

ENVIRONMENTAL ASSESSMENT
FOR
Westover Air Reserve Base Airfield Improvements

Draft



PREPARED BY:
U.S. Air Force Reserve Command

September 2023

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COVER SHEET
ENVIRONMENTAL ASSESSMENT
AIRFIELD IMPROVEMENTS

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- b. Proposed Action: Construct airfield improvements at Westover Air Reserve Base (ARB)
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Abstract: The United States (U.S.) Air Force Reserve Command (AFRC) proposes to construct airfield improvements at Westover ARB to better accommodate training requirements and airfield operations in support of the 439th Airlift Wing's existing C-5M aircraft. This EA evaluates the potential environmental impacts associated with two alternatives for this Proposed Action: the Preferred Alternative and the No Action Alternative.

Under the Preferred Alternative, AFRC would construct improvements to the existing airfield at Westover ARB in Hampden County, Massachusetts. These improvements include two primary activities: 1) construction of a paved training apron, and 2) extension of the existing Taxiway Golf (G). The paved training apron and associated stormwater feature would be constructed within the Dog Patch Training Area. Construction of the paved training apron would create approximately 1.2 acres of impervious surface, and a 0.3-acre stormwater feature (bioretention basin) would be constructed to the north of the paved training apron to collect runoff. The Taxiway G extension would involve constructing a new concrete taxiway surface between the existing Taxiway G and Pad 5 within the Westover ARB airfield. This extension would create approximately 16.1 acres of impervious surface. Stormwater management options would include installation of new drain lines and surface grading in areas adjacent to the taxiway extension, while existing underground utilities at the site would be relocated or abandoned in place. Under the No Action Alternative, the proposed airfield improvements at Westover ARB would not be constructed.

The following environmental resources were analyzed in the EA: air quality, earth resources, water resources, biological resources, cultural resources, utilities, socioeconomic and environmental justice, and hazardous and toxic materials and waste. Resources with no or negligible impacts from the Proposed Action, including airspace, land use and zoning, visual resources, noise, occupational health and safety, and transportation, were dismissed from detailed analysis. Based on the analysis presented in this EA, the AFRC has determined that with incorporation of best management practices, minimization measures, and environmental protection measures, the Proposed Action would have no significant impacts on the human or natural environment.

This Draft EA and Draft Finding of No Significant Impact (FONSI) are available on the Westover ARB 439th Airlift Wing website at <https://www.westover.afrc.af.mil/About-Us/Resources/Environmental-and-Noise/>.

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ABBREVIATIONS AND ACRONYMS

°F	Degree Fahrenheit	EIAP	Environmental Impact Analysis Process
ACAM	Air Conformity Applicability Model	EJ	Environmental Justice
AFCEC	Air Force Civil Engineer Center	EO	Executive Order
AFFF	Aqueous Film Forming Foam	EPM	Environmental Protection Measures
AFMAN	Air Force Manual	ERP	Environmental Restoration Program
AFPD	Air Force Policy Directive	ESA	Endangered Species Act
AFRC	Air Force Reserve Command	FAA	Federal Aviation Administration
APE	Area of Potential Effects	FEMA	Federal Emergency Management Agency
ARB	Air Reserve Base	FONSI	Finding of No Significant Impact
ASL	Above sea level	FPPA	Farmland Protection Policy Act
BASH	Bird Air Strike Hazard	GHG	Greenhouse Gases
BMP	Best Management Practice	GWP	Global Warming Potential
CAA	Clean Air Act	HAP	Hazardous Air Pollutant
CEL	Chicopee Electric Light	HTMW	Hazardous and toxic materials and waste
CEQ	Council on Environmental Quality	HWMP	Hazardous Waste Management Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980	INRMP	Integrated Natural Resource Management Plan
CFR	Code of Federal Regulations	IPaC	Information for Planning and Consultation
CH ₄	Methane	JP-8	Jet petroleum-8
CMU	Concrete masonry unit	LID	Low Impact Development
CO	Carbon Monoxide	LOD	Limits of Disturbance
CO ₂	Carbon Dioxide	LQG	Large-quantity generator
CO ₂ e	Carbon Dioxide Equivalent	MBTA	Migratory Bird Treaty Act
CWA	Clean Water Act	MDFW	Massachusetts Division of Fisheries & Wildlife
CY	Calendar year	MESA	Massachusetts Endangered Species Act
DAFI	Department of the Air Force Instruction	MS4	Municipal Separate Storm Sewer System
DoD	Department of Defense	N ₂ O	Nitrous Oxide
DODI	Department of Defense Instruction	NAAQS	National Ambient Air Quality Standards
EA	Environmental Assessment		
EESOH-MIS	Enterprise, Environmental, Safety, Occupational Health-Management Information System		

