

Franklin County State Airport (FSO) Environmental Assessment - **DRAFT**

Prepared For:
Vermont Agency of Transportation
October 2018

Prepared By:
Passero Associates

This Environmental Assessment becomes a Federal document when evaluated, signed and dated by the responsible FAA official.

AIP# 3-50-0007-010-2017





TABLE OF CONTENTS

CHAPTERS

1. PURPOSE AND NEED	5
1.1 Introduction	5
1.2 Background	5
1.3 Proposed Action	6
1.4 Purpose and Need	6
2. ALTERNATIVES AND PROPOSED ACTION.....	9
2.1 Introduction	9
2.2 Alternative 1: No Build Alternative.....	9
2.3 Alternative 2: Runway 1 1,000’ Runway/Taxiway Extension	11
2.4 Alternative 3: Runway 19 1000’ Runway/Taxiway Extension	13
2.5 Alternative 4: 1000’ Runway and Taxiway Extension Split.....	15
2.6 Alternative 5: Shift Runway 1-19.....	17
2.7 Alternatives Dismissed After Initial Analysis	20
2.8 Alternatives Carried Forward for Detailed Evaluation.....	20
3. AFFECTED ENVIRONMENT	22
3.1 Regional Setting	22
3.1.1 Franklin County State Airport.....	22
3.2 Surrounding Area	25
3.3 Environmental Categories	27
3.3.1 Air Quality	27
3.3.2 Biological Resources.....	27
3.3.3 Climate	31
3.3.4 Coastal Resources.....	31
3.3.5 Department of Transportation Act: Section 4(f).....	31
3.3.6 Farmlands.....	31
3.3.7 Hazardous Materials, Solid Waste, and Pollution Prevention	35
3.3.8 Historical, Architectural, Archeological, and Cultural Resources	35
3.3.9 Land Use.....	36
3.3.10 Natural Resources and Energy Supply.....	38
3.3.11 Noise and Noise-Compatible Land Use.....	38
3.3.12 Socioeconomics, Environmental Justice, and Children’s Environmental Health and Safety Risks.....	39
3.3.13 Visual Effects	40
3.3.14 Water Resources	40
3.4 Environmental Categories Carried Forward for Review	42
4. ENVIRONMENTAL CONSEQUENCES	45
4.1 Air Quality.....	45
4.2 Biological Resources	47
4.3 Climate 50	
4.4 Farmlands.....	51
4.5 Historical, Archeological and Cultural Resources	54
4.6 Land Use	55
4.7 Natural Resources and Energy Supply.....	56
4.8 Noise 57	
4.9 Visual Impacts: Light Emissions.....	58
4.10 Water Resources	59
4.10.1 Wetlands	59
4.10.2 Groundwater/Stormwater	69
4.11 Other Considerations.....	70



4.11.1 Possible Conflicts.....	70
4.11.2 Inconsistency with any Approved State or Local Plans and Laws.....	70
4.11.3 Means to Mitigate Adverse Environmental Impacts.....	70
4.12 Cumulative Impacts.....	71
4.13 Environmental Summary.....	72



TABLES

Table 3-1: State Listed Rare, Threatened and Endangered Species 28
 Table 3-2: Migratory Birds 29
 Table 3-3: Soil/Farmland Chart 34
 Table 3-4: Stormwater Permits..... 41
 Table 3-5: Environmental Impact Categories Carried Forward 42
 Table 4-1: Operational Emissions Inventory Results 46
 Table 4-2: Construction Emissions Inventory Results..... 46
 Table 4-3: Total Construction Emissions Inventory Results..... 46
 Table 4-4: Potentially Affected Bird Species and Wetland Communities..... 47
 Table 4-5: CO₂ Emissions Inventory Results..... 50
 Table 4-6: Soils Matrix..... 53
 Table 4-7: Precontact and Historic Sensitivity 54
 Table 4-8: Wetland Summary Table..... 65
 Table 4-9: Wetland Jurisdiction Summary 66
 Table 4-10: Wetland Impacts – Alternative 2 66
 Table 4-11: Wetland Impacts – Alternative 5 67
 Table 4-12: Environmental Summary 72

FIGURES

Figure 2-1: Alternative 1: No Build..... 10
 Figure 2-2: Alternative 2 – 1000’ Runway/Taxiway Extension off Runway 1 12
 Figure 2-3: Alternative 3 – 1000’ Runway/Taxiway Extension off Runway 19 14
 Figure 2-4: Alternative 4 – 1000’ Runway/Taxiway Extension Split 16
 Figure 2-5: Alternative 5 – Shifted Runway 18
 Figure 3-1: Vicinity Map 23
 Figure 3-2: Location Map 24
 Figure 3-3: Aerial of Surrounding Area 26
 Figure 3-4: Vermont Endangered/Threatened Species Map 30
 Figure 3-5 Soil Map 33
 Figure 3-6: Town of Highgate Zoning Map 37
 Figure 3-7 Water Resources..... 43
 Figure 4-1 Wetland Map and Vernal Pools: Alternative 2 63
 Figure 4-2 Wetland Map and Vernal Pools: Alternative 5 64

APPENDICES

APPENDIX A: AIRPORT LAYOUT PLAN A
 APPENDIX B: ENVIRONMENTAL DOCUMENTATION B
 APPENDIX C: WETLAND DELINEATION & ENDANGERED SPECIES H
 APPENDIX D: ARCHEOLOGICAL REPORT D
 APPENDIX E: LIST OF PREPARERS..... E
 APPENDIX F: PUBLIC PARTICIPATION F



Chapter One

Purpose and Need

1. PURPOSE AND NEED

1.1 Introduction

FAA Order 1050.1F, Environmental Impacts: Policies and Procedures (July 16, 2015), Section 3-1.2 requires an Environmental Assessment (EA) be prepared for a Proposed Action when the initial review of the Proposed Action indicates that *“(1) It is not categorically excluded ; (2) It is normally categorically excluded but, in this instance, involves at least one extraordinary circumstance that may significantly impact the human environment; or (3) The action is not one known normally to require an EIS and is not categorically excluded.”*

The Proposed Action is not categorically excluded, resulting in the preparation of this EA. The EA will evaluate potential environmental impacts of the Proposed Action in accordance with the National Environmental Policy Act (NEPA), FAA Order 1050.1F, FAA Order 5050.4B, and FAA Environmental Desk Reference.

1.2 Background

Franklin County State Airport (FSO) is a public-use facility in Highgate, Franklin County, Vermont. Geographically, the airport is in Northwestern Vermont, less than 6 miles from the Canadian Border. It's off Interstate 89, fewer than 32 miles north of Burlington. Owned and operated by the State of Vermont Agency of Transportation (VTTrans), the airport consists of one runway, numbered 1-19, measuring 3001 ft. long, by 60 ft. wide. There is a RNAV (GPS) instrument approach available to each Runway end (see **Appendix A.**)

The basis for this Environmental Assessment comes from two studies. The first was a runway length analysis, and the second was an obstruction analysis.

Since 2006, the Airport Layout Plan (ALP) has shown a 1,000-foot runway extension of Runway 1, with additional taxiway and hangar development east of the runway (see **Appendix A**). Per the FAA's request, in 2016-2017 a runway length analysis was completed to justify the runway extension given the airport's current situation. Based on the findings of this study, a 600-foot runway and taxiway extension are justified. The revised ALP continues to show a 1,000-foot extension, with the anticipated funding for the additional 400 feet to be a source other than the Federal Aviation Administration.

Additionally, an obstruction analysis was completed for the existing runway length, a 600-foot runway extension, and a 1,000-foot runway extension. For each respective runway length, the analysis identified obstructions to the FAR Part 77 surface and the FAA airspace design surfaces. Through this study, non-airport lands that have obstructions on them were identified.

In November 2017, a Categorical Exclusion (CATEX) was approved for this a project at the airport (**see Appendix A**). The project included:

- Construction of a 350-linear foot long, 25-foot-wide Taxiway C and relocation of utilities
- Construction of a 920-linear foot long, 25-foot-wide new access Taxiway B. It starts at Taxiway A and heads east, leading to proposed construction of 352,000 square feet of apron (including Taxiway B and Taxiway B1, for future tie-downs); construction of a 1,425 linear foot, 26 feet



wide access road with gate installation from Airport Road to the new Taxiway B apron. These projects will be included in the cumulative impact category of this EA.

Although the Runway Length Analysis Study justified an extension to 600 feet, this Environmental Assessment will examine the original 1,000-foot extension (VTTrans, the sponsor, is looking into funding 400 feet of the 1,000-foot extension) to secure the land necessary to ensure obstructions are removed to the ultimate length.

1.3 Proposed Action

VTTrans, owner of Franklin County State Airport requests federal funding approval for the following projects:

- Rehabilitate and construct 15' runway widening (3001 x 60')
- Construct Runway 1 extension (1,000' x 75')
- Installation of medium intensity edge lighting and NAVAIDs
- Construct Partial Parallel Taxiway to Runway extension (1,000' x 25')
- Construct Partial Parallel Taxiway to Runway 19 end (1960 x 25')
- Easement acquisition for obstruction removal
- Obstruction removal (8 +/- acres on and 18.2 +/- acres off airport property)
- Upgrade underground fuel tanks to (2) 12,000 gallon above ground tanks
- Construct Perimeter access road (3000 LF x 26 ft. wide)
- Remove existing fence (880 LF), Yard Rd and remove dirt haul road, and install new fence (5300 LF) and relocated Yard Road (4000 LF)
- Main apron rehabilitation (150,000 SF +/-)
- Hangar development (3 hangars each 7,000 SF +/-)
- Design and build an adequate size storm water system to handle future development
- Potential 16.5± acres of land swap for additional hangar development

1.4 Purpose and Need

The need for the project is multifaceted. A detailed runway length analysis was completed in 2017 showing the current length of 3,001 feet does not provide the runway length necessary for the aircraft that regularly use the airport for small airplanes having 10 or more passenger seats. The width of the current runway does not provide the necessary width for RDC A/B-II design. The runway is not served by a parallel taxiway per design standards. The approaches to the runway ends are not clear, impacting operational safety. There is insufficient hangar space to meet the need.

The **purpose** of the proposed action is to adequately position the airport to serve its client base, meet FAA design and safety criteria and provide financial stability. This can be done by:

- Widening the original runway to 75 feet to meet design standards for RDC A/B-II aircraft
- Extending the runway and construct a partial parallel taxiway 1,000 feet to increase safety at the airport
- Extend the taxiway to Runway 19 end to increase safety at the airport
- Acquiring easements off airport property to remove tree obstructions that will provide for clear approaches to each runway



- Increasing the terminal area through constructing an additional apron, hangar and fuel facility for financial stability. All hangars are full and there continues to be a waiting list for hangar space.
- Maintaining safety by separating vehicles from taxiways for access around the airfield through the construction of a perimeter access road.
- Meeting bulk petroleum regulations for secondary containment, replace existing below ground fuel tanks with above ground tanks for both 100LL and Jet A.
- Performing a land swap for lands closer to the airside that will help support future hangar development for added financial stability.

The improvements must ensure that approaches to the airport are not jeopardized through the clearing of on and off airport obstructions to provide standard safety areas and clear approaches.

The proposed runway extension includes a parallel taxiway extension to comply with Advisory Circular 150/5300-13A, *Airport Design*, section 405, which states that *"a parallel taxiway eliminates using the runway for taxiing, thus increasing capacity and protecting the runway under low visibility conditions. In addition, a full length parallel taxiway is required for instrument approach procedures with visibility minimums below one mile and recommended for all other conditions."*

Hangar and storm water capacity at the airport is full. There are lands available for additional hangar development that could assist the airport toward a goal of financial sustainability. To reach the future hangar development, separate taxilanes, an apron, and additional aircraft tie-downs are needed.



Chapter Two

Alternatives and Proposed Action



2. ALTERNATIVES AND PROPOSED ACTION

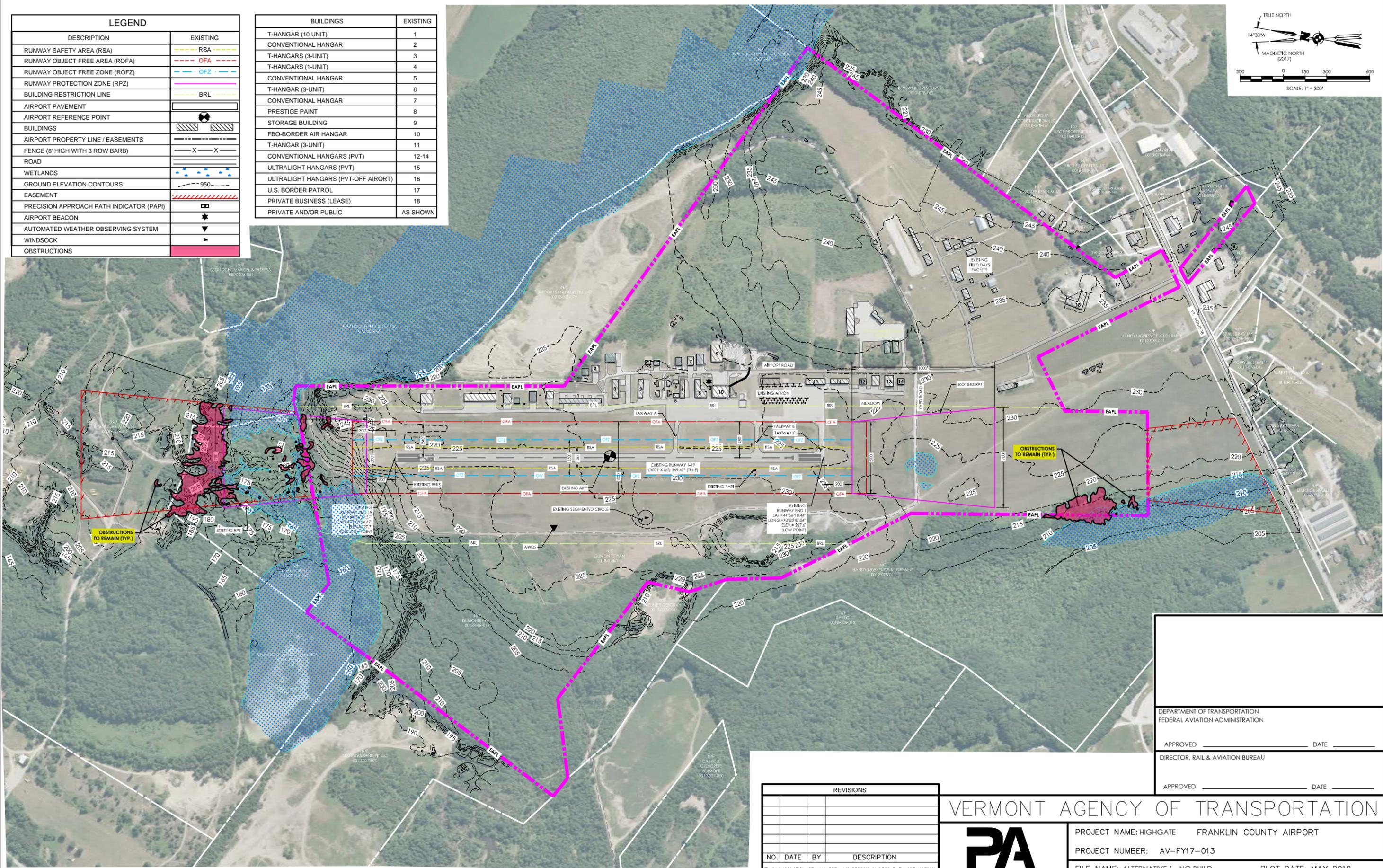
2.1 Introduction

This document is prepared to determine whether the Proposed Action or its alternatives have potential to significantly affect the environment. The EA provides detailed description of the alternatives to aid decision makers in choosing a development option that meets the Purpose and Need of the Proposed Action. This chapter describes viable alternatives to meet the Proposed Action and evaluates them on their ability to meet the Purpose and Need. To satisfy NEPA requirements, this EA will consider the No Build Alternative to provide decision makers a baseline for comparing the impacts of the Proposed Action.

In addition to Alternative 1, the No Build Alternative, this chapter includes descriptions of three other alternatives for consideration.

2.2 Alternative 1: No Build Alternative

Under this Alternative, the runway will remain at its existing width and length, and no future development projects will be pursued (see **Figure 2-1**). The existing obstructions that were identified as part of the Obstruction Study will continue to be obstructions, ultimately negatively impacting the approaches to both runway ends in the long-term. No additional terminal development will occur under this alternative.



LEGEND	
DESCRIPTION	EXISTING
RUNWAY SAFETY AREA (RSA)	--- RSA ---
RUNWAY OBJECT FREE AREA (ROFA)	--- OFA ---
RUNWAY OBJECT FREE ZONE (ROFZ)	--- OFZ ---
RUNWAY PROTECTION ZONE (RPZ)	--- RPZ ---
BUILDING RESTRICTION LINE	--- BRL ---
AIRPORT PAVEMENT	[Symbol]
AIRPORT REFERENCE POINT	[Symbol]
BUILDINGS	[Symbol]
AIRPORT PROPERTY LINE / EASEMENTS	--- ---
FENCE (8' HIGH WITH 3 ROW BARB)	-X-X-
ROAD	==
WETLANDS	[Symbol]
GROUND ELEVATION CONTOURS	--- 950 ---
EASEMENT	///
PRECISION APPROACH PATH INDICATOR (PAPI)	[Symbol]
AIRPORT BEACON	[Symbol]
AUTOMATED WEATHER OBSERVING SYSTEM	[Symbol]
WINDSOCK	[Symbol]
OBSTRUCTIONS	[Symbol]

BUILDINGS	EXISTING
T-HANGAR (10 UNIT)	1
CONVENTIONAL HANGAR	2
T-HANGARS (3-UNIT)	3
T-HANGARS (1-UNIT)	4
CONVENTIONAL HANGAR	5
T-HANGAR (3-UNIT)	6
CONVENTIONAL HANGAR	7
PRESTIGE PAINT	8
STORAGE BUILDING	9
FBO-BORDER AIR HANGAR	10
T-HANGAR (3-UNIT)	11
CONVENTIONAL HANGARS (PVT)	12-14
ULTRALIGHT HANGARS (PVT)	15
ULTRALIGHT HANGARS (PVT-OFF AIRPORT)	16
U.S. BORDER PATROL	17
PRIVATE BUSINESS (LEASE)	18
PRIVATE AND/OR PUBLIC	AS SHOWN

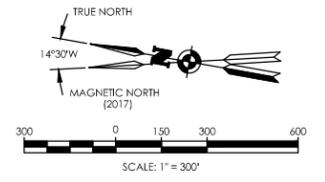


Fig. 2-1 - Alternate #1 - No Build

AIP 3-50-0007-009-2017

REVISIONS			
NO.	DATE	BY	DESCRIPTION

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECT SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER THESE PLANS IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

VERMONT AGENCY OF TRANSPORTATION

PA
 PASSERO ASSOCIATES
 242 WEST MAIN STREET, SUITE 100
 ROCHESTER, NY 14614
 (585)325-1000 FAX: (585)-325-1691

PROJECT NAME: HIGHGATE FRANKLIN COUNTY AIRPORT
 PROJECT NUMBER: AV-FY17-013
 FILE NAME: ALTERNATIVE 1 - NO BUILD
 PROJECT LEADER: LISA CHEUNG
 DESIGNED BY: LISA CHEUNG
 SHEET TITLE: NO BUILD
 PLOT DATE: MAY 2018
 DRAWN BY: WAYNE ZIAN
 CHECKED BY: L.M.C.
 SHEET 1 OF 4

DEPARTMENT OF TRANSPORTATION
 FEDERAL AVIATION ADMINISTRATION
 APPROVED _____ DATE _____
 DIRECTOR, RAIL & AVIATION BUREAU
 APPROVED _____ DATE _____

2.3 Alternative 2: Runway 1 1,000' Runway/Taxiway Extension

This Alternative proposes full depth asphalt construction of a 1,000-foot runway and taxiway extension off Runway 1 (see **Figure 2-2**).

Alternative 2 also includes installing new 30" high Medium Intensity Runway and LED Taxiway Edge Lighting, non-precision pavement markings, Precision Approach Path Indicators (PAPI), new 36" high Runway End Identification Lights (REILS), and associated electrical conduit and drainage improvements associated with new pavement, along with clearing and grubbing, and fence relocations. Finally, the alternative includes upgrading the storm water system.

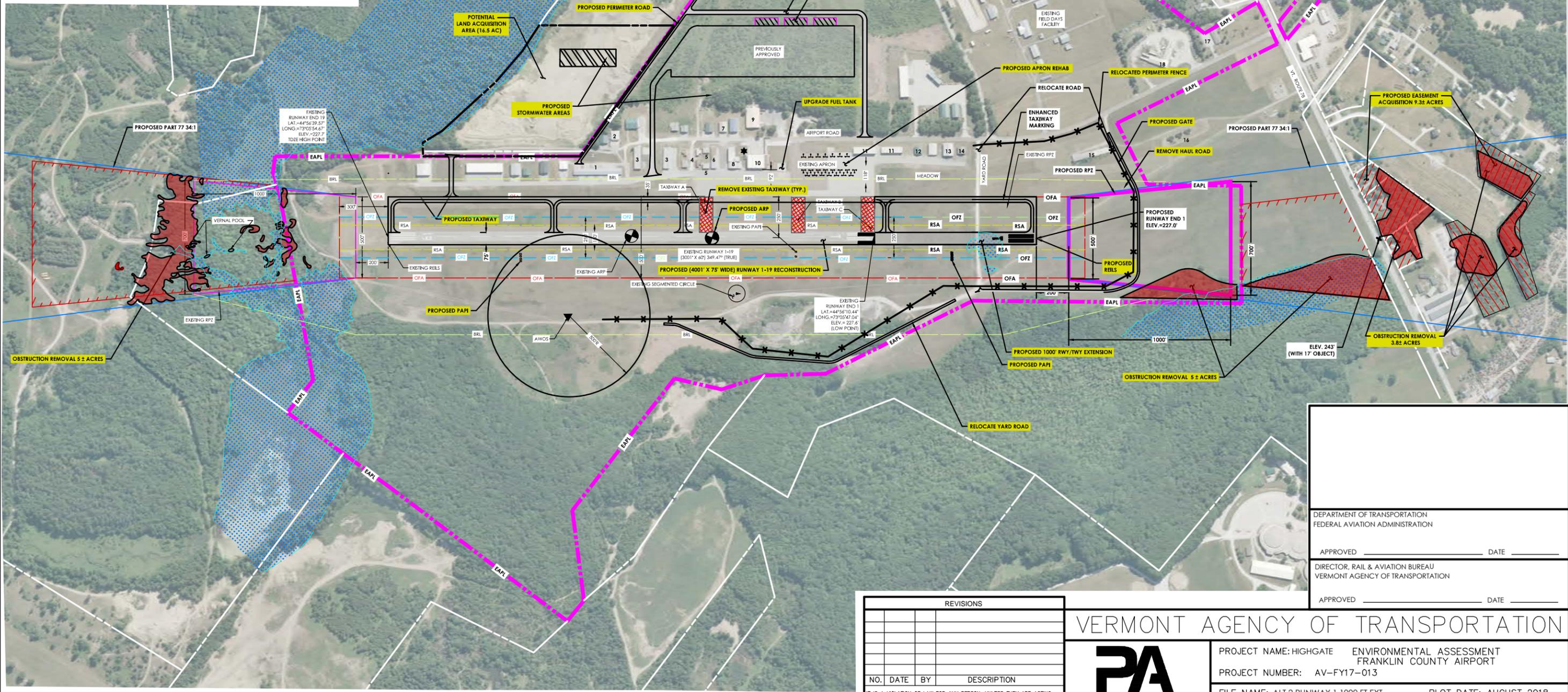
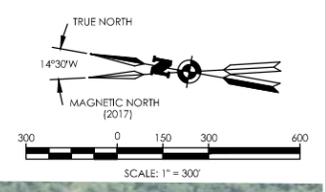
This alternative also provides the additional support facilities that are needed at the airport to improve safety and security, including taxilane access to landside hangar development, expansion of the apron and land or easement acquisition for tree removal.

In summary, this alternative includes the following elements:

- Rehabilitate and construct 15' runway widening (3001 x 60')
- Construct Runway extension (1,000' x 75')
- Installation of medium intensity edge lighting and NAVAIDs
- Construct Partial Parallel Taxiway to Runway 1 extension (1,000' x 25')
- Construct Partial Parallel Taxiway to Runway 19 end, remove existing taxiway connectors (2700 x 35')
- Relocation of Yard Road and removal of haul road
- Easement acquisition (9.3 +/- acres) for obstruction removal
- Obstruction removal (13.8 +/- acres)
- Upgrade underground fuel tanks to (2) 12,000 gallon above ground tanks
- Construct Perimeter access road (3000 LF x 26 ft. wide)
- Remove existing fence (880 LF), Yard Rd and remove dirt haul road, and install new fence (5300 LF) and relocate Yard Road (4000 LF)
- Main apron rehabilitation (150,000 SF +/-)
- Hangar development (3 hangars each 7,000 SF +/-)
- Potential 16.5± acres of land swap for additional hangar development. Construct access taxilane
- Design and build an adequate size storm water system to handle future development

LEGEND		
DESCRIPTION	EXISTING	PROPOSED
RUNWAY SAFETY AREA (RSA)	--- RSA ---	--- RSA ---
RUNWAY OBJECT FREE AREA (ROFA)	--- OFA ---	--- OFA ---
RUNWAY OBJECT FREE ZONE (ROFZ)	--- OFZ ---	--- OFZ ---
RUNWAY PROTECTION ZONE (RPZ)	--- RPZ ---	--- RPZ ---
BUILDING RESTRICTION LINE	--- BRL ---	--- BRL ---
AIRPORT PAVEMENT	[Symbol]	[Symbol]
AIRPORT REFERENCE POINT	[Symbol]	[Symbol]
BUILDINGS	[Symbol]	[Symbol]
AIRPORT PROPERTY LINE / EASEMENTS	--- EAPL ---	--- EAPL ---
FENCE (8' HIGH WITH 3 ROW BARB)	--- X ---	--- X ---
ROAD	--- ROAD ---	--- ROAD ---
WETLANDS	[Symbol]	[Symbol]
GROUND ELEVATION CONTOURS	--- 950 ---	--- 950 ---
EASEMENT	--- EASEMENT ---	--- EASEMENT ---
PRECISION APPROACH PATH INDICATOR (PAPI)	[Symbol]	[Symbol]
AIRPORT BEACON	[Symbol]	[Symbol]
AUTOMATED WEATHER OBSERVING SYSTEM	[Symbol]	[Symbol]
WINDSOCK	[Symbol]	[Symbol]

BUILDINGS	EXISTING
T-HANGAR (10 UNIT)	1
CONVENTIONAL HANGAR	2
T-HANGARS (3-UNIT)	3
T-HANGARS (1-UNIT)	4
CONVENTIONAL HANGAR	5
T-HANGAR (3-UNIT)	6
CONVENTIONAL HANGAR	7
PRESTIGE PAINT	8
STORAGE BUILDING	9
FBO-BORDER AIR HANGAR	10
T-HANGAR (3-UNIT)	11
CONVENTIONAL HANGARS (PVT)	12-14
ULTRALIGHT HANGARS (PVT)	15
ULTRALIGHT HANGARS (PVT-OFF AIRPORT)	16
U.S. BORDER PATROL	17
PRIVATE BUSINESS (LEASE)	18
PRIVATE AND/OR PUBLIC	AS SHOWN



DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

APPROVED _____ DATE _____

DIRECTOR, RAIL & AVIATION BUREAU
VERMONT AGENCY OF TRANSPORTATION

APPROVED _____ DATE _____

REVISIONS			
NO.	DATE	BY	DESCRIPTION

VERMONT AGENCY OF TRANSPORTATION

PA
PASSERO ASSOCIATES
242 WEST MAIN STREET, SUITE 100
ROCHESTER, NY 14614
(585)325-1000 FAX: (585)-325-1691

PROJECT NAME: HIGHGATE ENVIRONMENTAL ASSESSMENT
FRANKLIN COUNTY AIRPORT

PROJECT NUMBER: AV-FY17-013

FILE NAME: ALT 2 RUNWAY 1 1000 FT EXT.
PROJECT LEADER: LISA CHEUNG
DESIGNED BY: LISA CHEUNG
SHEET TITLE: ALTERNATIVE #2 - RUNWAY 1 1000' EXT.

PLOT DATE: AUGUST 2018
DRAWN BY: WAYNE ZIAN
CHECKED BY: L.M.C.
SHEET 2 OF 4

Fig. 2-2- Alternate #2 - Runway 1 1000' Extension With Land Swap

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECT SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER THESE PLANS IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

2.4 Alternative 3: Runway 19 1000' Runway/Taxiway Extension

This Alternative proposes full depth asphalt construction of a 600-foot runway and taxiway extension off Runway 19, see **Figure 2-3**.

Alternative 3 also includes installing new 30" high Medium Intensity Runway and LED Taxiway Edge Lighting, non-precision pavement markings, Precision Approach Path Indicators (PAPI), new 36" high Runway End Identification Lights (REILS), and associated electrical conduit and drainage improvements associated with new pavement, along with clearing and grubbing, and fence relocations. Finally, this alternative includes an upgraded storm water system

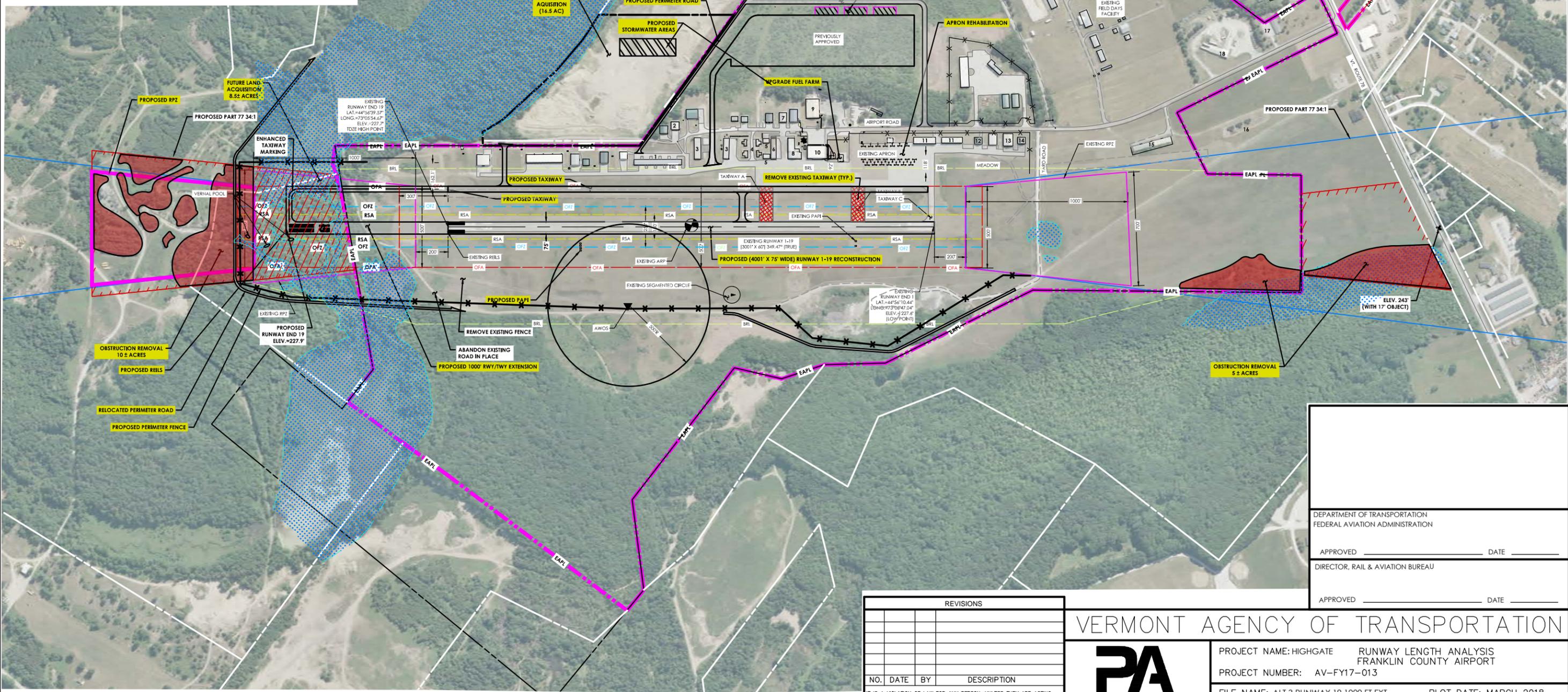
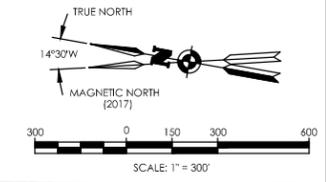
This alternative also provides the additional support facilities that are needed at the airport to improve safety and security, including taxilane access to landside hangar development, expansion of the apron and land or easement acquisition for tree removal.

In summary, this alternative includes the following elements:

- Rehabilitate and construct 15' runway widening (3001 x 60')
- Construct Runway extension (1,000' x 75')
- Installation of medium intensity edge lighting and NAVAIDs
- Construct Partial Parallel Taxiway to Runway 19 extension (1,000' x 25')
- Construct Partial Parallel Taxiway to Runway 19 end, remove existing taxiway connectors (2700 x 35')
- Future land acquisition 8.5 +/- acres for Runway/Taxiway Extension
- Fill required to raise the Runway 19 end
- Obstruction removal (15 +/- acres)
- Upgrade underground fuel tanks to (2) 12,000 gallon above ground tanks
- Construct Perimeter access road (3000 LF x 26 ft. wide)
- Remove existing fence (858 LF), Install new fence (6400LF)
- Abandon haul road and relocate Yard Rd (4800 LF)
- Main apron rehabilitation (150,000 SF +/-)
- Hangar development (3 hangars each 7,000 SF +/-)
- Potential 16.5± acres of land swap area for additional hangar development. Construct access taxilane
- Design and build an adequate size storm water system to handle future development

LEGEND		
DESCRIPTION	EXISTING	PROPOSED
RUNWAY SAFETY AREA (RSA)	--- RSA ---	--- RSA ---
RUNWAY OBJECT FREE AREA (ROFA)	--- OFA ---	--- OFA ---
RUNWAY OBJECT FREE ZONE (ROFZ)	--- OFZ ---	--- OFZ ---
RUNWAY PROTECTION ZONE (RPZ)	--- RPZ ---	--- RPZ ---
BUILDING RESTRICTION LINE	--- BRL ---	--- BRL ---
AIRPORT PAVEMENT	[Symbol]	[Symbol]
AIRPORT REFERENCE POINT	[Symbol]	[Symbol]
BUILDINGS	[Symbol]	[Symbol]
AIRPORT PROPERTY LINE / EASEMENTS	--- EAPL ---	--- EAPL ---
FENCE (8' HIGH WITH 3 ROW BARB)	-X-X-	-X-X-
ROAD	[Symbol]	[Symbol]
WETLANDS	[Symbol]	[Symbol]
GROUND ELEVATION CONTOURS	--- 950 ---	--- 950 ---
EASEMENT	[Symbol]	[Symbol]
PRECISION APPROACH PATH INDICATOR (PAPI)	[Symbol]	[Symbol]
AIRPORT BEACON	[Symbol]	[Symbol]
AUTOMATED WEATHER OBSERVING SYSTEM	[Symbol]	[Symbol]
WINDSOCK	[Symbol]	[Symbol]

BUILDINGS	EXISTING
T-HANGAR (10 UNIT)	1
CONVENTIONAL HANGAR	2
T-HANGARS (3-UNIT)	3
T-HANGARS (1-UNIT)	4
CONVENTIONAL HANGAR	5
T-HANGAR (3-UNIT)	6
CONVENTIONAL HANGAR	7
PRESTIGE PAINT	8
STORAGE BUILDING	9
FBO-BORDER AIR HANGAR	10
T-HANGAR (3-UNIT)	11
CONVENTIONAL HANGARS (PVT)	12-14
ULTRALIGHT HANGARS (PVT)	15
ULTRALIGHT HANGARS (PVT-OFF AIRPORT)	16
U.S. BORDER PATROL	17
PRIVATE BUSINESS (LEASE)	18
PRIVATE AND/OR PUBLIC	AS SHOWN



DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

APPROVED _____ DATE _____

DIRECTOR, RAIL & AVIATION BUREAU

APPROVED _____ DATE _____

REVISIONS			
NO.	DATE	BY	DESCRIPTION

VERMONT AGENCY OF TRANSPORTATION

PA
PASSERO ASSOCIATES
242 WEST MAIN STREET, SUITE 100
ROCHESTER, NY 14614
(585)325-1000 FAX: (585)-325-1691

PROJECT NAME: HIGHGATE RUNWAY LENGTH ANALYSIS
FRANKLIN COUNTY AIRPORT

PROJECT NUMBER: AV-FY17-013

FILE NAME: ALT 3 RUNWAY 19 1000 FT EXT
PROJECT LEADER: LISA CHEUNG
DESIGNED BY: LISA CHEUNG
SHEET TITLE: ALTERNATE #3 - RUNWAY 19 1000' EXTENSION

PLOT DATE: MARCH 2018
DRAWN BY: WAYNE ZIAN
CHECKED BY: L.M.C.
SHEET 3 OF 4

Fig. 2-3 - Alternate #3 - Nothing Runway 1, Runway 19 1000' Extension With Land Swap
AIP 3-50-0007-009-2017

2.5 Alternative 4: 1000' Runway and Taxiway Extension Split

This Alternative proposes full depth asphalt construction of a 1000-foot runway and taxiway extension split, 600 feet off Runway 1, 400 feet off Runway 19, see **Figure 2-4**.

Alternative 4 also includes installing new 30" high Medium Intensity Runway and LED Taxiway Edge Lighting, non-precision pavement markings, Precision Approach Path Indicators (PAPI), new 36" high Runway End Identification Lights (REILS), and associated electrical conduit and drainage improvements associated with new pavement, along with clearing and grubbing, and fence relocations. Finally, this alternative includes upgrading the storm water system.

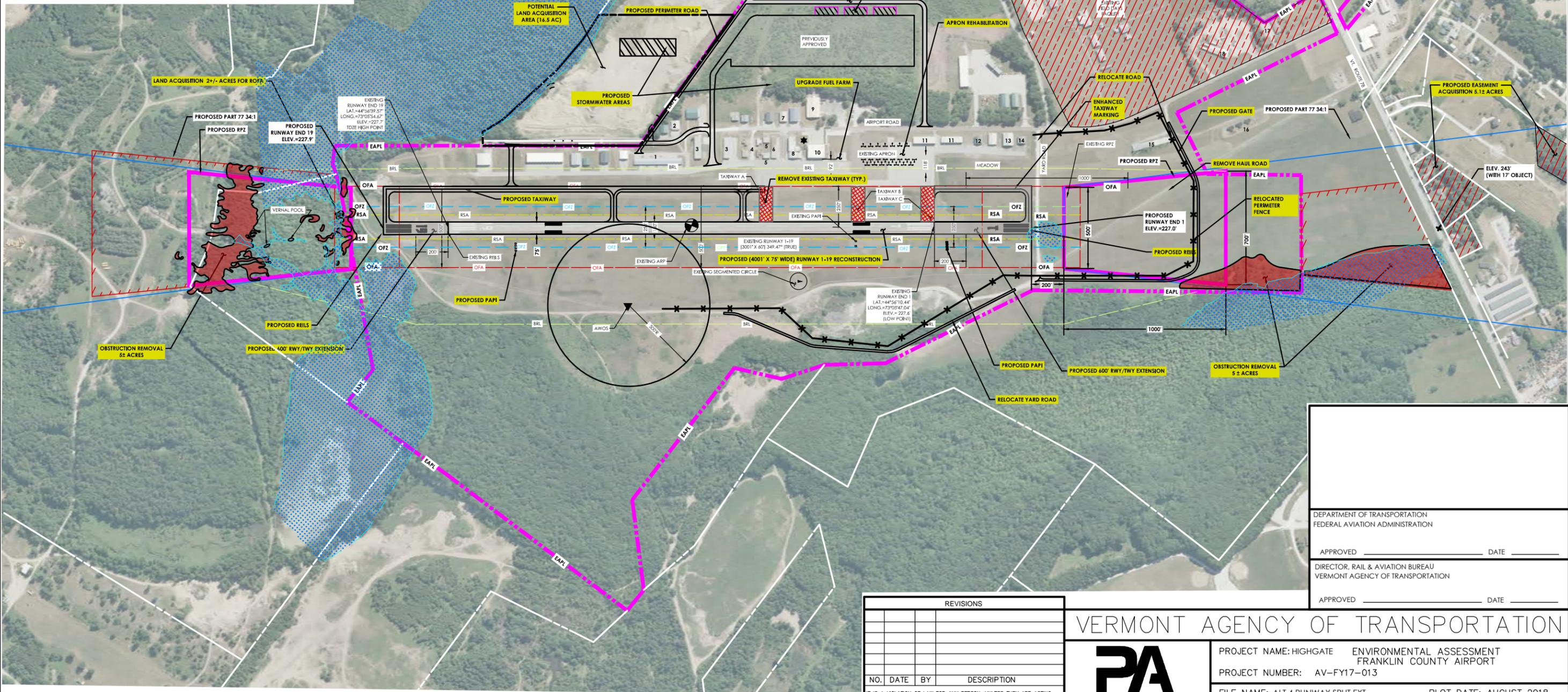
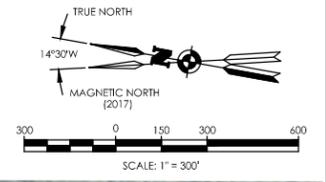
This alternative also provides the additional support facilities that are needed at the airport to improve safety and security, including taxilane access to landside hangar development, expansion of the apron and land or easement acquisition and tree removal.

In summary, this alternative includes the following elements:

- Rehabilitate and construct 15' runway widening (3001 x 60')
- Construct Runway 1 extension (600' x 75'), split
- Construct Runway 19 extension (400' x 75'), split
- Installation of medium intensity edge lighting and NAVAIDs
- Construct Partial Parallel Taxiway to Runway 19 end (2700 x 35')
- Construct Partial Parallel Taxiway to Runway 1 extension, remove existing taxiway connectors (600' x 25'), split
- Construct Partial Parallel Taxiway to Runway 19 extension (400' x 25'), split
- Relocation of Yard Road and removal of haul road
- Land Acquisition (2 +/- acres) for Runway Object Free Area off Runway 19
- Easement acquisition (5.1 +/- acres) for obstruction removal
- Obstruction removal (10 +/- acres)
- Upgrade underground fuel tanks to (2) 12,000 gallon above ground tanks
- Construct Perimeter access road (3000 LF x 26 ft. wide)
- Remove existing fence (880 LF), Yard Road and remove dirt haul road, and install new fence (5500 LF) and relocate Yard Road (4000 LF)
- Main apron rehabilitation (150,000 SF +/-)
- Hangar development (3 hangars each 7,000 SF +/-)
- Potential 16.5± acres of land swap area for additional hangar development. Construct access taxilane
- Design and build an adequate size storm water system to handle future development

LEGEND		
DESCRIPTION	EXISTING	PROPOSED
RUNWAY SAFETY AREA (RSA)	--- RSA ---	--- RSA ---
RUNWAY OBJECT FREE AREA (ROFA)	--- OFA ---	--- OFA ---
RUNWAY OBJECT FREE ZONE (ROFZ)	--- OFZ ---	--- OFZ ---
RUNWAY PROTECTION ZONE (RPZ)	--- RPZ ---	--- RPZ ---
BUILDING RESTRICTION LINE	--- BRL ---	--- BRL ---
AIRPORT PAVEMENT	[Symbol]	[Symbol]
AIRPORT REFERENCE POINT	[Symbol]	[Symbol]
BUILDINGS	[Symbol]	[Symbol]
AIRPORT PROPERTY LINE / EASEMENTS	--- EAPL ---	--- EAPL ---
FENCE (8' HIGH WITH 3 ROW BARB)	--- X ---	--- X ---
ROAD	--- ROAD ---	--- ROAD ---
WETLANDS	[Symbol]	[Symbol]
GROUND ELEVATION CONTOURS	--- 950 ---	--- 950 ---
EASEMENT	--- EASEMENT ---	--- EASEMENT ---
PRECISION APPROACH PATH INDICATOR (PAPI)	[Symbol]	[Symbol]
AIRPORT BEACON	[Symbol]	[Symbol]
AUTOMATED WEATHER OBSERVING SYSTEM	[Symbol]	[Symbol]
WINDSOCK	[Symbol]	[Symbol]

BUILDINGS	EXISTING
T-HANGAR (10 UNIT)	1
CONVENTIONAL HANGAR	2
T-HANGARS (3-UNIT)	3
T-HANGARS (1-UNIT)	4
CONVENTIONAL HANGAR	5
T-HANGAR (3-UNIT)	6
CONVENTIONAL HANGAR	7
PRESTIGE PAINT	8
STORAGE BUILDING	9
FBO-BORDER AIR HANGAR	10
T-HANGAR (3-UNIT)	11
CONVENTIONAL HANGARS (PVT)	12-14
ULTRALIGHT HANGARS (PVT)	15
ULTRALIGHT HANGARS (PVT-OFF AIRPORT)	16
U.S. BORDER PATROL	17
PRIVATE BUSINESS (LEASE)	18
PRIVATE AND/OR PUBLIC	AS SHOWN



DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

APPROVED _____ DATE _____

DIRECTOR, RAIL & AVIATION BUREAU
VERMONT AGENCY OF TRANSPORTATION

APPROVED _____ DATE _____

REVISIONS			
NO.	DATE	BY	DESCRIPTION

VERMONT AGENCY OF TRANSPORTATION

PA
PASSERO ASSOCIATES
242 WEST MAIN STREET, SUITE 100
ROCHESTER, NY 14614
(585)325-1000 FAX: (585)-325-1691

PROJECT NAME: HIGHGATE ENVIRONMENTAL ASSESSMENT
FRANKLIN COUNTY AIRPORT

PROJECT NUMBER: AV-FY17-013

FILE NAME: ALT 4 RUNWAY SPLIT EXT
PROJECT LEADER: LISA CHEUNG
DESIGNED BY: LISA CHEUNG
SHEET TITLE: ALTERNATE #4 - RUNWAY 1 600' EXT. RUNWAY 19 400' EXT. SHEET 4 OF 4

PLOT DATE: AUGUST 2018
DRAWN BY: WAYNE ZIAN
CHECKED BY: L.M.C.

Fig. 2-4 - Alternate #4 - Split 1000' Extension With Land Swap

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECT SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER THESE PLANS IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

2.6 Alternative 5: Shift Runway 1-19

This Alternative was examined to try to minimize the obstruction removal off Runway 19, while maintain the Runway 1 RPZ within the confines of Route 78. To accomplish this goal, this alternative proposes to relocate Runway 19 end of runway 620 feet from its existing end, and adding it to the Runway 1 end. This alternative therefore considers full depth asphalt construction of a 1,620-foot runway and taxiway extension off Runway 1 (see **Figure 2-5**).

Alternative 5 also includes installing new 30" high Medium Intensity Runway and LED Taxiway Edge Lighting, non-precision pavement markings, Precision Approach Path Indicators (PAPI), new 36" high Runway End Identification Lights (REILS), and associated electrical conduit and drainage improvements associated with new pavement, along with clearing and grubbing, and fence relocations. Finally, this alternative includes upgrading the storm water system.

This alternative also provides the additional support facilities that are needed at the airport to improve safety and security, including taxilane access to landside hangar development, expansion of the apron and land or easement acquisition and tree removal.

In summary, this alternative includes the following elements:

- Rehabilitate and construct 15' runway widening (2131 x 60')
- Construct Runway 1 extension (1620' x 75')
- Remove Runway 19 end (620' x 60')
- Installation of medium intensity edge lighting and NAVAIDs
- Construct Partial Parallel Taxiway to Runway 19 end (2131 x 35')
- Construct Partial Parallel Taxiway to Runway 1 extension (1620' x 25')
- Relocation of Yard Road and removal of haul road
- Land Acquisition (8.2 +/- acres) for the shifted Runway 1 RPZ
- Easement acquisition (9.3 +/- acres) for obstruction removal
- Obstruction removal (9.0 +/- acres)
- Upgrade underground fuel tanks to (2) 12,000 gallon above ground tanks
- Construct Perimeter access road (3000 LF x 26 ft. wide)
- Remove existing fence (880 LF), Yard Road and remove dirt haul road, and install new fence (7700 LF) and relocate Yard Road (4500 LF)
- Main apron rehabilitation (150,000 SF +/-)
- Hangar development (3 hangars each 7,000 SF +/-)
- Potential 16.5± acres of land swap area for additional hangar development. Construct access taxilane
- Design and build an adequate size storm water system to handle future development

LEGEND		
DESCRIPTION	EXISTING	PROPOSED
RUNWAY SAFETY AREA (RSA)	--- RSA ---	--- RSA ---
RUNWAY OBJECT FREE AREA (ROFA)	--- OFA ---	--- OFA ---
RUNWAY OBJECT FREE ZONE (ROFZ)	--- OFZ ---	--- OFZ ---
RUNWAY PROTECTION ZONE (RPZ)	--- RPZ ---	--- RPZ ---
BUILDING RESTRICTION LINE	--- BRL ---	--- BRL ---
AIRPORT PAVEMENT	[Symbol]	[Symbol]
AIRPORT REFERENCE POINT	[Symbol]	[Symbol]
BUILDINGS	[Symbol]	[Symbol]
AIRPORT PROPERTY LINE / EASEMENTS	--- EAPL ---	--- EAPL ---
FENCE (8' HIGH WITH 3 ROW BARB)	-X-X-	-X-X-
ROAD	--- ROAD ---	--- ROAD ---
WETLANDS	[Symbol]	[Symbol]
GROUND ELEVATION CONTOURS	--- 950 ---	--- 950 ---
EASEMENT	[Symbol]	[Symbol]
PRECISION APPROACH PATH INDICATOR (PAPI)	[Symbol]	[Symbol]
AIRPORT BEACON	[Symbol]	[Symbol]
AUTOMATED WEATHER OBSERVING SYSTEM	[Symbol]	[Symbol]
WINDSOCK	[Symbol]	[Symbol]

BUILDINGS	EXISTING
T-HANGAR (10 UNIT)	1
CONVENTIONAL HANGAR	2
T-HANGARS (3-UNIT)	3
T-HANGARS (1-UNIT)	4
CONVENTIONAL HANGAR	5
T-HANGAR (3-UNIT)	6
CONVENTIONAL HANGAR	7
PRESTIGE PAINT	8
STORAGE BUILDING	9
FBO-BORDER AIR HANGAR	10
T-HANGAR (3-UNIT)	11
CONVENTIONAL HANGARS (PVT)	12-14
ULTRALIGHT HANGARS (PVT)	15
ULTRALIGHT HANGARS (PVT-OFF AIRPORT)	16
U.S. BORDER PATROL	17
PRIVATE BUSINESS (LEASE)	18
PRIVATE AND/OR PUBLIC	AS SHOWN

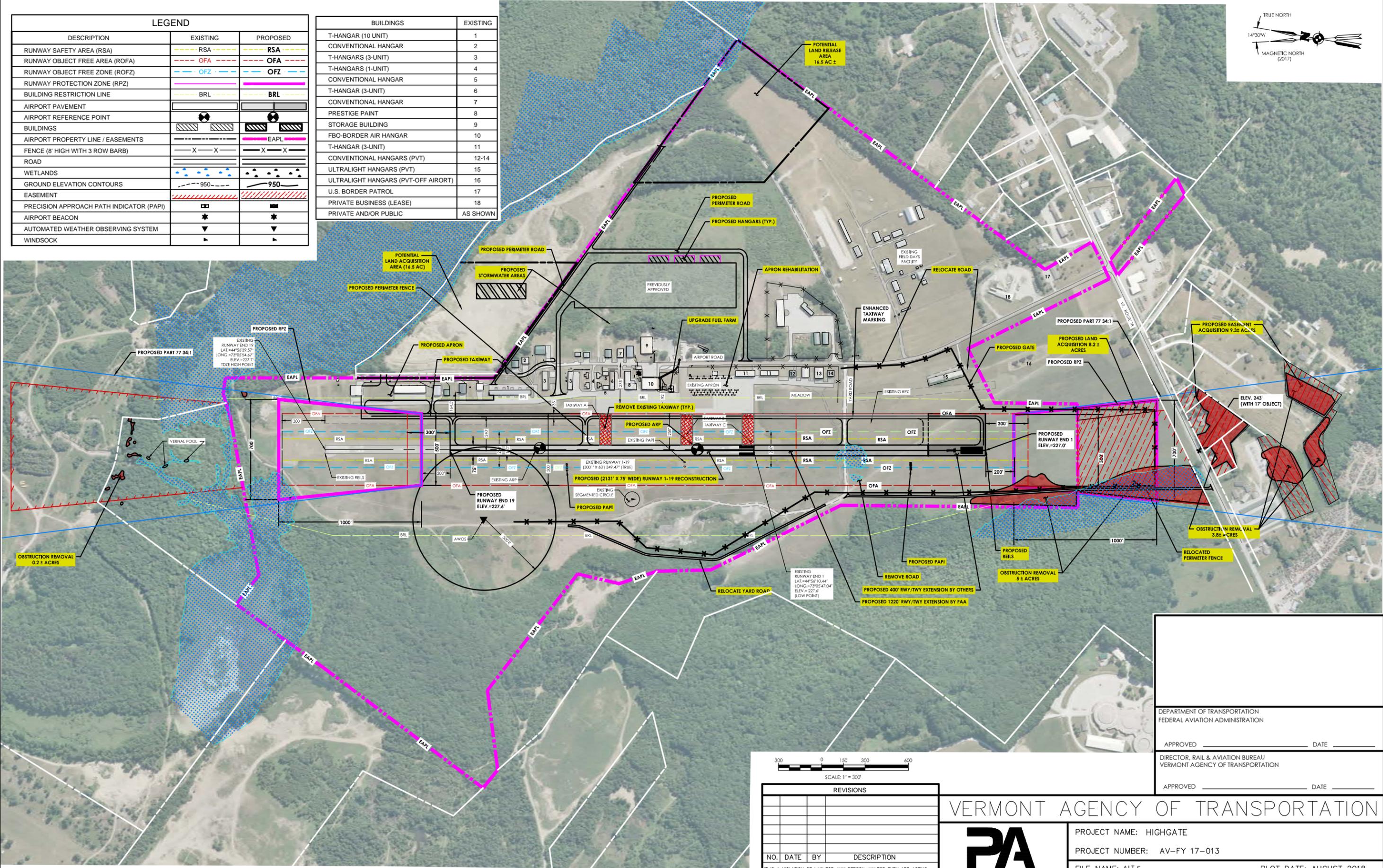
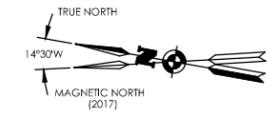
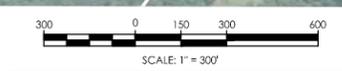


Fig. 2-5- Alternate #5 - Shift Runway with 1000' Extension

AIP 3-50-0007-009-2017



REVISIONS			
NO.	DATE	BY	DESCRIPTION

VERMONT AGENCY OF TRANSPORTATION

PA
 PASSERO ASSOCIATES
 242 WEST MAIN STREET, SUITE 100
 ROCHESTER, NY 14614
 (585)325-1000 FAX: (585)-325-1691

PROJECT NAME: HIGHGATE
 PROJECT NUMBER: AV-FY 17-013
 FILE NAME: ALT 5
 PROJECT LEADER: LISA CHEUNG
 DESIGNED BY: LISA CHEUNG
 SHEET TITLE: ALT 5
 PLOT DATE: AUGUST 2018
 DRAWN BY: WAYNE ZIAN
 CHECKED BY: L.M.C.
 SHEET 1 OF 1

DEPARTMENT OF TRANSPORTATION
 FEDERAL AVIATION ADMINISTRATION
 APPROVED _____ DATE _____
 DIRECTOR, RAIL & AVIATION BUREAU
 VERMONT AGENCY OF TRANSPORTATION
 APPROVED _____ DATE _____



Table 2-1: Alternative Evaluation Matrix

Description	Alternative 1: No Build	Alternative 2: Rwy 1 Extension	Alternative 3: Rwy 19 Extension	Alternative : 4 Rwy Extension Split	Alternative : 5 Shifted Runway
DESIGN STANDARDS					
Standard Runway Width	Yes	Yes	Yes	Yes	Yes
Standard Runway Safety Area (RSA) Width	Yes	Yes	Yes	Yes	Yes
Standard Extended RSA Length	Yes	Yes	Yes	Yes	Yes
Standard Runway Object Free Area (ROFA)	Yes	Yes	Yes	Yes	Yes
Standard Runway to Taxiway Centerline Separation	Yes	Yes	Yes	Yes	Yes
Standard Taxiway Width	Yes	Yes	Yes	Yes	Yes
Standard Taxiway Safety Area (TSA)	Yes	Yes	Yes	Yes	Yes
Standard Taxiway Object Free Area (TOFA)	Yes	Yes	Yes	Yes	Yes
ENVIRONMENTAL SCREENING	None				
Wetlands		X	X	X	X
Archeology			X	X	
Endangered Species		X	X	X	X
Terrain			X	X	
LAND ACQUISITION	None	None	8.5 +/- Acres	2 +/- Acres	8.2 +/- Acres
EASEMENT ACQUISITION	None	9.3 +/- Acres	None	5.1 +/- Acres	9.3 +/- Acres
OBSTRUCTION REMOVAL	None	13.8 +/- Acres	15 +/- Acres	10 +/- Acres	9.0 +/- Acres
COST	None	\$8.5 million	\$9.5 million	\$8.7 million	\$9.1 million
FEASIBILITY					
IMPLEMENTATION	Easily implemented	More difficult to implement	Most difficult to implement	Most difficult to implement	More difficult to implement
FACILITY REQUIREMENTS	Doesn't provide the facility requirements	Provides the facility requirements	Provides the facility requirements	Provides the facility requirements	Provides the facility requirements

Environmental Screening identifies key area of potential impact. More detail follows throughout the report.



2.7 Alternatives Dismissed After Initial Analysis

Alternatives 3 and 4 were dismissed after it was discovered that the terrain off Runway 19 would adversely impact a known wetland. The impacts to the wetlands could be significant.

2.8 Alternatives Carried Forward for Detailed Evaluation

The three alternatives carried over for detailed evaluation to address the Proposed Action elements include Alternative 1 (No Build), Alternative 2 (Runway 1 1,000' Runway/Taxiway Extension), and Alternative 5 (Shifted Runway).

Alternatives 2 and 5 both share:

- Runway widening to 75'
- Lengthen the runway to 4,001 feet
- Installation of medium intensity edge lighting and NAVAIDs
- Construct Partial Parallel Taxiway to Runway 1 extension
- Construct Partial Parallel Taxiway to Runway 19 end
- Relocation of Yard Road and removal of haul road
- Easement acquisition for obstruction removal
- Obstruction removal
- Upgrade underground fuel tanks to (2) 12,000 gallon above ground tanks
- Construct Perimeter access road (3000 LF x 26 ft. wide)
- Remove existing fence (880 LF), Yard Rd and remove dirt haul road, and install new fence and Yard Road
- Main apron rehabilitation (150,000 SF +/-)
- Hangar development (3 hangars each 7,000 SF +/-)
- Potential 16.5± acres of land swap for additional hangar development. Construct access taxilane
- Design and build an adequate size storm water system to handle future development



Chapter Three

Affected Environment



3. AFFECTED ENVIRONMENT

FAA published environmental guidelines, specifically from FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* (July 16, 2015) and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, outline requirements for an environmental assessment. As a Federal Agency, the FAA is required under NEPA to prepare an environmental assessment for major federal actions that have potential to affect the environment. FAA Order 1050.1F, Chapter 4, and the FAA Environmental Desk Reference identify the environmental categories that may be impacted from the proposed project. This chapter provides an overview of these existing environmental resources within the Proposed Action impacted area. Initial documentation for each environmental category will be assessed here, with **Chapter 4, Environmental Consequences**, containing more formal documentation if the Proposed Action is anticipated to affect said environmental category. This chapter was prepared using research obtained by Passero Associates and The Smart Associates, Environmental Consultants, Inc. (Smart Associates), and supplemented with additional field investigation by Smart Associates.

3.1 Regional Setting

Franklin County State Airport is in Franklin County, VT, which according to the 2010 Census has a population of 47,746. Situated in the Northwestern corner of Vermont, the airport is near the Vermont-Canada border to the north as well Lake Champlain to the west. Only three miles west of the Town of Highgate, VT, the airport is approximately 61 miles southeast of Montreal, Canada and 38 miles north of Burlington, Vermont. The general vicinity of the airport can be seen in **Figure 3-1**.

3.1.1 Franklin County State Airport

Franklin County State Airport (FSO) is a public use facility, owned and operated by the State of Vermont. The airport covers 348 acres and has one runway, Runway 1-19, which measures 3,001 feet long by 60 feet wide. Per the airport's last Master Record, recorded on June 30, 2017, there are 76 based aircraft. The airport is located at 44°56'25.01"N, 73° 05' 50.86"W, at an elevation of 227.8 feet above mean sea level. **Figure 3-2** shows the immediate location map of the airport.



