

Phone Number 304-252-6216 **Fax Number**

Email Address Susan.stafford@faa.gov

6. Applicant Contact Information

Contact Person Mary Ashburn Pearson c/o Delta Airport Consultants

Mailing Address 2700 Polo Parkway Midlothian, VA 23113

Phone Number 804-275-8301 **Fax Number** 804-275-8371

Email Address MAPearson@deltaairport.com

II. PROJECT LOCATION AND DESCRIPTION

7. USGS Quadrangle Name Winchester

8. Number of acres included in the project 50± Direct / 165± Indirect APE

9. Have any architectural or archaeological surveys of the area been conducted? **YES___ NO__X_**

If yes, list author, title, and date of report here. Indicate if a copy is on file at DHR.

Conducted directly adjacent to the project site:

2022 Phase 1A Archaeological Study, DOVE, FK-175
1988 Phase 1 Archeological Reconnaissance, BROWNING

Conducted near the project site:
1993 Phase 1 Archaeological Survey, LBG, FK-027
2017 Phase 1 Archeological Survey, STANTEC, FK-141
2002 Cultural Resources Survey of Proposed I-81 Widening and Expansion, WMCAR, FK-060

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10. Are any structures 50 years old or older within or adjacent to the project area? **YES___ NO__X_**

If yes, give date(s) of construction and provide photographs.

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11. Does the project involve the rehabilitation, alteration, removal, or demolition of any structure, building, designed site (e.g. park, cemetery), or district that is 50 years or older? If *yes*, this must be explained fully in the project description. **YES___ NO__X_**

12. Does the project involve any ground disturbance (e.g. excavating for footings, installing sewer or water lines or utilities, grading roads, etc.)? If *yes*, this must be explained fully in the project description. **YES__X_ NO___**

13. DESCRIPTION: Attach a complete description of the project. Refer to the instructions for the required information.

To the best of my knowledge, I have accurately described the proposed project and its likely impacts.

_ _11/27/2023_____
_____
Signature of Applicant/Agent Date

The following information must be attached to this form:

X Completed DHR Archives search
USGS map with APE shown
X
Complete project description
X
Any required photographs and plans
x

MAIL COMPLETED FORM AND ATTACHMENTS TO:
Virginia Department of Historic Resources
Attention: Project Review
2801 Kensington Avenue, Richmond, VA 23221
www.dhr.virginia.gov

____ No historic properties affected _____ No adverse effect

____ Additional information is needed in order to complete our review.

____ We have previously reviewed this project. A copy of our correspondence is attached.

Comments: _____

_____

_____

_____

Signature_____ Date _____

Phone number _____ DHR File # _____

This Space For Department Of Historic Resources Use Only

MAIL COMPLETED FORM AND ATTACHMENTS TO:

Virginia Department of Historic Resources
Attention: Project Review
2801 Kensington Avenue, Richmond, VA 23221
www.dhr.virginia.gov

U.S. Department of Transportation
Federal Aviation Administration

Beckley Airports Field Office
176 Airport Circle, Room 101
Beaver, West Virginia 25813
Telephone: (304) 252-6216
FAX: (304) 253-8028

December 04, 2023

Diane Shields, Chief
Monacan Indian Nation
111 Highview Drive
Madison Heights, VA 24572

Subject: Project Review for Airport Development – "Northside Development"
Winchester Regional Airport (OKV)

Dear Chief Shields:

The Winchester Regional Airport Authority ("the Authority"), owner and operator of the Winchester Regional Airport (OKV), is proposing to develop the Northside area of the airfield. The study area encompasses approximately 50 acres, which is a conservative study area. The projects, referred to as the Proposed Action, are illustrated conceptually in the enclosed attachment and would take place within the boundaries of airport property.

The Proposed Action is the construction of a building/hangar up to 600,000-square feet (sf) in size with associated apron frontage and automobile parking and access. The future use of the development is not yet known. The proposed project could accommodate a future aeronautical use such as aircraft manufacturing and final assembly (assumed to be the manufacture of advanced air mobility [AAM]/electric vertical take-off and landing [eVTOL] aircraft) or aircraft maintenance and/or storage. A fuel facility may be installed within the study area depending on the ultimate future use of the site. Depending on the needs of the future tenant, the "fuel" could include above-ground tanks assumed to include two 20,000 gallon tanks of Jet-A, one 12,000 gallon tank of Av-Gas (or its unleaded equivalent), and/or electric aircraft chargers.

As these projects are anticipated to be federally funded, licensed, or permitted they are subject to review to comply with Section 106 of the National Historic Preservation Act of 1966, as amended. Your tribe has expressed interest in Frederick County, Virginia.

Note that FAA procedures dictate that in the event a cultural or archeological artifact is discovered during construction, that the construction is halted and the State Historic Preservation Officer (SHPO) and/or the interested Tribe is notified.

If you have any questions or need further information regarding the project, please feel free to contact Susan Stafford of my staff (Susan.Stafford@faa.gov) directly.

Sincerely,

MATTHEW DIGIULIAN

Digitally signed by MATTHEW DIGIULIAN
Date: 2023.12.04 12:18:00 -05'00'

Matthew Di Giulian, Manager
FAA, Beckley Airports Field Office

Enclosures: Project Descriptions and Exhibits

U.S. Department of Transportation
Federal Aviation Administration

Beckley Airports Field Office
176 Airport Circle, Room 101
Beaver, West Virginia 25813
Telephone: (304) 252-6216
FAX: (304) 253-8028

December 04, 2023

Paul Barton, THPO/Director of Cultural Preservation Programs/NAGPRA
Eastern Shawnee Tribe of Oklahoma
70500 E. 128 Road
Wyandotte, OK 74370

Subject: Project Review for Airport Development – "Northside Development"
Winchester Regional Airport (OKV)

Dear Mr. Barton:

The Winchester Regional Airport Authority ("the Authority"), owner and operator of the Winchester Regional Airport (OKV), is proposing to develop the Northside area of the airfield. The study area encompasses approximately 50 acres, which is a conservative study area. The projects, referred to as the Proposed Action, are illustrated conceptually in the enclosed attachment and would take place within the boundaries of airport property.

The Proposed Action is the construction of a building/hangar up to 600,000-square feet (sf) in size with associated apron frontage and automobile parking and access. The future use of the development is not yet known. The proposed project could accommodate a future aeronautical use such as aircraft manufacturing and final assembly (assumed to be the manufacture of advanced air mobility [AAM]/electric vertical take-off and landing [eVTOL] aircraft) or aircraft maintenance and/or storage. A fuel facility may be installed within the study area depending on the ultimate future use of the site. Depending on the needs of the future tenant, the "fuel" could include above-ground tanks assumed to include two 20,000 gallon tanks of Jet-A, one 12,000 gallon tank of Av-Gas (or its unleaded equivalent), and/or electric aircraft chargers.

As these projects are anticipated to be federally funded, licensed, or permitted they are subject to review to comply with Section 106 of the National Historic Preservation Act of 1966, as amended. Your tribe has expressed interest in Frederick County, Virginia.

Note that FAA procedures dictate that in the event a cultural or archeological artifact is discovered during construction, that the construction is halted and the State Historic Preservation Officer (SHPO) and/or the interested Tribe is notified.

If you have any questions or need further information regarding the project, please feel free to contact Susan Stafford of my staff (Susan.Stafford@faa.gov) directly.

Sincerely,

MATTHEW DIGIULIAN

Digitally signed by MATTHEW DIGIULIAN
Date: 2023.12.04 12:18:46 -05'00'

Matthew Di Giulian, Manager
FAA, Beckley Airports Field Office

Enclosures: Project Descriptions and Exhibits

U.S. Department of Transportation
Federal Aviation Administration

Beckley Airports Field Office
176 Airport Circle, Room 101
Beaver, West Virginia 25813
Telephone: (304) 252-6216
FAX: (304) 253-8028

December 04, 2023

Dr. Wenonah G. Haire, THPO and Catawba Cultural Center Executive Director
Catawba Indian Nation (aka Catawba Indian Tribe of South Carolina)
1536 Tom Steven Road
Rock Hill, SC 29730

Subject: Project Review for Airport Development – "Northside Development"
Winchester Regional Airport (OKV)

Dear Dr. Haire:

The Winchester Regional Airport Authority ("the Authority"), owner and operator of the Winchester Regional Airport (OKV), is proposing to develop the Northside area of the airfield. The study area encompasses approximately 50 acres, which is a conservative study area. The projects, referred to as the Proposed Action, are illustrated conceptually in the enclosed attachment and would take place within the boundaries of airport property.

The Proposed Action is the construction of a building/hangar up to 600,000-square feet (sf) in size with associated apron frontage and automobile parking and access. The future use of the development is not yet known. The proposed project could accommodate a future aeronautical use such as aircraft manufacturing and final assembly (assumed to be the manufacture of advanced air mobility [AAM]/electric vertical take-off and landing [eVTOL] aircraft) or aircraft maintenance and/or storage. A fuel facility may be installed within the study area depending on the ultimate future use of the site. Depending on the needs of the future tenant, the "fuel" could include above-ground tanks assumed to include two 20,000 gallon tanks of Jet-A, one 12,000 gallon tank of Av-Gas (or its unleaded equivalent), and/or electric aircraft chargers.

As these projects are anticipated to be federally funded, licensed, or permitted they are subject to review to comply with Section 106 of the National Historic Preservation Act of 1966, as amended. Your tribe has expressed interest in Frederick County, Virginia.

Note that FAA procedures dictate that in the event a cultural or archeological artifact is discovered during construction, that the construction is halted and the State Historic Preservation Officer (SHPO) and/or the interested Tribe is notified.

If you have any questions or need further information regarding the project, please feel free to contact Susan Stafford of my staff (Susan.Stafford@faa.gov) directly.

Sincerely,

MATTHEW DIGIULIAN

Digitally signed by MATTHEW DIGIULIAN
Date: 2023.12.04 12:20:41 -05'00'

Matthew Di Giulian, Manager
FAA, Beckley Airports Field Office

Enclosures: Project Descriptions and Exhibits

Office 803-328-2427

January 16, 2024

Attention: Susan Stafford
Federal Aviation Administration
176 Airport Circle, Room 101
Beaver, WV 25813

Re. THPO # TCNS # Project Description
2024-40-5 "Northside Development" – Winchester Regional Airport (OKV)

Dear Ms. Stafford,

The Catawba have no immediate concerns with regard to traditional cultural properties, sacred sites or Native American archaeological sites within the boundaries of the proposed project areas. **However, the Catawba are to be notified if Native American artifacts and / or human remains are located during the ground disturbance phase of this project.**

If you have questions please contact Caitlin Rogers at 803-328-2427 ext. 226, or e-mail Caitlin.Rogers@catawba.com.

Sincerely,

Wenonah G. Haire
Tribal Historic Preservation Officer

U.S. Department of Transportation
Federal Aviation Administration

Beckley Airports Field Office
176 Airport Circle, Room 101
Beaver, West Virginia 25813
Telephone: (304) 252-6216
FAX: (304) 253-8028

December 04, 2023

Katelyn Lucas, Tribal Historic Preservation Assistant
Delaware Nation, Oklahoma
PO Box 825
Anadarko, OK 73005
klucas@delawarenation-nsn.gov

Subject: Project Review for Airport Development – "Northside Development"
Winchester Regional Airport (OKV)

Dear Ms. Lucas:

The Winchester Regional Airport Authority ("the Authority"), owner and operator of the Winchester Regional Airport (OKV), is proposing to develop the Northside area of the airfield. The study area encompasses approximately 50 acres, which is a conservative study area. The projects, referred to as the Proposed Action, are illustrated conceptually in the enclosed attachment and would take place within the boundaries of airport property.

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If you have any questions or need further information regarding the project, please feel free to contact Susan Stafford of my staff (Susan.Stafford@faa.gov) directly.

Sincerely,

MATTHEW DIGIULIAN

Digitally signed by MATTHEW DIGIULIAN
Date: 2023.12.04 12:19:46 -05'00'

Matthew Di Giulian, Manager
FAA, Beckley Airports Field Office

Enclosures: Project Descriptions and Exhibits

Project Description- Northside Development at OKV

The Proposed Undertaking is the construction of a building/aircraft hangar up to 600,000-square feet (sf) in size with associated apron frontage and automobile parking and access in the northern (Northside) portion of airport property. Because the future use is not yet known, the development is depicted and described conceptually.

The proposed project could accommodate an aeronautical use such as aircraft manufacturing and final assembly, charter services, or aircraft maintenance and/or storage. A fuel facility could be constructed to serve the needs of the future tenant. Depending on the needs of the future tenant, the "fuel" could include above-ground tanks assumed to include two 20,000 gallon tanks of Jet-A, one 12,000 gallon tank of Av-Gas (or its unleaded equivalent), and/or electric aircraft chargers. The Proposed Undertaking and the 50± acre study area are depicted in Figure 1. The study area is more expansive than the area proposed for development to account for grading and stormwater management needs. The study area is depicted in Figure 2 over an aerial image. Based on preliminary estimates before the design phase has begun, the assumed depths of disturbance for the undertaking are a maximum of 12 feet.

Figure 1: Conceptual Proposed Undertaking and Study Area

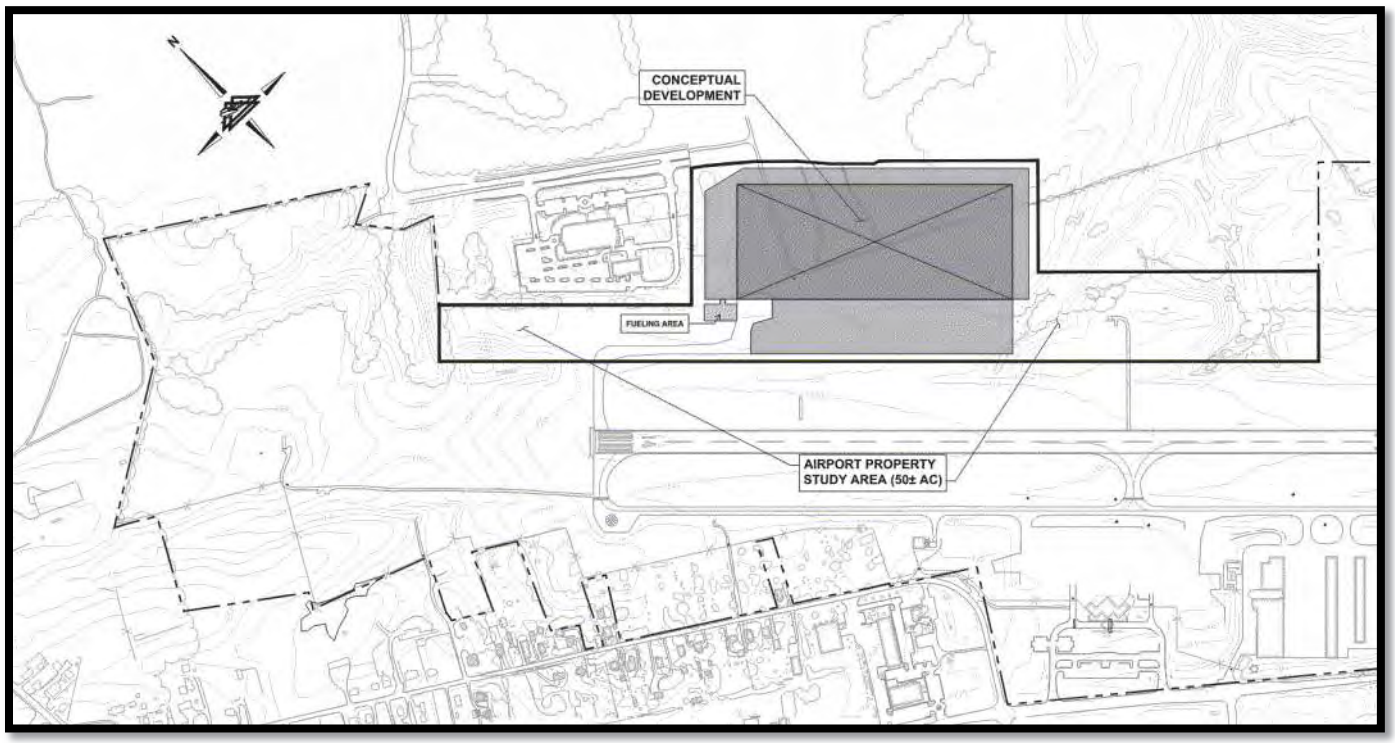

Figure 2: Study Area

Existing Land Use

OKV is a general aviation airport in Frederick County, Virginia which has been operating since the 1930s. No known historic, architectural, or cultural resources which are listed in the National Register of Historic Places (NRHP) exist on airport property. No known national or state parks, forests or refuges are located within the airport limits. Land uses to the north and east of the airport are agricultural and industrial. There is a row of residences northwest of the airport along Bufflick Road, and the Airport Authority has acquired several of these residences to remove the incompatible land use adjacent to the airport.

The Virginia Department of Historic Resources (DHR) V-Cris website depicts the boundary of the Second Winchester Battlefield (DHR ID 034-5023) within the direct APE, which is defined as the 50± acre study area, overlapping the northwestern portion of airport property and bisects the study area (see Table 1 and Figure 3). The Second Winchester Battlefield is the site of a June 1863 battle during the American Civil War and the resource has been recommended for listing in the NRHP.

The 50± acre project area has not been field surveyed, although previous coordination with DHR for other airport development on and within this site resulted in "no affect" determinations (DHR Project Number 2007-1433, see Attachment 1). The prior project included a different hangar and apron configuration within the same footprint as the current project. According to the V-Cris site, Phase 1 Cultural Resources surveys have been conducted directly adjacent to the project site, as well as in the vicinity of the project site and airport property (see green hatches in Figure 3). These surveys include the following:

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2017 Phase 1 Archeological Survey, STANTEC, FK-141
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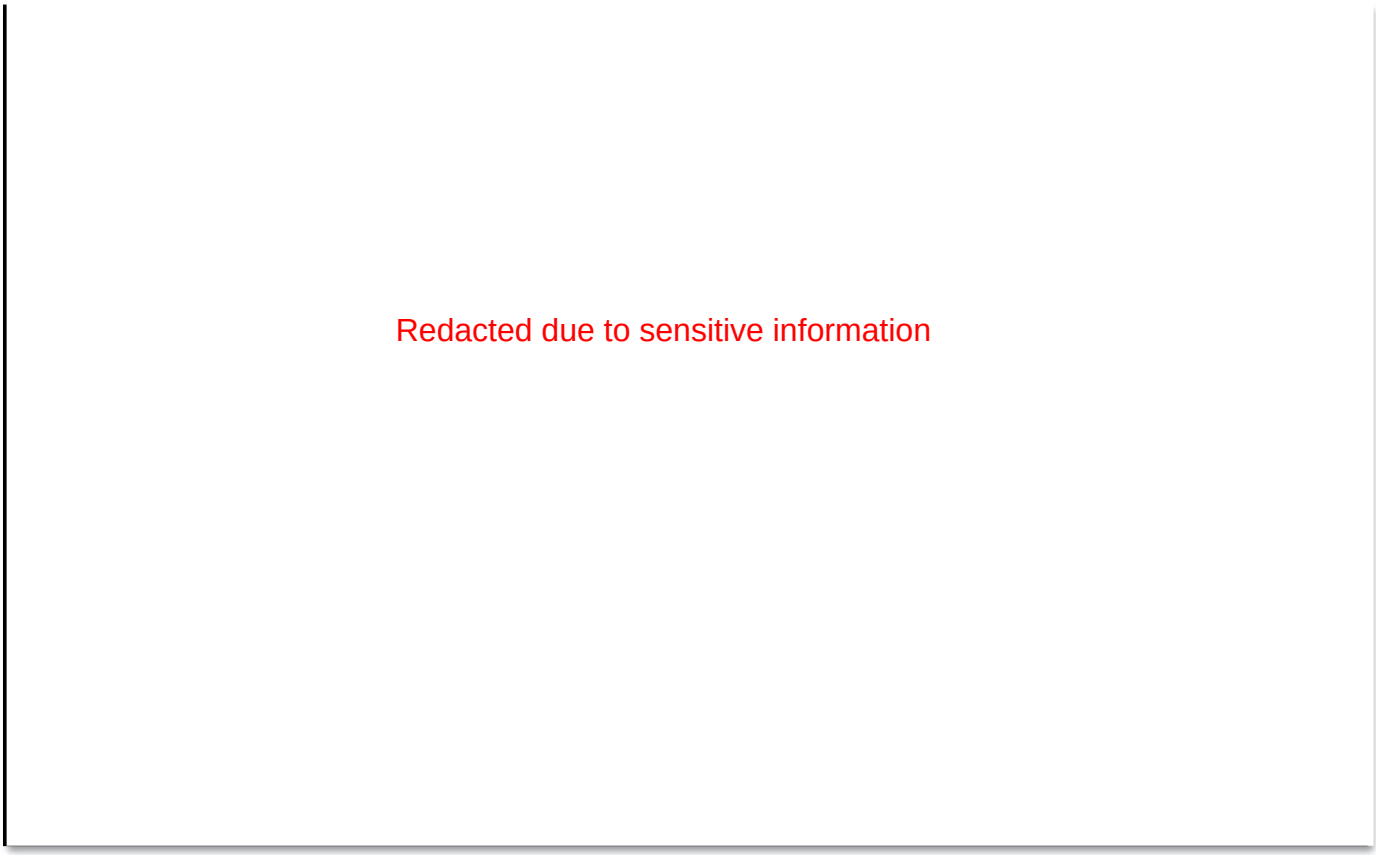
Figure 3: Direct APE with Known Resources



The known DHR resources in the vicinity of the project are described in Table 1 and depicted in Figures 4 and 5. These are off-airport and there are no plans to physically impact these resources.

Table 1: DHR Resources in the Vicinity of Proposed Airport Development

Within Direct APE		
Resource	**Description**	**NHRP Eligibility**
034-5023	Apple Pie Ridge/West Fort Parcel	Eligible
Within Indirect APE		
Resource	**Description**	**NHRP Eligibility**
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034-5023	Apple Pie Ridge/West Fort Parcel	Eligible

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The indirect APE also includes DHR Resource 44FK0488 which is approximately 600 feet from the project site and which has been determined to be Not Eligible for listing in the NRHP, although it appears that construction has already occurred over the resource.

Figure 4: Direct APE

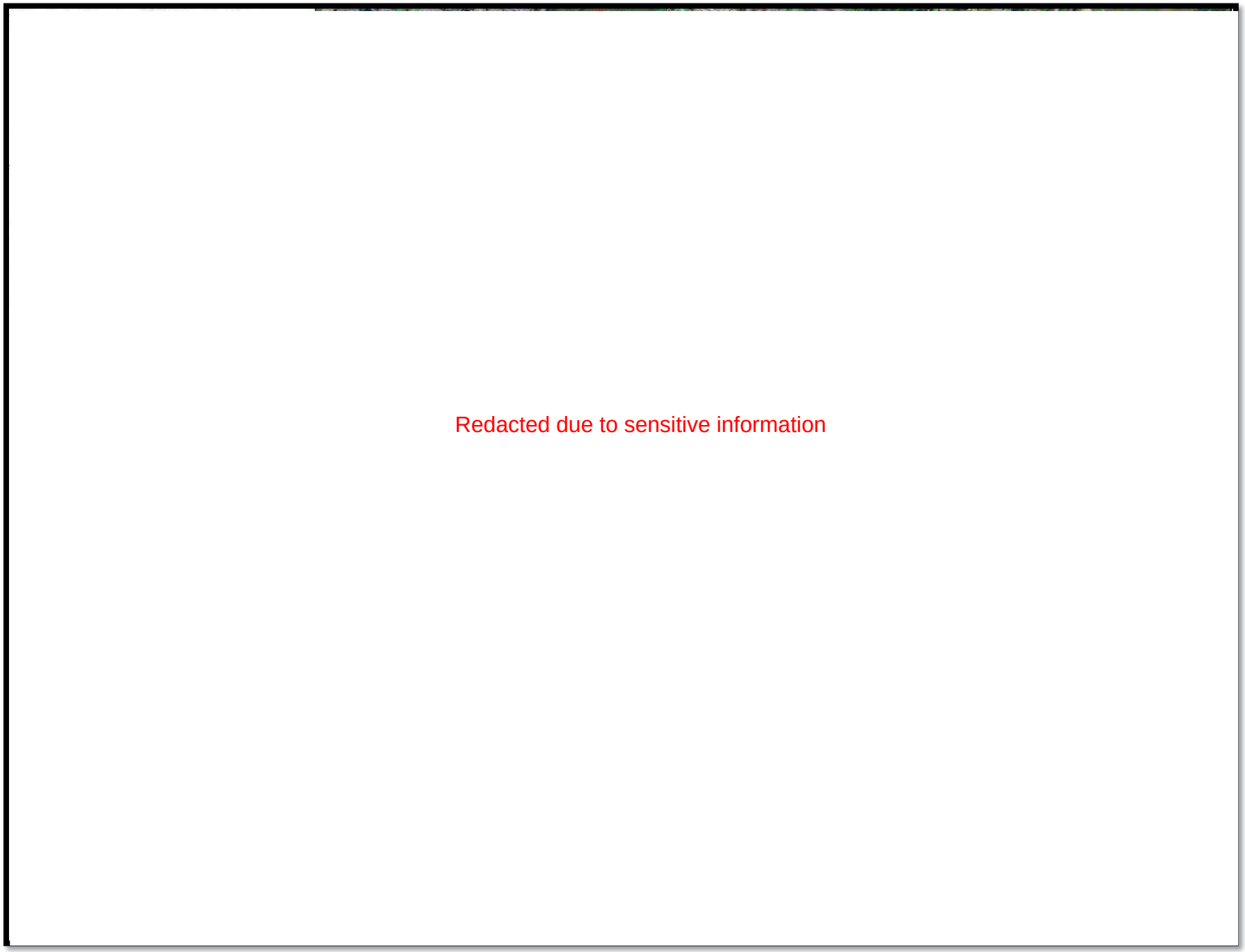

Figure 5: Direct and Indirect APEs

Modifications to Landscape

On the Winchester USGS quadrangle map, Route 50 in the vicinity of the airport (which runs north of the runway) remains in the same place today as recorded on the USGS map; Bufflick Road (which runs southwest of the runway) has been slightly realigned. The runway orientation and size does not appear to be 'markedly different' than what is shown on the USGS maps; not surprisingly, new development exists south of the runway opposite Bufflick Road which has been built since the USGS quadrangle map was drawn. Based on historic aerial imagery, areas of the direct APE and areas directly adjacent to the direct APE have been previously disturbed, although the precise depths of grading cannot be determined via the images (which are included below).