NEPA	National Environmental Policy Act	RCRA	Resource Conservation and Recovery Act
NH ₃	Ammonia	ROI	Region of Influence
NHPA	National Historic Preservation Act of 1966	SF ₆	Sulfur Hexafluoride
NLEB	Northern long-eared bat	SHPO	State Historic Preservation Offices
NO ₂	Nitrogen Dioxide	SIP	State Implementation Plan
NO _x	Nitrogen Oxides	SO ₂	Sulfur Dioxide
NPDES	National Pollutant Discharge Elimination System	SO _x	Sulfur Oxides
NRCS	Natural Resources Conservation Service	SPCC	Spill Prevention and Countermeasure
O ₃	Ozone	SWPPP	Stormwater Pollution Prevention Plan
Pb	Lead	TMDL	Total Maximum Daily Load
PCB	Polychlorinated biphenyls	TSS	Total suspended solids
PFAS	Polyfluorinated Substances	U.S.	United States
PFOS	Perfluorooctane sulfonic acid	UFC	Unified Facilities Criteria
PM ₁₀	Particulate Matter with aerodynamic size less than or equal to 10 micrometers	USACE	United States Army Corps of Engineers
PM _{2.5}	Particulate Matter with aerodynamic size less than or equal to 2.5 micrometers	USAF	United States Air Force
POL	Petroleum, oils, and lubricants	USC	United States Code
ppb	Parts per billion	USEPA	United States Environmental Protection Agency
ppm	Parts per million	USFWS	United States Fish and Wildlife Service
		USGS	United States Geological Survey
		VOC	Volatile Organic Compounds

1.0 PURPOSE AND NEED

1.1 INTRODUCTION

This environmental assessment (EA) evaluates the potential environmental impacts associated with the United States (U.S.) Air Force Reserve Command's (AFRC) proposal to construct airfield improvements at Westover Air Reserve Base (ARB) in order to meet training requirements and conduct airfield operations required to support existing 439th Airlift Wing C-5M aircraft (Proposed Action). Westover ARB is located in two separate communities. The main base is located in the City of Chicopee and the eastern portion is located in the Town of Ludlow, both in Hampden County, Massachusetts (**Figure 1**).

The AFRC prepared this EA in compliance with the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S. Code [USC] 4321, et seq.); the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508); and the Air Force Environmental Impact Analysis Process (32 CFR Part 989).

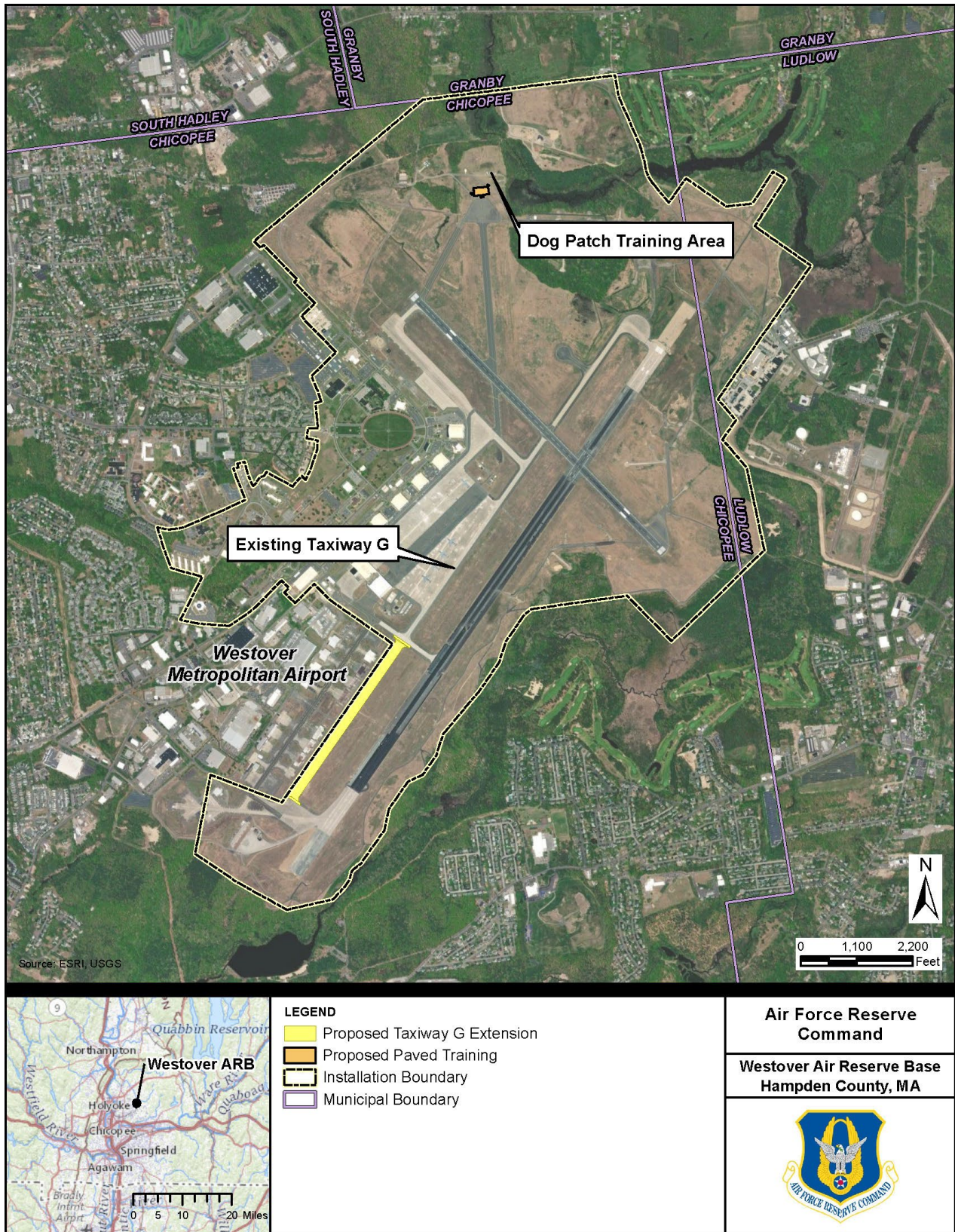
To facilitate public review of this EA, the AFRC published this Draft EA and Draft Finding of No Significant Impact (FONSI) on the Westover ARB 439th Airlift Wing website at <https://www.westover.afrc.af.mil/About-Us/Resources/Environmental-and-Noise/>.