PASSERO ASSOCIATES

Franklin County Airport

Vicinity Map

Fig. 3-1



PASSERO ASSOCIATES

Franklin County Airport

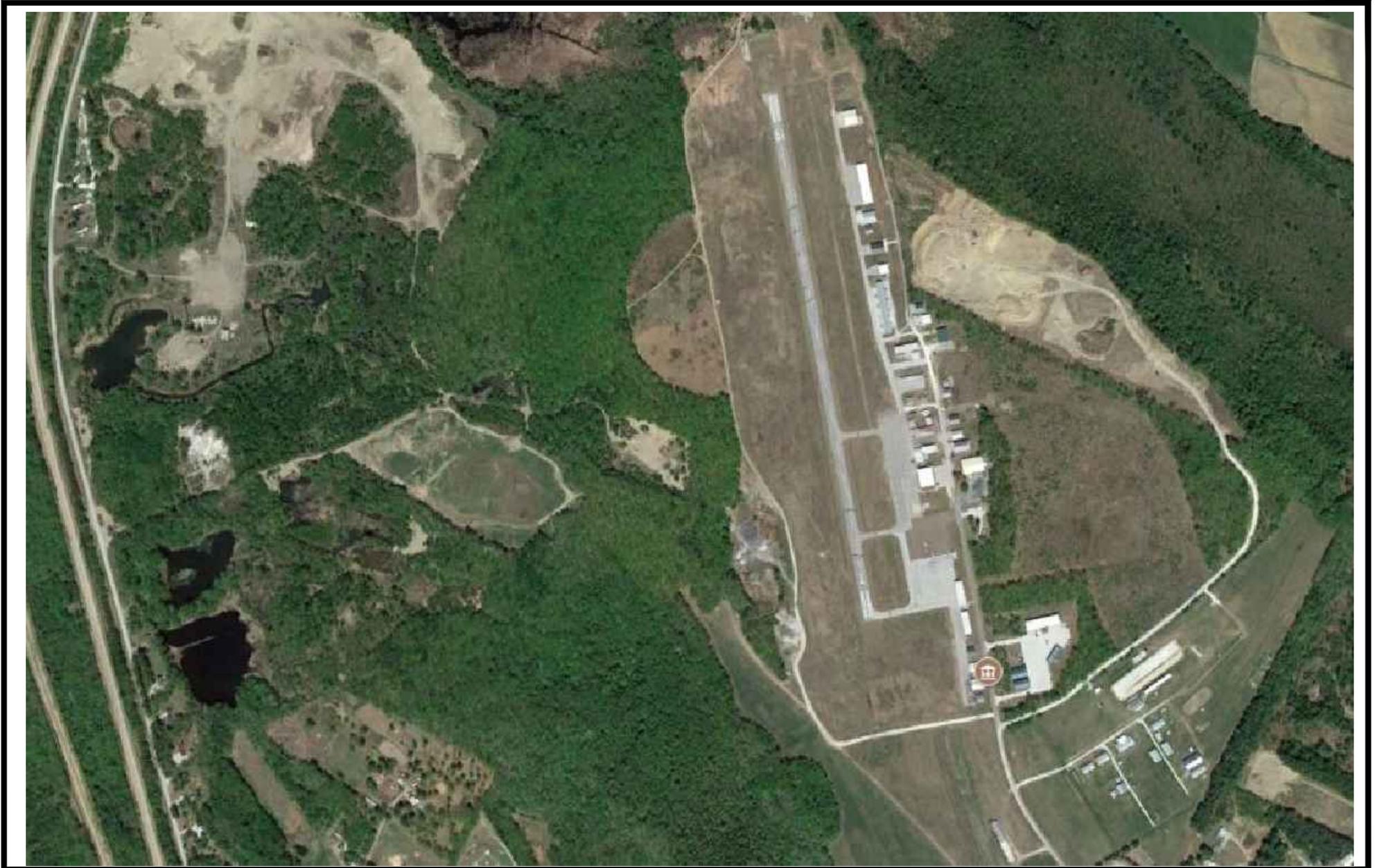
Location Map

Fig. 3-2



3.2 Surrounding Area

The airport lies in rolling terrain, as shown in **Figure 3-3**. There are mapped wetlands to the north of the airport. There is minimal residential development around the airport. The airport lies within the Town of Highgate, just outside the jurisdiction of Swanton, VT, but Swanton does provide the airport with some utilities.



PASSERO ASSOCIATES

Franklin County Airport

Surrounding Area

Fig. 3-3



3.3 Environmental Categories

The following subsections will briefly outline the surrounding environmental categories identified in FAA Desk Reference, and FAA Order 5050.4B. If there is a known environmental category that may be impacted, based on existing published information, then additional documentation will be referenced to **Chapter 4, Environmental Consequences**.

Vermont Agency of Natural Resources database, <http://anr.vermont.gov/maps/nr-atlas>, hereinafter referred to as Vermont ANR, and Vermont Center for Geographic Information Interactive Map Viewer, <http://maps.vermont.gov/vcgi/html5viewer/?viewer=vtmapviewer>, hereinafter referred to as VCGI, was reviewed for most of the categories to determine the initial impact from the proposed action.

3.3.1 Air Quality

Air quality is regulated by two primary laws: the Clean Air Act (CAA), and the National Environmental Policy Act (NEPA). The Clean Air Act (CAA) established National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The U.S. Environmental Protection Agency (USEPA) has oversight for the CAA. Evaluating air quality seeks to answer: will the Proposed Action cause or create a reasonably foreseeable emission increase?

In 2014 the FAA published a revision to its Air Quality Handbook, entitled “*Aviation Emissions and Air Quality Handbook, Version 3.*” The new guidance requires the preparer to determine if FAA involvement is required, then determine if the action will increase emissions, and then determine attainment/non-attainment status. Following procedures set forth, the Proposed Action involves the FAA for approval and funding; has potential for increased emissions from construction and increased operations; and per the US EPA Green Book, is located in an attainment area. Based on the decision flow diagram in the Air Quality handbook, an emissions inventory is required. Therefore, additional documentation can be found in **Chapter 4, Environmental Consequences**.

3.3.2 Biological Resources

The Endangered Species Act of 1973, 16 USC Section 1531-1544, protects Federally-listed endangered or threatened species and their critical habitats. FAA Order 1050.1F, Appendix A, Section 8, *Fish, Wildlife, and Plants*, states that “...*Section 7 of the Endangered Species Act (ESA), as amended, applies to Federal agency actions and sets forth requirements for consultation to determine if the proposed action may affect an endangered or threatened species. If an agency determines that an action may affect a threatened or endangered species, then Section 7(a)(2) requires the lead agency, to consult with the U.S. Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (NMFS), as appropriate, to ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of any Federally listed endangered or threatened species or result in the destruction or adverse modification of critical habitat.*”

Biological resources include terrestrial and aquatic plant and animal species; game and non-game species; special status species, including state or Federally-listed threatened or endangered species.



National Marine Sanctuaries and Wilderness Areas

There are no National Marine Sanctuaries in the airport's vicinity. Based on VCGI, there are no deer wintering areas in the Proposed Project area (see **Appendix B**). There are no Vermont ANR public lands

Vermont Fish and Wildlife Department Endangered Species

The Vermont ANR was reviewed to determine the location of any threatened or endangered species known to exist near the study area. This data review indicated that there are records of threatened or endangered species and significant natural communities near the airport, as shown in **Table 3-1**. The project area lies within a biological hotspot as shown in **Figure 3-4**.

Table 3-1: State Listed Rare, Threatened and Endangered Species

Common Name	Scientific Name	State Rank	State Status
Significant Natural Communities			
Northern White Cedar Swamp		S3	-
Pine-Oak-Heath Sandplain Forest		S1	-
Red Maple-Black Ash Seepage Swamp		S4	-
Vertebrate Animals			
Grasshopper Sparrow	Ammodramus savannarum	S1B	T
Eastern Whip-poor-will	Antrostomus vociferous	S2B	T
Upland Sandpiper	Bartramia longicauda	S2B	E
Least Bittern	Ixobrychus exilis	S2B	SC
Vesper Sparrow	Poocetes gramineus	S2S3B	SC

Source: Vermont Natural Heritage Inventory

T = Threatened

E = Endangered

SC = Special Concern

Therefore, additional documentation can be found in **Chapter 4, Environmental Consequences**.

Federal Threatened and Endangered Species

Per the US Department of Interior Fish and Wildlife Services IPAC, the Northern Long-Eared Bat (Threatened) was identified for the Proposed Project area (see **Appendix B**). Therefore, additional documentation can be found in **Chapter 4, Environmental Consequences**.

Migratory Birds

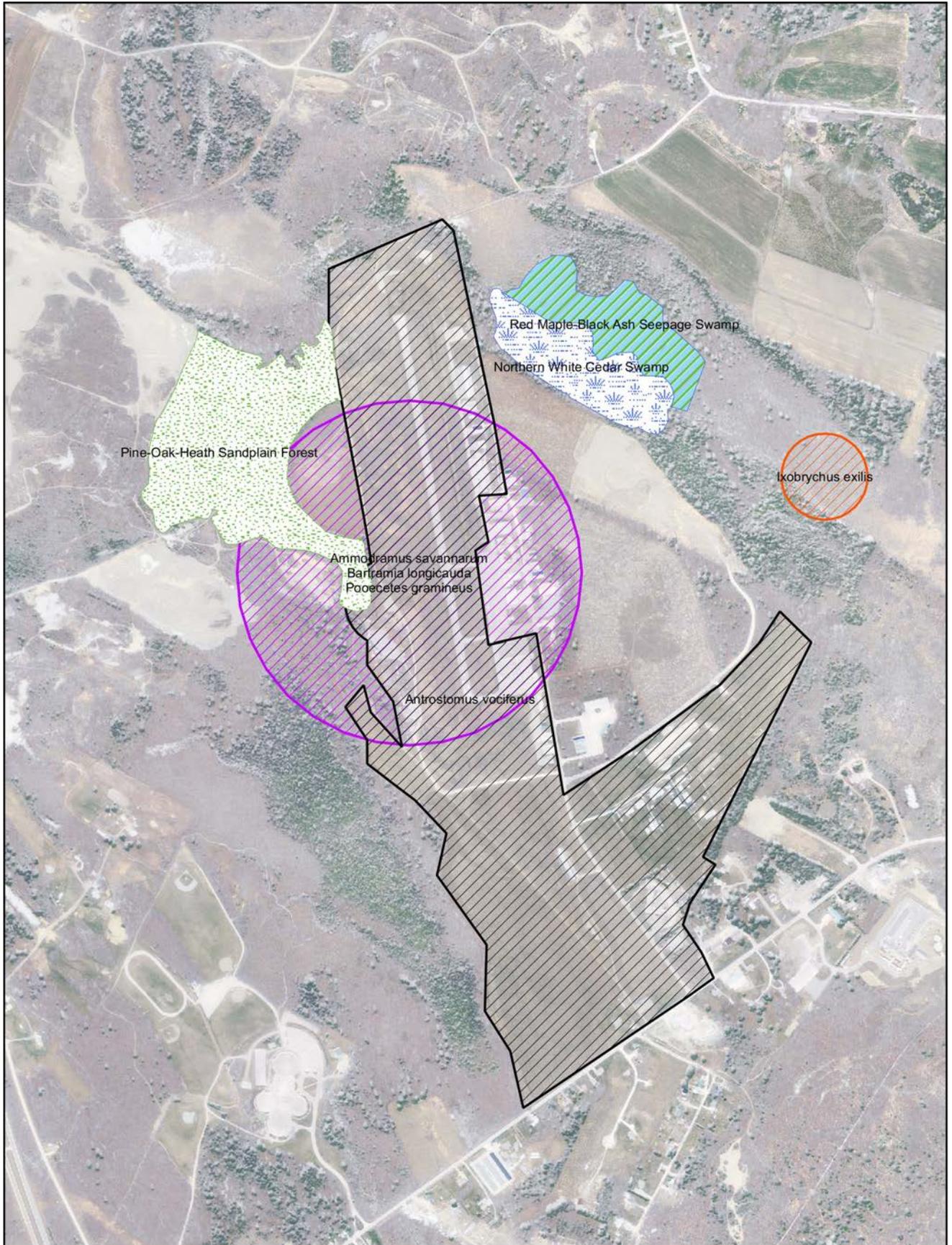
Per US Fish and Wildlife IPAC, several migratory birds are listed in the Proposed Project area, as shown in **Table 3-2**. The breeding period was provided by US Department of Interior Fish and Wildlife Services IPAC. Therefore, additional documentation can be found in **Chapter 4, Environmental Consequences**.



Table 3-2: Migratory Birds

Common Name	Scientific Name	Breeding Season
American Golden-plover	<i>Pluvialis dominica</i>	Breeds elsewhere
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	Breeds May 15 to Oct 10
Bobolink	<i>Dolichonyx oryzivorus</i>	Breeds May 20 to Jul 31
Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>	Breeds elsewhere
Canada Warbler	<i>Wilsonia canadensis</i>	Breeds May 20 to Aug 10
Cerulean Warbler	<i>Dendroica cerulea</i>	Breeds Aug 20 to Jul 20
Dunlin	<i>Calidris alpina hudsonia</i>	Breeds elsewhere
Eastern Whip-poor-will	<i>Antrostomus vociferus</i>	Breeds May 1 to Aug 20
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	Breeds May 1 to Jul 20
Lesser Yellowlegs	<i>Tringa flavipes</i>	Breeds elsewhere
Prairie Warbler	<i>Dendroica discolor</i>	Breeds May 1 to Jul 31
Ruddy Turnstone	<i>Arenaria interpres morinella</i>	Breeds elsewhere
Semipalmated Sandpiper	<i>Calidris pusilla</i>	Breeds elsewhere
Short-billed Dowitcher	<i>Limnodromus griseus</i>	Breeds elsewhere
Snowy Owl	<i>Bubo scandiacus</i>	Breeds elsewhere
Wood Thrush	<i>Hylocichla mustelina</i>	Breeds May 10 to Aug 31

Source: US Fish and Wildlife, IPAC





3.3.3 Climate

Greenhouse Gases (GHG) affect the global climate. GHG emissions from anthropogenic sources, such as burning fossil fuels, can contribute to climate change, thus warming the planet. CO₂ is the most important anthropogenic GHG because it is a long-lived gas that remains in the atmosphere for up to 100 years.

The Proposed Action is to improve the safety of the airfield to the pilot community. Additional buildings may contribute to GHG emissions. Additionally, construction vehicles will have temporary emissions, but this is too small of an amount to make any contribution to global climate change. Therefore, additional documentation can be found in **Chapter 4, Environmental Consequences**.

3.3.4 Coastal Resources

Coastal resources include natural resources occurring within coastal water and their adjacent shore lands. Coastal resources 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. It also includes the coastlines of the Atlantic and Pacific Oceans, the Great Lakes and the Gulf of Mexico.

The airport does not lie within coastal boundaries. Therefore, no additional documentation is warranted.

3.3.5 Department of Transportation Act: Section 4(f)

Section 4(f) of the Department of Transportation Act of 1966 (DOT Act) provides that *"...the Secretary of Transportation will not approve any program or project that requires the use of any publicly owned land from a public park, recreation area, or wildlife refuge of national, state, or local significance or land from an historic site of national, state, or local significance as determined by the officials having jurisdiction thereof, unless there is no feasible and prudent alternative to the use of such land and such program, and the project includes all possible planning to minimize harm resulting from the use."*

A property must be a significant resource for Section 4(f) to apply. Section 4(f) protects only those historic or archeological properties that are listed as eligible for inclusion on the National Register of Historic Places (NRHP).

A review of the VGCI, Protected Lands, revealed that there are no Section 4(f) resources near or around the airport that would be affected by the Proposed Action. There is an active trail system off Runway 19, that is outside the proposed project area. Therefore, no further documentation is warranted.

3.3.6 Farmlands

The Farmland Protection Policy Act (FPPA) regulates Federal actions with the potential to convert important farmland to non-agricultural uses. It defines prime, unique, statewide, and locally important farmlands:



Prime farmland is land having the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimal use of fuel, fertilizer, pesticides, or products.

Unique farmland is land used for producing high-value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture necessary to produce high quality crops or high yields of crops.

Statewide and locally important farmland is land that has been designated as “important” by either a state government (state Secretary of Agriculture or higher office), by county commissioners or by an equivalent elected body.

Determining important farmlands requires an analysis of the soils of the area. Farmlands within the project area are south of Runway 1, between the runway’s end and Route 78. As stated earlier, farmlands are located mainly to the east and north of the airport. Using the *Web Soil Survey* tool from the Natural Resources Conservation Service (NRCS), those farmlands were classified. The soils/farmlands in and around the airport can be seen in **Figure 3-4** and **Table 3-1**. Geologically, based on VGIS the entire project area is sand.

Based on the data, the Proposed Action occurs on farmland of statewide importance, farmland of local importance, and prime farmland, if drained. Therefore, additional documentation can be found in **Chapter 4, Environmental Consequences**.



Table 3-3: Soil/Farmland Chart

Soil Symbol	Soil Name	Rating	Project Area
<u>AuA</u>	Au Gres loamy fine sand, 0 to 6 percent slopes	Farmland of statewide importance	N/A
<u>Ce</u>	Carlisle muck	Not prime or statewide farmland	Rwy 19 Tree Removal Access Road
<u>MsA</u>	Missisquoi loamy sand, 0 to 3 percent slopes	Farmland of statewide importance	Rwy/Twy 1 Ext Rwy 1 Tree removal (south 78 and north 78) Hangars (east and land swap) Access Road
<u>MsB</u>	Missisquoi loamy sand, 3 to 8 percent slopes	Farmland of statewide importance	Rwy 19 Tree Removal, Rwy 1 Tree Removal (south 78 and north 78) Access Road
<u>MsC</u>	Missisquoi loamy sand, 8 to 15 percent slopes	Farmland of local importance	Rwy 19 Tree removal, Rwy 1 Tree removal (south 78) Access Road Hangars (land swap)
<u>MsD</u>	Missisquoi loamy sand, 15 to 25 percent slopes	Not prime or statewide farmland	Rwy 19 Tree removal
<u>Tm</u>	Terric medisaprists	Not prime or statewide farmland	Access Road
<u>Wh</u>	Wareham loamy fine sand	Prime farmland if drained	Rwy 1 Tree Removal (north 78)
<u>WsA</u>	Windsor loamy fine sand, 0 to 3 percent slopes	Farmland of statewide importance	N/A
<u>WsB</u>	Windsor loamy fine sand, 3 to 8 percent slopes	Farmland of statewide importance	Access Road Hangars (land swap)
<u>WsC</u>	Windsor loamy fine sand, 8 to 15 percent slopes	Not prime or statewide farmland	Access Road
<u>WsD</u>	Windsor loamy fine sand, 15 to 25 percent slopes	Not prime or statewide farmland	Proposed Hangars (east and land swap) Access Road

Source: Web Soil Survey



3.3.7 Hazardous Materials, Solid Waste, and Pollution Prevention

This subsection examines waste streams that would be generated by a project; potential hazardous materials that could be used during construction and operations of a project; potential to encounter existing hazardous materials at contaminated sites during construction; and potential to interfere with any ongoing remediation of existing contaminated sites within the project area. This section seeks to address if the project uses lands that contain hazardous materials or causes potential contamination from hazardous materials; generates significant amounts of solid waste; or produces an appreciable different quantity or type of hazardous waste.

Hazardous Materials include hazardous waste, hazardous substances, and hazardous materials, as defined below, in FAA 1050.1F Desk Reference.

Hazardous waste is a type of solid waste defined under the implementing regulations of RCRA. A hazardous waste (see 40 CFR § 261.3) is a solid waste that possesses at least one of the following four characteristics: ignitibility, corrosivity, reactivity, or toxicity as defined in 40 CFR part 261 subpart C or is listed in one of four lists in 40 CFR part 261 subpart D.

Hazardous substance is a term broadly defined under Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Hazardous substances can include: compounds, mixtures, solutions, hazardous air pollutants or chemicals. Reference to the applicable regulations is necessary to determine a hazardous substance. Hazardous substances under CERCLA excludes petroleum products.

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.

Solid Waste is defined as any discarded material that meets specific regulatory requirements, as defined in Resource Conservation and Recovery Act (RCRA).

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

A search of the VGCI and Vermont ANR indicated two hazardous sites numbered 890471, and 941667. Site #890471 was closed on 9/5/1990 and no further action is planned. Site #941667 was closed on 4/9/2010 under a Site Management Activity Complete action. Since these sites are both closed, no further documentation is warranted.

3.3.8 Historical, Architectural, Archeological, and Cultural Resources

There are four primary Acts to consider when evaluating potential impacts to Historical, Architectural, Archeological, and Cultural Resources.



The National Historic Preservation Act (NHPA) of 1966, as amended, establishes the Advisory Council on Historic Preservation and the National Register of Historic Places (NRHP) within the National Park Service. Section 106 requires Federal agencies to consider the effect of their undertaking on properties on or eligible for inclusion in the NRHP. Section 110 governs Federal agencies' responsibilities to preserve and use historic buildings.

The Archeological and Historic Preservation Act of 1974 provides for the preservation of historic American sites, buildings, objects and antiquities of national significance.

The Archeological Resources Protection Act prohibits unauthorized excavation of archeological resources on Federal or Indian land, establishing standards for permissible excavation by permit.

The Native American Graves Protection and Repatriation Act deals with the disposition of cultural items, including human remains, by a federally funded repository.

A Phase 1A Archeological Study was completed for this airport by Hartgen Archeological Associates in November 1999, which can be found in **Appendix D**. The project area included areas beyond the airport property south of Route 78 and north of Youngman Brook designated as runway protection zones and aviation easements. This report showed potential archeological areas north of Runway 19 and west of Runway 1-19. Therefore, additional documentation can be found in **Chapter 4, Environmental Consequences**. Separately, individual archaeological assessment was conducted for the east side of the terminal area, which were cleared.

A review of the Vermont Division of Historic Preservation identified three properties on the National Register: the Highgate Springs Border Station, Douglas and Jarvis Patent Parabolic Truss Iron Bridge and St John's Episcopal Church. None are within the project area.

3.3.9 Land Use

The compatibility of existing and planned land uses with an aviation or aerospace proposal is usually associated with noise impacts. This section seeks to address impacts to land use, other than noise, such as disruption to communities, relocation of residences to businesses, or impacts to natural resource areas. Included in this section is the potential for the project to be located near or to create a wildlife hazard, as defined in FAA Advisory Circular 150/5200-33.

The airport is in an industrial/commercial zoning district, see **Figure 3-6**. On top of that, the Town of Highgate has implemented an Airport Overlay District (AO) (see **Appendix B**). Within the AO district, structures are restricted to 35 feet in height unless the FAA or Development Review Board determines an exception is necessary.

The proposed land swap includes acquiring land as part of airport property that was a former sand mine. The re-use of the land will be discussed further in **Chapter 4, Environmental Consequences**. Additionally, the alternatives include easement acquisition over non-airport lands to remove obstructions. Therefore, additional documentation can be found in **Chapter 4, Environmental Consequences**.



3.3.10 Natural Resources and Energy Supply

Natural resources and energy supply provides an evaluation of a project's consumption of natural resources (such as water, asphalt, aggregate, wood, etc.) and use of energy supplies (such as coal for electricity; natural gas for heating; and fuel for aircraft, commercial space launch vehicles, or other ground vehicles).

The proposed alternatives include additional lighting and asphalt, therefore additional documentation can be found in **Chapter 4, Environmental Consequences**.

3.3.11 Noise and Noise-Compatible Land Use

Noise may be defined as unwanted sound. All sound comes from a sound source. The sound energy produced by a source is transmitted through the air in sound waves, creating the sound we hear. Sound pressure levels are measured in decibel (dB). Because decibels are logarithmic quantities, combining decibels is unlike common arithmetic. For example, if two sound sources each produce 100 dB operating individually and they are then operated together, they produce 103dB – not the 200 decibels we might expect. For every doubling of the number of equal sources, the sound pressure level goes up another 3 decibels. A tenfold increase in the number of sources makes the sound pressure level go up by 10 dB.

The FAA determined the cumulative exposure of individuals to noise energy resulting from aviation activities must be established in terms of yearly day/night average sound level (DNL) as the FAA's primary metric. The DNL is a noise measure used to describe the average sound level over a 24-hour period. In computing DNL, an extra weight of 10 dB is assigned to noise occurring between the hours of 10 pm to 7 am to account for increased annoyance when ambient noise levels are lower and people are trying to sleep. DNL may be determined for individual locations or expressed in noise contours connecting points of equal DNL levels. The DNL is used to determine compatible land use, and potential effects on other environmental resources. It is noted that DNL is an average noise level and not a single aircraft operation.

Both the Department of Housing and Urban Development (HUD) and FAA (14 CFR Part 150) define 65 dB DNL as the threshold of noise incompatibility with residential and other noise sensitive land uses. The 65 dB DNL contour defines the area of potential significant impact. The "threshold of significance" is determined when a location of incompatible land use is exposed to a project-related increase in noise level of DNL 1.5 dB or more, and that location lies within the 65 dB DNL noise contour for the "action" condition, then the location is considered to be significantly impacted by noise.

The Proposed Action may produce noise from construction. According to VGSI, there are no places of public assembly, hospitals, schools, college campuses or libraries around the airport.

Therefore, additional documentation can be found in **Chapter 4, Environmental Consequences**.



3.3.12 Socioeconomics, Environmental Justice, and Children’s Environmental Health and Safety Risks

Executive Order 12898, which was enacted in 1994, requires that an Environmental Justice evaluation be conducted for all transportation projects that are undertaken, funded, or approved by the Federal Aviation Administration (FAA) to avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, and social and economic effects, on minority populations and low-income populations.

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, requires Federal agencies to “make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children” (FAA, 2006).

The FAA is also required to meet 49 CFR Part 24 for projects that involve acquisition of real property or the displacement of persons.

Socioeconomics

The Proposed Action doesn’t require business relocation, alter surface transportation or disrupt communities. It will not create an appreciable change in employment. Therefore, no further documentation regarding socioeconomics is warranted.

Environmental Justice

According to VTTrans, there are three fundamental environmental justice principles:

1. To avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects, on minority populations and low-income populations.
2. To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
3. To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority populations and low-income populations.

The US Census Bureau records that 95.2% of Franklin County is White alone, 0.7% is Black or African American alone, 1.0% is Native American alone, 0.7% is Asian alone, 1.5% is Hispanic or Latino, and 2.3% is two or more races. Additionally, the median household income is \$58,884, \$3,500 more than the US average.

Franklin County is not an Environmental Justice area. None of the projects of the Proposed Action will disproportionately affect minority communities. Therefore, no further documentation regarding Environmental Justice is warranted.

Children’s Health and Safety

The project will not create products or substances that will impact children. Therefore, no further documentation regarding Children’s Health and Safety is warranted.

No further documentation is warranted for this category.



3.3.13 Visual Effects

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.

Light Emissions

The Proposed Action includes installing medium intensity edge lighting and NAVAIDs. Therefore, additional documentation can be found in **Chapter 4, *Environmental Consequences***.

Visual Impacts

The Proposed Action includes additional airfield facilities that will occur on airport property and are not likely to change the visual landscape of the area. The proposed tree removal is for safety, and will not clear cut areas, therefore the visual impact will be minimized. Therefore, no further documentation is warranted for this category.

3.3.14 Water Resources

This section seeks to address all water resources including wetlands, floodplains, surface waters, groundwater and wild and scenic rivers.

The Clean Water Act of 1977 applies to both surface and subsurface waters. Impacts to water quality are not considered significant if a project meets state and federal water quality standards.

Wetlands

Initial review of the National Wetland Inventory (NWI) Database and VGCI identified potential wetlands around the airport, see **Figure 3-7**. Fieldwork was performed to verify wetland locations so that potential impacts from the Proposed Action and its alternatives could be better identified. Therefore, additional documentation can be found in **Chapter 4, *Environmental Consequences***.

Floodplains

Executive Order 11988 directs Federal agencies to take actions to reduce the risk of flood loss; minimize flood impacts on human safety, health and welfare; and restore and preserve the natural and beneficial values served by floodplains.

The Federal Emergency Management Agency (FEMA) map, Map 5000550015B, was reviewed. Franklin County State Airport is classified as zone C. A zone C floodplain is an area that experiences minimal flooding; the area is above the 500-year flood level and may have ponding and local drainage problems that don't warrant a detailed study or designation as a base floodplain. Therefore, no additional documentation is warranted regarding floodplains.

Surface Waters

Not including wetlands, the only surface water near the airport is Youngman Brook, which is north of Hemp Yard Rd., almost 700 feet north of Runway 19. There are no surface waters on airport property. According to VGCI there are no 303d Part A impaired surface waters, Class A



water resources, or priority surface waters around the airport. However, three vernal pools were identified off the Runway 19 end, in the area of proposed tree removal. As such, additional documentation can be found in **Chapter 4, Environmental Consequences**.

Groundwater

Review of the EPA Sole Source Aquifers database indicates there are no EPA designated Sole Source Aquifers in the project area. However, there are three private wells in the area that need to be considered for placement of proposed projects.

Several stormwater permits have been issued for the airport. **Table 3-3** identified the permit number, the type of permit and its expiration date.

Table 3-4: Stormwater Permits

Permit Number	Type	Receiving Waters	Expiration
3065-9003.R	Stormwater Discharge under Multi-Sector General Permit 3-9003	Unnamed Tributary to Missisquoi River	August 4, 2016
3065-9010	Stormwater Discharge under Multi-Sector General Permit 3-9010	Unnamed Tributary to Missisquoi River	August 10, 2021
3065-9020.4	Stormwater Discharge under Multi-Sector General Permit 3-9020	Kelly Brook and Unnamed Tributary to Missisquoi River	April 16, 2020

The proposed action and associated alternatives include additional pavement, which results in additional runoff. Therefore, additional documentation can be found in **Chapter 4, Environmental Consequences**.

Wild and Scenic Rivers

The Wild and Scenic Rivers Act, as amended, describes those river segments designated or eligible to be included in the Wild and Scenic Rivers System.

According to the National Park Service Wild and Scenic Rivers website, there is a stretch of the Missisquoi River 1.5 miles west of the airport that is designated as a Wild and Scenic River. The Proposed Action is not anticipated to impact this waterway. Therefore, no additional documentation regarding Wild and Scenic Rivers is warranted.



3.4 Environmental Categories Carried Forward for Review

Based on the information presented in this chapter, **Table 3-5** contains the categories that will be carried forward into the environmental consequences section.

Table 3-5: Environmental Impact Categories Carried Forward

FAA Order 1050.1E Environmental Category
Air Quality
Biological Resources
Climate
Farmlands
Historical
Land Use: Land Swap Re-Use and Easements for Obstruction Removal
Natural Resources and Energy Supply
Noise
Visual Impacts: Light Emissions
Water Resources

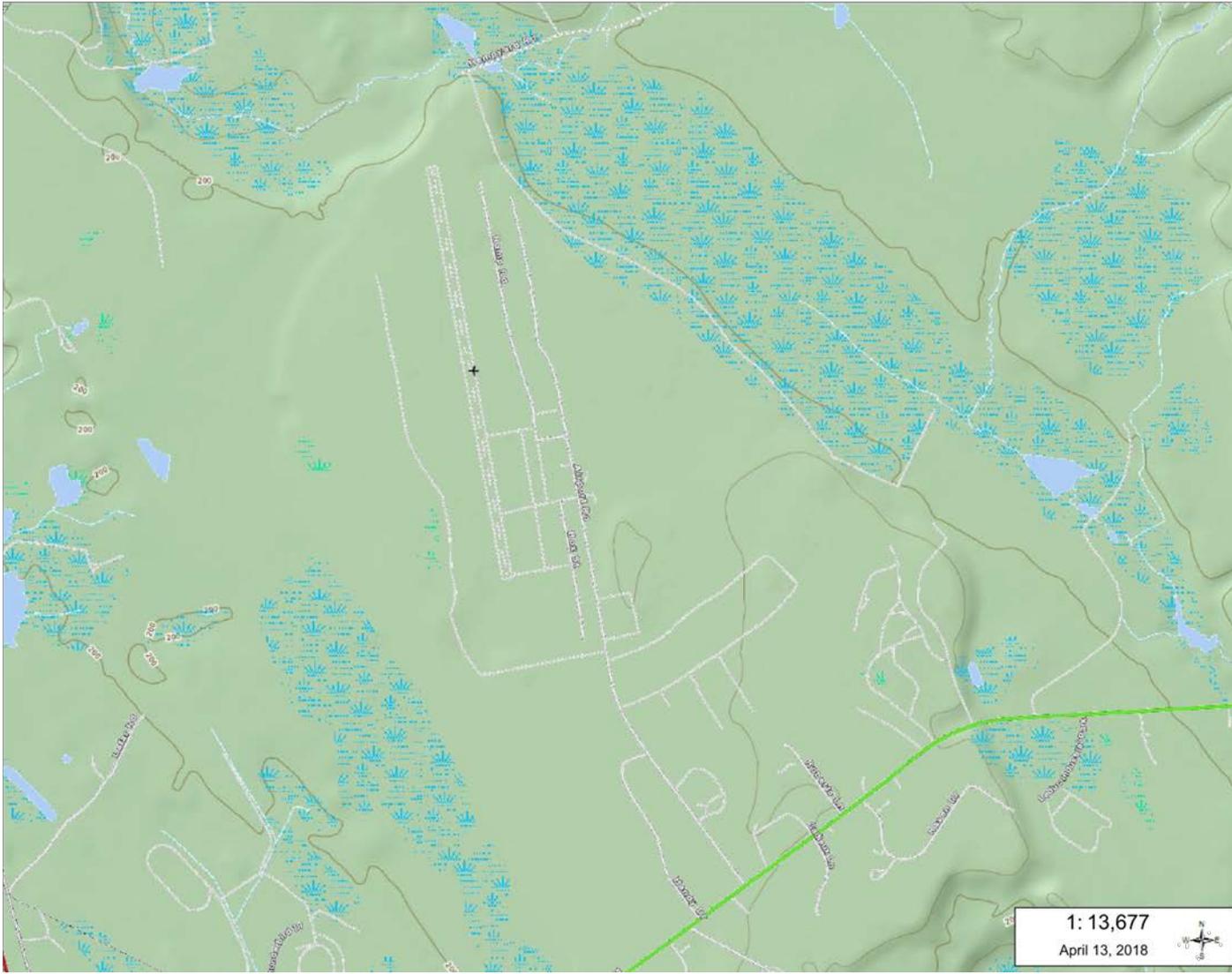


LEGEND

-  Airports
-  Rail Lines
-  Town Boundaries
-  County Boundaries
-  Buildings
-  Village Boundaries
-  VT Significant Wetlands Invent
-  National Wetlands Inventory
-  VT State Boundary



NOTES



1: 13,677
April 13, 2018



Chapter Four

Environmental Consequences



4. ENVIRONMENTAL CONSEQUENCES

This chapter further explains the potential environmental impact categories that were identified in **Table 3-2**. Alternative 1 (No Build), Alternative 2 (Runway 1 1,000' Runway/Taxiway Extension), and Alternative 5 (Runway 1 1,250 ft. Extension and Runway 19 250 ft. Removal) will each be evaluated to determine if any have a significant impact on any of the following categories.

4.1 Air Quality

This section evaluates the emission increases of six criteria pollutants to the National Ambient Air Quality Standards (NAAQS). Under NEPA, federal agencies are required to assess what impacts an airport's federal actions may have on air quality and the human environment. The Proposed Action has potential to increase emissions due to construction and an increase in airport operations.¹ The airport is located in an attainment area for the criteria pollutants.

Alternative 1: No Build Alternative

Alternative 1 is anticipated to have no effect on air quality since there will be no development or construction.

Alternative 2: (Runway 1 1,000' Runway/Taxiway Extension) and Alternative 5: (Shifted Runway)

The constructability elements in the proposed action are included in this section. The methodology for evaluating the need to conduct an air quality analysis is provided in the FAA's *Air Quality Procedures for Civilian Airports and Air Force Bases, Version 3.0*. The air quality assessment was based on the following:

- FAA approval is needed for the project
- There are foreseeable increases in emissions from construction and additional airfield operations resulting from additional hangars
- The airport is located in an attainment area, thus General Conformity requirements are not required.

An operational emissions inventory was prepared. This emissions inventory considered the additional airfield operations that may result from the additional hangars that are proposed, using FAA Aviation Environmental Design Tool (AEDT) 2d to determine the foreseeable inventory emissions. This analysis used the annual operations for 2018 from the FAA Terminal Area Forecast (TAF) for the baseline year, and for future inventory applied the operations per based aircraft by the quantity of additional hangars (for an anticipated increase of 1,908 operations) to obtain the proposed action emissions. Calculations can be found in the **Appendix B**.

¹ Due to the similarities of the construction in Alternatives 2 and 5, their emissions results are equivalent to each other.



Table 4-1: Operational Emissions Inventory Results

Source	Proposed Action (short tons/year)					
	CO	VOC	NO _x	SO _x	PM ₁₀	PM _{2.5}
Aircraft						
Total Proposed Action (Alts. 2 and 5)	52.46	0.51	0.26	0.06	0.05	0.05
Total No Action	44.12	0.43	0.22	0.05	0.04	0.04
Net Increase	8.34	0.08	0.04	0.01	0.01	0.01

Source: AEDT 2d

The construction impacts for the runway/taxiway extension would be short-term. The taxiway will change the pattern by which the aircraft use the airport environment. The purpose of the taxiway is for improved safety.

A second emissions inventory was prepared to determine construction impacts. This inventory used EPA’s Motor Vehicle Emissions Simulator (MOVES), which estimates emissions from mobile sources. The input for this simulator included:

- Location: Franklin County
- Construction: Weekdays
- Duration: 1 year (anticipated duration of multiple projects)
- Equipment: Construction and Logging
- Fuel Types: Gas and Diesel

Table 4-2 lists the results of the EPA MOVES analysis.

Table 4-2: Construction Emissions Inventory Results

Fuel Source	Tons per Project Timeframe					
	CO	VOC	NO _x	SO _x	PM ₁₀	PM _{2.5}
Gasoline	1.96	0.16	0.02	0.00	0.02	0.02
Diesel	0.62	0.17	1.17	0.00	0.09	0.09
Total net increase	2.58	0.33	1.19	0.00	0.11	0.11

Source: EPA MOVES 2014a

Table 4-3: Total Construction Emissions Inventory Results

Fuel Source	Tons per Project Timeframe					
	CO	VOC	NO _x	SO _x	PM ₁₀	PM _{2.5}
Proposed Action (Alts. 2 and 5)	55.04	0.84	1.45	0.06	0.16	0.161
No build	44.12	0.43	0.22	0.05	0.04	0.04
Net increase	10.92	0.41	1.23	0.01	0.12	0.12
de Minimus levels	100	100	100	100	100	100

Source: Tables 4-1 and 4-2, de Minimus levels from EPA

Conclusion: Since Franklin County is in attainment, and the anticipated impacts are lower than the *de Minimus* levels, the building alternative would not have a significant air quality impact.



4.2 Biological Resources

Endangered species are provided protection on both federal and state levels. The Federal Endangered Species Act of 1973 (16 USC 1531-1543, Sec. 2A) is the federal legislation that provides protection, while the State of Vermont protects species pursuant to 10 V.S.A. Chapter 123.

The Vermont ANR online GIS program was used to determine the location of any threatened or endangered species known to exist near the project area. VT Fish & Wildlife was also contacted to obtain additional information. The U.S. Fish and Wildlife Service’s (USFWS) IPAC website was also reviewed to determine if any federally-listed threatened or endangered species are known to occur near the airport.

The Smart Associates, in consultation with the Vermont Fish & Wildlife Department conducted a wildlife and vegetation study for the Proposed Project area. Five bird species and three wetland communities were identified by the Vermont Fish and Wildlife Department, as shown in **Table 4-4**

Table 4-4: Potentially Affected Bird Species and Wetland Communities

Vertebrate Animals	Project Area
Grasshopper Sparrow (T)	Runway – midfield
Upland Sandpiper (E)	Runway – midfield
Least Bittern (SC)	Outside project area
Vesper Sparrow (SC)	Runway - midfield
Whip-poo-will (T)	Runway 1 extension area
Vermont Significant Natural Communities	
Northern White Cedar Swamp	Outside project area
Red Maple-Black Ash Seepage Swamp	Outside project area
Pine-Oak-Heath Sandplain Forest	Outside project area

Source: Vermont Natural Heritage Inventory

T = Threatened

E = Endangered

SC = Special Concern

State species consist of Significant Natural Communities and vertebrate animals. The significant natural communities generally occur outside the limits of the airfield and project study area. Of the vertebrate animals the Least Bittern does not occur in the area around the airfield grass surfaces. A visual survey of the airfield area was conducted in November 2017 with VT ANR, but that date was prior to most species arrival for the spring season. A second visual survey was completed on June 19, 2018. Observations at that time included the Vesper Sparrow and common species of grass/shrub/forest edge habitat occurring on the east side of the airport including Tree Swallow, Song Sparrow, Common Yellowthroat and American Goldfinch.

Federally-listed species that may be present in the study area were identified during the US Fish and Wildlife Service IPaC review, which include the Northern Long-eared bat, a threatened species. There were no critical habitats noted within the project area.



Alternative 1: No Build Alternative

This alternative would not affect any of the wildlife or vegetation in the area because there is no development occurring.

Alternative 2: Runway 1 and Associated Taxiway Extension

In terms of wildlife and vegetation effects, this alternative is broken down into three parts: (1) runway widening; runway/taxiway extension and relocation of Yard Road, (2) apron/hangar development, perimeter access road, and (3) tree clearing at both runway ends. No species habitat was found in the land swap area. Rehabilitation projects are not anticipated to have an effect on biological resources since the area is previously developed.

- (1) Runway widening, runway/taxiway extension and relocation of Yard Road: the classified Wetland III off Runway 1 end, in the area of the proposed runway extension, was initially flagged as having habitat of value for the state-listed endangered species, grasshopper sparrow due to the potential for grassland bird nesting habitat. After the site visit in November 2017, Vermont Fish and Wildlife has determined that the affected species are not wetland dependent and not likely to use this habitat. However, construction of the runway extension will affect approximately 1.72 acres of airfield grassland habitat. Portions of this area likely provide grassland habitat for bird species identified as state-listed protected species in the project study area. Work in the airfield area or other grassland habitats, such as the runway extension should occur outside the bird's nesting season. Ideally the work start date would be after July 30. Potential mitigation measures to offset the loss of grassland habitats must avoid development of on-airport wildlife habitat having characteristics to attract hazardous wildlife. During the design phase VT Fish & Wildlife will be consulted to determine the exact mitigation measures to be undertaken. Conservation strategies as set forth in the "*Conserving Vermont's Natural Heritage, 2013*", should be referenced. Some suggested measures (See **Appendix C**, letter dated June 21, 2018) could include, but are not limited to:
 - a. *Determination of the viability of creating new grassland habitat on the east side of Airport Road when constructing new hangars. This area is located away from airport operations areas.*
 - b. *Maximize additional habitat on west side of property, outside of the fenced airfield, northeast of the wind sock, mowing or brush-hogging in the off season on a rotational basis to maintain optimal habitat conditions.*
 - c. *Mow or brush-hog field edges during the off-season to reclaim fields and maintain maximum grassland acreage.*
 - d. *Coordinate land management activities with contributing neighbors to the extent practical.*
- (2) Apron/Hangar development, Perimeter Access Road: Regarding the proposed hangar development, the Vermont Fish & Wildlife Department has noted that since the project is "*located directly to the east of the existing airport facility in the young forest that was recently cleared...there are no issues regarding significant wildlife habitat or rare species of wildlife.*" (see **Appendix B**)
- (3) Tree clearing: Regarding the tree clearing, this would occur in sensitive areas. This alternative has the potential to impact vernal pool habitat during the tree removal anticipated off Runway 19 end. A vernal pool study was completed April 30, 2018 with Vermont Fish and Wildlife (See **Appendix C**). "*No evidence of vernal pool species were noted in the field. Although no evidence existed confirming that vernal pool species were utilizing these pools, [these areas] should be*



assumed to be potential vernal pools when examining the impact of the clearing of tree obstructions off Runway 19." Thus, for tree removal off Runway 19 additional coordination during the design phase will be undertaken with Vermont Fish and Wildlife to avoid negative impact to the vernal pools and species. **Figure 4-1** shows the location of the tree clearing to the vernal pool areas. Additionally, season restrictions for the Northern long-eared bat will be implemented. Tree clearing will necessarily be scheduled during the winter season to avoid the bat's roosting season. This timing will also address the minimization of wetland impacts (refer to **section 4.10.1**).

Alternative 5: Shifted Runway

In terms of wildlife and vegetation effects, like with Alternative 2, this alternative is broken down into three parts: (1) runway widening; runway/taxiway extension and relocation of Yard Road, (2) apron/hangar development, perimeter access road, and (3) tree clearing at both runway ends. No species habitat was found in the land swap area. Rehabilitation projects are not anticipated to have an effect on biological resources since the area is previously developed.

- (1) Runway widening, runway/taxiway extension and relocation of Yard Road: the classified Wetland III off Runway 1 end, in the area of the proposed runway extension, was initially flagged as having habitat of value for the state-listed endangered species, grasshopper sparrow due to the potential for grassland bird nesting habitat. After the site visit in November 2017, Vermont Fish and Wildlife has determined that the affected species are not wetland dependent and not likely to use this habitat. However, construction of the runway extension will affect approximately 8.9 acres of potential airfield grassland habitat. Portions of this area likely provide grassland habitat for bird species identified as state-listed protected species in the project study area. Work in the airfield area or other grassland habitats, such as the runway extension should occur outside the bird's nesting season. Ideally the work start date would be after July 30. Consider mitigation measures to offset the loss of grassland habitats. Potential mitigation measures to offset the loss of grassland habitats must avoid development of on-airport wildlife habitat having characteristics to attract hazardous wildlife. During the design phase VT Fish & Wildlife will be consulted to determine the exact mitigation measures to be undertaken. Conservation strategies as set forth in the "*Conserving Vermont's Natural Heritage, 2013*", should be referenced. Some suggested measures (See **Appendix C**, letter dated June 21, 2018) could include, but are not limited to:
 - a. *Determination of the viability of creating new grassland habitat on the east side of Airport Road when constructing new hangars. This area is located away from airport operations areas.*
 - b. *Maximize additional habitat on west side of property, outside of the fenced airfield, northeast of the wind sock, mowing or brush-hogging in the off season on a rotational basis to maintain optimal habitat conditions.*
 - c. *Mow or brush-hog field edges during the off-season to reclaim fields and maintain maximum grassland acreage.*
 - d. *Coordinate land management activities with contributing neighbors to the extent practical.*
- (2) Apron/Hangar development, Perimeter Access Road: Regarding the proposed hangar development, the Vermont Fish & Wildlife Department has noted that since the project is "located directly to the east of the existing airport facility in the young forest that was recently



cleared...there are no issues regarding significant wildlife habitat or rare species of wildlife.” (see Appendix B)

- (3) **Tree clearing:** Regarding the tree clearing, this alternative avoids the vernal pools, and reduces the tree clearing that would occur in sensitive areas, which supports nesting habitat. Thus, for tree removal off Runway 19 additional coordination during the design phase will be undertaken with Vermont Fish and Wildlife to avoid negative impact to nesting species. **Figure 4-2** shows the location of the tree clearing for this alternative. Additionally, season restrictions for the Northern long-eared bat will be implemented. Tree clearing will necessarily be scheduled during the winter season to avoid the bat’s roosting season. This timing will also address the minimization of wetland impacts (refer to **section 4.10.1**).

Conclusion: With necessary coordination with Vermont Fish and Wildlife and mitigation, neither development of Alternatives 2 nor 5 should have an adverse impact on listed species or significant natural communities.

4.3 Climate

Greenhouse gases (GHGs) are another category of pollutants for which there are no comparative standards, but are of concern because of their climate-changing potential. Moreover, the guidance points out there are currently no federal requirements for reporting GHG emissions from aviation sources as well as no significance thresholds.

Typically for aviation projects this is captured by the amount of CO₂ which is the by-product of fuel consumption. This section anticipates an increase in CHGs resulting from potential increased operations, resulting in additional fuel burn of AVGas.

Federal regulations require CHGs to be measured in metric tons. A quantitative analysis is shown in **Table 4-5** comparing the resulting increase in CO₂ from the additional operations to the baseline today.

Table 4-5: CO₂ Emissions Inventory Results

Fuel Source	Metric Tons per Project
	CO ₂
Alternatives 2 and 5	151.8
No Action	127.6
Net Increase	24.2

Source: EDMS 5.1.3

Per FAA Order 1050.1F Desk Reference. CEQ has noted that *“it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions, as such direct linkage is difficult to isolate and to understand.”* Accordingly, it is not useful to attempt to determine the significance of such impacts.



4.4 Farmlands

Farmlands are defined as those agricultural areas considered important and protected by Federal, state, and local regulations. Important farmlands include all pasturelands, croplands, and forests (even if zoned for development) considered to be prime, unique, or of statewide or local importance. According to the FAA Desk Reference, section 6, the Farmland Protection Policy Act (FPPA) regulates Federal actions with the potential to convert farmland to non-agricultural uses. Specifically, the Act regulates farmland identified as prime, unique, or of statewide or local importance.

The airport and its surrounding property include lands classified as prime farmland, farmland of statewide importance, and farmland of local importance. In Vermont Farmlands are under the jurisdiction of the Vermont Agency of Agriculture, Food and Markets (AFFM).

Alternative 1: No Build

This alternative would not affect farmlands because there would be no interactions with said lands.

Alternative 2: Runway 1 and Associated Taxiway Extension and Alternative 5: Shifted Runway

Table 4-6 highlights the soils in the project area that will be impacted. Initial consultation with AFFM has indicated that NRCS-rated soils warrant Act 250: Criterion 9(B), Protection of Primary Agricultural Soils (PAS), review with the agency. The soils matrix in Table 4-6 provides the Key (NRCS soil identifier), Soil Type, Rating, Agricultural Value (per AFFM) and Total Area (within the proposed action) as initial data needed for an AFFM determination, **Appendix B** contains the graphics for each project area.

Soils mapped by NRCS as prime, statewide or local importance meet the definition of PAS unless they have already lost agricultural potential. Mitigation is warranted for impacts to PAS under Criterion 9(B), though the Agency considers impacts for which <2 acres mitigation is warranted to be de minimus. Mitigation for de minimus impacts is only warranted when the cumulative mitigation totals 2 acres from present and future permitted amendments.

From the soils identified in Table 4-6 only soils MsA, MsB, MsC, Wh and WsB qualify as prime agricultural soils. Prime soils are subject to the Act 250, Criterion 9(B) review. Grading prime agriculture lands is often an impact to PAS unless the full soil horizon and agricultural potential of the soils is left intact. An application to the AFFM will be necessary to determine the impact to the prime agricultural soils. Mitigation measures may be required, and are based on the agricultural value. Development with agricultural value of 6 will require a two to one mitigation, while development with agricultural value of 8 will require a one to one mitigation. Mitigation options include reclamation or off-site, in-lieu fee. Fees for off-site mitigation will need to be obtained from AFFM at the time of the application. This permit should be sought during the design phase of the project. The soils matrix presented here is preliminary, and the actual acreage will be determined during the design phase.

Some area of the proposed development includes tree removal off the Runway 19 end. These trees coincide with wetland areas, as such will seek to removing trees to the ground but will not include ground disturbance through grubbing. Similarly trees off Runway 1, south of Route 78, will selectively trim trees to the ground and not grub. In areas where trees will be removed but soils themselves are not disturbed, no PAS mitigation under 9(B) is warranted for just removing trees, but it must be proven



that the full soil horizon is intact. Similarly, for the apron rehabilitation and fuel farm no mitigation may be required because the area is already developed and the full soil horizon is likely to remain intact.

Conclusion: In summary, with the appropriate permitting with the Agency under Criterion 9(B), and mitigation there should be no significant impact to farmlands.



Table 4-6: Soils Matrix

Key	Soil Type	Rating	Ag Value	Alt 2: Total Area (acres)	Alt 5: Total Area (acres)	Project Area
Ce	Carlisle muck	Not prime or statewide farmland	-	2.3	0.2	Rwy 19 Tree Removal Perimeter Access Road
MsA	Missisquoi loamy sand, 0 to 3 percent slopes	Farmland of statewide importance	6	29.9	37.52	Rwy/Twy 1 Ext Rwy 1 Tree removal (south 78 and north 78) Hangars (east and land swap) Perimeter Access Road Relocated Yard Rd/Fence Apron Rehab/Fuel Runway Widening Partial Parallel 19
MsB	Missisquoi loamy sand, 3 to 8 percent slopes	Farmland of statewide importance	6	10.7	12.5	Rwy 19 Tree Removal, Rwy 1 Tree Removal (south 78 and north 78) Perimeter Access Road Relocated Yard Rd/Fence Runway Widening Partial Parallel 19
MsC	Missisquoi loamy sand, 8 to 15 percent slopes	Farmland of local importance	8	26.4	27.3	Rwy 19 Tree removal, Rwy 1 Tree removal (south 78) Perimeter Access Road Hangars (land swap) Runway Widening Partial Parallel 19
MsD	Missisquoi loamy sand, 15 to 25 percent slopes	Not prime or statewide farmland	-	3.8	0.2	Rwy 19 Tree removal
Tm	Terric medisaprists	Not prime or statewide farmland	-	0.1	0.1	Perimeter Access Road
Wh	Wareham loamy fine sand	Prime farmland if drained	6 (MsA)	3.6	5.0	Rwy 1 Tree Removal (north 78)
WsB	Windsor loamy fine sand, 3 to 8 percent slopes	Farmland of statewide importance	6 (MsA)	0.5	0.5	Perimeter Access Road Hangars (land swap)
WsC	Windsor loamy fine sand, 8 to 15 percent slopes	Not prime or statewide farmland	-	0.1	0.1	Perimeter Access Road
WsD	Windsor loamy fine sand, 15 to 25 percent slopes	Not prime or statewide farmland	-	4.9	4.9	Proposed Hangars (east and land swap) Perimeter Access Road

Source: Web Soil Survey for soil types

Ag Value sourced from Vermont ANR Atlas, with reference to the value as defined in the Atlas (MsA)

4.5 Historical, Archeological and Cultural Resources

The Phase 1A archeological literature review for this airport, conducted by Hartgen in 1999, revealed potential archeological sites for Franklin County State Airport (see **Appendix D**). The literature search examined the Vermont Archeological Inventory (VAI) files, town files and National Register files at the Vermont Division of Historic Properties in Montpelier. The airport property was evaluated in entirety including runways, facilities, runway protection zones, and avigation easements outside the property.

The Phase 1A review identified, *“The airport and runway rest on the relatively level terraced spine of Pudding Hill at an elevation of 230 feet AMSL with a sudden drop in elevation at the north end of the runway to Youngman Brook located approximately 50 feet in elevation below.”*

A review of the Vermont VAI at the Division of Historic Preservation (VDHP) found there are a number of precontact and historic sites in the area, as shown in **Table 4-7**.

Table 4-7: Precontact and Historic Sensitivity

Identifier	Description
VT FR43	Located to the west of the airport adjacent to Small Creek
VT FR 1/44	Located west of the airport. Referred to as “Hempyard burial ground”. This site has been destroyed by expansion of a sand and gravel quarry
VT FR 12	Located on the Missisquoi River, southeast of the airport.
VT FR 10	Located on the floodplain by a brook entering the Missisquoi River, under two miles southeast of the airport
VT FR 11	Located downstream from Site FR 10 on the Missisquoi River a mile and a half southeast of the airport.

Source: Phase 1A Archeological Investigations for Franklin County Airport, Hartgen 1999

Per the Hartgen report, based on files at VDHP there are two historic sites within one mile radius of the airport, including VT FR 293 and VT FR 294, both which denote historic foundations. The report went on to state, *“None of the prehistoric archeological sites are located within the project area. Site FR 1/44 is located about 2,600 feet to the west. The high terrace edge at the north end of the runway which continues west along Youngman Brook display characteristics of areas of high archeological sensitivity.”* *“Aside from the northern portion of the property the project area as a whole has a low sensitivity for historic archaeological resources.”*

Alternative 1: No Build

This alternative does not include any construction thus there is no potential to adversely impact historical resources.

Alternative 2: Runway 1 and Associated Taxiway Extension

Development of this alternative occurs mostly to the south and the east (runway 1 extension, relocation Yard Road, proposed hangars, apron rehabilitation, hangar development, parallel taxiway extensions, installation of lighting and NAVAIDs, fuel farm upgrade, relocation of perimeter fence, perimeter access road, land swap), distanced from water resources and in a low archeologically sensitive area. The only proposed project that may be located in an archeologically sensitive area is the proposed tree removal within the existing north easement, off Runway 19, approximately 3.5+/- acres. Because of location near Youngman Brook, and in wetlands, tree removal will be restricted to cutting trees to the ground, and not



removing the stumps, thus minimizing ground disturbance in this archeological sensitive site. The alternative does not include any development to the west of the airfield, that could impact FR 1/44.

Alternative 5: Shifted Runway

Development of this alternative occurs mostly to the south and the east (runway 1 extension, relocation Yard Road, proposed hangars, apron rehabilitation, hangar development, parallel taxiway extensions, installation of lighting and NAVAIDs, fuel farm upgrade, relocation of perimeter fence, perimeter access road, land swap), distanced from water resources and in a low archeologically sensitive area. The only proposed project that may be located in an archeologically sensitive area is the proposed tree removal within the existing north easement, off Runway 19, approximately 0.2+/- acres. Because of location near Youngman Brook, and in wetlands, tree removal will be restricted to cutting trees to the ground, and not removing the stumps, thus minimizing ground disturbance in this archeological sensitive site. The alternative does not include any development to the west of the airfield, that could impact FR 1/44.

Conclusion: Based on the limited scope of work in the northern area of the airport easement, and minimizing the disturbance by cutting trees to the ground, there is no anticipated significant impact expected on this resource.

4.6 Land Use

For airport actions, the Land Use section of the environmental document shall document how the airport sponsor will adhere to grant assurance to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. The assurance must be related to existing and planned land uses. The airport is zoned for industrial commercial development, and there is an Airport Overlay District to limit incompatible land uses around the airport. As a result, most projects will have no effect on land use.

As identified in Section 3.3.9, there is zoning in place to restrict height development around the airport. This section is being reviewed for two of the proposed projects: (1) the land swap re-use and (2) easement acquisition for off-airport obstruction removal.

Alternative 1: No Build

This alternative does not include any construction or easement acquisition. Consequently, there will be no effect on land use.

Alternative 2: Runway 1 and Associated Taxiway Extension

While most of the Proposed Action's projects occur on airport property, there is one project that occurs outside airport property, and need to be addressed to adhere to the sponsor's grant assurances, specifically obstruction removal (hazard removal and mitigation).

The 16.5 +/- acres of lands that are to be swapped are to ensure that the sand pit, which is incompatible to the airport because of the dust generation, and to benefit the adjacent industrial park development and the future airport development. The swapped lands for the airport will be re-used for additional hangar storage with taxilane and roadway access, which are compatible with the airport. The lands to the north that are part of airport property are too far from the remaining airfield support system to be



useful for airfield development. Thus, the land swap is proposed to help with compatible land use and provide additional financial stability to the airport.

The second element involves acquiring easements over six different parcels off airport property. An aviation easement is a negotiated agreement between the landowner and the airport sponsor for air-right permission to remove trees, and prevent erection of tall structures that penetrate airspace, thereby creating a safer environment for the pilots and the community, by providing clear passage for takeoff and landing on the runway. It typically will not alter the ability of the landowner to conduct business on their property. These easements are necessary to clear trees that penetrate airspace, thus compromising safety for aircraft landing and taking off into an unclear path. Four of the parcels are along Route 78, and used by local businesses. Only tree removal will occur on these parcels. The physical structures are not obstructions; thus relocation is not necessary. The remaining parcels are undeveloped, forested areas, where tree removal will occur. Some tree removal is in wetlands, which is discussed in Section 4.10 below.

Alternative 5: Shifted Runway

While most of the Proposed Action's projects occur on airport property, there is one project that occurs outside airport property, and need to be addressed to adhere to the sponsor's grant assurances, specifically obstruction removal (hazard removal and mitigation).

The 16.5 +/- acres of lands that are to be swapped are to ensure that the sand pit, which is incompatible to the airport because of the dust generation, and to benefit the adjacent industrial park development and the future airport development. The swapped lands for the airport will be re-used for additional hangar storage with taxilane and roadway access, which are compatible with the airport. The lands to the north that are part of airport property are too far from the remaining airfield support system to be useful for airfield development. Thus, the land swap is proposed to help with compatible land use and provide additional financial stability to the airport.

The second element involves acquiring easements over seven different parcels off airport property. An aviation easement is a negotiated agreement between the landowner and the airport sponsor for air-right permission to remove trees, and prevent erection of tall structures that penetrate airspace, thereby creating a safer environment for the pilots and the community, by providing clear passage for takeoff and landing on the runway. It typically will not alter the ability of the landowner to conduct business on their property. These easements are necessary to clear trees that penetrate airspace, thus compromising safety for aircraft landing and taking off into an unclear path. Four of the parcels are along Route 78, and used by local businesses. Only tree removal will occur on these parcels. The physical structures are not obstructions; thus relocation is not necessary. The remaining parcels are undeveloped, forested areas, where tree removal will occur. Tree removal in the wetlands is discussed in Section 4.10 below.

Conclusion: Neither alternative should have a significant environmental impact.

4.7 Natural Resources and Energy Supply

As an impact category, natural resources and energy supply provides an evaluation of a project's consumption of natural resources (such as water, asphalt, aggregate, wood, etc.) and use of energy



supplies (such as coal for electricity; natural gas for heating; and fuel for aircraft, commercial space launch vehicles, or other ground vehicles). Consumption of natural resources and use of energy supplies may result from construction, operation, and/or maintenance of the proposed action or alternative(s).

[Alternative 1: No Build](#)

This alternative does not include any construction. Consequently, there will be no effect on natural resources and energy supply.

[Alternative 2: \(Runway 1 1,000' Runway/Taxiway Extension\) and Alternative 5: \(Shifted Runway\)](#)

This category is being evaluated because the proposed action includes additional lighting for the runway, taxiway extensions, fuel farm, perimeter access road, and additional asphalt for the runway, taxiway, aprons, taxilanes and roadways.

The additional asphalt is not in limited supply. There is an asphalt plant in the Town of Swanton. This additional asphalt will impact the amount of impervious surface, resulting in additional runoff. This will be addressed in water resources below.

The Town of Highgate provides utilities to the airport via a primary service along the airport access road from Route 78. The additional lighting will likely consist of quartz lighting to be compatible with the State's airport parts department. This will increase the energy footprint supply, although lighting will be pilot-controlled, therefore only active when the runway environment is active. Additional lighting will be tied into the vault.

Conclusion: The alternatives are not anticipated to have long-term environmental impacts on natural resources.

4.8 Noise

Noise impacts may come from two sources. The first is from temporary construction equipment for construction of the proposed action. The second is from the potential increase of aircraft operations at the airport.

[Alternative 1: No Build](#)

Alternative 1 is anticipated to have no effect on noise because there would be no additional construction noise.

[Alternative 2: \(Runway 1 1,000' Runway/Taxiway Extension\) and Alternative 5: \(Shifted Runway\)](#)

Noise is anticipated to be from two sources: (1) construction and (2) additional aircraft operations.

Construction impacts are anticipated to be short-term from construction equipment used for of the projects within the proposed action. Noise will be limited to daytime work hours. There are no residential areas around the airport that will be exposed to the construction noise, as the surrounding land uses are compatible to airport usage, business development. No long-term construction impacts are anticipated.