Figure 6: Direct and Indirect APEs with 'Winchester' Quad Map

Figure 7: Study Area (2006)

Figure 8: Study Area (2011)

Figure 9: Study Area (2017)

Figure 10: Study Area (2023)

Attachment E

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

June 06, 2024

PRELIMINARY JURISDICTIONAL DETERMINATION

Northern Virginia Regulatory Section
NAO-2008-01979 (Conococheague-Opequeon)

Delta Airport Consultants, Inc.
2700 Polo Parkway
Midlothian, VA 23113

Dear Delta Airport Consultants, Inc.:

This letter is regarding your request for a preliminary jurisdictional determination of the aquatic resources (e.g., wetlands, streams, and ponds), on an approximately 47-acre parcel located off Airport Road, known as the Winchester Regional Airport (OKV) in Frederick County, Virginia (tax parcel 64-A-79) hereinafter referred to as project area.

The map entitled “Delineation Map: Winchester Regional Airport”, received by the U.S. Army Corps of Engineers (Corps) on March 1, 2024 (copy enclosed) provides the locations of the aquatic resources within the project area referenced above. This letter is not confirming the Cowardin classifications of these aquatic resources.

These aquatic resources exhibit wetland criteria as defined in the 1987 Corps of Engineers Wetland Delineation Manual and the Eastern Mountains and Piedmont Regional Supplement.

This preliminary jurisdictional determination and associated aquatic resource delineation map may be submitted with a permit application.

Please be aware that you may be required to obtain a Corps permit for any discharge of dredged and/or fill material, either temporary or permanent, into a water of the U.S. In addition, you may be required to obtain a Corps permit for certain activities occurring within, under, or over a navigable water of the U.S. subject to the Section 10 of the Rivers and Harbors Act. Furthermore, you may be required to obtain state and local authorizations, 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 delineation and preliminary jurisdictional determination may not be valid for the Wetland Conservation Provisions of the Food Security Act of 1985, as amended.

The Norfolk District has relied on the information and data provided by the agent to make this preliminary determination. If it is determined such information and data are materially false or materially incomplete, a new preliminary determination would be necessary.

This is a preliminary jurisdictional determination and is not a legally binding determination regarding whether Corps jurisdiction applies to the aquatic resources in question. To determine Corps' jurisdiction, you may request and obtain an approved jurisdictional determination.

This delineation of aquatic resources can be relied upon for no more than five years from the date of this letter. New information may warrant revision. Enclosed is a copy of the "Preliminary Jurisdictional Determination Form". Please review the document, sign, and return one copy to the Corps, either by email Robert.W.Howell@usace.army.mil or by standard mail to Attn: Robert Howell, U.S. Army Corps of Engineers, Norfolk District, CENAO-WR-R, 803 Front Street, Norfolk, VA 23510-1011.

If you have any questions, please contact the office either by telephone at (540) 824-2053 or by email at Robert.W.Howell@usace.army.mil.

Sincerely,

R Howell

Robert Howell
Northern Virginia
Regulatory Section

Robert Wayne Howell

Digitally signed by Robert Wayne Howell
Date: 2024.06.06 09:48:27 -04'00'

Enclosure(s):

cc: Agent
DEQ

Appendix 2 - PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PJD: June 06, 2024

B. NAME AND ADDRESS OF PERSON REQUESTING PJD:
Delta Airport Consultants, Inc. Mary Ashburn Pearson, AICP 2700 Polo Parkway Midlothian, VA

C. DISTRICT OFFICE, FILE NAME, AND NUMBER:
NAO-2008-01979 (Winchester Regional Airport / PJD / Frederick)

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:
(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)

State: Virginia County/parish/borough: Frederick City: Winchester

Center coordinates of site (lat/long in degree decimal format): 39° 8' 45.8664" 78° 8' 45.834"

Lat.: xx.xxx° Long.: yy.yyy°

Universal Transverse Mercator:

Name of nearest waterbody: Conococheague-Opequeon

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☑ Office (Desk) Determination. Date: June 05, 2024

☐ Field Determination. Date(s):

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

Site number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
PEM(A)	39.146143N	78.1460841W	0.15 acres	Wetland	Section 404
PEM(B)	39.144341N	78.14333W	0.17 acres	Wetland	Section 404
R4 (A)	39.146212N	78.145229W	261-LF	Stream	Section 404
R4 (B)	39.144826N	78.142421W	473-LF	Stream	Section 404

1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.

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 AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) 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) 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) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (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 PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives 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 AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, 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. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there *"may be"* waters of the U.S. and/or that there *"may be"* navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for PJD (check all that apply)

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

- [x] Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
  Map: WINCHESTER REGIONAL AIRPORT.
- [x] Data sheets prepared/submitted by or on behalf of the PJD requestor.
  - [x] Office concurs with data sheets/delineation report.
  - [ ] Office does not concur with data sheets/delineation report. Rationale: _____.
- [ ] 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.
- [x] U.S. Geological Survey map(s). Cite scale & quad name: Winchester VA
- [x] Natural Resources Conservation Service Soil Survey. Citation: Frederick County, VA
- [x] National wetlands inventory map(s). Cite name: WINCHESTER REGIONAL AIRPORT (March 1, 2024)
- [ ] State/local wetland inventory map(s): _____.
- [ ] FEMA/FIRM maps: _____.
- [ ] 100-year Floodplain Elevation is: ____. (National Geodetic Vertical Datum of 1929)
- [x] Photographs: [ ] Aerial (Name & Date): _____.
  or [x] Other (Name & Date): WINCHESTER REGIONAL AIRPORT (November 2023)
- [x] Previous determination(s). File no. and date of response letter: NAO-2008-01979 (AJD issued July 21, 2008)
- [ ] Other information (please specify): _____.

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Robert Wayne Howell

Digitally signed by Robert Wayne Howell
Date: 2024.06.06 09:20:15 -04'00'

Signature and date of Regulatory staff member completing PJD

Signature and date of person requesting PJD (REQUIRED, unless obtaining the signature is impracticable)[1]

[1] Districts may establish timeframes for requestor to return signed PJD forms. If the requestor does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

Wetland Delineation Report

Winchester Regional Airport (OKV)

Frederick County, Virginia

March 1, 2024

Prepared for:
Delta Airport Consultants, Inc.

Prepared By:
Stephen White
Greenway Engineering, Inc.

151 Windy Hill Lane
Winchester, VA 22602
Telephone 540-662-4185
Fax 540-722-4185
www.greenwayeng.com

File #0806D//SW

Table of Contents

List of Tables

Appendices

Executive Summary

The waters of the U.S., including wetlands, identified during this investigation of the Winchester Regional Airport (OKV) project were delineated by Greenway Engineering (Greenway) in accordance with 33 CFR Part 328 – *Definition of Waters of the United States,* the 1987 *Corps of Engineers' Wetlands Delineation Manual* (the Manual)[1], and the Regional Supplement to the Manual (the Supplement)[2], and represent those areas that are most likely within the regulatory purview of the U.S. Army Corps of Engineers (USACE) and/or state agencies. The delineation of surface waters described by this report and plans constitutes an assessment of features at the site at the time of our site visits during November 2023, and does not represent conditions which may exist in the future. This report outlines the review of the published resource materials, existing site conditions, and the results of the field investigation. This report does not represent a legal jurisdictional determination and any federally jurisdictional or isolated waters and wetlands which may be delineated for this project, and conversely the absence of said waters and wetlands, must be confirmed by the USACE. It is strongly recommended that the USACE be consulted in an effort to gain written confirmation of the delineation described by this report prior to engaging in any design or construction on the property described herein.

The appropriate permits must be obtained from the federal and/or state regulatory agencies prior to any proposed impacts to waters of the U.S./Commonwealth.

Project Contacts

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sjwhite@greenwayeng.com

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2700 Polo Parkway
Midlothian, VA 23113
804-955-4556
mapearson@deltaairport.com

[1] Environmental Laboratory. (1987). "Corps of Engineers Wetlands Delineation Manual." Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

[2] U.S. Army Corps of Engineers. 2012. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont*, ed. J.S. Wakeley, R.W. Lickvar, and C.W. Noble. ERDC/EL TR-09-19 Vicksburg, MS: U.S. Army Engineer Research and Development Center.

Project Description

The Winchester Regional Airport (OKV) project described herein is located in Winchester, VA in the eastern portion of Frederick County. The project is located off Airport Road and is situated on a portion of Tax Parcel 64-A-79 and is approximately 47 acres in size located on the north side of the airport runway. The proposed project consists of expansion of the airport. The approximate center coordinates are 39.14583N latitude and -78.1456W longitude. The property is located within the Conococheague-Opequeon area identified by Hydrologic Unit Code (HUC8) 02070004. It is important to note that this property had an approved Jurisdictional Determination (JD) Letter issued on July 21, 2008 (Project Number 2008-1979). The current delineation is consistent with the previously approved JD letter.

See Appendix B for an aerial overview of the project area.

Methodology

The Manual outlines a three-parameter approach to identifying wetlands: dominant hydrophytic vegetation, hydric soils, and indicators of surface and subsurface hydrology. All three parameters must be present for an area to be considered a jurisdictional wetland in accordance with these criteria, unless determined to be a "difficult wetland situation" as outlined in the Manual.
Any waters of the U.S. identified in this Project were classified according to the Cowardin System, as described in *Classification of Wetlands and Deepwater Habitats of the United States* (1979). This is a hierarchical system, which aids resource managers and others by providing uniformity of concepts and terms used to define wetlands according to hydrologic, geomorphologic, chemical, and biological factors.

Desktop Evaluation

Greenway Engineering performed a preliminary evaluation using available map resources prior to the field investigation. These resources included, but may not be limited to:

- Frederick County Soil Survey (Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture, Web Soil Survey. Available online at: http://websoilsurvey.nrcs.usda.gov/)

- USGS 7.5' Quadrangle, Winchester VA. (United States Department of the Interior, United States Geological Service, Washington, DC. Available online at: http://www.usgs.gov/)

- GIS data provided by the Frederick County VA GIS Department.

- National Wetlands Inventory (United States Department of the Interior, United States Fish and Wildlife Service, Washington, DC. Available online at: http://www.fws.gov/)

The National Wetlands Inventory Map does show an intermittent stream (R4) within the project area. See Appendix C for the Hydrography Map identifying the NWI Wetlands and County GIS hydrography data.

The soils, vegetation, and hydrology conditions are described in more detail in the following sections.

Soils

The National Technical Committee for Hydric Soils defines a hydric soil as a "soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part." Hydric soil indicators are defined in the latest version of Field Indicators of Hydric Soils in the United States.[3] A hydric soil may also be identified by listing in The National List of Hydric Soils, published by the USDA Soil Conservation Service, and state and local hydric soils lists.

The Soil Survey of Frederick County, Virginia was accessed through the Web Soil Survey on the Natural Resources Conservation Service (NRCS) website.

The following table summarizes the mapped soils within the project area. (see Appendix D for the Soils Map)

[3] *United States Department of Agriculture, Natural Resources Conservation Service. 2016. Field Indicators of Hydric Soils in the United States, Version 8.0. L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils*

Table 1: Soil Summary Table

Frederick County, Virginia

Symbol	Map Unit Name
1B	BERKS CHANNERY SILT LOAM, 2 TO 7 PERCENT SLOPES
1C	BERKS CHANNERY SILT LOAM, 7 TO 15 PERCENT SLOPES
3B	BLAIRTON SILT LOAM, 2 TO 7 PERCENT SLOPES
41C	WEIKERT-BERKS CHANNERY SILT LOAMS, 7 TO 15 PERCENT SLOPES
41D	WEIKERY-BERKS CHANNERY SILT LOAMS, 15 TO 25 PERCENT SLOPES
41E	WEIKERY-BERKS CHANNERY SILT LOAMS, 25 TO 65 PERCENT SLOPES
9B	CLEARBROOK CHANNERY SILT LOAM, 2 TO 7 PERCENT SLOPES
9C	CLEARBROOK CHANNERY SILT LOAM, 7 TO 15 PERCENT SLOPES

During the field investigation, soil pits were dug to describe soil morphological characteristics. Soil characteristics including texture, color (hue, value, and chroma), and odor were inspected for each sample. *Munsell Soil Color Charts* were used for determining the moist soil color. In order for the soil to be considered hydric, it must meet the definition of a hydric soil, which is "a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part" (USDA Soil Conservation Service 1994). Hydric soil indicators assist in identifying hydric soils, but an indicator is not required to be present as long as the definition is met, unless determined to be a "difficult wetland situation" as outlined in the Manual. The Results section of this report describes the soils onsite in more detail and also on the attached Data Sheets (Appendix F).

Vegetation

Plant species observed on the site were identified and the wetland indicator status for each species was determined from the 2020 *National Wetland Plant List* (U.S. Army Corps of Engineers 2020. National Wetland Plant List, version 3.5 https://wetland-plants.usace.army.mil/). Table 2 provides the definition for each plant indicator category. In order for the vegetation parameter to be met, the vegetation must meet the rapid test, dominance test, prevalence index, or morphological adaptation definition. Each of these tests is outlined in the Manual. Typically, if more than 50% of the dominant plant species are listed as FAC or wetter, then the hydrophytic vegetation condition is met, unless determined to be a "difficult wetland situation" as outlined in the Manual.

Table 2: Plant Indicator Status

Plant Indicator Category	Indicator Symbol	Definition
Obligate Wetland	OBL	Plants that always occur in standing water or in saturated soils
Facultative Wetland	FACW	Plants that nearly always occur in areas of prolonged flooding or require standing water or saturated soils but may, on rare occasions, occur in non-wetlands
Facultative	FAC	Plants that occur in a variety of habitats, including wetland and mesic to xeric non-wetland habitats but commonly occur in standing water or saturated soils
Facultative Upland	FACU	Plants that typically occur in xeric or mesic non-wetland habitats but may frequently occur in standing water or saturated soils
Obligate Upland	UPL	Plants that rarely occur in water or saturated soils

The vegetation is described in more detail in the Results section of this report and also on the attached Data Sheets (Appendix F).

Hydrology

The Manual and Supplement state that wetland hydrology encompasses all hydrologic characteristics of areas that are periodically inundated or have soils that are saturated to the surface at some time during the growing season. Hydrologic indicators include, but are not limited to, sediment deposits, visual inundation, drift lines, soil erosion, and hummocking. Evidence of these indicators is present even during dry periods, and therefore are useful indicators of wetland hydrology. One primary indicator of hydrology or two secondary indicators must be present for this condition to be met, unless determined to be a "difficult wetland situation" as outlined in the Manual. See Appendix C for Hydrography maps that include NWI, Streams, and Floodplain maps from available GIS data.

The Results section of this report describes the hydrology for each wetland area and also on the attached Data Sheets (Appendix F).

Results

There were two wetlands (Wetlands A and B) and two stream channels (Streams A and B) delineated within the project area, subject to confirmation by the USACE. Boundaries for wetlands were generally well defined by vegetation, hydrologic indicators, and elevation transition zones as they were located within defined drainage swales. The wetlands collect surface and subsurface drainage from upland areas draining from the airport runway and surrounding areas that were previously graded to direct water away from the runway. Both Wetlands A and B are connected to intermittent streams. Streams A and B appear to both be intermittent channels. Stream A has Wetland A directly connected and above where the stream channel starts. Stream B starts at culvert pipe outfall that appears to drain under the runway. Wetland B also drains into Stream B. Both streams contained flowing water during the field delineation. See Table 3 for aquatic resources classification and size within the project area. A total of 6 data points were taken within the project area representing both upland and wetland conditions.

The delineation results were consistent with the previously approved JD letter issued in July 2008 and identified as Project Number 2008-1979. Please note that the 2008 delineation continued the wetland areas further east outside of the current airport property.
See Appendix F for wetland delineation data sheets.

Table 3: Waters Classification and Size in Project Area

Water Feature	Classification	Size
Wetland A	PEM	0.15 acres
Wetland B	PEM	0.17 acres
Stream A	Intermittent	261 LF
Stream B	Intermittent	473 LF

The delineated features are shown on Appendix E.

Table 4: Data Point Summary Table

Data Point	Mapped Soil Unit	Hydrophytic Vegetation	Wetland Hydrology	Hydric Soils	Community ID
DP1	3B	Yes	Yes	Yes	PEM Wetland
DP2	3B	No	No	No	Upland Field
DP3	3B	No	No	No	Upland Field
DP4	1B	No	No	No	Upland Forest
DP5	3B	No	No	No	Upland Field
DP6	3B	Yes	Yes	Yes	PEM Wetland

Permitting and Mitigation

Any impacts to the wetlands and/or streams will require permits, generally issued from the Department of Environmental Quality (DEQ) and the U.S. Army Corps of Engineers (USACE). If it is assumed that all wetlands and streams will be impacted with the airport expansion, that would include 734 linear feet of stream and 0.32 acres of PEM wetlands. The federal permit needed for these impacts would likely be a State Programmatic General Permit (SPGP). To qualify for this permit, the project must not cause the loss of greater than 1 acre of Waters of the United States (WOTUS), must have no more than minimal individual and cumulative impacts to WOTUS and must have avoided impacts to WOTUS to the greatest extent practicable.

The Virginia DEQ would likely require a state individual permit, as their general permit (WP1) limits the stream impacts to 300 linear feet.

Compensatory mitigation for the loss of aquatic resources is generally required for impacts that exceed 1/10 acre. The current wetland mitigation ratios are 1:1 for PEM wetlands, so 0.32 acres of wetland credits would be needed if all wetlands were impacted. Stream mitigation credits are based on stream assessments utilizing the Unified Stream Methodology (USM). There are 734 linear feet of delineated streams onsite. An assumption of 1.3:1 stream ratio is used to calculate potential credits needed, which would indicate needing 954 stream credits for all stream impacts.

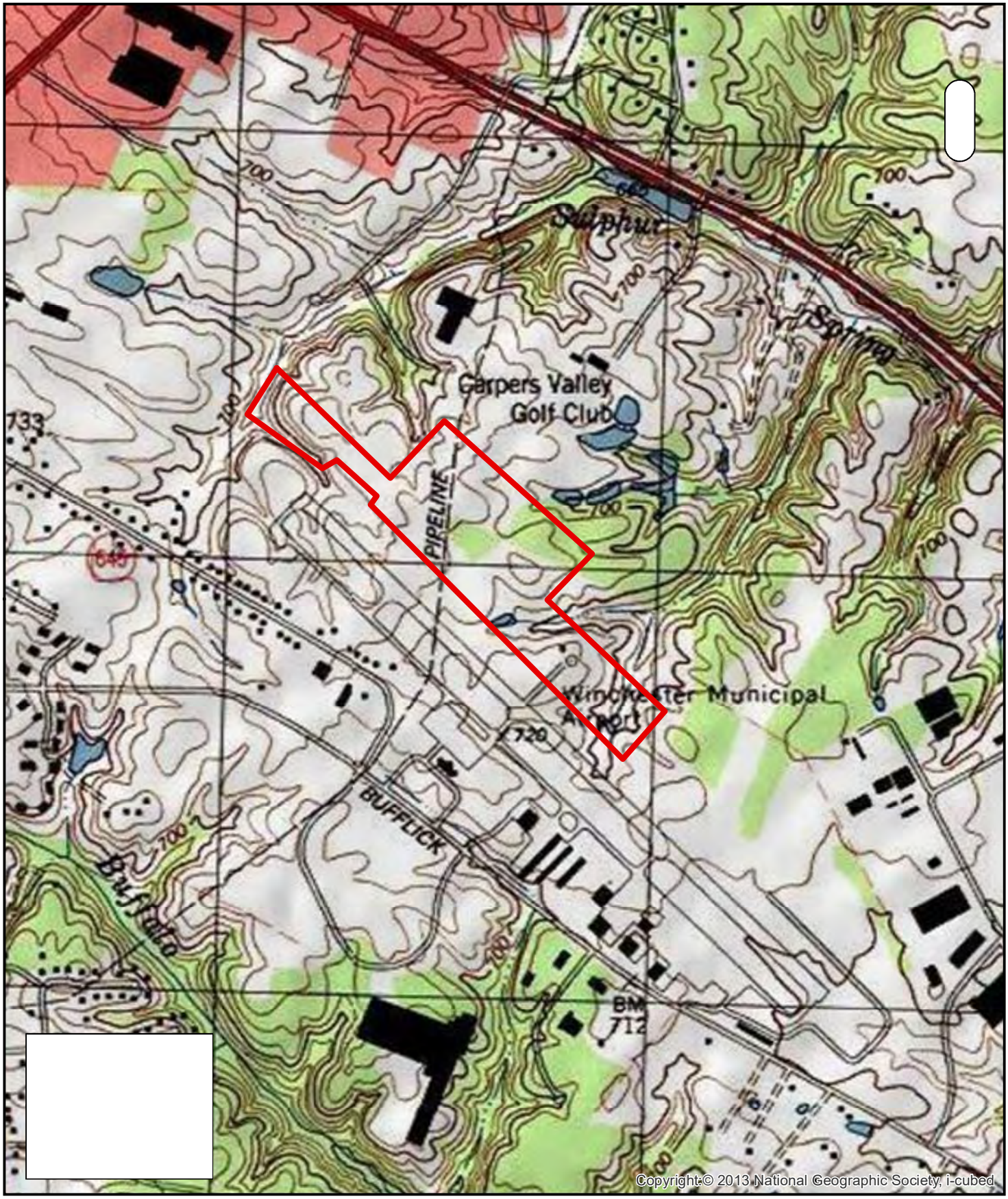
For a recent project in the same HUC8 watershed, mitigation costs were $500 per stream credit and $85,000 per 1 acre of wetland credit. Assuming the costs are the same, the total stream credits could cost around $477,000 and wetland credits at $27,000. These are very rough

estimated costs and will vary based on agency approval, stream assessment, credit cost and availability at the time of the request.

During the permitting process, Greenway will evaluate the mitigation requirement based on the proposed design and the associated impacts to aquatic resources and will formulate a cost-effective conceptual mitigation plan based on specific project needs. Currently, the RIBITS (Regulatory In lieu fee and Bank Information Tracking System) does not show any available mitigation credits listed for this HUC8 watershed.

During the permitting process, Greenway will evaluate the mitigation requirement based on the proposed design and the associated impacts to aquatic resources and will formulate a cost-effective conceptual mitigation plan based on specific project needs. Currently, the RIBITS (Regulatory In lieu fee and Bank Information Tracking System) does not show any available mitigation credits listed for this HUC8 watershed.

Appendix A:
USGS Quadrangle Map



LEGEND

Project Area

APPENDIX A: USGS QUAD WINCHESTER

WINCHESTER REGIONAL AIRPORT
WETLAND DELINEATION REPORT

LOCATION: FREDERICK COUNTY, VA.