1.2 PURPOSE AND NEED

Westover ARB is home to the 439th Airlift Wing, which operates eight permanently assigned C-5M aircraft. The 439th Airlift Wing's mission is to organize, train, and equip aircrews to provide strategic at-the-ready airlift capabilities. Westover ARB currently lacks the infrastructure necessary to fully conduct C-5M aircraft training requirements and airfield operations. Westover ARB does not have a paved training apron capable of supporting the ground equipment necessary to conduct C-5M aircraft training near Pad 19 and the Dog Patch Training Area, or adequate taxiways to accommodate efficient movement of the C-5M aircraft to Runway 05. The base currently performs contingency C-5M training in a designated cantonment area of Westover ARB, which lacks improved grounds needed for training. Additionally, all aircraft at Westover ARB are currently required to back-taxi on the runway surface, which reduces pavement life and available runway time for both military and civilian aircraft (AFRC, 2023a).

The purpose of the Proposed Action is to make airfield improvements to better accommodate C-5M aircraft training requirements and airfield operations at Westover ARB. The Proposed Action is needed because existing infrastructure results in inefficient operations. The 439th Airlift Wing is currently reliant on temporary use of Runway 05 and vacant areas that vary in availability to conduct required training and create inefficient conditions for airfield operations.

Figure 1: Westover ARB Site Vicinity



1.3 INTERAGENCY AND INTERGOVERNMENTAL COORDINATION/CONSULTATION

The AFRC coordinated with the following federal, state, and local agencies with jurisdiction by law or special expertise over the Proposed Action to inform the range of issues to be addressed in the EA.

- Federal Aviation Administration (FAA)
- U.S. Army Corps of Engineers (USACE)
- U.S. Department of Agriculture Natural Resources Conservation Service (NRCS)
- U.S. Environmental Protection Agency (USEPA)
- U.S. Fish and Wildlife Service (USFWS)
- Massachusetts Commission on Indian Affairs
- Massachusetts Department of Conservation and Recreation
- Massachusetts Department of Environmental Protection
- Massachusetts Department of Fish and Game
- Massachusetts Department of Public Health
- Massachusetts Division of Fisheries and Wildlife (MDFW)
- Massachusetts Environmental Policy Act Office
- Massachusetts Executive Office of Transportation
- Massachusetts Historical Commission (State Historic Preservation Office [SHPO])
- Chicopee Community Development Department
- Chicopee Historical Commission
- Chicopee Planning Department
- Pioneer Valley Planning Commission
- Westover Airport

Coordination letters and responses received are consolidated in **Appendix A** and discussed in **Section 3.0**, as appropriate. Westover ARB's consultation with the Massachusetts SHPO under Section 106 of the National Historic Preservation Act of 1966 (NHPA) is included in **Appendix B**.

Consistent with NHPA implementing regulations (36 CFR Part 800), Department of Defense (DoD) Instruction (DODI) 4710.02, *Interactions with Federally-Recognized Tribes*, Department of the Air Force Instruction (DAFI) 90-2002, *Air Force Interaction with Federally-Recognized Tribes*, and Air Force Manual (AFMAN) 32-7003, *Environmental Conservation*, the AFRC is also consulting with federally recognized tribes that are historically affiliated with the geographic region of Westover ARB regarding the potential for the Proposed Action to affect properties of cultural, historical, or religious significance to the tribes. A record of this consultation is included in **Appendix C**.

1.4 PUBLIC AND AGENCY REVIEW OF THE EA

In accordance with CEQ and Air Force NEPA regulations, this Draft EA and Draft FONSI have been made available for a 30-day public review and comment period between September 28, 2023, and October 28, 2023. A Notice of Availability for the Draft EA and Draft FONSI was published in the *Wilbraham-Hampden Times* on September 28, 2023, and the *Chicopee Register* on September 29, 2023.