Relative to noise due to increased aircraft operations, there are no significant noise increases anticipated, as the alternatives fall into subsection 11.1.2 of Order 1050.1F Desk Reference. This subsection, *“Projects Not Requiring a Noise Analysis,”* details what projects do not require a noise analysis. Projects that do not require a noise analysis include those *“involving Design Group I and II airplanes in Approach Categories A through D operating at airports whose forecast operations in the period covered by the NEPA document do not exceed 90,000 annual propeller operations.”* The aircraft using Franklin County State Airport involve design group I and II airplanes with approach categories A and B. Based on the Airport Master Record, the annual propeller operations at the airport are presently 4,530, significantly lower than the 90,000 annual operational limit.

Conclusion: The alternatives are not anticipated to have long-term environmental impacts on noise.

4.9 Visual Impacts: Light Emissions

Light emissions include any light that emanates from a light source into the surrounding environment. Examples of sources of light emissions include airfield lighting, navigational aids, terminal lighting, parking facility lighting, roadway lighting, and hangar lighting. Glare is a type of light emission that occurs when light is reflected off a surface (e.g., window glass, solar panels, or reflective building surfaces).

Alternative 1: No Build

This alternative does not include any construction. Consequently, there will be no effect on light emissions.

Alternative 2: (Runway 1 1,000' Runway/Taxiway Extension) and Alternative 5: (Shifted Runway)

There is very little development around the airport that is not airport related. The closest businesses are on the south side of Route 78. This alternative includes additional lighting for the runway, taxiway visual aids, and street lights for the fuel farm and perimeter access road.

The airfield lighting will be pilot controlled thus will only be active when the runway is in use. The PAPI will be tied into the pilot-controlled lighting system as well. The PAPI are also visible from an upward angle and should not disseminate light into the businesses across Route 78. The lights for the fuel farm and perimeter access road are typical street lights that will be downward facing to illuminate the area immediately around the area. These lights will not affect the businesses across Route 78.

There is no known installation of solar panels included in the proposed action. However, should the airport sponsor, or a private owner wish to place solar panels atop the proposed hangars, a solar glare analysis will need to be performed to ensure there is no adverse light impact to pilots using the airport.

Conclusion: No significant light emissions impacts are expected to occur on adjacent landowners.



4.10 Water Resources

The two water resources that may be impacted by the proposed action are groundwater and wetlands.

4.10.1 Wetlands

An initial review of the National Wetland Inventory (NWI) Database identified potential wetlands around the airport. As the Proposed Action includes working in those wetlands, The Smart Associates was retained to provide wetland delineation services for this Environmental Assessment. Wetlands were delineated within 100 feet of the proposed improvement projects. A wetland delineation report was prepared, and can be found in **Appendix C**. An additional field visit was conducted in June 2018 for the land swap area. No wetlands were found in this area.

Highlights from the Wetland Delineation follow:

Wetlands within and adjacent to the project area were delineated by The Smart Associates, using methodology outlined in the *U.S. Army Corps of Engineers Wetland Delineation Manual* (ACOE, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (ACOE, 2012). The wetland delineation was conducted between October 26 and November 7, 2017. On November 8, 2017, The Smart Associates met with Vermont Agency of Natural Resources (VANR) to review the wetlands.

Both Federal and State of Vermont regulations address activities conducted in wetlands and waters of the U.S. The fundamental intent of these regulations is to minimize the reduction and degradation of these resources and strive to achieve the government's "no net loss" policy. The Federal program is based on Section 404 of the Clean Water Act and the Army Corps of Engineers (ACOE) implementation regulations (33 CFR, Parts 320-330). In addition, Executive Order 11990 directs all Federal agencies to minimize the destruction, loss, and degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. These regulations define those lands that are considered wetlands and other waters of the US, including lakes, ponds, rivers, and streams. The regulations require an ACOE permit for the placement of dredge or fill material in wetlands or other waters of the US. The Wetlands Program of the Vermont Department of Environmental Conservation (VTDEC) is responsible for administering wetlands protection at the State level and coordinates with the ACOE to determine the jurisdictional status of wetlands and waterways.

The Vermont Wetland Rules were originally adopted in 1990 and have had several revisions since then. In 2010, new wetland rules, pursuant to 10 V.S.A. § 6025(d)(5), were passed by the Vermont Water Resources Panel. The new rules identify 10 functions and values that are used to determine if a wetland is considered "significant" and therefore regulated. These functions and values are:

- Water storage for flood water and storm runoff;
- Surface and ground water protection;
- Fish habitat;
- Wildlife habitat;
- Exemplary wetland natural community;



- Rare, threatened, and endangered species habitat;
- Education and research in natural sciences;
- Recreational value and economic benefits;
- Open space and aesthetics; and
- Erosion control through binding and stabilizing the soil.

The Vermont Wetland Rules classify wetlands into three categories, based on significance:

- Class I wetlands are defined as wetlands that are identified as Class I on the Vermont Significant Wetland Inventory (VSWI) Maps, wetlands that were identified by the former Water Resources Board as Class I wetlands, and wetlands that are determined to be exceptional or irreplaceable in their contribution to Vermont’s natural heritage by the Water Resources Panel. A 100-foot protected buffer zone, which is an adjacent area of upland designed to protect the wetland functions and values, is designated adjacent to Class I wetlands.
- Class II wetlands are defined as wetlands that are identified as Class II on the VSWI Maps and wetlands that are determined to merit protection based on the wetlands’ functions and values. The buffer zone associated with Class II wetlands is 50-feet.
- Class III wetlands are wetlands that are neither Class I or Class II. Class III wetlands do not have an associated buffer and are also not protected under the Vermont Wetland Rules.
- A total of 3 wetland resource areas were delineated and are shown in **Figure 4-2**.

Wetland 1: North End of the Airport

This wetland is north of the end of Runway 19.

This wetland community includes large emergent marsh on the east side of the study area, continuing to the west as a narrow stream approximately 150 yards before entering a scrub/shrub march. This wetland is considered a Significant Natural Community by the state of Vermont. The wetland boundaries along the south side of the wetland follow the marsh and stream but also include a large area of phragmites on the west side of the runway. The northern boundary of the wetland is more convoluted with narrow drainages, hummocks and intermittent stream channels is a forested community.

During the wetland delineation, three wetland pockets were identified as being potential vernal pool habitat and may be subject to spring amphibian surveys to confirm their status. Smart Associates and Vermont Fish and Game visited the site on April 30, 2018 to look at the vernal pools and determine the level of activity by breeding amphibians (see **Appendix C**). **Figure 4-2** highlights the location of the wetlands and vernal pools as they relate to tree removal areas.

- **Pool 1** located 1300 feet north of the end of Runway 19 pavement, well below runway grade. This pool is found within the boundaries of a larger delineated wetland.
- **Pool 2** is located 100 feet north of Pool 1 and hydrologically connected to Pool 1. This pool has similar tree species in the overstory and shrub layer as Pool 1. Area is forested with a



mix of red maple, black ash, and Atlantic white cedar. The understory is relatively sparse with species including American hornbeam, balsam fir and saplings.

- **Pool 3** is small shallow pool located in an upland forest approximately 200 feet north of Pool 2. It is located higher in the landscape than Pools 1 and 2. Tree species were similar in nature but due to the upland character of this location also included trembling aspen. This pool was determined to not provide sufficient hydrology for viable a vernal pool habitat.

No egg masses or activity was observed. At the time of the study other vernal pools in the area were active. The tree cutting off Runway 19, may impact one of the identified vernal pools. Additional correspondence with Vermont Fish and Wildlife is needed during the permit process. A permit from the Vermont Fish and Wildlife will be sought.

The portion of this wetland within the project area provides many of the functions listed in the Vermont Wetland Rules. This wetland is classified as **Class II** and regulated by the State of Vermont with a 50-foot buffer zone. Tree cutting within this wetland accounts for 1+/- acres for Alternative 2 and 0.2 +/- acres for Alternative 5. If permitting for impacts to Wetland 1 and/or 3 is required, In Lieu Fees will likely be triggered to compensate for the loss/degradation of these features. Ducks Unlimited is the manager of these funds under an agreement with the US Army Corps of Engineers (ACOE).

Wetland 2: South End of the Airport

This wetland is south of the end of Runway 1, in the proposed runway extension area, and will be impacted. This wetland community contains two small, isolated wetlands. The wetland is classified as palustrine emergent wetlands with persistent vegetation and seasonally flooded/saturates hydrology (PEM1E). Emergent wetland occurs just south of the existing perimeter fence and is crossed by an existing access road. These two small wetland communities occur in a low area which appears to have been influenced by old excavations or some other form of site disturbance which influenced drainage and the overall vegetation community. Due to the small size of this wetland complex, the isolated condition, lack of diversity and hydrologic condition, Wetland 2 is considered to provide limited function as described in the Vermont Wetland Rule. The soils in the area are excessively well drained. Based on the limited functional values of the wetland community and lack of connection to other wetland communities, these wetlands are determined to be **Class III** wetland, and are not regulated by the State of Vermont.

During the November 2017 site visit with VTDEC (ANR) this wetland was flagged as having potential habitat of value to the state-listed Endangered Species Grasshopper Sparrow. The findings would have changed the wetland classification to Class II. Since that time Vermont Fish and Wildlife has determined the affected species are not wetland dependent and therefore not likely to utilize this habitat (see **Appendix B**). As a result, Wetland 2 will remain a Class III wetland.

Wetland 3: Area between end of Runway 1 and Vermont Route 78

This wetland is south of the end of Runway 1, up to Vermont Route 78, in the area of proposed obstruction removal.

Much of the airport's property is currently mowed with scattered trees along the road. A forested area with large trees does occur along the southwestern edge and parallel the edge of



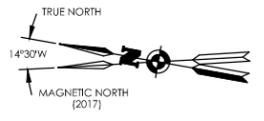
the woods with wetlands occurring in the adjacent field before continuing into the woods and turning away from the airfield. The wetland is classified as palustrine, forested, broad-leaved deciduous/needle-leaved evergreen, seasonally flooded/saturated (PFO1/4E) in the wooded portion to the west of the mowed field. Those portions which extend into the adjacent field would be classified as palustrine, emergent, persistent, saturated (PEM1B). Provides various functions and values, as described in the Vermont Wetland Evaluation Form. Wetland 3 is considered a **Class II** wetland. This determination was confirmed during a VANR Site meeting. As such, it is regulated by State of Vermont and has a 50-foot buffer zone.

Tree cutting within this wetland will account for up to 3.5 +/- acres for both alternatives 2 and 5.

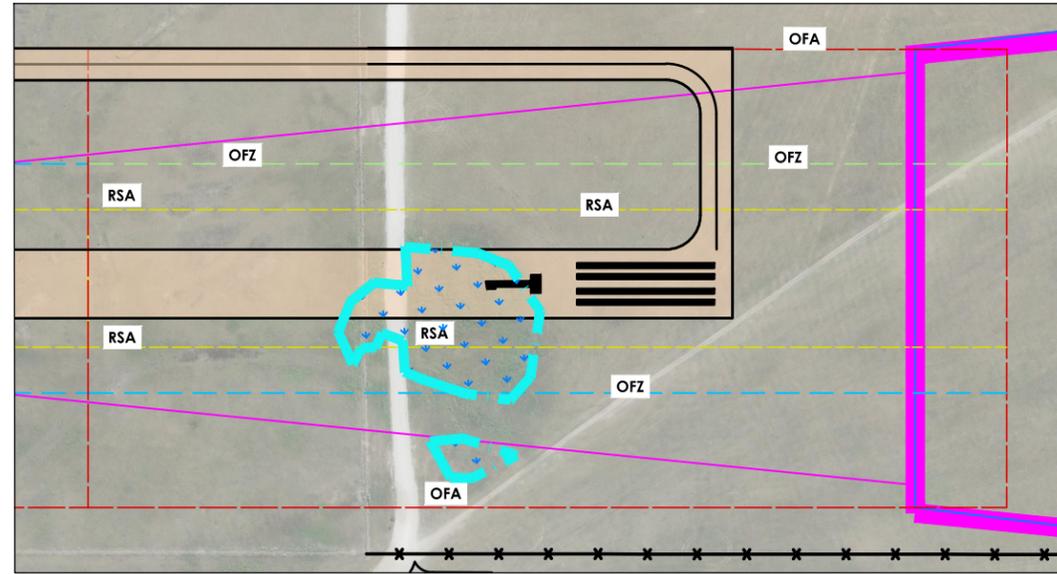
If permitting is required for impacts to Wetlands 1 and/or 3, In Lieu Fee's will likely be triggered to compensate for the loss/degradation of these features. Ducks Unlimited is the manager of these funds under an agreement with the US Army Corps of Engineers (ACOE).

Land Swap area

In June 2018 The Smart Associates conducted a field wetland resource review of the land swap area. This property is an open area of previous gravel excavation and is generally flat. Vegetation is scattered with patches of bare ground. Plants were generally non-wetland in nature, such as sweet fern, evening primrose and whorled yellow loosestrife, all upland species. In addition, most areas also had various grass species. No wetlands were identified in the study area. There are wetlands to the north of this area, outside the project location, that were field verified, but not mapped. These wetlands are about 10-15 feet below the land swap area.

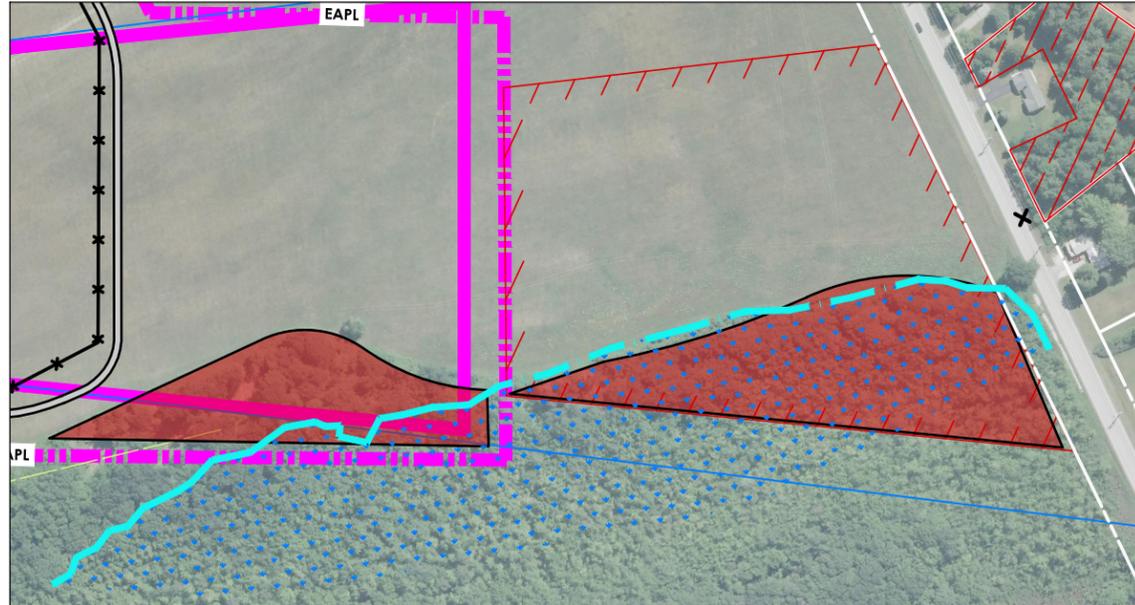


Wetland 2- Runway 1 Extension



Wetland Type: Class III

Wetland 3- South Runway 1



Wetland Type: Class II
3.5 ± Acres of trees in wetlands

DEPARTMENT OF TRANSPORTATION
 FEDERAL AVIATION ADMINISTRATION

APPROVED _____ DATE _____

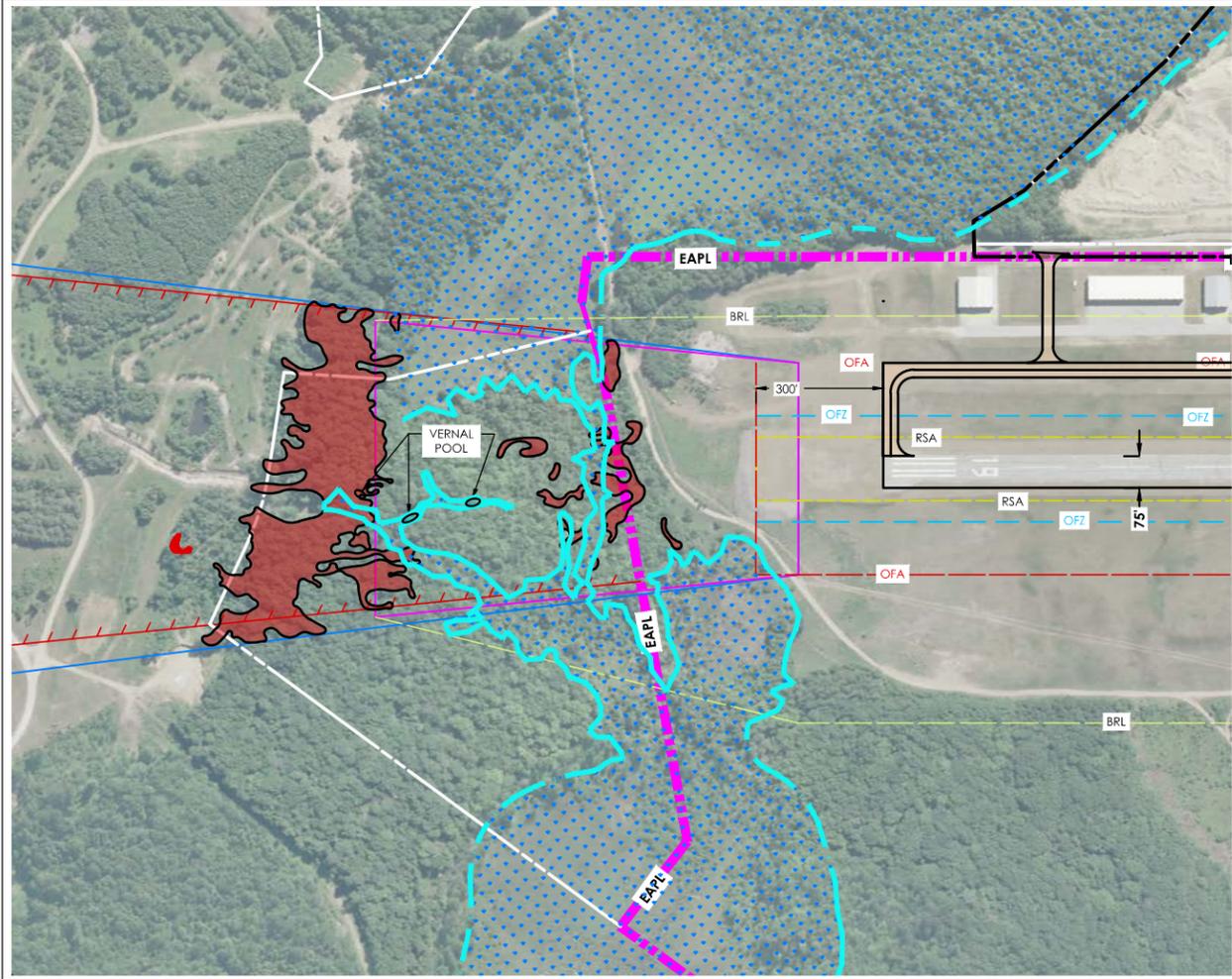
DIRECTOR, RAIL & AVIATION BUREAU

APPROVED _____ DATE _____

LEGEND		
DESCRIPTION	EXISTING	PROPOSED
RUNWAY SAFETY AREA (RSA)	--- RSA ---	--- RSA ---
RUNWAY OBJECT FREE AREA (ROFA)	--- OFA ---	--- OFA ---
RUNWAY OBJECT FREE ZONE (ROFZ)	--- OFZ ---	--- OFZ ---
RUNWAY PROTECTION ZONE (RPZ)	--- RPZ ---	--- RPZ ---
BUILDING RESTRICTION LINE	--- BRL ---	--- BRL ---
AIRPORT PAVEMENT	[Symbol]	[Symbol]
AIRPORT REFERENCE POINT	[Symbol]	[Symbol]
BUILDINGS	[Symbol]	[Symbol]
AIRPORT PROPERTY LINE / EASEMENTS	--- EAPL ---	--- EAPL ---
FENCE (8' HIGH WITH 3 ROW BARB)	-X-X-	-X-X-
ROAD	==	==
WETLANDS	[Symbol]	[Symbol]
GROUND ELEVATION CONTOURS	-950-	-950-
EASEMENT	///	///
PRECISION APPROACH PATH INDICATOR (PAPI)	[Symbol]	[Symbol]
AIRPORT BEACON	[Symbol]	[Symbol]
AUTOMATED WEATHER OBSERVING SYSTEM	[Symbol]	[Symbol]
WINDSOCK	[Symbol]	[Symbol]
ARCHEOLOGICAL	---	---
WETLAND BOUNDARY	---	---

BUILDINGS	EXISTING
T-HANGAR (10 UNIT)	1
CONVENTIONAL HANGAR	2
T-HANGARS (3-UNIT)	3
T-HANGARS (1-UNIT)	4
CONVENTIONAL HANGAR	5
T-HANGAR (3-UNIT)	6
CONVENTIONAL HANGAR	7
PRESTIGE PAINT	8
STORAGE BUILDING	9
FBO-BORDER AIR HANGAR	10
T-HANGAR (3-UNIT)	11
CONVENTIONAL HANGARS (PVT)	12-14
ULTRALIGHT HANGARS (PVT)	15
ULTRALIGHT HANGARS (PVT-OFF AIRPORT)	16
U.S. BORDER PATROL	17
PRIVATE BUSINESS (LEASE)	18
PRIVATE AND/OR PUBLIC	AS SHOWN

Wetland 1- Runway 19



Wetland Type: Class II
1 ± Acres of trees in wetlands

Fig. 4-1 Wetlands with Vernal Pools: Alternative 2

REVISIONS			
NO.	DATE	BY	DESCRIPTION

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECT SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER THESE PLANS IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

VERMONT AGENCY OF TRANSPORTATION



PROJECT NAME: HIGHGATE ENVIRONMENTAL ASSESSMENT
 FRANKLIN COUNTY AIRPORT

PROJECT NUMBER: AV-FY17-013

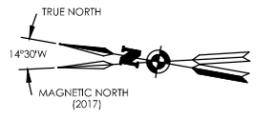
FILE NAME: ALT 2 RUNWAY 1 1000 FT EXT. PLOT DATE: MARCH 2018

PROJECT LEADER: LISA CHEUNG DRAWN BY: WAYNE ZIAN

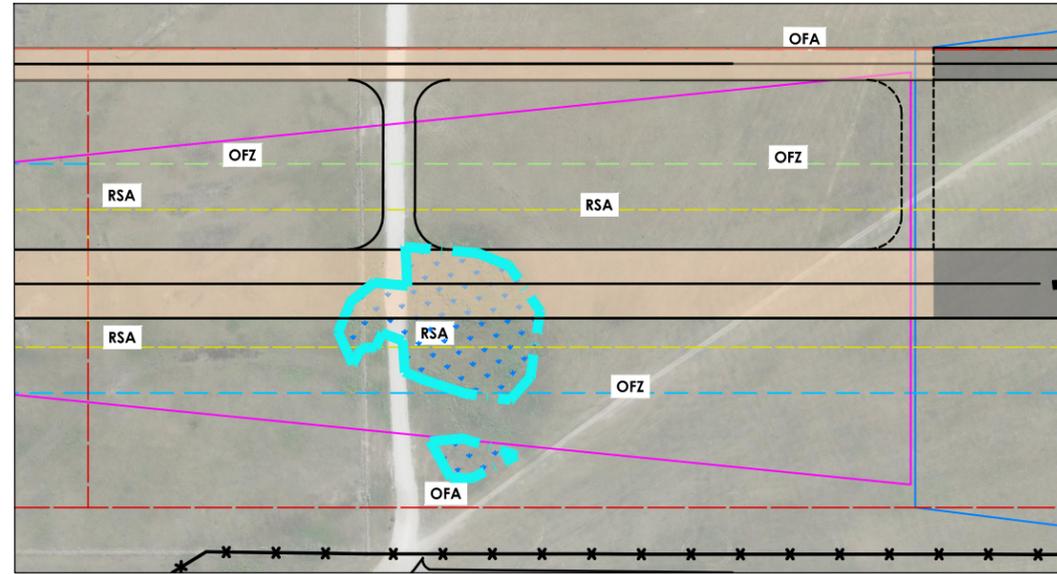
DESIGNED BY: LISA CHEUNG CHECKED BY: L.M.C.

SHEET TITLE: ALTERNATIVE #2 - RUNWAY 1 1000 FT. SHEET 2 OF 4

Z:\2012\20120400\20120400\001\Drawings\Airport\Fig 4-1 Wetland Boundary alternate 2.dwg, 10/12/2018 2:17:31 PM, wzian

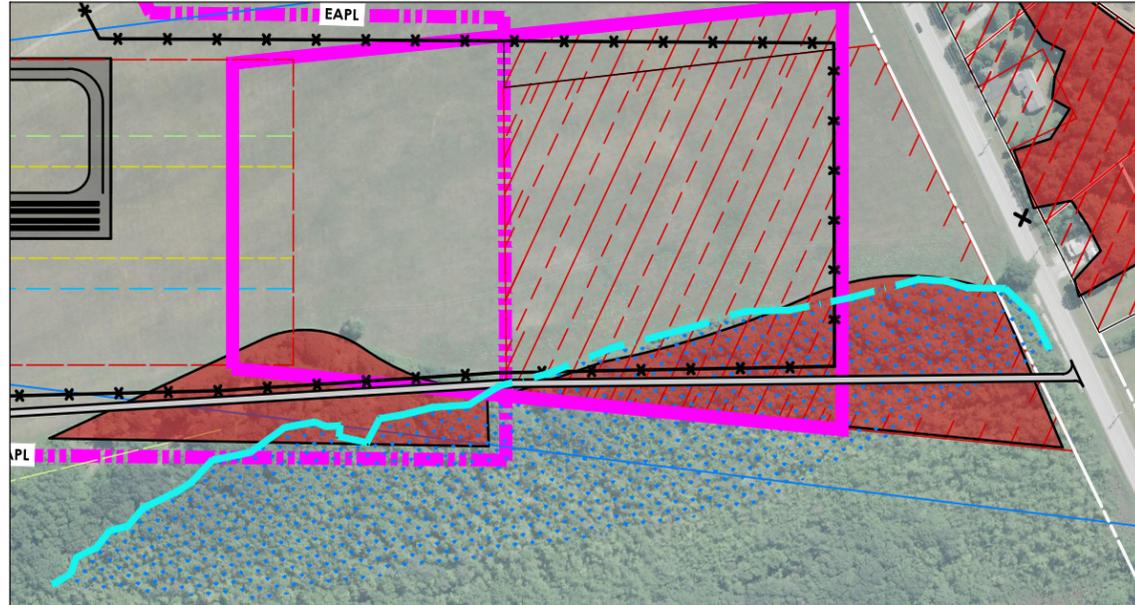


Wetland 2- Runway 1 Extension



Wetland Type: Class III

Wetland 3- South Runway 1



Wetland Type: Class II
3.5 ± Acres of trees in wetlands

DEPARTMENT OF TRANSPORTATION
 FEDERAL AVIATION ADMINISTRATION

APPROVED _____ DATE _____

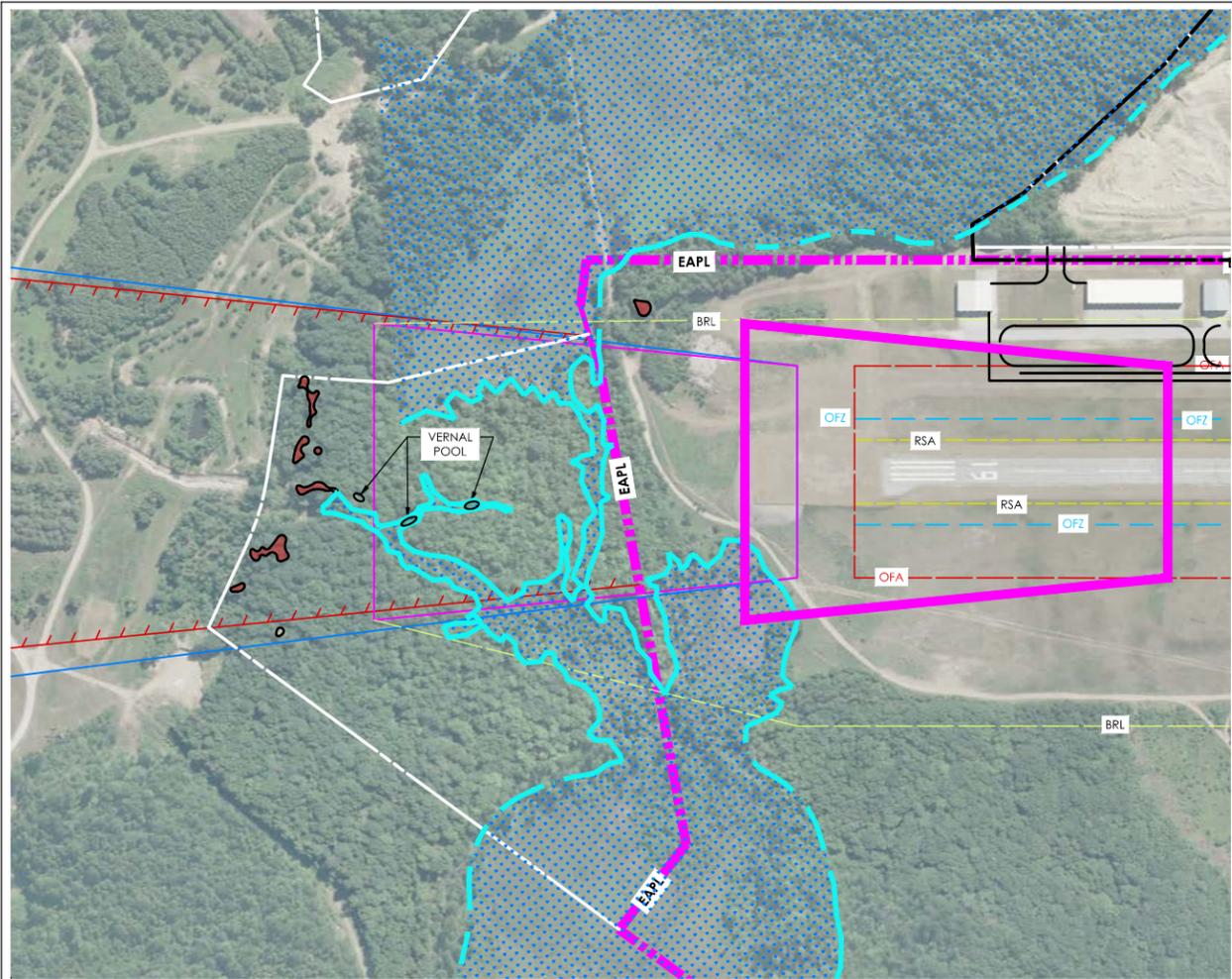
DIRECTOR, RAIL & AVIATION BUREAU

APPROVED _____ DATE _____

LEGEND		
DESCRIPTION	EXISTING	PROPOSED
RUNWAY SAFETY AREA (RSA)	--- RSA ---	--- RSA ---
RUNWAY OBJECT FREE AREA (ROFA)	--- OFA ---	--- OFA ---
RUNWAY OBJECT FREE ZONE (ROFZ)	--- OFZ ---	--- OFZ ---
RUNWAY PROTECTION ZONE (RPZ)	--- RPZ ---	--- RPZ ---
BUILDING RESTRICTION LINE	--- BRL ---	--- BRL ---
AIRPORT PAVEMENT	--- Pavement ---	--- Pavement ---
AIRPORT REFERENCE POINT	--- ARP ---	--- ARP ---
BUILDINGS	--- Buildings ---	--- Buildings ---
AIRPORT PROPERTY LINE / EASEMENTS	--- EAPL ---	--- EAPL ---
FENCE (8' HIGH WITH 3 ROW BARB)	--- Fence ---	--- Fence ---
ROAD	--- Road ---	--- Road ---
WETLANDS	--- Wetlands ---	--- Wetlands ---
GROUND ELEVATION CONTOURS	--- 950 ---	--- 950 ---
EASEMENT	--- Easement ---	--- Easement ---
PRECISION APPROACH PATH INDICATOR (PAPI)	--- PAPI ---	--- PAPI ---
AIRPORT BEACON	--- Beacon ---	--- Beacon ---
AUTOMATED WEATHER OBSERVING SYSTEM	--- AWOS ---	--- AWOS ---
WINDSOCK	--- Windsock ---	--- Windsock ---
ARCHEOLOGICAL	--- Archeological ---	--- Archeological ---
WETLAND BOUNDARY	--- Wetland Boundary ---	--- Wetland Boundary ---

BUILDINGS	EXISTING
T-HANGAR (10 UNIT)	1
CONVENTIONAL HANGAR	2
T-HANGARS (3-UNIT)	3
T-HANGARS (1-UNIT)	4
CONVENTIONAL HANGAR	5
T-HANGAR (3-UNIT)	6
CONVENTIONAL HANGAR	7
PRESTIGE PAINT	8
STORAGE BUILDING	9
FBO-BORDER AIR HANGAR	10
T-HANGAR (3-UNIT)	11
CONVENTIONAL HANGARS (PVT)	12-14
ULTRALIGHT HANGARS (PVT)	15
ULTRALIGHT HANGARS (PVT-OFF AIRPORT)	16
U.S. BORDER PATROL	17
PRIVATE BUSINESS (LEASE)	18
PRIVATE AND/OR PUBLIC	AS SHOWN

Wetland 1- Runway 19



Wetland Type: Class II
0.2 ± Acres of trees in wetlands

Fig. 4-2 Wetlands with Vernal Pools: Alternative 5

REVISIONS			
NO.	DATE	BY	DESCRIPTION

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECT SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER THESE PLANS IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

VERMONT AGENCY OF TRANSPORTATION

PA
 PASSERO ASSOCIATES
 242 WEST MAIN STREET, SUITE 100
 ROCHESTER, NY 14614
 (585)325-1000 FAX: (585)-325-1691

PROJECT NAME: HIGHGATE ENVIRONMENTAL ASSESSMENT
 FRANKLIN COUNTY AIRPORT

PROJECT NUMBER: AV-FY17-013

FILE NAME: ALT 2 RUNWAY 1 1000 FT EXT. PLOT DATE: MARCH 2018
 PROJECT LEADER: LISA CHEUNG DRAWN BY: WAYNE ZIAN
 DESIGNED BY: LISA CHEUNG CHECKED BY: L.M.C.
 SHEET TITLE: ALTERNATIVE #2 - RUNWAY 1 1000 FT EXT. SHEET 2 OF 4

Z:\2012\20120400\20120400\001\Drawings\Airport\Fig 4-2 Wetland Boundary alternate 5.dwg, 10/12/2018 2:19:47 PM, wzian



Table 4-8: Wetland Summary Table

Wetland ID	Description	Federal Classifications ⁽¹⁾	Vermont Functions
1	Wetland located north of Runway 19 end	PEM1C (east side) PSS1E/EM1E (west side) R3UBH (central stream) PFO1E (north of stream)	<ul style="list-style-type: none"> ➤ Water storage for flood water and storm runoff (high) ➤ Wildlife habitat (high) ➤ Erosion control (high) ➤ Exemplary wetland natural community ➤ Rare, threatened, and endangered species ➤ Surface and ground water protection ➤ Fish habitat ➤ Open space and aesthetics
2	Two isolated wetlands off Runway 1, near existing access road	PEM1E	Limited
3	Wetland south of Runway 1, north of Vermont Route 78	PFO1/4E (wooded portion) PEM1B (adjacent to field)	<ul style="list-style-type: none"> ➤ Water storage for flood water and storm runoff (high) ➤ Wildlife habitat (high) ➤ Surface and ground water protection

1.) Key to federal classifications:

PEM1C: P = palustrine, EM = emergent, 1 = persistent, C = seasonally flooded/saturated

PSS1E/EM1E: P = palustrine, SS = scrub-shrub, 1 = broad-leaved deciduous and emergent, persistent E = seasonally flooded/saturated

R3UBH: R = Riverine, upper Perennial, UB = unconsolidated bottom, H = permanently flooded

PFO1E: P = palustrine, FO = forested, 1 = broad-leaved deciduous, E = seasonally flooded/saturated

PEM1E: P = palustrine, EM = emergent, 1 = persistent, E = seasonally flooded/saturated

PFO1/4E: P = palustrine, F = forested, 1/4 = broad-leaved deciduous/needle-leaved evergreen, E = seasonally flooded



Table 4-9: Wetland Jurisdiction Summary

Resource Area ID	Anticipated Vermont Class ⁽¹⁾	Vermont Buffer Zone	Anticipated Federal Jurisdiction ⁽²⁾
1	Class II	50 feet	Jurisdictional
2	Class III	None	Non-jurisdictional (potentially isolated)
3	Class II	50 feet	Jurisdictional

1. Subject to review by the VTDEC Wetlands Program
2. Subject to review by the ACOE

Table 4-10: Wetland Impacts – Alternative 2

Resource ID	Wetland Impacts	Federal Classifications of Impacted Area
1	1 +/- acres of tree cutting	PEM1C (east side) PSS1E/EM1E (west side) R3UBH (central stream) PFO1E (north of stream)
2	0.63 +/- acres	PEM1E
3	3.5 +/- acres of tree cutting	PFO1/4E (wooded portion) PEM1B (adjacent to field)
Total Impact to Regulated Wetlands - 4.5 +/- acres (tree cutting)		
Total Impact to Non-Jurisdictional Wetlands 0.63 +/- acres (removal)		

Notes: Wetland 1 and 3 are anticipated to have tree cutting to the ground, no root removal, and tree cutting occurring during the winter months to minimize disturbance to the wetland.



Table 4-11: Wetland Impacts – Alternative 5

Resource ID	Wetland Impacts	Federal Classifications of Impacted Area
1	0.2 +/- acres of tree cutting	PEM1C (east side) PSS1E/EM1E (west side) R3UBH (central stream) PFO1E (north of stream)
2	0.63 +/- acres	PEM1E
3	3.5 +/- acres of tree cutting	PFO1/4E (wooded portion) PEM1B (adjacent to field)
Total Impact to Regulated Wetlands - 3.7 +/- acres (tree cutting)		
Total Impact to Non-Jurisdictional Wetlands 0.63 +/- acres (removal)		

Notes: Wetland 1 and 3 are anticipated to have tree cutting to the ground, no root removal, and tree cutting occurring during the winter months to minimize disturbance to the wetland.

Key to federal classifications:

PEM1C: P = palustrine, EM = emergent, 1 = persistent, C = seasonally flooded/saturated

PSS1E/EM1E: P = palustrine, SS = scrub-shrub, 1 = broad-leaved deciduous and emergent, persistent E = seasonally flooded/saturated

R3UBH: R = Riverine, upper Perennial, UB = unconsolidated bottom, H = permanently flooded

PFO1E: P = palustrine, FO = forested, 1 = broad-leaved deciduous, E = seasonally flooded/saturated

PEM1E: P = palustrine, EM = emergent, 1 = persistent, E = seasonally flooded/saturated

PFO1/4E: P = palustrine, F = forested, 1/4 = broad-leaved deciduous/needle-leaved evergreen, E = seasonally flooded



Alternative 1: No Build

This alternative would not affect any of the wetlands because there would be no construction in them.

Alternative 2: Runway 1 and Associated Taxiway Extension and Alternative 5: (Shifted Runway)

Two projects could potentially affect the wetlands:

- Runway 1 extension
- Tree removal off both runway ends

The proposed runway extension will impact the entire Wetland 2, which was identified as a non-jurisdictional wetland.

Coordination with the VTDEC will occur during the project design and permitting phase in order to confirm wetland classifications, and obtain permitting for actions within Wetland 1 and Wetland 3, particularly for the tree removal areas. These wetlands are likely to be regulated by the ACOE and impacts to them require a Section 404 permit. Tree removal will be limited to cutting trees within the wetlands, likely during the winter months, to minimize wetland impacts to the ground from equipment. There is no anticipated grubbing within the tree removal areas that are within wetlands. Thus, there is no anticipated loss of wetlands in the tree removal areas. There are no other identified wetlands in the project area.

Permitting Requirements

Alternatives 2 and 5 would involve impacts to wetlands under both federal and state jurisdiction, a Section 404 Permit from the U.S. Army Corps of Engineers and a Wetland Permit from the Vermont Department of Environmental Conservation (ANR) would be required.

An ACOE Section 404 Permit is required under Section 404 of the Clean Water Act for those activities involving the discharge of dredged or fill material in all waters of the U.S., including navigable waters, inland rivers, lakes, streams, and wetlands. Impacts subject to Federal review include not only the area of direct wetland impacts, but also secondary impacts such as inundation or drainage of wetlands caused by the placement of fill or mechanized land clearing. Projects that impact one acre or greater of wetlands require a Section 404 Individual Permit from the ACOE. Projects that involve less than one acre of wetland impact generally qualify for a Programmatic General Permit. It is anticipated that while the tree removal within the wetlands for Alternatives 2 are not anticipated to have ground disturbance, one acre or greater will be impacted, thus an Individual Permit from the ACOE would be required.

Any impact to Class II wetlands and their regulated buffer zones requires a Wetland Permit from the VTDEC. Alternatives 2 and 5 impacts Class II wetlands and 50-foot buffer zones, so a permit from VTDEC would be required.

Mitigation

If during the permitting process, Alternatives 2 and 5 involves unavoidable adverse impacts to wetlands, mitigation for these impacts would be required. Mitigation typically includes wetland creation, wetland restoration, preservation (the establishment of a conservation easement), an in-lieu fee payment, or any combination of these.



An in-lieu fee payment is the preferred option for wetland mitigation since there are few wetland restoration or preservation opportunities within the vicinity of the airport. Wetland creation at the airport is not a preferred mitigation option due to the potential to attract waterfowl and other wildlife that could be hazardous to aircraft. The in-lieu fee payment would be calculated in accordance with the ACOE's current guidelines and recommendations. Ducks Unlimited is the manager of these fees under an agreement with ACOE.

The mitigation plan will be finalized during the permitting and design phase, once the proposed wetland impacts have been more precisely defined based on the project design.

4.10.2 Groundwater/Stormwater

Several private drinking water wells are located adjacent to the airport. No groundwater protection areas are located within the vicinity of the airport. There are no EPA-designated Sole Source Aquifers in Vermont.

A significant increase in the amount of impervious surfaces can have the potential to adversely impact the quantity of groundwater recharge to local aquifers. An increase in impervious surfaces can also impair local groundwater quality if spills or accidental releases of contaminants occur. Previous stormwater permits have been issued by the Vermont Department of Environmental Conservation.

Alternative 1: No Build

Would have no effect on groundwater quality and quantity compared to existing conditions.

Alternative 2: (Runway 1 1,000' Runway/Taxiway Extension) and Alternative 5: (Shifted Runway)

This alternative would result in approximately 414,000 square feet (alternative 2) and 443,000 square feet (alternative 5) of additional impervious surface from the construction of the runway widening, runway/taxiway extensions, perimeter access road, relocated Yard road and hangars. This increased impervious surface will require additional coordination with the Vermont Department of Environmental Conservation (ANR) and the submittal of an Act 250 permit. Included in this permit will be the design and build of adequate size storm water system to handle future development.

Appropriate Operational and Construction stormwater permits will be filed during the design phase to address water quality for each project.

All construction activities would be conducted in compliance with VTDEC's stormwater requirements. The design, implementation, and monitoring of appropriate BMPs would avoid the release of any significant volume of construction-generated water quality constituents.

Section 401 of the Clean Water Act gives states the authority to review water quality impacts for any project that requires a federal license or permit (such as a Section 404 Permit from the U.S. Army Corps of Engineers) and may involve discharges to waters of the U.S. The federal permitting agency cannot issue the permit before the state grants or waives certification. In Vermont, the VTDEC Wetlands Section issues Section 401 Water Quality Certifications.



Projects that qualify for a Section 404 Programmatic General Permit from the U.S. Army Corps of Engineers (ACOE) are generally automatically granted certification provided certain conditions are met. Projects that require an ACOE Section 404 Individual Permit need to submit a separate application for a Section 401 Water Quality Certification.

Since wetlands impacts caused by Alternatives 2 and 5 would likely require a Section 404 Individual Permit from the ACOE – (discussed in Section 4.10.1), a Section 401 Water Quality Certification from the State of Vermont would also likely be required. An application to VTDEC would be submitted during the design and permitting process. The Section 401 Water Quality Certification would need to be obtained before the ACOE can issue the Section 404 Individual Permit.

4.11 Other Considerations

This section will focus on the proposed action and its interaction with possible conflicts, inconsistency with approvals and laws, and means of mitigation.

4.11.1 Possible Conflicts

There are no identified conflicts between the alternatives and the objectives of Federal, state, regional or local policies. The runway extension is needed to provide additional safety to accommodate the critical aircraft using the airport, and comply with Federal design standards for the existing aircraft utilizing the airport.

4.11.2 Inconsistency with any Approved State or Local Plans and Laws

The proposed alternative development is consistent with plans and laws relating to the environment. The proposed buildings will comply with local zoning regulations for height.

4.11.3 Means to Mitigate Adverse Environmental Impacts

Alternative 2 has impacts that must be mitigated. Following is the summary of mitigation measures to be implemented:

- Wetland impacts from proposed obstruction removal. This removal will be limited to time of year restrictions to avoid the impact to the Northern Long-Eared Bat habitat and ground disturbance to the wetland environment. Trees within the wetlands will be trimmed to the ground, and no removal of stumps will occur within wetlands.
- If determined to require mitigation, the ACOE and Vermont Wetlands Office will determine if payment into the “in lieu fee” program is required. Ducks Unlimited is the manager of these funds under an agreement with ACOE.
- Water Quality impacts will be resolved through adhering to VTDEC requirements and obtaining required permits.



- Vernal pool impacts will be limited to time of year restrictions for the tree removal off the Runway 19 end.
- Bird species impacts from the runway 1 extension will be limited to time of year and re-establishing the habitat on airport property outside of the design surfaces. Areas to consider for creating new grassland habitat: east side of Airport Road when constructing new hangars; west side of the property, outside of the fenced airfield. Portions of the shrub areas northeast of the wind sock could be mowed or brush-hogged in the off season on a rotational basis to maintain optimal habitat conditions; mow or brush-hog field edges during the off season to reclaim fields and maintain maximum grassland acreage; or coordinate land management activities with contributing neighbors to the extent practical.

4.12 Cumulative Impacts

NEPA regulations (40 CFR 1508.7) defines cumulative impacts as “...the impact on the environment, which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency, Federal and non-Federal, or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.”

The cumulative impact assessment examined actions conducted both at the airport and within the surrounding environment going back three years and looking forward five years. Information regarding projects was obtained from airport grant histories.

Past Projects and Present

Franklin County State Airport has not undertaken any construction projects in the last several years. The Airport sponsor cleared a cast area east of Runway 1-19 for future development, which never came to fruition. This area is now being designed to include a new taxilane and apron are, that will support aircraft tie-downs, and future hangars. In design with this is a project to convert an existing roadway, that also serves as a taxilane to a full-fledged taxiway. The airport has recently completed some planning studies that examined the runway length and obstruction removal necessary to provide clear approaches to the runway.

Future Projects

The Airport sponsor is gearing up to commence land acquisition for the removal of both on and off-airport obstructions to provide clear approaches. Permits are underway for the construction of the taxiway conversion, construction of Taxiway B and apron construction. Preliminary design will commence, after this EA is complete, for the runway and taxiway extension and obstruction removal. The land swap area will be graded and prepared to support future hangar development, when needed. There are no known future projects that are no included in this EA, that will occur within the next five years. The projects will have short-term construction impacts, and may attract a slight increase in operations, both within the threshold standards, thus not negatively impacting the environment.



4.13 Environmental Summary

Table 4-5 provides a summary of each environmental category as it pertains to the alternatives.

Table 4-12: Environmental Summary

ENVIRONMENTAL RESOURCES	Alternative 1: No Build	Alternative 2: RWY 1 Ext	Alternative 5: Shifted Runway
Net Change in Impervious Area	None	9.5 +/- Acres	10.2 +/-
Wetland Impacts (Total)	None	5.13 +/- Acres	4.22 +/- Acres
Impact to Regulated Wetlands	None	4.5 +/- Acres	3.7 +/- Acres
Impact to Non-Jurisdictional Wetlands	None	0.63 +/- Acres	0.63 +/- Acres
Air Quality	None	Minimal	Minimal
Biological Resources	None	Minimal *	Minimal *
Climate	None	Minimal	Minimal
Coastal Resources	None	None	None
DOT Section 4(f) Resources	None	Minor	Minor
Farmlands	None	Minimal *	Minimal *
Hazardous Materials	None	None	None
Historic, Archeological and Cultural Resources	None	Minimal	Minimal
Land Use	None	Minimal	Minimal
Natural Resources & Energy Supply	None	Minimal	Minimal
Noise & Noise-Compatible Land Use	None	Minimal	Minimal
Socioeconomic Impacts	None	None	None
Visual Impacts	None	Minimal	Minimal
Water Resources	None	Minimal *	Minimal *
Cost Estimate	\$0	\$8.5 million	\$9.1 million

* Additional permitting required



**Table 4-6: Environmental Summary
(Continued)**

Description	Alternative 1: No Build	Alternative 2: RWY 1 EXT	Alternative 5: Shifted Runway
PERMITTING*			
Town of Highgate Site Plan Review	No	Yes	Yes
Act 250	No	Yes	Yes
VT Storm water Discharge Permit Design: Operational	No	Yes	Yes
VT Storm water Discharge Permit Construction	No	Yes	Yes
Sect. 401 Water Quality Certification	No	Yes	Yes
Sect. 404 Wetland Permit from ACOE	No	Individual	Individual
Wetland Permit from VTDEC (ANR)	No	Yes	Yes
Wetland Mitigation Required	No	Yes	Yes

* Permits required from respective agencies

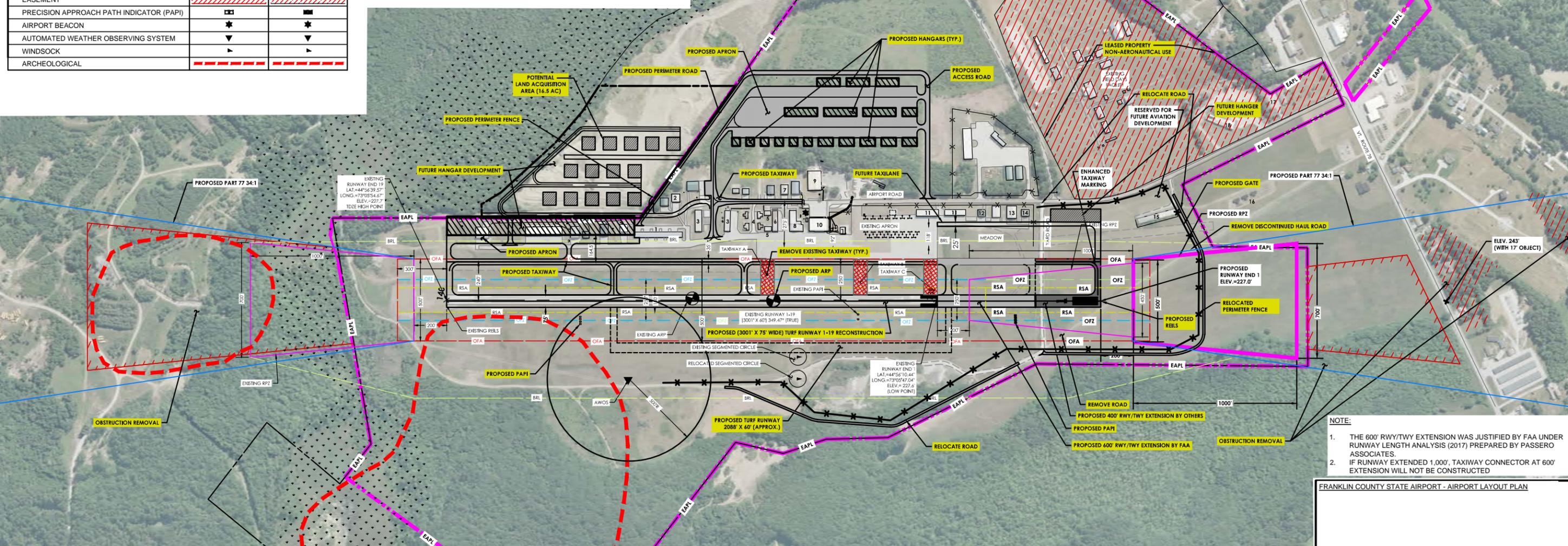
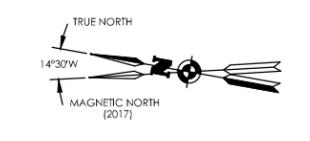


Appendix A:

Airport Layout Plan

LEGEND		
DESCRIPTION	EXISTING	PROPOSED
RUNWAY SAFETY AREA (RSA)	--- RSA ---	--- RSA ---
RUNWAY OBJECT FREE AREA (ROFA)	--- OFA ---	--- OFA ---
RUNWAY OBJECT FREE ZONE (ROFZ)	--- OFZ ---	--- OFZ ---
RUNWAY PROTECTION ZONE (RPZ)	--- RPZ ---	--- RPZ ---
BUILDING RESTRICTION LINE	--- BRL ---	--- BRL ---
AIRPORT PAVEMENT	[Symbol]	[Symbol]
AIRPORT REFERENCE POINT	[Symbol]	[Symbol]
BUILDINGS	[Symbol]	[Symbol]
AIRPORT PROPERTY LINE / EASEMENTS	--- EAPL ---	--- EAPL ---
FENCE (8' HIGH WITH 3 ROW BARB)	--- X ---	--- X ---
ROAD	--- ROAD ---	--- ROAD ---
WETLANDS	[Symbol]	[Symbol]
GROUND ELEVATION CONTOURS	--- 950 ---	--- 950 ---
EASEMENT	[Symbol]	[Symbol]
PRECISION APPROACH PATH INDICATOR (PAPI)	[Symbol]	[Symbol]
AIRPORT BEACON	[Symbol]	[Symbol]
AUTOMATED WEATHER OBSERVING SYSTEM	[Symbol]	[Symbol]
WINDSOCK	[Symbol]	[Symbol]
ARCHEOLOGICAL	[Symbol]	[Symbol]

AIRPORT DATA		
ITEM	EXISTING	FUTURE
ARC	B-II	B-II
Mean Maximum Temperature of Hottest Month	70 F	70 F
Airport Elevation	228'	228'
Airport NAVAIDS (F=FAA, S=Sponsor)	REIL, PAPI, BEACON, SEG CIRCLE	REIL, PAPI, BEACON, SEG CIRCLE
Airport Reference Point (NAD 83)	44 56' 25.00"N 73 05' 50.90"W	44 56' 20.13"N 73 05' 49.63"W
TAXIWAY LIGHTING	LOW INTENSITY	MEDIUM INTENSITY
TAXIWAY MARKINGS	CENTERLINE, HOLDLINES	CENTERLINE, HOLDLINES
Critical Design Aircraft	KING AIR	KING AIR
Airport Magnetic Variation/Date/Source	14 30' W (2017)/NGDC	14 30' W (2017)/NGDC
NPIAS LEVEL	LOCAL/BASIC	LOCAL/BASIC
STATE LEVEL	GENERAL AVIATION	GENERAL AVIATION
ACREAGE OWNED IN EASEMENT	40.3	40.3



RUNWAY DATA				
ITEM	RWY 1		RWY 19	
	EXISTING	FUTURE	EXISTING	FUTURE
Runway length - width	3001' x 60'	4001' x 75'	3001' x 60'	4001' x 75'
Strength (pounds)	SW 12,500	SW 12,500	SW 12,500	SW 12,500
Composition	ASPHALT	ASPHALT	ASPHALT	ASPHALT
Markings	NON-PRECISION	NON-PRECISION	NON-PRECISION	NON-PRECISION
Instrument Procedures	RNAV/GPS	RNAV/GPS	RNAV/GPS/VOR/DME	RNAV/GPS/VOR/DME
Instrument Minimums	1 Mile	1 Mile	1 Mile	1 Mile
Lighting Runway	Medium Intensity	Medium Intensity	Medium Intensity	Medium Intensity
NAVAIDS	NONE	NONE	NONE	NONE
Visual Aids	PAPI, REIL	PAPI, REIL	REIL	PAPI, REIL
Effective Gradient	0.00%	0.00%	0.00%	0.00%
End Elevations	227.6	227.0	227.7	227.7
Runway End Coordinates (NAD83 / NAVD88)				
Latitude	44 56' 10.44"	44 56' 00.68"	44 56' 39.57"	44 56' 39.57"
Longitude	73 05' 47.04"	73 05' 44.58"	73 05' 54.67"	73 05' 54.67"
Safety Area (RSA)	150' x 300'	150' x 300'	150' x 300'	150' x 300'
Object Free Area (OFA)	500' x 300'	500' x 300'	500' x 300'	500' x 300'
Obstacle Free Zone (OFZ)	250' x 200'	250' x 200'	250' x 200'	250' x 200'
Design Aircraft	King air	King air	King air	King air
Reference code	B-II	B-II	B-II	B-II
Approach Surfaces	NP Utility 20:1	NP 34:1	NP Utility 20:1	NP 34:1

BUILDINGS	EXISTING
T-HANGAR (10 UNIT)	1
CONVENTIONAL HANGAR	2
T-HANGARS (3-UNIT)	3
T-HANGARS (1-UNIT)	4
CONVENTIONAL HANGAR	5
T-HANGAR (3-UNIT)	6
CONVENTIONAL HANGAR	7
PRESTIGE PAINT	8
STORAGE BUILDING	9
FBO-BORDER AIR HANGAR	10
T-HANGAR (3-UNIT)	11
CONVENTIONAL HANGARS (PVT)	12-14
ULTRALIGHT HANGARS (PVT)	15
ULTRALIGHT HANGARS (PVT-OFF AIRPORT)	16
U.S. BORDER PATROL	17
PRIVATE BUSINESS (LEASE)	18
PRIVATE AND/OR PUBLIC	AS SHOWN

REVISIONS		
NO.	DATE	DESCRIPTION

SOURCES:
 PREPARED FROM STANTEC ALP DATED SEPTEMBER 2006.
 RUNWAY/TAXIWAY EXTENSION FROM PA RUNWAY LENGTH ANALYSIS, 2017.
 APRON/TAXIWAY PERIMETER ROAD FROM PA, UPDATE TO STANTEC ALP.
 OBSTRUCTION REMOVAL FROM PA OBSTRUCTIONS STUDY, 2017.

NOTE:
 1. THE 600' RWY/TWY EXTENSION WAS JUSTIFIED BY FAA UNDER RUNWAY LENGTH ANALYSIS (2017) PREPARED BY PASSERO ASSOCIATES.
 2. IF RUNWAY EXTENDED 1,000', TAXIWAY CONNECTOR AT 600' EXTENSION WILL NOT BE CONSTRUCTED

FRANKLIN COUNTY STATE AIRPORT - AIRPORT LAYOUT PLAN

DEPARTMENT OF TRANSPORTATION
 FEDERAL AVIATION ADMINISTRATION
 APPROVED _____ DATE _____
 DIRECTOR, RAIL & AVIATION BUREAU
 VERMONT AGENCY OF TRANSPORTATION
 APPROVED _____ DATE _____

VERMONT AGENCY OF TRANSPORTATION

PA
 PASSERO ASSOCIATES
 242 WEST MAIN STREET, SUITE 100
 ROCHESTER, NY 14614
 (585)325-1000 FAX: (585)-325-1691

PROJECT NAME: HIGHGATE
 PROJECT NUMBER: AV-FY 17-013
 FILE NAME: PROPOSED ALP
 PROJECT LEADER: LISA CHEUNG
 DESIGNED BY: LISA CHEUNG
 SHEET TITLE: ALP (ULTIMATE)
 PLOT DATE: AUGUST 2018
 DRAWN BY: WAYNE ZIAN
 CHECKED BY: L.M.C.
 SHEET 1 OF 1



Appendix B:

Environmental Documentation



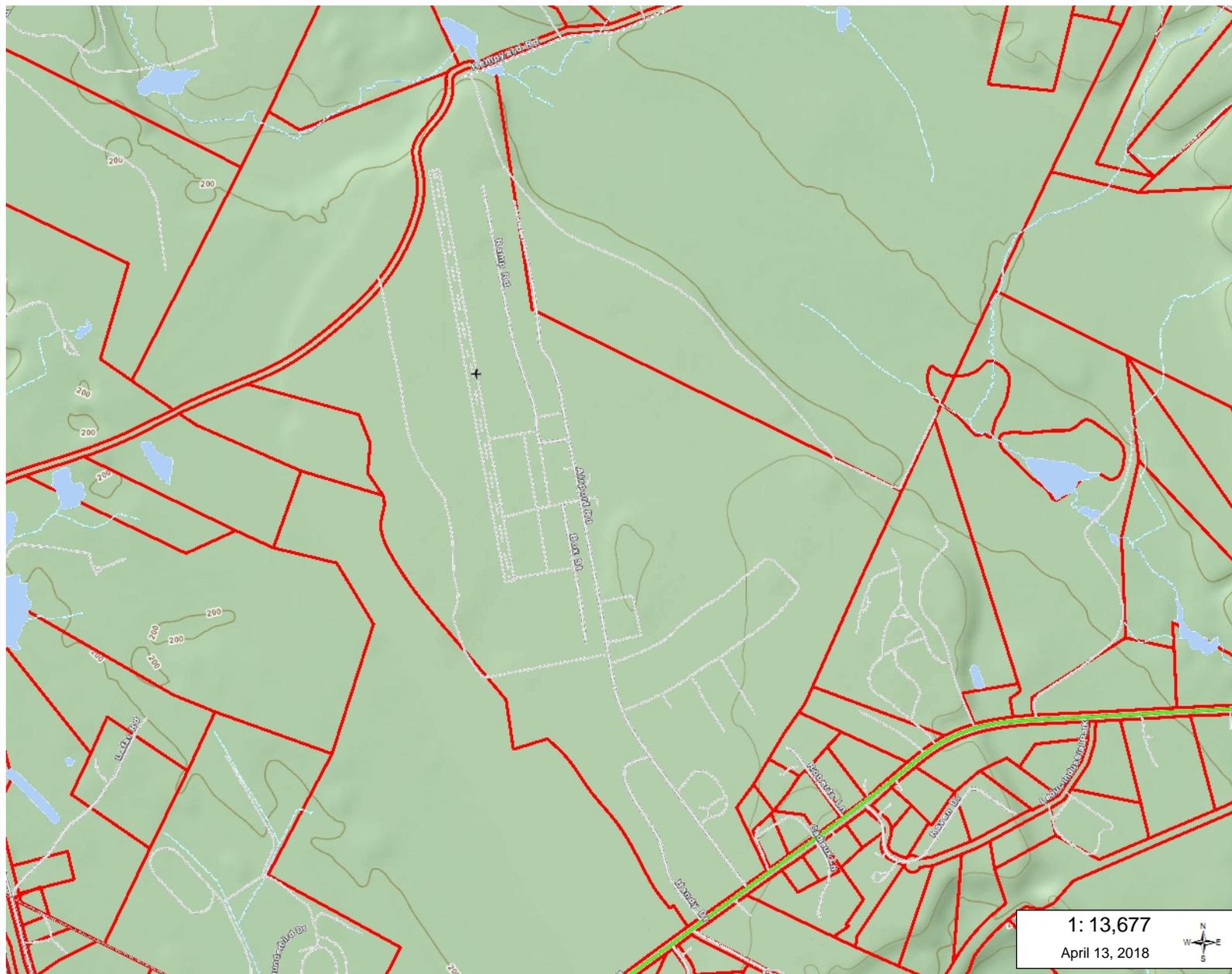
Vermont Center for Geographic Information
Mapping of Franklin County State Airport



ANR Public Lands

Vermont Center for Geographic Information

vermont.gov



LEGEND

- Airports
- Rail Lines
- Town Boundaries
- County Boundaries
- Buildings
- Village Boundaries
- ANR Public lands**
 - Environmental Conservation
 - Fish and Wildlife
 - Forests, Parks, and Recreation
- Parcels (unofficial data)
- VT State Boundary



NOTES

1: 13,677

April 13, 2018



0.43 0 0.22 0.43 Miles

WGS_1984_Web_Mercator_Auxiliary_Sphere
© Vermont Center For Geographic Information

THIS MAP IS NOT TO BE USED FOR NAVIGATION

DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. VCGI and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.