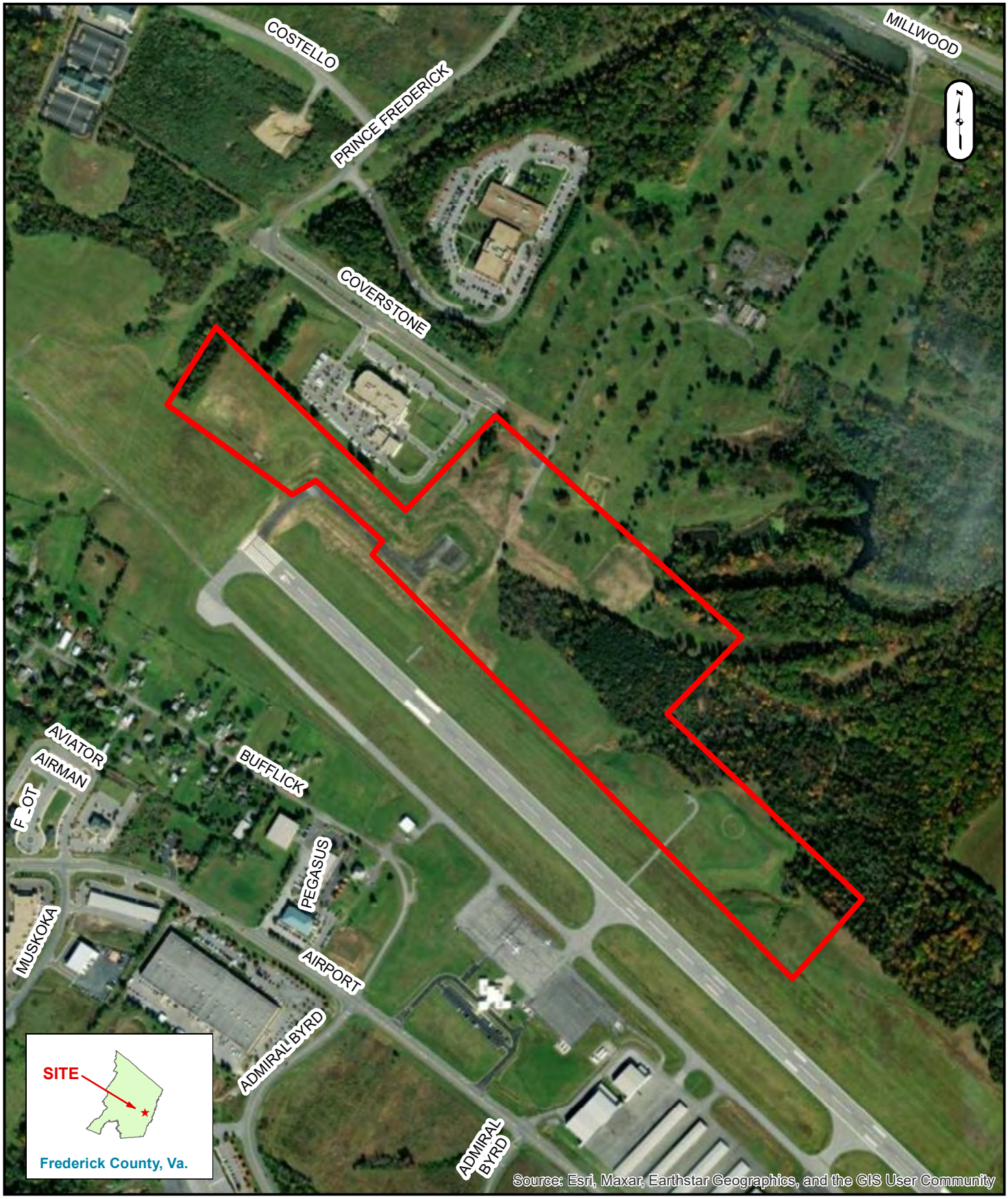
GREENWAY ENGINEERING

GREENWAY ENGINEERING PROJECT NUMBER: 0806D

1 Inch = 1,000 Feet | 0 | 1,000 | 2,000 Ft.

Map Data Source: Shenandoah County, Va. GIS Department, 2018 Data; Aerial imagery courtesy of ESRI; Greenway Engineering

Appendix B:
Aerial Photograph



GREENWAY ENGINEERING

GREENWAY ENGINEERING PROJECT NUMBER: 0806D

LEGEND

Project Area

1 Inch = 600 Feet

0 600 1,200 Ft.

APPENDIX B: AERIAL OVERVIEW WINCHESTER

WINCHESTER REGIONAL AIRPORT
WETLAND DELINEATION REPORT

LOCATION: FREDERICK COUNTY, VA.

Map Data Source: Shenandoah County, Va. GIS Department, 2018 Data; Aerial imagery courtesy of ESRI; Greenway Engineering

Appendix C:
Hydrography Map

GREENWAY ENGINEERING

GREENWAY ENGINEERING PROJECT NUMBER: 0806D

LEGEND

- Project Area
- Streams
- Ponds
- 100 Year Floodplain
- Wetlands NWI

1 Inch = 1,000 Feet | 0 | 1,000 | 2,000 Ft.

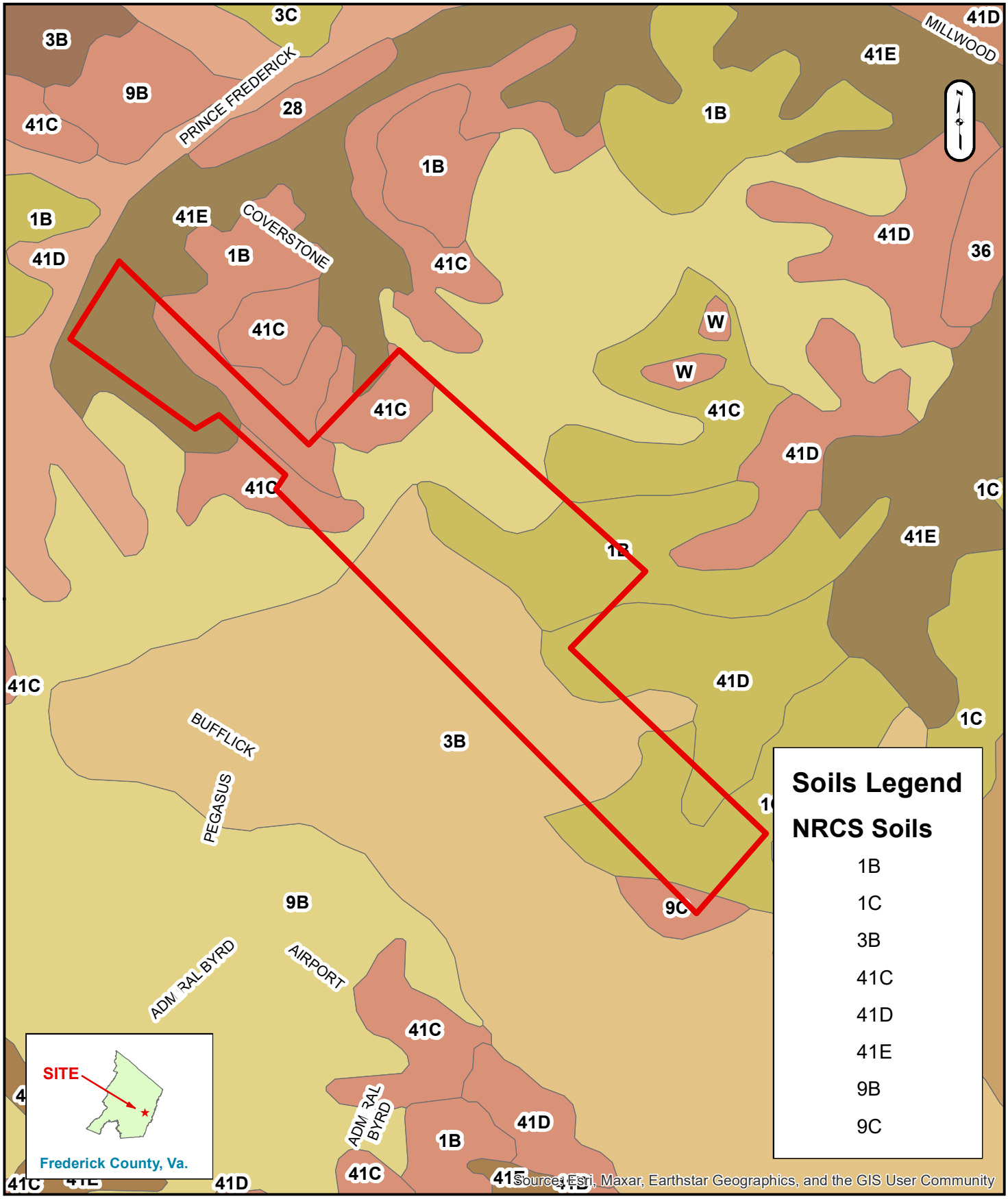
APPENDIX C: HYDROGRAPHY MAP
WINCHESTER

WINCHESTER REGIONAL AIRPORT
WETLAND DELINEATION REPORT

LOCATION: FREDERICK COUNTY, VA.

Map Data Source: Shenandoah County, Va. GIS Department, 2018 Data; Aerial imagery courtesy of ESRI; Greenway Engineering

Appendix D:
NRCS Soils Map



GREENWAY ENGINEERING

GREENWAY ENGINEERING PROJECT NUMBER: 0806D

LEGEND

Project Area

1 Inch = 600 Feet | 0 | 600 | 1,200 Ft.

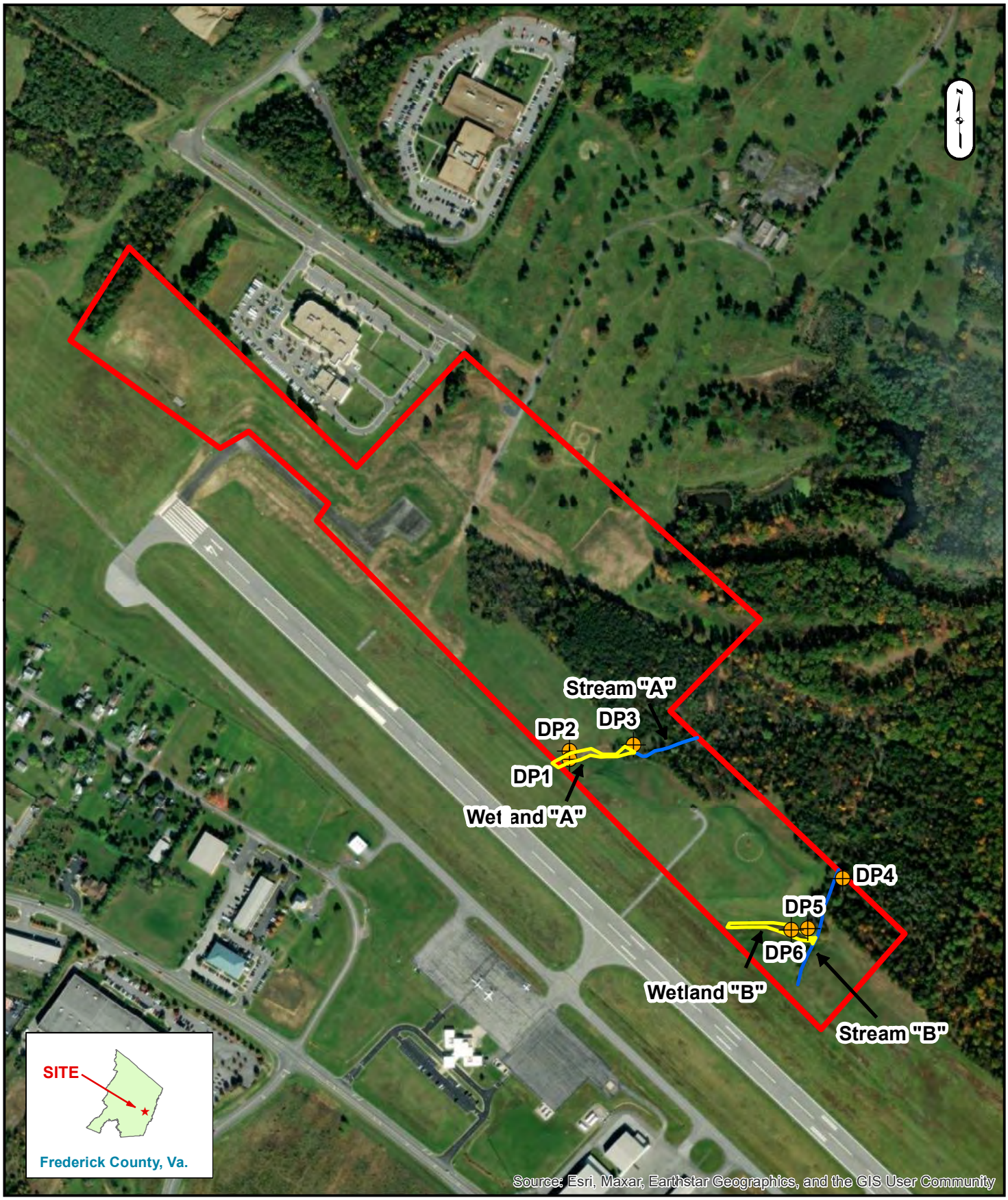
APPENDIX D: SOILS MAP
WINCHESTER

WINCHESTER REGIONAL AIRPORT
WETLAND DELINEATION REPORT

LOCATION | FREDERICK COUNTY, VA.

Map Data Source: Shenandoah County, Va. GIS Department, 2018 Data; Aerial imagery courtesy of ESRI; Greenway Engineering

Appendix E:
Wetland Delineation Map



GREENWAY ENGINEERING

GREENWAY ENGINEERING PROJECT NUMBER: 0806D

LEGEND

- Project Area
- Data Point (DP)
- Streams
- Wetlands

1 Inch = 500 Feet | 0 | 500 | 1,000 Ft.

APPENDIX E: DELINEATION MAP WINCHESTER

WINCHESTER REGIONAL AIRPORT
WETLAND DELINEATION REPORT

LOCATION | FREDERICK COUNTY, VA.

Map Data Source: Shenandoah County, Va. GIS Department, 2018 Data; Aerial imagery courtesy of ESRI; Greenway Engineering

Appendix F:
Wetland Delineation Data Sheets

WETLAND DETERMINATION DATA Fc RM – Eastern Mountains and Piedmont c

Project/Site: Winchester Regional Airport City/County: Frederick Sampling Date: 11/8/2023

Applicant/Owner: Delta Airport Consultants State: VA Sampling Point: DP1

Investigator(s): SW Section, Township, Range:

Landform (hillslope, terrace, etc.): toe slope Local relief (concave, convex, none): concave

Slope (%): <5 Lat: 39.146074 Long: -78.146065 Datum: NAD 83

Soil Map Unit Name: BLAIRTON SILT LOAM, 2 TO 7 PERCENT SLOPES NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

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
Water Table Present?	Yes ✓	No _____	Depth (inches): 12"
Saturation Present? (includes capillary fringe)	Yes _____	No _____	Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: DP1

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 30)			
1. Typha latifolia	80%	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
	= 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 (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:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ 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 Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ____

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

SOILc

Sampling Point: DP1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/3	100					SiL	
2 - 14	10YR 5/1	80	10YR 5/6	15	C	M	SiCL	

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

Hydric Soil Indicators:c

- ___ 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) **(Lc N, LRcAd147, 148)c**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLc Ad147, 148)**
- ___ Thin Dark Surface (S9) **(MLc Ad147, c148)c**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(Lc N,c LRcAd136)**
- ___ Umbric Surface (F13) **(MLc Ad136, 122)c**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)c**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydri Soils [3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coastal 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? c Yes ✓ **c** **No** ___ **c**

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Winchester Regional Airport City/County: Frederick Sampling Date: 11/8/2023

Applicant/Owner: Delta Airport Consultants State: VA Sampling Point: DP2

Investigator(s): SW Section, Township, Range:

Landform (hillslope, terrace, etc.): sideslope Local relief (concave, convex, none): concave

Slope (%): 6 Lat: 39.146143 Long: -78.1460841 Datum: NAD 83

Soil Map Unit Name: BLAIRTON SILT LOAM, 2 TO 7 PERCENT SLOPES NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes _____ No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

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): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: DP2

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 30)			
1. Solanum carolinense	15	Yes	FACU
2. Festuca rubra	15	Yes	FACU
3. Rubus allegheniensis	20	Yes	FACU
4. Trifolium pratense	15	Yes	FACU
5. Trifolium repens	15	Yes	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
	= 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: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 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:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ 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 Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes _____ No ✓

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

SOILc Sampling Point: DP1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 4/3	100					SiL	
3 - 6	10YR 5/6	100					SiL	
6+	Rock						Rock	

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

Hydric Soil Indicators:c

- ___ 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) **(Lc N, LRcAd147, 148)c**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLc Ad147, 148)**
- ___ Thin Dark Surface (S9) **(MLc Ad147, c148)c**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(Lc N,c LRcAd136)**
- ___ Umbric Surface (F13) **(MLc Ad136, 122)c**
- ___ Piedmont Floodplain Soils (F19) **(MLRAd148)c**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydri Soils[3]:

- ___ 2 cm Muck (A10) **(MLRAd147)**
- ___ Coastal 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? c Yes ___c___ No ___✓___c

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Winchester Regional Airport City/County: Frederick Sampling Date: 11/8/023

Applicant/Owner: Delta Airport Consultants State: VA Sampling Point: DP3

Investigator(s): SW Section, Township, Range:

Landform (hillslope, terrace, etc.): toe slope Local relief (concave, convex, none): none

Slope (%): <5 Lat: 39.146212 Long: -78.145229 Datum: NAD 83

Soil Map Unit Name: BLAIRTON SILT LOAM, 2 TO 7 PERCENT SLOPES NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes _____ No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

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): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: DP3

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 30)			
1. Solanum carolinense	15	Yes	FACU
2. Andropogon virginicus	20	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
	= 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: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 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:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ 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 Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes _____ No ✓

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

SOILc

Sampling Point: DP1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 3	10YR 3/3	100					L	
3 - 13	10YR 5/4	90	10YR 4/2	<5	D	M	SiL	

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

Hydric Soil Indicators:c

- ___ 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) **(Lc N, LRcAd147, 148)c**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLc Ad147, 148)**
- ___ Thin Dark Surface (S9) **(MLc Ad147, 148)c**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(Lc N,c LRcAd136)**
- ___ Umbric Surface (F13) **(MLc Ad136, 122)c**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)c**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydri Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coastal 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? c Yes ___c___ No ✓ c

Remarks:

WETLAND DETERMINATION DATA Fc RM – Eastern Mountains and Piedmont c

Project/Site: Winchester Regional Airport City/County: Frederick Sampling Date: 11/8/2023

Applicant/Owner: Delta Airport Consultants State: VA Sampling Point: DP4

Investigator(s): SW Section, Township, Range:

Landform (hillslope, terrace, etc.): footslope along stream bottom Local relief (concave, convex, none): concave

Slope (%): <5 Lat: 39.144826 Long: -78.142421 Datum: NAD 83

Soil Map Unit Name: WEIKERT-BERKS CHANNERY SILT LOAMS, 15 TO 25 % Slope NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

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): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: DP4

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Juniperus virginiana	25	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (Plot size: 30)			
1. Quercus alba	15	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 30)			
1. Rubus allegheniensis	20	Yes	FACU
2. Solidago altissima	15	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
	= 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 (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:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ 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 Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes _____ No ✓

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

SOILc Sampling Point: DP1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 4/3	100					SiL	
1-12	10YR 5/4	100					SiL	
12+	rock							

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

Hydric Soil Indicators:c

- ___ 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) **(Lc N, LRcAd147, 148)c**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLc Ad147, 148)**
- ___ Thin Dark Surface (S9) **(MLc Ad147, 148)c**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(Lc N,c LRcAd136)**
- ___ Umbric Surface (F13) **(MLc Ad136, 122)c**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)c**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydri Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coastal 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? c Yes ___c___ No ✓ c

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Winchester Regional Airport City/County: Frederick Sampling Date: 11/8/2023

Applicant/Owner: Delta Airport Consultants State: VA Sampling Point: DP5

Investigator(s): SW Section, Township, Range:

Landform (hillslope, terrace, etc.): footslope Local relief (concave, convex, none): concave

Slope (%): <5 Lat: 39.144301 Long: -78.142891 Datum: NAD 83

Soil Map Unit Name: BLAIRTON SILT LOAM, 2 TO 7 PERCENT SLOPES NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes _____ No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

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): _____
Saturation Present? (includes capillary fringe)	Yes _____	No _____	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: DP5

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 30)			
1. Solanum carolinense	20	Yes	FACU
2. Andropogon virginicus	15	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	35 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
	= 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: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 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:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ 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 Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes _____ No ✓

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

SOILc Sampling Point: DP1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 4/3	100					SiL	
3-11	10YR 5/6	100					SiL	
11+	rock						rock	

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

Hydric Soil Indicators:c

- ___ 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) **(Lc N, LRcAd147, 148)c**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLc Ad147, 148)**
- ___ Thin Dark Surface (S9) **(MLc Ad147, 148)c**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(Lc N,c LRcAd136)**
- ___ Umbric Surface (F13) **(MLc Ad136, 122)c**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)c**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydri Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coastal 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? c Yes ___c___ No ✓ c

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Winchester Regional Airport City/County: Frederick Sampling Date: 11/8/2023

Applicant/Owner: Delta Airport Consultants State: VA Sampling Point: DP6

Investigator(s): SW Section, Township, Range:

Landform (hillslope, terrace, etc.): toe slope Local relief (concave, convex, none): concave

Slope (%): <5 Lat: 39.144341 Long: -78.14333 Datum: NAD 83

Soil Map Unit Name: BLAIRTON SILT LOAM, 2 TO 7 PERCENT SLOPES NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** **Yes ✓ No _____**
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

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

Water Table Present? Yes ✓ No _____ Depth (inches): 10"

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants. Sampling Point: DP6

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Shrub Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 30)			
1. Juncus effusus	30	Yes	FACW
2. Scirpus atrovirens	15	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	45 = Total Cover		
Woody Vine Stratum (Plot size: 30)			
1.			
2.			
3.			
4.			
5.			
	= 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 (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:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ 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 Five Vegetation Strata:

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

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

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

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

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ____

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

SOILc

Sampling Point: DP6

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/3	100					SiL	
3-14	10YR 5/1	60	10YR 5/8	5	C	M	SiCl	
	10YR 4/2	30						

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

Hydric Soil Indicators:c

- ___ 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) **(Lc N, LRcAd147, 148)c**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLc Ad147, 148)**
- ___ Thin Dark Surface (S9) **(MLc Ad147, 148)c**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(Lc N,c LRcAd136)**
- ___ Umbric Surface (F13) **(MLc Ad136, 122)c**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)c**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydri Soils [3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coastal 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? c Yes ✓ **c** **No** ___ **c**

Remarks:

Appendix G:
Project Area Photographs

Photo 1: Western project area. Photo facing southeast.

Photo 2: Western project area. Photo facing west looking at stormwater management facility.

GREENWAY ENGINEERING

Photo 3: Western project area. Photo facing east.

Photo 4: Western project area. Photo facing northwest.

Photo 5: Northern project area. Photo facing north.

Photo 6: Northern project area. Photo facing northwest.

Photo 7: Wetland A. Photo facing northeast.

Photo 8: Soil Profile at Data Point 1 in Wetland A.

Photo 9: Upland area at Data Point 2. Photo facing northeast.

Photo 10: Soil Profile at Data Point 2.

GREENWAY ENGINEERING

Photo 11: Data Point 3 in upland area. Photo facing northeast.

Photo 12: Soil profile at data point 3.

Photo 13: Stream A. Photo facing northeast.

Photo 14: Central project area. Photo facing northwest.

Photo 15: Central project area. Photo facing southeast.

Photo 16: Central project area. Photo facing southeast.

Photo 17: Upland area at Data Point 4. Photo facing west.

Photo 18: Soil Profile at Data Point 4.

Photo 19: Upland area at Data Point 5. Photo facing west.

Photo 20: Soil Profile at Data Point 5 in upland area.

Photo 21: Wetland B. Photo facing east. Data Point 6.

Photo 22: Soil Profile at Data Point 6.

Photo 23: Stream B. Photo facing west.

Photo 24: Drainage swale west of Wetland B area. Photo facing east.

Attachment F

Preliminary Engineering Report

Environmental Assessment: Northside Development

Winchester Regional Airport (OKV)

Prepared for: Winchester Regional Airport Authority

Prepared by: Delta Airport Consultants, Inc.
5/15/2024

Preliminary Engineering Report

for

Environmental Assessment: Northside Development at the Winchester Regional Airport Frederick County, Virginia

AIP Project No.: 3-51-0059-045-2023
Delta Project No.: 22081

Prepared for the Winchester Regional Airport Authority

By Delta Airport Consultants, Inc.