The Draft EA and Draft FONSI were published digitally on the Westover ARB 439th Airlift Wing website at <https://www.westover.afrc.af.mil/About-Us/Resources/Environmental-and-Noise/>. Printed copies of the Draft EA and Draft FONSI are available for public review at the Chicopee Fairview Branch Library, 402 Britton Street, Chicopee, Massachusetts 01020. During the Draft EA public review period, written comments may be mailed to John Moriarty, P.E., Environmental Flight Chief, 439th Airlift Wing, 250 Patriot Avenue, Box 35, Westover ARB, MA 01022; or emailed to john.moriarty.1@us.af.mil. The AFRC will only respond to public comments during specified, formal public comment and review periods.

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2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

The Proposed Action entails construction of airfield improvements at two locations within the existing airfield at Westover ARB. These improvements would create new hardened areas to better accommodate training requirements and airfield operations at Westover ARB in support of the existing C-5M aircraft.

2.2 SCREENING OF ALTERNATIVES

The AFRC developed selection standards to evaluate specific reasonable alternatives by which to implement the Proposed Action. “Reasonable alternatives” are those that could be utilized to meet the purpose of and need for the Proposed Action. The AFRC’s selection standards used to evaluate reasonable alternatives include the following:

1. **Standard 1 – Compliance with Design Requirements:** Airfield improvements must be designed in compliance with design requirements, such as the Unified Facilities Criteria (UFCs) applicable to airfield operations. The UFC system provides planning, design, construction, sustainment, restoration, and modernization criteria for DoD real property. UFCs that are applicable to this Proposed Action include, but are not limited to, UFC 3-210-10, *Low Impact Development*; UFC 4-010-01, *DoD Minimum Antiterrorism Standards for Buildings*; UFC 3-260-01, *Airfield and Heliport Planning and Design*; and UFC 3-260-02, *Pavement Design for Airfields*. The AFRC evaluated each alternative based on its ability to meet design requirements pertaining to airfield operations.
2. **Standard 2 – Adequate Size:** Airfield improvements must be of adequate size to accommodate training activities and airfield operations. The AFRC evaluated each alternative on its ability to provide ample space/acreage to allow for efficient movement around the airfield as well as ease of construction.
3. **Standard 3 – Compatible with Neighboring Operations:** Westover ARB is co-located with the Westover Metropolitan Airport, an FAA Certified Class IV Air Carrier Airport that serves large aircraft, including public and private charters. The AFRC evaluated each alternative on its compatibility with neighboring activities of the Westover Metropolitan Airport.

2.3 EVALUATED ALTERNATIVES

2.3.1 Preferred Alternative

AFRC proposes to construct two airfield improvements at Westover ARB: a paved training apron with an associated stormwater feature (bioretention basin), and an extension of an existing taxiway. The Preferred Alternative has been designed specifically to comply with all applicable design requirements and to be an adequate size to accommodate training activities and airfield operations. In addition, the Preferred Alternative would not create any conflicts with neighboring operations at the Westover Metropolitan Airport. This is AFRC’s Preferred Alternative because it ensures the best operating and training conditions at Westover ARB and best meets the selection standards identified in **Section 2.2**. The two components of the Proposed Action are not dependent on each other and AFRC may choose to implement one without the other. These projects are AFRC directive actions that are analyzed together in this EA for efficiency and due to the similarities in their potential environmental impacts, particularly with respect to grassland conversion and stormwater. Both projects are fully analyzed as part of the Preferred Alternative in this EA.