Resource

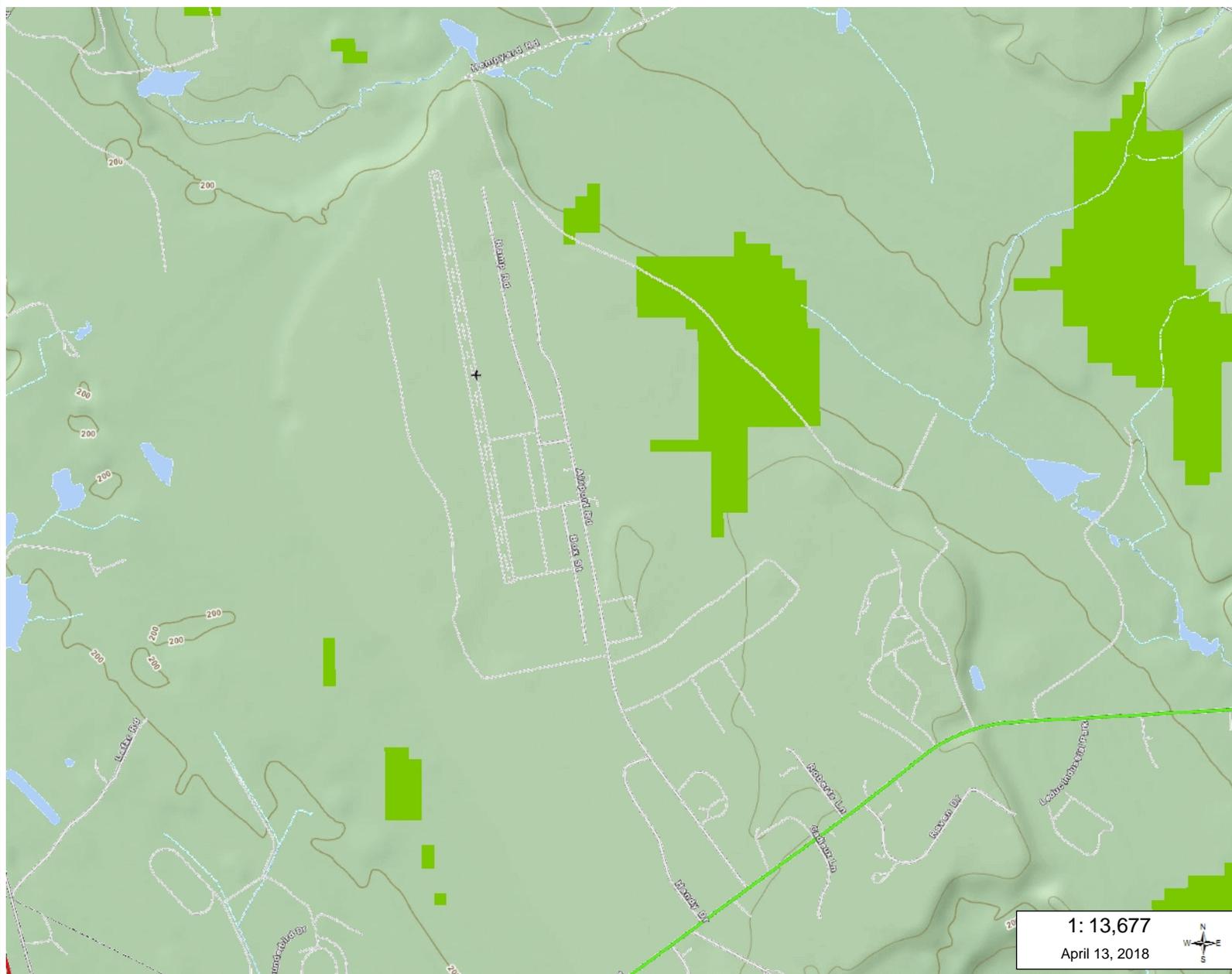
County	Town	File Type	Project Name	Project Number	Document Type
Franklin	Highgate	National Register	Highgate Springs Border Station		Nomination Form
Franklin	Highgate	National Register	Douglas and Jarvis Patent Parabolic Truss Iron Bridge		Nomination Form
Franklin	Highgate	National Register	St. John's Episcopal Church		Nomination Form



Core Habitats

Vermont Center for Geographic Information

vermont.gov



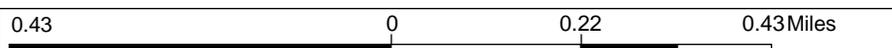
LEGEND

- Airports
- Rail Lines
- Town Boundaries
- County Boundaries
- Buildings
- Village Boundaries
- Core Habitats
- VT State Boundary



NOTES

1: 13,677
 April 13, 2018

WGS_1984_Web_Mercator_Auxiliary_Sphere
 © Vermont Center For Geographic Information

THIS MAP IS NOT TO BE USED FOR NAVIGATION

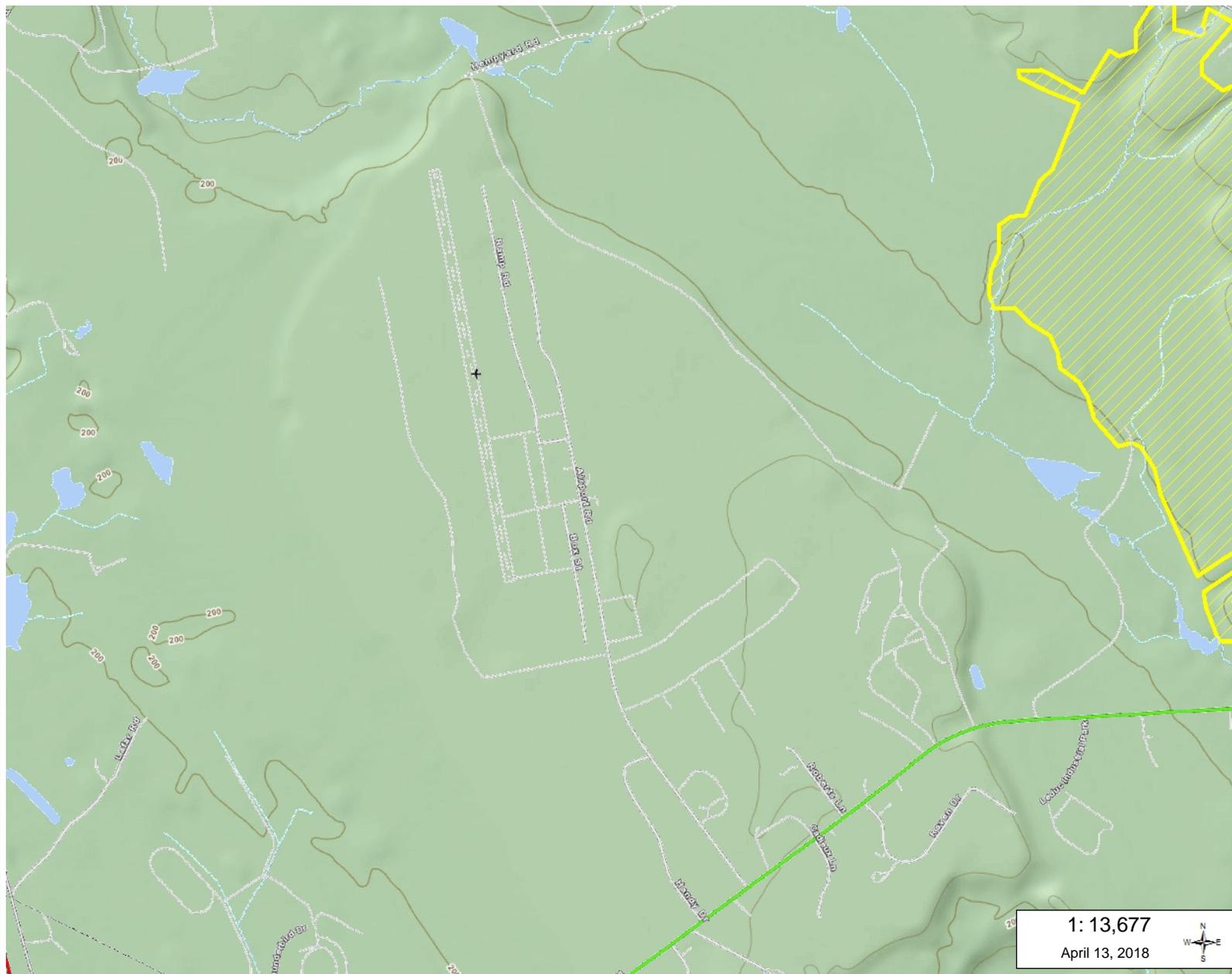
DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. VCGI and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.



Deer Wintering

Vermont Center for Geographic Information

vermont.gov



LEGEND

- Airports
- Rail Lines
- Town Boundaries
- County Boundaries
- Buildings
- Village Boundaries
- Deer wintering yards
- VT State Boundary

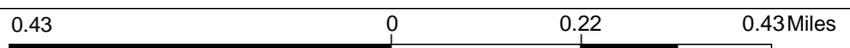


1: 13,677

April 13, 2018



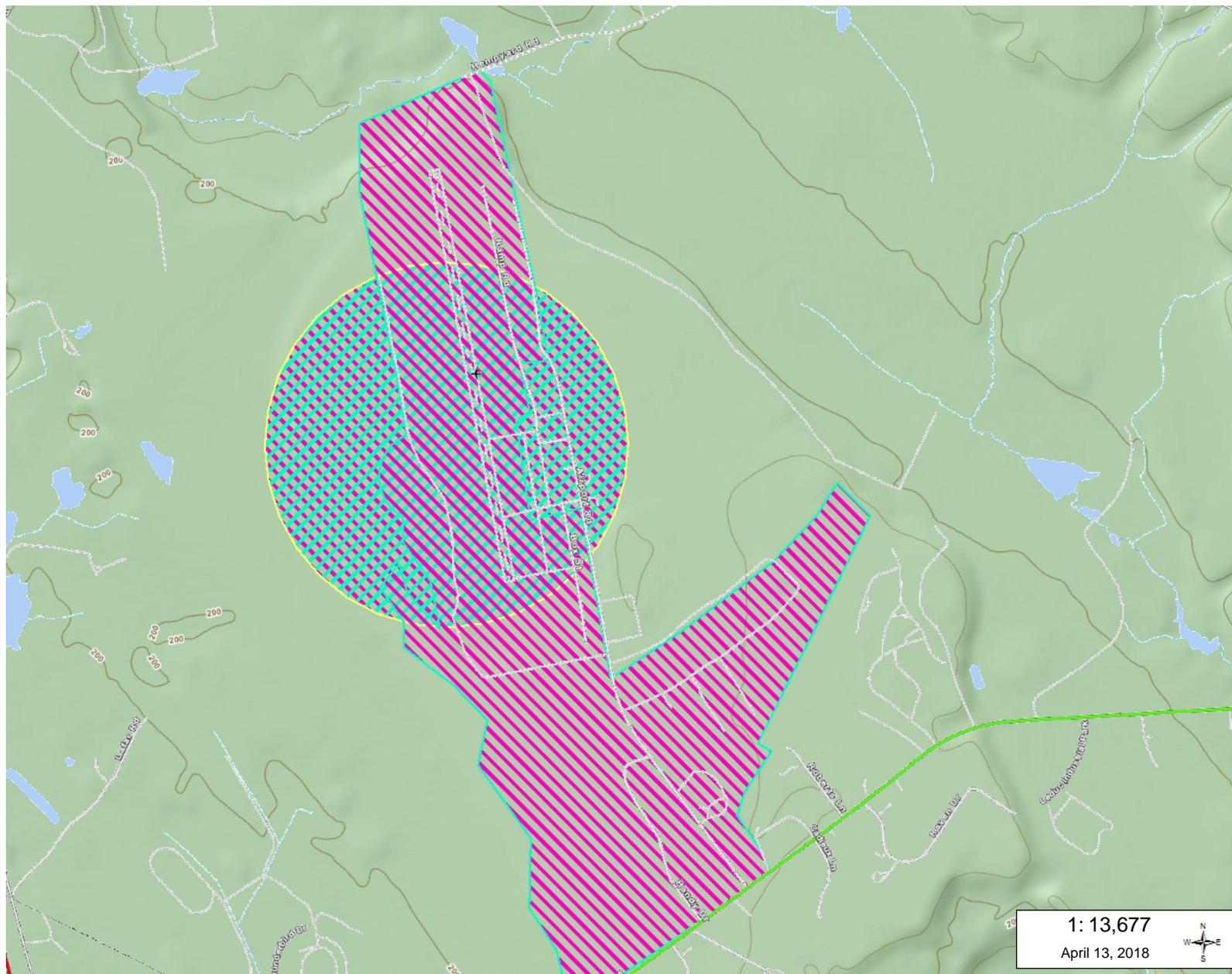
NOTES



WGS_1984_Web_Mercator_Auxiliary_Sphere
© Vermont Center For Geographic Information

THIS MAP IS NOT TO BE USED FOR NAVIGATION

DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. VCGI and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.



LEGEND

- Airports
- Rail Lines
- Town Boundaries
- County Boundaries
- Buildings
- Village Boundaries
- Endangered species**
 - Endangered
 - Threatened
- VT State Boundary



1: 13,677

April 13, 2018



NOTES



WGS_1984_Web_Mercator_Auxiliary_Sphere
© Vermont Center For Geographic Information

THIS MAP IS NOT TO BE USED FOR NAVIGATION

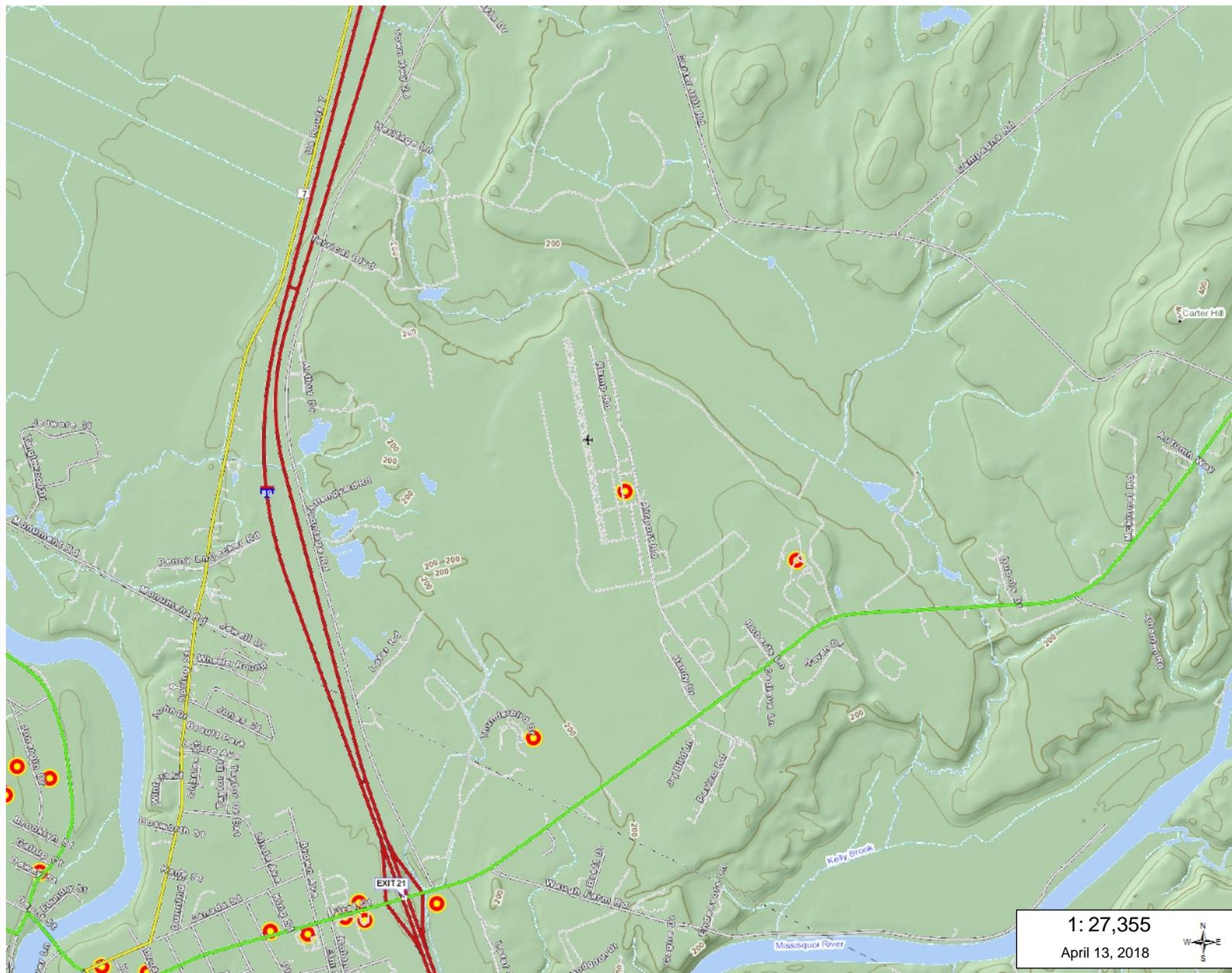
DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. VCGI and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.



Hazardous Waste Site

Vermont Center for Geographic Information

vermont.gov



LEGEND

- Airports
- Rail Lines
- Town Boundaries
- County Boundaries
- Village Boundaries
- Hazardous Waste Sites
- VT State Boundary



1: 27,355

April 13, 2018

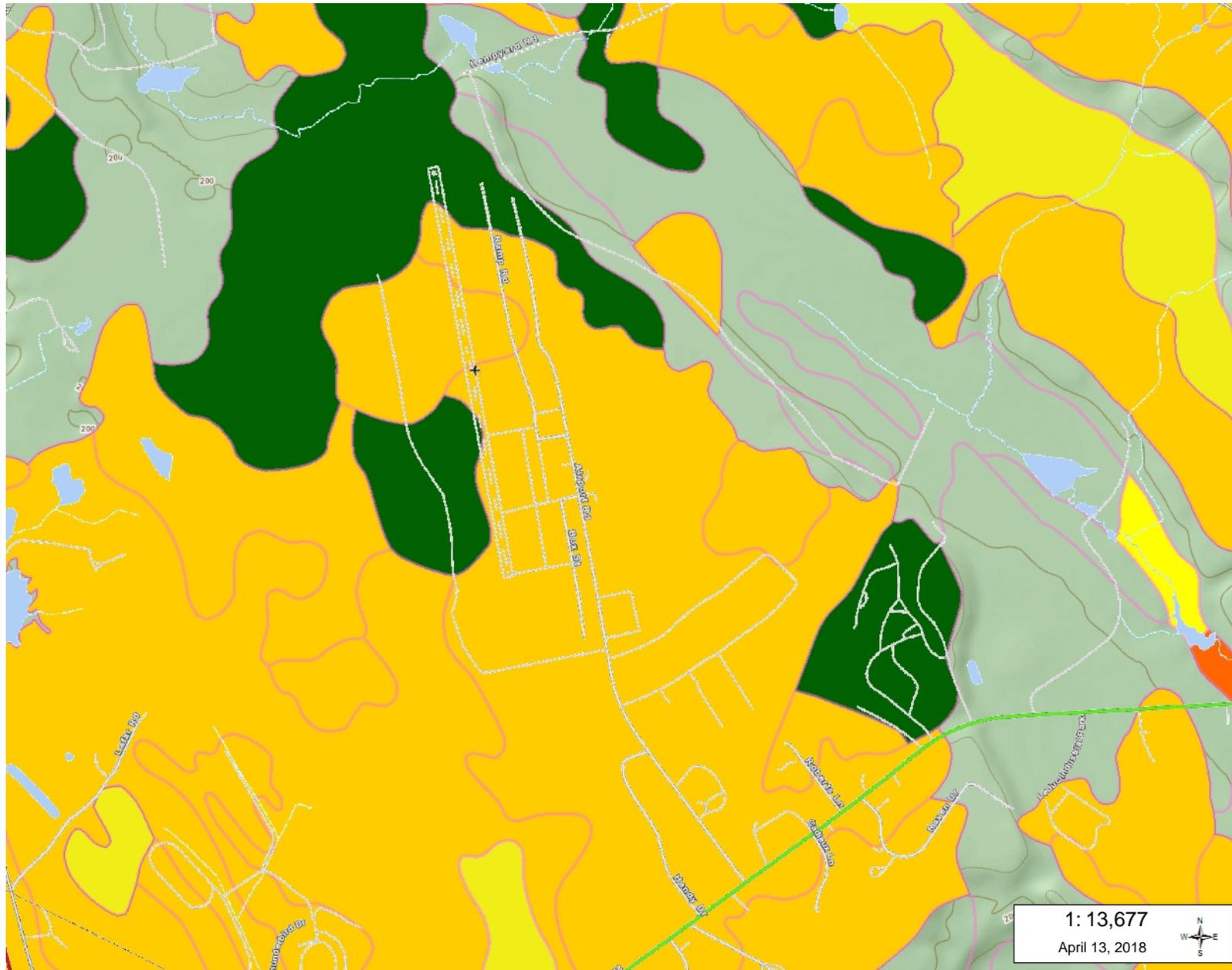


WGS_1984_Web_Mercator_Auxiliary_Sphere
© Vermont Center For Geographic Information

THIS MAP IS NOT TO BE USED FOR NAVIGATION

DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. VCGI and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.

NOTES



LEGEND

- Airports
- Rail Lines
- Town Boundaries
- County Boundaries
- Buildings
- Village Boundaries
- Soil units
- Soils - Prime Agriculture**
 - Local
 - Local (b)
 - Prime
 - Prime (b)
 - Prime (f)
 - Statewide
 - Statewide (a)
 - Statewide (b)
 - Statewide (c)
- VT State Boundary



NOTES

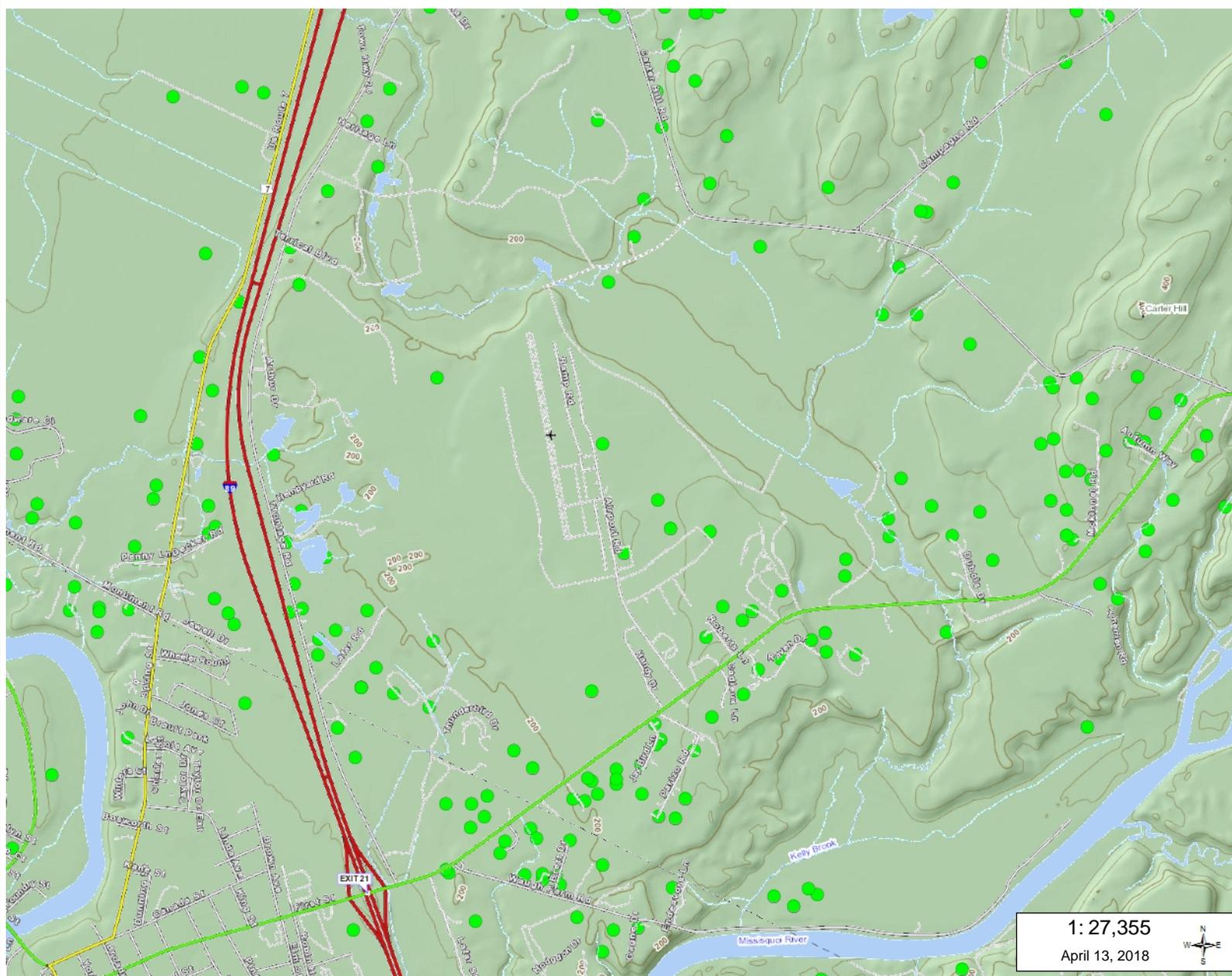


WGS_1984_Web_Mercator_Auxiliary_Sphere
© Vermont Center For Geographic Information

THIS MAP IS NOT TO BE USED FOR NAVIGATION

DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. VCGI and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.

1: 13,677
April 13, 2018



LEGEND

- Airports
- Rail Lines
- Town Boundaries
- County Boundaries
- Village Boundaries
- Private wells
- VT State Boundary



1: 27,355

April 13, 2018



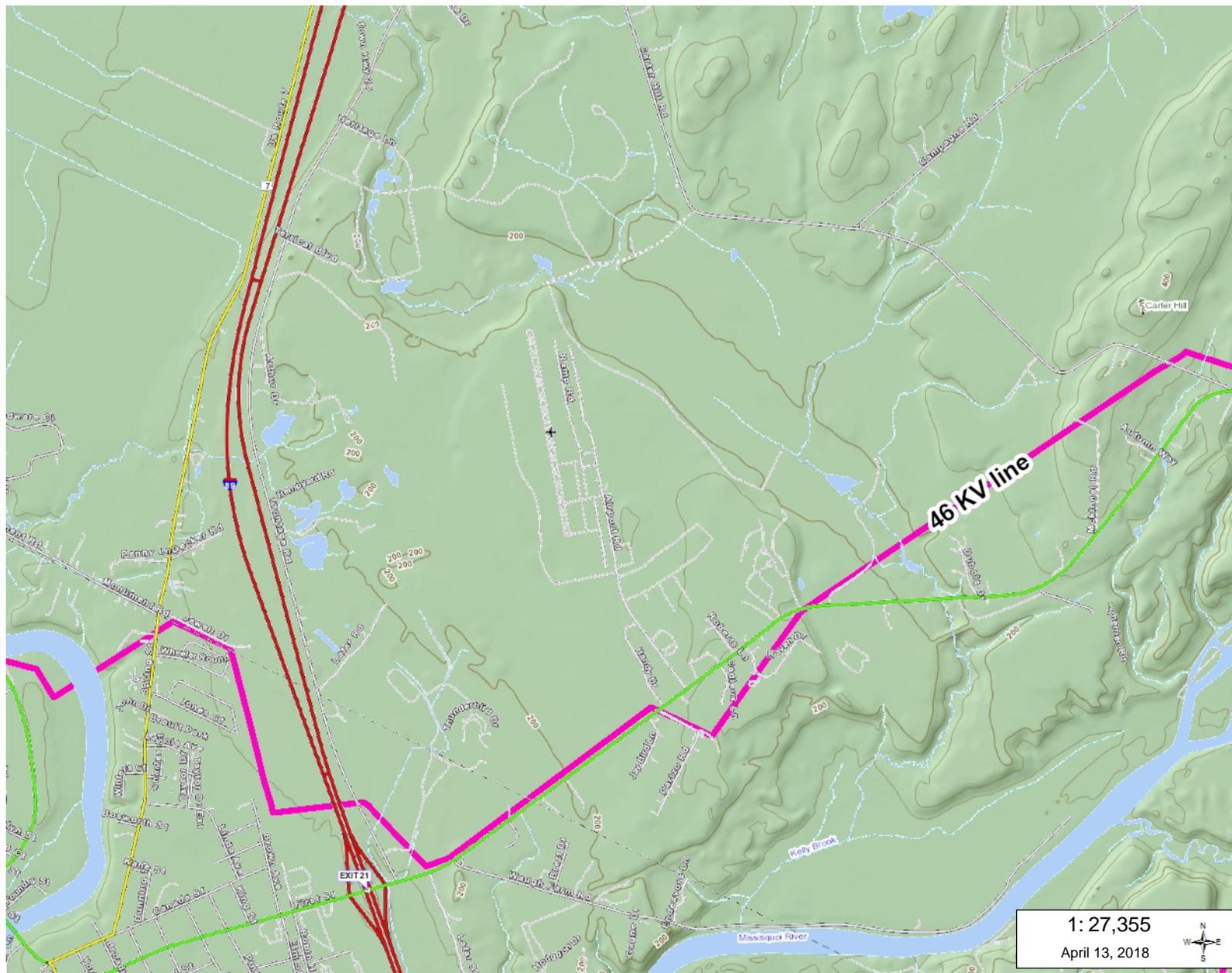
NOTES

0.86 0 0.43 0.86 Miles

WGS_1984_Web_Mercator_Auxiliary_Sphere
© Vermont Center For Geographic Information

THIS MAP IS NOT TO BE USED FOR NAVIGATION

DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. VCGI and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.



LEGEND

- Airports
- Rail Lines
- Town Boundaries
- County Boundaries
- Village Boundaries
- Electric Transmission Line - su (generalized)
- Electric Transmission Lines - c (generalized)
- VT State Boundary



1: 27,355

April 13, 2018



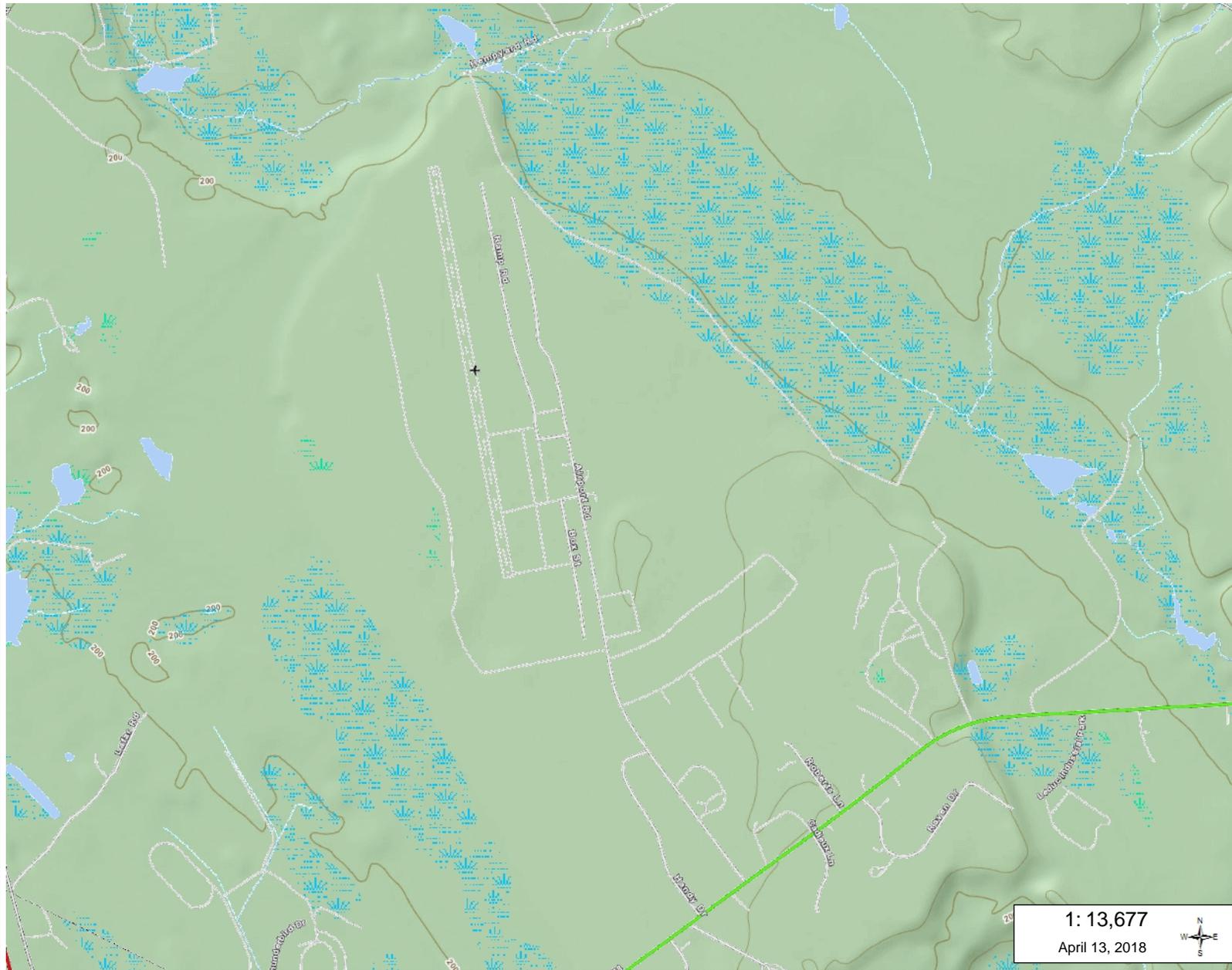
NOTES



WGS_1984_Web_Mercator_Auxiliary_Sphere
© Vermont Center For Geographic Information

THIS MAP IS NOT TO BE USED FOR NAVIGATION

DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. VCGI and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.



LEGEND

- Airports
- Rail Lines
- Town Boundaries
- County Boundaries
- Buildings
- Village Boundaries
- VT Significant Wetlands Invent
- National Wetlands Inventory
- VT State Boundary



NOTES

1: 13,677
April 13, 2018

0.43 0 0.22 0.43 Miles

WGS_1984_Web_Mercator_Auxiliary_Sphere
© Vermont Center For Geographic Information

THIS MAP IS NOT TO BE USED FOR NAVIGATION

DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. VCGI and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.



BIOLOGICAL RESOURCES



United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
<http://www.fws.gov/newengland>

In Reply Refer To:

July 23, 2018

Consultation Code: 05E1NE00-2018-SLI-2492

Event Code: 05E1NE00-2018-E-05798

Project Name: Franklin County State Airport EA

Subject: List of threatened and endangered species that may occur in your proposed project location, and/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.*).

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

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

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

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

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

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

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 Consultation Tracking Number 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
-

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:

New England Ecological Services Field Office

70 Commercial Street, Suite 300

Concord, NH 03301-5094

(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2018-SLI-2492

Event Code: 05E1NE00-2018-E-05798

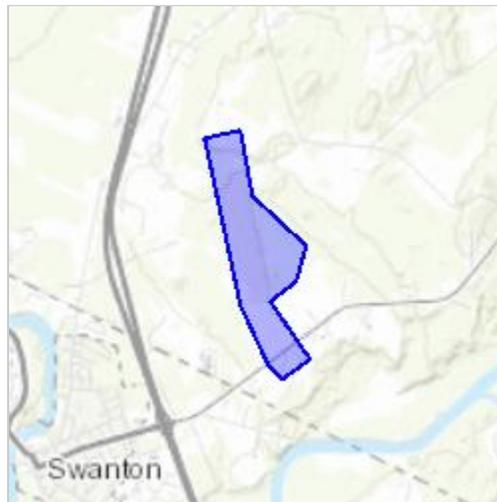
Project Name: Franklin County State Airport EA

Project Type: TRANSPORTATION

Project Description: EA for land swap, runway/taxiway extension, partial parallel taxiway construction, obstruction removal

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/44.93806683184981N73.09401747502027W>



Counties: Franklin, VT

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

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

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, 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
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

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



Fish & Wildlife Department
1 National Life Drive, Davis 2
Montpelier VT 05620
www.vtfishandwildlife.com

[phone] 802-828-1000
[fax] 802-828-1250
[tdd] 802-828-3345

Agency Of Natural Resources

March 10, 2018

Mr. Glenn Gingras
Vermont Agency of Transportation
Montpelier, VT

Re: Franklin County State Airport – Proposed Hanger Development.

Dear Glenn:

Based on the information provided by you and your consultant, Mr. Jim Fougere, there are no issues regarding significant wildlife habitat or rare species of wildlife, including grassland birds. This is based on a consideration of the project being located directly to the east of the existing airport facility in the young forest that was recently cleared, as confirmed by aerial photography. Unfortunately, this affects our ability to assess the value of the site for wildlife habitat since it was recently cleared and stumped for development prior to our review.

Mr. Fougere's submittals indicate an interest in clearing trees and vegetation at the north and south end of the runway. These are sensitive areas that support nesting habitat for grassland birds, including the state threatened grasshopper sparrow. They also support rare wetland natural communities at the north and northwest end of the runway including potential amphibian breeding pools, pine-oak-heath sandplain forest, northern white cedar swamp, and red maple-black ash seepage swamp. There are likely to be rare plants associated with these areas that would require careful survey to identify locations. The wetland identified as "wetland #2" to the south of the runway that was classified as class III wetland is part of the significant grassland bird nesting habitat that is necessary for their survival. These habitats should all be protected from development. Any future proposals for airport development or activities that may disturb these habitats should be considered and reviewed in close coordination and consultation with the Vermont Fish and Wildlife Department.

Respectfully,



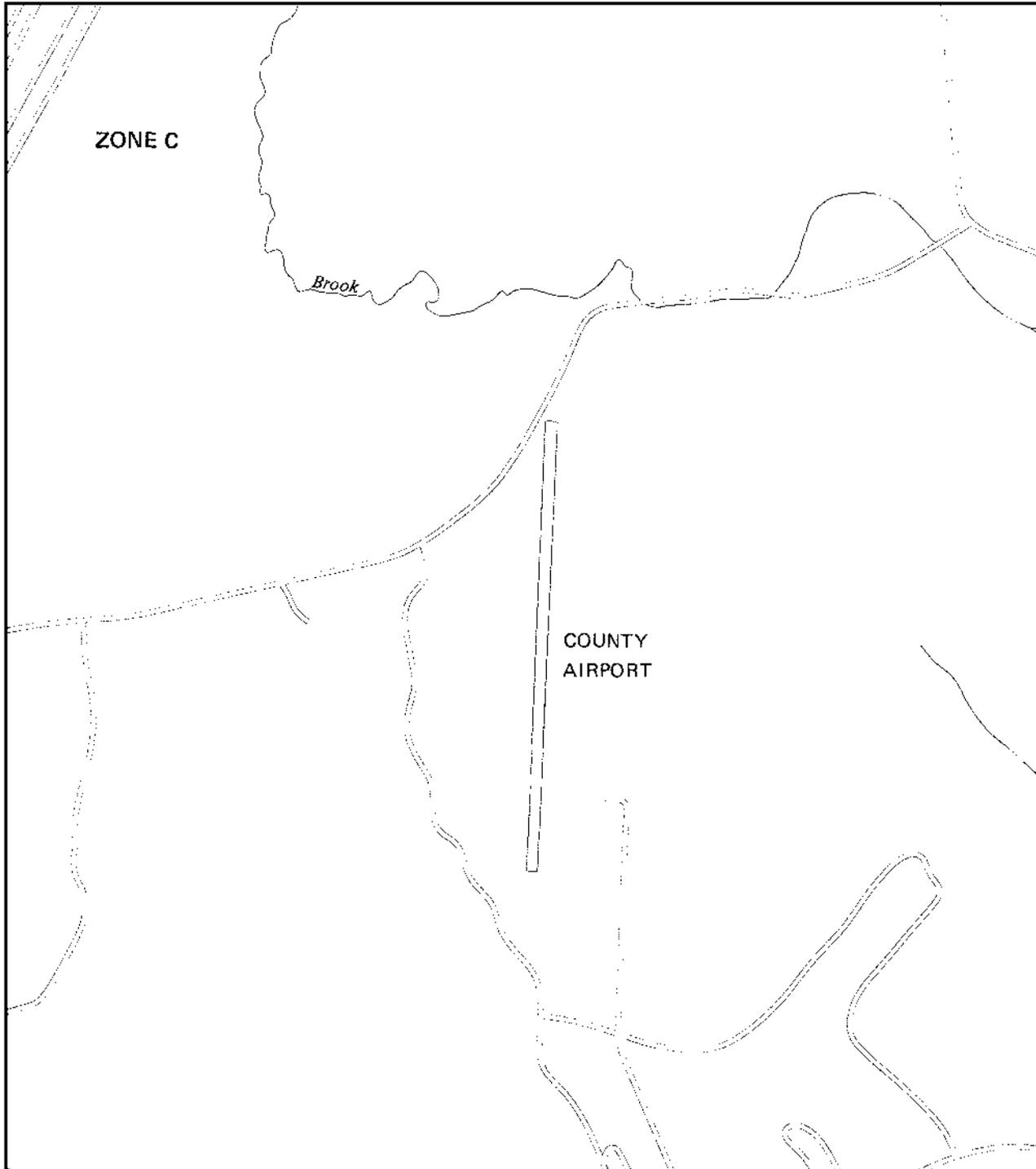
John M. Austin, Land & Habitat Program Manager
Vermont Fish & Wildlife Department

cc: John Buck, Migratory Bird Project Leader
Jen Mojo, Regulatory Policy Analyst
Noel Dodge, Wildlife Biologist





FEMA MAPPING



APPROXIMATE SCALE

1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

TOWN OF
HIGHGATE, VERMONT
FRANKLIN COUNTY

PANEL 15 OF 20
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
500055 0015 B

EFFECTIVE DATE:
APRIL 4, 1983



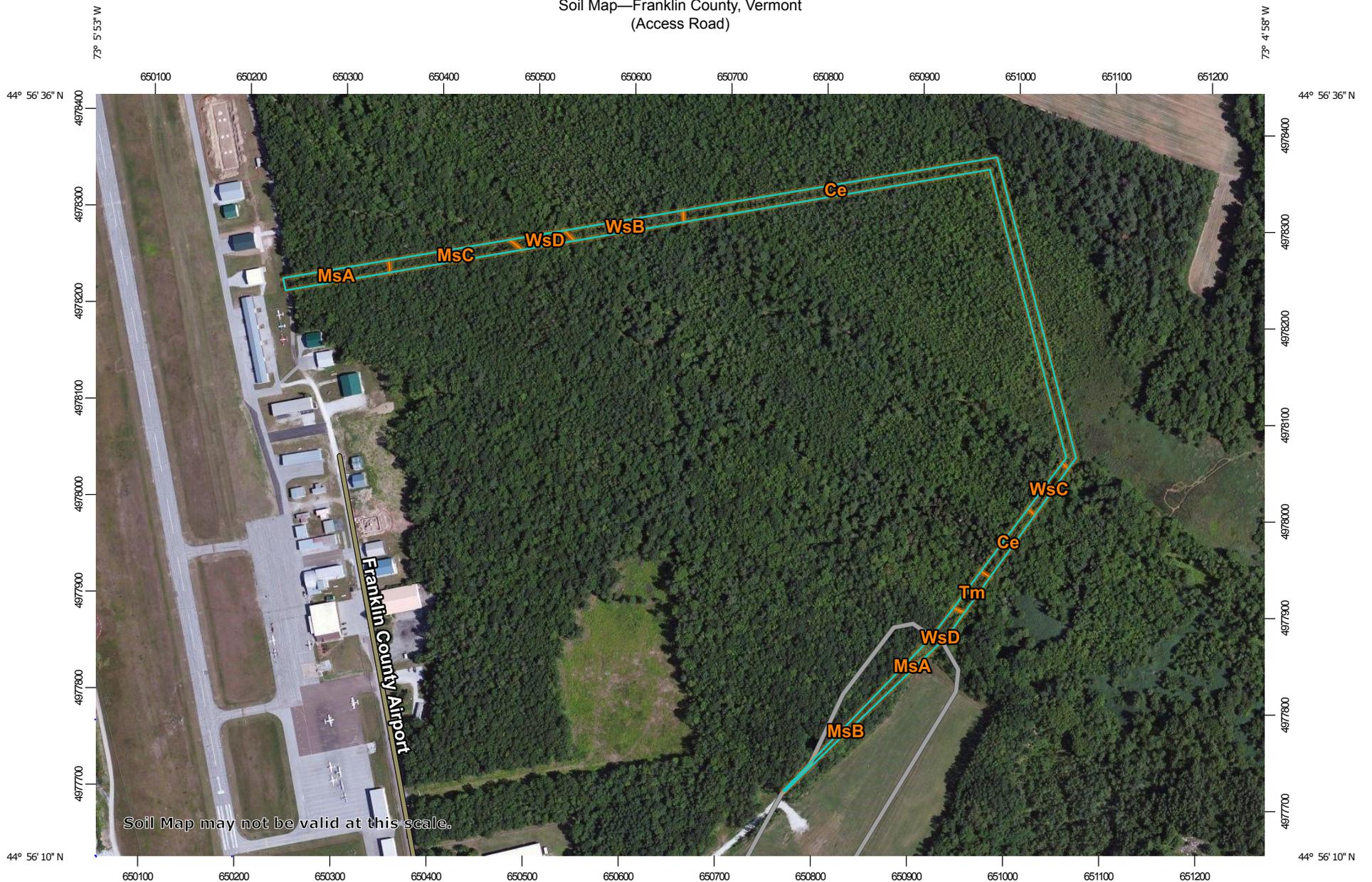
Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



SOILS MAPS FOR FARMLAND

Soil Map—Franklin County, Vermont
(Access Road)



Map Scale: 1:5,560 if printed on A landscape (11" x 8.5") sheet.

0 50 100 200 300 Meters

0 250 500 1000 1500 Feet

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



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Franklin County, Vermont

Survey Area Data: Version 21, Oct 11, 2017

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

Date(s) aerial images were photographed: Aug 28, 2010—Oct 8, 2011

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

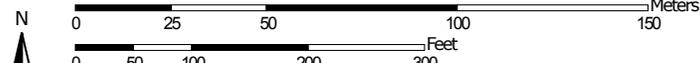
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ce	Carlisle muck	2.0	49.3%
MsA	Missisquoi loamy sand, 0 to 3 percent slopes	0.4	9.1%
MsB	Missisquoi loamy sand, 3 to 8 percent slopes	0.2	6.1%
MsC	Missisquoi loamy sand, 8 to 15 percent slopes	0.4	10.4%
Tm	Terric Medisaprists	0.1	3.4%
WsB	Windsor loamy fine sand, 3 to 8 percent slopes	0.4	9.0%
WsC	Windsor loamy fine sand, 8 to 15 percent slopes	0.1	3.3%
WsD	Windsor loamy fine sand, 15 to 25 percent slopes	0.4	9.4%
Totals for Area of Interest		4.0	100.0%

Soil Map—Franklin County, Vermont
(Main Apron/Fuel)



Map Scale: 1:1,970 if printed on A portrait (8.5" x 11") sheet.



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



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Franklin County, Vermont

Survey Area Data: Version 21, Oct 11, 2017

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

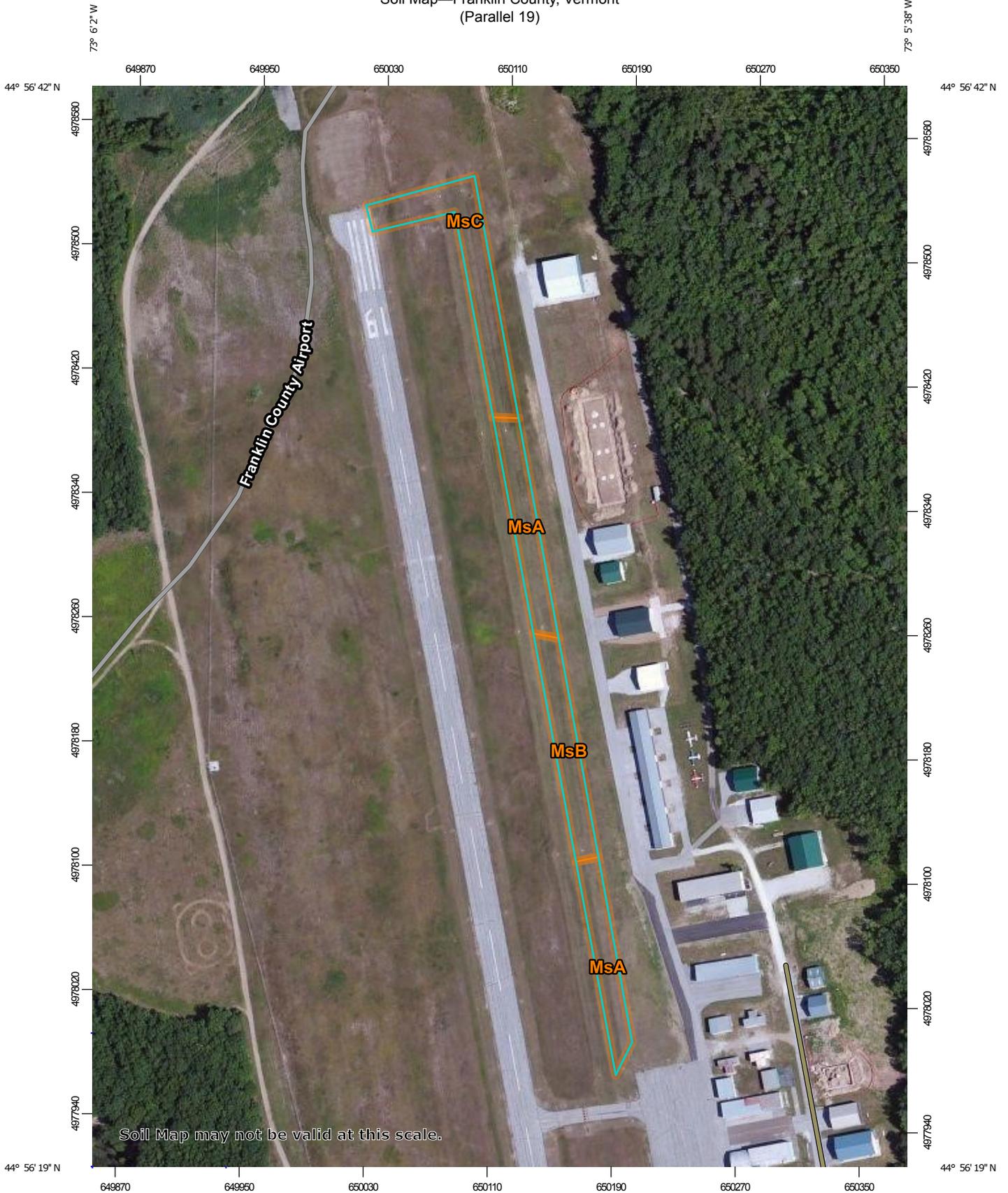
Date(s) aerial images were photographed: Jun 28, 2012—Mar 7, 2017

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

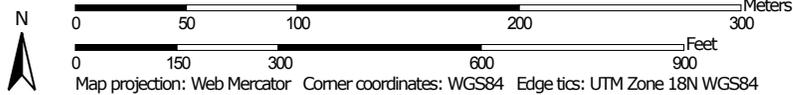
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MsA	Missisquoi loamy sand, 0 to 3 percent slopes	5.2	100.0%
Totals for Area of Interest		5.2	100.0%

Soil Map—Franklin County, Vermont
(Parallel 19)



Map Scale: 1:3,390 if printed on A portrait (8.5" x 11") sheet.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Franklin County, Vermont

Survey Area Data: Version 21, Oct 11, 2017

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

Date(s) aerial images were photographed: Jun 28, 2012—Mar 7, 2017

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

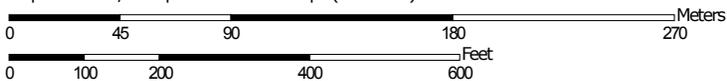
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MsA	Missisquoi loamy sand, 0 to 3 percent slopes	1.0	41.8%
MsB	Missisquoi loamy sand, 3 to 8 percent slopes	0.5	22.3%
MsC	Missisquoi loamy sand, 8 to 15 percent slopes	0.9	35.9%
Totals for Area of Interest		2.5	100.0%

Soil Map—Franklin County, Vermont
(Proposed Hangar)



Map Scale: 1:3,050 if printed on A landscape (11" x 8.5") sheet.



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



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Franklin County, Vermont

Survey Area Data: Version 21, Oct 11, 2017

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

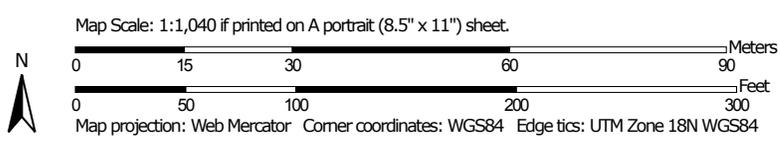
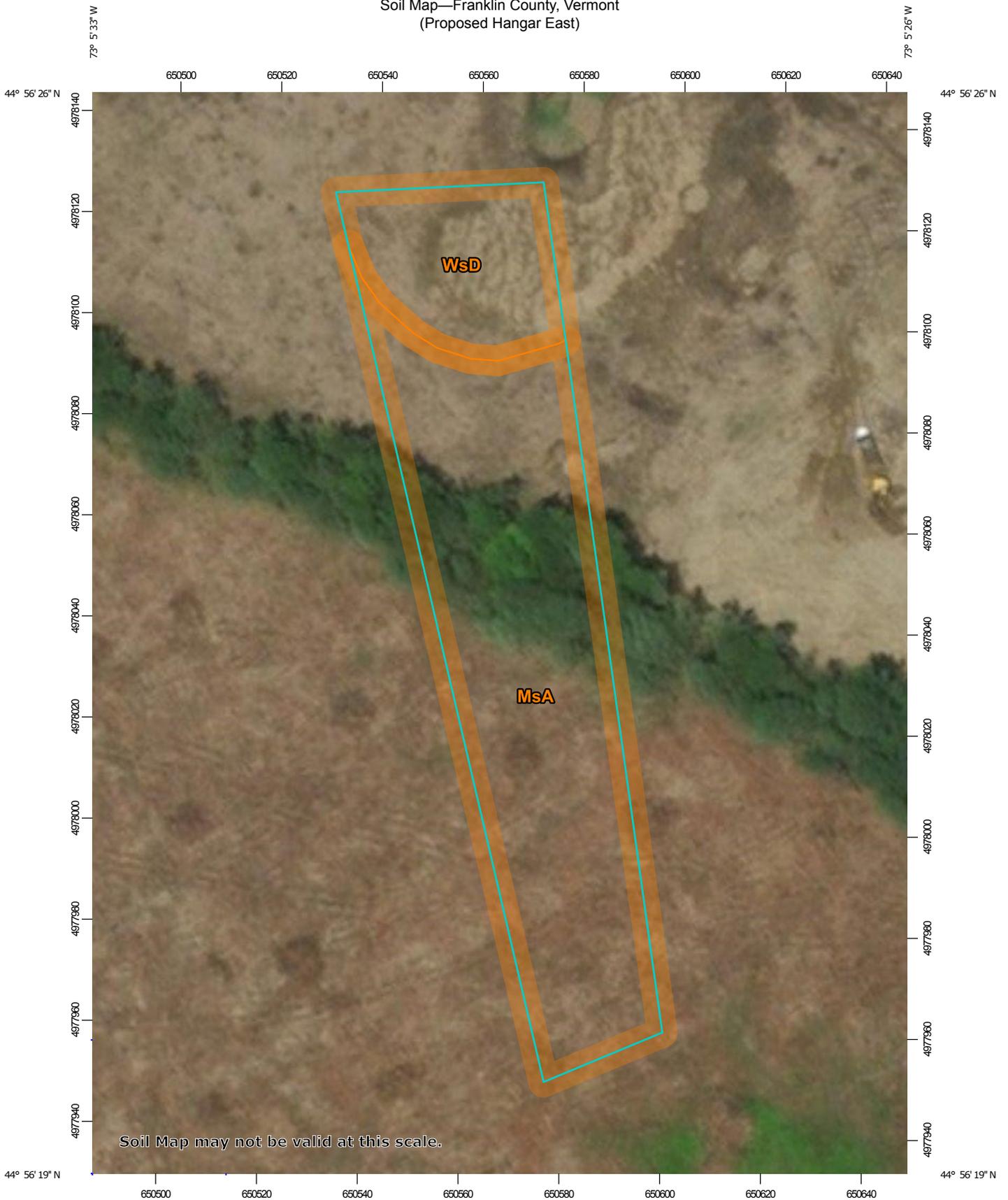
Date(s) aerial images were photographed: Jun 28, 2012—Mar 7, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MsA	Missisquoi loamy sand, 0 to 3 percent slopes	3.9	25.6%
MsC	Missisquoi loamy sand, 8 to 15 percent slopes	7.0	46.2%
WsB	Windsor loamy fine sand, 3 to 8 percent slopes	0.1	0.7%
WsD	Windsor loamy fine sand, 15 to 25 percent slopes	4.2	27.5%
Totals for Area of Interest		15.1	100.0%

Soil Map—Franklin County, Vermont
(Proposed Hangar East)



Soil Map—Franklin County, Vermont
(Proposed Hangar East)

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Franklin County, Vermont

Survey Area Data: Version 21, Oct 11, 2017

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

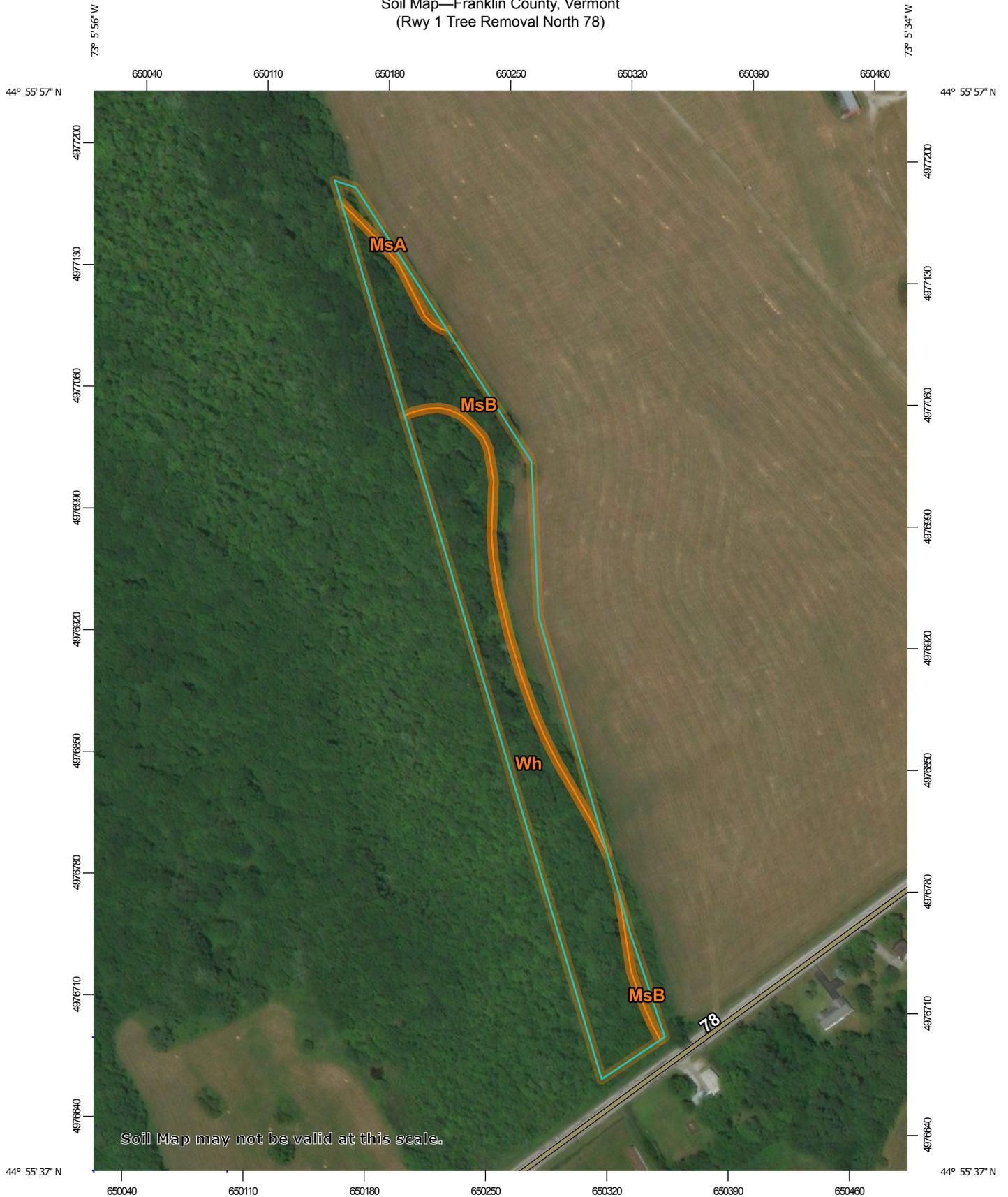
Date(s) aerial images were photographed: Jun 28, 2012—Mar 7, 2017

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

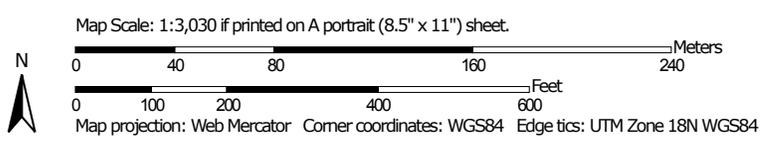
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MsA	Missisquoi loamy sand, 0 to 3 percent slopes	1.1	78.9%
WsD	Windsor loamy fine sand, 15 to 25 percent slopes	0.3	21.1%
Totals for Area of Interest		1.4	100.0%

Soil Map—Franklin County, Vermont
(Rwy 1 Tree Removal North 78)



Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

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

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

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

Soil Survey Area: Franklin County, Vermont
Survey Area Data: Version 21, Oct 11, 2017

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

Date(s) aerial images were photographed: Jun 28, 2012—Mar 7, 2017

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

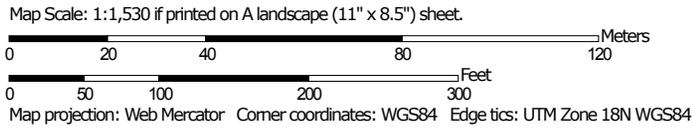
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MsA	Missisquoi loamy sand, 0 to 3 percent slopes	0.2	2.9%
MsB	Missisquoi loamy sand, 3 to 8 percent slopes	2.1	39.6%
Wh	Wareham loamy fine sand	3.1	57.5%
Totals for Area of Interest		5.4	100.0%

Soil Map—Franklin County, Vermont
(Rwy 1 Tree Removal South 78 Part 2)



Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Franklin County, Vermont

Survey Area Data: Version 21, Oct 11, 2017

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

Date(s) aerial images were photographed: Jun 28, 2012—Mar 7, 2017

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

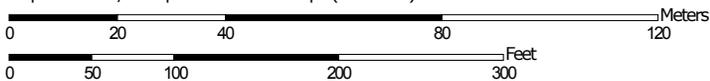
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MsA	Missisquoi loamy sand, 0 to 3 percent slopes	0.6	14.4%
MsC	Missisquoi loamy sand, 8 to 15 percent slopes	2.9	73.3%
Wh	Wareham loamy fine sand	0.5	12.3%
Totals for Area of Interest		3.9	100.0%

Soil Map—Franklin County, Vermont
(Rwy 1 Tree Removal South 78)



Map Scale: 1:1,390 if printed on A landscape (11" x 8.5") sheet.