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1. PURPOSE OF PRELIMINARY ENGINEERING REPORT (PER)

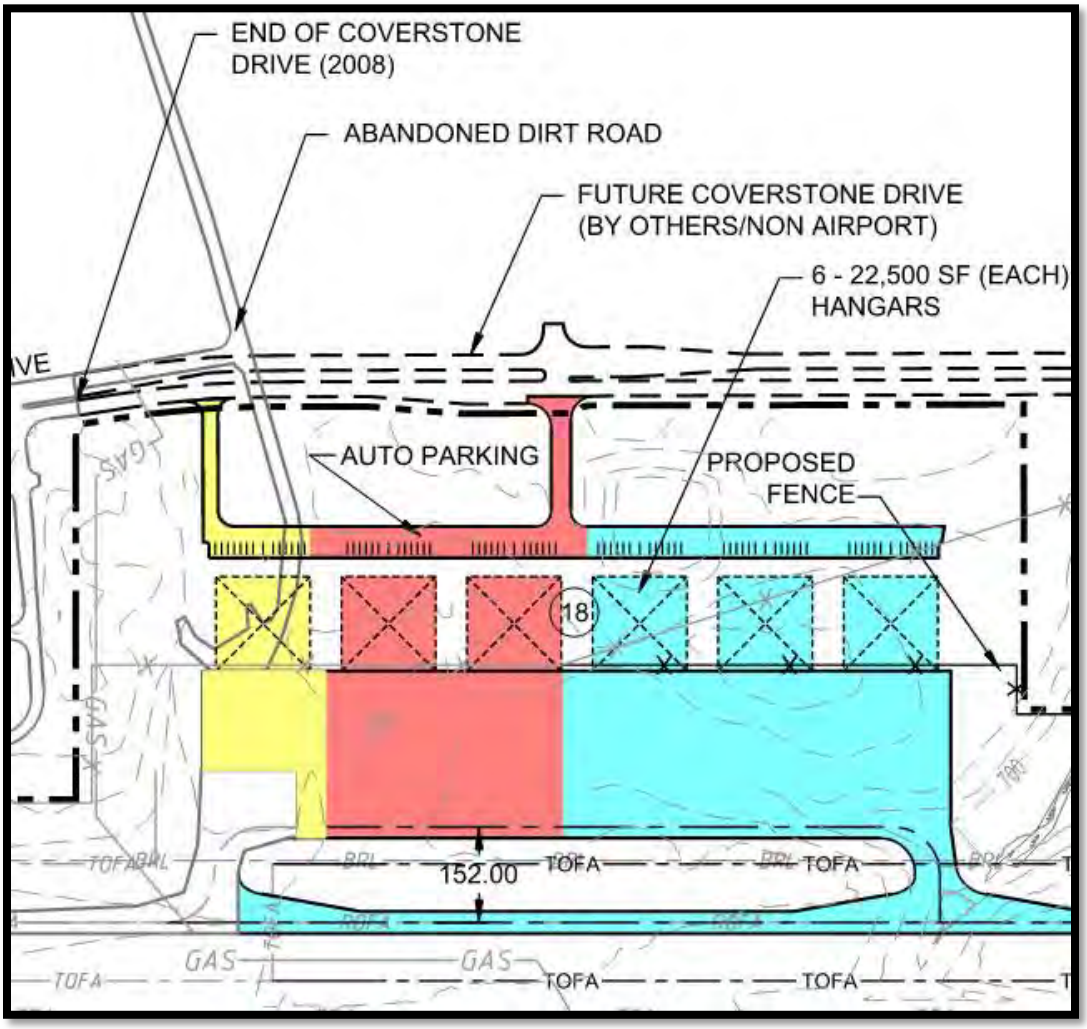
The purpose of this report is to summarize the preliminary engineering effort associated with the Environmental Assessment (EA) being completed for the Northside Development Site at Winchester Regional Airport in Winchester, Virginia. Figure 1 identifies the proposed development site within the airport property.

Figure 1: Proposed Site Development on Winchester Regional Airport

Source: Delta Airport Consultants, Inc.

The airport owner, the Winchester Regional Airport Authority (the Authority), has expressed a desire to develop the site as Conceptually depicted on the approved Airport Layout Plan (ALP). See Figure 2 for the section of the approved ALP with the Conceptual layout. The Airport Authority is preparing an EA in accordance with the National Environmental Protection Act (NEPA) to review potential impacts of the proposed development.

Figure 2: ALP Conceptual Layout



Source: 2005 ALP for OKV, last revised March 2021

The preliminary engineering effort will include the following:

- Geometric design standards and pavement limits
- Grading design standards
- Conceptual drainage
- Conceptual erosion and sediment control measures
- Approximate grading limits/limits of disturbance
- Stormwater management requirements
- Potential utility conflicts
- Potential environmental or historical impacts
- Offsite property impacts
- Engineers' opinion of probable cost

2. PROJECT DESCRIPTION

The Northside Development site is an approximately 47 acre (ac) site intended for aeronautical development with direct access to the single runway at Winchester Regional Airport (OKV). The approved ALP depicts an extension of the partial parallel Taxiway B, an aircraft apron, large clear span hangars, and auto access and parking. In addition to the scenario depicted on the ALP, the Airport Authority wants to study two other development scenarios for the site. They include a large single manufacturing facility and an airpark layout with numerous smaller hangars. Section 3 will provide additional information on each of the development scenarios.

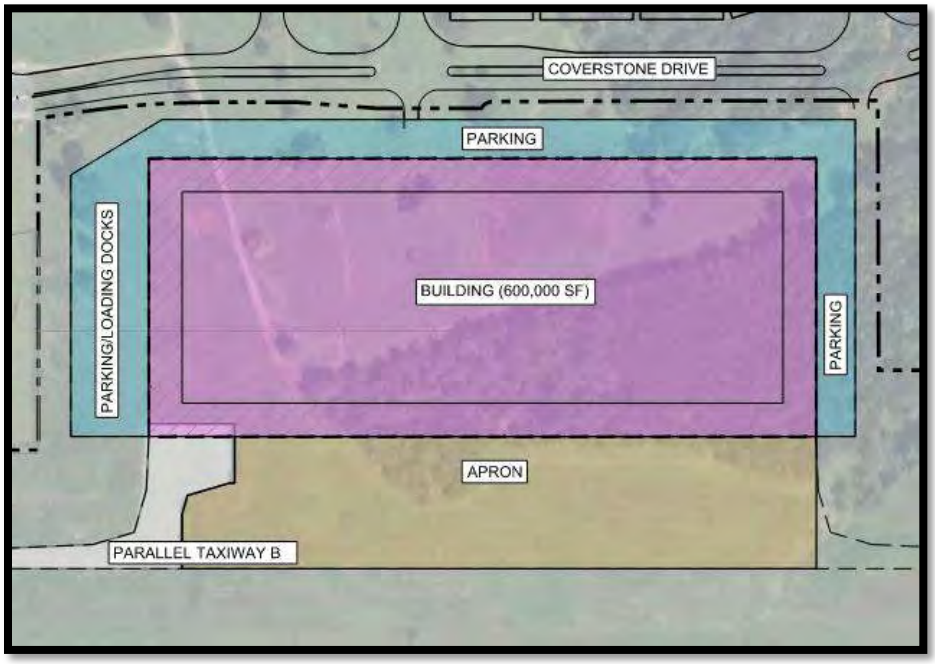
3. DEVELOPMENT SCENARIOS

3.1 AIRCRAFT MANUFACTURING FACILITY (DEVELOPMENT SCENARIO 1)

This scenario includes a large facility, approximately 600,000 square feet (sf), for original equipment manufacturing of small aircraft, both fixed wing and vertical take-off and landing. Figure 3 provides a depiction of this scenario. For this scenario, an aircraft apron would connect the facility with the extension of Taxiway B along the western length of the proposed apron. Auto parking and circulation would surround the building as needed to meet local parking requirements. Access would be from the proposed Coverstone Drive extension conducted by others[1]. Utilities would need to be extended from existing systems along Coverstone Drive to the new facility. Space for a traditional fuel farm and/or electronic charging station will be accounted for.

[1] As of spring 2024, the One Logistics Park industrial site is under construction directly northeast of the airport property across Coverstone Drive. Currently, Coverstone Drive terminates just after the Frederick County Sheriff's office and prior to the airport's development site . The parcel was rezoned in 2021 from residential to industrial use. As part of the rezoning approvals, Frederick County has required the developers to extend Coverstone Drive to Millwood Pike to serve as an urban four-lane divided collector road with turn lanes.

Figure 3: Aircraft Manufacturing Facility Scenario

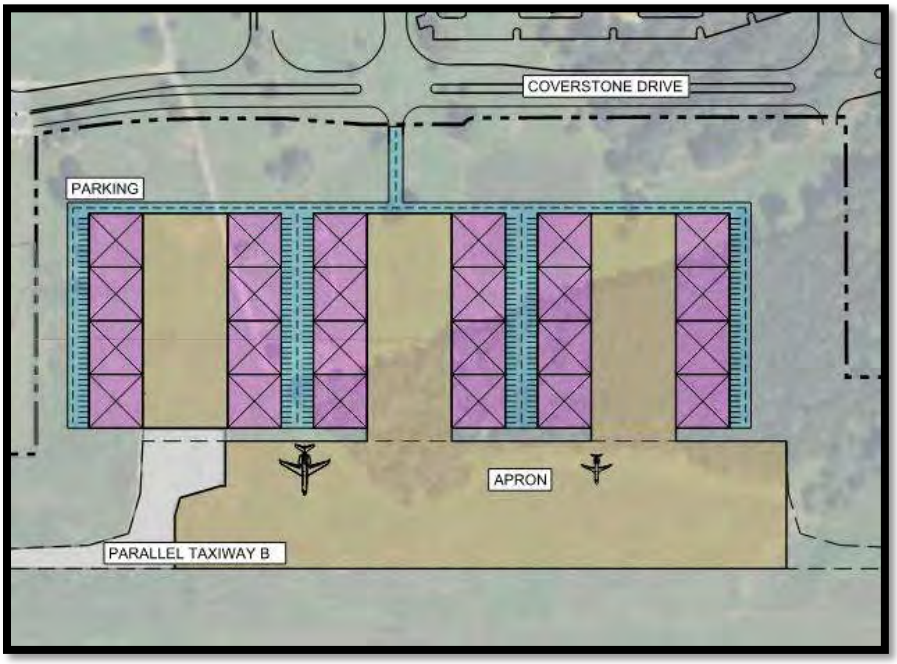


Source: Delta Airport Consultants, Inc.

3.2 AIRPARK DEVELOPMENT (DEVELOPMENT SCENARIO 2, CONCEPT 1)

This scenario includes mid-size clear span hangars grouped along taxilanes to maximize the number of hangars. These hangars could be used for aircraft maintenance operations or aircraft storage. Figure 5 provides a depiction of this scenario. For this scenario, hangar taxilanes would extend perpendicularly from Taxiway B with hangars on either side of the taxilane. Auto parking and circulation would be constructed on the backside of the hangars as needed to meet local parking requirements. Access would be from the proposed Coverstone Drive extension. Utilities would need to be extended from existing systems along Coverstone Drive to the new hangars. Space for a traditional fuel farm and/or electronic charging station will be accounted for.

Figure 4: Airpark Development (Scenario 2, Concept 1)

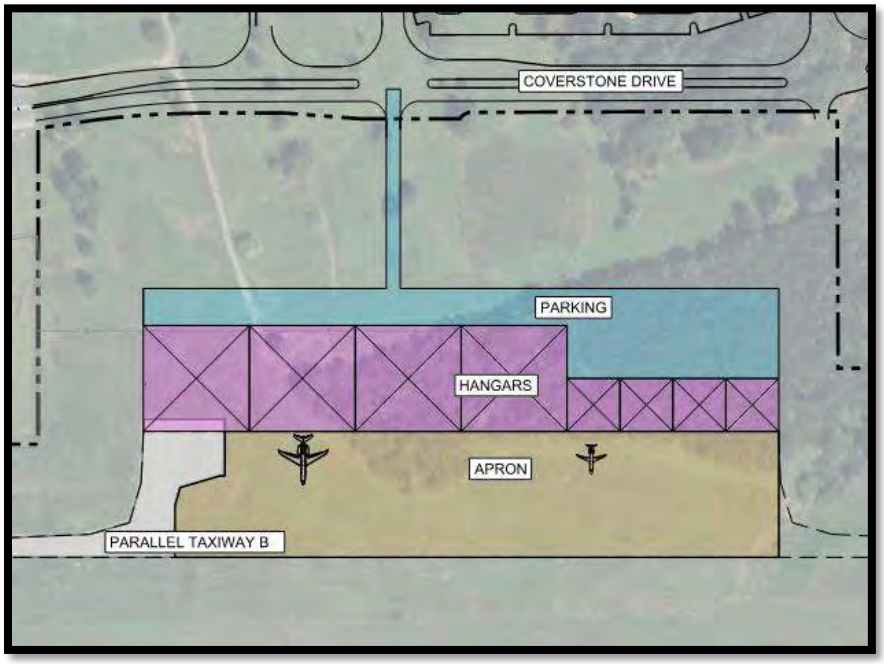


Source: Delta Airport Consultants, Inc.

3.3 AIRPARK DEVELOPMENT (DEVELOPMENT SCENARIO 2, CONCEPT 2)

This scenario includes large clear span hangars similar to what is depicted on the ALP. These hangars could be used for aircraft maintenance operations or aircraft storage. Figure 4 provides a depiction of this scenario. For this scenario, an aircraft apron would connect the hangars with the extension of Taxiway B the length of the site. Auto parking and circulation would be constructed on the backside of the hangars as needed to meet local parking requirements. Access would be of the proposed Coverstone Drive extension. Utilities would need to be extended from existing systems along Coverstone Drive to the new hangars. Space for a traditional fuel farm and/or electronic charging station will be accounted for.

Figure 5: Airpark Development (Scenario 2, Concept 2)



Source: Delta Airport Consultants, Inc.

3.4 MOST CONSERVATIVE

All the scenarios were analyzed based on estimated impervious areas, disturbed areas, and assumed traffic flows that could affect Coverstone Drive and the airport. Conceptual layouts of all scenarios were developed and analyzed. Exhibits 1, 2, and 3 in **Appendix A** show the options that were evaluated. Table 1 summarizes the estimated impacts from each layout. The large hangar/aircraft manufacturing facility is assumed to have the greatest total impacts because it has the largest area of disturbance, largest increase in impervious area, and largest increase on auto traffic volumes; this scenario has been carried forward in the Preliminary Engineering analysis as the "worst case" development scenario.

Table 1: Summary of Estimated Impacts of the Three Build Scenarios

Development Project	Impervious Area Increase (AC)	Amount of Disturbance (AC)	Auto Traffic Volumes (VEH/YR)[7]	Flight Traffic Volumes (Operations/YR)
Aircraft Manufacturing Facility (Scenario 1)	24.5	42	112,950[1]	400[2]
Airpark Development (Scen. 2, Concept 1)[3]	14	39	7,032[4]	7,032[5]
Airpark Development (Scen. 2, Concept 2)[6]	19	42	3,140[4]	3,140[5]

1. **Assumed 450 employees and 251 working days a year**
2. **Assumed 200 annual single engine piston and 200 annual rotorcraft operations**
3. **Assumed to accommodate 48 turboprops and 24 jets**
4. **Each aircraft departure requires 2 auto roundtrips (pilot and passenger driving separately)**
5. **Assumes 94 annual operations per turboprop aircraft and 105 annual operations per jet**
6. **Assumed to accommodate 20 turboprops and 12 jets**
7. **Vehicles per year (VEH/YR)**

Note: Calculations above do not include impervious surface related to a potential fuel farm/electric chargers

4. PROPOSED ACTION

The Proposed Action being reviewed in the EA and associated PER is as follows:

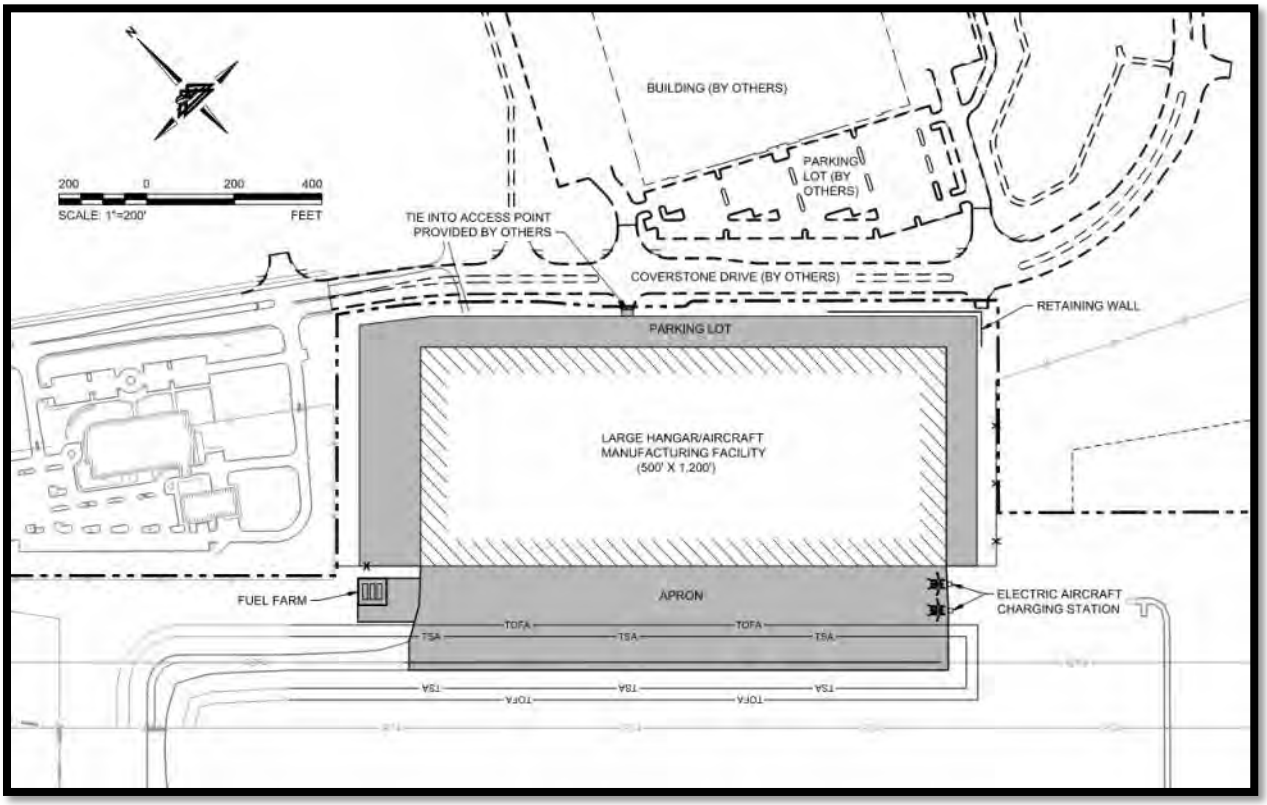
1. Large Hangar/Aircraft Manufacturing Facility up to 600,000 square feet in size
2. Associated Apron (35,000 square yards)
3. Automobile Parking (25,000 square yards)
4. Fuel Farm/Electric Aircraft Chargers

The future use of the development site is not yet known. Assumptions made during preparation of the EA are that the project site could accommodate a future aeronautical use such as aircraft manufacturing and final assembly (assumed to be the manufacture of advanced air mobility (AAM)/electric vertical take-off and landing (eVTOL) aircraft) or aircraft maintenance and/or storage.

5. NORTHSIDE DEVELOPMENT PROJECTS

The Northside Development has been broken down into four components: the manufacturing facility, the taxiway and apron, the parking lot, and the fuel/charging facilities. A depiction of the combined geometric layout of all components can be found below in Figure 6 or at a larger scale in Exhibit 4 of **Appendix A**.

Figure 6: Proposed Development Scenario



Source: Delta Airport Consultants, Inc.

5.1 LARGE HANGAR/AIRCRAFT MANUFACTURING FACILITY

A 600,000± square foot (SF) building/aircraft manufacturing facility is proposed on the northern side of the property. This is the most conservative development scenario proposed and as such was selected for review in this preliminary engineering analysis.

5.2 ASSOCIATED TAXIWAY AND APRON

To provide access to the proposed hangar/manufacturing facility, the partial parallel Taxiway B will be extended and an apron connecting the hangar/facility to the taxiway is proposed to be constructed. The proposed apron is anticipated to be approximately 35,000 square yards (sy).

5.3 ASSOCIATED AUTOMOBILE PARKING AND ACCESS

To support the hangar/manufacturing facility, a proposed parking lot is to be constructed looping from the north side of the building to the south side. Access to the parking lot and facility is proposed to be from Coverstone Drive. Currently the road stops after the Frederick County Sheriff's office and prior to the development site. However, just north of the project site, an industrial park is under development, One Logistics Park. The developers of One Logistics Park will be extending Coverstone Drive and in addition will be providing two access points to tie into. Figure 7 depicts the proposed development of One Logistics Park. Due to grading restraints, it is likely that only one of the two access points will be viable to serve Airport users. Access points are illustrated in Exhibit 4 of **Appendix A.**

Figure 7: One Logistics Park

Source: One Logistics Park/Colliers

5.4 FUEL FARM AND ELECTRIC AIRCRAFT CHARGERS

Depending on the ultimate future use of the site, the facility could include two, 20,000 gallon tanks of Jet-A; one, 12,000 gallon tank of AvGas (or its unleaded equivalent); and/or two electric aircraft charging facilities. For the purpose of this analysis, it was assumed that both the fuel farm and electric charging stations would be installed. In the Conceptual layout reviewed for this preliminary engineering effort, the fuel farm is proposed to be built on the northwest side of the proposed apron and the electric charging stations would be located directly across the apron on the southeast side.

Market research noted in the Airport Cooperative Research Program (ACRP) Research Report 236 shows that approximately two percent of the United States aircraft fleet could be electric by the year 2030. Applying this percentage to the potential aircraft which could be housed in Development Scenario 2, Concept 1 and Scenario 2, Concept 2 results in the assumption that one or two based aircraft in the Northside would be electric and would require electric charging capabilities. This does not take into account the transient aircraft that would need to use the chargers. In Scenario 1 (Aircraft Manufacturing Facility), the assumption is that the AAM/eVTOL aircraft being manufactured and tested on site would need to be charged.

6. DESIGN ELEMENTS

6.1 GEOMETRIC AND GRADING

6.1.1 LARGE HANGAR/AIRCRAFT MANUFACTURING FACILITY

The aircraft manufacturing facility depicted in the "worst case scenario" is a 600,000 square foot building (1,200' by 500'). These dimensions were assumed since they seem to provide the best use of space. The edge of building was set 620' from the runway centerline. This distance keeps it outside the key airspaces discussed in Section 6.6.5. In addition to airspace constraints to the southwest, the building needs to follow the county setback requires to the northwest, northeast, and southeast where the airport property line is. The front setback requirement for the building is 60 feet and the side and rear setback requirements for the building are 100 feet. The Frederick County Fire Prevention Code (FCFPC) calls for building separation of 50 feet.

Based on preliminary grading, the finished floor elevation for the building/aircraft manufacturing facility is anticipated to be 720' mean sea level (MSL). This was determined based on the profile and grade of the associated taxiway and apron as well as trying to maintain a relatively even cut/fill. The building, apron, and taxiway site combined results in an approximate required net fill of 30,000 cubic yards. This fill will likely be provided by the cut that will be generated from the basin expansion described in Section 6.4.1.

6.1.2 ASSOCIATED TAXIWAY AND APRON

The preliminary design of the taxiway was prepared in accordance with the FAA's Advisory Circular (AC) 150/5300-13B, *Airport Design*, Tables 4-1 and 4-2, which can be found in **Appendix A.** The Airplane Design Group (ADG) III and Taxiway Design Group (TDG) 2B were used to size the taxiway. The design groups are based off the airport's proposed design aircraft, a Gulfstream 500/550, from the ALP approved March 2021. The fillets were laid out in accordance with Table J-4 of AC 150/5300-13B.

Transverse and longitudinal slopes for the parallel taxiway are to be in accordance with Section 4.14 of AC 150/5300-13B. Longitudinal grades are not to exceed 1.5%, while transverse grades shall be between 1% and 1.5%. Taxiway Safety Area (TSA) grades shall be between 1.5% and 5%. Outside of the TSA, wherever possible, slopes will be limited to 4:1 or flatter for maintainability.

The apron will extend from the Northeast edge of Taxiway B to the face of the building. This makes the apron about 200 feet long and 1,200 feet wide. In addition to complying with airspace restrictions, the building was set back to provide a large apron. This is so that there will be enough room outside of the Taxiway Object Free Area (TOFA) to park aircraft. With the proposed layout, there will be approximately 135 feet between the TOFA and the building face.

The apron will be graded to meet the requirements in the Airport Design AC 150/5300-13B as well as the National Fire Protection Association (NFPA) 407. As required in the NFPA 407, the apron is proposed to slope away at 1% for the first 50 feet off the hangar and may be as flat as 0.5% for the remainder of the apron. The grades on the apron can be a maximum of 2% in accordance with Section 5.9.1.3 of AC 150/5300-13B, but it is recommended that they stay below 1.5% for apron taxilanes servicing aircraft over 30,000 lbs and at or below 1% for parking positions. Exhibits 7 and 8 in **Appendix A** show the preliminary profiles for the taxiway and apron.

6.1.3 ASSOCIATED AUTOMOBILE PARKING AND ACCESS

The Conceptual layout of the parking lot was prepared in accordance with Section 165, Part 202 of the Frederick County, Virginia Code: Off Street Parking, Loading and Access. The setbacks dictated in the code are the following:

1. At least 10 feet away from any street or road right-of-way
2. At least five feet from all other property lines, except in cases where more than one lot
3. In the M1 (Light Industrial) District and M2 (Industrial General) District, parking lots shall be located no closer than 10 feet to any minor or local street or road right-of-way and no closer than 25 feet to any collector or arterial street or road right-of-way

It is assumed that the aircraft manufacturing facility would fall under the use "Wholesaling, warehouses, truck terminals and construction storage, manufacturing and other industrial uses". In accordance with the Frederick County Code, 1.5 parking spots per employee must be provided as well as 1 truck spot for each 40,000 square feet of floor area. It was estimated that 450 employees will work in the 600,000± sf manufacturing facility. Based on this, the facility would require 675 parking spots and 15 truck spots. In order to accommodate these spaces, the parking lot would need to be at least 256,000 sf to accommodate 9' x 20' parking spaces, 12' x 45' truck spots, and a 22' driving lane.