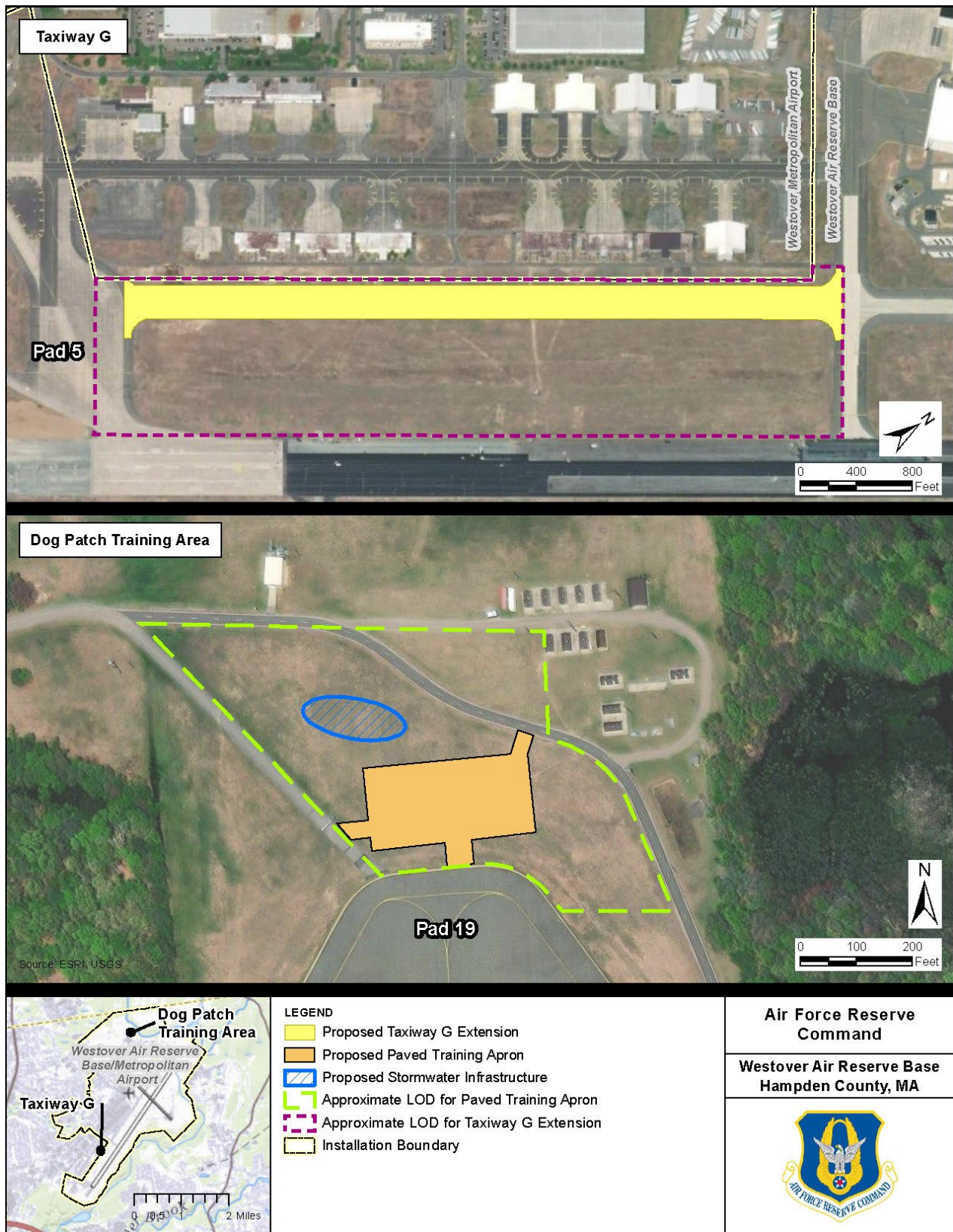
2.3.1.1 Construction of Airfield Improvements

Construction of the Preferred Alternative would occur within the Dog Patch Training Area and south of Taxiway Golf (G) within the Westover ARB airfield.

Paved Training Apron: In the Dog Patch Training Area, an approximately 1.2-acre concrete training apron and 0.3-acre bioretention basin would be constructed. Construction of the paved training apron would involve removing the existing topsoil, compacting the existing subgrade, and adding new base coarse materials before laying concrete over the area (AFRC, 2021a). Maximum excavation depth would be 1 foot for the paved training apron and up to 7 feet for the bioretention basin. The concrete training apron and bioretention basin would be constructed on an area currently consisting of grassland and surrounded by existing improved surfaces. The paved training apron would connect to Pad 19 to the south and existing roadways to the west and east (**Figure 2**). The bioretention basin would be constructed as a full exfiltration basin system that relies solely on infiltration to drain the basin; overflows would be conveyed either via spillway or overland flow to adjacent grassy areas (AECOM, 2023). The bioretention basin would not have standing water outside of storm events to prevent attracting birds and wildlife to the airfield. Existing underground utility infrastructure in the proposed Project Site would remain in place and no changes to existing utility infrastructure would occur under this component of the Preferred Alternative (AFRC, 2023b). Construction of the paved training apron would begin in calendar year (CY) 2024 and last for approximately 60 days.

Taxiway G Extension: This component of the Preferred Alternative entails constructing a new concrete taxiway surface between the existing Taxiway G and Pad 5 within the Westover ARB airfield. This extension would be approximately 3,816 feet long and 175 feet wide including 50-foot shoulders on either side, creating approximately 16.1 acres of impervious surface. The existing Taxiway G parallels approximately two-thirds of the length of Runway 05, and this project would extend the taxiway to the full length of the runway. Construction of the Taxiway G extension would include clearing and grading the site, placement of rigid pavement and associated reinforcement, construction of paved shoulders, construction of new paved access leading to the glide slope antenna, installation of taxiway edge lighting and signage, and all required pavement markings per UFC and applicable codes (AFRC, 2023a). To facilitate extension of Taxiway G, electrical infrastructure associated with the airfield's glide slope antenna would need to be relocated. The electrical infrastructure is currently located on the southeast side of the access road near the existing hangars and consists of a medium voltage sectionalizing switch; pad-mounted transformer; diesel-fired emergency backup generator; and small concrete masonry unit (CMU) building that contains the switchgear, electrical panels, automatic transfer switch, and communication boxes. Additionally, a secondary circuit in a duct runs from the CMU building to the glide slope antenna. Under the Preferred Alternative, the CMU building would be demolished, and both the medium-voltage electrical equipment and the backup generator would be relocated (AFRC, 2023a). Maximum excavation depth would be 13-18 feet below ground surface to facilitate installation of stormwater infrastructure. The site is currently covered by a warm season grassland over previously disturbed soils and existing underground utilities (Westover ARB, 2016). Existing underground utilities at the proposed site would be relocated or abandoned in place. Construction of the Taxiway G extension would begin in CY 2026 and last approximately nine months.