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



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

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

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

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

Soil Survey Area: Franklin County, Vermont
Survey Area Data: Version 21, Oct 11, 2017

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

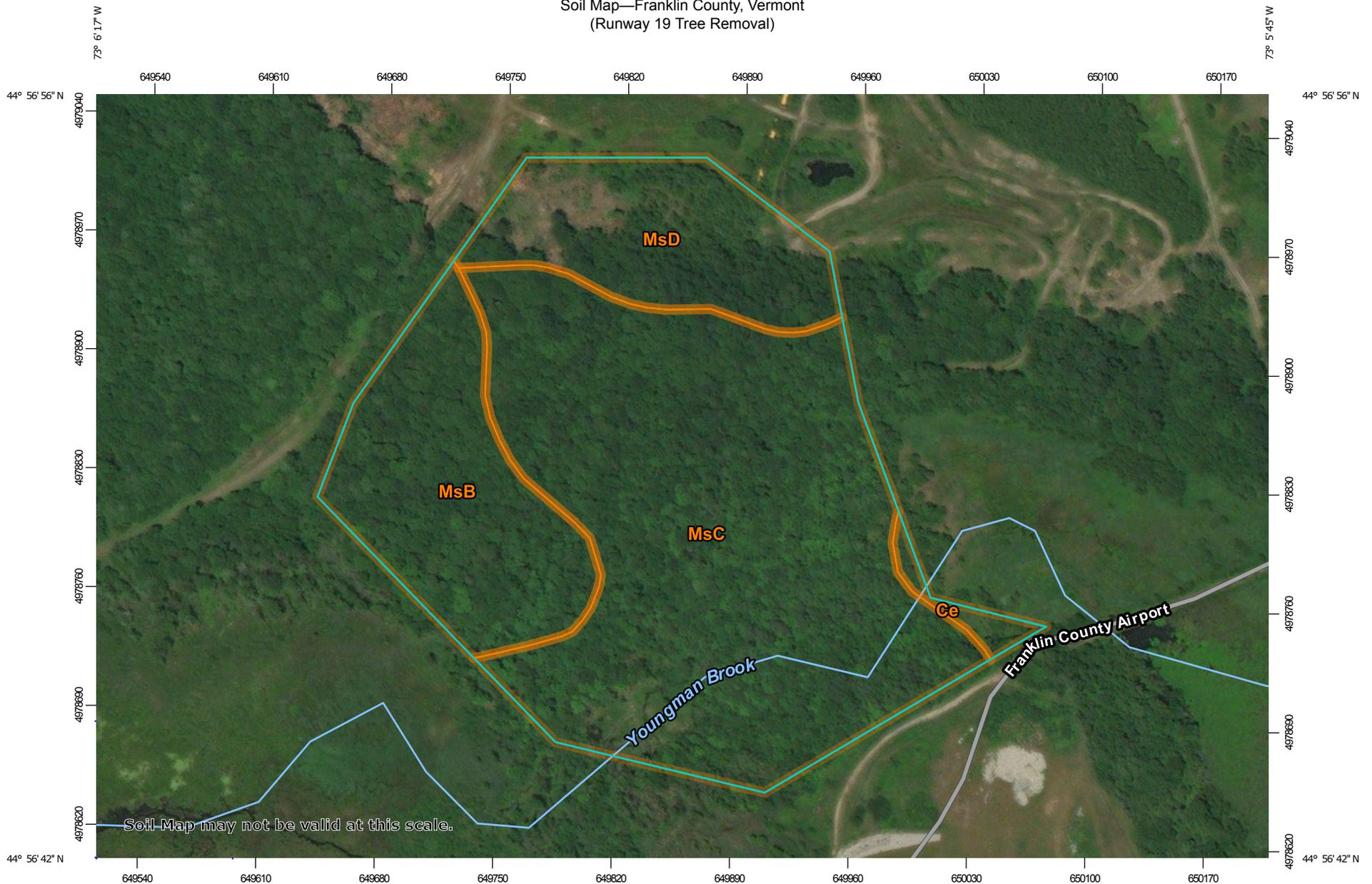
Date(s) aerial images were photographed: Jun 28, 2012—Mar 7, 2017

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

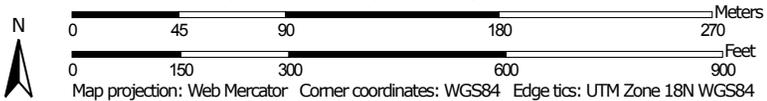
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MsA	Missisquoi loamy sand, 0 to 3 percent slopes	1.1	40.6%
MsB	Missisquoi loamy sand, 3 to 8 percent slopes	1.6	59.4%
Totals for Area of Interest		2.6	100.0%

Soil Map—Franklin County, Vermont
(Runway 19 Tree Removal)



Map Scale: 1:3,170 if printed on A landscape (11" x 8.5") sheet.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Franklin County, Vermont

Survey Area Data: Version 21, Oct 11, 2017

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

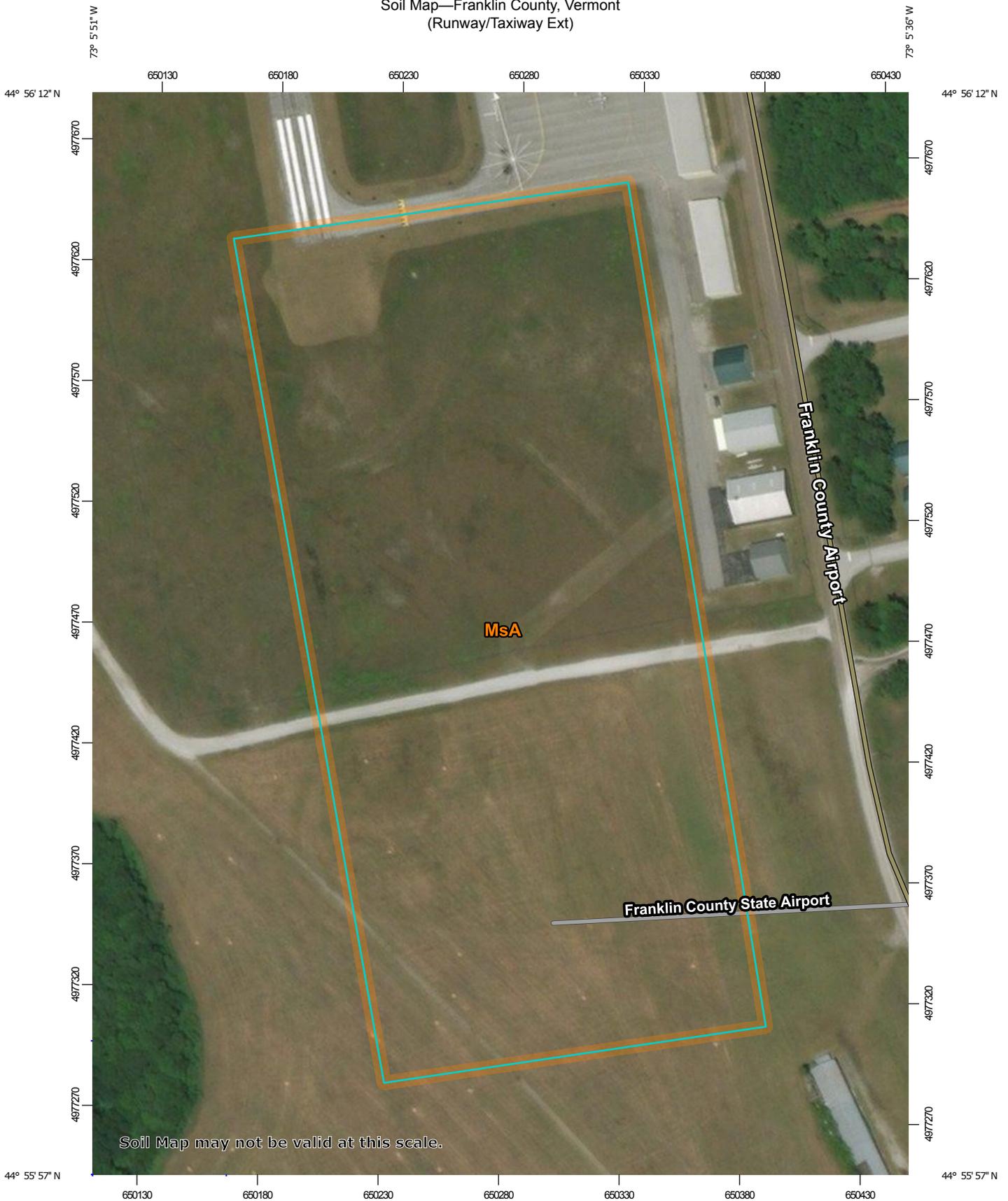
Date(s) aerial images were photographed: Jun 28, 2012—Mar 7, 2017

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

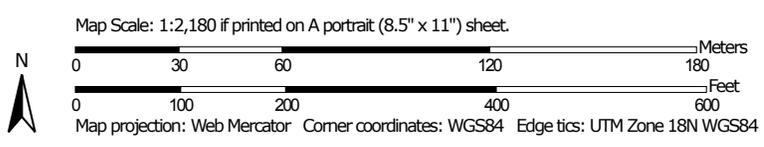
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ce	Carlisle muck	0.3	1.5%
MsB	Missisquoi loamy sand, 3 to 8 percent slopes	4.8	20.5%
MsC	Missisquoi loamy sand, 8 to 15 percent slopes	14.6	62.1%
MsD	Missisquoi loamy sand, 15 to 25 percent slopes	3.8	16.0%
Totals for Area of Interest		23.6	100.0%

Soil Map—Franklin County, Vermont
(Runway/Taxiway Ext)



Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Franklin County, Vermont

Survey Area Data: Version 21, Oct 11, 2017

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

Date(s) aerial images were photographed: Jun 28, 2012—Mar 7, 2017

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

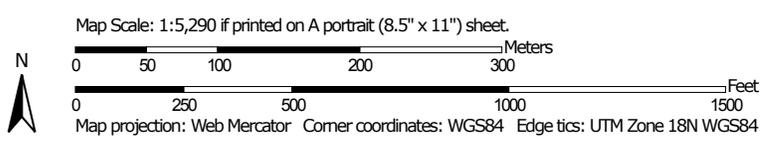
Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MsA	Missisquoi loamy sand, 0 to 3 percent slopes	14.3	100.0%
Totals for Area of Interest		14.3	100.0%

Soil Map—Franklin County, Vermont
(Rwy widening)



Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Franklin County, Vermont

Survey Area Data: Version 21, Oct 11, 2017

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

Date(s) aerial images were photographed: Aug 28, 2010—Oct 8, 2011

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

Map Unit Legend

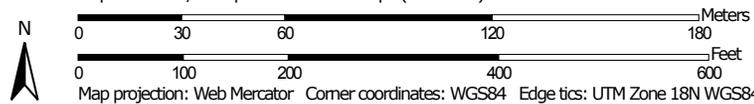
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MsA	Missisquoi loamy sand, 0 to 3 percent slopes	1.4	50.4%
MsB	Missisquoi loamy sand, 3 to 8 percent slopes	0.8	27.4%
MsC	Missisquoi loamy sand, 8 to 15 percent slopes	0.6	22.2%
Totals for Area of Interest		2.8	100.0%

Soil Map—Franklin County, Vermont
(Yard Road/Fence)



Soil Map may not be valid at this scale.

Map Scale: 1:2,180 if printed on A landscape (11" x 8.5") sheet.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Franklin County, Vermont

Survey Area Data: Version 21, Oct 11, 2017

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

Date(s) aerial images were photographed: Jun 28, 2012—Mar 7, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
MsA	Missisquoi loamy sand, 0 to 3 percent slopes	1.7	65.1%
MsB	Missisquoi loamy sand, 3 to 8 percent slopes	0.9	34.9%
Totals for Area of Interest		2.6	100.0%

MsA: Missisquoi loamy sand, 0 to 3 percent slopes

The Missisquoi component makes up 76 percent of the map unit. The natural drainage class is excessively drained. Water movement in the most restrictive layer is high. This component is on terraces on river valleys. The parent material consists of sandy glaciofluvial deposits. Depth to a root restrictive layer is greater than 60 inches.

Important farmland classification: Statewide	Land capability: 3 s	Vermont Agricultural Value Group: 6
--	----------------------	-------------------------------------

Vermont Residential Onsite Waste Disposal Group and Subgroup: Ia

This unit is well suited as a site for soil-based residential wastewater disposal systems, based on a review by the Natural Resources Conservation Service of criteria set forth in the Vermont 2007 Environmental Protection Rules. The rapid permeability in the substratum is a concern. Backfilling absorption trenches with at least one foot of finer textured material or other site modifications may be necessary to slow the percolation rate enough to allow for thorough filtering of effluent.

PHYSICAL and CHEMICAL PROPERTIES							EROSION FACTORS		
Soil name	Depth (In)	Typical texture	Clay (Pct)	Soil reaction (pH)	Permeability (In/Hr)	Organic matter (Pct)			
							Kw	Kf	T
Missisquoi	0-5	LS	2-5	5.1 - 6.5	6-20	2.0-5.0	.15	.15	5
	5-12	LS	2-5	5.1 - 6.5	6-20	0.5-2.0	.17	.17	
	12-35	GR-COS	0-5	5.1 - 6.5	6-20	0.0-0.5	.02	.02	
	35-60	GR-COS	0-5	6.1 - 7.8	6-20	0.0-0.5	.02	.02	

WATER FEATURES					SOIL FEATURES			
Soil name	Hydrologic group	Depth to seasonal high water table (Feet)	Flooding		Ponding		Hydric soil?	Depth to bedrock (range in inches)
			Frequency	Duration	Frequency	Duration		
Missisquoi	A	---	None		None		No	---

LAND USE LIMITATIONS				AGRICULTURAL YIELD DATA	
Soil name	Land use	Rating	Reason **	Crop name	Yield / acre
Missisquoi	Dwellings with basements:	Not limited		Grass-legume hay	2.5 Tons
Missisquoi	Pond reservoir areas:	Very limited	Seepage	Grass-clover	4 AUM
				Corn silage	12 Tons
				Alfalfa hay	3 Tons

WOODLAND MANAGEMENT				
Soil name	Management concern	Rating	Reason	Vermont natural communities
Missisquoi	Harvest equip operability:	Well suited		Hemlock-Northern Hardwood Forest, Hemlock-White Pine-Northern Hardwood Forest Variant
Missisquoi	Road suitability:	Well suited		
Missisquoi	Erosion hazard (off-road):	Slight		

MsB: Missisquoi loamy sand, 3 to 8 percent slopes

The Missisquoi component makes up 76 percent of the map unit. The natural drainage class is excessively drained. Water movement in the most restrictive layer is high. This component is on terraces on river valleys. The parent material consists of sandy glaciofluvial deposits. Depth to a root restrictive layer is greater than 60 inches.

Important farmland classification: Statewide	Land capability: 3 s	Vermont Agricultural Value Group: 6
--	----------------------	-------------------------------------

Vermont Residential Onsite Waste Disposal Group and Subgroup: Ia

This unit is well suited as a site for soil-based residential wastewater disposal systems, based on a review by the Natural Resources Conservation Service of criteria set forth in the Vermont 2007 Environmental Protection Rules. The rapid permeability in the substratum is a concern. Backfilling absorption trenches with at least one foot of finer textured material or other site modifications may be necessary to slow the percolation rate enough to allow for thorough filtering of effluent.

PHYSICAL and CHEMICAL PROPERTIES							EROSION FACTORS		
Soil name	Depth (In)	Typical texture	Clay (Pct)	Soil reaction (pH)	Permeability (In/Hr)	Organic matter (Pct)			
							Kw	Kf	T
Missisquoi	0-5	LS	2-5	5.1 - 6.5	6-20	2.0-5.0	.15	.15	5
	5-12	LS	2-5	5.1 - 6.5	6-20	0.5-2.0	.17	.17	
	12-35	GR-COS	0-5	5.1 - 6.5	6-20	0.0-0.5	.02	.02	
	35-60	GR-COS	0-5	6.1 - 7.8	6-20	0.0-0.5	.02	.02	

WATER FEATURES					SOIL FEATURES			
Soil name	Hydrologic group	Depth to seasonal high water table (Feet)	Flooding		Ponding		Hydric soil?	Depth to bedrock (range in inches)
			Frequency	Duration	Frequency	Duration		
Missisquoi	A	---	None		None		No	---

LAND USE LIMITATIONS				AGRICULTURAL YIELD DATA	
Soil name	Land use	Rating	Reason **	Crop name	Yield / acre
Missisquoi	Dwellings with basements:	Not limited		Grass-legume hay	2.5 Tons
Missisquoi	Pond reservoir areas:	Very limited	Seepage	Grass-clover	4 AUM
				Corn silage	12 Tons
				Alfalfa hay	3 Tons

WOODLAND MANAGEMENT				
Soil name	Management concern	Rating	Reason	Vermont natural communities
Missisquoi	Harvest equip operability:	Well suited		Hemlock-Northern Hardwood Forest, Hemlock-White Pine-Northern Hardwood Forest Variant
Missisquoi	Road suitability:	Well suited		
Missisquoi	Erosion hazard (off-road):	Slight		

MsC: Missisquoi loamy sand, 8 to 15 percent slopes

The Missisquoi component makes up 85 percent of the map unit. The natural drainage class is excessively drained. Water movement in the most restrictive layer is high. This component is on terraces on river valleys. The parent material consists of sandy glaciofluvial deposits. Depth to a root restrictive layer is greater than 60 inches.

Important farmland classification: Local	Land capability: 4 s	Vermont Agricultural Value Group: 8
--	----------------------	-------------------------------------

Vermont Residential Onsite Waste Disposal Group and Subgroup: Ia

This unit is well suited as a site for soil-based residential wastewater disposal systems, based on a review by the Natural Resources Conservation Service of criteria set forth in the Vermont 2007 Environmental Protection Rules. The rapid permeability in the substratum is a concern. Backfilling absorption trenches with at least one foot of finer textured material or other site modifications may be necessary to slow the percolation rate enough to allow for thorough filtering of effluent.

PHYSICAL and CHEMICAL PROPERTIES							EROSION FACTORS		
Soil name	Depth (In)	Typical texture	Clay (Pct)	Soil reaction (pH)	Permeability (In/Hr)	Organic matter (Pct)			
							Kw	Kf	T
Missisquoi	0-5	LS	2-5	5.1 - 6.5	6-20	2.0-5.0	.15	.15	5
	5-12	LS	2-5	5.1 - 6.5	6-20	0.5-2.0	.17	.17	
	12-35	GR-COS	0-5	5.1 - 6.5	6-20	0.0-0.5	.02	.02	
	35-60	GR-COS	0-5	6.1 - 7.8	6-20	0.0-0.5	.02	.02	

WATER FEATURES					SOIL FEATURES			
Soil name	Hydrologic group	Depth to seasonal high water table (Feet)	Flooding		Ponding		Hydric soil?	Depth to bedrock (range in inches)
			Frequency	Duration	Frequency	Duration		
Missisquoi	A	---	None		None		No	---

LAND USE LIMITATIONS				AGRICULTURAL YIELD DATA	
Soil name	Land use	Rating	Reason **	Crop name	Yield / acre
Missisquoi	Dwellings with basements:	Somewhat limited	Slope	Corn silage	10 Tons
Missisquoi	Pond reservoir areas:	Very limited	Seepage	Alfalfa hay	3 Tons
				Grass-clover	4 AUM
				Grass-legume hay	2.5 Tons

WOODLAND MANAGEMENT				
Soil name	Management concern	Rating	Reason	Vermont natural communities
Missisquoi	Harvest equip operability:	Well suited		Hemlock-Northern Hardwood Forest, Hemlock-White Pine-Northern Hardwood Forest Variant
Missisquoi	Road suitability:	Moderately suited	Slope	
Missisquoi	Erosion hazard (off-road):	Slight		



TOWN OF HIGHGATE
DEVELOPMENT REGULATIONS

**Town of Highgate
Vermont**

**Development
Regulations**



**Prepared by the Highgate Planning Commission
Adopted by the Highgate Selectboard: March 5, 2015**

Effective Dates:

Amended December 20, 2007

Amended January 10, 2008

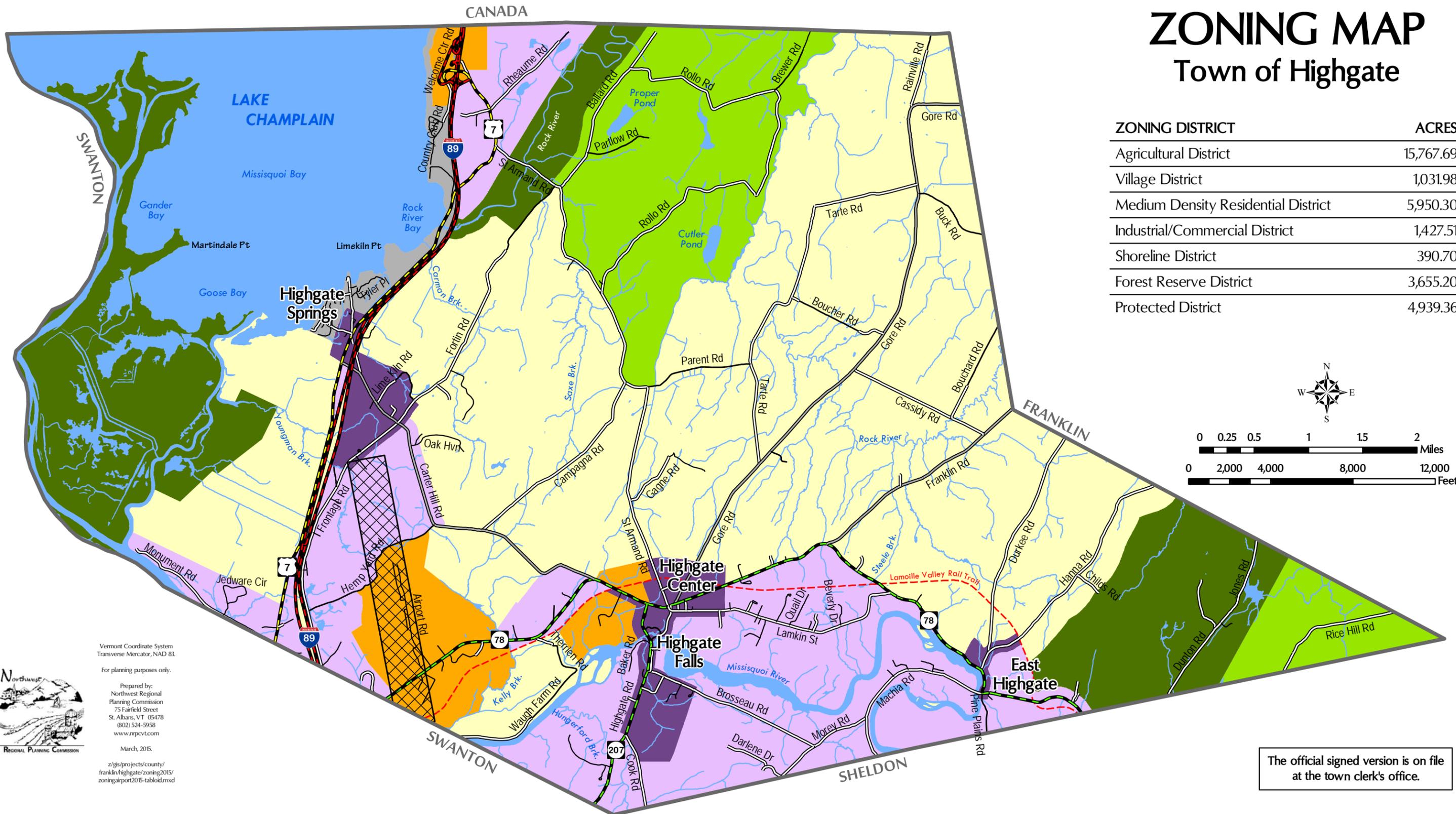
Amended July 21, 2009

Amended February 11, 2010

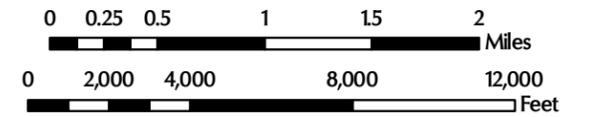
Amended June 23, 2011

ZONING MAP

Town of Highgate



ZONING DISTRICT	ACRES
Agricultural District	15,767.69
Village District	1,031.98
Medium Density Residential District	5,950.30
Industrial/Commercial District	1,427.51
Shoreline District	390.70
Forest Reserve District	3,655.20
Protected District	4,939.36



Vermont Coordinate System
Transverse Mercator, NAD 83.

For planning purposes only.

Prepared by:
Northwest Regional
Planning Commission
75 Fairfield Street
St. Albans, VT 05478
(802) 524-5958
www.nrpcvt.com

March, 2015.

z:\gis\projects\county/
franklin/highgate/zoning2015/
zoningairport2015-tableid.mxd



The official signed version is on file
at the town clerk's office.

LEGEND

Zoning Districts

- Agricultural District
- Village District
- Medium Density Residential District
- Industrial/Commercial District

- Shoreline District
- Forest Reserve District
- Protected District
- Airport Overlay District

Transportation Features

- Interstate Highway
- Federal Highway
- State Highway
- Class 2 Town Highway

- Class 3 Town Highway
- Class 4 Town Highway
- Private Road
- Lamoille Valley Rail Trail

Surface Water Features

- River, Stream or Brook
- Lake, Pond or River
- Town Boundary

Other Feature

- Town Boundary

than the Village District. A medium density of development will preserve the environment and character of this zone.

- D. **The (PA) Protected Area District** represents the unique and irreplaceable areas of natural beauty, which, for the public good, should remain in their natural state for the generations to come. This area contains steep slopes, fragile soils and vegetation, headwaters of the Rock River, wetlands and similar features. It is the intent of these Bylaws, through the designation of this district, to preserve these areas from medium to high density and intensive development, therefore limited uses are allowed in the district. To conserve large tracts of land any major subdivision in this district must be designated as a PUD.
- E. **The (I/C) Industrial/Commercial District** provides for industrial enterprises which are consistent with the general well-being of the town. This district contains the native site characteristics desired by industry and has the potential of being serviced by all essential public services. This district is intended to afford the opportunities of increased municipal tax base and employment for the citizens of Highgate and the entire region. Because of the unique favorable physical features of this district, it shall be protected from residential and other uses that would reduce its desirability as an industrial site.
- F. **The (SL) Shoreline District** includes land adjacent to those bodies of water within the Town of Highgate with a total impoundment area of twenty (20) acres or more. The Shoreline District includes the shores of Lake Champlain and Cutler Pond. Pursuant to Section 4411 of the Act, this district is established to control and prevent water pollution, to protect spawning grounds, fish and aquatic life and to control building sites along the waters in the best interest of the citizens of Highgate.
- G. **The (FR) Forest Reserve District** is to protect the natural resource value of lands which are essentially undeveloped, lack direct access to public roads, are important for wildlife and wildlife habitat, have potential for commercial forestry use or have one or more physical limitations to development. Residential and recreational development which is compatible with the district purposes and does not require additional facilities and services beyond what is being planned will be encouraged; other limited uses are allowed in the district.

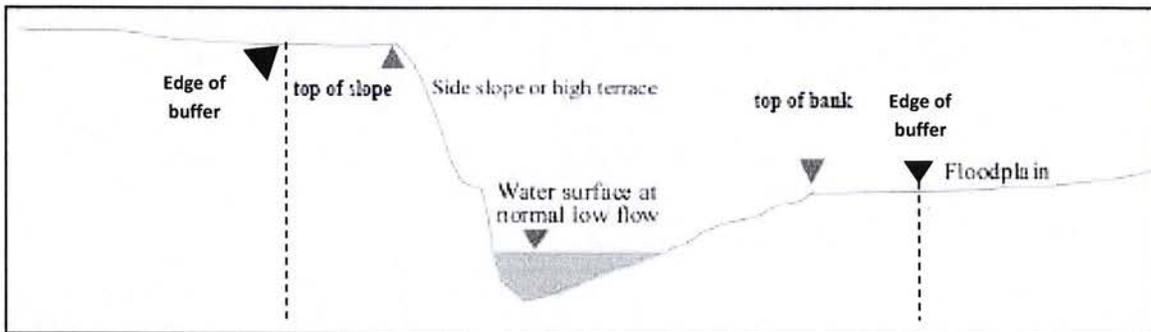
Section 2.4 Intent of Overlay Districts

- A. **The (AO) Airport Overlay District** is to limit the height of objects in the vicinity of the **Franklin County Airport** to prevent their interference with the safe and efficient operations of the airport. In addition, the District is created to encourage and enhance the ability to establish associated industry and commercial uses as appropriate, and in conformance with the **Airport Master Plan** completed by the State of Vermont. Uses allowed in the District will be the same as the underlying District uses listed in the **Use Table** in **Section 2.5**. Modified height requirements are contained in **Article 5** and modified dimensional requirements are contained in **Section 2.6**.

Table 5.1. Minimum Width of Buffer Strips (feet along the ground surface)

Type of Waterway	Required Buffer
Seasonal (intermittent) streams and permanent streams < 10 feet in average channel width	25 feet
Unnamed rivers and streams > 10 feet in average channel width	50 feet
Named rivers and streams (Missisquoi River and Rock River)	100 feet
Lakes and ponds > 1.0 acre in area (not including Lake Champlain)	50 feet

Figure 5.2. Finding Top of Slope and Top of Bank for Measuring Buffer Setbacks



Section 5.10 Height Limits

- A. **Maximum Height.** No building or other structure, whether principal or accessory, except those intended for the storage of crops (such as silos), shall exceed thirty five (35) feet in height above the average ground level, except as provided below.
1. Ornamental and symbolic features of buildings and structures, including spires, towers, cupolas, belfries and domes, are exempt from height regulations provided they are not used for human occupancy or commercial advertisement and do not take up more than 10% of the total roof area.
 2. The DRB may approve as a conditional use a higher height providing the structure shall be unoccupied and used for normal maintenance, communication, health and safety or essential manufacturing processes.
 3. In the Airport Overlay District, no structure, except those used for airport operations, may be higher than thirty-five (35) feet. Exceptions to this may only be granted by approval of the DRB after determination by the Federal Aviation Administration that the structure would not be an obstruction in the airspace or a hazard to air navigation.
 4. In the runway approach areas located within the Airport Overlay District, no structure shall be of a height greater than that determined to be safe by Federal Aviation Regulations.

land uses could be permitted in this district, such as outdoor recreational activities that do not involve large structures and forestry that does not create erosion problems or harm unique and fragile areas.

Forest Reserve (F.R.) - The purpose of the Forest Reserve District is to protect the natural resource value of a portion of Highgate that is essentially undeveloped, lacks direct access to arterial and collector roads, is important for wildlife and wildlife habitat, has potential for commercial forestry use, has one or more physical limitations to development, and includes significant natural, recreational, or scenic resources. Class III roads in the district are to be maintained but no Class IV roads are to be upgraded for at least the next five years. No further facilities or services should be considered for this district other than what has already been planned or established. This limits the residential development to only what can be accommodated by existing infrastructure. Outdoor recreational uses, conservation uses and forestry practices that are compatible with the district purposes and do not require additional facilities and services are permitted.

Airport Overlay (A.O.) - The purpose of the Airport Overlay District is to limit the height of objects in the vicinity of the Franklin County Airport and to prevent their interference with safe and efficient operations of the airport. In addition, the district is created to encourage and enhance the ability to establish associated industry and commercial uses as appropriate, and in conformance with the Airport Master Plan completed by the State of Vermont.

Flood Plain (F.P.) - The Flood Plain District is the area delineated on the Flood Insurance Rate Map for the Town of Highgate by the Federal Emergency Management Agency (FEMA). The requirements of this district are promulgated to minimize and prevent the loss of life and property, the disruption of commerce, the impairment of the tax base, and all extraordinary public expenditures required following flood disasters. Establishment of this zone is also meant to ensure that the design and construction of development in special flood hazard areas is accomplished in a manner that minimizes or eliminates the potential for flood damage. This district is to be administered according to the National Flood Insurance Program (NFIP), which is required for community eligibility in the NFIP and thereby ensures availability of flood insurance to property owners.



Appendix C:

Wetland Delineation & Endangered Species

WETLAND DELINEATION AND FUNCTIONAL ASSESSMENT REPORT
FRANKLIN COUNTY STATE AIRPORT
HIGHGATE, VERMONT

Prepared by:

The Smart Associates
Environmental Consultants, Inc.

72 North Main Street
Concord, NH 03301

January 2018

TABLE OF CONTENTS

Wetland Delineation and Functional Assessment Report Franklin County State Airport Highgate, Vermont

1.0	INTRODUCTION	1
2.0	WETLANDS	1
2.1	METHODOLOGY	1
2.2	WETLAND REGULATIONS	2
2.3	SUMMARY OF FINDINGS	3
3.0	TECHNICAL REFERENCES	7

FIGURES

- Figure 1: USGS Locus Map
- Figure 2: Site Plan
- Figure 3: VT VSWI Wetland Maps
- Figure 4: USFWS Wetlands Inventory

APPENDICES

- Appendix A: VANR Site Meeting Minutes
- Appendix B: Wetland Delineation Data Forms
- Appendix C: Vermont Wetland Evaluation Forms
- Appendix D: Photo Log
- Appendix E: Wetland Delineation Field Maps

1.0 INTRODUCTION

This report describes the wetland resources found within the limits of several proposed projects at Franklin County State Airport in Highgate, Vermont. The Airport is located just west of Interstate 89 and north of Vermont State Route 78 (Figure 1). The proposed project locations on the airport include the area north of the runway, much of the southern half of the airfield, and a section in the southwest corner of the airfield as depicted on plans (Figure 2) provided by Passero Associates (Passero). The Smart Associates, Environmental Consultants, Inc. (The Smart Associates) delineated the wetlands within and adjacent to the proposed project locations, and also prepared documentation for the various wetland communities. The Smart Associates met Brock Freyer of the Vermont Agency of Natural Resources to review the wetlands in the field on November 8, 2017. Meeting minutes are included in Appendix A.

The following sections provide a summary of the wetland delineation methodology and the wetland resources identified within the limits of the project study area.

2.0 WETLANDS

2.1 METHODOLOGY

The project study area for the purposes of the wetland delineation encompassed the following areas of the airport:

- The proposed hangar development area on the east side of Airport Access Road between the VTrans maintenance facility and the northeastern airport property boundary. This area is proposed to include future hangar development with access roads, taxiways, and aprons.
- A 1,000 foot runway and taxiway extension on the south end of Runway 1.
- Tree removal to address obstructions off of Runway 19 (north end) and Runway 1 (south end) to maintain clear approaches.

The limits of the wetland delineation included the area within 100 feet of the project locations to allow for shifts in location, as well as regulatory and design requirements for the project. Wetland boundaries are shown on the attached aerial photos (Appendix E).

Wetlands within the project study area were delineated by The Smart Associates using methodology outlined in the *U.S. Army Corps of Engineers Wetland Delineation Manual* (ACOE, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0* (ACOE, 2012). The wetland delineation was conducted between October 26 and November 7, 2017. Within the project study area, individually numbered wetland delineation flags were placed in the field to mark the wetland boundaries. The locations of the wetland flags were then identified in the field using a Trimble Global Positioning System (GPS) device. The accuracy of the corrected GPS data is generally within 1-2 meters. An AutoCAD file with the wetland flags and boundary data was provided to Passero Associates (the project's prime consultant) on November 22, 2017.

Prior to conducting the field work, The Smart Associates reviewed existing information and maps including Vermont Wetland Maps (VSWI), USFWS Wetland Inventory (NWI) Maps and the Natural Resources Conservation Service (NRCS) web soil survey to obtain background information on the project study area.

Federal wetland classifications were assigned according to the criteria published by the U.S. Fish and Wildlife Service (USFWS) in Cowardin et al. (1979). These classifications are discussed in the descriptions below. Wetland delineation data forms were completed for the wetlands delineated. Completed data forms are included in Appendix B.

Wetland functions were reviewed utilizing the Vermont Wetland Evaluation Form which examines 10 functions including the following:

- Water Storage for Flood Water and Storm Runoff
- Surface and Ground Water Protection
- Fish habitat
- Wildlife Habitat
- Exemplary Wetland Natural Community
- Rare, Threatened, and Endangered Species Habitat
- Education and Research in Natural Sciences
- Recreational Value and Economic Benefits
- Open Space and Aesthetics
- Erosion Control through Binding and Stabilizing the Soil

This method involves reviewing the key factors and determining whether each function is present in a wetland and at what level it is provided. Generally speaking, if a wetland had virtually none of the features contributing to a function, the function was considered to be absent from the wetland; if the wetland had few of the features contributing to a function, the function was Low or Present; and if the wetland had many of the features and the features suggested high value, it was considered to provide a high value. The Vermont Wetland Evaluation Forms for the delineated wetlands are provided in Appendix C.

2.2 WETLAND REGULATIONS

Both Federal and State of Vermont regulations address activities conducted in wetlands and waters of the US. The fundamental intent of these regulations is to minimize the reduction and degradation of these resources, and strive to achieve the government's "no net loss" policy. The Federal program is based on Section 404 of the Clean Water Act and the U.S. Army Corps of Engineers (ACOE) implementation regulations (33 CFR, Parts 320-330). In addition, Executive Order 11990 directs all Federal agencies to minimize the destruction, loss, and degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. These regulations define those lands that are considered wetlands and other waters of the US, including lakes, ponds, rivers, and streams. The regulations require an ACOE permit for the placement of dredge or fill material in wetlands or other waters of the US. The Wetlands Program of the Vermont

Agency of Natural Resources (VANR) is responsible for administering wetlands protection at the State level and coordinates with the ACOE to determine the jurisdictional status of wetlands and waterways.

The Vermont Wetland Rules were originally adopted in 1990 and have had several revisions since including in 2017. In 2010, wetland rules, pursuant to 10 V.S.A. § 6025(d) (5), were passed by the Vermont Water Resources Panel which identified the 10 functions described above. These functions are used to determine if a wetland is considered “significant” and therefore regulated.

The Vermont Wetland Rules classify wetlands into three categories, based on significance:

- Class I wetlands are defined as wetlands that are identified as Class I on the Vermont Significant Wetland Inventory (VSWI) Maps, wetlands that were identified by the former Water Resources Board as Class I wetlands, and wetlands that are determined to be exceptional or irreplaceable in their contribution to Vermont’s natural heritage by the Water Resources Panel. A 100-foot protected buffer zone, which is an adjacent area of upland designed to protect the wetland functions and values, is designated adjacent to Class I wetlands.
- Class II wetlands are defined as wetlands that are identified as Class II on the VSWI Maps and wetlands that are determined to merit protection based on the wetlands’ functions and values. The buffer zone associated with Class II wetlands is 50 feet.
- Class III wetlands are wetlands that are neither Class I or Class II. Class III wetlands do not have an associated buffer and are also not protected under the Vermont Wetland Rules.

2.3 SUMMARY OF FINDINGS

The Airport is situated in a generally flat area with the topography sloping away from the north-south oriented runway. Wetlands are scattered around the perimeter of the airfield. The following sections provide information on the wetlands delineated within the study area. Representative photographs of the study area are included in Appendix D.

NORTH END OF THE AIRPORT

Wetland 1

Wetland 1 is a diverse wetland community north of the end of Runway 19 with a large emergent wetland on the east side which outlets to the west via a narrow stream channel and continues approximately 400 feet before entering another large scrub/shrub and emergent wetland on the west side of the runway approach area. Flow from the eastern wetland community, surface flows, and groundwater discharge appear to contribute to the overall wetlands’ hydrology.

The predominant wetland classes include:

Palustrine, Emergent, Persistent, seasonally flooded/saturated (PEM1C) on the east side.

Palustrine Scrub/Shrub Broad-leaved Deciduous and Emergent, Persistent, seasonally flooded/saturated (PSS1E/EM1E) on the west side.

Riverine, Upper Perennial, Unconsolidated Bottom, Permanently Flooded (R3UBH) for the central stream community,

Palustrine, Forested, broad-leaved deciduous, seasonally flooded/saturated (PFO1E) north of the stream.

Dominant vegetation species noted during the delineation included red maple (*Acer rubrum*), black ash (*Fraxinus nigra*), Atlantic white cedar (*Chamaecyparis thyoides*), Ironwood (*Carpinus caroliniana*) and Maidenhair fern (*Adiantum pedatum*). Wetland hydrology indicators included saturated soils and evidence of standing water.

This series of wetlands provides a variety of functions and values, due to its connection to large wetland communities upstream and downstream, as well as on-site features such as the presence of potential vernal pool habitats within the study area. The large wetland communities northwest and northeast of the site and outside the project study area are considered to be Significant Natural Communities which also influences wetland functions and values.

Those portions of Wetland 1 within the project study area, provide many of the functions listed in the Vermont Wetland Rules. Functions that are present at a higher level include water storage for flood water and storm runoff, wildlife habitat, and erosion control through binding and stabilizing the soil. At the same time, the study area provides the functions of surface and ground water protection, fish habitat, and open space and aesthetics. Exemplary wetland communities, as well as rare, threatened, and endangered species habitat are high values provided by areas of Wetland 1 located beyond the study area. Other functions occur but are reduced by their generally limited accessibility.

Since Wetland 1 is part of a large wetland, contains a diversity of wetland classes, and is mapped on the VSMI maps. The wetland was confirmed as **Class II** during the VANR site meeting. As such, Wetland 1 is regulated by the State of Vermont and has a 50-foot buffer zone.

SOUTH END OF AIRPORT

Wetland 2

Wetland 2 is a pair of small, isolated wetlands generally located outside the existing Airport fencing directly south of Runway 1. These two small depressions do not connect hydrologically to other wetlands in the area.

The wetlands are classified as palustrine emergent wetlands with persistent vegetation and seasonally flooded/saturated hydrology (PEM1E). Typical wetland vegetation includes blue-joint grass (*Calamagrostis canadensis*), meadowsweet (*Spiraea latifolia*),

wooly sedge (*Scirpus cyperinus*), and purple loosestrife (*Lythrum salicaria*). Much of the vegetation in the wetlands also included upland species such as timothy grass (*Phleum pratense*), red clover (*Trifolium pratense*), and orange hawkweed (*Hieracium aurantiacum*). An existing narrow, gravel access road crosses the wetland community from east to west near the northern edge of the wetland community.

Due to the small size of this wetland complex, the isolated condition, lack of diversity and hydrologic condition, Wetland 2 is considered to provide limited functions as described in the Vermont Wetland Rules. Due to its location in the mowed airfield where several protected grassland species are known to occur, Wetland 2 may indirectly contribute to rare, threatened, and endangered species habitat. The wetland may not be contributing to the bird habitat on site as a wetland function, but rather it could provide cover within the airfield habitat.

Given the extent of excessively well drained soils throughout the airfield, the presence of these wetlands is surprising, especially with the number of upland plant species within the wetlands. The most likely explanation for the presence of the wetlands would be excavation of materials for earlier projects in the airport. Likewise, compression of the soils by construction equipment could have disrupted the “normal” drainage conditions of the area.

Based on the limited functional values of the wetland community and lack of connection to other wetland communities, these wetlands were determined to be a **Class III wetland** during the VANR site meeting and therefore would not be regulated by the State of Vermont. Although, the wetlands are isolated further coordination with the US Army Corps of Engineers (ACOE) is recommended to determine the jurisdictional nature of Wetland 2.

Wetland 3

Wetland 3 is a large forested wetland in the southwestern area of the airport that continues off property to the area adjacent to Vermont State Route 78. The wetland is primarily forested with small pockets of scrub/shrub wetlands. The wetland also extends into the adjacent field as a narrow band of emergent wetlands.

The wetland is classified as palustrine, forested, broad-leaved deciduous/needle-leaved evergreen, seasonally flooded/saturated (PFO1/4E) in the wooded portion to the west of the mowed field. Those portions which extend into the adjacent field would be classified as palustrine, emergent, persistent, saturated (PEM1B). Dominant vegetation includes red maple, speckled alder (*Alnus incana*), eastern hemlock (*Tsuga canadensis*) and sensitive fern (*Onoclea sensibilis*).

The large size of Wetland 3 and diverse site conditions contribute to the ability of the wetland to provide various functions and values, as described in the Vermont Wetland Evaluation Form. These include high values for water storage functions for flood water and storm runoff, surface and ground water protection, and wildlife habitat. In addition, the wetland is considered to provide recreational value and economic benefits, open

space and aesthetics, and erosion control through binding and stabilizing the soil. The functions of fish habitat, and rare, threatened and endangered species habitat are provided but not within the location of the obstruction clearing area.

Since Wetland 3 is part of a large diverse wetland community and is mapped on the VSMI maps, it would be considered **Class II**. This determination was confirmed during the VANR Site Meeting. As such, Wetland 3 is regulated by the State of Vermont and has a 50-foot buffer zone.

Summary

A total of 3 wetland communities were delineated within the study area which were reviewed and delineated in October and November 2017. The location of these wetlands is shown on the aerial photos provided in Appendix E. A variety of wetland classes were identified including riverine, emergent, scrub-shrub, and forested wetlands.

Wetlands 1 and 3 are considered Class II wetlands and are regulated by the State of Vermont. Any impact to these wetlands or their 50-foot buffer zone would require a permit from VANR. Wetland 2 is considered to be a Class III wetland due to its isolated condition, small size and limited functions provided. As such, Wetland 2 is not regulated by the State of Vermont and does not have any buffer zones.

Wetlands 1 and 3 would be regulated by the Army Corps of Engineers (ACOE) and impacts to them may require a Section 404 permit depending upon the activity proposed. Coordination with the ACOE should be conducted to determine wetland jurisdiction in Wetland 2.

3.0 TECHNICAL REFERENCES

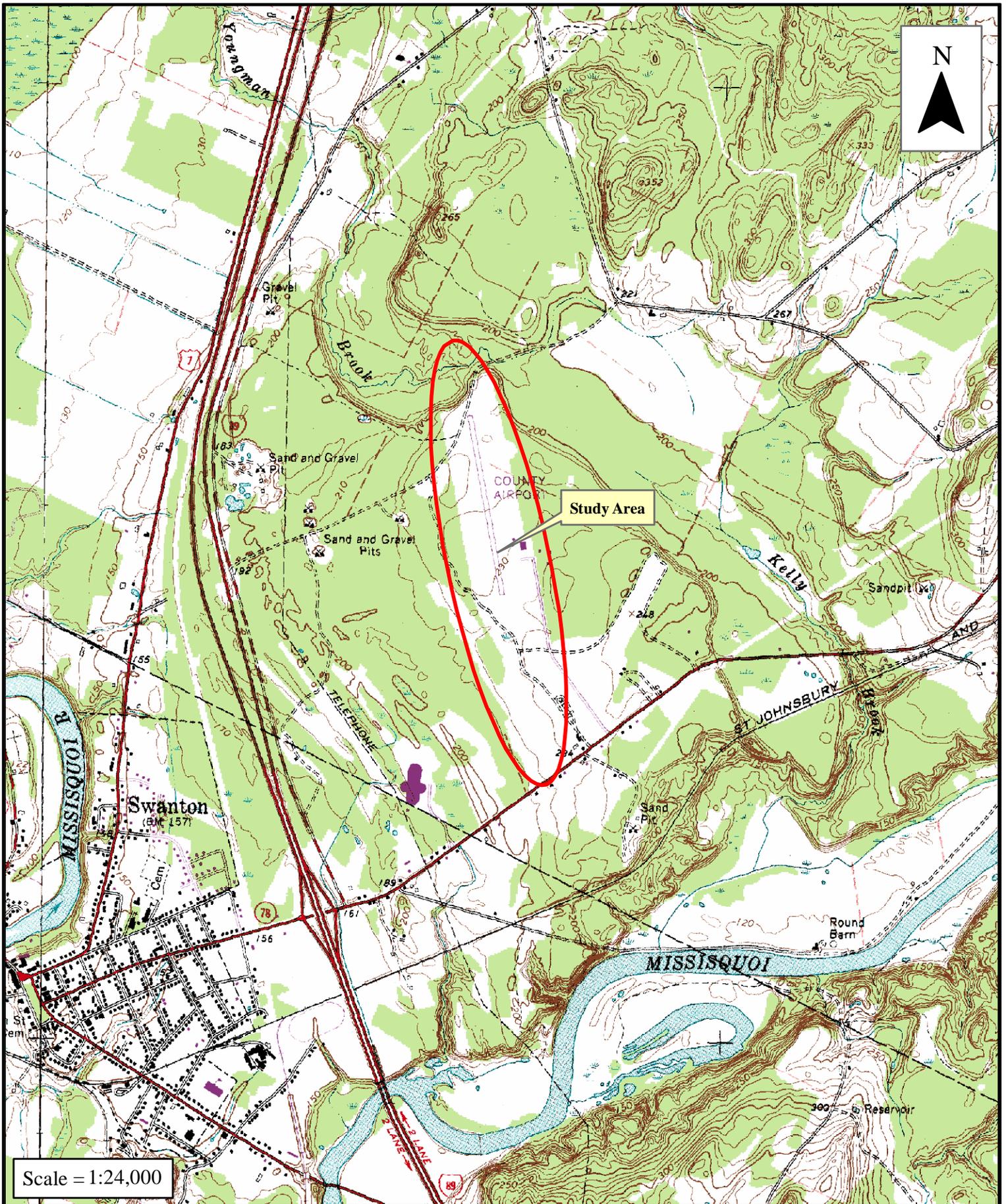
Cowardin, L.M., Carter, V., Golet, F.C., and LaRoe, E.T. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service, Washington, D.C. 1979.

New England Hydric Soils Technical Committee. *Field Indicators for Identifying Hydric Soils in New England*. Version 4. New England Interstate Water Pollution Control Commission, Lowell, MA. 2017.

U.S. Army Corps of Engineers. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS. 1987.

U.S. Army Corps of Engineers. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region*. U.S. Army Corps of Engineer Research and Development Center, Vicksburg, MS. January 2012.

Figure 1
USGS Locus Map



Scale = 1:24,000

Franklin County State Airport
Highgate, Vermont

Figure 1
USGS Locus Map

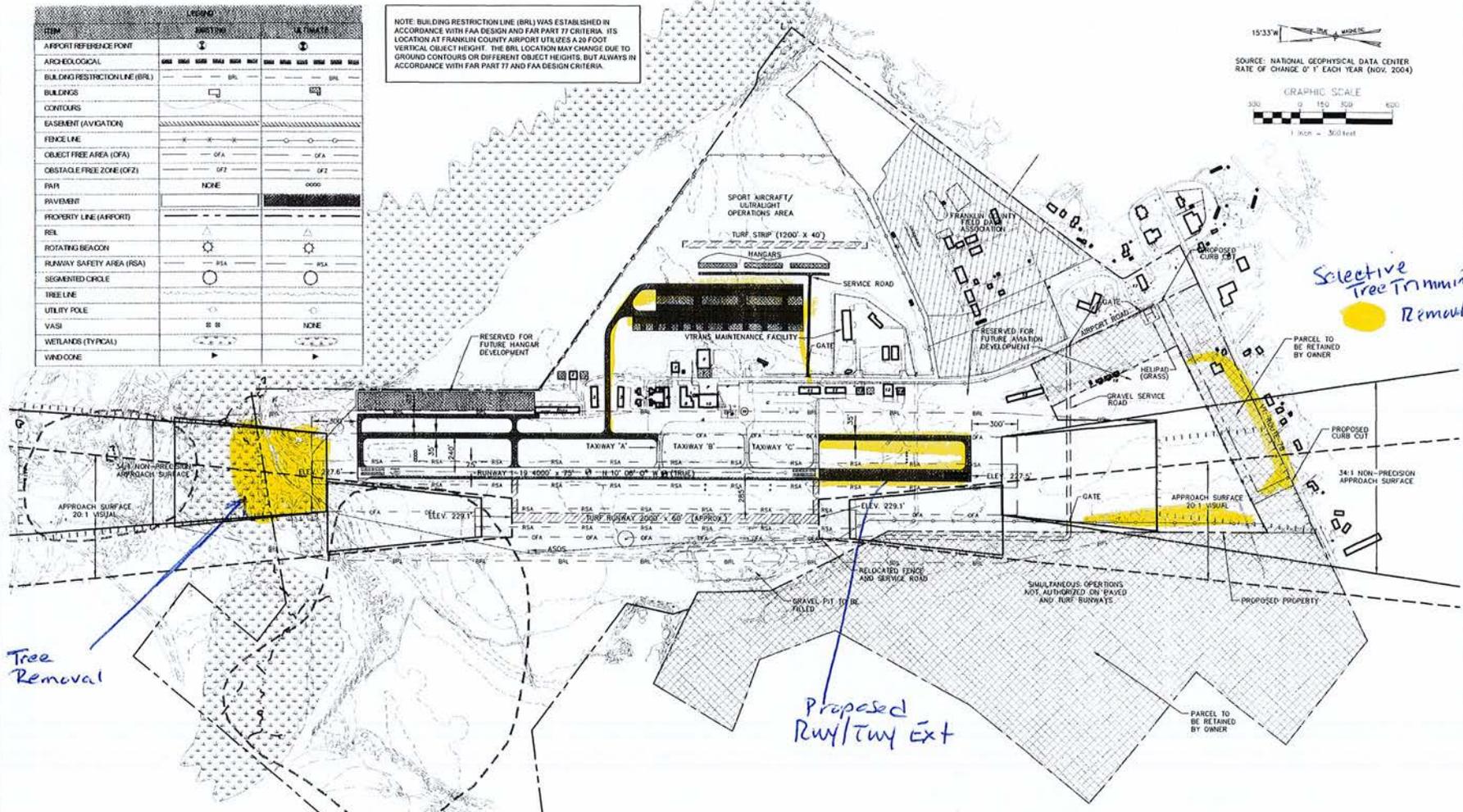
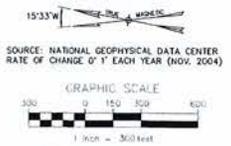
The Smart Associates
Environmental Consultants, Inc.

Figure 2

Site Plan

ITEM	SYMBOL	LEGEND
AIRPORT REFERENCE POINT	↓	↓
ARCHAEOLOGICAL	○	○
BUILDING RESTRICTION LINE (BRL)	---	---
BUILDINGS	□	□
CONTOURS	~	~
EASEMENT (AVIGATION)	---	---
FENCE LINE	---	---
OBJECT FREE AREA (OFA)	---	---
OBSTACLE FREE ZONE (OFZ)	---	---
PAPI	---	---
PAVEMENT	---	---
PROPERTY LINE (AIRPORT)	---	---
REL	△	△
ROTATING BEACON	○	○
RUNWAY SAFETY AREA (RSA)	---	---
SEGMENTED CIRCLE	○	○
TREE LINE	---	---
UTILITY POLE	○	---
VASI	---	---
WETLANDS (TYPICAL)	---	---
WIND CONE	---	---

NOTE: BUILDING RESTRICTION LINE (BRL) WAS ESTABLISHED IN ACCORDANCE WITH FAA DESIGN AND FAR PART 77 CRITERIA. ITS LOCATION AT FRANKLIN COUNTY AIRPORT UTILIZES A 20 FOOT VERTICAL OBJECT HEIGHT. THE BRL LOCATION MAY CHANGE DUE TO GROUND CONTOURS OR DIFFERENT OBJECT HEIGHTS, BUT ALWAYS IN ACCORDANCE WITH FAR PART 77 AND FAA DESIGN CRITERIA.



Tree Removal

Selective Tree Trimming/Removal

Proposed Run/Twy Ext

FEDERAL AVIATION ADMINISTRATION		
APPROVED:	PLANNER AIRPORTS DIVISION	DATE
VERMONT AGENCY OF TRANSPORTATION		
APPROVED:	DIRECTOR OF OPERATIONS	DATE
VERMONT AGENCY OF TRANSPORTATION		
APPROVED:	AVIATION PROGRAM MANAGER	DATE

NON-CONFORMING CONDITIONS				
DESCRIPTION	EXISTING/PLANNED	STANDARD	REMARKS	DATE APPROVED
RUNWAY WIDTH	60	75	RAW WIDTH WILL BE INCREASED CONSISTENT WITH IACR WHEN EXTENDED AND/OR RECONSTRUCTED	
RUNWAY 19 SAFETY AREA	150 x 200	150 x 300	RSA TO BE CONSTRUCTED TO STANDARDS	
SIMULTANEOUS OPERATIONS NOT PERMITTED	NA	NA		

VERMONT AGENCY OF TRANSPORTATION CERTIFIES THAT ALL AIRPORT ELEMENTS SHOWN ON THIS ALP ARE IN ACCORDANCE WITH CRITERIA CONTAINED IN THE CURRENT EDITION OF FAA ADVISORY CIRCULAR 150/5300-13, EXCEPT AS NOTED IN TABLE ENTITLED "NONCONFORMING CONDITIONS".

Stantec Consulting Services Inc.
1000 North Main Street
Portland, ME 04101-3900
Tel: 207.775.8244
Fax: 207.775.8244
www.stantec.com

Stantec

Project No.	19021001
Drawn By	ECD
Checked By	JKL
Scale	1" = 300'
Approval	ECD
Date	MAY 2007

FRANKLIN COUNTY STATE AIRPORT
AIRPORT LAYOUT PLAN
(ULTIMATE FACILITIES)

VERMONT
MIDDLEBURY

Sheet 3 of 4

Figure 3

Vermont VSWI Wetland Map



- LEGEND**
- Vernal Pools Confirmed – AE/VCE
 - Vernal Pools Unconfirmed – AE/VCE
 - Wetlands - VSWI**
 - Class 1 Wetland
 - Class 2 Wetland
 - Town Boundary

NOTES

Map created using ANR GIS mapping technology.

1: 12,088

February 18, 2017

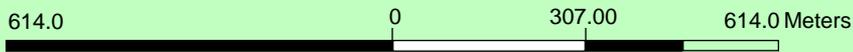


Figure 4

USFWS Wetland Inventory Map

Appendix A
Agency Site Meeting Notes

Caledonia County State Airport
Wetland Site Meeting with VANR
November 8, 2017

An on-site meeting was held with the Vermont Agency of Natural Resources (VANR) Wetlands Program to review the wetlands located at Franklin County State Airport related to the proposed projects.

Attendees:

- Brock Freyer (VANR)
- Jim Fougere, The Smart Associates (TSA)

Project Overview

The meeting started outside the Airport's terminal building with the purpose of generally discussing the proposed projects as well as the various wetland communities in the vicinity of the projects.

Jim Fougere gave an overview of the proposed improvement projects as well as the various wetland delineation issues by region:

- East of Airport Road and north of the VTrans maintenance facility is a proposed hangar development area with taxiways connecting to the airfield and access roads originating off Airport Road. An access road is also proposed along the northern boundary of this parcel which abuts the adjacent gravel excavation area on the adjacent property.
- Upgrading and relocating the fuel farm in the area south of the terminal building.
- Runway/taxiway extension south of Runway 1.
- Obstruction removal in the southwestern corner of the airport between Vermont Route 78 and Runway 1.
- Obstruction removal north of Runway 19.

Findings

Based on a field walk in the area of the proposed projects and delineated wetland boundaries, the following wetland issues or findings were identified:

- **Eastern Hangar Development Area** was reviewed to include the hangar area as well access road locations. No wetlands were noted in this portion of the site during the walkover or during the previous field searches conducted by TSA. These field findings were confirmed by a review of the soils information. The existing soils on this portion of the site are identified in the Web Soil Survey (NRCS, 2017) as Missisquoi loamy sand and Windsor loamy fine sand, both excessively drained soils.