Due to a lack of space in the proposed development area, only a 203,000 sf parking lot will fit. This lot size can accommodate approximately 500 parking spots and 10 truck spots. This assumes that the parking lot will have no green spaces and has an optimal layout. The actual need for parking will depend on the number of employees/users, their schedule, and the ultimate use of the proposed building. Depending on the results of the factors previously listed, an exception to the code might be required.

6.1.4 FUEL FARM AND ELECTRIC AIRCRAFT CHARGERS

The containment area was Conceptually laid out to accommodate two 20,000-gallon jet fuel tanks and one 12,000 gallon Avgas (or its unleaded equivalent) tank. NFPA 30 and 407 were used as guidelines for the initial layout of the containment area. Table 2 highlights the critical spacing requirements.

Table 2: Fuel Farm Spacing Requirements

	Spacing	Code
Fuel Hydrant/Pits to Terminal/Hangar/Service Bldg/Passenger Concourse	50'	NFPA 407
Parked Truck to Parked Truck	10'	NFPA 407
Tanks to Property Line	10'	NFPA 30
Tanks to Nearest Side of Public Way	2.5'	NFPA 30
Tank to Tank	Greater of 3' or 1/6* sum of adjacent tank diameters	NFPA 30

Source: Delta Airport Consultants, Inc.

As for electric aircraft charging station, there are no standardized spacing requirements. However, the spacing requirements for parked aircraft should be followed. This includes being outside object free areas and maintaining a 10-foot minimum wing tip separation between parked aircraft. The Alia-250, an electric vertical take-off and landing aircraft being developed by Beta Technologies, was used as the design aircraft. The charging stations for these aircraft are assumed to have a 25' charge radius.

Figure 8 below shows the potential layout for electric charging stations.

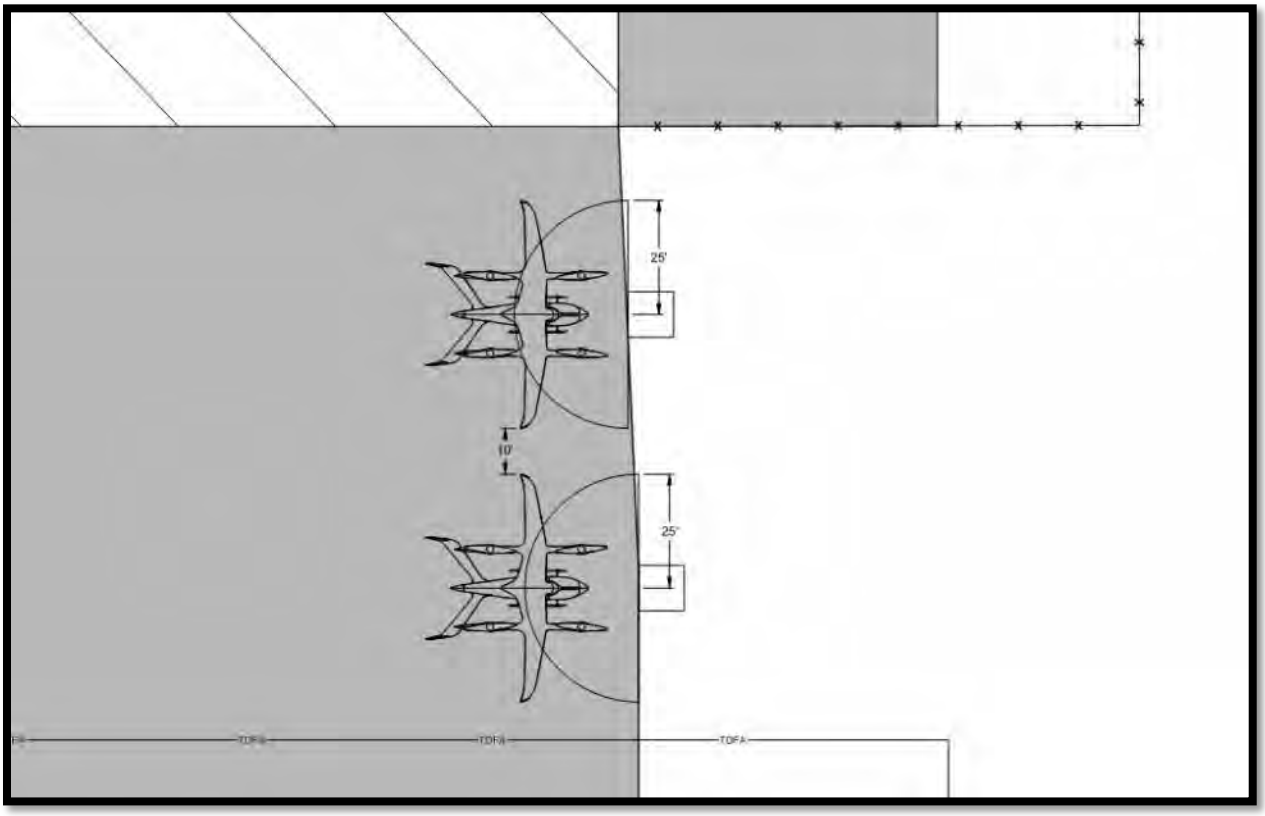
ACRP Research Report 236, *Preparing Your Airport for Electric Aircraft and Hydrogen Technologies* (2022) reports that smaller all-electric general aviation aircraft, such as those likely to operate and charge at OKV in the short term, can be charged in about 45 minutes with 40 to 60 kW chargers. Two aircraft charging simultaneously would have an electric demand of approximately 80 to 120 kW. Assuming the AAM aircraft which require charging at OKV in the short term (next five years) are small general aviation aircraft, this additional electricity requirement is not anticipated to require the airport to upgrade its main electrical connection to the greater power grid, and the required infrastructure modifications are anticipated to be the installation of the charging stations and associated power distribution and management systems. However, the same report notes that small commuter aircraft may require from 400 to 600 kW for charging. This would increase the energy needs to up to 1,200 kW, or more than 1 W, should two aircraft charge simultaneously. This may require upgrades to the existing electrical capacity at the airport. The ultimate need for electricity to serve electric aircraft at OKV will depend on several factors, such as type of aircraft, density of traffic, and preferred charging speed.

6.2 POTENTIAL UTILITY CONFLICTS

To accommodate the proposed manufacturing facility, water and sewer line connections will need to be made. Water and sewer lines are anticipated to be designed in accordance with Frederick Water and Sewer Standards and Specifications. One Logistics Park is extending the water and sewer and adding stub outs to the airport property during their development. The manufacturing facility's water and sewer are anticipated to connect at that point.

A gas line runs through the east side of the proposed development. This gas line was relocated and the piece that runs under the development sight was abandoned in place as part of the Airport's Construct Northside Connector project in 2017. The abandoned line will potentially need to be removed while the existing gas line could need another relocation due to the proximity of the proposed fuel farm. Please see Exhibit 5 in **Appendix A** for a reference of gas, electrical, and water utilities, as well as the proposed location of the stub outs provided by One Logistics Park. Power, including the potential need for additional electrical capacity, will need to be coordinated with the appropriate utility companies once the future use of the site has been confirmed.

Figure 8: Electric Aircraft Charge Station Spacing



Source: Delta Airport Consultants, Inc.

6.3 IMPERVIOUS SURFACE ADDITIONS

Based on the proposed layout and assuming that the ultimate development would include both a fuel farm and two electric aircraft chargers, approximately 26 acres of impervious surface is anticipated to be added. The approximate net impervious changes for the development are summarized below in Table 3.

Table 3: Impervious Area Additions

Development Project	Impervious Area (ac)
Aircraft Manufacturing Facility	14
Associated Apron	6
Automobile Parking	5
Fuel Farm/Electric Aircraft Chargers	1

Source: Delta Airport Consultants, Inc.

According to the Frederick County, Virginia Code, there are no “Open Space” requirements for rural area zoning with developments designated for commercial use.

6.4 STORMWATER ANALYSIS

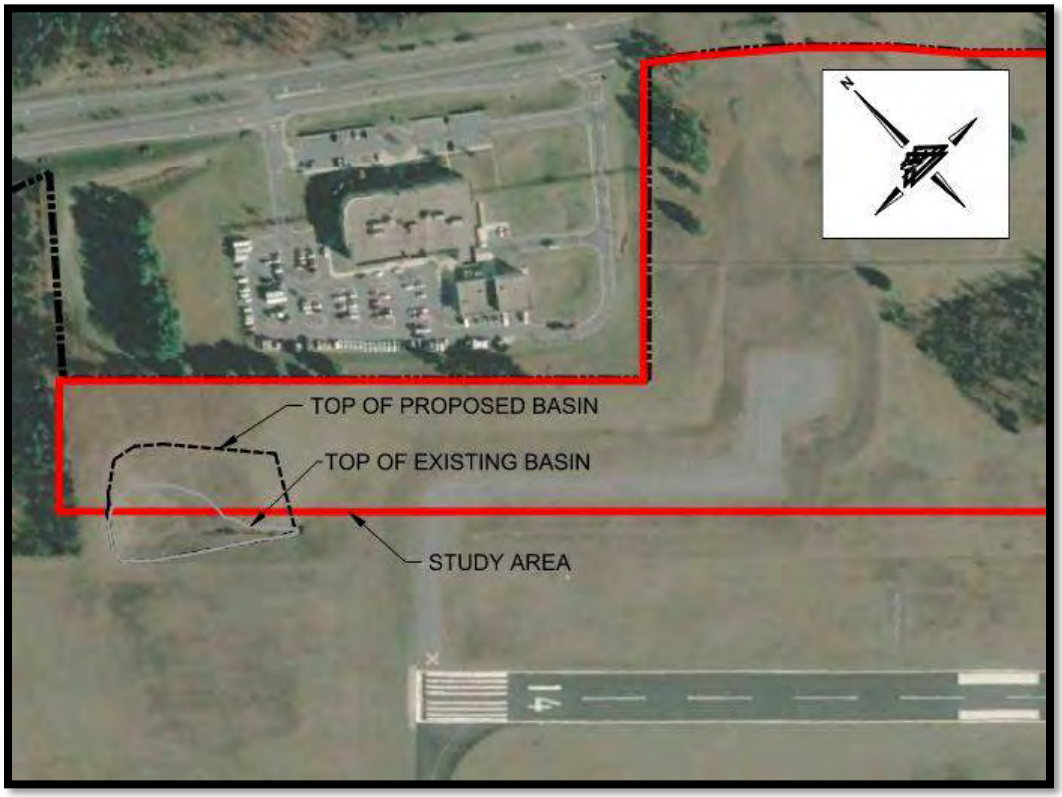
The Frederick County, Virginia Code, Chapter 143 requires a stormwater management plan for all new construction. The regulations provide requirements for water quality and water quantity controls for the 1-, 2-, and 10-year storm events for water quality treatment, channel protection, and flood control.

An analysis was conducted to evaluate future stormwater impacts due to the Proposed Actions and ultimate build-out conditions of the site. The purpose of the study was to review existing stormwater drainage features and determine future catchment areas to ensure sufficient space was reserved for required stormwater controls. Existing drainage basins and stormwater management facilities were identified and compared to previous stormwater studies prepared for the site to understand existing conditions. The preliminary grading was used to delineate future drainage basins to compare with existing and future treatment areas.

6.4.1 WATER QUANTITY

There is an existing basin just north of the Runway 14 end, shown in Figure 9. It is anticipated that the site will be developed so that the majority of stormwater is directed into this basin. This results in a significant increase in drainage area and peak inflows. In order to manage this increase, the basin's storage volume will need to be significantly increased. Table 4 summarizes the changes in the basin that are needed.

Figure 9: Existing and Proposed Basin



Source: Delta Airport Consultants, Inc.

Table 4: Pre vs Post Development Basin

Property	Pre	Post
Invert Elevation (MSL)	689	687
Storage Volume (cy[1])	5,435	19,149
Drainage Area (ac[2])	32	54
Peak Inflow (cfs[3])	46	196
Max Water Depth (ft)	7.43	9.36
Max Water Elevation (10-year storm, MSL)	696.43	696.36
Top of Basin (MSL)	699	699

Source: Delta Airport Consultants, Inc.

*** All values approximate**

1. Mean sea level
2. Cubic yards (cy)
3. Acre (ac)
4. Cubic feet per second (cfs)

Peak discharge rates for each drainage area were determined for pre- and post-development conditions for the 1-, 2-, and 10-year storm events. Composite curve numbers were developed from soil data for the project site provided by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey and current and proposed land cover. A copy of the soil

report can be found in **Appendix B**. Time of concentrations for each drainage area were determined using the SCS TR-55 Method.

Using Autodesk Storm and Sanitary Analysis (SSA), each pre- and post-drainage area was modelled to determine peak discharges. The results for the 1-, 2-, and 10-year hydrologic analysis can be found in Table 5. Table 6 summarizes information for each pre- and post-development drainage area used in the analysis. An analysis report for each of the three storm events which includes rainfall details and subbasin information can be found in **Appendix B**. Note that the reports contain drainage areas that are not affected by the project. Only drainage areas A4, B, F, and G are affected by this project. Pre- and post-development drainage area maps are located in **Appendix B**.

Table 5: Pre vs Post Development Discharge(cubic feet/second)

	1 year		2 year		10 year	
Outfall	Pre	Post	Pre	Post	Pre	Post
A	0.45	0.54	0.55	0.62	13.37	11.17
B	1.40	2.48	4.53	6.00	28.74	26.75
F	0.00	0.00	0.02	0.02	1.22	1.07
G	0.04	0.00	0.20	0.01	5.70	1.61

***All values approximate**

Table 6: Pre vs Post Development Drainage Areas

	Area (ac)		Curve Number		Time of Concentration (minutes)	
Drainage Area	Pre	Post	Pre	Post	Pre	Post
A4	12	33	56	86	26	7
B	32	22	59	63	29	31
F	4	3	46	48	15	15
G	13	3	51	47	26	5

***All values approximate**

6.4.2 WATER QUALITY

The stormwater management plan must meet the water quantity requirements of Virginia's Code 9VAC25-870-66. In order to meet the channel protection requirements, it is likely that limits of analysis (division B subdivision 4) will need to be utilized. This is because the one-year storm has such a small peak discharge it is likely to cause issues with larger storms if flows for this storm event are reduced. The expansion of the basin should meet the requirements of flood protection set forth in division C since the post-development 10-year storm discharge is less than the pre-development discharge (subdivision 2b). Exhibits 7-9 in **Appendix A** show the drainage scenario for the development site.

In addition to meeting water quantity, the water quality requirements of Virginia's Code 9VAC25-870-63 must be met. This site will be analyzed as new development. Therefore, the total phosphorus shall not exceed 0.41 pounds per year. The Virginia Runoff Reduction Method was used to calculate the amount of phosphorus leaving the site. Without any Best Management Practices (BMPs) in place, this site produces approximately 20 pounds per year. This is a conservative estimate since the whole of any

drainage area that had disturbance within its limits was used as opposed to just the disturbed area. This calculation can be found in **Appendix B**.

The Virginia Code allows offsite alternatives to help address quality requirements (9VAC25-870-69). One of the alternative options is to use the nonpoint nutrient offset program (62.1-44.15:35). This is typically the method that is used on airports to avoid introducing wildlife attractants, such as trees and vegetation, to these facilities. However, this option is limited to less than five acres of disturbance or less than 10 pounds per year.

The only other way to utilize this option is to demonstrate to the Virginia Stormwater Management Program (VSMP) Authority that the following have been considered:

1. Alternative Site Design that accommodate BMPs.
2. Onsite BMPs have been considered in alternative site design to the maximum extent.
3. Appropriate onsite BMPs will be implemented.
4. Compliance with water quality technical criteria cannot practically be met onsite.
5. The requirements of 1-4 are deemed to have been met if it is demonstrated at least 75 percent of the required phosphorus water quality reduction will be achieved.

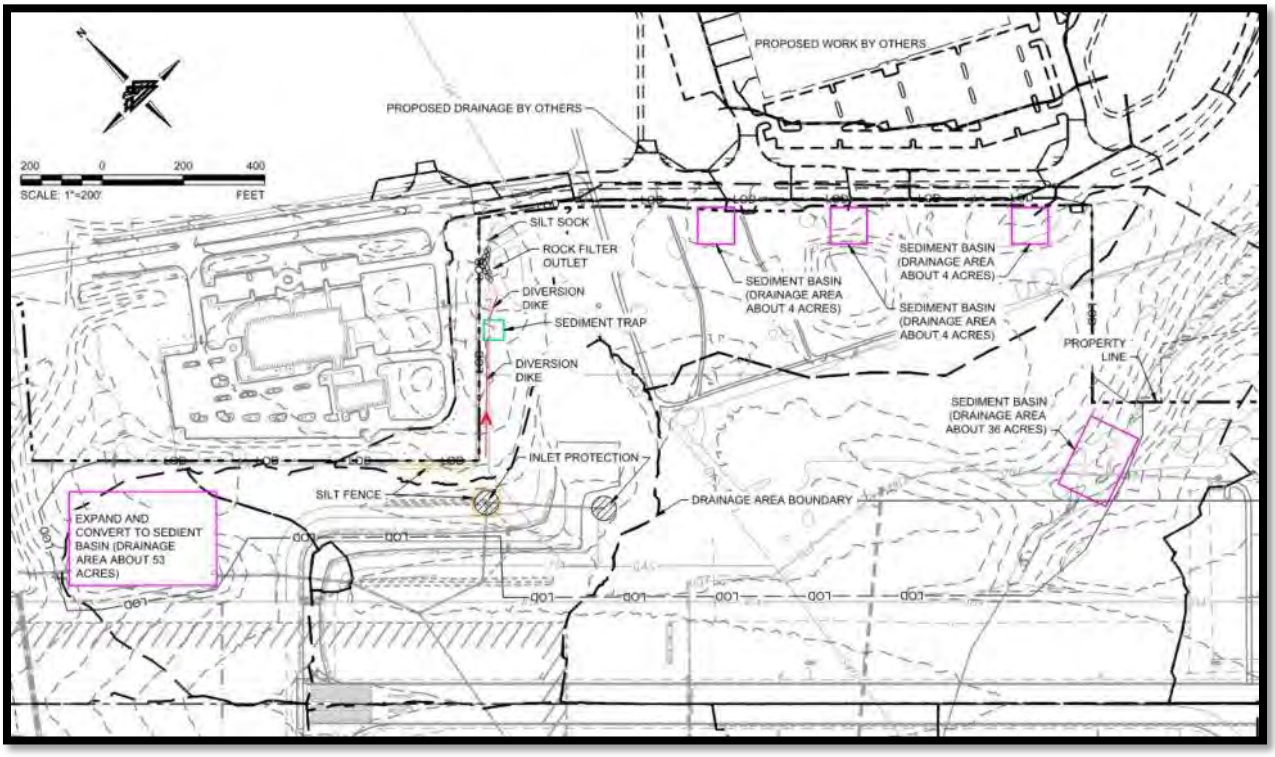
With these criteria, it is likely that some BMPs will need to be designed. Practices that may be able to be incorporated into the development area are grass channels, bioretention, dry or wet swales, and/or permeable pavement. The permeable pavement would only be able to be used on the landside pavement due to the heavy aircraft loads the apron and taxiway will be under. In general, BMPs are best used on the landside of an airport since they tend to be animal attractants. An underground detention basin, although expensive, may be another solution. If used, the existing basin may not need to be expanded or the amount of expansion could be reduced. See **Appendix D** for a more detailed analysis of BMP options.

6.5 EROSION AND SEDIMENT CONTROL MEASURES

Erosion and sediment control is going to be a significant portion of the design process for this project. The limits of construction are close to the property line, the final drainage is anticipated to significantly change the current drainage pattern, and this project requires large limits of disturbance. These constraints create challenges when protecting the site from erosion and sediment.

A Conceptual layout of potential erosion and sediment control measures have been shown in Figure 10 and a larger version in **Appendix A**. Due to large drainage areas, it is assumed sediment basins will be the primary perimeter control measure used. Diversion dikes, silt sock, inlet protection, and silt fence are anticipated to supplement the basins.

Figure 10: Erosion and Sediment Control Scenario



Source: Delta Airport Consultants, Inc.

On the west side of the development site, the existing basin will likely need to be expanded and converted into a sediment basin that can handle approximately 53 acres. Four other basins will need to be constructed at the different outfall points. The three basins along Coverstone Drive are placed at pipe entrances that are proposed to be constructed during the development of One Logistic Park. These basins will each need to handle about 4 to 5 acres. The sediment basin on the south side of the project site will need to be larger and handle approximately 36 acres. A sediment trap, silt fence, diversion dikes, and a rock filter outlet should be able to protect the north side of the property stub out.

In order for the building and apron to be constructed, the erosion and sediment controls will have to be considered carefully when phasing the project. It is likely that the work areas will have to be centered around the erosion and sediment control measures, particularly the sediment basins. The project will probably have to be built around one of the sediment traps and stabilized before the trap can be filled in and move to the next work area/sediment trap area. During the design process, careful consideration should be given to how and where the water is flowing in each stage of construction.

6.6 POTENTIAL ENVIRONMENTAL OR LAND USE IMPACTS

6.6.1 POTENTIAL IMPACTS TO WETLANDS AND STREAMS

A wetlands survey and delineation were conducted in November 2023 as part of this environmental effort within the approximately 47-acre project area. Two wetlands (Wetlands A and B) and two stream channels (Streams A and B) were delineated within the project area (Exhibit 6 in **Appendix A**). Both wetlands are classified as Palustrine Emergent (PEM). Streams A and B appear to both be intermittent channels (see Table 7).

A Jurisdictional Determination (JD) request was submitted to the United States Army Corps of Engineers (USACE) in spring 2024 and is anticipated in June 2024. The permit application would be prepared and submitted during the design phase. At that time, the agencies would advise on jurisdiction of the water resources and permitting and mitigation requirements based on the amount of wetlands and streams being impacted.

Table 7: Waters Classification and Size Within Project Area

Water Feature	Classification	Size
Wetland A	PEM	0.15 acres
Wetland B	PEM	0.17 acres
Stream A	Intermittent	261 LF
Stream B	Intermittent	473 LF

Source: Greenway Engineering, 2023

Based on the preliminary analysis conducted as part of this EA effort, the grading associated with the proposed development would require that Wetland A and Stream A be graded and filled. This represents an impact of approximately 0.15 acres of wetland and approximately 261 feet of stream, which are expected to correspond to a State Programmatic General Permit (SPGP) and a state general permit (WP1). The level of permit required would be confirmed by the permitting agencies during the design phase.

Compensatory mitigation for the loss of aquatic resources is generally required for impacts that exceed 0.10 acre. The current wetland mitigation ratio for PEM wetlands is 1:1, suggesting that 0.15 acres of wetland credits would be required. Stream mitigation credits are based on stream assessments using the Unified Stream Methodology (USM). An assumption of 1.3:1 stream ratio was used to calculate potential credits needed for the approximately 261 LF of stream impacts, which would require approximately 340 stream credits. These estimates will vary based on agency approval, stream assessment, credit cost and availability at the time that permitting and mitigation takes place.

The primary sources of compensatory mitigation accepted by the USACE and the Virginia Department of Environmental Quality (DEQ) are listed below, in order of agency preference:

- purchasing credits from an authorized mitigation bank
- participation in an in-lieu fee program (which involves funds paid to a governmental or non-governmental natural resource management organization to restore, establish, enhance, and/or preserve resources on an applicant's behalf)
- Permittee Responsible Mitigation (PRM) (which involves construction and monitoring of wetland resources by the applicant itself)

As of spring 2024, according to the USACE's Regulatory In-Lieu Fee and Bank Information Tracking System (RIBITS), there are no mitigation credits (including pending credits) listed for the Hydrologic Unit Code (HUC-8) watershed where the project would take place. Should wetland and stream credits be unavailable as the project moves forward, mitigation options would include federal and/or state in-lieu fee programs and PRM. These would be refined in coordination with the permitting agencies in a compensatory mitigation plan prepared during the design and permitting phase.

6.6.2 POTENTIAL IMPACTS TO HISTORIC OR CULTURAL RESOURCES

The Proposed Action would occur on airport property. The Virginia Department of Historic Resources (DHR) V-Cris website depicts the Second Winchester Battlefield/Apple Pie Ridge (DHR ID 034-5023) boundary as including the western portion of airport property, including the western half of the proposed development site. The Second Winchester Battlefield is the site of a June 1863 battle during the American Civil War and the resource has been recommended for listing on the National Register of Historic Places (NRHP). The V-Cris database identifies several other resources near the proposed development site, none of which have been classified as eligible for listing on the NRHP.