Figure 2: Proposed Airfield Improvements



Construction staging areas for the paved training apron and Taxiway G extension have not yet been identified but would likely occur either within the proposed Project Sites or within adjacent paved areas. For the purposes of this analysis, AFRC has identified approximate limits of disturbance (LOD) for the Taxiway G extension (75.6 acres) and paved training apron (6.2 acres) construction. These approximate LODs include areas where temporary impacts may occur, such as construction staging and underground utility extensions (**Figure 2**). These projects are still in the design phase and temporary impacts (e.g., from utility installation) are not quantifiable at this time. Prior to starting construction, all areas that would be disturbed by the Proposed Action would have their existing grassland habitat removed from biological production via methods included in Westover ARB's Vegetation Management Plan (i.e., ongoing and targeted prescribed burning, mowing, or tilling) prior to the start of the nesting season for migratory birds (April 15). Construction activities would be conducted in accordance with the applicable requirements of the USEPA National Pollutant Discharge Elimination System (NPDES) and associated permits to manage the quantity and quality of stormwater discharged from the proposed Project Sites and minimize the potential for pollution and sedimentation.

2.3.1.2 Operation and Maintenance

Once construction of the paved training apron and Taxiway G extension are complete, these new improved areas would be incorporated into the airfield's military and civilian operations, which would include clearing these areas of snow and debris, and maintaining pavement markings and stormwater infrastructure. The airfield improvements would be used as needed to ensure C-5M aircraft training and airfield operations at Westover ARB are conducted efficiently. There would be no change to the type of training activities, number or personnel, number of flights, or number or type of aircraft stationed at Westover ARB.

2.3.2 No Action Alternative

Under the No Action Alternative, AFRC would not construct the paved training apron in the Dog Patch Training Area or the Taxiway G extension. Westover ARB and personnel would not have fully adequate training and operational areas for assigned C-5M aircraft, and associated functions at Westover ARB would continue to be less efficient. While the No Action Alternative would not meet the Proposed Action's purpose and need, it is analyzed in this EA to provide a comparative baseline with the Preferred Alternative.

2.4 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

The AFRC initially considered an alternative site layout for the paved training apron component of the Proposed Action. Under the alternative site layout, the paved training apron would immediately abut the existing Pad 19, and a connecting road would have been constructed to connect the training apron to the existing road to the north. Stormwater infrastructure would have been constructed immediately to the north of the paved training apron (AFRC, 2021b). An additional hardened area would have been constructed in the grassy area immediately southwest of the existing buildings within the Dog Patch Training Area. Following an initial analysis, AFRC determined this site layout would create construction difficulties associated with impacts to existing manhole structures. Therefore, this alternative does not meet Selection Standard 2 as described in **Section 2.2** and was therefore eliminated from further consideration.

No alternatives were considered for the Taxiway G extension, as its location and layout are fixed due to it being an extension of an existing taxiway. The paved training apron and Taxiway G extension are analyzed together rather than as separate alternatives due to similarities in their potential environmental impacts, particularly with respect to grassland conversion and stormwater. These projects are not dependent on one another and the AFRC may choose implement one project without the other.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

This chapter describes the affected environment and potential environmental consequences for resource areas that could be affected by the Proposed Action. Resources dismissed from detailed analysis in the EA, and the justification for their dismissal, are presented in **Table 1**.

Table 1: Resources Dismissed from Detailed Analysis in the EA

Environmental Resource	Justification
Airspace	The Proposed Action would have no potential to interfere with airspace operations. The Proposed Action would not result in additional aircraft, aircraft operations, or requirements for changes in airspace use. The Proposed Action would not create any substantial bird/wildlife air strike hazard (BASH) risks, nor would any vertical construction occur which would interfere with the airfield's imaginary surfaces. Temporary construction waivers would be obtained to allow for work within Westover ARB's Air Installation Compatible Use Zone. Therefore, there would be no impact on airspace.
Land Use and Zoning	No encroachment issues would be created from the Proposed Action. The Proposed Action would occur entirely on-base and has no potential to affect off-base land. The Proposed Action is compatible with existing and future land uses on Westover ARB and is outlined in the Westover ARB District Plan for the Airfield and Training Districts (AFRC, 2021c). AFRC would coordinate with Westover Metropolitan Airport to minimize potential interruptions to civilian airfield operations that may result from the Proposed Action. Therefore, there would be no impact on land use.
Visual Resources	The Proposed Action locations are shielded from off-base residences by mature trees and existing structures. The Proposed Action does not include any vertical construction. The Proposed Action would not result in any obvious modifications to the existing aesthetic and visual landscapes. Therefore, there would be no impact on aesthetics and visual resources.
Noise	Noise generated by construction activities is considered an insignificant contributor to the overall noise environment at Westover ARB, given existing ground and air operations. Additionally, there are no residential receptors within 1,000 feet of the proposed Project Sites; distance and landscape (including existing structures and a buffer of mature trees) would further attenuate noise. Therefore, there would be no impact on noise.
Safety and Occupational Health	The Proposed Action and long-term maintenance activities would be conducted in accordance with applicable federal, state, U.S. Air Force (USAF), and local worker safety and regulatory requirements and guidelines, including those established by the Occupational Safety and Health Administration. Adherence to these requirements would substantially minimize the potential for worker injuries during construction and maintenance. The Proposed Action would have no potential to adversely impact public safety. Therefore, there would be no impact on safety and occupational health. Additionally, Westover ARB has developed a BASH program to help minimize the potential for birds to congregate on Westover ARB. As noted above for Airspace, the Proposed Action would not create any substantial BASH risks.
Transportation	The Proposed Action would not require new transportation facilities or modification of existing facilities/roadways. The Proposed Action would result in a temporary increase in vehicle traffic associated with contractor vehicles and the transportation of construction equipment and materials to the proposed Project Sites. The Proposed Action would not substantially increase vehicle traffic or affect the existing level of service on any roadways. Therefore, there would be no impact on the transportation network on or near the proposed Project Sites.