- **North of Runway 19** . Wetlands on this portion of the site were delineated by TSA and identified as **Wetland 1**. This wetland community includes a large emergent marsh (PEM1E) on the east side of the study area, continuing to the west as a narrow stream for approximately 150 yards before entering a scrub/shrub marsh and emergent wetland that continues to the west. This wetland is considered a Significant Natural Community by the state of Vermont. The wetland boundaries along the south side of the wetland follow the marsh and stream but also include a large area of phragmites on the west side of the runway (Wetland flag 1-59 to 1-75). The northern boundary of the wetland is more convoluted with narrow drainages, hummocks and intermittent stream channels in a forested community. During the site review with ANR, three wetland pockets were identified as being potential vernal pool habitat and may be subject to spring amphibian surveys to confirm their status.

VT Wetland Classification: Class II

- **Runway Extension Area**. This portion of the site includes **Wetland 2**, a two part emergent wetland that occurs just south of the existing perimeter fence and is crossed by an existing access road. These two small wetland communities occur in a low area which appears to have been influenced by old excavations or other some other form of site disturbance which influenced drainage and the overall vegetation community. The existing delineation was tweaked along the southern edge but it was agreed the wetlands had limited functional value and do not connect to other adjacent wetland communities.

VT Wetland Classification: Class III

- **Obstructions South of Runway 1**. This portion of the site includes the area between Runway 1 and Vermont Route 78. Much of the airport's property is currently mowed with scattered trees along the road. A forested area with large trees does occur along the west side of the runway approach. Wetlands associated with this portion of the site occur along the southwestern edge and parallel the edge of the woods with wetlands occurring in the adjacent field before continuing into the woods and turning away from the airfield. Several flags along this line were relocated by agreement during the site visit to be consistent with soil conditions along the line.

VT Wetland classification: Class II

Action Items

Based on the field review, several items were noted for review by Brock Freyer (ANR) and should be considered during future project development including:

- The wetland delineation conducted by TSA was generally agreed upon by TSA and Brock Freyer of ANR with a few minor wetland flag adjustments on Wetland 1, 2 and 3. These changes have been made to the site maps.
- The wetlands north of Runway 19 are considered a Significant Natural Community and included three areas which appeared to be capable of providing vernal pool habitat. These specific sites may be subject to spring amphibian surveys to confirm the presence or absence of breeding amphibians.

These pool areas were noted as occurring adjacent to the following wetland flags.
11-49, 1-53, and 1-75.

- Additional wetlands are likely to occur north of the delineated portion of Wetland 1 and should be reviewed if obstruction removal requires tree clearing beyond the limit of the wetland delineation.
- A wetland classification map identifying the classes of the wetlands and a wetland report will be submitted.

Distribution:

All attendees

VTrans, Lisa Cheung(Passero)

Appendix B
Wetland Delineation
Data Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Franklin County State Airport City/County: Highgate/Franklin Sampling Date: 11/8/2017
 Applicant/Owner: Vermont AOT, Aviation State: VT Sampling Point: 1 up
 Investigator(s): J. Fougere, TSA Section, Township, Range: _____
 Landform (hillside, terrace, etc.): stream and marsh Local relief (concave, convex, none): concave Slope (%): 3-5
 Subregion (LRR or MLRA): LRR R, MLRA 142 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Missisquoi loamy sand NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>X</u>	No _____	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Hydric Soil Present?	Yes _____	No <u>X</u>	
Wetland Hydrology Present?	Yes _____	No <u>X</u>	
Remarks: (Explain alternative procedures here or in a separate report.)			

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) _____ Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ 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 <u>x</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>x</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>x</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
--	---

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

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Franklin County State Airport City/County: Highgate/Franklin Sampling Date: 11/8/2017
 Applicant/Owner: Vermont AOT, Aviation State: VT Sampling Point: 1 wet
 Investigator(s): J. Fougere, TSA Section, Township, Range: _____
 Landform (hillside, terrace, etc.): marsh and stream Local relief (concave, convex, none): _____ Slope (%): 3
 Subregion (LRR or MLRA): LRR R, MLRA 142 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Missisquoi loamy sand NWI classification: PEM1E, PSS1E, R3SB2

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 <u>x</u> No _____ Hydric Soil Present? Yes <u>x</u> No _____ Wetland Hydrology Present? Yes <u>x</u> No _____	Is the Sampled Area within a Wetland? Yes <u>x</u> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Area undergoing low precipitation in the past 9 months.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input checked="" type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input checked="" type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
--	---

Field Observations: Surface Water Present? Yes <u>x</u> No _____ Depth (inches): _____ Water Table Present? Yes <u>x</u> No _____ Depth (inches): _____ Saturation Present? Yes <u>x</u> No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
--	---

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: 1 wet

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: <u>30</u>)			
1. <u>Populus tremuloides</u>	<u>40</u>	<u>Yes</u>	<u>FACU</u>
2. <u>Fraxinus nigra</u>	<u>17</u>	<u>Yes</u>	<u>FACW</u>
3. <u>Chamaecyparis thyoides</u>	<u>17</u>	<u>Yes</u>	<u>OBL</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
	<u>74</u>	=Total Cover	
Sapling/Shrub Stratum (Plot size: <u>15</u>)			
1. <u>Carpinus caroliniana</u>	<u>41</u>	<u>Yes</u>	<u>FAC</u>
2. <u>Ostrya virginiana</u>	<u>12</u>	<u>Yes</u>	<u>FACU</u>
3. <u>Acer rubrum</u>	<u>12</u>	<u>Yes</u>	<u>FAC</u>
4. <u>Fraxinus nigra</u>	<u>12</u>	<u>Yes</u>	<u>FACW</u>
5. <u>Chamaecyparis thyoides</u>	<u>12</u>	<u>Yes</u>	<u>OBL</u>
6. _____	_____	_____	_____
7. _____	_____	_____	_____
	<u>89</u>	=Total Cover	
Herb Stratum (Plot size: <u>5</u>)			
1. <u>Phalaris arundinacea</u>	<u>52</u>	<u>Yes</u>	<u>FACW</u>
2. <u>Vicia cracca</u>	<u>14</u>	<u>No</u>	<u>UPL</u>
3. <u>Vicia americana</u>	<u>28</u>	<u>Yes</u>	<u>FACU</u>
4. <u>Melilotus alba</u>	<u>14</u>	<u>No</u>	<u>UPL</u>
5. <u>Bidens aristosa</u>	<u>3</u>	<u>No</u>	<u>FACW</u>
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
	<u>111</u>	=Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
	_____	=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 70.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>29</u>	x 1 = <u>29</u>
FACW species <u>84</u>	x 2 = <u>168</u>
FAC species <u>53</u>	x 3 = <u>159</u>
FACU species <u>80</u>	x 4 = <u>320</u>
UPL species <u>28</u>	x 5 = <u>140</u>
Column Totals: <u>274</u> (A)	<u>816</u> (B)
Prevalence Index = B/A = <u>2.98</u>	

Hydrophytic Vegetation Indicators:

 1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

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

 Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Vegetation Strata:

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

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

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

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

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

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Morrisville-Stowe State Airport fencing projeFranklin County State Airport City/County: Highgate/Franklin Sampling Date: 11/8/2017
 Applicant/Owner: Vermont AOT, Aviation State: VT Sampling Point: 2 up
 Investigator(s): J. Fougere, TSA Section, Township, Range: _____
 Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1
 Subregion (LRR or MLRA): LRR R, MLRA 142 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Missisquoi loamy sand NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 <u>X</u> Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Area undergoing low precipitation in the past 9 months.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) _____ Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ 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 <u>x</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>x</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>x</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
--	---

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: 2 up

<u>Tree Stratum</u> (Plot size: <u>30</u>)		Absolute % Cover	Dominant Species?	Indicator Status
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
		_____	=Total Cover	
<u>Sapling/Shrub Stratum</u> (Plot size: <u>20</u>)				
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
		_____	=Total Cover	
<u>Herb Stratum</u> (Plot size: <u>5</u>)				
1.	<u>Hieracium aurantiacum</u>	<u>49</u>	<u>Yes</u>	<u>UPL</u>
2.	<u>Aristida oligantha</u>	<u>21</u>	<u>Yes</u>	<u>UPL</u>
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
8.	_____	_____	_____	_____
9.	_____	_____	_____	_____
10.	_____	_____	_____	_____
11.	_____	_____	_____	_____
12.	_____	_____	_____	_____
		<u>70</u>	=Total Cover	
<u>Woody Vine Stratum</u> (Plot size: _____)				
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
		_____	=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: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>70</u>	x 5 = <u>350</u>
Column Totals: <u>70</u> (A)	<u>350</u> (B)
Prevalence Index = B/A = <u>5.00</u>	

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

Definitions of Vegetation Strata:

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

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

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

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No X

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

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Franklin county Sate Airport City/County: Highgate/Franklin Sampling Date: 11/8/2017
 Applicant/Owner: Vermont AOT, Aviation State: VT Sampling Point: 2 wet
 Investigator(s): J. Fougere, TSA Section, Township, Range: _____
 Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1
 Subregion (LRR or MLRA): LRR R, MLRA 142 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Missisquoi loamy sand NWI classification: PEM1E

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Area undergoing low precipitation in the past 9 months.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) _____ Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) _____ Marl Deposits (B15) <input checked="" type="checkbox"/> Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ 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) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
---	---

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
---	--

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: 2 wet

<u>Tree Stratum</u> (Plot size: <u>30</u>)		Absolute % Cover	Dominant Species?	Indicator Status
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
		=Total Cover		
<u>Sapling/Shrub Stratum</u> (Plot size: <u>20</u>)		Absolute % Cover	Dominant Species?	Indicator Status
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
		=Total Cover		
<u>Herb Stratum</u> (Plot size: <u>5</u>)		Absolute % Cover	Dominant Species?	Indicator Status
1.	<u>Calamagrostis canadensis</u>	<u>69</u>	<u>Yes</u>	<u>OBL</u>
2.	<u>Phleum pratense</u>	<u>10</u>	<u>No</u>	<u>FACU</u>
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
5.	_____	_____	_____	_____
6.	_____	_____	_____	_____
7.	_____	_____	_____	_____
8.	_____	_____	_____	_____
9.	_____	_____	_____	_____
10.	_____	_____	_____	_____
11.	_____	_____	_____	_____
12.	_____	_____	_____	_____
		<u>79</u> =Total Cover		
<u>Woody Vine Stratum</u> (Plot size: _____)		Absolute % Cover	Dominant Species?	Indicator Status
1.	_____	_____	_____	_____
2.	_____	_____	_____	_____
3.	_____	_____	_____	_____
4.	_____	_____	_____	_____
		=Total Cover		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>69</u>	x 1 = <u>69</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>10</u>	x 4 = <u>40</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>79</u> (A)	<u>109</u> (B)
Prevalence Index = B/A = <u>1.38</u>	

Hydrophytic Vegetation Indicators:

 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

 3 - Prevalence Index is ≤3.0¹

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

 Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Vegetation Strata:

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

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

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

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

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

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Franklin County State Airport City/County: Highgate/Franklin Sampling Date: 11/8/2017
 Applicant/Owner: Vermont AOT, Aviation State: VT Sampling Point: 3 up
 Investigator(s): J. Fougere, TSA Section, Township, Range: _____
 Landform (hillside, terrace, etc.): low slope Local relief (concave, convex, none): _____ Slope (%): 1
 Subregion (LRR or MLRA): LRR R, MLRA 142 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Mlssisquoi loamy sand NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Hydric Soil Present?	Yes _____	No <u>X</u>	
Wetland Hydrology Present?	Yes _____	No <u>X</u>	
Remarks: (Explain alternative procedures here or in a separate report.)			

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) _____ Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ 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 <u>x</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>x</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>x</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
--	---

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: 3 up

	Absolute % Cover	Dominant Species?	Indicator Status																	
Tree Stratum (Plot size: <u>30</u>)																				
1. <u><i>Acer rubrum</i></u>	<u>49</u>	<u>Yes</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>9</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>44.4%</u> (A/B) Prevalence Index worksheet: <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; text-align: center;">Total % Cover of:</td> <td style="width:50%; text-align: center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>18</u></td> <td>x 2 = <u>36</u></td> </tr> <tr> <td>FAC species <u>97</u></td> <td>x 3 = <u>291</u></td> </tr> <tr> <td>FACU species <u>136</u></td> <td>x 4 = <u>544</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>251</u> (A)</td> <td><u>871</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>3.47</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>18</u>	x 2 = <u>36</u>	FAC species <u>97</u>	x 3 = <u>291</u>	FACU species <u>136</u>	x 4 = <u>544</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>251</u> (A)	<u>871</u> (B)	Prevalence Index = B/A = <u>3.47</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>18</u>	x 2 = <u>36</u>																			
FAC species <u>97</u>	x 3 = <u>291</u>																			
FACU species <u>136</u>	x 4 = <u>544</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>251</u> (A)	<u>871</u> (B)																			
Prevalence Index = B/A = <u>3.47</u>																				
2. <u><i>Populus tremuloides</i></u>	<u>23</u>	<u>Yes</u>	<u>FACU</u>																	
3. _____																				
4. _____																				
5. _____																				
6. _____																				
7. _____																				
	<u>72</u> =Total Cover																			
Sapling/Shrub Stratum (Plot size: <u>20</u>)																				
1. <u><i>Betula papyrifera</i></u>	<u>30</u>	<u>Yes</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>2</u> - Dominance Test is >50% <u>3</u> - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. <u><i>Acer rubrum</i></u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>																	
3. <u><i>Populus tremuloides</i></u>	<u>30</u>	<u>Yes</u>	<u>FACU</u>																	
4. _____																				
5. _____																				
6. _____																				
7. _____																				
	<u>90</u> =Total Cover																			
Herb Stratum (Plot size: <u>5</u>)																				
1. <u><i>Rubus allegheniensis</i></u>	<u>35</u>	<u>Yes</u>	<u>FACU</u>	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height. Hydrophytic Vegetation Present? Yes <u> </u> No <u> X </u>																
2. <u><i>Solidago altissima</i></u>	<u>18</u>	<u>Yes</u>	<u>FACU</u>																	
3. <u><i>Solidago rugosa</i></u>	<u>18</u>	<u>Yes</u>	<u>FAC</u>																	
4. <u><i>Onoclea sensibilis</i></u>	<u>18</u>	<u>Yes</u>	<u>FACW</u>																	
5. _____																				
6. _____																				
7. _____																				
8. _____																				
9. _____																				
10. _____																				
11. _____																				
12. _____																				
	<u>89</u> =Total Cover																			
Woody Vine Stratum (Plot size: _____)																				
1. _____																				
2. _____																				
3. _____																				
4. _____																				
	_____ =Total Cover																			

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

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Franklin County State Airport City/County: Highgate/Franklin Sampling Date: 11/8/2017
 Applicant/Owner: Vermont AOT, Aviation State: VT Sampling Point: 3 wet
 Investigator(s): J. Fougere, TSA Section, Township, Range: _____
 Landform (hillside, terrace, etc.): low slope Local relief (concave, convex, none): _____ Slope (%): 1
 Subregion (LRR or MLRA): LRR R, MLRA 142 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Wareham loamy fine sand NWI classification: PFO1E

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____ If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) Area undergoing low precipitation in the past 9 months.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) <u>x</u> Water-Stained Leaves (B9) <u>x</u> High Water Table (A2) _____ Aquatic Fauna (B13) <u>x</u> Saturation (A3) _____ Marl Deposits (B15) <u>x</u> Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ 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 <u>x</u> Depth (inches): _____ Water Table Present? Yes <u>x</u> No _____ Depth (inches): <u>12"</u> Saturation Present? Yes <u>x</u> No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
---	---

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: 3 wet

	Absolute % Cover	Dominant Species?	Indicator Status																	
Tree Stratum (Plot size: <u>30</u>)																				
1. <u><i>Acer rubrum</i></u>	<u>61</u>	<u>Yes</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66.7%</u> (A/B) Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>13</u></td> <td>x 1 = <u>13</u></td> </tr> <tr> <td>FACW species <u>62</u></td> <td>x 2 = <u>124</u></td> </tr> <tr> <td>FAC species <u>76</u></td> <td>x 3 = <u>228</u></td> </tr> <tr> <td>FACU species <u>115</u></td> <td>x 4 = <u>460</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>266</u> (A)</td> <td><u>825</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align:center;">Prevalence Index = B/A = <u>3.10</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>13</u>	x 1 = <u>13</u>	FACW species <u>62</u>	x 2 = <u>124</u>	FAC species <u>76</u>	x 3 = <u>228</u>	FACU species <u>115</u>	x 4 = <u>460</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>266</u> (A)	<u>825</u> (B)	Prevalence Index = B/A = <u>3.10</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>13</u>	x 1 = <u>13</u>																			
FACW species <u>62</u>	x 2 = <u>124</u>																			
FAC species <u>76</u>	x 3 = <u>228</u>																			
FACU species <u>115</u>	x 4 = <u>460</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>266</u> (A)	<u>825</u> (B)																			
Prevalence Index = B/A = <u>3.10</u>																				
2. <u><i>Populus tremuloides</i></u>	<u>12</u>	<u>No</u>	<u>FACU</u>																	
3. <u><i>Betula papyrifera</i></u>	<u>8</u>	<u>No</u>	<u>FACU</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
	<u>81</u> =Total Cover																			
Sapling/Shrub Stratum (Plot size: <u>20</u>)																				
1. <u><i>Tsuga canadensis</i></u>	<u>54</u>	<u>Yes</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <u> </u> 1 - Rapid Test for Hydrophytic Vegetation <u> X </u> 2 - Dominance Test is >50% <u> </u> 3 - Prevalence Index is ≤3.0 ¹ <u> </u> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. <u><i>Viburnum recognitum</i></u>	<u>15</u>	<u>No</u>	<u>FAC</u>																	
3. <u><i>Pinus strobus</i></u>	<u>15</u>	<u>No</u>	<u>FACU</u>																	
4. <u><i>Spiraea latifolia</i></u>	<u>15</u>	<u>No</u>	<u>FACW</u>																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
	<u>99</u> =Total Cover																			
Herb Stratum (Plot size: <u>5</u>)																				
1. <u><i>Osmundastrum cinnamomeum</i></u>	<u>47</u>	<u>Yes</u>	<u>FACW</u>	Definitions of Vegetation Strata: Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines – All woody vines greater than 3.28 ft in height. Hydrophytic Vegetation Present? Yes <u> X </u> No <u> </u>																
2. <u><i>Osmunda spectabilis</i></u>	<u>13</u>	<u>No</u>	<u>OBL</u>																	
3. <u><i>Tsuga canadensis</i></u>	<u>13</u>	<u>No</u>	<u>FACU</u>																	
4. <u><i>Pinus strobus</i></u>	<u>13</u>	<u>No</u>	<u>FACU</u>																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
	<u>86</u> =Total Cover																			
Woody Vine Stratum (Plot size: _____)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
	_____ =Total Cover																			

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

Appendix C
Vermont Wetland
Evaluation Forms

VERMONT WETLAND EVALUATION FORM

Wetland 1

Project Name: Franklin County State Airport

Date: 12/13/2017 Investigator: __J. Fougere, TSA

SUMMARY OF FUNCTIONAL EVALUATION:

Each function gets a score of 0= not present; L = Low; P = Present; or H = High.

1. Water Storage for Flood Water and Storm Runoff <input type="text" value="H"/>	6. Rare, Threatened, and Endangered Species Habitat <input type="text" value="P"/>
2. Surface & Ground Water Protection <input type="text" value="P"/>	7. Education and Research in Natural Sciences <input type="text" value="L"/>
3. Fish Habitat <input type="text" value="P"/>	8. Recreational Value and Economic Benefits <input type="text" value="L"/>
4. Wildlife Habitat <input type="text" value="H"/>	9. Open Space and Aesthetics <input type="text" value="P"/>
5. Exemplary Wetland Natural Community <input type="text" value="P"/>	10. Erosion Control through Binding and Stabilizing the Soil <input type="text" value="H"/>

Note:

- **When to use this form:** This is a field form to help you compile data needed to evaluate the 10 possible functions and values of a wetland as described in the Vermont Wetland Rules. All information in this form is replicated in the applications for both wetland determinations and wetland permits.
- **Both a desktop review and field examination** should be employed to accurately determine surrounding land use, hydrology, hydroperiod, vegetation, position in the landscape, and physical attributes.
- **The entire wetland or wetland complex** in question must be evaluated to determine the level of function in all ten (10) categories for accurate classification. A wetland complex can be defined as a series of interconnected wetland types.
- **The surrounding upland and outflow area** of the wetland should be examined to determine land use, development, nearby natural resources, and hydrology. The surrounding land use, previous development, and cumulative impacts may play a role in the current function of the wetland. For best results please read all descriptions prior to scoring activity.
- **Evaluation:** The first portion in each section determines whether the wetland does or does not provide the function. If none of the conditions listed in the first section are met, proceed

9/14/2010

to the next section. If any of these conditions are met, determine if the wetland provides this function at a higher or lower level based on the information listed in the subsequent sections.

- **Presumptions:** Please note that many wetlands are already presumed to be significant under the Vermont Wetland Rules. A wetland is presumed to be significant if:
 - The wetland is mapped on the VSWI map
 - The wetland is contiguous to a VSWI mapped wetland
 - The wetland meets the presumptions of significance under Section 4.6
 - The wetland has a preliminary determination that it is Class II

1. Water Storage for Flood Water and Storm Runoff

Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.

- Constricted outlet or no outlet and an unconstricted inlet.
- Physical space for floodwater expansion and dense, persistent, emergent vegetation or dense woody vegetation that slows down flood waters or stormwater runoff during peak flows and facilitates water removal by evaporation and transpiration.
- If a stream is present, its course is sinuous and there is sufficient woody vegetation to intercept surface flows in the portion of the wetland that floods.
- Physical evidence of seasonal flooding or ponding such as water stained leaves, water marks on trees, drift rows, debris deposits, or standing water.
- Hydrologic or hydraulic study indicates wetland attenuates flooding.

If any of the above boxes are checked, the wetland provides this function. Complete the following to determine if the wetland provides this function above or below a moderate level:

- Check box if any of the following conditions apply that may indicate the wetland provides this function at a *lower* level.
 - Significant flood storage capacity upstream of the wetland, and the wetland in question provides this function at a negligible level in comparison to upstream storage (unless the upstream storage is temporary such as a beaver impoundment).
 - Wetland is contiguous to a major lake or pond that provides storage benefits independently of the wetland.
 - Wetland's storage capacity is created primarily by recent beaver dams or other temporary structures.
 - Wetland is very small in size, not contiguous to a stream, and not part of a collection of small wetlands in the landscape that provide this function cumulatively.
- Check box if any of the following conditions apply that may indicate the wetland provides this function at a *higher* level.
 - History of downstream flood damage to public or private property.
 - Any of the following conditions present downstream of the wetland, but upstream of a major lake or pond, could be impacted by a loss or reduction of the water storage function.
 - 1. Developed public or private property.
 - 2. Stream banks susceptible to scouring and erosion.
 - 3. Important habitat for aquatic life.
 - The wetland is large in size and naturally vegetated.

9/14/2010

- Any of the following conditions present upstream of the wetland may indicate a large volume of runoff may reach the wetland.
 - 1. A large amount of impervious surface in urbanized areas.
 - 2. Relatively impervious soils.
 - 3. Steep slopes in the adjacent areas.

2. Surface and Ground Water Protection

Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.

- Constricted or no outlets.
- Low water velocity through dense, persistent vegetation.
- Hydroperiod permanently flooded or saturated.
- Wetlands in depositional environments with persistent vegetation wider than 20 feet.
- Wetlands with persistent vegetation comprising a defined delta, island, bar or peninsula.
- Presence of seeps or springs.
- Wetland contains a high amount of microtopography that helps slow and filter surface water.
- Position in the landscape indicates the wetland is a headwaters area.
- Wetland is adjacent to surface waters.
- Wetland recharges a drinking water source.
- Water sampling indicates removal of pollutants or nutrients.
- Water sampling indicates retention of sediments or organic matter.
- Fine mineral soils and alkalinity not low.
- The wetland provides an obvious filter between surface water or ground water and land uses that may contribute point or nonpoint sources of sediments, toxic substances or nutrients to the wetland, such as: steep erodible slopes; row crops; dumps; areas of pesticide, herbicide or fertilizer application; feed lots; parking lots or heavily traveled road; and septic systems.

If any of the above boxes are checked, the wetland provides this function. Complete the following to determine if the wetland provides this function above or below a moderate level.

Check box if any of the following conditions apply that may indicate the wetland provides this function at a *lower* level.

- Presence of dead forest or shrub areas in sufficient amounts to result in diminished

9/14/2010

nutrient uptake.

- Presence of ditches or channels that confine water and restrict contact of water with vegetation.
- Wetland is very small in size, not contiguous to a stream, and not part of a collection of small wetlands in the landscape that provide this function cumulatively.
- Current use in the wetland results in disturbance that compromises this function.
- Check box if any of the following conditions apply that may indicate the wetland provides this function at a *higher* level.
 - The wetland is adjacent to a well head or source protection area, and provides ground water recharge.
 - The wetland provides flows to Class A surface waters.
 - The wetland contributes to the protection or improvement of water quality of any impaired waters.
 - The wetland is large in size and naturally vegetated.

3. Fish Habitat

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
 - Contains woody vegetation that overhangs the banks of a stream or river and provides any of the following: shading that controls summer water temperature; cover including refuges created by overhanging branches or undercut banks; source of terrestrial insects as fish food; or streambank stability.
 - Provides spawning, nursery, feeding or cover habitat for fish (documented or professionally judged). Common habitat includes deep marsh and shallow marsh associates with lakes and streams, and seasonally flooded wetlands associated with streams and rivers.
 - Documented or professionally judged spawning habitat for northern pike.
 - Provides cold spring discharge that lowers the temperature of receiving waters and creates summer habitat for salmonoid species.
 - The wetland is located along a tributary that does not support fish, but contributes to a larger body of water that does support fish. The tributary supports downstream fish by providing cooler water, and food sources.

4. Wildlife Habitat

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
 - Provides resting, feeding staging or roosting habitat to support waterfowl migration, and feeding habitat for wading birds. Good habitats for these species include open water wetlands.
 - Habitat to support one or more breeding pairs or broods of waterfowl including all species of ducks, geese, and swans. Good habitats for these species include open water habitats adjacent shallow marsh, deep marsh, shrub wetland, forested wetland, or naturally vegetated buffer zone.
 - Provides a nest site, a buffer for a nest site or feeding habitat for wading birds including but not limited to: great blue heron, black-crowned night heron, green-backed heron, cattle egret, or snowy egret. Good habitats for these species include open water or deep marsh adjacent to forested wetlands, or standing dead trees.
 - Supports or has the habitat to support one or more breeding pairs of any migratory bird that requires wetland habitat for breeding, nesting, rearing of young, feeding, staging roosting, or migration, including: Virginia rail, common snipe, marsh wren, American bittern, northern water thrush, northern harrier, spruce grouse, Cerulean warbler, and common loon.
 - Supports winter habitat for white-tailed deer. Good habitats for these species include softwood swamps. Evidence of use includes deer browsing, bark stripping, worn trails, or pellet piles.
 - Provides important feeding habitat for black bear, bobcat, or moose based on an assessment of use. Good habitat for these types of species includes wetlands located in a forested mosaic.
 - Has the habitat to support muskrat, otter or mink. Good habitats for these species include deep marshes, wetlands adjacent to bodies of water including lakes, ponds, rivers and streams.
 - Supports an active beaver dam, one or more lodges, or evidence of use in two or more consecutive years by an adult beaver population.
 - Provides the following habitats that support the reproduction of Uncommon Vermont amphibian species including:
 - 1. Wood Frog, Jefferson Salamander, Blue-spotted Salamander, or Spotted Salamander. Breeding habitat for these species includes vernal pools and small ponds.
 - 2. Northern Dusky Salamander and the Spring Salamander. Habitat for these species includes headwater seeps, springs, and streams.
 - 3. The Four-toed salamander; Fowler's Toad; Western or Boreal Chorus frog, or other amphibians found in Vermont of similar significance.

9/14/2010

- Supports or has the habitat to support significant populations of Vermont amphibian species including, but not limited to Pickerel Frog, Northern Leopard Frog, Mink Frog, and others found in Vermont of similar significance. Good habitat for these types of species includes large marsh systems with open water components.
- Supports or has the habitat to support populations of uncommon Vermont reptile species including: Wood Turtle, Northern Map Turtle, Eastern Musk Turtle, Spotted Turtle, Spiny Softshell, Eastern Ribbonsnake, Northern Watersnake, and others found in Vermont of similar significance.
- Supports or has the habitat to support significant populations of Vermont reptile species, including Smooth Greensnake, DeKay's Brownsnake, or other more common wetland-associated species.
- Meets four or more of the following conditions indicative of wildlife habitat diversity:
 - 1. Three or more wetland vegetation classes (greater than 1/2 acre) present including but not limited to: open water contiguous to, but not necessarily part of, the wetland, deep marsh, shallow marsh, shrub swamp, forested swamp, fen, or bog;
 - 2. The dominant vegetation class is one of the following types: deep marsh, shallow marsh, shrub swamp or, forested swamp;
 - 3. Located adjacent to a lake, pond, river or stream;
 - 4. Fifty percent or more of surrounding habitat type is one or more of the following: forest, agricultural land, old field or open land;
 - 5. Emergent or woody vegetation occupies 26 to 75 percent of wetland, the rest is open water;
 - 6. One of the following:
 - i. hydrologically connected to other wetlands of different dominant classes or open water within 1 mile;
 - ii. hydrologically connected to other wetlands of same dominant class within 1/2 mile;
 - iii. within 1/4 mile of other wetlands of different dominant classes or open water, but not hydrologically connected;
- Wetland or wetland complex is owned in whole or in part by state or federal government and managed for wildlife and habitat conservation; and
- Contains evidence that it is used by wetland dependent wildlife species.

If any of the above boxes are checked, the wetland provides this function. Complete the following to determine if the wetland provides this function above or below a moderate level.

- Check box if any of the following conditions apply that may indicate the wetland provides this function at a *lower* level.
 - The wetland is small in size for its type and does not represent fugitive habitat in

9/14/2010

developed areas (vernal pools and seeps are generally small in size, so this does not apply).

- The surrounding land use is densely developed enough to limit use by wildlife species (with the exception of wetlands with open water habitat). Can be negated by evidence of use.
- The current use in the wetland results in frequent cutting, mowing or other disturbance.
- The wetland hydrology and character is at a drier end of the scale and does not support wetland dependent species.
- Check box if any of the following conditions apply that may indicate the wetland provides this function at a *higher* level.
 - The wetland complex is large in size and high in quality.
 - The habitat has the potential to support several species based on the assessment above.
 - Wetland is associated with an important wildlife corridor.
 - The wetland has been identified by ANR-F&W as important habitat.

5. Exemplary Wetland Natural Community

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
 - Wetlands that are identified as high quality examples of Vermont's natural community types recognized by the Natural Heritage Information Project of the Vermont Fish and Wildlife Department, including rare types such as dwarf shrub bogs, rich fens, alpine peatlands, red maple-black gum swamps and the more common types including deep bulrush marshes, cattail marshes, northern white cedar swamps, spruce-fir-tamarack swamps, and red maple-black ash seepage swamps are automatically significant for this function.

The wetland is also likely to be significant if any of the following conditions are met:

- Is an example of a wetland natural community type that has been identified and mapped by, or meets the ranking and mapping standards of, the Natural Heritage Information Project of the Vermont Fish and Wildlife Department.
- Contains ecological features that contribute to Vermont's natural heritage, including, but not limited to:
 - Deep peat accumulation reflecting a long history of wetland formation;
 - Forested wetlands displaying very old trees and other old growth characteristics;
 - A wetland natural community that is at the edge of the normal range for that type;

9/14/2010

- A wetland mosaic containing examples of several to many wetland community types; or
- A large wetland complex with examples of several wetland community types.

6. Rare, Threatened, and Endangered Species Habitat

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
 - Wetlands that contain one or more species on the federal or state threatened or endangered lists, as well as species that are rare in Vermont, are automatically significant for this function.

The wetland is also likely to be significant if any of the following apply:

 - There is credible documentation that the wetland provides important habitat for any species on the federal or state threatened or endangered species lists;
 - There is credible documentation that threatened or endangered species have been present in past 10 years;
 - There is credible documentation that the wetland provides important habitat for any species listed as rare in Vermont (S1 or S2 ranks), state historic (SH rank), or rare to uncommon globally (G1, G2, or G3 ranks) by the Natural Heritage Information Project of the Vermont Fish and Wildlife Department;
 - There is credible documentation that the wetland provides habitat for multiple uncommon species of plants or animals (S3 rank).

List name of species and ranking:
Least Bittern

7. Education and Research in Natural Sciences

- Function is present and likely to be significant: Any of the following characteristics indicate the wetland provides this function.
 - Owned by or leased to a public entity dedicated to education or research.
 - History of use for education or research.
 - Has one or more characteristics making it valuable for education or research.

9/14/2010

8. Recreational Value and Economic Benefits

- Function is present and likely to be significant: Any of the following characteristics indicate the wetland provides this function.
 - Used for, or contributes to, recreational activities.
 - Provides economic benefits.
 - Provides important habitat for fish or wildlife which can be fished, hunted or trapped under applicable state law.
 - Used for harvesting of wild foods.

Comments:

9. Open Space and Aesthetics

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
 - Can be readily observed by the public; and
 - Possesses special or unique aesthetic qualities; or
 - Has prominence as a distinct feature in the surrounding landscape;
 - Has been identified as important open space in a municipal, regional or state plan.

10. Erosion Control through Binding and Stabilizing the Soil

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
 - Erosive forces such as wave or current energy are present and any of the following are present as well:
 - Dense, persistent vegetation along a shoreline or stream bank that reduces an adjacent erosive force.
 - Good interspersion of persistent emergent vegetation and water along course of water flow.
 - Studies show that wetlands of similar size, vegetation type, and hydrology are important for erosion control.

9/14/2010

What type of erosive forces are present?

- Lake fetch and waves
- High current velocities
- Water level influenced by upstream impoundment

If any of the above boxes are checked, the wetland provides this function. Complete the following to determine if the wetland provides this function above or below a moderate level.

- Check box if any of the following conditions apply that may indicate the wetland provides this function at a *lower* level.
 - The stream is artificially channelized and/or lacks vegetation that contributes to controlling the erosive force.
- Check box if any of the following conditions apply that may indicate the wetland provides this function at a *higher* level.
 - The stream contains high sinuosity.
 - Has been identified through fluvial geomorphic assessment to be important in maintaining the natural condition of the stream or river corridor.

VERMONT WETLAND EVALUATION FORM

Wetland 2

Project Name: Franklin County State Airport

Date: __12/13/2017 Investigator: __J. Fougere, TSA

SUMMARY OF FUNCTIONAL EVALUATION:

Each function gets a score of 0= not present; L = Low; P = Present; or H = High.

1. Water Storage for Flood Water and Storm Runoff <input type="text" value="L"/>	6. Rare, Threatened, and Endangered Species Habitat <input type="text" value="L"/>
2. Surface & Ground Water Protection <input type="text" value="L"/>	7. Education and Research in Natural Sciences <input type="text" value="0"/>
3. Fish Habitat <input type="text" value="0"/>	8. Recreational Value and Economic Benefits <input type="text" value="0"/>
4. Wildlife Habitat <input type="text" value="L"/>	9. Open Space and Aesthetics <input type="text" value="0"/>
5. Exemplary Wetland Natural Community <input type="text" value="0"/>	10. Erosion Control through Binding and Stabilizing the Soil <input type="text" value="0"/>

Note:

- **When to use this form:** This is a field form to help you compile data needed to evaluate the 10 possible functions and values of a wetland as described in the Vermont Wetland Rules. All information in this form is replicated in the applications for both wetland determinations and wetland permits.
- **Both a desktop review and field examination** should be employed to accurately determine surrounding land use, hydrology, hydroperiod, vegetation, position in the landscape, and physical attributes.
- **The entire wetland or wetland complex** in question must be evaluated to determine the level of function in all ten (10) categories for accurate classification. A wetland complex can be defined as a series of interconnected wetland types.
- **The surrounding upland and outflow area** of the wetland should be examined to determine land use, development, nearby natural resources, and hydrology. The surrounding land use, previous development, and cumulative impacts may play a role in the current function of the wetland. For best results please read all descriptions prior to scoring activity.
- **Evaluation:** The first portion in each section determines whether the wetland does or does not provide the function. If none of the conditions listed in the first section are met, proceed

9/14/2010

to the next section. If any of these conditions are met, determine if the wetland provides this function at a higher or lower level based on the information listed in the subsequent sections.

- **Presumptions:** Please note that many wetlands are already presumed to be significant under the Vermont Wetland Rules. A wetland is presumed to be significant if:
 - The wetland is mapped on the VSWI map
 - The wetland is contiguous to a VSWI mapped wetland
 - The wetland meets the presumptions of significance under Section 4.6
 - The wetland has a preliminary determination that it is Class II

1. Water Storage for Flood Water and Storm Runoff

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
- Constricted outlet or no outlet and an unconstricted inlet.
 - Physical space for floodwater expansion and dense, persistent, emergent vegetation or dense woody vegetation that slows down flood waters or stormwater runoff during peak flows and facilitates water removal by evaporation and transpiration.
 - If a stream is present, its course is sinuous and there is sufficient woody vegetation to intercept surface flows in the portion of the wetland that floods.
 - Physical evidence of seasonal flooding or ponding such as water stained leaves, water marks on trees, drift rows, debris deposits, or standing water.
 - Hydrologic or hydraulic study indicates wetland attenuates flooding.

If any of the above boxes are checked, the wetland provides this function. Complete the following to determine if the wetland provides this function above or below a moderate level:

- Check box if any of the following conditions apply that may indicate the wetland provides this function at a *lower* level.
- Significant flood storage capacity upstream of the wetland, and the wetland in question provides this function at a negligible level in comparison to upstream storage (unless the upstream storage is temporary such as a beaver impoundment).
 - Wetland is contiguous to a major lake or pond that provides storage benefits independently of the wetland.
 - Wetland's storage capacity is created primarily by recent beaver dams or other temporary structures.
 - Wetland is very small in size, not contiguous to a stream, and not part of a collection of small wetlands in the landscape that provide this function cumulatively.
- Check box if any of the following conditions apply that may indicate the wetland provides this function at a *higher* level.
- History of downstream flood damage to public or private property.
 - Any of the following conditions present downstream of the wetland, but upstream of a major lake or pond, could be impacted by a loss or reduction of the water storage function.
 - 1. Developed public or private property.
 - 2. Stream banks susceptible to scouring and erosion.
 - 3. Important habitat for aquatic life.
 - The wetland is large in size and naturally vegetated.

9/14/2010

- Any of the following conditions present upstream of the wetland may indicate a large volume of runoff may reach the wetland.
 - 1. A large amount of impervious surface in urbanized areas.
 - 2. Relatively impervious soils.
 - 3. Steep slopes in the adjacent areas.

2. Surface and Ground Water Protection

Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.

- Constricted or no outlets.
- Low water velocity through dense, persistent vegetation.
- Hydroperiod permanently flooded or saturated.
- Wetlands in depositional environments with persistent vegetation wider than 20 feet.
- Wetlands with persistent vegetation comprising a defined delta, island, bar or peninsula.
- Presence of seeps or springs.
- Wetland contains a high amount of microtopography that helps slow and filter surface water.
- Position in the landscape indicates the wetland is a headwaters area.
- Wetland is adjacent to surface waters.
- Wetland recharges a drinking water source.
- Water sampling indicates removal of pollutants or nutrients.
- Water sampling indicates retention of sediments or organic matter.
- Fine mineral soils and alkalinity not low.
- The wetland provides an obvious filter between surface water or ground water and land uses that may contribute point or nonpoint sources of sediments, toxic substances or nutrients to the wetland, such as: steep erodible slopes; row crops; dumps; areas of pesticide, herbicide or fertilizer application; feed lots; parking lots or heavily traveled road; and septic systems.

If any of the above boxes are checked, the wetland provides this function. Complete the following to determine if the wetland provides this function above or below a moderate level.

Check box if any of the following conditions apply that may indicate the wetland provides this function at a *lower* level.

- Presence of dead forest or shrub areas in sufficient amounts to result in diminished

9/14/2010

nutrient uptake.

- Presence of ditches or channels that confine water and restrict contact of water with vegetation.
 - Wetland is very small in size, not contiguous to a stream, and not part of a collection of small wetlands in the landscape that provide this function cumulatively.
 - Current use in the wetland results in disturbance that compromises this function.
- Check box if any of the following conditions apply that may indicate the wetland provides this function at a *higher* level.
- The wetland is adjacent to a well head or source protection area, and provides ground water recharge.
 - The wetland provides flows to Class A surface waters.
 - The wetland contributes to the protection or improvement of water quality of any impaired waters.
 - The wetland is large in size and naturally vegetated.

3. Fish Habitat

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
- Contains woody vegetation that overhangs the banks of a stream or river and provides any of the following: shading that controls summer water temperature; cover including refuges created by overhanging branches or undercut banks; source of terrestrial insects as fish food; or streambank stability.
 - Provides spawning, nursery, feeding or cover habitat for fish (documented or professionally judged). Common habitat includes deep marsh and shallow marsh associates with lakes and streams, and seasonally flooded wetlands associated with streams and rivers.
 - Documented or professionally judged spawning habitat for northern pike.
 - Provides cold spring discharge that lowers the temperature of receiving waters and creates summer habitat for salmonoid species.
 - The wetland is located along a tributary that does not support fish, but contributes to a larger body of water that does support fish. The tributary supports downstream fish by providing cooler water, and food sources.

4. Wildlife Habitat

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
 - Provides resting, feeding staging or roosting habitat to support waterfowl migration, and feeding habitat for wading birds. Good habitats for these species include open water wetlands.
 - Habitat to support one or more breeding pairs or broods of waterfowl including all species of ducks, geese, and swans. Good habitats for these species include open water habitats adjacent shallow marsh, deep marsh, shrub wetland, forested wetland, or naturally vegetated buffer zone.
 - Provides a nest site, a buffer for a nest site or feeding habitat for wading birds including but not limited to: great blue heron, black-crowned night heron, green-backed heron, cattle egret, or snowy egret. Good habitats for these species include open water or deep marsh adjacent to forested wetlands, or standing dead trees.
 - Supports or has the habitat to support one or more breeding pairs of any migratory bird that requires wetland habitat for breeding, nesting, rearing of young, feeding, staging roosting, or migration, including: Virginia rail, common snipe, marsh wren, American bittern, northern water thrush, northern harrier, spruce grouse, Cerulean warbler, and common loon.
 - Supports winter habitat for white-tailed deer. Good habitats for these species include softwood swamps. Evidence of use includes deer browsing, bark stripping, worn trails, or pellet piles.
 - Provides important feeding habitat for black bear, bobcat, or moose based on an assessment of use. Good habitat for these types of species includes wetlands located in a forested mosaic.
 - Has the habitat to support muskrat, otter or mink. Good habitats for these species include deep marshes, wetlands adjacent to bodies of water including lakes, ponds, rivers and streams.
 - Supports an active beaver dam, one or more lodges, or evidence of use in two or more consecutive years by an adult beaver population.
 - Provides the following habitats that support the reproduction of Uncommon Vermont amphibian species including:
 - 1. Wood Frog, Jefferson Salamander, Blue-spotted Salamander, or Spotted Salamander. Breeding habitat for these species includes vernal pools and small ponds.
 - 2. Northern Dusky Salamander and the Spring Salamander. Habitat for these species includes headwater seeps, springs, and streams.
 - 3. The Four-toed salamander; Fowler's Toad; Western or Boreal Chorus frog, or other amphibians found in Vermont of similar significance.

9/14/2010

- Supports or has the habitat to support significant populations of Vermont amphibian species including, but not limited to Pickerel Frog, Northern Leopard Frog, Mink Frog, and others found in Vermont of similar significance. Good habitat for these types of species includes large marsh systems with open water components.
- Supports or has the habitat to support populations of uncommon Vermont reptile species including: Wood Turtle, Northern Map Turtle, Eastern Musk Turtle, Spotted Turtle, Spiny Softshell, Eastern Ribbonsnake, Northern Watersnake, and others found in Vermont of similar significance.
- Supports or has the habitat to support significant populations of Vermont reptile species, including Smooth Greensnake, DeKay's Brownsnake, or other more common wetland-associated species.
- Meets four or more of the following conditions indicative of wildlife habitat diversity:
 - 1. Three or more wetland vegetation classes (greater than 1/2 acre) present including but not limited to: open water contiguous to, but not necessarily part of, the wetland, deep marsh, shallow marsh, shrub swamp, forested swamp, fen, or bog;
 - 2. The dominant vegetation class is one of the following types: deep marsh, shallow marsh, shrub swamp or, forested swamp;
 - 3. Located adjacent to a lake, pond, river or stream;
 - 4. Fifty percent or more of surrounding habitat type is one or more of the following: forest, agricultural land, old field or open land;
 - 5. Emergent or woody vegetation occupies 26 to 75 percent of wetland, the rest is open water;
 - 6. One of the following:
 - i. hydrologically connected to other wetlands of different dominant classes or open water within 1 mile;
 - ii. hydrologically connected to other wetlands of same dominant class within 1/2 mile;
 - iii. within 1/4 mile of other wetlands of different dominant classes or open water, but not hydrologically connected;
- Wetland or wetland complex is owned in whole or in part by state or federal government and managed for wildlife and habitat conservation; and
- Contains evidence that it is used by wetland dependent wildlife species.

If any of the above boxes are checked, the wetland provides this function. Complete the following to determine if the wetland provides this function above or below a moderate level.

- Check box if any of the following conditions apply that may indicate the wetland provides this function at a *lower* level.
 - The wetland is small in size for its type and does not represent fugitive habitat in

9/14/2010

developed areas (vernal pools and seeps are generally small in size, so this does not apply).

- The surrounding land use is densely developed enough to limit use by wildlife species (with the exception of wetlands with open water habitat). Can be negated by evidence of use.
 - The current use in the wetland results in frequent cutting, mowing or other disturbance.
 - The wetland hydrology and character is at a drier end of the scale and does not support wetland dependent species.
- Check box if any of the following conditions apply that may indicate the wetland provides this function at a *higher* level.
- The wetland complex is large in size and high in quality.
 - The habitat has the potential to support several species based on the assessment above.
 - Wetland is associated with an important wildlife corridor.
 - The wetland has been identified by ANR-F&W as important habitat.

5. Exemplary Wetland Natural Community

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
- Wetlands that are identified as high quality examples of Vermont's natural community types recognized by the Natural Heritage Information Project of the Vermont Fish and Wildlife Department, including rare types such as dwarf shrub bogs, rich fens, alpine peatlands, red maple-black gum swamps and the more common types including deep bulrush marshes, cattail marshes, northern white cedar swamps, spruce-fir-tamarack swamps, and red maple-black ash seepage swamps are automatically significant for this function.

The wetland is also likely to be significant if any of the following conditions are met:

- Is an example of a wetland natural community type that has been identified and mapped by, or meets the ranking and mapping standards of, the Natural Heritage Information Project of the Vermont Fish and Wildlife Department.
- Contains ecological features that contribute to Vermont's natural heritage, including, but not limited to:
 - Deep peat accumulation reflecting a long history of wetland formation;
 - Forested wetlands displaying very old trees and other old growth characteristics;
 - A wetland natural community that is at the edge of the normal range for that type;

9/14/2010

- A wetland mosaic containing examples of several to many wetland community types; or
- A large wetland complex with examples of several wetland community types.

6. Rare, Threatened, and Endangered Species Habitat

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
 - Wetlands that contain one or more species on the federal or state threatened or endangered lists, as well as species that are rare in Vermont, are automatically significant for this function.

The wetland is also likely to be significant if any of the following apply:

 - There is credible documentation that the wetland provides important habitat for any species on the federal or state threatened or endangered species lists;
 - There is credible documentation that threatened or endangered species have been present in past 10 years;
 - There is credible documentation that the wetland provides important habitat for any species listed as rare in Vermont (S1 or S2 ranks), state historic (SH rank), or rare to uncommon globally (G1, G2, or G3 ranks) by the Natural Heritage Information Project of the Vermont Fish and Wildlife Department;
 - There is credible documentation that the wetland provides habitat for multiple uncommon species of plants or animals (S3 rank).

List name of species and ranking:

Adjacent grasslands provide habitat for Upland Sandpiper, Grasshopper Sparrow, Vesper Sparrow, and Whip-poor-will.

7. Education and Research in Natural Sciences

- Function is present and likely to be significant: Any of the following characteristics indicate the wetland provides this function.
 - Owned by or leased to a public entity dedicated to education or research.
 - History of use for education or research.
 - Has one or more characteristics making it valuable for education or research.

9/14/2010

8. Recreational Value and Economic Benefits

- Function is present and likely to be significant: Any of the following characteristics indicate the wetland provides this function.
 - Used for, or contributes to, recreational activities.
 - Provides economic benefits.
 - Provides important habitat for fish or wildlife which can be fished, hunted or trapped under applicable state law.
 - Used for harvesting of wild foods.

Comments:

9. Open Space and Aesthetics

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
 - Can be readily observed by the public; and
 - Possesses special or unique aesthetic qualities; or
 - Has prominence as a distinct feature in the surrounding landscape;
 - Has been identified as important open space in a municipal, regional or state plan.

10. Erosion Control through Binding and Stabilizing the Soil

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
 - Erosive forces such as wave or current energy are present and any of the following are present as well:
 - Dense, persistent vegetation along a shoreline or stream bank that reduces an adjacent erosive force.
 - Good interspersion of persistent emergent vegetation and water along course of water flow.
 - Studies show that wetlands of similar size, vegetation type, and hydrology are important for erosion control.

9/14/2010

What type of erosive forces are present?

- Lake fetch and waves
- High current velocities
- Water level influenced by upstream impoundment

If any of the above boxes are checked, the wetland provides this function. Complete the following to determine if the wetland provides this function above or below a moderate level.

- Check box if any of the following conditions apply that may indicate the wetland provides this function at a *lower* level.
 - The stream is artificially channelized and/or lacks vegetation that contributes to controlling the erosive force.
- Check box if any of the following conditions apply that may indicate the wetland provides this function at a *higher* level.
 - The stream contains high sinuosity.
 - Has been identified through fluvial geomorphic assessment to be important in maintaining the natural condition of the stream or river corridor.

VERMONT WETLAND EVALUATION FORM

Wetland 3

Project Name: Franklin County State Airport

Date: __12/13/2017 Investigator: __J. Fougere, TSA

SUMMARY OF FUNCTIONAL EVALUATION:

Each function gets a score of 0= not present; L = Low; P = Present; or H = High.

1. Water Storage for Flood Water and Storm Runoff <input type="text" value="H"/>	6. Rare, Threatened, and Endangered Species Habitat <input type="text" value="P"/>
2. Surface & Ground Water Protection <input type="text" value="H"/>	7. Education and Research in Natural Sciences <input type="text" value="0"/>
3. Fish Habitat <input type="text" value="P"/>	8. Recreational Value and Economic Benefits <input type="text" value="P"/>
4. Wildlife Habitat <input type="text" value="H"/>	9. Open Space and Aesthetics <input type="text" value="P"/>
5. Exemplary Wetland Natural Community <input type="text" value="0"/>	10. Erosion Control through Binding and Stabilizing the Soil <input type="text" value="P"/>

Note:

- **When to use this form:** This is a field form to help you compile data needed to evaluate the 10 possible functions and values of a wetland as described in the Vermont Wetland Rules. All information in this form is replicated in the applications for both wetland determinations and wetland permits.
- **Both a desktop review and field examination** should be employed to accurately determine surrounding land use, hydrology, hydroperiod, vegetation, position in the landscape, and physical attributes.
- **The entire wetland or wetland complex** in question must be evaluated to determine the level of function in all ten (10) categories for accurate classification. A wetland complex can be defined as a series of interconnected wetland types.
- **The surrounding upland and outflow area** of the wetland should be examined to determine land use, development, nearby natural resources, and hydrology. The surrounding land use, previous development, and cumulative impacts may play a role in the current function of the wetland. For best results please read all descriptions prior to scoring activity.
- **Evaluation:** The first portion in each section determines whether the wetland does or does not provide the function. If none of the conditions listed in the first section are met, proceed

9/14/2010

to the next section. If any of these conditions are met, determine if the wetland provides this function at a higher or lower level based on the information listed in the subsequent sections.

- **Presumptions:** Please note that many wetlands are already presumed to be significant under the Vermont Wetland Rules. A wetland is presumed to be significant if:
 - The wetland is mapped on the VSWI map
 - The wetland is contiguous to a VSWI mapped wetland
 - The wetland meets the presumptions of significance under Section 4.6
 - The wetland has a preliminary determination that it is Class II

1. Water Storage for Flood Water and Storm Runoff

Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.

- Constricted outlet or no outlet and an unconstricted inlet.
- Physical space for floodwater expansion and dense, persistent, emergent vegetation or dense woody vegetation that slows down flood waters or stormwater runoff during peak flows and facilitates water removal by evaporation and transpiration.
- If a stream is present, its course is sinuous and there is sufficient woody vegetation to intercept surface flows in the portion of the wetland that floods.
- Physical evidence of seasonal flooding or ponding such as water stained leaves, water marks on trees, drift rows, debris deposits, or standing water.
- Hydrologic or hydraulic study indicates wetland attenuates flooding.

If any of the above boxes are checked, the wetland provides this function. Complete the following to determine if the wetland provides this function above or below a moderate level:

Check box if any of the following conditions apply that may indicate the wetland provides this function at a *lower* level.

- Significant flood storage capacity upstream of the wetland, and the wetland in question provides this function at a negligible level in comparison to upstream storage (unless the upstream storage is temporary such as a beaver impoundment).
- Wetland is contiguous to a major lake or pond that provides storage benefits independently of the wetland.
- Wetland's storage capacity is created primarily by recent beaver dams or other temporary structures.
- Wetland is very small in size, not contiguous to a stream, and not part of a collection of small wetlands in the landscape that provide this function cumulatively.

Check box if any of the following conditions apply that may indicate the wetland provides this function at a *higher* level.

- History of downstream flood damage to public or private property.
- Any of the following conditions present downstream of the wetland, but upstream of a major lake or pond, could be impacted by a loss or reduction of the water storage function.
 - 1. Developed public or private property.
 - 2. Stream banks susceptible to scouring and erosion.
 - 3. Important habitat for aquatic life.

The wetland is large in size and naturally vegetated.

9/14/2010

- Any of the following conditions present upstream of the wetland may indicate a large volume of runoff may reach the wetland.
 - 1. A large amount of impervious surface in urbanized areas.
 - 2. Relatively impervious soils.
 - 3. Steep slopes in the adjacent areas.

2. Surface and Ground Water Protection

Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.

- Constricted or no outlets.
- Low water velocity through dense, persistent vegetation.
- Hydroperiod permanently flooded or saturated.
- Wetlands in depositional environments with persistent vegetation wider than 20 feet.
- Wetlands with persistent vegetation comprising a defined delta, island, bar or peninsula.
- Presence of seeps or springs.
- Wetland contains a high amount of microtopography that helps slow and filter surface water.
- Position in the landscape indicates the wetland is a headwaters area.
- Wetland is adjacent to surface waters.
- Wetland recharges a drinking water source.
- Water sampling indicates removal of pollutants or nutrients.
- Water sampling indicates retention of sediments or organic matter.
- Fine mineral soils and alkalinity not low.
- The wetland provides an obvious filter between surface water or ground water and land uses that may contribute point or nonpoint sources of sediments, toxic substances or nutrients to the wetland, such as: steep erodible slopes; row crops; dumps; areas of pesticide, herbicide or fertilizer application; feed lots; parking lots or heavily traveled road; and septic systems.

If any of the above boxes are checked, the wetland provides this function. Complete the following to determine if the wetland provides this function above or below a moderate level.

Check box if any of the following conditions apply that may indicate the wetland provides this function at a *lower* level.

- Presence of dead forest or shrub areas in sufficient amounts to result in diminished

9/14/2010

nutrient uptake.

- Presence of ditches or channels that confine water and restrict contact of water with vegetation.
 - Wetland is very small in size, not contiguous to a stream, and not part of a collection of small wetlands in the landscape that provide this function cumulatively.
 - Current use in the wetland results in disturbance that compromises this function.
- Check box if any of the following conditions apply that may indicate the wetland provides this function at a *higher* level.
- The wetland is adjacent to a well head or source protection area, and provides ground water recharge.
 - The wetland provides flows to Class A surface waters.
 - The wetland contributes to the protection or improvement of water quality of any impaired waters.
 - The wetland is large in size and naturally vegetated.

3. Fish Habitat

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
 - Contains woody vegetation that overhangs the banks of a stream or river and provides any of the following: shading that controls summer water temperature; cover including refuges created by overhanging branches or undercut banks; source of terrestrial insects as fish food; or streambank stability.
 - Provides spawning, nursery, feeding or cover habitat for fish (documented or professionally judged). Common habitat includes deep marsh and shallow marsh associates with lakes and streams, and seasonally flooded wetlands associated with streams and rivers.
 - Documented or professionally judged spawning habitat for northern pike.
 - Provides cold spring discharge that lowers the temperature of receiving waters and creates summer habitat for salmonoid species.
 - The wetland is located along a tributary that does not support fish, but contributes to a larger body of water that does support fish. The tributary supports downstream fish by providing cooler water, and food sources.

4. Wildlife Habitat

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
 - Provides resting, feeding staging or roosting habitat to support waterfowl migration, and feeding habitat for wading birds. Good habitats for these species include open water wetlands.
 - Habitat to support one or more breeding pairs or broods of waterfowl including all species of ducks, geese, and swans. Good habitats for these species include open water habitats adjacent shallow marsh, deep marsh, shrub wetland, forested wetland, or naturally vegetated buffer zone.
 - Provides a nest site, a buffer for a nest site or feeding habitat for wading birds including but not limited to: great blue heron, black-crowned night heron, green-backed heron, cattle egret, or snowy egret. Good habitats for these species include open water or deep marsh adjacent to forested wetlands, or standing dead trees.
 - Supports or has the habitat to support one or more breeding pairs of any migratory bird that requires wetland habitat for breeding, nesting, rearing of young, feeding, staging roosting, or migration, including: Virginia rail, common snipe, marsh wren, American bittern, northern water thrush, northern harrier, spruce grouse, Cerulean warbler, and common loon.
 - Supports winter habitat for white-tailed deer. Good habitats for these species include softwood swamps. Evidence of use includes deer browsing, bark stripping, worn trails, or pellet piles.
 - Provides important feeding habitat for black bear, bobcat, or moose based on an assessment of use. Good habitat for these types of species includes wetlands located in a forested mosaic.
 - Has the habitat to support muskrat, otter or mink. Good habitats for these species include deep marshes, wetlands adjacent to bodies of water including lakes, ponds, rivers and streams.
 - Supports an active beaver dam, one or more lodges, or evidence of use in two or more consecutive years by an adult beaver population.
 - Provides the following habitats that support the reproduction of Uncommon Vermont amphibian species including:
 - 1. Wood Frog, Jefferson Salamander, Blue-spotted Salamander, or Spotted Salamander. Breeding habitat for these species includes vernal pools and small ponds.
 - 2. Northern Dusky Salamander and the Spring Salamander. Habitat for these species includes headwater seeps, springs, and streams.
 - 3. The Four-toed salamander; Fowler's Toad; Western or Boreal Chorus frog, or other amphibians found in Vermont of similar significance.

9/14/2010

- Supports or has the habitat to support significant populations of Vermont amphibian species including, but not limited to Pickerel Frog, Northern Leopard Frog, Mink Frog, and others found in Vermont of similar significance. Good habitat for these types of species includes large marsh systems with open water components.
- Supports or has the habitat to support populations of uncommon Vermont reptile species including: Wood Turtle, Northern Map Turtle, Eastern Musk Turtle, Spotted Turtle, Spiny Softshell, Eastern Ribbonsnake, Northern Watersnake, and others found in Vermont of similar significance.
- Supports or has the habitat to support significant populations of Vermont reptile species, including Smooth Greensnake, DeKay's Brownsnake, or other more common wetland-associated species.
- Meets four or more of the following conditions indicative of wildlife habitat diversity:
 - 1. Three or more wetland vegetation classes (greater than 1/2 acre) present including but not limited to: open water contiguous to, but not necessarily part of, the wetland, deep marsh, shallow marsh, shrub swamp, forested swamp, fen, or bog;
 - 2. The dominant vegetation class is one of the following types: deep marsh, shallow marsh, shrub swamp or, forested swamp;
 - 3. Located adjacent to a lake, pond, river or stream;
 - 4. Fifty percent or more of surrounding habitat type is one or more of the following: forest, agricultural land, old field or open land;
 - 5. Emergent or woody vegetation occupies 26 to 75 percent of wetland, the rest is open water;
 - 6. One of the following:
 - i. hydrologically connected to other wetlands of different dominant classes or open water within 1 mile;
 - ii. hydrologically connected to other wetlands of same dominant class within 1/2 mile;
 - iii. within 1/4 mile of other wetlands of different dominant classes or open water, but not hydrologically connected;
- Wetland or wetland complex is owned in whole or in part by state or federal government and managed for wildlife and habitat conservation; and
- Contains evidence that it is used by wetland dependent wildlife species.

If any of the above boxes are checked, the wetland provides this function. Complete the following to determine if the wetland provides this function above or below a moderate level.

- Check box if any of the following conditions apply that may indicate the wetland provides this function at a *lower* level.
 - The wetland is small in size for its type and does not represent fugitive habitat in

9/14/2010

developed areas (vernal pools and seeps are generally small in size, so this does not apply).

- The surrounding land use is densely developed enough to limit use by wildlife species (with the exception of wetlands with open water habitat). Can be negated by evidence of use.
- The current use in the wetland results in frequent cutting, mowing or other disturbance.
- The wetland hydrology and character is at a drier end of the scale and does not support wetland dependent species.
- Check box if any of the following conditions apply that may indicate the wetland provides this function at a *higher* level.
 - The wetland complex is large in size and high in quality.
 - The habitat has the potential to support several species based on the assessment above.
 - Wetland is associated with an important wildlife corridor.
 - The wetland has been identified by ANR-F&W as important habitat.

5. Exemplary Wetland Natural Community

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
 - Wetlands that are identified as high quality examples of Vermont's natural community types recognized by the Natural Heritage Information Project of the Vermont Fish and Wildlife Department, including rare types such as dwarf shrub bogs, rich fens, alpine peatlands, red maple-black gum swamps and the more common types including deep bulrush marshes, cattail marshes, northern white cedar swamps, spruce-fir-tamarack swamps, and red maple-black ash seepage swamps are automatically significant for this function.