During preparation of this report and associated EA, the DHR confirmed that it does not anticipate historic impacts as a result of the proposed development if the project scope does not change and provided that design drawings and/or more concrete plans are provided to DHR. Coordination with Native American tribes that have expressed interest in Frederick County also did not result in identified, anticipated impacts.

6.6.3 POTENTIAL LAND USE IMPACTS

The airport is currently zoned under rural area (RA), while One Logistics Park is zoned under industrial use (M1). RA zoning has a height restriction of 35 feet and M1 zoning has a height restriction of 60 feet.. A rezoning or conditional use permit may be required should the height of the proposed building exceed what is permitted by right.

6.6.4 OFFSITE IMPACTS

The biggest offsite impact will be if any updates to Coverstone Drive need to be made due to the installation of a large Manufacturing Facility. The developers of One Logistics Park have likely coordinated traffic flow for the road extension and improvements. However, it is possible that a 600,000 square foot facility would produce enough additional traffic to require additional road and/or signal improvements.

In addition to road and signal improvements, the access points for the new facility off Coverstone Drive will need to be considered. Although One Logistic Park is providing access points off Coverstone Drive, they may need to be modified depending on the design vehicle or additional entrances may be required depending on the ultimate use of the facility. The access point off the road will likely be classified as

commercial entrances under the Virginia Department of Transportation (VDOT) road manual. Design guidance for entrances is found in Appendix F of the manual. One of the critical components will be a turn lane analysis. If a left and/or right turn lane are required to be added this may cut into the available parking lot space, which is already limited.

The required road improvements will not be known until the ultimate building use is determined and real data can be collected.

6.6.5 AIRSPACE ANALYSIS

14 CFR Part 77 establishes standards and notification requirements for objects which may affect navigable airspace and includes the primary, transitional, conical, horizontal, and approach surfaces. The primary surface at Winchester Regional Airport is 1,000 feet wide (500' extending from runway centerline). The transitional surface extends out from the primary surface and slopes upwards at an angle of 7:1 until it reaches 150' above the airport's established elevation.

The proposed manufacturing facility sits 620 feet from the runway centerline. A building this distance can sit as high as 17 feet above the runway elevation and be in accordance with Part 77. The lowest elevation of the runway parallel to the building is 719, making the max elevation of the building 636 to be incompliance with Part 77 (max building height 16 feet).

The facility is assumed to have a height of 50', this would be considered a penetration. An airspace study will need to be done to determine the safety of this location and height, once the future use and ultimate building height have been established. It should be noted that a missed approach for Runway 32 is a right turn towards the proposed building. It is not anticipated to be a conflict but it is of note. Note that the parallel taxiway and apron are fixed by function, so they are not subject to the Part 77 primary surface restriction.

It is also recommended that modeling be conducted to ensure that the proposed development does not interfere with the existing localizer, which is located behind the Runway 14 end.

6.7 PERMITS AND MITIGATION

6.7.1 PERMITS

The following list outlines a list of permits, letters, and concurrences that are anticipated to be necessary for the project. These permits are to be acquired during the proposed action projects, both the design and construction.

- Frederick County is anticipated to be responsible for reviewing and approving the Stormwater Management Plan.
- The Lord Fairfax Soil Conservation District is anticipated to be responsible for reviewing and approving Erosion and Sediment Control Plans.
- A Virginia Pollutant Discharge Elimination System (VPDES) VAR-10 permit must be issued by the VDEQ.
- A State Programmatic General Permit (SPGP) from USACE

- A State general permit (WP1) from DEQ
- Land Use Permit Commercial Entrance Installation (LUP-CEI) from VDOT

6.7.2 MITIGATION

The Preliminary Engineering analysis estimates that the project would impact approximately 0.15 acres of wetlands and approximately 231 linear feet of stream (340 stream credits). Mitigation options were discussed in Section 6.6.1. In addition to wetlands and stream mitigation, the site will require approximately 20 lbs/ac/year of phosphorous reduction. Mitigation options are discussed in Section 6.4.2 and **Appendix D**.

7. ENGINEER'S OPINION OF PROBABLE COST

An approximate sum of over $380,000,000 is anticipated as the total development cost. The approximate costs for the development are summarized below in Table 8. A breakdown of the cost along with assumptions can be found in **Appendix C.** These opinions of probable cost were prepared based on the "most conservative" Development Scenario reviewed during this preliminary engineering effort. Actual project costs would depend on many factors, including the scope and extent of the ultimate future use of the site.

Table 8: Engineer's Opinion of Probable Cost for the Development Scenario

Development Project	Project Cost
Aircraft Manufacturing Facility	$300,000,000
Associated Apron	$7,000,000
Associated Parking	$6,300,000
Fuel Farm	$4,500,000
Stream Mitigation	$150,000
Wetlands Mitigation	$20,000
Nutrient Credits/BMP	$500,000
Localizer Modeling	$50,000
Soft Costs	$64,000,000
Roadway Proffers	Unknown
Total	**$382,520,000**

1. Soft costs include design, mobilization, permits, surveys, etc. (20% of each item excluding localizer modeling)

Electric Aircraft Chargers: Based on cost estimates provided in the 2022 ACRP Research Report 236, *Preparing Your Airport for Electric Aircraft and Hydrogen Technologies*, the facility elements and installation costs for a 120 (kW) charger could range from $200,000 to $250,000. For the purposes of this report, it is assumed that the manufacturer of the charger would pay to install and would own the equipment.

8. DESIGN REFERENCES

Table 9 lists the FAA ACs and state/local manuals/handbooks and other documents were used in the preliminary design effort. The project was preliminarily designed in accordance with FAA ACs that were current as of April, 2024.

Table 9: Design References

Document Number	Document Title
AC 150/5300-13B	Airport Design
AC 150/5320-5D	Airport Drainage Design
AC 150/5340-1M	Standards for Airport Marking
State/Local	Virginia Department of Transportation Drainage Manual
State/Local	Virginia Erosion and Sediment Control Handbook
State/Local	Virginia Stormwater Management Handbook
State/Local	Virginia Department of Transportation Road Design Manual
State/Local	Code of Virginia
NFPA 30	Flammable and Combustible Liquids
NFPA 409	Standard on Aircraft Hangars
NFPA 415	Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways
NFPA 407	Standard for Aircraft Fuel Servicing

9. CONCLUSION

Winchester Regional Airport is planning to develop the Northside of their airport and as part of the Environmental Assessment effort, this Preliminary Engineering Report was compiled. The airport is undecided on the ultimate use of this area; therefore, several development scenarios were Conceptually analyzed to determine the option with the greatest impacts. The option that was selected to be further analyzed was a 600,000 square foot manufacturing facility because its impacts were the most significant.

The manufacturing facility has the largest limits of disturbance, approximately 42 acres, and adds the most impervious, approximately 26 acres. This facility includes a large parking lot, apron/taxiway pavement, fuel farm and electric aircraft charging stations.

Due to the large size of the building, there are several challenges that will likely arise during design. First, the size of the building limits the space available for a parking lot. Second, the large increase in impervious and assumed change in drainage pattern will require on-site water quality treatment as well as an expansion of the existing basin off the Runway 14 end. Third, the proximity of construction to the property line will likely result in a complicated erosion and sediment control plan. Fourth, the building will need to go through an airspace study as the assumed height results in a transitional surface penetration. In addition to an airspace study, the future height of the building could exceed what is permitted by the current County zoning designation. Finally, Coverstone Drive may need to be modified to account for the increased traffic a manufacturing facility of this size would cause.

A large manufacturing facility is feasible but not without its design and construction challenges. Reducing the size of the proposed building, would minimize the challenges as well as the overall cost.

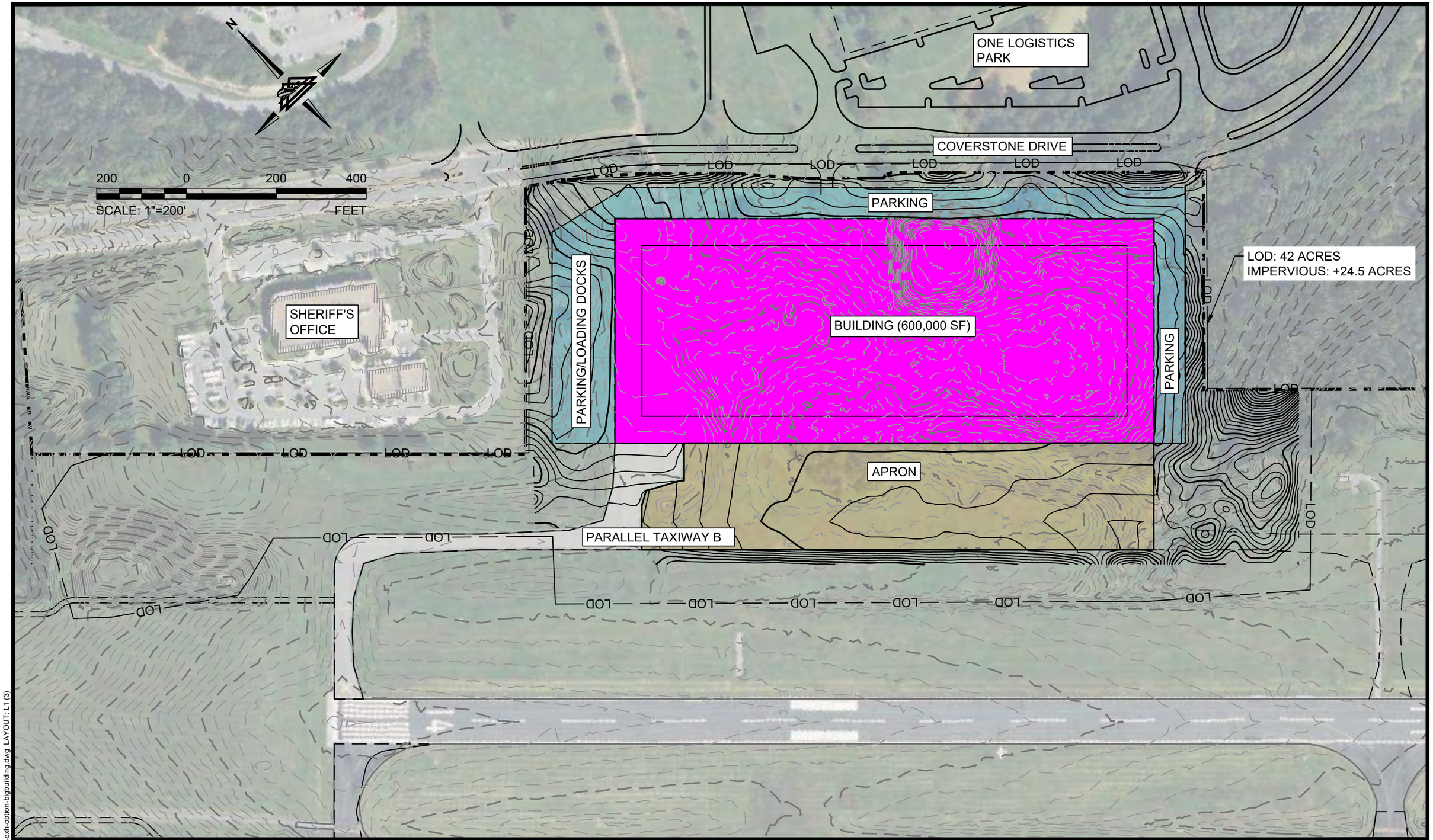
Appendix A - Exhibits

Appendix B – Stormwater Analysis

Appendix C - Engineer's Opinion of Probable Construction Costs

Appendix D – BMP Discussion

Appendix A - Exhibits



CONCEPTUAL LAYOUT - LARGE MANUFACTURING FACILITY

WINCHESTER REGIONAL AIRPORT

www.deltaairport.com

DRAWN BY:	LMH/SRS	CHECKED BY:	ADS	SCALE:	1" = 200'	DATE:	DECEMBER 2023

EXHIBIT 1

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SCENARIO 2, CONCEPT 1 AIRPORT DEVELOPMENT (CONCEPT 2)

WINCHESTER REGIONAL AIRPORT

DRAWN BY:	CHECKED BY:	SCALE:	DATE:
LMH/SRS	ADS	1" = 200'	DECEMBER 2023

www.deltaairport.com

EXHIBIT 23

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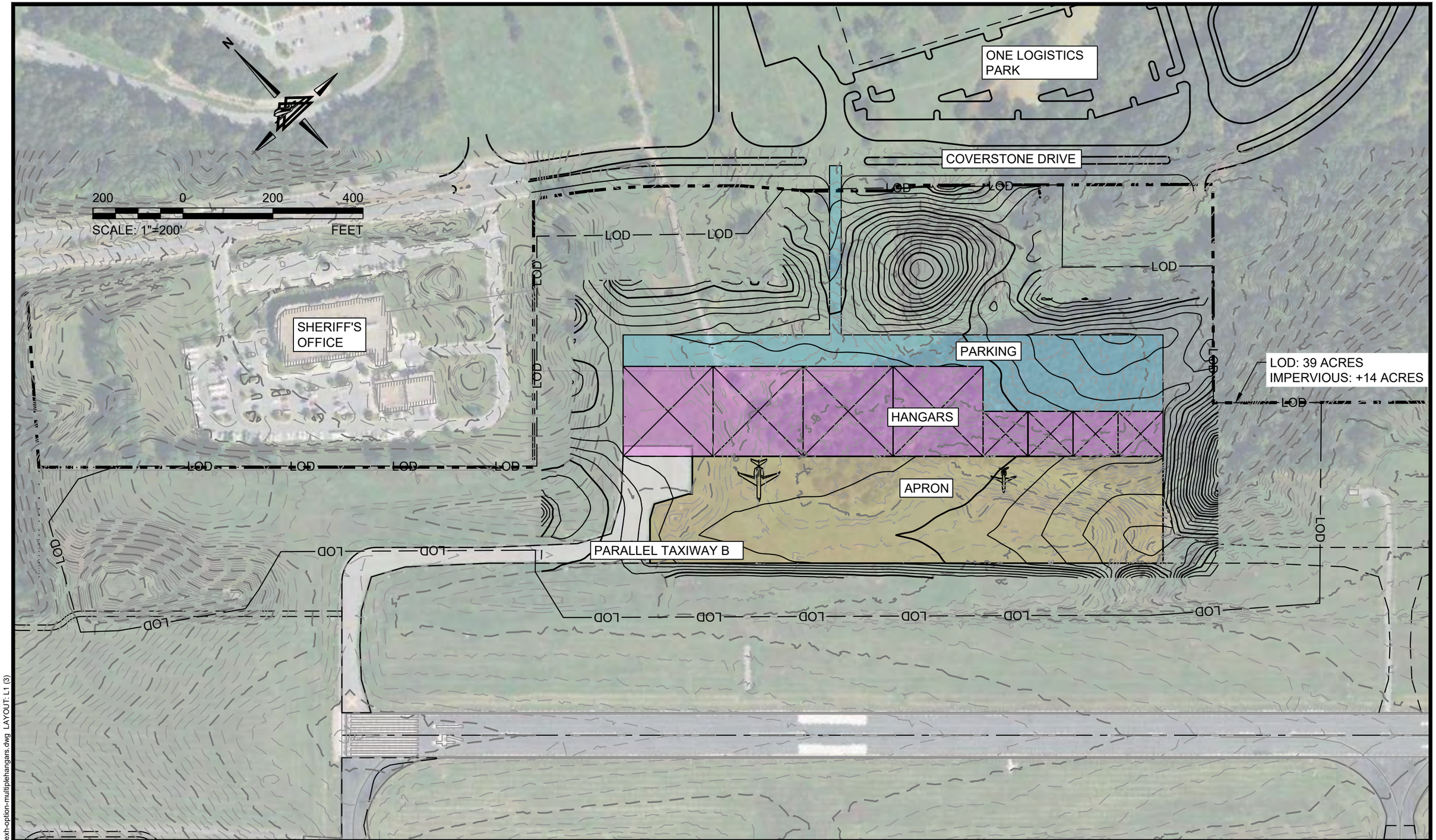

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DRAWING: 23051-exh-option-multiplehangars.dwg LAYOUT: L1 (3)

www.deltaairport.com

SCENARIO 1, CONCEPT 2 AIRPORT DEVELOPMENT (CONCEPT 1)

WINCHESTER REGIONAL AIRPORT

DRAWN BY:	CHECKED BY:	SCALE:	DATE:
LMH/SRS	ADS	1" = 200'	DECEMBER 2023

EXHIBIT 2

N

200 0 200 400

SCALE: 1"=200' FEET

BUILDING (BY OTHERS)

PARKING LOT (BY OTHERS)

TIE INTO ACCESS POINT PROVIDED BY OTHERS

COVERSTONE DRIVE (BY OTHERS)

RETAINING WALL

PARKING LOT

LARGE HANGAR/AIRCRAFT MANUFACTURING FACILITY (500' X 12,000')

FUEL FARM

APRON

TOFA TOFA

TSA TSA TSA

ROFA ROFA ROFA ROFA ROFA

TSA TSA TSA

TOFA TOFA

RSA RSA RSA RSA RSA RSA

RPZ

DRAWING: Geometry.dwg LAYOUT: L1

www.deltaairport.com

GEOMETRIC LAYOUT
WINCHESTER REGIONAL AIRPORT

DRAWN BY:	SRS	CHECKED BY:	ADS	SCALE:	1" = 200'	DATE:	MARCH 2024

EXHIBIT
4

N

200 0 200 400

SCALE: 1"=200' FEET

SANITARY SEWER LINE BY OTHERS

WATER LINE BY OTHERS

COVERSTONE DRIVE

PARKING LOT

PROPOSED WATERLINE

PROPOSED SANITARY SEWER LINE

PROPOSED FIRE HYDRANT

LARGE HANGAR/AIRCRAFT MANUFACTURING FACILITY

DEMO ABANDONED GAS LINE

RELOCATE GAS LINE AWAY FROM FUEL FARM

RELOCATE

GAS

UGT

W

SAN

DRAWING: Utility Layout.dwg LAYOUT: L1

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UTILITIES
WINCHESTER REGIONAL AIRPORT

DRAWN BY:	SRS	CHECKED BY:	ADS	SCALE:	1" = 200'	DATE:	MARCH 2024

EXHIBIT
5

N

300 0 300 600

SCALE: 1"=300' FEET

LEGEND

STREAM

IMPACTED STREAM

WETLANDS

IMPACTED WETLANDS

LOD

LOD

LOD

LOD

LOD

LOD

LOD

LOD

S.S. EASEMENT

AIRPORT PROPERTY LINE

STREAM A (261 LF)

STREAM B (473 LF)

WETLAND A (0.15 AC)

WETLAND B (0.17 AC)

LIMITS OF DISTURBANCE

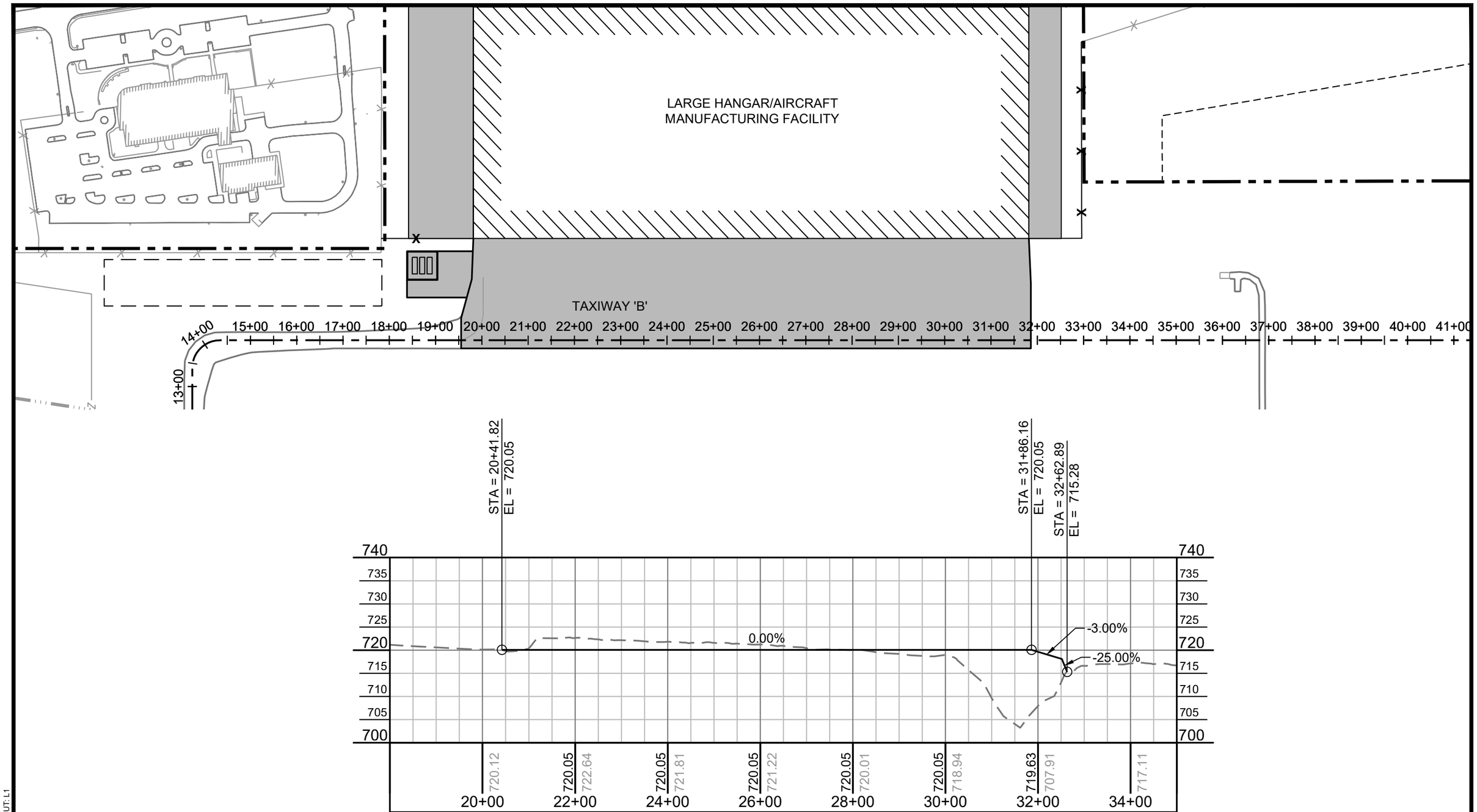
DRAWING: Wetlands-updated.dwg LAYOUT: L1

www.deltaairport.com

WETLANDS
WINCHESTER REGIONAL AIRPORT

DRAWN BY:	SRS	CHECKED BY:	ADS	SCALE:	1" = 300'	DATE:	MARCH 2024

EXHIBIT
6



BASELINE "Taxiway 'B'"