3.2 AIR QUALITY AND CLIMATE

Air quality conditions at a given location are a function of several factors including the quantity and type of pollutants emitted locally and regionally, as well as the dispersion rates of pollutants in the region. Primary factors affecting pollutant dispersal include wind speed and direction, atmospheric stability, climate and temperature, and topography.

The Region of Influence (ROI) for air quality is the Hartford-New Haven-Springfield Interstate (Connecticut, Massachusetts) Air Quality Control Region that encompasses the states of Massachusetts and Connecticut.

3.2.1 Affected Environment

3.2.1.1 Criteria Pollutants

National Ambient Air Quality Standards (NAAQS) are established by the USEPA for six “criteria pollutants” (as listed under Section 108 of the Clean Air Act [CAA] of 1970) (Table 2): carbon monoxide (CO); lead (Pb); nitrogen dioxide (NO₂); ozone (O₃); particulate matter (PM), divided into two size classes of 1) aerodynamic size less than or equal to 10 micrometers (PM₁₀), and 2) aerodynamic size less than or equal to 2.5 micrometers (PM_{2.5}); and sulfur dioxide (SO₂). The state of Massachusetts has adopted the NAAQS to regulate air pollution levels.

The ambient air quality in an area is characterized in terms of whether it complies with the NAAQS. Areas where monitored outdoor air concentrations are within an applicable NAAQS are considered in *attainment* of that NAAQS. If sufficient ambient air monitoring data are not available to make a determination, the area is instead deemed as *attainment/unclassifiable*. Areas where monitored outdoor air concentrations exceed the NAAQS are designated by the USEPA as *nonattainment*. Nonattainment designations for some pollutants (e.g., O₃) can be further classified based on the severity of the NAAQS exceedances. Lastly, areas that have historically exceeded the NAAQS but have since instituted controls and programs that have successfully remedied these exceedances are known as *maintenance* areas.

The General Conformity Rule of the federal CAA mandates that the federal government abide by approved State Implementation Plans (SIP) (i.e., air quality control plans). Air Force Policy Directive (AFPD) 32-70, *Environmental Considerations in Air Force Programs and Activities*, mandates that the USAF comply with all federal, state, and local environmental laws and standards. In accordance with AFPD 32-70, AFMAN 32-7002, *Environmental Compliance and Pollution Prevention*, explains responsibilities and specific details on how to comply with the CAA and other federal, state, and local air quality regulations. This AFMAN provides further and more specific instruction on the requirements of the USAF's Environmental Impact Analysis Process (EIAP) for air quality promulgated at 32 CFR 989.30, which mandates that EIAP documents, such as this EA, address General Conformity.

According to the most current attainment list maintained by the Air Force Civil Engineer Center (AFCEC), Westover ARB is located in a *maintenance* area for CO, a *nonattainment* area for O₃ within the northeast transportation region per the 1997 NAAQS, and in *attainment* areas for all other criteria pollutants (AFCEC, 2020).

Table 2: National and Massachusetts Ambient Air Quality Standards

Pollutant	Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)	Primary	8-hour	9 parts per million (ppm)	Not to be exceeded more than once per year
		1-hour	35 ppm	
Lead	Primary and Secondary	Rolling 3-month average	0.15 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) ⁽¹⁾	Not to be exceeded
Nitrogen Dioxide (NO ₂)	Primary	1-hour	100 (parts per billion) ppb	98th percentile, averaged over 3 years
	Primary and Secondary	Annual	53 ppb ⁽²⁾	Annual mean
Ozone	Primary and Secondary	8-hour	0.070 ppm ⁽³⁾	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particulate matter equal to or less than 2.5 microns in diameter (PM _{2.5})	Primary	Annual	12 $\mu\text{g}/\text{m}^3$	Annual mean, averaged over 3 years
	Secondary	Annual	15 $\mu\text{g}/\text{m}^3$	Annual mean, averaged over 3 years
	Primary and Secondary	24-hour	35 $\mu\text{g}/\text{m}^3$	98th percentile, averaged over 3 years
Particulate matter equal to or less than 10 microns in diameter (PM ₁₀)	Primary and Secondary	24-hour	150 $\mu\text{g}/\text{m}^3$	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO ₂)	Primary	1-hour	75 ppb ⁽⁴⁾	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

⁽¹⁾ In areas designated nonattainment for lead standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 $\mu\text{g}/\text{m}^3$ as a calendar quarter average) also remain in effect.