The wetland is also likely to be significant if any of the following conditions are met:

- Is an example of a wetland natural community type that has been identified and mapped by, or meets the ranking and mapping standards of, the Natural Heritage Information Project of the Vermont Fish and Wildlife Department.
- Contains ecological features that contribute to Vermont's natural heritage, including, but not limited to:
 - Deep peat accumulation reflecting a long history of wetland formation;
 - Forested wetlands displaying very old trees and other old growth characteristics;
 - A wetland natural community that is at the edge of the normal range for that type;

9/14/2010

- A wetland mosaic containing examples of several to many wetland community types; or
- A large wetland complex with examples of several wetland community types.

6. Rare, Threatened, and Endangered Species Habitat

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
 - Wetlands that contain one or more species on the federal or state threatened or endangered lists, as well as species that are rare in Vermont, are automatically significant for this function.

The wetland is also likely to be significant if any of the following apply:

 - There is credible documentation that the wetland provides important habitat for any species on the federal or state threatened or endangered species lists;
 - There is credible documentation that threatened or endangered species have been present in past 10 years;
 - There is credible documentation that the wetland provides important habitat for any species listed as rare in Vermont (S1 or S2 ranks), state historic (SH rank), or rare to uncommon globally (G1, G2, or G3 ranks) by the Natural Heritage Information Project of the Vermont Fish and Wildlife Department;
 - There is credible documentation that the wetland provides habitat for multiple uncommon species of plants or animals (S3 rank).

List name of species and ranking:

Adjacent grasslands provide habitat for Grasshopper sparrow, Eastern Whip-poor-will, Upland sandpiper, and Vesper Sparrow.

7. Education and Research in Natural Sciences

- Function is present and likely to be significant: Any of the following characteristics indicate the wetland provides this function.
 - Owned by or leased to a public entity dedicated to education or research.
 - History of use for education or research.
 - Has one or more characteristics making it valuable for education or research.

9/14/2010

8. Recreational Value and Economic Benefits

- Function is present and likely to be significant: Any of the following characteristics indicate the wetland provides this function.
 - Used for, or contributes to, recreational activities.
 - Provides economic benefits.
 - Provides important habitat for fish or wildlife which can be fished, hunted or trapped under applicable state law.
 - Used for harvesting of wild foods.

Comments:

9. Open Space and Aesthetics

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
 - Can be readily observed by the public; and
 - Possesses special or unique aesthetic qualities; or
 - Has prominence as a distinct feature in the surrounding landscape;
 - Has been identified as important open space in a municipal, regional or state plan.

10. Erosion Control through Binding and Stabilizing the Soil

- Function is present and likely to be significant: Any of the following physical and vegetative characteristics indicate the wetland provides this function.
 - Erosive forces such as wave or current energy are present and any of the following are present as well:
 - Dense, persistent vegetation along a shoreline or stream bank that reduces an adjacent erosive force.
 - Good interspersion of persistent emergent vegetation and water along course of water flow.
 - Studies show that wetlands of similar size, vegetation type, and hydrology are important for erosion control.

9/14/2010

What type of erosive forces are present?

- Lake fetch and waves
- High current velocities
- Water level influenced by upstream impoundment

If any of the above boxes are checked, the wetland provides this function. Complete the following to determine if the wetland provides this function above or below a moderate level.

- Check box if any of the following conditions apply that may indicate the wetland provides this function at a *lower* level.
 - The stream is artificially channelized and/or lacks vegetation that contributes to controlling the erosive force.
- Check box if any of the following conditions apply that may indicate the wetland provides this function at a *higher* level.
 - The stream contains high sinuosity.
 - Has been identified through fluvial geomorphic assessment to be important in maintaining the natural condition of the stream or river corridor.

Appendix D

Photo Log

**Franklin County State Airport
Photo Log**



Wetland 1, looking east to marsh.
Photo taken November 7, 2017



Wetland 1, stream portion downstream of eastern marsh, just north of Runway 19.
Photo taken November 7, 2017

**Franklin County State Airport
Photo Log**



Wetland 1, typical hummocky area north of stream
Photo taken on November 7, 2017



Wetland 2, west side looking southeast.
Photo taken on November 7, 2017

**Franklin County State Airport
Photo Log**



Wetland 2. East side looking southwest.
Photo taken on November 7, 2017



Wetland 3, at western edge of mowed airfield. Wetland occurs in interior of woods at this location.
Photo taken on November 7, 2017

**Franklin County State Airport
Photo Log**



Upland field east of Airport Road. Proposed location of hangar development.
Photo taken on November 3, 2017



Northern limit of Runway 19 Runway Safety Area, looking west.
Photo taken on November 3, 2017

Appendix E

Wetland Delineation Field Maps



WETLAND 1
(Class II)

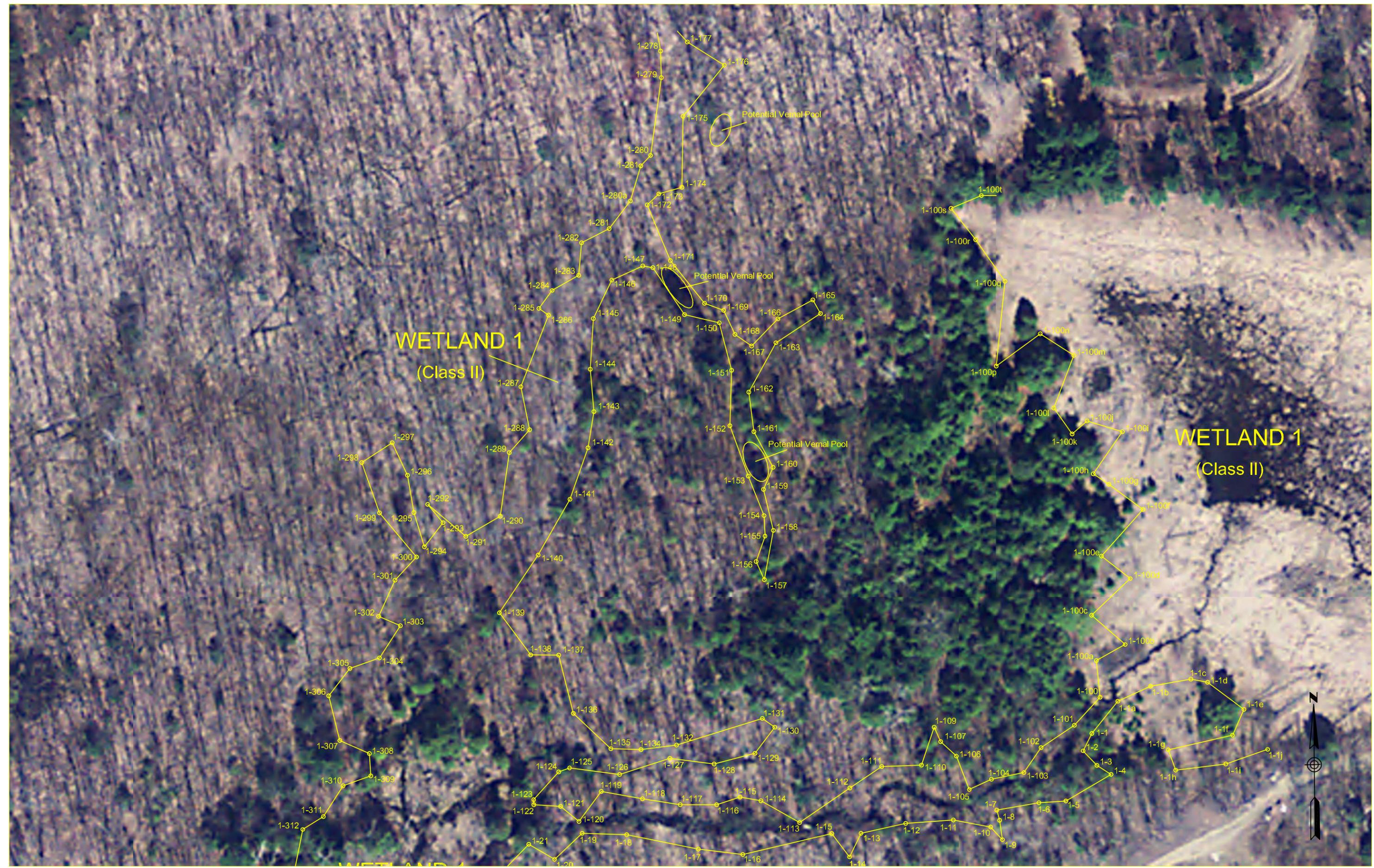
WETLAND 2
(Class III)

WETLAND 3
(Class II)



WETLAND 1
(Class II)

WETLAND 1
(Class II)



WETLAND 1
(Class II)

WETLAND 1
(Class II)





WETLAND 2
(Class III)

WETLAND 2
(Class III)

2-101
2-102
2-100
2-104
2-103

2-15
2-14
2-16
2-17
2-18
2-11
2-12
2-10
2-9
2-8
2-7
2-6
2-5
2-4
2-3
2-2
2-1
2-19
DP-2 wet
DP-2 up





WETLAND 3
(Class II)





WETLAND 3
(Class II)



The Smart Associates
Environmental Consultants, Inc.

MEMORANDUM

TO: Lisa Cheung, Passero
FROM: Jim Fougere
DATE: June 21, 2018
SUBJECT: Franklin County State Airport
Gravel Pit Review

This memo describes the results of the review of potential wetland resources found within the limits of the gravel pit located adjacent to Franklin County State Airport in Highgate, Vermont. The specific area of the review is defined on the figure, Overall Site Plan, Airport Technology Park, Cross Consulting Engineers, Inc. (Date: 3/16/18), attached with this memo.

The Smart Associates, Environmental Consultants, Inc. (The Smart Associates) walked over the boundaries of the parcel, as well as traversing the parcel interior on an east/west bearing approximately every 75 feet. The presence of wetlands offsite to the north was also confirmed for planning purposes, although not flagged. These wetlands occur at an elevation 10-15 feet below the gravel pit.

The following sections provide a summary of the wetland delineation methodology and the wetland resources identified within the limits of the project study area.

METHODOLOGY

The Smart Associates used the methodology outlined in the *U.S. Army Corps of Engineers Wetland Delineation Manual* (ACOE, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0* (ACOE, 2012) when reviewing site conditions on June 19, 2018.

Prior to conducting the field work, The Smart Associates reviewed existing information and maps including Vermont Wetland Maps (VSWI), USFWS Wetland Inventory (NWI) Maps and the Natural Resources Conservation Service (NRCS) web soil survey to obtain background information on the project study area.

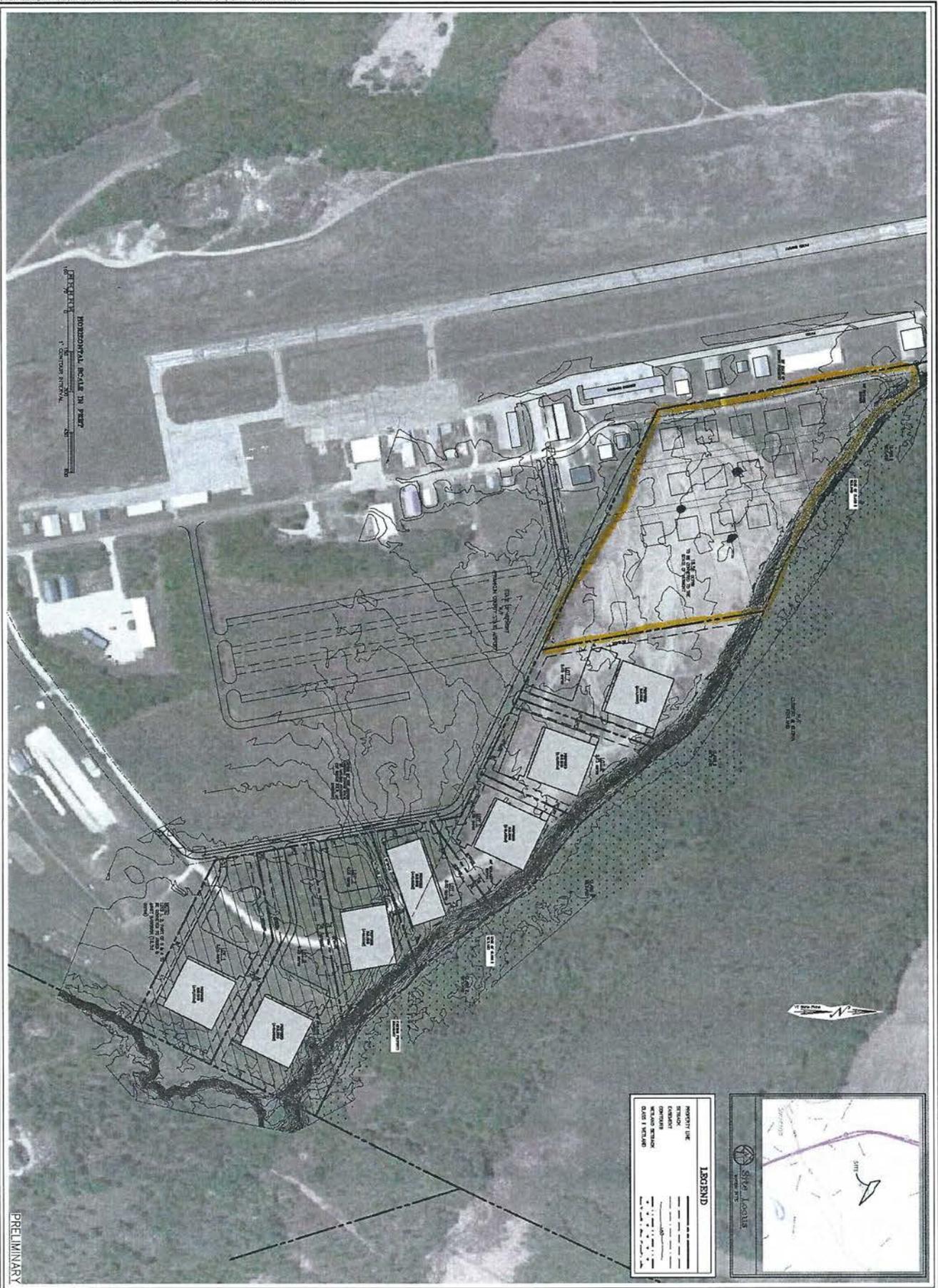
FINDINGS

The property is an open area of previous gravel excavation and is generally flat with gravel piles at several locations across the site. Vegetation is scattered with patches of bare ground. Plants were generally non-wetland in nature, such as sweet fern (*Comptonia peregrina*), evening primrose (*Oenothera parviflora*) and whorled yellow loosestrife (*Lysimachia quadrifolia*), all upland species. In addition, most areas also had various grass species.

No wetlands were identified in study area. To confirm these findings, three separate data points were dug and examined. These sheets are provided in Appendix B.

A photo log illustrating the site conditions are included in Appendix C.

APPENDIX A
FIGURES



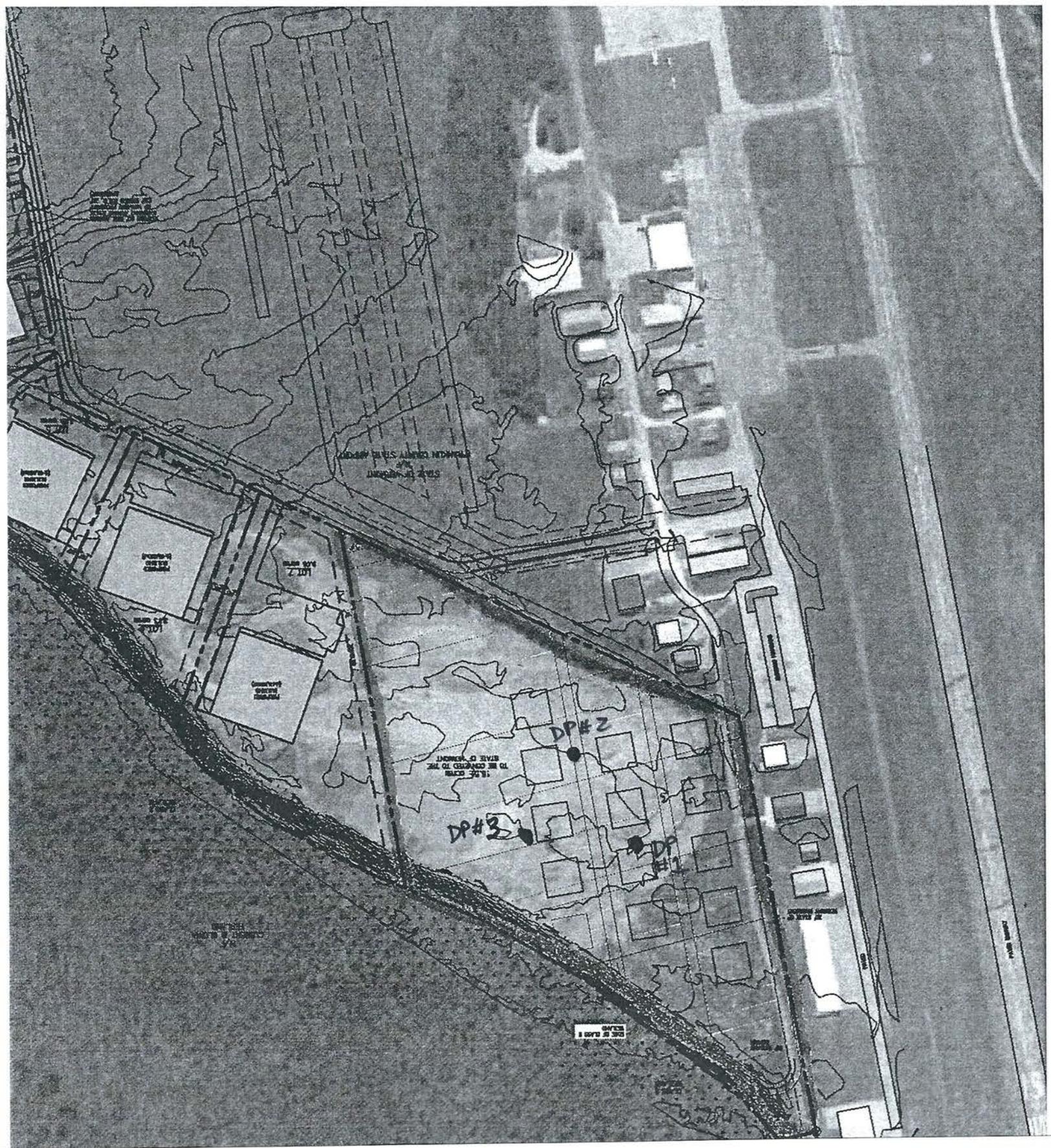
C-1
CIVIL

James & Janet Harrison
Georgia, VT
Airport Technology Park
Airport Rd. Highgate, VT

Overall Site Plan

CFE CROSS
CONSULTING ENGINEERS, P.C.
107 Factory St.
St. Albans, Vermont 05478
Tel: 802-249-1111
Fax: 802-249-1112

PROJECT: 13039
DATE: 3/16/2018
DESIGN: PIG
DRAWN: NRB
CHECKED: PHC
APPROVED: PHC



Location of Wetland Data Points in Gravel Pit

DP #1 = Data Point 1

DP #2 = Data Point 2

DP #3 = Data Point 3

APPENDIX B
WETLAND DAT SHEETS

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Franklin County State Airport City/County: Highgate/Franklin Sampling Date: 6/19/2018
 Applicant/Owner: Vermont AOT, Aviation State: VT Sampling Point: DP #1
 Investigator(s): J. Fougere, TSA Section, Township, Range: _____
 Landform (hillside, terrace, etc.): gravel pit Local relief (concave, convex, none): concave Slope (%): 0-3
 Subregion (LRR or MLRA): LRR R, MLRA 142 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Missisquoi loamy sand & Windsor loamy fine sand NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 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 <u>X</u> Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) _____ Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ 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 <u>x</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>x</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>x</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: 	
Remarks: No evidence of standing water except at a few low spots but general conditon of site is lacking evidence of hydrology	

VEGETATION – Use scientific names of plants.

Sampling Point: DP #1

	Absolute % Cover	Dominant Species?	Indicator Status																	
Tree Stratum (Plot size: <u>30</u>)				<p>Dominance Test worksheet:</p> <p>Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)</p> <p>Total Number of Dominant Species Across All Strata: <u>2</u> (B)</p> <p>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.0%</u> (A/B)</p> <p>Prevalence Index worksheet:</p> <table style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>2</u></td> <td>x 2 = <u>4</u></td> </tr> <tr> <td>FAC species <u>4</u></td> <td>x 3 = <u>12</u></td> </tr> <tr> <td>FACU species <u>5</u></td> <td>x 4 = <u>20</u></td> </tr> <tr> <td>UPL species <u>12</u></td> <td>x 5 = <u>60</u></td> </tr> <tr> <td>Column Totals: <u>23</u> (A)</td> <td><u>96</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align:center;">Prevalence Index = B/A = <u>4.17</u></td> </tr> </table> <p>Hydrophytic Vegetation Indicators:</p> <p><u> </u> 1 - Rapid Test for Hydrophytic Vegetation</p> <p><u> </u> 2 - Dominance Test is >50%</p> <p><u> </u> 3 - Prevalence Index is ≤3.0¹</p> <p><u> </u> 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)</p> <p><u> </u> Problematic Hydrophytic Vegetation¹ (Explain)</p> <p>¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p> <p>Definitions of Vegetation Strata:</p> <p>Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.</p> <p>Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.</p> <p>Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</p> <p>Woody vines – All woody vines greater than 3.28 ft in height.</p> <p>Hydrophytic Vegetation Present? Yes <u> </u> No <u> X </u></p>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>2</u>	x 2 = <u>4</u>	FAC species <u>4</u>	x 3 = <u>12</u>	FACU species <u>5</u>	x 4 = <u>20</u>	UPL species <u>12</u>	x 5 = <u>60</u>	Column Totals: <u>23</u> (A)	<u>96</u> (B)	Prevalence Index = B/A = <u>4.17</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>2</u>	x 2 = <u>4</u>																			
FAC species <u>4</u>	x 3 = <u>12</u>																			
FACU species <u>5</u>	x 4 = <u>20</u>																			
UPL species <u>12</u>	x 5 = <u>60</u>																			
Column Totals: <u>23</u> (A)	<u>96</u> (B)																			
Prevalence Index = B/A = <u>4.17</u>																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
			=Total Cover																	
Sapling/Shrub Stratum (Plot size: <u>20</u>)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
			=Total Cover																	
Herb Stratum (Plot size: <u>5</u>)																				
1. <u>Juncus tenuis</u>	<u>2</u>	<u>No</u>	<u>FAC</u>																	
2. <u>Potentilla recta</u>	<u>2</u>	<u>No</u>	<u>UPL</u>																	
3. <u>Solidago gigantea</u>	<u>2</u>	<u>No</u>	<u>FACW</u>																	
4. <u>Euthamia graminifolia</u>	<u>2</u>	<u>No</u>	<u>FAC</u>																	
5. <u>Comptonia peregrina</u>	<u>10</u>	<u>Yes</u>	<u>UPL</u>																	
6. <u>Oenothera biennis</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
			<u>23</u> =Total Cover																	
Woody Vine Stratum (Plot size: _____)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
			=Total Cover																	

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

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Franklin County State Airport City/County: Highgate/Franklin Sampling Date: 6/19/2018
 Applicant/Owner: Vermont AOT, Aviation State: VT Sampling Point: DP #2
 Investigator(s): J. Fougere, TSA Section, Township, Range: _____
 Landform (hillside, terrace, etc.): gravel pit Local relief (concave, convex, none): concave Slope (%): 0-3
 Subregion (LRR or MLRA): LRR R, MLRA 142 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Missisquoi loamy sand & Windsor loamy fine sand NWI classification: NA

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 <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
--	--

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
---	---

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

Remarks:
 No evidence of standing water across the site. General condition of site is lacking evidence of hydrology

VEGETATION – Use scientific names of plants.

Sampling Point: DP #2

	Absolute % Cover	Dominant Species?	Indicator Status																	
Tree Stratum (Plot size: <u>30</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0.0%</u> (A/B) Prevalence Index worksheet: <table style="width:100%; border:none;"> <tr> <td style="width:50%; text-align:center;">Total % Cover of:</td> <td style="width:50%; text-align:center;">Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>2</u></td> <td>x 3 = <u>6</u></td> </tr> <tr> <td>FACU species <u>8</u></td> <td>x 4 = <u>32</u></td> </tr> <tr> <td>UPL species <u>13</u></td> <td>x 5 = <u>65</u></td> </tr> <tr> <td>Column Totals: <u>23</u> (A)</td> <td><u>103</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align:center;">Prevalence Index = B/A = <u>4.48</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>2</u>	x 3 = <u>6</u>	FACU species <u>8</u>	x 4 = <u>32</u>	UPL species <u>13</u>	x 5 = <u>65</u>	Column Totals: <u>23</u> (A)	<u>103</u> (B)	Prevalence Index = B/A = <u>4.48</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>0</u>	x 2 = <u>0</u>																			
FAC species <u>2</u>	x 3 = <u>6</u>																			
FACU species <u>8</u>	x 4 = <u>32</u>																			
UPL species <u>13</u>	x 5 = <u>65</u>																			
Column Totals: <u>23</u> (A)	<u>103</u> (B)																			
Prevalence Index = B/A = <u>4.48</u>																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
			=Total Cover																	
Sapling/Shrub Stratum (Plot size: <u>20</u>)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
			=Total Cover																	
Herb Stratum (Plot size: <u>5</u>)																				
1. <u>Lysimachia quadrifolia</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>																	
2. <u>Potentilla recta</u>	<u>3</u>	<u>No</u>	<u>UPL</u>																	
3. <u>Rubus idaeus</u>	<u>3</u>	<u>No</u>	<u>FACU</u>																	
4. <u>Betula populifolia</u>	<u>2</u>	<u>No</u>	<u>FAC</u>																	
5. <u>Comptonia peregrina</u>	<u>10</u>	<u>Yes</u>	<u>UPL</u>																	
6. _____	_____	_____	_____																	
7. <u>Graminae spp.</u>	<u>2</u>	<u>No</u>	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
			<u>25</u> =Total Cover																	
Woody Vine Stratum (Plot size: _____)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
			=Total Cover																	
Hydrophytic Vegetation Present? Yes _____ No <u>X</u>																				

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

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Franklin County State Airport City/County: Highgate/Franklin Sampling Date: 6/19/2018
 Applicant/Owner: Vermont AOT, Aviation State: VT Sampling Point: DP #3
 Investigator(s): J. Fougere, TSA Section, Township, Range: _____
 Landform (hillside, terrace, etc.): gravel pit Local relief (concave, convex, none): concave Slope (%): 0-3
 Subregion (LRR or MLRA): LRR R, MLRA 142 Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: Missisquoi loamy sand & Windsor loamy fine sand NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
 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 <u>X</u> Hydric Soil Present? Yes _____ No <u>X</u> Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Water-Stained Leaves (B9) _____ High Water Table (A2) _____ Aquatic Fauna (B13) _____ Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Drift Deposits (B3) _____ Presence of Reduced Iron (C4) _____ Algal Mat or Crust (B4) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Iron Deposits (B5) _____ Thin Muck Surface (C7) _____ Inundation Visible on Aerial Imagery (B7) _____ Other (Explain in Remarks) _____ Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ 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 <u>x</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>x</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>x</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: 	
Remarks: No evidence of standing water except at a few low spots but general conditon of site is lacking evidence of hydrology.	

VEGETATION – Use scientific names of plants.

Sampling Point: DP #3

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30</u>)				
1.				
2.				
3.				
4.				
5.				
6.				
7.				
		=Total Cover		
Sapling/Shrub Stratum (Plot size: <u>20</u>)				
1.				
2.				
3.				
4.				
5.				
6.				
7.				
		=Total Cover		
Herb Stratum (Plot size: <u>5</u>)				
1.	<u>Graminae spp.</u>	<u>5</u>	<u>Yes</u>	
2.	<u>Potentilla recta</u>	<u>3</u>	<u>No</u>	<u>UPL</u>
3.	<u>Solidago juncea</u>	<u>2</u>	<u>No</u>	<u>UPL</u>
4.	<u>Solidago rugosa</u>	<u>3</u>	<u>No</u>	<u>FAC</u>
5.	<u>Comptonia peregrina</u>	<u>5</u>	<u>Yes</u>	<u>UPL</u>
6.	<u>Lysimachia quadrifolia</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>
7.	<u>Muhlenbergia schreberi</u>	<u>3</u>	<u>No</u>	<u>FAC</u>
8.				
9.				
10.				
11.				
12.				
		<u>26</u>	=Total Cover	
Woody Vine Stratum (Plot size: _____)				
1.				
2.				
3.				
4.				
			=Total Cover	

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>6</u>	x 3 = <u>18</u>
FACU species <u>5</u>	x 4 = <u>20</u>
UPL species <u>10</u>	x 5 = <u>50</u>
Column Totals: <u>21</u> (A)	<u>88</u> (B)
Prevalence Index = B/A = <u>4.19</u>	

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0¹

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

 Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Vegetation Strata:

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

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

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

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No X

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

APPENDIX C
PHOTO LOG

**Franklin County State Airport
Gravel Pit Photo Log**



Photo 1: Center of site looking northeast.
Photo taken June 19, 2018



Photo 2: Southwestern edge of site looking east.
Photo taken June 19, 2018

**Franklin County State Airport
Gravel Pit Photo Log**



Photo 3: Typical vegetative cover in pit.
Photo taken on June 19, 2018



Photo 4: Northern portion of site looking north east.
Photo taken on June 19, 2018.

The Smart Associates
Environmental Consultants, Inc.

MEMORANDUM

TO: Lisa Cheung, Passero
Mark Ferguson, VT Fish and Wildlife

FROM: Jim Fougere

DATE: APRIL 30, 2018

SUBJECT: Franklin County State Airport, Vernal Pool Site Review with VT Fish and Game

An on-site meeting was held with the Vermont Fish and Wildlife representatives to review the wetlands previously identified as potential vernal pool habitat located at Franklin County State Airport.

Attendees:

- Mark Ferguson, Vermont Department of Fish and Wildlife
- Noel Dodge, Vermont Department of Fish and Wildlife
- Jim Fougere, The Smart Associates (TSA)

Project Overview

The meeting started outside the Airport's terminal building with the purpose of generally discussing the proposed projects at the airport especially the tree clearing in the vicinity of the potential vernal pools which were identified during the field delineation and review by Brock Freyer of Vermont ANR. The vernal pools are located in the general area north of Runway 19, a low area in the landscape which will be reviewed for potential tree obstructions within the runway approach surfaces. The three specific areas identified as potential vernal pools are located approximately 1300 to 1600 feet north of the end of Runway 19 pavement.

These vernal pools occur within the wetland community identified as Wetland 1 during the 2017 field delineation. These pool areas were noted as occurring adjacent to the following wetland flags, 1-49, 1-53, and 1-75. This community also includes Youngman Brook which flows from east to west, as well as a large marsh on the east side of the study area and a large scrub-shrub wetland on the west side of the study area. These wetlands include two Significant Natural Communities which were identified on mapping by the Vermont Natural Heritage program as occurring outside the limits of the project study area.

Findings

Field conditions at the time of the site visit were very wet with significant rainfall occurring over the previous 12 hours. The resulting field conditions included swollen conditions at Youngman Brook and throughout the site. The three potential vernal pools were approached from the south with the initial condition of the pools deemed to be very good with water depths general ranging from 1-3 feet in the three pools. Debris noted in the pools was small in size and primarily on the north end of the pool. No downed limbs or shrubs occurred in the pool.

The following findings were noted:

- **Vernal Pool 1 (southern most)** was thoroughly reviewed. No evidence of egg masses or other typical evidence of vernal species was noted in the pool.
- **Vernal Pool 2 (middle pool)**. This pool lies within 50 feet of pool 1 with the two hydrologically connected during high runoff periods with flow carried from pool 1 to pool 2. Findings in Vernal Pool 2 were similar to vernal pool 1. No evidence of egg masses or other vernal pool indicators.
- **Vernal Pool 3 (northern most)**. This pool was significantly smaller than Pool 1 and 2, at the time of the site visit. Pool 3 is also located higher in the landscape than Pools 1 and 2. Depth of water was more typically ½ foot deep. No evidence of vernal pool species was noted in this pool as well.

Action Items Despite the appearance that these three pools were capable of providing excellent habitat for vernal pool species, no evidence was noted in the field. The lack of evidence in these pool areas was not expected to be associated with the timing of the site visit since other pools in the general area were reported to be active by Noel Dodge of Vt Fish and Wildlife.

Although no evidence existed confirming that vernal pool species were utilizing these pools, they will be assumed to be potential vernal pools when examining the impact of the clearing of tree obstructions off Runway 19. Any potential issues will be considered once available but it was noted that most trees in the area around the pools were evenly aged and similar in size so how this will impact the pool area will have to be examined as the project progresses.

Distribution:

All attendees

VTrans, Lisa Cheung(Passero)



View of Vernal Pool 1
West side looking N
Photo taken on 4/30/18



View north of Vernal
Pool 2
North end looking S
Photo taken on 4/30/18



Vernal Pool 3
West side facing E
Photo taken on
4/30/18

**US Army Corps of Engineers - New England District
DRAFT Vernal Pool Characterization Form**

Project File # _____ Project Name Franklin County State Airport IFA Pool ID 1
Observer J. Fougere (The Smart Associates) + Noel Dodge & Mark Ferguson (VT F&W) Phone or E-mail 603-224-7550
Landowner/Applicant Vermont AOT, Aviation Phone or E-mail _____
Address _____ City _____ State _____ Zip _____
Location of vernal pool: City/State Highgate, Vermont
Survey date(s) 1/30/2012
Longitude/Latitude (in decimal degrees) _____

A. VERNAL POOL CHARACTERISTICS (fill in all information known):

1. Landscape setting (check all that apply):

- Upland depression (4 pts; if this is also in a floodplain, use 2 pts) Pool part of wildlife corridor (4 pts)
 Pool part of a pool complex (within 1000 feet of one or more other vernal pools) (NA)
 Pool within larger wetland system (4 pts; if this is also in a floodplain, use 2 pts) Other: _____ (variable pts)

2. Vernal pool condition:

Describe any recent modifications to the pool and associated landscape: Area around pools has had little disturbance in the last 25 years

3. Parent material:

- Glacial fluvial ("outwash") Loose till Peat
 Dense till Alluvium Coastal marine sediments

4. Aquatic resource type that best applies to this pool (choose dominant):

- Forested wetland (4 pts) Herbaceous wetland (4 pts) Floodplain (overflow/oxbow) (3 pts)
 Shrub wetland (4 pts) Open water (2 pts) Other: _____ (variable points)
 Peatland (acidic fen or bog) (4 pts) Intermittent stream reach (2 pts)

5. Pool canopy cover (%): 90+

6. Predominant substrate:

- Mineral soil
 Organic matter (peat/muck) Depth <6" Sampling location (e.g., deepest zone, edge, etc.) edge

7. Pool size:

- a. Approximate dimensions of pool (at maximum capacity; include units): Length 80 Width 30
Area: _____
b. Maximum depth at deepest point at time of survey (include units): 3'-1"

8. Hydrology:

a. Estimated hydroperiod (unless actual, observed hydroperiod value(s) is(are) known, use the presence of these example indicator species to best predict the expected hydroperiod of the pool):

- Dries between early March and early July (e.g., *Thelypteris palustris*, *Carex stricta*, *Impatiens capensis*, *Ilex verticillata*) (6 pts)
 Dries between early July and early September (e.g., *Sagittaria latifolia*, *Scirpus cyperinus*, *Dulichium arund.*, *Cephalanthus occ.*) (8 pts)
 Dries between early September and early November (e.g., *Eleocharis palustris*, *Glyceria cana.*, *Utricularia spp.*, *Decodon vert.*) (8 pts)
 Dries between early November and late December, or intermittently exposed (e.g., *Nuphar spp.*, *Potamogeton spp.*) (2 pts)

b. Inlet/outlet (pick one):

- No inlet/outlet (8 pts) Permanent inlet or outlet (channel with well-defined banks and permanent flow) (2 pts)
 Temporary inlet/outlet (6 pts) Flow into and out of wetland during periods of runoff

9. Water quality:

- Clear w/ slight coloration High turbidity High algae content Tannic

22 TOTAL for Pool Characteristics (out of 28 max.)

B. VERNAL POOL ENVELOPE (100 ft) AND CRITICAL HABITAT AREA (100-750 ft) CHARACTERISTICS (fill in all information known):

1. Landuse type and approximate percentage within the 100-ft vernal pool envelope:

- Forested 90% % (16 pts) Open (e.g., meadow, agriculture, golf course) _____ % (4 pts)
 Shrub _____ % (10 pts) Developed _____ % (0 pts)

2. Landuse type and approximate percentage within the 100 - 750-ft vernal pool critical terrestrial habitat:

- Forested 75% % (16 pts) Open (e.g., agriculture, golf course) emergent 25 % (4 pts)
 Shrub _____ % (10 pts) Developed _____ % (0 pts)

Are there one or more barriers to vernal pool fauna movement within the envelope and/or critical terrestrial habitat? If so, check here and see directions for explanation of how to incorporate this information.

Based on: Field estimate GIS Aerial photo estimate

32 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area (out of 32 max.)**

C. SPECIES PRESENT IN VERNAL POOL

INDICATOR SPECIES	DATE	EGG MASSES (#)	TADPOLES/LARVAE
Wood Frog (<i>Lithobates sylvaticus</i>)	<u>4/30/19</u>	<u>None</u>	<u>None</u>
Spotted Salamander (<i>Ambystoma maculatum</i>)	<u>4/30/19</u>	↓	↓
Blue-spotted Salamander (<i>Ambystoma laterale</i>)	↓	↓	↓
Jefferson's Salamander (<i>Ambystoma jeffersonianum</i>)	↓	↓	↓
Marbled Salamander (<i>Ambystoma opacum</i>)	↓	↓	↓
Fairy Shrimp (<i>Eubranchipus</i> spp.)		PRESENT/ABSENT	ABUNDANCE:
OTHER SPECIES	DATE	PRESENCE/ABSENCE	FEW/COMMON/MANY
Facultative Species (e.g., Spring Peeper (<i>Pseudacris crucifer</i>), Gray Tree Frog (<i>Hyla versicolor</i>), Caddisflies (Limnephilidae, Phryganeidae), American Toad (<i>Anaxyrus americanus</i>), Eastern Spadefoot Toad (<i>Scaphiopus holbrookii</i>), Fowler's Toad (<i>Anaxyrus fowleri</i>), Fingernail Clams (Sphaeriidae, Pisidiidae))(list):		<u>NA</u>	<u>NA</u>
Rare Species (list): _____			
Predator Species (e.g., Bullfrog/Green frog tadpoles, Fish) (list): _____			
Other species (e.g., Ducks, Turtles, etc.)(list): _____			

Presence of Indicator Species

Yes No

No evidence noted. Everyone agreed that vernal pools are not likely to use pool 1 for some unknown reason.

SUMMARY:

22 **TOTAL for Pool Characteristics** 32 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area**

Other comments (append photographs, additional notes, sketch of pool and surrounding landscape):

Pool 1 & 2 very similar to each other. Pool 1 flows into Pool 2 during periods of run off.

US Army Corps of Engineers - New England District
DRAFT Vernal Pool Characterization Form

Project File # _____ Project Name Franklin County State Airport EA Pool ID 2
Observer J. Foye (TSA), Noel Dodge & Mark Ferguson (VT Fish & Wildlife) Phone or E-mail 603-724-7550
Landowner/Applicant Vermont AOT, Aviation Phone or E-mail _____
Address _____ City _____ State _____ Zip _____
Location of vernal pool: City/State Highgate, Vermont
Survey date(s) 4/30/2013
Longitude/Latitude (in decimal degrees) _____

A. VERNAL POOL CHARACTERISTICS (fill in all information known):

1. Landscape setting (check all that apply):

- Upland depression (4 pts; if this is also in a floodplain, use 2 pts) Pool part of wildlife corridor (4 pts)
 Pool part of a pool complex (within 1000 feet of one or more other vernal pools) (NA)
 Pool within larger wetland system (4 pts; if this is also in a floodplain, use 2 pts) Other: _____ (variable pts)

2. Vernal pool condition:

Describe any recent modifications to the pool and associated landscape: Limited disturbance of area in the last 25 years

3. Parent material:

- Glacial fluvial ("outwash") Loose till Peat
 Dense till Alluvium Coastal marine sediments

4. Aquatic resource type that best applies to this pool (choose dominant):

- Forested wetland (4 pts) Herbaceous wetland (4 pts) Floodplain (overflow/oxbow) (3 pts)
 Shrub wetland (4 pts) Open water (2 pts) Other: _____ (variable points)
 Peatland (acidic fen or bog) (4 pts) Intermittent stream reach (2 pts)

5. Pool canopy cover (%): 90+

6. Predominant substrate:

- Mineral soil
 Organic matter (peat muck) Depth <6" Sampling location (e.g., deepest zone, edge, etc.) _____

7. Pool size:

- a. Approximate dimensions of pool (at maximum capacity; include units): Length 90' Width 30'
Area: _____
b. Maximum depth at deepest point at time of survey (include units): 3'-4'

8. Hydrology:

a. Estimated hydroperiod (unless actual, observed hydroperiod value(s) is(are) known, use the presence of these example indicator species to best predict the expected hydroperiod of the pool):

- Dries between early March and early July (e.g., *Thelypteris palustris*, *Carex stricta*, *Impatiens capensis*, *Ilex verticillata*) (6 pts)
 Dries between early July and early September (e.g., *Sagittaria latifolia*, *Scirpus cyperinus*, *Dulichium arund.*, *Cephalanthus occ.*) (8 pts)
 Dries between early September and early November (e.g., *Eleocharis palustris*, *Glyceria cana*, *Utricularia spp.*, *Decodon vert.*) (8 pts)
 Dries between early November and late December, or intermittently exposed (e.g., *Nuphar spp.*, *Potamogeton spp.*) (2 pts)

b. Inlet/outlet (pick one):

- No inlet/outlet (8 pts) Permanent inlet or outlet (channel with well-defined banks and permanent flow) (2 pts)
 Temporary inlet/outlet (6 pts) pool is in wetland with gradient. Flow into and out of wetland occurs during periods of run off.

9. Water quality:

- Clear w/ slight coloration High turbidity High algae content Tannic

22 TOTAL for Pool Characteristics (out of 28 max.)

B. VERNAL POOL ENVELOPE (100 ft) AND CRITICAL HABITAT AREA (100-750 ft) CHARACTERISTICS (fill in all information known):

1. Landuse type and approximate percentage within the 100-ft vernal pool envelope:

- Forested 90% % (16 pts) Open (e.g., meadow, agriculture, golf course) _____ % (4 pts)
 Shrub _____ % (10 pts) Developed _____ % (0 pts)

2. Landuse type and approximate percentage within the 100 - 750-ft vernal pool critical terrestrial habitat:

- Forested 75% % (16 pts) Open (e.g., agriculture, golf course) Emergent wet ²⁵ % (4 pts)
 Shrub _____ % (10 pts) Developed _____ % (0 pts)

Are there one or more barriers to vernal pool fauna movement within the envelope and/or critical terrestrial habitat? If so, check here and see directions for explanation of how to incorporate this information.

Based on: Field estimate GIS Aerial photo estimate

32 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area (out of 32 max.)**

C. SPECIES PRESENT IN VERNAL POOL

INDICATOR SPECIES	DATE	EGG MASSES (#)	TADPOLES/LARVAE
Wood Frog (<i>Lithobates sylvaticus</i>)	4/30/13	None	None
Spotted Salamander (<i>Ambystoma maculatum</i>)	↓	↓	↓
Blue-spotted Salamander (<i>Ambystoma laterale</i>)	↓	↓	↓
Jefferson's Salamander (<i>Ambystoma jeffersonianum</i>)	↓	↓	↓
Marbled Salamander (<i>Ambystoma opacum</i>)	↓		
Fairy Shrimp (<i>Eubbranchipus</i> spp.)		PRESENT/ABSENT	ABUNDANCE:
OTHER SPECIES	DATE	PRESENCE/ABSENCE	FEW/Common/MANY
Facultative Species (e.g., Spring Peeper (<i>Pseudacris crucifer</i>), Gray Tree Frog (<i>Hyla versicolor</i>), Caddisflies (Limnephilidae, Phryganeidae), American Toad (<i>Anaxyrus americanus</i>), Eastern Spadefoot Toad (<i>Scaphiopus holbrookii</i>), Fowler's Toad (<i>Anaxyrus fowleri</i>), Fingernail Clams (Sphaeriidae, Pisidiidae))(list):	4/30/13	NA	NA

Rare Species (list): _____			

Predator Species (e.g., Bullfrog/Green frog tadpoles, Fish) (list): _____			

Other species (e.g., Ducks, Turtles, etc.)(list): _____			

Presence of Indicator Species

Yes No

SUMMARY: No evidence noted. Party agreed that vernal pool species unlikely to use pool 2 for some unknown reason.

_____ **TOTAL for Pool Characteristics** _____ **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area**

Other comments (append photographs, additional notes, sketch of pool and surrounding landscape):

Pool 1 & 2 very similar to each other and in close proximity

**US Army Corps of Engineers - New England District
DRAFT Vernal Pool Characterization Form**

Project File # _____ Project Name Franklin County State Airport FA Pool ID 3 (Northernmost)
Observer J. Foye (TSA) Noel Dodge & Mark Ferguson (Ut Fish & Wildlife) Phone or E-mail 603-224-7550
Landowner/Applicant Vermont AOT, Aviation Phone or E-mail _____
Address _____ City _____ State _____ Zip _____
Location of vernal pool: City/State Highgate, Vermont
Survey date(s) 1/30/2018
Longitude/Latitude (in decimal degrees) _____

A. VERNAL POOL CHARACTERISTICS (fill in all information known):

1. Landscape setting (check all that apply):

- Upland depression (4 pts; if this is also in a floodplain, use 2 pts) Pool part of wildlife corridor (4 pts)
 Pool part of a pool complex (within 1000 feet of one or more other vernal pools) (NA)
 Pool within larger wetland system (4 pts; if this is also in a floodplain, use 2 pts) Other: _____ (variable pts)

2. Vernal pool condition:

Describe any recent modifications to the pool and associated landscape: _____

3. Parent material:

- Glacial fluvial ("outwash") Loose till Peat
 Dense till Alluvium Coastal marine sediments

4. Aquatic resource type that best applies to this pool (choose dominant):

- Forested wetland (4 pts) Herbaceous wetland (4 pts) Floodplain (overflow/oxbow) (3 pts)
 Shrub wetland (4 pts) Open water (2 pts) Other: _____ (variable points)
 Peatland (acidic fen or bog) (4 pts) Intermittent stream reach (2 pts)

5. Pool canopy cover (%): 80%

6. Predominant substrate:

- Mineral soil
 Organic matter (peat/muck) Depth _____ Sampling location (e.g., deepest zone, edge, etc.) _____

7. Pool size:

- a. Approximate dimensions of pool (at maximum capacity; include units): Length 25' Width 15'
Area: _____
b. Maximum depth at deepest point at time of survey (include units): 6"-1'

8. Hydrology:

a. Estimated hydroperiod (unless actual, observed hydroperiod value(s) is(are) known, use the presence of these example indicator species to best predict the expected hydroperiod of the pool):

- Dries between early March and early July (e.g., *Thelypteris palustris*, *Carex stricta*, *Impatiens capensis*, *Ilex verticillata*) (6 pts)
 Dries between early July and early September (e.g., *Sagittaria latifolia*, *Scirpus cyperinus*, *Dulichium arund.*, *Cephalanthus occ.*) (8 pts)
 Dries between early September and early November (e.g., *Eleocharis palustris*, *Glyceria cana.*, *Utricularia spp.*, *Decodon vert.*) (8 pts)
 Dries between early November and late December, or intermittently exposed (e.g., *Nuphar spp.*, *Potamogeton spp.*) (2 pts)

b. Inlet/outlet (pick one):

- No inlet/outlet (8 pts) Permanent inlet or outlet (channel with well-defined banks and permanent flow) (2 pts)
 Temporary inlet/outlet (6 pts)

9. Water quality:

- Clear High turbidity High algae content Tannic

16 **TOTAL for Pool Characteristics (out of 28 max.)**

B. VERNAL POOL ENVELOPE (100 ft) AND CRITICAL HABITAT AREA (100-750 ft) CHARACTERISTICS (fill in all information known):

1. Landuse type and approximate percentage within the 100-ft vernal pool envelope:

- Forested 80 % (16 pts) Open (e.g., meadow, agriculture, golf course) _____ % (4 pts)
 Shrub _____ % (10 pts) Developed _____ % (0 pts)

2. Landuse type and approximate percentage within the 100 - 750-ft vernal pool critical terrestrial habitat:

- Forested 60% % (16 pts) Open (e.g., agriculture, golf course) Emergent wet. 20% % (4 pts)
 Shrub 5% % (10 pts) Developed 15% % (0 pts)

Are there one or more barriers to vernal pool fauna movement within the envelope and/or critical terrestrial habitat? If so, check here and see directions for explanation of how to incorporate this information.

Based on: Field estimate GIS Aerial photo estimate

32

TOTAL for Pool Envelope and Critical Terrestrial Habitat Area (out of 32 max.)

C. SPECIES PRESENT IN VERNAL POOL

INDICATOR SPECIES	DATE	EGG MASSES (#)	TADPOLES/LARVAE
Wood Frog (<i>Lithobates sylvaticus</i>)	4/30/13	None	None
Spotted Salamander (<i>Ambystoma maculatum</i>)			
Blue-spotted Salamander (<i>Ambystoma laterale</i>)	↓	↓	↓
Jefferson's Salamander (<i>Ambystoma jeffersonianum</i>)	↓	↓	↓
Marbled Salamander (<i>Ambystoma opacum</i>)	↓		
Fairy Shrimp (<i>Eubranchipus</i> spp.)		PRESENT/ABSENT	ABUNDANCE:
OTHER SPECIES	DATE	PRESENCE/ABSENCE	FEW/Common/MANY
Facultative Species (e.g., Spring Peeper (<i>Pseudacris crucifer</i>), Gray Tree Frog (<i>Hyla versicolor</i>), Caddisflies (Limnephilidae, Phryganeidae), American Toad (<i>Anaxyrus americanus</i>), Eastern Spadefoot Toad (<i>Scaphiopus holbrookii</i>), Fowler's Toad (<i>Anaxyrus fowleri</i>), Fingernail Clams (Sphaeriidae, Pisidiidae))(list):		N/A	N/A
		↓	↓
Rare Species (list):		↓	↓
Predator Species (e.g., Bullfrog/Green frog tadpoles, Fish) (list):			
Other species (e.g., Ducks, Turtles, etc.)(list):			

Presence of Indicator Species

- Yes No

SUMMARY:

16 **TOTAL for Pool Characteristics** 32 **TOTAL for Pool Envelope and Critical Terrestrial Habitat Area**

Other comments (append photographs, additional notes, sketch of pool and surrounding landscape):

This was a smaller pool in an upland area. Pool was dry when observed in October - November 2017. Pool area considered to be unlikely to provide VFA habitat!

EAPL

00 -7+00 -6+00 -5+00 -4+00 -3+00 -2+00 -1+00 0+00 1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00 10+00

VERNAL POOL #3

↑ VERNAL POOL #1

↑ VERNAL POOL #2



**Franklin County State Airport
Highgate, VT**

Information for Vernal Pool Assessment

Three potential vernal pools were identified in the field during wetland delineation in October 2017. The need for a determination of vernal pool species utilization of these pools was confirmed by Brock Freyer of Vermont Agency of Natural Resources during the November 8th, 2018 field review of the wetland delineation due to the potential for obstruction removal or tree clearing in the area of these pools.

The assessment of these potential vernal pools was conducted on April 30, 2018 by Jim Fougere of The Smart Associates (TSA), along with the assistance of Mark Ferguson and Noel Dodge of Vermont Fish and Wildlife. It was noted by Noel Dodge that a number of other vernal pool sites in the region were recently noted to be active at this time.

Description

Pool 1 is located approximately 1300 feet north of the end of Runway 19 pavement. This pool is approximately 80 feet X 20 feet and at the time of the site review on April 30, 2018 the water depth was 2-3 feet. The pool is found within the boundaries of a much larger delineated wetland and well below the elevation of Runway 19.

Pool 2 is located 100 feet north of Pool 1 and is hydrologically connected with Pool 1. This pool is similar in size and character to Pool 1 with similar tree species in the overstory and shrub layer.

The area surrounding these pools is forested with a mix of red maple (*Acer rubrum*), black ash (*Fraxinus nigra*), and Atlantic white cedar (*Chamaecyparis thyoides*). In general, the understory is relatively sparse with species that include American hornbeam (*Carpinus caroliniana*), balsam fir (*Abies balsamea*), and saplings.

Pool 3 is a small shallow pool located in an upland forest approximately 200 feet north of Pool 2. Pool 3 is located higher in the landscape from Pools 1 and 2. Tree species were similar in nature but due to the upland character of this location also included trembling aspen (*Populus tremuloides*). This pool was determined to not provide sufficient hydrology for viable a vernal pool habitat.

Sampling Methods

The pool was field reviewed on April 30, 2018. Photographs were taken during the site visit and are included with this report. During the spring field review, each pool was visually inspected by all three members of the assessment crew for egg masses or other evidence of utilization by vernal pool species.

Findings

Despite the overall characteristics of these pools, no egg masses or evidence of any obligate or facultative vernal pool species were noted in any of the three pools. The water in Pool 1 and 2 was clear with debris in the northern half of each basin. There was a slight discoloration to the water in Pools 1 and 2, however no evidence of obvious negative conditions was observed in either pool.

Pool 3 had very little water in the pool despite recent rains so it may be the area did not have a drainage area of sufficient size to provide proper hydrologic conditions.

The Smart Associates
Environmental Consultants, Inc.

MEMORANDUM

TO: Lisa Cheung, Passero
FROM: Jim Fougere
DATE: June 21, 2018
SUBJECT: Addressing Environmental Constraints Identified at
Franklin County State Airport

The Smart Associates Environmental Consultants, Inc. (TSA) was scoped to provide wetland delineation services for an Environmental Assessment for Franklin County State Airport in Highgate, Vermont. The associated tasks include wetland delineation within 100 feet of the proposed improvement projects, as well as the necessary documentation. A wetland delineation report was prepared summarizing these findings.

Vermont ANR was contacted to obtain information on state-listed threatened and endangered species and significant natural communities. The scope also calls out The Smart Associates reviewing the study area for the Threatened and Endangered Species, potential habitat, and significant natural communities.

This memo addresses the status of the various tasks.

Wetland delineation

The wetland delineation tasks were conducted in October and November 2017. A comprehensive review of the delineation and proposed project locations was conducted by TSA and Brock Freyer of Vermont ANR on November 7, 2017. This review is required for approval of the wetland information submitted with the Environmental Assessment and various wetland permits.

A Wetland Report was submitted to Passero which summarized wetlands in the study area as well as providing documentation including wetland delineation data sheets, functional assessment forms, photographs and the appropriate mapping of the delineated wetlands.

Other issues encountered and addressed during the process included:

- Wetland 2 is small isolated which occurs south of Runway 1 outside the existing fence. This emergent wetland was classified as a Class III wetland (unregulated) due to its isolated condition and low functional values. During the protected species review, Wetland 2 was initially tagged as having habitat of value to the state-listed Endangered

species, Grasshopper Sparrow (*Ammodramus savannarum*) due to the potential for grassland bird nesting habitat. This finding would have changed the wetland classification to Class II. Since that time Vermont Fish and Wildlife has determined that the affected species are not wetland dependent and therefore not likely to utilize this habitat. As a result, Wetland 2 will remain Class III or unregulated.

- During the field delineation and review with Brock Freyer, three wetland pools were identified over 1000 feet north of Runway 19 which appeared to provide potential vernal pool habitat. As such, an inspection of the pools during the spring season would be required to determine their utilization by vernal pool species as a breeding habitat.

On April 30, 2018, Jim Fougere of The Smart Associates plus Mark Ferguson and Noel Dodge of Vermont Fish and Wildlife visited the pools to assess their utilization. The timing of the visit was keyed to the local breeding season for vernal pool species. Noel Dodge had noted that other pools in the area were active at that time.

No egg masses or evidence of use by obligate or facultative vernal pool species was noted at that time despite the presence of the standing water and the availability of appropriate habitat in the surrounding wetlands and uplands. It was determined that the pool is not likely to be used in the 2018 breeding season and may not be a viable habitat for some reason which we could not determine at that time.

The presence of the pools in an area of potential tree clearing for obstruction removal in the area north of Runway 19 will require coordination during the permitting process for tree removal or clearing. The outcome may include a requirement to minimize disturbance in the area around the pools, especially the two larger pools closer to the runway. One item of note is these two pools do occur lower in the landscape than Pool 3. An initial mapping of tree obstructions overlain with the vernal pool mapping indicates that tree clearing is limited in the area around these two pools.

- The wetland delineation for obstruction clearing north of Runway 19 was limited to the approximate boundaries of the Runway Protection Zone (RPZ). That area did encompass the three vernal pools but did not extend further to the north. As the permitting process continues on and the areas of impact are better defined, additional delineation may be required.

Protected Species

The issue of state-listed species was initiated with a review of significant natural communities and rare, threatened and endangered species in the vicinity of the project area. These findings include:

State-listed species

Significant Natural Communities include Northern White Cedar Swamp, Pine-Oak-Heath Sandplain Forest and Red Maple-Black Ash Seepage Swamp. These three communities generally occur outside the limits of the airfield and project study area.

Vertebrate Animals include Grasshopper Sparrow (*Ammodramus savannarum*), Eastern Whip-poor-will (*Antrastomus vociferous*), Upland Sandpiper (*Bartramia longicauda*), Least Bittern (*Ixobrychus exilis*), and Vesper Sparrow (*Pooecetes gramineus*). Generally, these species except the Least Bittern, occur in the area around the airfield grass surfaces.

- Previous surveys have noted these bird species on site but some, such as the Upland Sandpiper have not been observed in a number of years. It is assumed the state-listed grassland bird species identified at the airport do occur on site. A visual survey of the airfield area was conducted during the vernal pool survey but that date was prior to most species arrival for the spring season. A second visual survey occurred on June 19, 2018. Observations at that time included the Vesper Sparrow and common species of the grass/shrub/forest edge habitat occurring on the east side of the airport including Tree Swallow (*Tachycineta bicolor*), Song Sparrow (*Melospiza melodia*), Common Yellowthroat (*Geothlypis trichas*) and American Goldfinch (*Spinus tristis*).

Federally-listed species

The presence of federally-listed protected species that may be present in the study area was identified during the US Fish and Wildlife Service, IPaC review to include the Northern Long-eared Bat (*Myotis septentrionalis*), a threatened species. There were no Critical Habitats noted within the project area.

Site Constraints and Mitigative Measures

- Based on the projects proposed for the airport, tree clearing in the wetlands is probably unavoidable on the north and south end of the airport. As a result, they will likely require an Individual Permit from Vermont ANR and the U.S. Army Corps of Engineers.
- Limitations associated with protected species include seasonal restrictions for the Northern Long-eared Bat. Tree clearing will necessarily be scheduled during the winter season to avoid the bat's roosting season, typically April 15 through September 15. Tree clearing during the winter months would also help with minimizing wetland impacts due to colder weather and more stable ground.
- The construction of the 1000 foot by 75 foot runway extension on the south end of the airport will directly impact approximately 1.72 acres of airfield grassland habitat. Portions of this area likely provides grassland habitat for the bird species identified as state-listed protected species in the project study area. Work in the airfield area or other grassland habitats, such as the runway extension should occur outside the bird's nesting season. Ideally the work start date would be after July 30.
- Measures to address impacts to these grassland species must avoid development of on-airport wildlife habitats having characteristics that attract hazardous wildlife. These measures could include:
 - Determination of the viability of creating new grassland habitat on the east side of Airport Road when constructing new hangars. This area is located away from airport operation areas, reducing the potential for creating hazardous conditions contrary to Federal Aviation Administration (FAA) requirements.

- Maximize additional habitat on the west side of the property, outside of the fenced airfield. Portions of the shrub areas northeast of the wind sock (Photo 1 and 2) could be mowed or brush-hogged in the off season on a rotational basis to maintain optimal habitat conditions.
- Mow or brush-hog field edges during the off season to reclaim fields and maintain maximum grassland acreage.
- Coordinate land management activities with contributing neighbors to the extent practical.

**Franklin County State Airport
Habitat Photo Log**



PHOTO 1: Shrubby border on west side of airfield fence.
Photo taken June 19, 2018



PHOTO 2: Mixed shrub/grass habitat to be managed
Photo taken June 19, 2018



Appendix D:

Archeological Report

**Phase IA Archeological Investigations
for the Airport Layout Plan of Six State Airports:**

**Caledonia County State Airport
Franklin County State Airport
Hartness State Airport
John H. Boylan State Airport
Middlebury State Airport
William H. Morse State Airport**

Prepared for:

**The Vermont Agency of Transportation
Division of Rail and Aviation**

Prepared by:

Hartgen Archeological Associates, Inc.

Certified WBE / DBE

PO Box 81

Putney, Vermont 05346

Phone (802)387-6020

November 1999

Hartgen Archeological Associates, Inc.

Cultural Resource Specialists

PO BOX 81 • PUTNEY, VERMONT 05346

Abstract

The Airport Layout Plan (ALP) for the Vermont Agency of Transportation, Maintenance and Aviation Division (VAOT) includes an environmental overview of the following six state airports:

- Caledonia County State Airport
- Franklin County State Airport
- Hartness State Airport (Windsor County)
- John H. Boylan State Airport (Essex County)
- Middlebury State Airport (Addison County)
- William H. Morse State Airport (Bennington County)

This archeological assessment has been prepared as part of the environmental overview for the ALP. The purpose is to identify archeological concerns to be considered when reviewing the needs and potential development plans for the state airports. The airports are located across the state from Franklin County in the north to Bennington County in the south with properties ranging in size from 78 to 348 acres. Site visits to the airports were conducted between mid May and mid June of 1999. The archeological survey was conducted as a walkover and visual inspection without excavation. Each property was assessed in its entirety including terminal areas, tarmac, runway protection zones, and aviation easements. No specific developments are addressed in this report.

This report documents the results of a Phase IA archeological literature review and site visit for each of the six state airports listed above. This study is conducted under the guidelines of Section 106 of the National Historic Preservation Act, Vermont's Historic Preservation Act, and Act 250 and according to the guidelines set forth by the Vermont Division for Historic Preservation or VDHP (Peebles 1989).