TAXIWAY 'B' PROFILE
WINCHESTER REGIONAL AIRPORT

www.deltaairport.com

DRAWN BY:	SRS	CHECKED BY:	ADS	SCALE:	1" = 200'	DATE:	MARCH 2024

EXHIBIT 7

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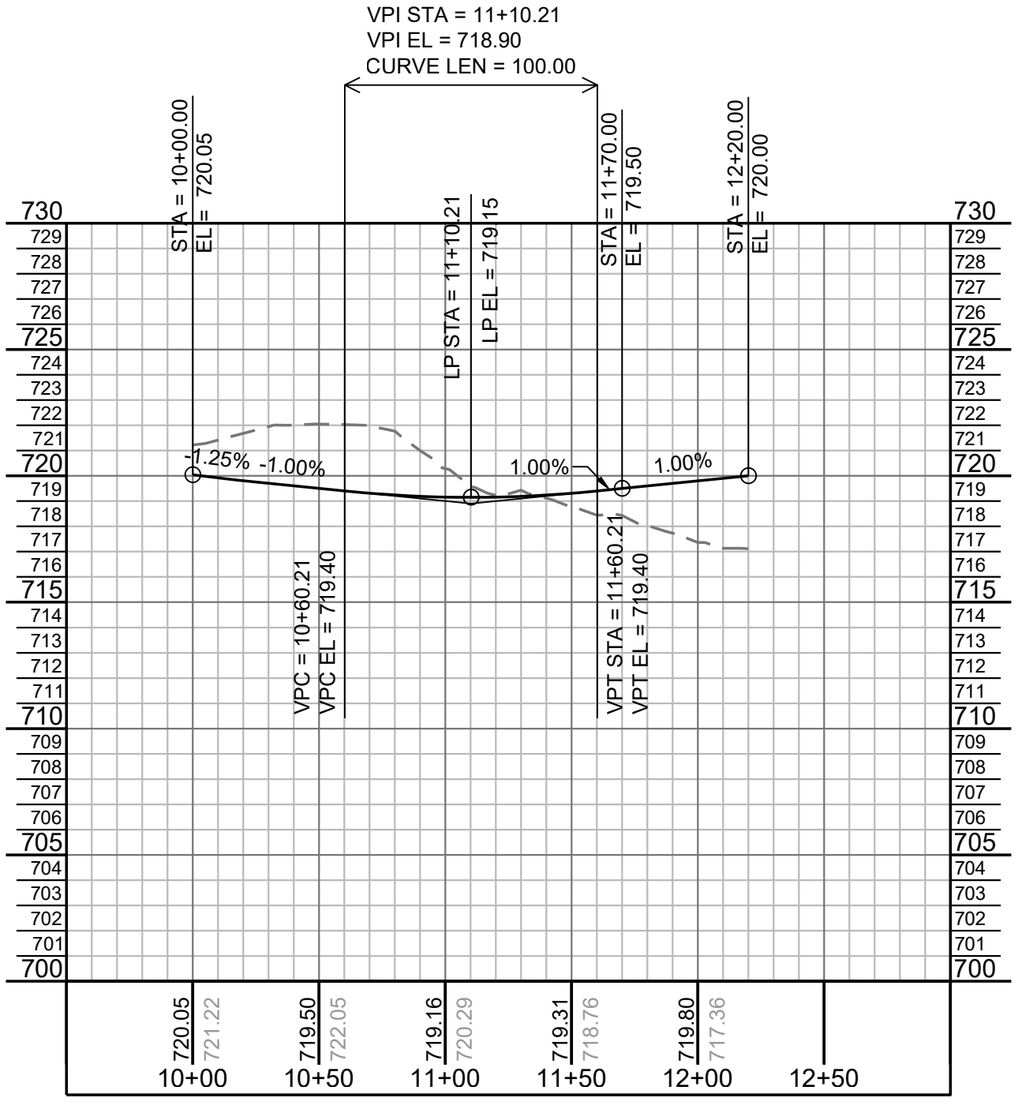
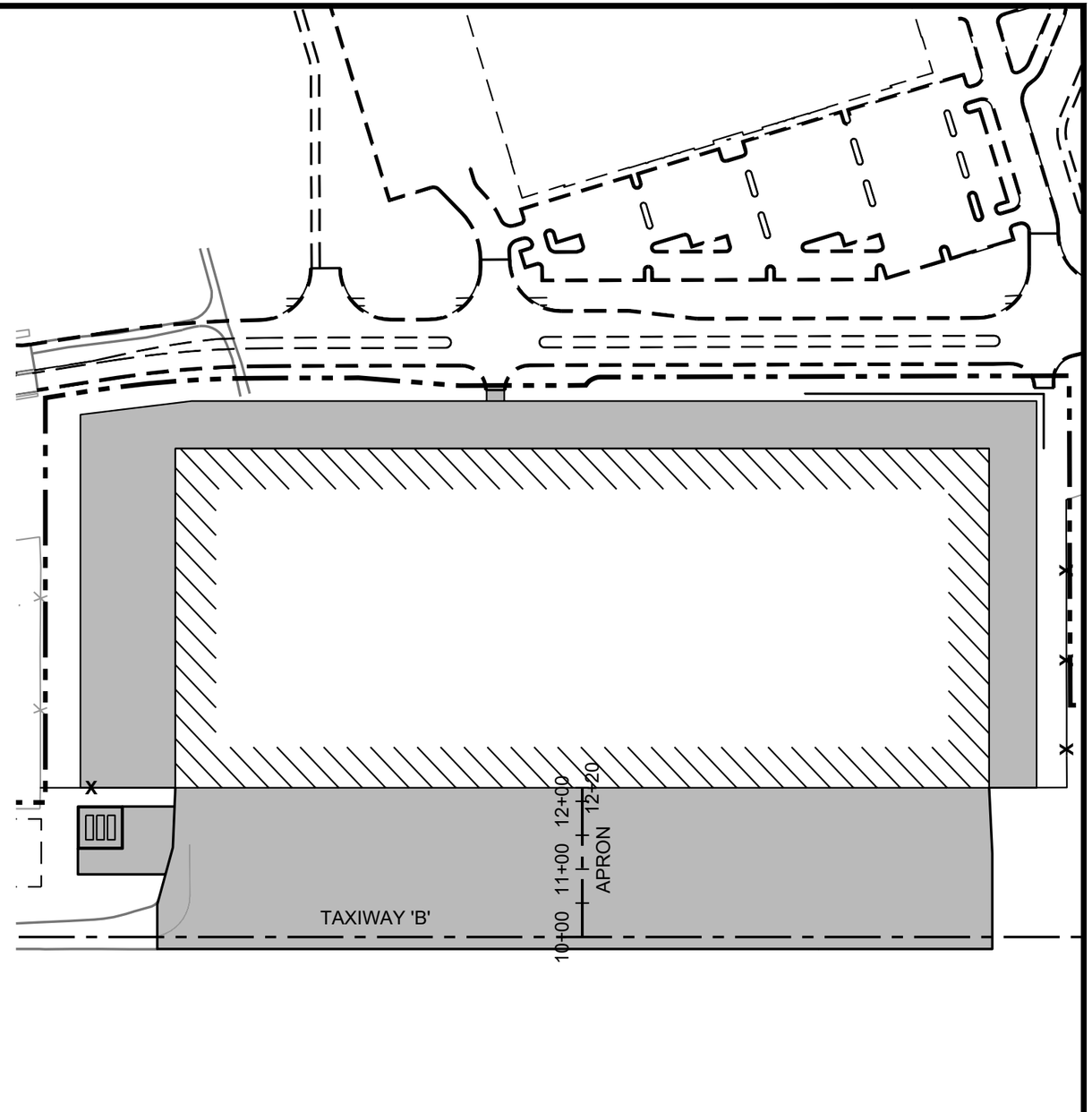


BASELINE "Apron"



APRON PROFILE
WINCHESTER REGIONAL AIRPORT

DRAWN BY:	SRS	CHECKED BY:	ADS	SCALE:	1" = 200'	DATE:	MARCH 2024

www.deltaairport.com

EXHIBIT 8

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DRAWING: TW Profile.dwg LAYOUT: L1 (2)

N

60 0 60 120
SCALE: 1"=60' FEET

COVERSTONE DRIVE (BY OTHERS)

RETAINING WALL

PIPE

PARKING LOT

3%

CURB INLET

PIPE

LARGE HANGAR/AIRCRAFT
MANUFACTURING FACILITY
(600' X 12,000')

PIPE

3%

3%

S.S. EASEMENT

PIPE

PIPE

TRENCH DRAIN

1%

1%

PIPE

4%

RPZ

RSA

1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00 10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+0

DRAINAGE

WINCHESTER REGIONAL AIRPORT
FREDERICK COUNTY, VA

DELTA AIRPORT CONSULTANTS, INC.
www.deltaairport.com

EXHIBIT 9

DRAWN BY:	SRS	SCALE:	1" = 100'
CHECKED BY:	ADS	DATE:	MARCH 2024

DRAWING: Drainage.dwg, LAYOUT: L1
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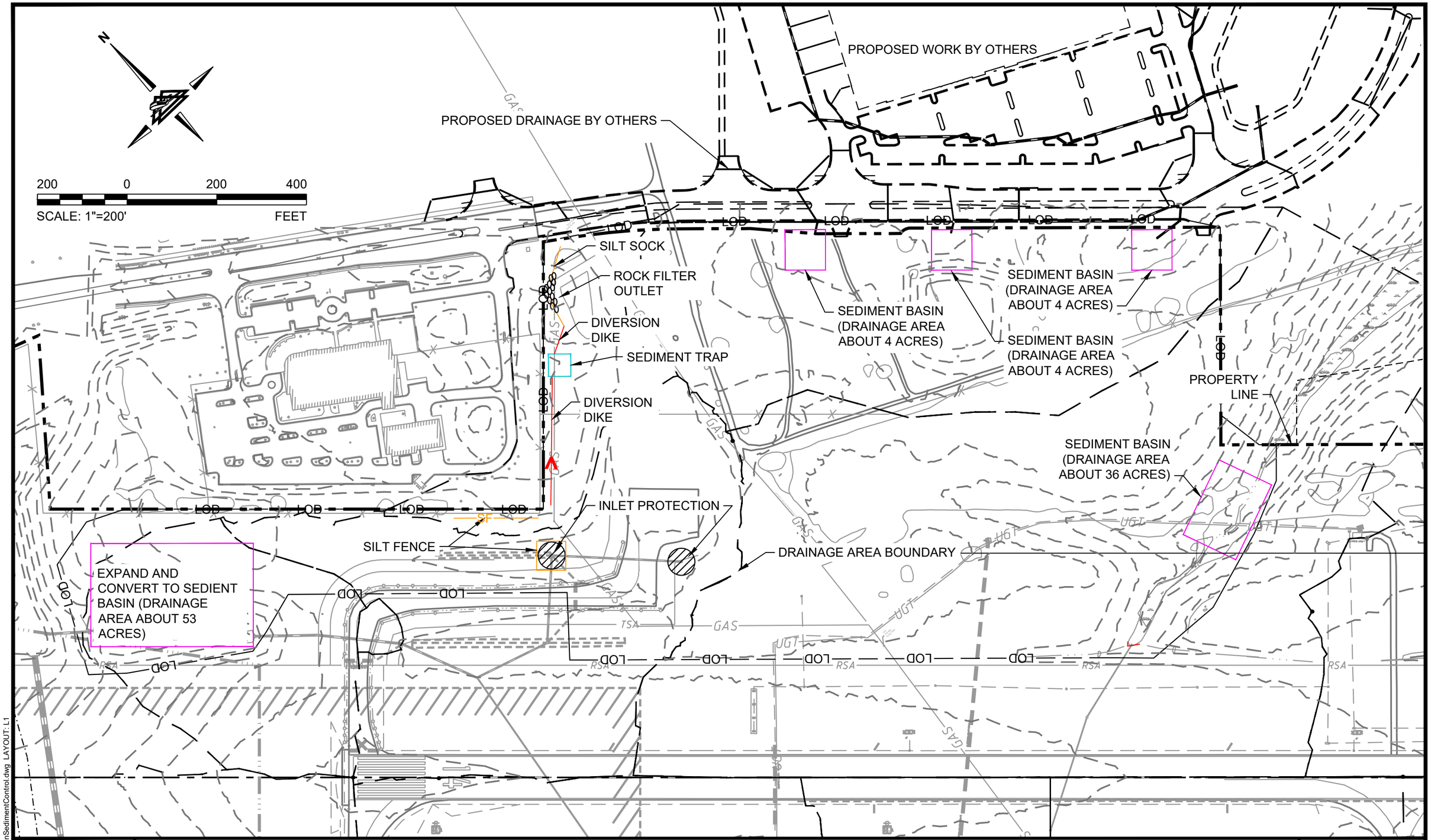


DRAWING: ErosionSedimentControl.dwg LAYOUT: L1

www.deltaairport.com

CONCEPTUAL EROSION AND SEDIMENT CONTROL
WINCHESTER REGIONAL AIRPORT

DRAWN BY:	SRS	CHECKED BY:	ADS	SCALE:	1"=200'	DATE:	MAY 2024

EXHIBIT
10

Table 4-1. Design Standards Based on Airplane Design Group (ADG)

Item	ADG					
	I	II	III	IV	V	VI
Taxiway and Taxilane Protection						
TSA (maximum ADG wingspan)	49 ft (14.9 m)	79 ft (24.1 m)	118 ft (36 m)	171 ft (52 m)	214 ft (65 m)	262 ft (80 m)
TOFA [2]	89 ft (27.1 m)	124 ft (38 m)	171 ft (52 m)	243 ft (74 m)	285 ft (87 m)	335 ft (102 m)
TLOFA [2]	79 ft (24.1 m)	110 ft (34 m)	158 ft (48 m)	224 ft (68 m)	270 ft (82 m)	322 ft (98 m)
Taxiway and Taxilane Separation						
Taxiway centerline to parallel taxiway centerline [1]	70 ft (21.3 m)	101.5 ft (30.9 m)	144.5 ft (44 m)	207 ft (63 m)	249.5 ft (76.1 m)	298.5 ft (91 m)
Taxiway centerline to fixed or movable object [2]	44.5 ft (13.6 m)	62 ft (18.9 m)	85.5 ft (26.1 m)	121.5 ft (37 m)	142.5 ft (43 m)	167.5 ft (51 m)
Taxilane centerline to parallel taxilane centerline [1]	64 ft (19.5 m)	94.5 ft (28.8 m)	138 ft (42 m)	197.5 ft (60.2 m)	242 ft (74 m)	292 ft (89 m)
Taxilane centerline to fixed or movable object [2]	39.5 ft (12.2 m)	55 ft (16.8 m)	79 ft (24.1 m)	112 ft (34 m)	135 ft (41 m)	161 ft (49 m)
Wingtip Clearance						
Taxiway wingtip clearance	20 ft (6.1 m)	22.5 ft (6.9 m)	26.5 ft (8.1 m)	36 ft (11 m)	35.5 ft (10.8 m)	36.5 ft (11.1 m)
Taxilane wingtip clearance	15 ft (4.6 m)	15.5 ft (4.7 m)	20 ft (6.1 m)	26.5 ft (8.1 m)	28 ft (8.5 m)	30 ft (9.1 m)

Note 1: See Figure 4-5.
Note 2: See Figure 4-6.
Note 3: See paragraphs 4.5.3.1 and 4.5.4.1 for TSA and TOFA standards at fillets.

Table 4-2. Design Standards Based on Taxiway Design Group (TDG)

Item	TDG							
	1A	1B	2A	2B	3	4	5	6
Taxiway/Taxilane Width [1]	25 ft (7.6 m)	25 ft (7.6 m)	35 ft (10.7 m)	35 ft (10.7 m)	50 ft (15.2 m)	50 ft (15.2 m)	75 ft (22.9 m)	75 ft (22.9 m)
Taxiway Edge Safety Margin [1]	5 ft (1.5 m)	5 ft (1.5 m)	7.5 ft (2.3 m)	7.5 ft (2.3 m)	10 ft (3 m)	10 ft (3 m)	14 ft (4.3 m)	14 ft (4.3 m)
Taxiway Shoulder Width [2]	10 ft (3 m)	10 ft (3 m)	15 ft (4.6 m)	15 ft (4.6 m)	20 ft (6.1 m)	20 ft (6.1 m)	30 ft (9.1 m)	30 ft (9.1 m)
Taxiway/Taxilane Centerline to Parallel Taxiway/Taxilane Centerline w/180 Degree Turn	See Table 4-6 and Table 4-7.							

Note 1: See Figure 4-4.
Note 2: When the most demanding aircraft has four engines and is TDG 6, the standard taxiway shoulder width is 40 feet (12.2 m).

Table J-4. Taxiway ntersection Dimensions for TDG 2B

Dimension (see note)	Δ (degrees)						
	30	45	60	90	120	135	150
W 0 (ft)	17.5	17.5	17.5	17.5	17.5	17.5	17.5
W 1 (ft)	30	36	24	25	23	23	23
W 2 (ft)	30	36	41	48	30	37	36
L 1 (ft)	205	228	162	176	156	155	152
L 2 (ft)	0	0	82	84	78	70	78
L 3 (ft)	8	15	24	48	141	199	310
R Fill t (ft)	0	0	0	0	50	50	50
R CL (ft)	75	75	75	60	73	76	78
R Out r (ft)	92.5	92.5	92.5	77.5	90.5	93.5	95.5

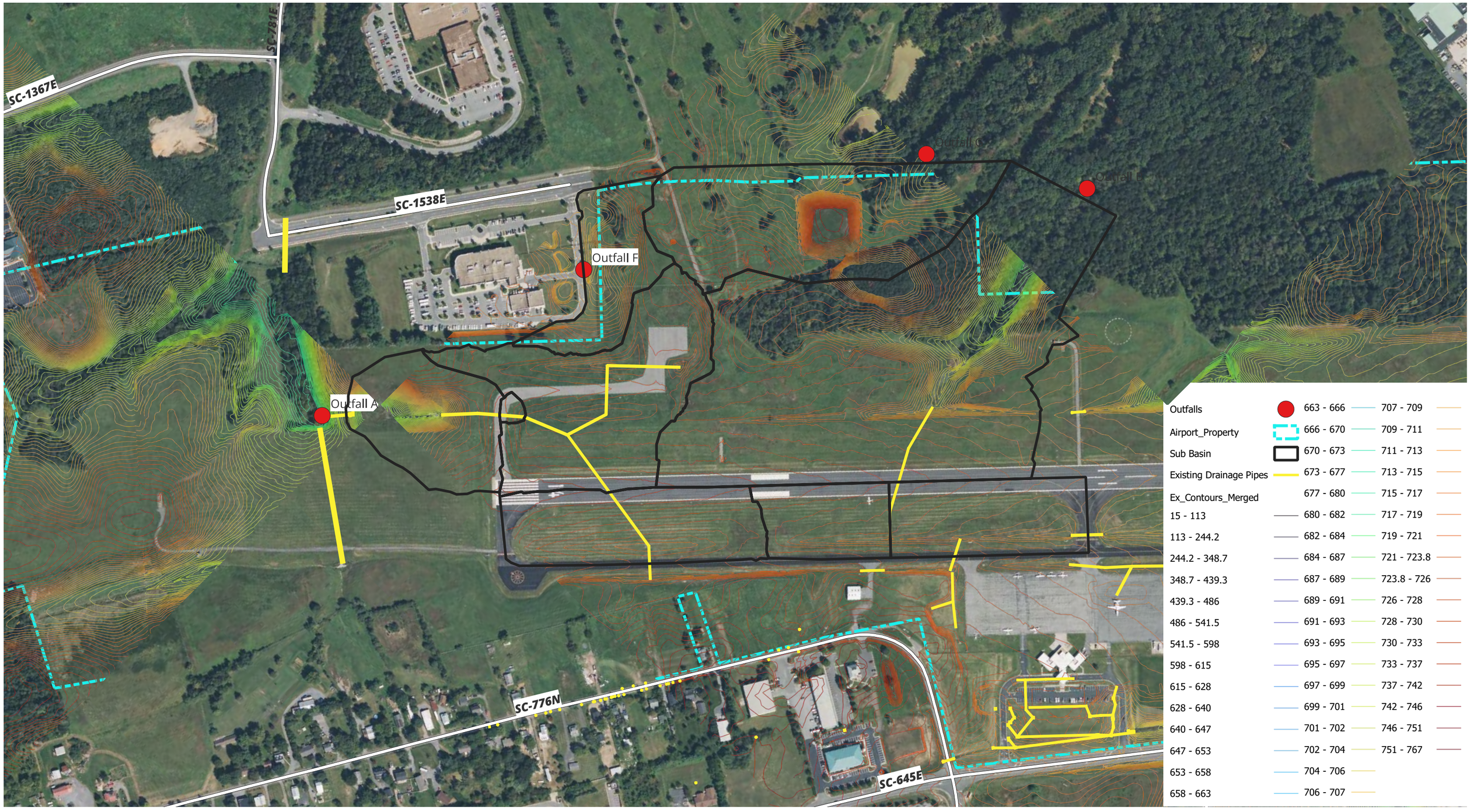
Note: S Figur 4 12, Figur 4 13, a d Figur 4 14. Dim sio s ar rou d d to th ar st foot or half foot. 1 foot = 0.305 m t rs.

Table J-5. Taxiway ntersection Dimensions for TDG 3

Dimension (see note)	Δ (degrees)						
	30	45	60	90	120	135	150
W 0 (ft)	25	25	25	25	25	25	25
W 1 (ft)	29	30	31	32	32	32	33
W 2 (ft)	37	43	47	54	52	53	55
L 1 (ft)	132	149	159	171	169	171	173
L 2 (ft)	71	77	81	83	81	80	80
L 3 (ft)	10	18	27	54	125	180	286
R Fill t (ft)	0	0	0	0	25	25	25
R CL (ft)	75	75	75	60	73	76	78
R Out r (ft)	100	100	100	85	98	101	103

Note: S Figur 4 12, Figur 4 13, a d Figur 4 14. Dim sio s ar rou d d to th ar st foot or half foot. 1 foot = 0.305 m t rs.

Appendix B – Stormwater Analysis



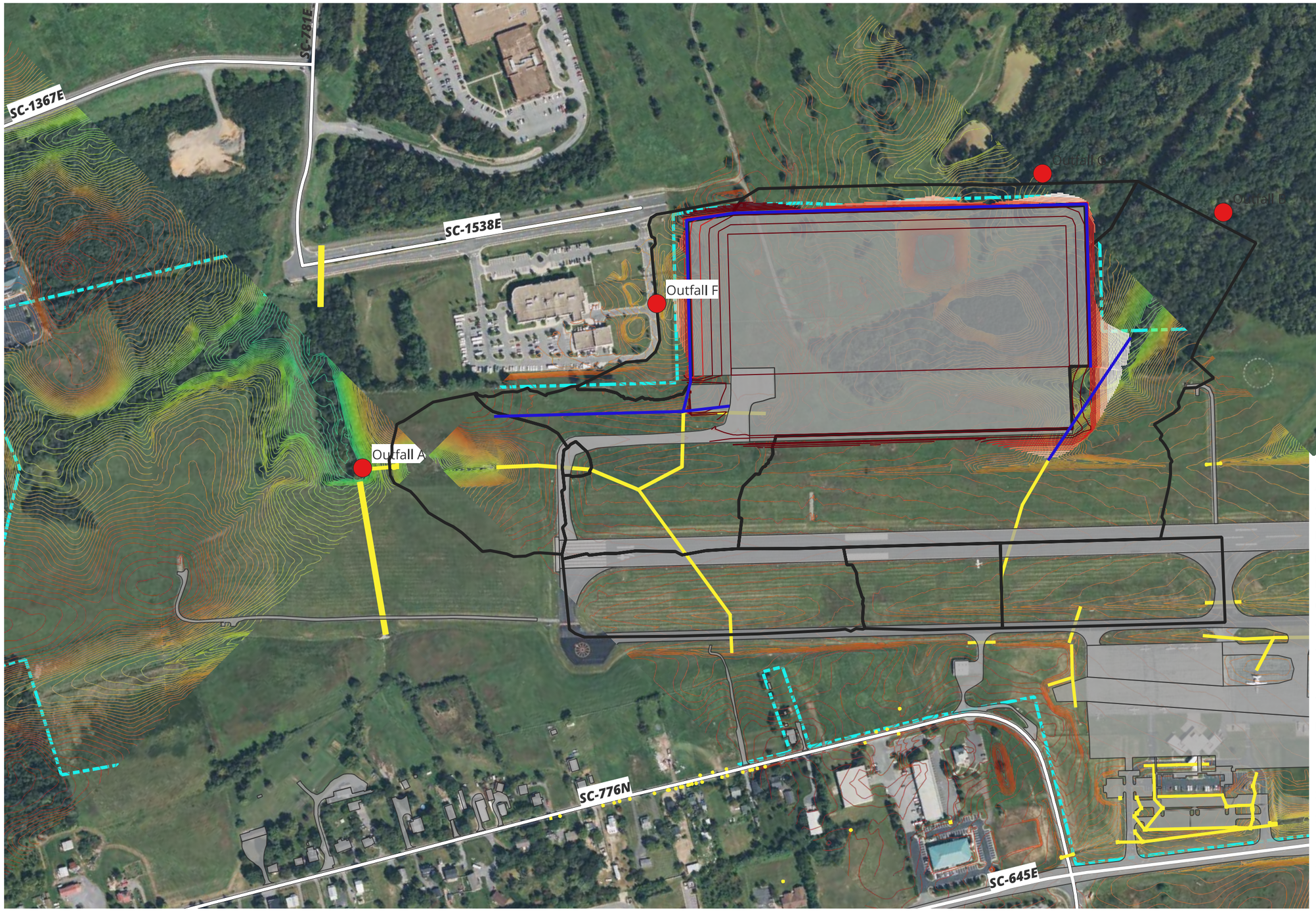
Pre-Drainage Area Map

Winchester Regional Airport

March 2024

300 0 300 600 900 1,200 ft

N



Outfalls
Airport_Property
Sub Basin
Existing Drainage Pipes
Proposed Drainage Pipe
Proposed Contours
690 - 705
705 - 710
710 - 713
713 - 717
717 - 725
Existing Contours
15 - 113
113 - 244.2
244.2 - 348.7
348.7 - 439.3
439.3 - 486
486 - 541.5
541.5 - 598
598 - 615
615 - 628
628 - 640
640 - 647
647 - 653
653 - 658
658 - 663
663 - 666
666 - 670
670 - 673
673 - 677
677 - 680
680 - 682
682 - 684
684 - 687
687 - 689
689 - 691
691 - 693
693 - 695
695 - 697
697 - 699
699 - 701
701 - 702
702 - 704
704 - 706
706 - 707
707 - 709
709 - 711
711 - 713
713 - 715
715 - 717
717 - 719
719 - 721
721 - 723.8
723.8 - 726
726 - 728
728 - 730
730 - 733
733 - 737
737 - 742
742 - 746
746 - 751
751 - 767

Post-Drainage Area Map

Winchester Regional Airport

March 2024

300 0 300 600 900 1,200 ft

Project Description

File Name	Pre-Development.SPF
Description	
	22081 Northside Development

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	SCS TR-55
Time of Concentration (TOC) Method	SCS TR-55
Link Routing Method	Kinematic Wave
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	NO

Analysis Options

Start Analysis On	00:00:00	0:00:00
End Analysis On	00:00:00	0:00:00
Start Reporting On	00:00:00	0:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Rainfall Details

SN	Rain Gage ID	Data Source	Data Source ID	Rainfall Type	Rain Units	State	County	Return Period (years)	Rainfall Depth (inches)	Rainfall Distribution
1	Rain Gage-01	Time Series	TS-01	Cumulative	inches	Virginia	Frederick	1.00	2.50	SCS Type II 24-hr

Subbasin Summary

SN	Subbasin ID	Area (ac)	Peak Rate Factor	Weighted Curve Number	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	A2	6.88	484.00	72.00	2.50	0.53	3.64	2.93	0 00:25:19
2	A3	7.03	484.00	73.00	2.50	0.57	3.99	5.63	0 00:05:00
3	A4	11.62	484.00	56.00	2.50	0.10	1.14	0.18	0 00:26:18
4	A5	0.22	484.00	89.00	2.50	1.45	0.32	0.40	0 00:14:38
5	A6	5.99	484.00	70.00	2.50	0.46	2.73	2.34	0 00:20:40
6	B	31.82	484.00	59.00	2.50	0.15	4.87	1.28	0 00:29:17
7	C1	15.73	484.00	60.00	2.50	0.17	2.74	0.99	0 00:21:29
8	C2	5.46	484.00	81.00	2.50	0.94	5.14	7.85	0 00:05:43
9	C3	3.51	0.00	80.00	2.50	0.89	3.12	2.98	0 00:24:28
10	C4	5.48	0.00	81.00	2.50	0.94	5.16	4.92	0 00:24:58
11	C5	3.62	484.00	75.00	2.50	0.65	2.35	2.23	0 00:22:01
12	C6	5.05	484.00	81.00	2.50	0.94	4.76	7.00	0 00:06:54
13	D1	13.01	484.00	67.00	2.50	0.36	4.63	2.90	0 00:26:59
14	D10	63.53	484.00	77.00	2.50	0.74	47.01	19.53	0 01:16:21
15	D11	4.65	484.00	86.00	2.50	1.24	5.78	7.98	0 00:10:13
16	D12	17.87	484.00	88.00	2.50	1.38	24.68	30.91	0 00:14:38
17	D13	4.88	484.00	81.00	2.50	0.94	4.60	3.91	0 00:30:02
18	D14	2.92	484.00	82.00	2.50	1.00	2.91	3.93	0 00:11:01
19	D15	0.77	484.00	87.00	2.50	1.31	1.01	1.25	0 00:15:10
20	D16	1.65	484.00	87.00	2.50	1.31	2.16	3.43	0 00:05:09
21	D17	0.26	484.00	84.00	2.50	1.12	0.29	0.46	0 00:05:00
22	D18	0.26	484.00	89.00	2.50	1.45	0.38	0.61	0 00:05:00
23	D19	1.37	484.00	89.00	2.50	1.46	1.99	3.16	0 00:05:00
24	D2	7.57	484.00	54.00	2.50	0.07	0.51	0.06	0 00:22:51
25	D20	2.11	0.00	94.00	2.50	1.87	3.94	5.88	0 00:06:03
26	D21	4.54	0.00	95.00	2.50	1.96	8.91	12.86	0 00:06:41
27	D3	4.00	484.00	68.00	2.50	0.39	1.55	1.11	0 00:24:07
28	D4	8.85	484.00	59.00	2.50	0.15	1.35	0.41	0 00:21:18
29	D5	7.83	484.00	67.00	2.50	0.36	2.79	1.62	0 00:30:15
30	D6	6.77	484.00	77.00	2.50	0.74	5.01	4.61	0 00:24:27
31	D8	2.49	484.00	80.00	2.50	0.89	2.21	2.30	0 00:21:00
32	D9	7.10	484.00	85.00	2.50	1.18	8.36	5.99	0 00:40:45
33	F	4.42	484.00	46.00	2.50	0.00	0.01	0.00	0 00:15:12
34	G	12.84	484.00	51.00	2.50	0.03	0.42	0.04	0 00:26:13

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft^2)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	Basin2-Out	Junction	689.58	695.31	0.00	696.00	0.00	0.57	690.61	0.00	4.70	0 00:00	0.00	0.00
2	E103	Junction	714.91	718.00	0.00	0.00	0.00	2.92	715.32	0.00	2.68	0 00:00	0.00	0.00
3	E104	Junction	711.07	715.32	711.07	0.00	0.00	6.86	711.96	0.00	3.36	0 00:00	0.00	0.00
4	E105	Junction	705.99	719.42	705.99	0.00	0.00	6.78	706.70	0.00	12.72	0 00:00	0.00	0.00
5	E106	Junction	718.73	719.98	718.73	719.98	0.00	6.68	719.28	0.00	0.70	0 00:00	0.00	0.00
6	E106A	Junction	684.18	696.94	0.00	0.00	0.00	0.45	684.36	0.00	12.58	0 00:00	0.00	0.00
7	E107	Junction	684.00	699.34	0.00	0.00	0.00	0.45	684.26	0.00	15.08	0 00:00	0.00	0.00
8	E108	Junction	715.39	717.39	715.39	718.00	0.00	8.25	716.52	0.00	0.87	0 00:00	0.00	0.00
9	E109	Junction	714.79	716.00	0.00	0.00	0.00	12.99	715.92	0.00	0.87	0 00:00	0.00	0.00
10	E111	Junction	713.55	718.64	0.00	0.00	0.00	0.41	714.51	0.00	4.13	0 00:00	0.00	0.00
11	E112	Junction	707.58	718.62	707.58	0.00	0.00	0.35	707.75	0.00	10.87	0 00:00	0.00	0.00
12	E116	Junction	709.52	714.00	0.00	0.00	0.00	12.53	710.89	0.00	3.11	0 00:00	0.00	0.00
13	E117	Junction	709.12	713.00	0.00	0.00	0.00	12.30	710.48	0.00	2.52	0 00:00	0.00	0.00
14	E124	Junction	698.61	708.27	698.61	0.00	0.00	12.94	699.66	0.00	8.61	0 00:00	0.00	0.00
15	E125	Junction	692.68	708.84	0.00	0.00	0.00	12.93	708.84	0.00	0.00	0 12:21	0.13	12.00
16	E127	Junction	699.46	704.00	699.46	0.00	0.00	3.85	699.83	0.00	4.17	0 00:00	0.00	0.00
17	E128	Junction	698.50	703.00	698.50	0.00	0.00	28.37	700.62	0.00	2.38	0 00:00	0.00	0.00
18	E142	Junction	691.58	694.00	691.58	0.00	0.00	28.56	692.75	0.00	1.84	0 00:00	0.00	0.00
19	E145-A	Junction	669.37	686.19	0.00	0.00	0.00	95.58	673.19	0.00	13.00	0 00:00	0.00	0.00
20	E159	Junction	680.38	695.00	680.38	6.00	0.00	0.82	690.04	0.00	4.96	0 00:00	0.00	0.00
21	E162	Junction	681.02	690.00	681.02	6.00	0.00	1.10	681.30	0.00	8.70	0 00:00	0.00	0.00
22	E167	Junction	702.90	715.49	0.00	0.00	0.00	7.14	703.68	0.00	11.81	0 00:00	0.00	0.00
23	E169	Junction	698.68	710.00	698.68	0.00	0.00	7.09	699.24	0.00	10.76	0 00:00	0.00	0.00
24	E504	Junction	709.62	714.60	709.62	0.00	12.56	11.82	710.81	0.00	3.79	0 00:00	0.00	0.00
25	Ex_D13	Junction	665.88	675.00	0.00	0.00	0.00	3.84	666.40	0.00	14.48	0 00:00	0.00	0.00
26	JunctionD5	Junction	690.40	695.70	0.00	695.70	0.00	1.60	690.76	0.00	4.94	0 00:00	0.00	0.00
27	Out-A	Outfall	682.47					0.45	682.62					
28	Out-B	Outfall	704.89					1.50	705.05					
29	Out-C	Outfall	690.41					13.44	691.73					
30	Out-D	Outfall	665.41					3.84	665.93					
31	Out-F	Outfall	705.00					0.00	705.00					
32	Out-G	Outfall	712.00					0.04	712.00					
33	Chan-E140-E145	Storage Node	673.58	687.00	673.58		0.00	74.82	676.09				0.00	0.00
34	E110	Storage Node	715.20	718.00	715.20		10000.00	2.95	715.45				0.00	0.00
35	E122-E129	Storage Node	699.00	705.00	699.00		0.00	26.23	701.02				0.00	0.00
36	E123	Storage Node	701.75	704.49	701.75		2059.00	13.22	702.69				0.00	0.00
37	E137	Storage Node	692.09	698.00	692.09		1272.00	66.88	693.97				0.00	0.00
38	E143	Storage Node	688.99	696.00	688.99		0.00	33.82	690.35				0.00	0.00
39	exDA-K-Channel	Storage Node	704.25	708.50	704.25		0.00	21.33	705.71				0.00	0.00
40	InfieldApronIsland	Storage Node	713.50	714.80	713.50		100.00	12.60	714.00				0.00	0.00
41	N.Basin1	Storage Node	689.00	699.50	0.00		0.00	8.71	692.61				0.00	0.00
42	SouthAirportBasin	Storage Node	666.57	682.00	0.00		0.00	85.29	672.28				0.00	0.00
43	SouthGA-Basin1	Storage Node	690.40	696.00	0.00		44584.84	5.94	692.38				0.00	0.00
44	SouthGA-Basin2	Storage Node	690.50	695.70	0.00		22000.00	1.61	691.50				0.00	0.00

Subbasin Hydrology

Subbasin : A2

Input Data

Area (ac) 6.88
Peak Rate Factor 484
Weighted Curve Number 72
Rain Gage ID ..... Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	6.88	-	72
Composite Area & Weighted CN	6.88		72

Time of Concentration

TOC Method : SCS TR-55

Sheet Flow Equation :

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where :

Tc = Time of Concentration (hr)
n = Manning's roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation :

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation :

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where :

Tc = Time of Concentration (hr)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft^2)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's roughness

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	2.1	0	0
2 yr, 24 hr Rainfall (in) :	3	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	21.75	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	100	411	0
Slope (%) :	2.1	2.2	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	2.34	2.39	0
Computed Flow Time (min) :	0.71	2.87	0

Total TOC (min) 25.33

Subbasin Runoff Results

Total Rainfall (in)	2.5
Total Runoff (in)	0.53
Peak Runoff (cfs)	2.93
Weighted Curve Number	72
Time of Concentration (days hh:mm:ss)	0 00:25:20

Subbasin : A3

Input Data

Area (ac)	7.03
Peak Rate Factor	484
Weighted Curve Number	73
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	7.03	-	73
Composite Area & Weighted CN	7.03		73

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.015	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	3	0	0
Velocity (ft/sec) :	0.93	0	0
Computed Flow Time (min) :	1.8	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	110	54.19	0
Slope (%) :	3.3	1.7	0
Surface Type :	Unpaved	Paved	Unpaved
Velocity (ft/sec) :	2.93	2.65	0
Computed Flow Time (min) :	0.63	0.34	0

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.03	0	0
Flow Length (ft) :	452.63	0	0
Channel Slope (%) :	0.8	0	0
Cross Section Area (ft^2) :	43.83	0	0
Wetted Perimeter (ft) :	61.35	0	0
Velocity (ft/sec) :	3.55	0	0
Computed Flow Time (min) :	2.12	0	0

Total TOC (min) 4.89

Subbasin Runoff Results

Total Rainfall (in)	2.5
Total Runoff (in)	0.57
Peak Runoff (cfs)	5.63
Weighted Curve Number	73
Time of Concentration (days hh:mm:ss)	0 00:04:53

Subbasin : A4

Input Data

Area (ac)	11.62
Peak Rate Factor	484
Weighted Curve Number	56
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	11.62	-	56
Composite Area & Weighted CN	11.62		56

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	105	0	0
Slope (%) :	2.4	0	0
2 yr, 24 hr Rainfall (in) :	3	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	21.44	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	394	0	0
Slope (%) :	1.8	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	2.16	0	0
Computed Flow Time (min) :	3.04	0	0

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.03	0.013	0.013
Flow Length (ft) :	257	196	175
Channel Slope (%) :	1.3	0.57	1.13
Cross Section Area (ft^2) :	26.06	7.07	7.07
Wetted Perimeter (ft) :	43.83	9.42	9.42
Velocity (ft/sec) :	4	7.15	10.06
Computed Flow Time (min) :	1.07	0.46	0.29

Total TOC (min) 26.30

Subbasin Runoff Results

Total Rainfall (in)	2.5
Total Runoff (in)	0.1
Peak Runoff (cfs)	0.18
Weighted Curve Number	56
Time of Concentration (days hh:mm:ss)	0 00:26:18

Subbasin : A5

Input Data

Area (ac)	0.22
Peak Rate Factor	484
Weighted Curve Number	89
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	0.22	-	89
Composite Area & Weighted CN	0.22		89

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0.015	0
Flow Length (ft) :	72	47	0
Slope (%) :	3.4	2.2	0
2 yr, 24 hr Rainfall (in) :	3	3	0
Velocity (ft/sec) :	0.09	0.93	0
Computed Flow Time (min) :	13.79	0.84	0

Total TOC (min) 14.64

Subbasin Runoff Results

Total Rainfall (in)	2.5
Total Runoff (in)	1.45
Peak Runoff (cfs)	0.4
Weighted Curve Number	89
Time of Concentration (days hh:mm:ss)	0 00:14:38

Subbasin : A6

Input Data

Area (ac)	5.99
Peak Rate Factor	484
Weighted Curve Number	70
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	5.99	-	70
Composite Area & Weighted CN	5.99		70

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	2.8	0	0
2 yr, 24 hr Rainfall (in) :	3	0	0
Velocity (ft/sec) :	0.09	0	0
Computed Flow Time (min) :	19.39	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	220	70	0
Slope (%) :	4	23.3	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	3.23	7.79	0
Computed Flow Time (min) :	1.14	0.15	0

Total TOC (min) 20.67

Subbasin Runoff Results

Total Rainfall (in)	2.5
Total Runoff (in)	0.46
Peak Runoff (cfs)	2.34
Weighted Curve Number	70
Time of Concentration (days hh:mm:ss)	0 00:20:40

Subbasin : B

Input Data

Area (ac)	31.82
Peak Rate Factor	484
Weighted Curve Number	59
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	13.78	-	59
Composite Area & Weighted CN	13.78		59

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	1.9	0	0
2 yr, 24 hr Rainfall (in) :	3	0	0
Velocity (ft/sec) :	0.07	0	0
Computed Flow Time (min) :	22.64	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	100	203	0
Slope (%) :	1.4	0.5	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	1.91	1.14	0
Computed Flow Time (min) :	0.87	2.97	0

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.03	0	0
Flow Length (ft) :	858	0	0
Channel Slope (%) :	1.6	0	0
Cross Section Area (ft^2) :	19.1	0	0
Wetted Perimeter (ft) :	26.17	0	0
Velocity (ft/sec) :	5.09	0	0
Computed Flow Time (min) :	2.81	0	0

Total TOC (min) 29.29

Subbasin Runoff Results

Total Rainfall (in)	2.5
Total Runoff (in)	0.15
Peak Runoff (cfs)	1.28
Weighted Curve Number	59
Time of Concentration (days hh:mm:ss)	0 00:29:17

Subbasin : C1

Input Data

Area (ac)	15.73
Peak Rate Factor	484
Weighted Curve Number	60
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	15.72	-	60
Composite Area & Weighted CN	15.72		60

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0.015	0
Flow Length (ft) :	65.55	54.45	0
Slope (%) :	1.5	0.7	0
2 yr, 24 hr Rainfall (in) :	3	3	0
Velocity (ft/sec) :	0.06	0.6	0
Computed Flow Time (min) :	17.75	1.5	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	251	0	0
Slope (%) :	2.7	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	2.65	0	0
Computed Flow Time (min) :	1.58	0	0

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.03	0	0
Flow Length (ft) :	613.56	0	0
Channel Slope (%) :	4.2	0	0
Cross Section Area (ft^2) :	74.65	0	0
Wetted Perimeter (ft) :	39.92	0	0
Velocity (ft/sec) :	15.45	0	0
Computed Flow Time (min) :	0.66	0	0

Total TOC (min) 21.49

Subbasin Runoff Results

Total Rainfall (in)	2.5
Total Runoff (in)	0.17
Peak Runoff (cfs)	0.99
Weighted Curve Number	60
Time of Concentration (days hh:mm:ss)	0 00:21:29

Subbasin : C2

Input Data

Area (ac)	5.46
Peak Rate Factor	484
Weighted Curve Number	81
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	5.46	-	81
Composite Area & Weighted CN	5.46		81

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.015	0	0
Flow Length (ft) :	126	0	0
Slope (%) :	1.5	0	0
2 yr, 24 hr Rainfall (in) :	3	0	0
Velocity (ft/sec) :	0.97	0	0
Computed Flow Time (min) :	2.16	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	49	105	0
Slope (%) :	3.3	2.4	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	2.93	2.5	0
Computed Flow Time (min) :	0.28	0.7	0

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.03	0	0
Flow Length (ft) :	543.81	0	0
Channel Slope (%) :	0.9	0	0
Cross Section Area (ft^2) :	23.19	0	0
Wetted Perimeter (ft) :	35.98	0	0
Velocity (ft/sec) :	3.52	0	0
Computed Flow Time (min) :	2.58	0	0

Total TOC (min) 5.72

Subbasin Runoff Results

Total Rainfall (in)	2.5
Total Runoff (in)	0.94
Peak Runoff (cfs)	7.85
Weighted Curve Number	81
Time of Concentration (days hh:mm:ss)	0 00:05:43

Subbasin : C3

Input Data

Area (ac)	3.51
Peak Rate Factor	0
Weighted Curve Number	80
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	3.51	-	80
Composite Area & Weighted CN	3.51		80

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.11	0.4	0
Flow Length (ft) :	40	60	0
Slope (%) :	1.4	1.4	0
2 yr, 24 hr Rainfall (in) :	3	3	0
Velocity (ft/sec) :	0.15	0.06	0
Computed Flow Time (min) :	4.38	17	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	172	0	0
Slope (%) :	2.1	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	2.34	0	0
Computed Flow Time (min) :	1.23	0	0

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.03	0	0
Flow Length (ft) :	363.59	0	0
Channel Slope (%) :	0.7	0	0
Cross Section Area (ft^2) :	26.22	0	0
Wetted Perimeter (ft) :	38.1	0	0
Velocity (ft/sec) :	3.24	0	0
Computed Flow Time (min) :	1.87	0	0

Total TOC (min) 24.47

Subbasin Runoff Results

Total Rainfall (in)	2.5
Total Runoff (in)	0.89
Peak Runoff (cfs)	2.98
Weighted Curve Number	80
Time of Concentration (days hh:mm:ss)	0 00:24:28

Subbasin : C4

Input Data

Area (ac)	5.48
Peak Rate Factor	0
Weighted Curve Number	81
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	5.48	-	81
Composite Area & Weighted CN	5.48		81

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.11	0.4	0
Flow Length (ft) :	67.8	32.2	0
Slope (%) :	0.5	1.4	0
2 yr, 24 hr Rainfall (in) :	3	3	0
Velocity (ft/sec) :	0.11	0.05	0
Computed Flow Time (min) :	10.07	10.33	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	174.24	0	0
Slope (%) :	1.4	0	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	1.91	0	0
Computed Flow Time (min) :	1.52	0	0

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.03	0	0
Flow Length (ft) :	592.19	0	0
Channel Slope (%) :	0.7	0	0
Cross Section Area (ft^2) :	26.22	0	0
Wetted Perimeter (ft) :	38.1	0	0
Velocity (ft/sec) :	3.24	0	0
Computed Flow Time (min) :	3.05	0	0

Total TOC (min) 24.97

Subbasin Runoff Results

Total Rainfall (in)	2.5
Total Runoff (in)	0.94
Peak Runoff (cfs)	4.92
Weighted Curve Number	81
Time of Concentration (days hh:mm:ss)	0 00:24:58

Subbasin : C5

Input Data

Area (ac)	3.62
Peak Rate Factor	484
Weighted Curve Number	75
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	3.62	-	75
Composite Area & Weighted CN	3.62		75

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	2.5	0	0
2 yr, 24 hr Rainfall (in) :	3	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	20.28	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	93	100	0
Slope (%) :	5.5	2.5	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	3.78	2.55	0
Computed Flow Time (min) :	0.41	0.65	0

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.03	0	0
Flow Length (ft) :	170	0	0
Channel Slope (%) :	1.2	0	0
Cross Section Area (ft^2) :	22.39	0	0
Wetted Perimeter (ft) :	33.33	0	0
Velocity (ft/sec) :	4.17	0	0
Computed Flow Time (min) :	0.68	0	0

Total TOC (min) 22.03

Subbasin Runoff Results

Total Rainfall (in)	2.5
Total Runoff (in)	0.65
Peak Runoff (cfs)	2.23
Weighted Curve Number	75
Time of Concentration (days hh:mm:ss)	0 00:22:02

Subbasin : C6

Input Data

Area (ac)	5.05
Peak Rate Factor	484
Weighted Curve Number	81
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	3.44	-	81
Composite Area & Weighted CN	3.44		81

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.015	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	1.2	0	0
2 yr, 24 hr Rainfall (in) :	3	0	0
Velocity (ft/sec) :	0.85	0	0
Computed Flow Time (min) :	1.97	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	262	0	0
Slope (%) :	2	0	0
Surface Type :	Paved	Unpaved	Unpaved
Velocity (ft/sec) :	2.87	0	0
Computed Flow Time (min) :	1.52	0	0

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.03	0.013	0.03
Flow Length (ft) :	118	88.82	277.62
Channel Slope (%) :	0.4	2	1.5
Cross Section Area (ft^2) :	22.39	0.79	11.07
Wetted Perimeter (ft) :	33.33	3.14	61
Velocity (ft/sec) :	2.41	6.46	1.95
Computed Flow Time (min) :	0.82	0.23	2.37

Total TOC (min) 6.91

Subbasin Runoff Results

Total Rainfall (in)	2.5
Total Runoff (in)	0.94
Peak Runoff (cfs)	7
Weighted Curve Number	81
Time of Concentration (days hh:mm:ss)	0 00:06:55

Subbasin : D1

Input Data

Area (ac)	13.01
Peak Rate Factor	484
Weighted Curve Number	67
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	13.01	-	67
Composite Area & Weighted CN	13.01		67

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.4	0	0
Flow Length (ft) :	100	0	0
Slope (%) :	2.2	0	0
2 yr, 24 hr Rainfall (in) :	3	0	0
Velocity (ft/sec) :	0.08	0	0
Computed Flow Time (min) :	21.35	0	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	100	641	0
Slope (%) :	2.2	1.9	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	2.39	2.22	0
Computed Flow Time (min) :	0.7	4.81	0

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.01	0	0
Flow Length (ft) :	187	0	0
Channel Slope (%) :	1.5	0	0
Cross Section Area (ft^2) :	30	0	0
Wetted Perimeter (ft) :	20	0	0
Velocity (ft/sec) :	23.91	0	0
Computed Flow Time (min) :	0.13	0	0

Total TOC (min) 26.99

Subbasin Runoff Results

Total Rainfall (in)	2.5
Total Runoff (in)	0.36
Peak Runoff (cfs)	2.9
Weighted Curve Number	67
Time of Concentration (days hh:mm:ss)	0 00:26:59

Subbasin : D10

Input Data

Area (ac)	63.53
Peak Rate Factor	484
Weighted Curve Number	77
Rain Gage ID	Rain Gage-01

Composite Curve Number

32 Soil/Surface Description	Area (acres)	Soil Group	Curve Number
-	63.53	-	77
Composite Area & Weighted CN	63.53		77

Time of Concentration

Sheet Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.015	0.4	0
Flow Length (ft) :	62	40	0
Slope (%) :	0.9	1.8	0
2 yr, 24 hr Rainfall (in) :	3	3	0
Velocity (ft/sec) :	0.69	0.06	0
Computed Flow Time (min) :	1.51	11.11	0

Shallow Concentrated Flow Computations	Subarea A	Subarea B	Subarea C
Flow Length (ft) :	180	154	0
Slope (%) :	1.5	0.8	0
Surface Type :	Unpaved	Unpaved	Unpaved
Velocity (ft/sec) :	1.98	1.44	0
Computed Flow Time (min) :	1.52	1.78	0

Channel Flow Computations	Subarea A	Subarea B	Subarea C
Manning's Roughness :	0.08	0.03	0
Flow Length (ft) :	2181	646	0
Channel Slope (%) :	0.3	0.8	0
Cross Section Area (ft^2) :	47.3	34	0
Wetted Perimeter (ft) :	94.68	68	0
Velocity (ft/sec) :	0.64	2.8	0
Computed Flow Time (min) :	56.6	3.85	0

Total TOC (min) 76.36

Subbasin Runoff Results

Total Rainfall (in)	2.5
Total Runoff (in)	0.74
Peak Runoff (cfs)	19.53
Weighted Curve Number	77
Time of Concentration (days hh:mm:ss)	0 01:16:22