The review consisted of the examination of the Vermont Archeological Inventory (VAI) files, town files, and National Register files at the VDHP in Montpelier. Historic maps, atlases, and town histories at the Vermont Historical Society, the Vermont State Library were consulted for relevant historical information. The Springfield Community Library was visited for information relevant to the history of Hartness State Airport. A site visit was conducted at each airport to examine the project area for locations sensitive for the presence of archeological deposits, areas of disturbance, excessive wetness, and slope.

Areas of sensitivity were defined based on the VDHP Site Predictive Model and observations during the site visits. Each airport property surveyed contained unique sensitivity areas focused along prominent land forms in proximity to water sources such as rivers, streams, small drainages, and various wetlands. In addition, there were sensitive areas identified at every airport associated with historic settlement and in the cases of the Hartness, William H. Morse, and the Middlebury State Airports structures were identified which could be considered historically and architecturally sensitive in association with early aviation in Vermont. All six properties have experienced varying degrees of disturbance in the 20th century from construction and expansion of airport runways and facilities. Areas of disturbance which affect archeological sensitivity and specific areas of sensitivity which should be examined prior to future development are delineated for each airport property. Recommendations on which areas at each airport should be examined prior to future development are included in this report.

Introduction

In May and June 1999 Hartgen Archeological Associates, Inc. (HAA) conducted Phase IA investigations at six State airport properties as part of the updates of the Airport Layout Plans (ALP). HAA was contracted by Dufresne - Henry, Inc. to conduct these studies to determine potential areas of archeological sensitivity, areas of low sensitivity, and disturbance within each airport property. These studies were conducted for the ALP in order to comply with Vermont Act 250 and Section 106 of the National Historic Preservation Act of 1966.

Project Description

The work described in this report was carried out at six separate locations to investigate the archeological potential for each airport property. The properties vary in size and are widely dispersed across the State (Figure 1). Caledonia County State Airport (78 acres) is located 3 kilometers (nearly two miles) northwest of Lyndonville. Franklin County State Airport (348 acres) is located 2.1 kilometers (over a mile and a third) northeast of Swanton. Hartness State Airport (185 acres) is located 0.6 kilometers (nearly half a mile) to the north of North Springfield in Windsor County. John H. Boylan State Airport (188 acres) is located 4.2 kilometers (over two and a half miles) southeast of Island Pond, Essex County. Middlebury State Airport (156 acres) is situated 1.1 kilometers (over half a mile) north of East Middlebury in Addison County; William H. Morse State Airport (100 acres) is found 3.3 kilometers (over two miles) west of Bennington in Bennington County.

The ALP for the six airports is preliminary and does not include any specific proposed improvements to any of the airport operations, facilities, or properties. Therefore, each airport property was evaluated in its entirety including runways, facilities, runway protection zones, and avigation easements outside the property. The objectives of the investigations were to determine the potential locations for archeologically sensitive areas within each airport property. Research for this report included the examination of site files, town reports, histories, historic maps, and a site visit to provide information relevant to the goals of the project. Archeological sensitivity was based on the background research and a visual inspection of the project area with emphasis on environmental and topographical conditions and the presence and extent of disturbances. Due to various adverse conditions such as the presence of wetlands, thick undergrowth, excessive slope and rough terrain, some areas were examined from a distance. Standing structures within the airport properties were noted for potential significance and possible listing on the National Register of Historic Places. However, because the survey was conducted without the use of an architectural historian, recommendations concerning historic structures are preliminary assessments designed to identify which buildings need more detailed evaluation were they to be impacted by any future development.

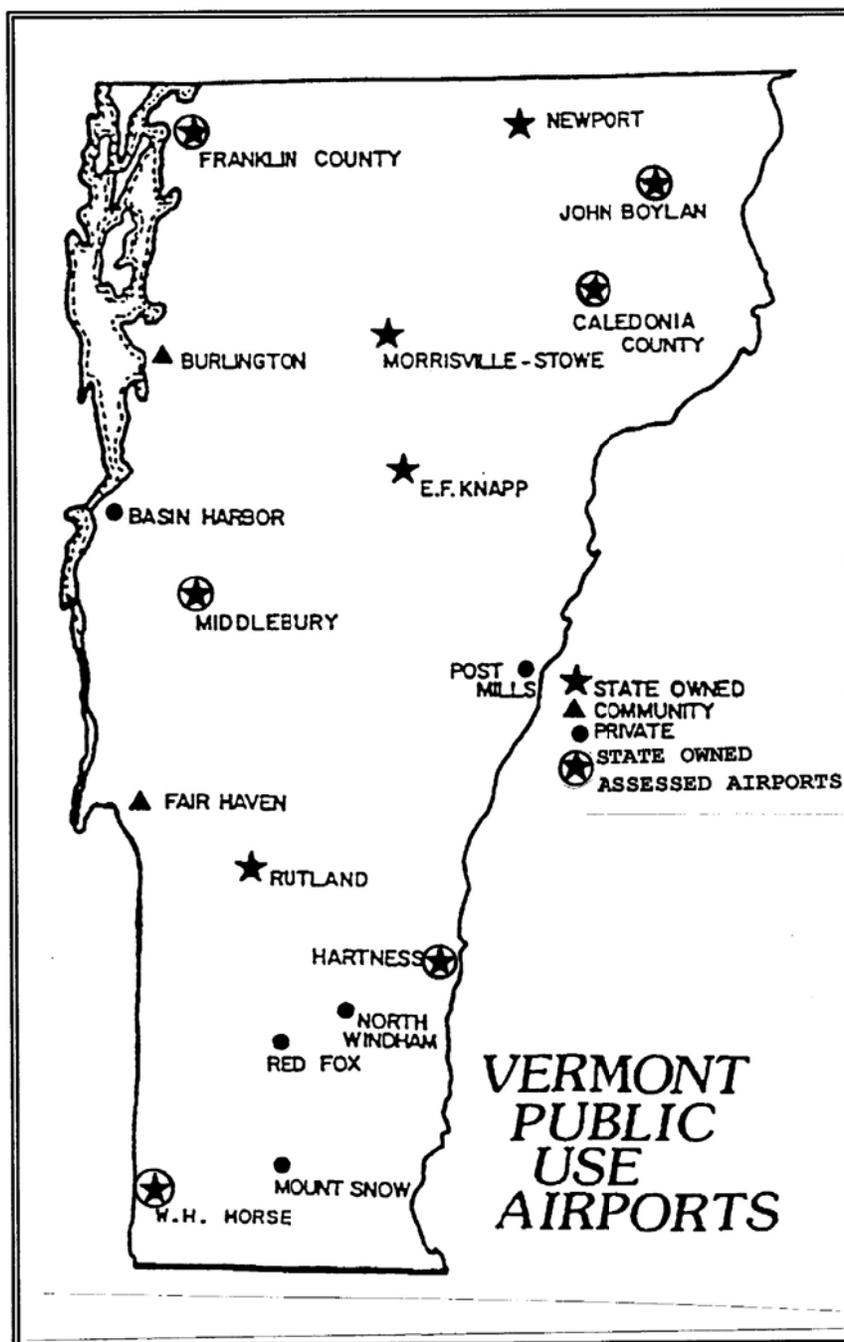


Figure 1. State owned public use airport locations throughout the State of Vermont.

Documentary Research

Research conducted at the Vermont Division for Historic Preservation (VDHP) included: an archeological site file search for sites located in or adjacent to each of the six project areas; examination of the town files; examination of the National Register for archeological sites located in or adjacent to each project area that are listed on, or proposed for listing on the National Register; and reference to *Burial Grounds of Vermont* for any cemeteries in or adjacent to each project location. In addition, the Vermont Historical Society library, the Vermont State Library, and the Springfield Town Library were consulted for town histories and historic maps relevant to the individual project locations.

Regional Culture History

The six airport properties are located in various topographic regions of the state including the southern Vermont Valley, the northern Champlain Basin, the Connecticut River Valley, and the foothills of the northern Green Mountains. More detailed information on the prehistory of Vermont is available in the report prepared by Peter Thomas for the Vermont Historic Preservation Plan entitled *Vermont's Prehistoric Cultural Heritage* (Thomas 1991). Other overviews of regional prehistories can be found in such publications as the Cultural Resources Planning Needs Assessment for the Lake Champlain Basin (Argus Architecture & Preservation, et al. 1995).

Evaluation of the prehistoric sensitivity of each project area is based on the results of the site file search, the site visit, and the environmental background for each airport property. To further assess sensitivity, the VDHP predictive model was applied to each project area. Predictive models of site location focus on proximity to water and other resources, soil drainage, slope, and orientation. The VDHP predictive model includes consideration of these factors as well as disturbance as a negative variable. Provided below is a general cultural prehistory for Vermont, the prehistory for each project area with a synopsis of the environmental background, site file search, and the predictive model will be presented in greater detail under the assessment section for each airport.

Native Americans have inhabited parts of the northeast for approximately 11,500 years. Population densities fluctuated through time, as did environmental conditions, and human populations utilized natural resources to varying degrees. Types of precontact sites in the northeast include bedrock quarries, quarry workshops, extractive camps (hunting, fishing, and gathering), rock shelters, small residential camps, base camps, small horticultural hamlets, villages (both fortified and unfortified), burial sites, and sacred sites.

Precontact Period

The precontact period in the northeastern United States has been divided into three distinct periods: the Paleoindian Period (subdivided into early and late), the Archaic Period (early, middle, and late),

and the Woodland Period (early, middle, and late). Sites from all of these periods have been identified in Vermont. Several of them have been the subject of professional investigation and are discussed below. The following sections summarize the cultures associated with the Paleoindian, Archaic, and Woodland Periods and the typical settings within which these sites are found.

Paleoindian Period (9,500-7,000 B.C.)

The Paleoindians were the first documented people in the Western Hemisphere, arriving soon after the glaciers receded at a date of approximately 9,500 B.C. Although the majority of identified Paleoindian sites consist of isolated projectile points, the Reagan site, located in northern Vermont, is an example of a relatively large site of approximately 2 acres. This site, like many other Paleoindian sites in New England, is located on a well-drained, sandy land form along a broad Pleistocene river or pro-glacial lake valley. Due to the recession of the glaciers and the lowered water levels, many of these land forms are now located at some distance from major waterways.

The Paleoindian populations that occupied terraces similar to that at the Reagan site were nomadic hunters and gatherers. Based on the information available, it appears that Paleoindians lived in small bands of perhaps 5 to 20 individuals that typically followed migrating herds of fauna across the landscape. By camping on raised terraces that overlooked the glacial outwash valleys, Paleo-hunters would have had a good vantage point for observing the herds as they migrated through the valleys.

During this period, the forests as we know them today did not exist. Instead, the landscape was typically an open tundra environment with limited stands of pioneer species of trees. This open landscape would have made it easy for early hunters to observe the movement of animals.

Paleoindian artifacts are often made of high-quality "exotic" raw materials that frequently originate from distant sources. These artifacts include the diagnostic fluted points, such as the Clovis type, that have only been associated with Paleoindian sites. These points are characterized by long narrow channel scars that result when specialized flakes are removed from the base of the tool. Later Paleoindian styles include Plano and St. Anne points. Both of these styles are very long, narrow and extremely thin lanceolate points with no flute removed. Other artifacts associated with this period include end scrapers and *pieces esquilles* (bi-polar flakes).

Archaic Period (7,000-1,000 B.C.)

The Archaic Period is subdivided into Early, Middle, and Late stages. Although there is a general continuity of cultures through this period, there are some important changes in precontact lifeways.

Formerly, prehistorians thought that there was a hiatus between the preceding Paleoindian Period and the subsequent Archaic stage during which it appeared that the Northeast was largely depopulated. Over the last 20 years, however, new research has begun to fill in this void in prehistory. Early Archaic material was initially found in isolated upland locations. However, in the southeastern United States, early Archaic deposits have often been found in deeply buried stratified

alluvial contexts. Recent investigations in the Northeast have begun to identify similar deposits (Thomas 1994). It now appears that the environment occupied by Archaic populations was more complex and varied than was originally estimated. Unfortunately, many of the river terraces that were used during this time have been eroded or deeply buried by subsequent alluvial action that may be beyond the reach of the more commonly-used archeological excavation methods. The loss of sites through erosion and the difficulty of excavating at great depths in alluvial soils may explain the perceived hiatus from this early time period.

During the Early Archaic, populations most likely remained relatively small and mobile, but also may have been less nomadic than Paleoindian groups. The large herds of migrating game that would have sustained Paleoindian hunters became extinct and the use of new resources would have been necessary. Recent investigations indicate that Early Archaic people lived in riverine environments and perhaps became more reliant on aquatic resources and riparian flora and fauna. The use of such resources would have allowed populations to obtain sufficient food resources in a smaller catchment area and may have led to the establishment of group or band "areas" within which a small group could migrate during the year in search of food and other resources.

Similar to the Early Archaic, the picture of the Middle Archaic Period has been clouded by a perceived lack of sites. Information regarding Middle Archaic occupations began to emerge in the mid-1970s with the excavation of the Neville site in Manchester, New Hampshire (Dincauze 1976). While the finds at the Neville site helped archeologists to better recognize Middle Archaic materials, to date, very little evidence of this period has been found in Vermont. One explanation for the absence of cultures dating to this time is that, like the Early Archaic occupations, the Middle Archaic sites are located on land forms that have been eroded, buried, or not investigated.

The Late Archaic is the first precontact period in which there is evidence of a diverse spectrum of cultural-environmental adaptations among groups existing side by side. Diverse traditions developed in the Northeast during this period including the Maritime Archaic along the Atlantic coast, the Susquehanna Tradition, the Narrow-stemmed Tradition, which was predominately along the river systems that flowed to the Atlantic Ocean, and the Laurentian Tradition that was focused on the interior of the continent and Great Lakes area. Although each of these traditions had a central geographic focus, examples of each are found scattered throughout the Northeast. In some cases a single archeological site may have components of several traditions represented in its cultural deposits. This is evidence that the traditions were fluid in distribution, that these seemingly disparate peoples had contact with one another.

Sites from this period are found on all types of land forms: along major rivers and their tributaries, on plains, and even to the highest uplands. Upland wetlands were often utilized as were upland ridges. This period has been described by Snow (1980) as a period of cultural florescence during which a population explosion occurred and people adapted to a wide variety of resources. Consequently, populations filled more ecological niches at this time than during any previous period. Yet despite the changes in subsistence economy and settlement patterns, local communities probably

continued to consist of relatively small bands of related individuals that migrated throughout their home area during the course of the year, utilizing local resources as they became available season by season. However, there may have been an amalgamation of smaller bands into larger units, and possibly a more centrally-based pattern of wandering, with specific areas being utilized for longer segments of the seasonal round. Large base camps often contain prodigious amounts of cultural material and deep midden deposits, both of which indicate extended use.

Perhaps one of the most significant cultural changes during the Late Archaic was the establishment of elaborate mortuary ritual along with the use of large cemeteries. Although a few burials have been found in previous periods, this period is characterized by the earliest recognized cemeteries and ritual treatment of the dead. At some sites, red ochre is found sprinkled over bodies and cultural materials are found within the graves. These artifacts also appear to be unique or in some way different than the more utilitarian tools found at other locations. The mortuary traditions that are established during this period appear to be continued and elaborated on in the following Woodland Period.

Woodland Period (1,000 B.C. to 1650 A.D.)

Similar to the Archaic, the Woodland Period has been divided into early, middle, and late stages and further subdivided into phases, based on technological and stylistic changes in ceramic vessels. Many of the cultural traditions that developed in the Late Archaic carry over into the Early Woodland. The most obvious difference between the two periods is the development and use of ceramic vessels during the Woodland Period. Sites of the Woodland Period have a riverine and lacustrine association, and range in type from base camps, hunting camps in the Early and Middle Woodland, to villages in the Late Woodland, as well as bedrock quarries, lithic workshops, and burial sites.

During the Early Woodland Period, a subsistence pattern similar to the Late Archaic was pursued with populations using multiple, seasonally-available resources. However, populations were beginning to become more sedentary, establishing fixed home areas. Evidence of large-scale storing of food resources in pits excavated into the ground and in large ceramic vessels is also present at this time. At about 1000 A.D., the middle of the Early Woodland, a general cooling of the environment is suggested by an increase of spruce and fir at higher elevations and on north facing slopes. It appears people may have abandoned the uplands and settled in the more resource rich lowlands. Therefore, some of the Early Woodland sites may have been eroded away or deeply buried along the major waterways, thus accounting for their low visibility.

During the Middle Woodland, there was increased use and technological development of ceramics accompanied by an apparent increase in population density. Middle Woodland habitation sites are common and well documented. A number of sites from this period have been identified in stratified contexts, providing an opportunity for a detailed examination of the culture of this period. These sites are found in riverine settings, near wetlands, and in coastal settings. Upland areas were also utilized.

The last precontact stage in the Northeast was the Late Woodland. This stage was characterized by population expansion that resulted in the development of the nations and tribes encountered by European settlers. Territorial expansion was also common at this time. Advances in ceramic technology continued and settlements became even more sedentary. Cultivation of food plants (which probably started elsewhere than in the Northeast during the Late Archaic or Early Woodland stages) reached its culmination in the Late Woodland with the introduction of maize (corn), bean, and squash horticulture in the Northeast sometime around A.D. 1000. In many areas corn agriculture allowed and encouraged people to develop sedentary villages.

The end of the Late Woodland and the beginning of the proto-historic period is marked by the introduction of European trade goods during the 16th century. The first contacts that native people of Vermont had with European culture was fishing fleets off the mouth of the St. Lawrence River and the Gaspé Peninsula. Sailors traded with the coastal natives and both new ideas and material objects traveled along the St. Lawrence River and its tributaries to the Northeast hinterland. The first direct recorded contact with native people of the inner St. Lawrence/Lake Champlain area (some of whom may have been Western Abenaki from the Vermont area) was by Jacques Cartier in 1534. The next recorded contact came in 1607 when Samuel Champlain traveled from the mouth of the St. Lawrence River to Montreal. By this time the St. Lawrence Iroquoians that Cartier had encountered nearly a century before had disappeared, so his contacts were definitely with Western Abenakis, whose descendants still reside in Vermont today. According to Haviland and Power (1994:136), most Late Woodland villages in western Vermont were situated at the mouths of major streams along the east shore of Lake Champlain, namely along Otter Creek, and the Lamoille, Winooski, and Missisquoi Rivers.

Franklin County State Airport

The Franklin County State Airport project area is the largest property covered during the airport survey consisting of a 348 acre parcel located on the high broad sandy terrace south of Youngman Brook and north of Route 78. The airport is located in the Town of Highgate approximately 2.1 kilometers (1.3 miles) between the Village of Swanton to the northeast, Highgate Center to the east, and 1.2 kilometers (4000 feet) east of Highway 89 (Figure 14). This irregular shaped property has dimensions of up to 2.9 kilometers (9,540 feet) north to south and at its widest 1.9 kilometers (6,240 feet) northwest to southeast (Figure 15). The total project area includes areas beyond the airport property south of Route 78 and north of Youngman Brook designated as runway protection zones and avigation easements. The airport and runway rest on the relatively level terraced spine of Pudding Hill at an elevation of 70 meters (230 feet) amsl with a sudden drop in elevation at the north end of the runway to Youngman Brook located approximately 15 meters (50 feet) in elevation below.

Environmental Background

The Franklin County State Airport is located in the Champlain Lowland physiographic region which is characterized by rolling hills composed of former beaches, deltas, and terraces originally formed primarily by the receding glaciers and the Champlain Sea. This area is part of the Missisquoi River drainage which flows into the St. Lawrence River Basin at Lake Champlain. Youngman Brook flows through the northern portion of the project area and drains to the northeast emptying into Goose Bay of Lake Champlain 3.2 kilometers (2 miles) northwest of the airport.

The tectonic map of Vermont indicates that the airport is on the Highgate Springs Thrust, which encompasses this region and extends west into the Champlain Basin. The underlying bedrock is Dunham dolomite, the lower portions of which are described as massive, and which grades into sandier consistency in the upper portions (Doll et al 1961). The surficial geology of this area is comprised primarily of pebbly marine sand. The majority of soils in the southern and eastern portions of the airport are Missisquoi loamy sand, with varying slopes of 0-15 % (Figure 16) (Flynn and Joslin 1979). These soils were water deposited, and are commonly found on broad terraces and deltas. The soils along the avigation easements and in the northern section of the airport are also Missisquoi loamy sand of 15-25% slopes, which are usually encountered on terrace escarpments or gully walls. In general, Missisquoi soils have fair potential for farming, but are subject to droughtiness which limits their potential as wildlife habitat and as woodland. The Missisquoi soils tend to have a dark brown loamy sand A horizon which becomes gravelly in the bottom part of the subsoil and throughout the substratum. The soils in the wetland areas in the northern portion of the project area along Youngman Brook are of the Carlisle series, a deep, very poorly drained organic muck. These low lying soils, common in bogs, are prevalent throughout the Champlain Valley.

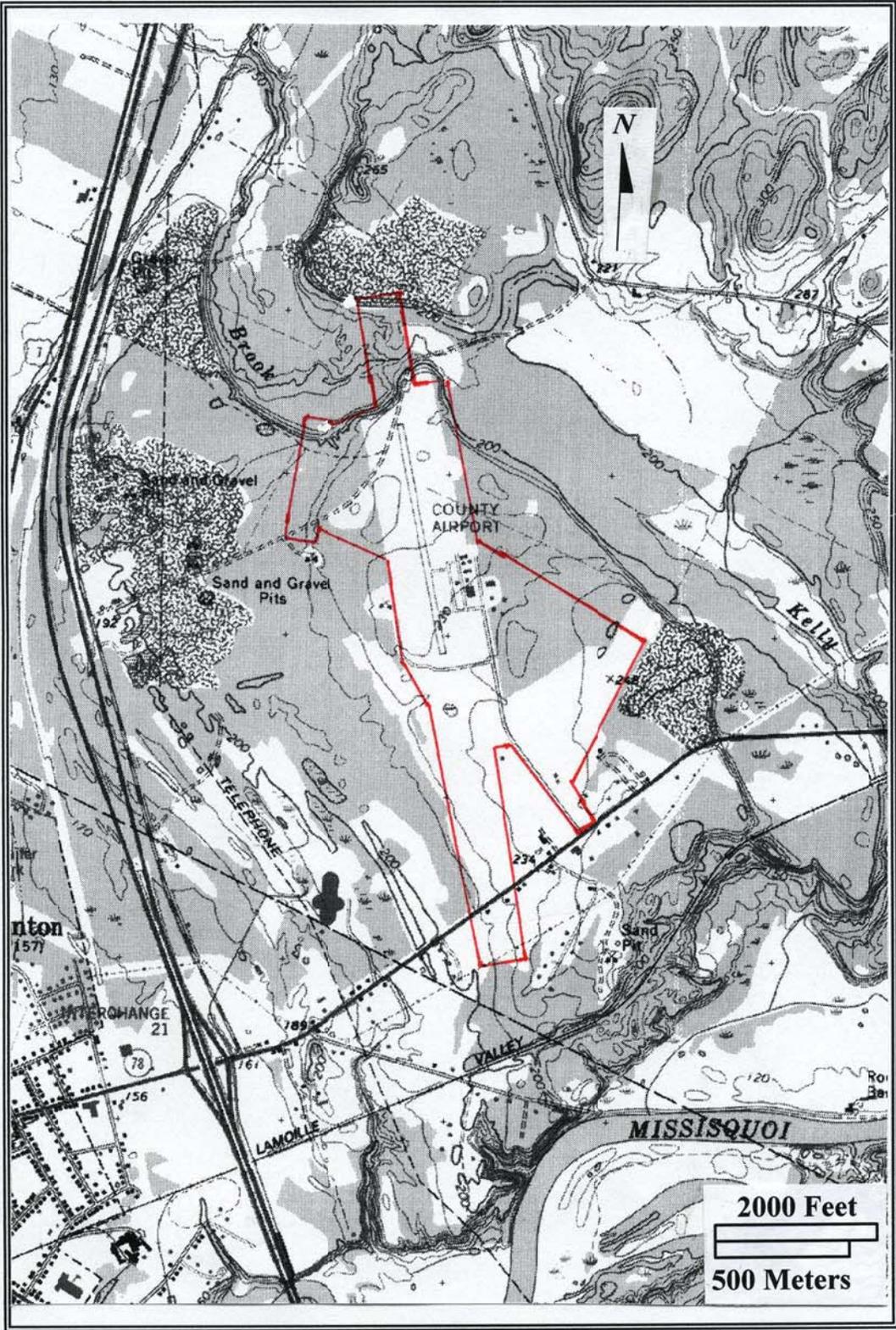


Figure 14. Project Location (1964 / 1987 Highgate Center 7.5' USGS Quad).

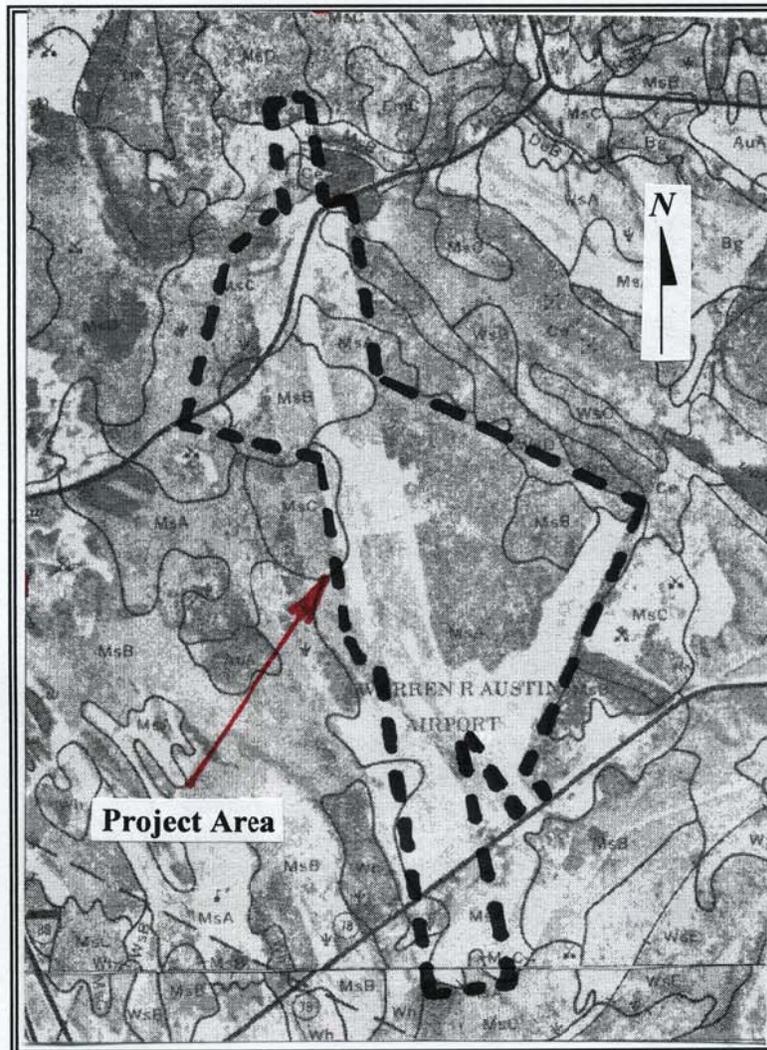


Figure 16. Soils of the Project Area (USDA 1979).

Legend: MsA - Missisquoi loamy sand, 0-3% slopes, MsB - Missisquoi loamy sand, 3-8% slopes, MsC - Missisquoi loamy sand, 8-15% slopes, MsD - Missisquoi loamy sand, 15-25% slopes, Ce - Carlisle Muck.

The general project vicinity is located in the transition zone between the Appalachian Oak Forest and the Northern Hardwood zone. The Appalachian Oak Forest is dominated by white and northern red oak while the Northern Hardwoods are dominated by sugar maple, beech, and hemlock. Currently, the majority of the project area is cleared, landscaped grassland. The undeveloped portions of the property to the north, east, and west are in mixed forest. The mature forest is to the west with less developed growth and thicker underbrush in the forest to the north and east.

Documentary Research

The Franklin County Airport is located in the Town of Highgate, Vermont approximately equidistant between the Village of Highgate Center to the east and the Village of Swanton on the Missisquoi River to the west. The charter for the town was first granted in 1763 by Benning Wentworth, governor of the province of New Hampshire and given its present name, most likely named after the suburb of London (Aldrich 1891, Swift 1977). During the eighteenth century, the town of Highgate passed through a series of owners who either forfeited or resold the land.

The original settlers in the 1780s were of Dutch ancestry who believed they were moving to Canadian soil. One of these men, John Saxe, built a grist mill in the northwest part of town which was still active in 1871. At Highgate Falls, described as "one of the most powerful waterfalls in the state," a sawmill and grist-mill were established by Andrew Potter around 1797 (Hemenway 1871). Mills of all kinds thrived in the area. An 1820 appraisal of town businesses included two saw mills at East Highgate, a grist mill, saw mill, distillery, store, blacksmith's shop, a fulling mill and carding machine at Allen's falls, a sawmill at Rock River, a furnace, a shop and factory, a grist mill and machine, a saw mill, and two blacksmiths shop. The town had been graced with a dense forest of white pine which spurred on the construction of mills. However, as early as 1820, these forests were destroyed with "reckless haste," and in 1871, the hemlock was "fast disappearing" (Hemenway 1871).

Precontact and Historic Sensitivity

A review of the Vermont Archeological Inventory (VAI) at the Division for Historic Preservation found that there are a number of precontact and historic sites in the area whose presence can partially be attributed to the waterways surrounding the project area. The following precontact and historic archeological sites have been reported for the general vicinity:

- VT FR 43 - Located to the west of the airport is a small upland campsite adjacent to Small Creek. The site file referred to this site as unusual, since it is one of the few in the area which is not located next to one of the larger waterways. Triangular and side notched points, and lithic debitage were recovered from this site.
- VT FR 1/44 - Located west of the project area is a site reported from collecting activities conducted in the 1930s and referred to, by William Ross, as the "Hempyard burial ground". Attributed to the site are projectile points, worked quartz, cord wrapped pottery, and a human burial ("Red Paint burials"), also a copper awl and a slate spear. Based on the 1987 photorevised topo sheet (Highgate Center, Vt) the site has been destroyed by expansion of a sand and gravel quarry.
- VT FR 12 - Located on the Missisquoi River, southeast of the airport is a prehistoric site of unknown time period from which a red jasper knife was collected. Described by William Ross as a "small camp site and workshop, east side of mouth of Kelly Creek on Theodore Waugh farm. Stemmed points, chert and quartzite, flakes and chips.

Low meadow land. Fire pits also.” An Archaic Period temporal affiliation is suggested by the stemmed projectile points.

Numerous additional prehistoric sites were noted scattered along the flood plain and high terrace overlooking the Missisquoi River beyond the general one mile site search radius. The following two sites are identified along the river closest to the project area;

VT FR 10 - Located on the flood plain by a brook entering the Missisquoi River, under two miles southeast of the airport. Described by William Ross as a “small camp site and workshop, stemmed points, chert and quartzite, flakes.” Similar to site VT FR 12 with possible Archaic Period affiliation due to presence of stemmed points.

VT FR 11 - Large campsite located downstream from Site FR 10 on the Missisquoi River a mile and a half southeast of the airport. Possibly Archaic through Woodland Period affiliation based on artifact description; triangular and notched projectile points of chert and quartzite, celts, gouges, sinew stones, hammerstones.

There are several historic properties identified on the Walling 1857 Franklin County map which appear to be located within the immediate vicinity of the airport (Figure 17). These include a number of residences/farms on one of the local roads, but presently this road is a disused dirt path. Structures are labeled *D. Griffin*, *H. Watson*, *A. C. Wright*, and *J. E. Wright*. Based on similar placement, the same structures appear on the Beers 1871 map identified under the names *E. Burns*, *E. Tarble*, *E. T.*, and *F. Wright* (Figure 18). Based on the files at VDHP, there are two historic sites within a one mile radius of the project area, which include VT FR 293 and VT FR 294, both of which denote historic foundations.

None of the prehistoric archeological sites are located within the project area; however, Site FR 1/44 (The Hempyard burial ground) is located on an adjacent landform 790 meters (2600 feet) to the west. Portions of the project area have features which are similar to that of Site FR 1/44 and other terrace precontact sites found throughout the region. In particular, the high terrace edge at the north end of the runway which continues to the west along Youngman Brook displays characteristics of areas of high archeological sensitivity. The dearth of sites located within the immediate project area is probably due to the preference for archeological investigation near the major rivers and on flood plains, in this case the Missisquoi, rather than upland wooded environs. This preference of archeological collectors and recorders does not denote a lack of prehistoric use or archeological sensitivity in these less visible upland areas.

The VDHP model for the project area yields a score of 28, with 20 being archeologically sensitive (Appendix 1). The major variables contributing this score are the inclusion in the project area of the wide wetland area along Youngman Brook combined with the high terrace overlook to the south. Although there are some areas of apparent disturbance from sand and gravel mining and runway construction near the brook in the northern portion of the project area, the majority of the terrace edge remains intact. Therefore, the northern portions of the project area along Youngman Brook should be considered sensitive for prehistoric archeological sites.

During the glacial retreat which eventually formed the Champlain Sea the airport project area was originally covered by an extension of the glacial ice sheet. As marine waters joined Lake Vermont to form the Champlain Sea during the final stage of the ice retreat the Missisquoi River Valley was a flooded inlet of the sea and the project area was under water. During the Paleoindian Period the project area was covered by the Champlain Sea during much of the time, but may have been exposed and close to the Champlain Sea shore line for some time. According to Meeks (1986:51), the sea level was at approximately the present 122 meter (400 feet) contour at St. Albans and at lower contours to the south. These contours indicate the high terrace edge along the northern portion of the project area may have overlooked an inlet of the marine waters of the Champlain Sea during the end of the Paleoindian Period. Such proximity would have encouraged occupation of the area, if the sea was gradually subsiding. However, if the sea drained rapidly there may have been little opportunity to exploit the proximity to the shore line (VDHP 1991:3-5 to 3-6).

Within the project area similar types of sites would be expected for all prehistoric time periods. Utilization of the project area may have been prompted by different factors during different periods of prehistory. Youngman Brook and associated wetland areas would encourage small residential or hunting camps. As is found today, there may have always been extensive wetlands associated with Youngman Brook that would have attracted people to exploit the varied vegetative and animal resources. The broad terraces in the project area overlooking the wetland may have served as prime sites for hunting stands or overlook sites for spotting game in the lower drainage to the north. Although the water washed bed of Youngman Brook is extensively dispersed with exposed underlying rocks and cobbles, there is no evidence of obvious lithic sources in the area to serve as resources for stone tool production. However, the prominence of sites along the Missisquoi River to the south and west suggests that lithic resources were available in the area.

With the advent of horticulture and agriculture during the Woodland Period, the sandy water-lain soils of the project area (Missisquoi loamy sand) would only have been suitable for limited utilization due to the distance of the high level terrace from water sources. The natural draughtiness and low nutrient level of these excessively drained soils makes them less suitable for agriculture and wildlife therefore as woodlands. However, the distance from probable base camp locations along the Missisquoi River suggests utilization of the project area may have been restricted to smaller procurement camps along Youngman Brook.

Thus, there is potential for prehistoric sites of any time period specifically within the northern portion of the project area. The frequency of reported sites in general suggests that small Late Archaic to Late Woodland procurement sites are the most likely to be found in the vicinity.

Historic settlement in the airport area has been sparse with settlement oriented along the main roads and in the town centers. This trend continues today, even though many modern homes and businesses were noted south of the airport along Route 78. The project area, with its level terrain was likely used in historic times first for its timber resources and later, based on present conditions, for pasture or hay. Much of the area bordering the airport and some locations on the property have been extensively quarried for sand and gravel. These operations continue.

The historic structures portrayed on the Walling 1857 and Beers 1871 maps were probable farm houses or other domestic structures. There is no documentary evidence of any early industrial use of the area. A key factor for industry in the region was water power; local mill operations employed the power of the Missisquoi River further to the south and east of the project. At the present time Youngman Brook is a small slow moving stream with wide shallow wetlands, which lack the potential water power for effective mill operations. Historic settlement near the project area appears to have been restricted to the road following Youngman Brook and along present Route 78. It is unclear if Youngman Brook in the earlier historic period provided a better water power source attracting settlement to the area. The most likely local business may have been quarrying and lumbering. Quarrying continues while, based on historic research, by 1820 early local lumbering operations were fast disappearing along with the forests. Based on the map and documentary research historic sensitivity in the project area is restricted to the northern portions of the airport property along the original route of the road which followed Youngman Brook. Aside from the northern portion of the property the project area as a whole has a low sensitivity for historic archeological resources.

It is unclear when the original airport in Franklin County was established, but possibly as early as the 1930s. The original airport and grass runway was southeast of the present property paralleling Route 78 (Figure 16). The original property is now under private ownership and is no longer used as an airfield. The new Franklin County State Airport with paved runway was constructed about 1984. Construction for the new airport included relocating some of the more sturdy modern structures such as the steel and aluminum hangar and terminal building from the old airport to their present sites (Figure 19). However, the majority of the airport facilities appear new (Figure 20). Some of the original wooden hangars and other storage facilities still stand at the former airport location (Figures 21 and 22). All of these wooden structures are outside the present airport property. None of the structures incorporated in the modern airport facilities appear to be of sufficient age nor architecturally unique to be considered eligible for inclusion on the National Register of Historic Places.



Figure 19. Relocated original Franklin Airport hangars on the center and right. View to the southwest.



Figure 20. Modern hangars and storage facilities. View to the northeast.



Figure 21. Original wooden hangar in background to the left at early airport site outside the present airport property. View is to the south.

Site Visit and Interpretation

The site visit at Franklin County State Airport provided an opportunity to assess the archeological sensitivity of this property. The archeological sensitivity assessment was limited to visual inspection with emphasis on land forms and distance to water as well as land modifications and disturbances associated with airport construction. The site visit included examination of the entire airport property including aviation easements and runway protection zones, portions of which fall outside the property boundaries. Most of the project area was closely examined, although some locations due to the size, density of vegetation, and rough topography of certain wooded areas were assessed with a cursory walk through.

The Franklin County Airport property is considered sensitive to prehistoric archeological resources based on the VDHP predictive model, specifically the northern portion of the project area, mainly along Youngman Brook, its associated wetland areas, and bordering high terrace. However, the majority of the broader airport property, although located on fairly level ground, is distant from known water sources and other resources and, thus, is considered to have a low to marginal sensitivity.

Construction for the modern airport in the 1980s caused major disturbances in the project area

through grading and earthmoving. However, these disturbances appear to be restricted nearly exclusively to the immediate vicinity of airport and runway operations. Construction for the new airport included clearing, grading and paving for the 3,000-foot north - south runway 1-19, the relocation and construction of the terminal with associated hangars and support structures, plus a paved apron and airport access road. Construction for the runway included grading an area approximately 34 meters (110 feet) wide by 3,500 feet long through the natural soft sands on the flat plain in the middle of the property. Additional disturbances include the excavation of drainage gullies along the runway (Figure 22). This area was then padded with an average of 1.5 meters (5 feet) of sand and gravel fill to support the paved runway. The depth of the fill varies across the length of the runway with the deepest areas of fill found at the ends of the runway where deposits exceed 6 meters (20 feet) (Figure 23). In the north half of the property, to the east and adjacent to the main paved runway, is a second, grass runway (Figure 22). Although the area of this runway was graded and cleared, the surface of the strip appears to be at the natural grade indicating only minimal disturbance to the area.

To the south the airport access road, terminal area, and apron evidenced substantial disturbance. All these areas in the middle of the property were graded and built up on sand and gravel fill. This is clearly illustrated at the southern border of the paved apron and parking lot where the paved surface is raised at least 1.2 meters (4 feet) above the surrounding natural ground surface (Figure 24). The airport's ASOP facilities, located opposite the terminal and west of the runway, is built on a large approximately 6.9 acre level mound of fill raised up to 1.5 meters (5 feet) above the natural ground surface (Figure 25). In addition, structures and parking areas for local businesses are built on airport property along the eastern side of the access road. Due to the extent of the grading and filling described above the archeological sensitivity in these areas has been severely compromised. Although located on relatively level land, the main portion of the airport facilities, except the northern end of the runway, are located distant from any known water or other resources. Thus, the majority of disturbance to the property was conducted in areas of low archeological sensitivity. It is unlikely, due to the level of disturbance and low sensitivity of the area, that any significant intact archeological deposits are located within the modern airport facilities.

Throughout the remainder of the project area there is little evidence of disturbance except for logging and possibly plowing. Only small areas of disturbance were noted along portions of the property boundaries which have been impacted by private sand and gravel mining operations. Large private quarry pits are common in the vicinity of the airport. One such disturbance is an abandoned gravel pit located at the edge of the project area west of the airport wind sock (Figure 26). This quarry pit may have been mined for airport construction and is presently being refilled. A large quarry operation surrounds the northwestern portion of the project (Figure 27). Due to the location of these quarry disturbances on the margins of the property they have made only a minimal impact to the project area itself.



Figure 22. View facing south from north end of airport. Note drainage gully in the center, paved runway to the right and grass runway to the left.



Figure 23. North end of runway raised above ground surface on deep fill.
View is to the northeast.



Figure 24. Paved apron and parking lot raised on fill above the surrounding ground surface. View is to the north.



Figure 25. Located opposite terminal and runway the ASOP facility is raised on a broad mound of fill. View is to the west.



Figure 26. Quarry pit located west of runway on property boundary. Presently being refilled. View is to the southwest.



Figure 27. Large quarry pit along the northwest property limit. View is to the west.

The area most affected by sand and gravel quarrying in the project area is at the north end of the runway and into the runway protection zone beyond (Figure 28). Conditions in this portion of the property suggest the area has been altered and possibly quarried, most likely for fill, to extend the runway. The steep slope from the terrace edge exhibits evidence of erosion of the soft sands with no obvious signs of remnant topsoil in the sparse grass on the level terrace top surrounding the runway. The higher hilltop east of the runway has been cut to the grade of the runway (Figure 29), while the east side of the hill, which is on the eastern border of the property, has been completely mined away for sand and gravel.

The disturbances at the north end of the runway and down the slope towards Youngman Brook are extensive and have impacted this otherwise archeologically sensitive portion of the project area. Sensitive areas at the base of the slope below the runway and bordering the brook are too disturbed to have retained any significant archeological deposits. The base of the slope is now a small wetland with the area graded below the water table. The vicinity of these disturbances and wetlands is also the possible location of the *D. Griffin / E. Burns* site seen on the 19th century maps (Walling 1857 and Beers 1871). Due to disturbances in the area, possible changes in the course of the brook, and the scale of the two maps it is impossible to determine accurately the original locations of the historic properties. They may have been located further to the east, outside the property in an area which is presently a wetland (Figure 30). In either case, no evidence of historic occupation was identified during the site visit while the disturbances and subsequent flooding in the vicinity suggest a low sensitivity for historic archeological resources.

Portions of the project area beyond the disturbances west of the runway and north of Youngman Brook are wooded with low secondary growth. Aside from logging, there is little evidence of disturbance in these woods. The northernmost portion of the project area in the runway protection zone and avigational easement is in the lowland drainage area of Youngman Brook characterized by wide wetlands dispersed with very rocky and uneven dry areas covered with moss and brush with little soil development. This area is a remnant river bottom scoured during the late recede of glacial waters of the Champlain Sea. Although conditions in the area may have varied during different periods water resources were probably always present. However, the wet and rocky conditions of the low drainage are not considered favorable for Native American habitation. In general, the terrain of the northern avigational easement portion of the project area is not considered archeologically sensitive. However, a small terrace in the middle of the easement and a high terrace on the far northern edge of the project area are locations more favorable for precontact deposits. The northern high terrace is privately owned and part of an active sand and gravel quarry in which any sensitive areas may be disturbed. Although the area as a whole has a low potential for archeological resources any future development plans north of the runway should have potential areas of effect assessed for possible archeological sensitivity.

The most sensitive locations for archeological resources in the project area are on the wide woodland portion of the property west of the runway (Figure 31). The edge of the high terrace overlooking Youngman Brook and wetlands to the south offer broad views and access to water and other



Figure 28. Disturbed and quarried area north of the runway. Note wetland area in low brush at base of slope with Youngman Brook in trees beyond. View is to the north.



Figure 29. Evidence of grading for runway construction in northeast corner of the project area. Note cut hill slope to right center. View is to the east.



Figure 30. Wetland along Youngman Brook at northeast border of the property.
View is to the northeast.

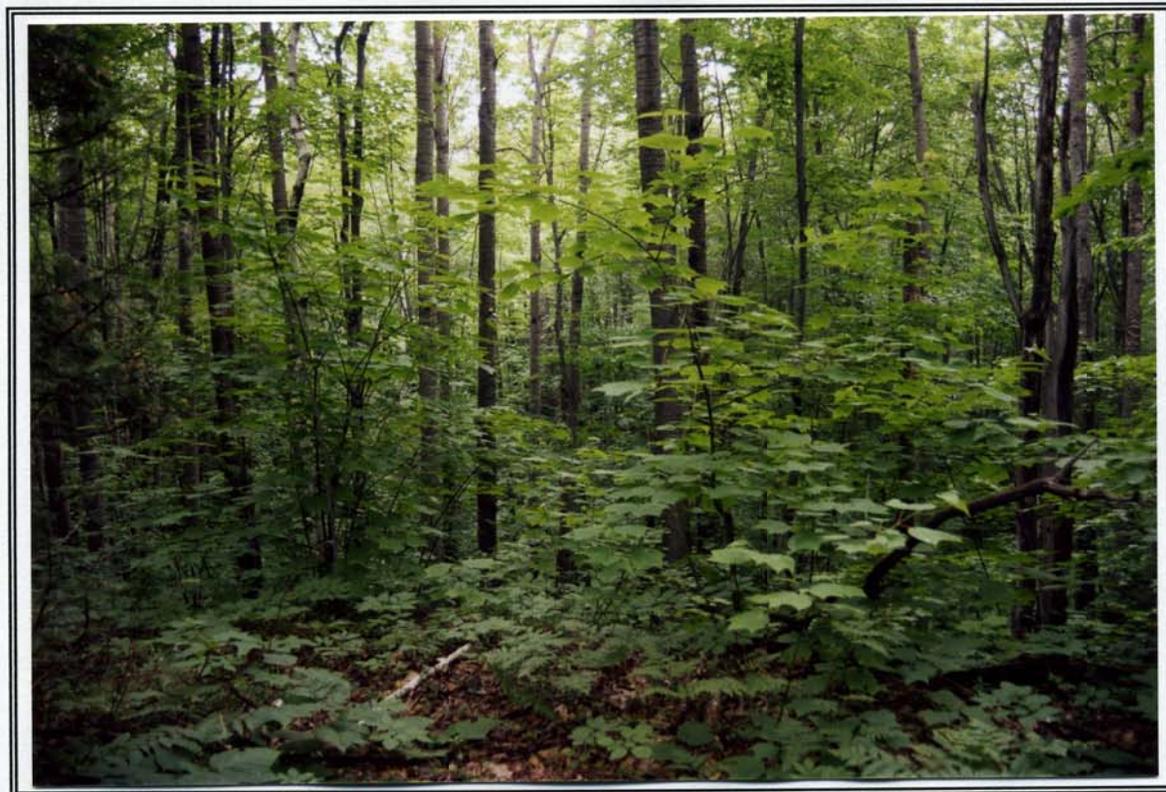


Figure 31. High terrace edge overlooking Youngman Brook in woodlands in northwest portion of the project area. View is to the north - northeast.

resources below. The predictive model identifies locations within 61 meters (200 feet) of water to be sensitive for prehistoric occupation. Thus, a wide area along the northwest edge of the property is considered to have a high prehistoric archeological sensitivity. The heads of numerous drainage gullies along the edge of the land form offer the highest sensitivity with easy access to both water and other resources below. The high location and distance from possible base camps on major rivers suggests potential for hunting camps or stands from all precontact time periods. Any prehistoric sensitivity in the area decreases to the south with increased distance from the edge of the terrace and the availability of water.

In addition to possible prehistoric deposits, the northwestern woods are sensitive for historic archeological resources as well. The Walling and Beers county maps identify at least three structures in the vicinity of this portion of the project area (Figures 17 and 18). The earlier 1857 map identified the three structures from north to south as *H. Watson occupant*, *A. C. Wright* and *J. E. Wright*. The same three structures were later labeled as *E. Tarble* (Beers 1871). These were probably residences or tenant properties. In the general vicinity of these 19th century residences, evidence of two possible historic sites was identified during the field visit. The first site was in the woods approximately 300 meters (984 feet) south of the terrace edge near the approximate location of the *H. Watson* residence. The site consists of a surface scatter of 20th century trash and building rubble (Figure 32). The historic materials included plank wood, brick, asphalt shingles, a TV antenna, bottles and glass. No foundation was visible and the site may be recent illicit dumping of trash in this remote location rather than a 19th century site.

The second possible historic site was 61 meters (200 feet) to the south of the historic scatter in a location suggesting an association with the two Wright residences on the 1857 county map. This location was identified in the field initially by a change in vegetation. A wide clearing of tall grass, raspberry bushes, strawberries, ivy, and an assortment of domestic flowers was found within the hardwood forest. Although overgrown, the former clearing also appeared landscaped with a variety of unique trees, including cedars, uncommon in the surrounding forest. At the edge of the clearing area, off the dirt access road, there was a small depression, though devoid of stone, that may indicate the cellar hole of a structure (Figure 33). No historic material was identified in the area. The vicinity of the two possible site locations, the historic scatter and clearing, suggest an area likely to contain potentially significant historic deposits.

Further to the south of the terrace edge the majority of the airport property is located on a relatively flat, broad, sandy plain distant from any known water source. This southern portion of the airport property is divided between cleared grasslands surrounding the runway and a young hardwood forest east of the terminal and hangars (Figure 34). The open grassy fields probably once were pasture while the woods may never have been farmed. Aside from plowing and lumbering, there is little evidence of disturbance, except for airport construction. However, the bulk of the property, although fairly level, is generally distant from water sources and any other known resources and, thus, is considered to have a low prehistoric sensitivity. It is possible that clearing of the land reduced the



Figure 32. Possible historic site location identified with historic surface scatter. View is to the northwest.



Figure 33. Possible historic site location in partial clearing. Note small depression possibly marking a cellar hole in foreground center. View is to the southeast.



Figure 34. Wide level plain in southern portion of the project area. View is to the south.

water retention properties of the soil causing small streams to dry up (Cronon 1983:125), but the lack of features suggesting archeological potential reinforces a low sensitivity for the broader airport property.

The furthest eastern portions of the project are divided between the young hardwood forest and an open field not presently under cultivation. The field contains a variety of modern wooden storage facilities and may be utilized for a town fair. The nearest known water source is Kelly Brook located 400 meters (1,312 feet) east of the property boundary. The distance from water sources and lack of features associated with high archeological sensitivity suggest the eastern portion of the project area is unlikely to contain significant precontact or historic deposits.

The only potentially significant standing historic structures or historic structures identified through historic research located along Route 78 are located outside the project area. The standing structures along the roadside within the southern aviation easement are all modern twentieth century homes which do not appear to possess any historic significance.

Conclusions and Recommendations

Since the scope of work for the VAOT airport layout plan encompasses six large project areas located across the state, final evaluations can only be made separately for each property. The size and diversity of each project indicates that certain areas are more sensitive for archeological resources than others. Some locations are distant from active drainages and with no apparent features to suggest archeological sensitivity. Other areas located away from drainages may be sensitive for specific reasons. The VDHP predictive model identifies locations within 61 meters (200 feet) of water to be sensitive for prehistoric occupation. In contrast, areas of steep slope, very poorly drained soils, excessive disturbance, and distant from drainages have a low sensitivity. The physical high point of an area may be sensitive, and used as a hunting stand or camp. Therefore, based on the model, the predicted motivations for prehistoric use, and the many varied project effects, only selected areas within each airport project are proposed for testing.

Historic archeological deposits may occur along historic roadways where farms and other structures are present. Historic maps aid in identifying general locations of structures no longer present. However, due to the limited number of local maps produced throughout the historic period, not all historic sites can be identified through map research alone. Visual inspection and subsurface testing can best identify historic sites.

Since the scope of work for this project did not include specific development plans for any of the airport properties, archeological sensitivity assessments were made as a general overview of each airport. Recommendations are based on identifying high sensitivity areas within each property which have the potential for prehistoric and historic archeological resources, and thus warrant further investigations if future plans are to affect these areas. The following assessments include recommendations for historic structures within the properties which have potential eligibility for inclusion on the National Register of Historic Places.

Areas designated as disturbed lack any archeological sensitivity and do not need to be considered in future development plans. Portions of the properties located outside the designated sensitivity and disturbance areas are considered low to marginally sensitive for archeological resources. Due to the broad scope of the present assessment low sensitivity areas are broadly defined without consideration for any specific future impacts. In general these low sensitivity areas are unlikely to contain significant archeological deposits and therefore development in these areas should not require archeological testing. However, due to the large size of these areas, any future development plans may require additional assessments of specific impacts to satisfy state requirements for Section 106 compliance. Any additional work in these portions of the airport properties may be restricted to minimal sampling of impact areas.

The following areas of each airport have been defined as sensitive for prehistoric or historic archeological deposits as shown on the individual project maps. A brief outline of low sensitivity areas based mainly on disturbances is included in the following overview.

Caledonia County State Airport (Figure 3):

- Near the middle of the property the relatively undisturbed portions of the level area surrounding a small stream cut by the runway is sensitive for precontact use.
- The high knoll top at the southern end of the project area due to its views of the surrounding territory is sensitive for precontact deposits.
- Portions of the avigation easement in the northeast corner of the project area within 180 meters (590 feet) of Quimby Brook due to the proximity to water is sensitive to precontact deposits.
- Also, the northern avigation easement is sensitive for historic archeological deposits associated with the 19th Century *Ray/Estarbrook* farm.
- The relocated 19th century schoolhouse is a potentially significant historic structure located on Town Highway 14 north of the airport terminal. The schoolhouse was originally located near the edge of the property to the west and presently houses the local Civil Air Patrol.
- This location is also significant for historic archeological deposits associated with an earlier 19th century Baptist Church, no longer extant. Historic sensitivity could include the possibility of a cemetery associated with the church.

Franklin County State Airport (Figure 15):

- The area of highest sensitivity for precontact occupation is along the high terrace edge south of Youngman Brook and the wetland at the north end of the property. Portions of this terrace have been impacted by sand and gravel quarrying near the north end of the runway thus affecting the sensitivity of this location.
- Portions of the avigation easement north of Youngman Brook may be sensitive for precontact deposits; however the rough and rocky terrain may limit the potential of identifying sites.
- To the west of the runway south of the terrace edge is an area sensitive to historic archeological deposits based on map research and surface indications noted during the field investigations.

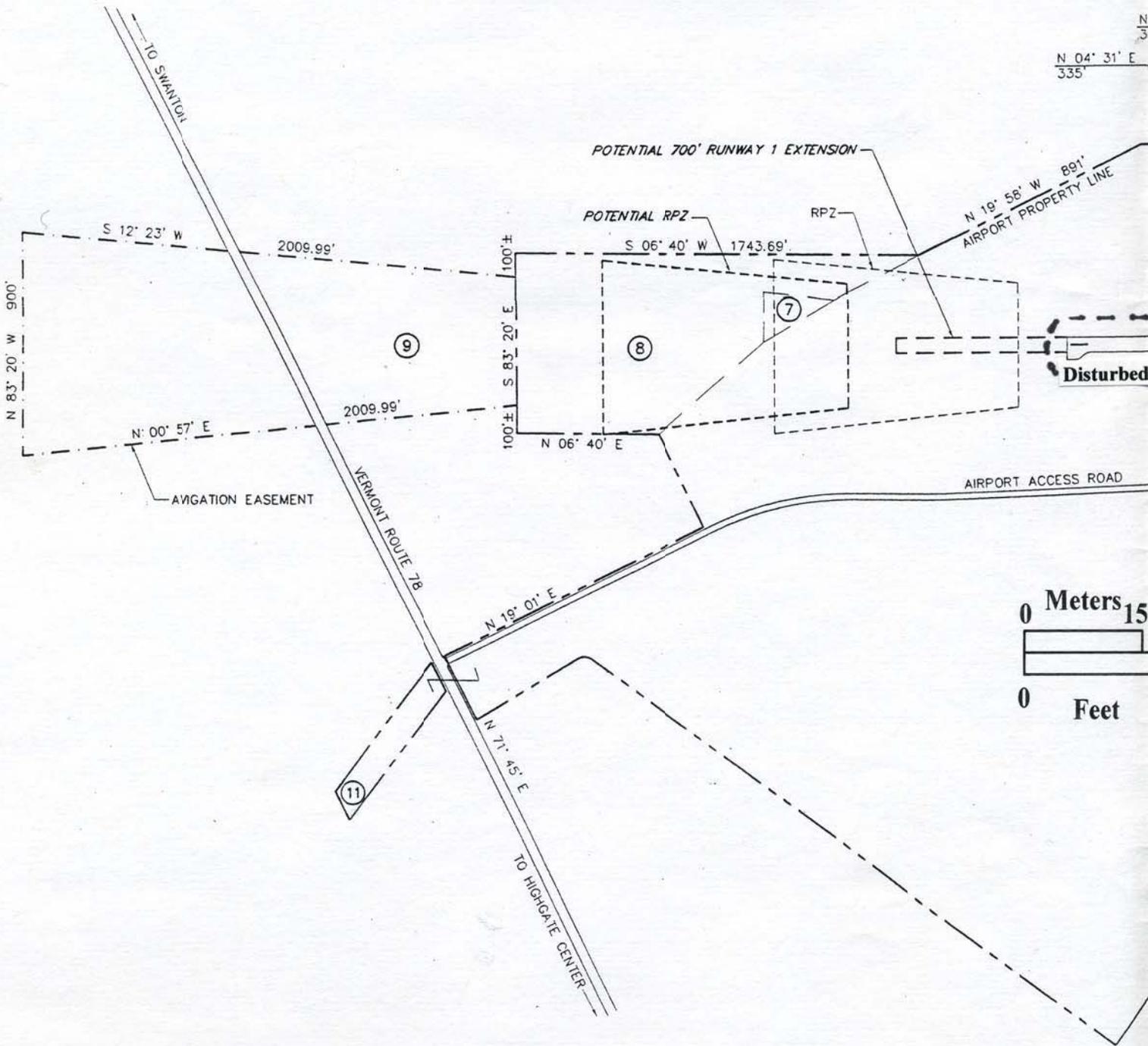
Hartness State Airport (Figure 36):

- The area of most archeological sensitivity for precontact occupation is located along the high terrace edge overlooking the North Springfield Reservoir and Black River Valley. The long terrace edge extends along the eastern border of the project area and into the northern avigation easement.
- A remnant portion of a lower terrace is located in a potential acquisition area at the east end of the eastern runway protection zone. Although this terrace location has been partially disturbed by sand and gravel quarrying its proximity to and with views of the Black River suggest an area of high sensitivity.
- The southern potential acquisition area is located on a level terrace edge above Baltimore

Project	Vermont Airports - Franklin County State Airport	Design Plans	
USGS	High Gate Center, VT	Staff	
	Date	B. Sterling	
	June 17, 1999		
Environmental Variable	Proximity	Value	Assigned Score
1) Distance to Existing or Relict River or Permanent Stream	0-60 M	12	<u>12</u>
	60-120 M	8	<u> </u>
	120-180 M	4	<u> </u>
2) Distance to Pond or Lake	0-60 M	12	<u> </u>
	60-120 M	8	<u> </u>
	120-180 M	4	<u> </u>
3) Distance to Intermittent Stream	0-60 M	12	<u> </u>
	60-120 M	8	<u> </u>
	120-180 M	4	<u> </u>
4) Distance to Wetland (wetlands > one acre in size)	0-60 M	12	<u>12</u>
	60-120 M	8	<u> </u>
	120-180 M	4	<u> </u>
5) Confluence of River / River or River / Brook	0-60 M	12	<u> </u>
	60-120 M	8	<u> </u>
	120-180 M	4	<u> </u>
6) Confluence of Intermittent Streams	0-60 M	8	<u> </u>
	60-120 M	4	<u> </u>
	120-180 M	2	<u> </u>
7) Falls or Rapids	0-60 M	8	<u> </u>
	60-120 M	4	<u> </u>
	120-180 M	2	<u> </u>
8) Restricted Access / Drainage Divide	0-60 M	8	<u> </u>
	60-120 M	4	<u> </u>
9) Head of Draw	0-60 M	8	<u> </u>
10) Isolated Spring	0-60 M	8	<u> </u>
	60-120 M	4	<u> </u>
11) Major Floodplain / Alluvial Terrace	0-60 M	8	<u> </u>
	60-120 M	4	<u> </u>
12) Lithic Outcrop	0-180 M	20	<u> </u>
13) Knoll Top / Ridge Crest / Promontory	0-60 M	8	<u> </u>
14) Kame / Outwash Terrace (valley edge features)	0-60 M	8	<u>8</u>
15) Other Major Topographic Break	0-60 M	8	<u> </u>
16) Relict Beach or Shore Line	0-60 M	12	<u> </u>
17) Caves / Rockshelters	0-60 M	12	<u> </u>
18) Excessive Slope (>15%) or Steep Erosional Slope (>20%)		-8	<u>-8</u>
19) Very Poorly Drained Soils		-8	<u> </u>
20) Excessively Disturbed		-24	<u> </u>
		Total Score:	<u>24</u>

20+ = Archaeologically Sensitive

0-18 = Archaeologically Non-Sensitive





Appendix E:

List of Preparers/Reviewers



List of Preparers

Name	Company	Section
Lisa Cheung	Passero Associates	History, Purpose and Need, Environmental Consequences
Daniel Jablansky	Passero Associates	Affected Environment, Environmental Consequences
Wayne Zian	Passero Associates	Graphics
Jenn Riordan	The Smart Associates	Wetland Delineation, Environmental Documentation
Jim Fougere	The Smart Associates	Wetland Delineation, Vernal Pool, Species Review

List of Reviewers

Name	Company	Section
Kyle Wells	VTrans	Project Manager
Jeff Ramsey	VTrans	Environmental Specialist
Jen Davis	VTrans	Aviation Northern Operations Manager
Glenn Gingras	VTrans	Biologist
Richard Doucette	FAA	Environmental Specialist

Coordinated With:

Name	Company	Section
John Austin	VT Fish and Wildlife	Land & Habitat
Mark Ferguson	VT Fish and Wildlife	Wildlife Biologist
Noel Dodge	VT Fish and Wildlife	Wildlife Biologist
John Buck	VT Fish and Wildlife	Migratory Bird
Brock Fryer	VT ANR	Wetlands



Appendix F: Public Participation

PLACE LEGAL NOTICE AND AFFIDAVIT OF PUBLICATION HERE