⁽²⁾ The official level of the annual NO₂ standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of a clearer comparison to the 1-hour standard.

⁽³⁾ Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O₃ standards additionally remain in effect in some areas. Revocation of the previous (2008) O₃ standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.

⁽⁴⁾ The previous SO₂ standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: 1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and 2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO₂ standards or is not meeting the requirements of a SIP call under the previous SO₂ standards (40 CFR 50.4(3)). A SIP call is a USEPA action requiring a state to resubmit all or part of its SIP to demonstrate attainment of the required NAAQS

Source: (USEPA, 2023a); 310 Code of Massachusetts Regulations (CMR) 60.00

3.2.1.2 Climate Change and Greenhouse Gas Emissions

The primary long-lived greenhouse gases (GHGs) directly emitted by human activities are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (SF₆). To estimate global warming potential (GWP), all GHGs are expressed relative to a reference gas, CO₂, which is assigned a GWP equal to 1. All six GHGs are multiplied by their GWP and the results are

added to calculate the total equivalent emissions of CO₂ (CO₂e). However, the dominant GHG emitted is CO₂, mostly from fossil fuel combustion (approximately 79 percent).

In January 2021 previous policies and guidance associated with GHG emissions and climate change were reinstated through Executive Orders (EOs) and other actions. Specifically, EO13990, issued on January 25, 2021, stated the policy of the federal government is to take a variety of actions, including reducing GHG emissions, to protect public health and the environment. The order also directed the CEQ to review, revise, and update the previous “Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews,” dated August 5, 2016. CEQ issued an interim *National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change* on January 9, 2023, to assist federal agencies in analyzing GHG and climate change effects. As such, this EA considered the potential effects of the Preferred Alternative on climate change and of climate change on the Preferred Alternative.

The current level of air emissions from all natural and human activities within a region represent the baseline emissions for that area. The National Emissions Inventory, updated every 3 years by the USEPA, can be used to identify the baseline emissions. It contains estimates of annual air emissions by county. The most recent publicly available inventory data nationally is for CY 2020. Table 3 presents the baseline GHG emission levels obtained from the 2020 National Emissions Inventory for Hampden County where Westover ARB is located. Nationally, the baseline 2021 GHG emission level is 6,340 million metric tons of CO₂e (USEPA, 2023b). Table 3 also summarizes climate conditions for the ROI.

Table 3: Climate Conditions in the ROI

Climate Feature	Conditions in the ROI
General Climate Description	Cold and Temperate
Average Annual Precipitation (Inches)	44.6
Wettest Month / Average Monthly Precipitation (inches)	October 4.2
Driest Month / Average Monthly Precipitation (inches)	February 3.1
Annual Mean Temperature (degrees Fahrenheit [°F])	49.2
Warmest Month / Average Temperature (°F)	July 72.5
Coolest Month / Average Temperature (°F)	January 25.2
County Baseline GHG Emissions (Metric Tons CO ₂ e) ¹	2,565,117
National Baseline GHG Emissions (Metric Tons CO ₂ e) ¹	6,340,000,000

Note: ¹. CO₂e = Carbon Dioxide Equivalent

Sources: (2020 NEI Supporting Data and Summaries, 2022; Climate-Data.org, 2022)

3.2.1.3 Other Air Quality Considerations

In addition to the criteria pollutants discussed above, Hazardous Air Pollutants (HAPs) also are regulated under the CAA. The USEPA has identified 187 HAPs that are known or suspected to cause health effects in small concentrations. HAPs are emitted by a wide range of man-made and naturally occurring sources,

including mobile and stationary combustion sources. However, unlike the NAAQS for criteria pollutants, federal ambient air quality standards do not exist for non-criteria pollutants. Therefore, HAPs are generally regulated through specific air emission permit provisions for stationary sources and HAP emission limits for mobile sources.

Special goals for visibility in many “Class I Federal areas” were also established by the CAA; these areas generally include national parks, wilderness areas, and international parks. The Regional Haze Rule (40 CFR Part 51) was subsequently enacted in 1999 and requires states to establish goals for improving visibility in national parks and wilderness areas and to develop long-term strategies for reducing emissions of air pollutants that cause visibility impairment. No Class I Federal areas occur in the vicinity of Westover ARB (USEPA, 2023c). Visibility-impairing pollutants can be transported over great distances; therefore, states are encouraged to work together to develop regional visibility goals and strategies. Visibility-impairing pollutants are emitted by a wide variety of activities and sources, including mobile source fuel combustion, agriculture, and manufacturing. Emissions of these pollutants are regulated by complying with the NAAQS, through state-specific programs, and through specific air emission permit provisions.

3.2.2 Environmental Consequences

Air quality is affected by stationary sources (e.g., boilers, emergency generators, and industrial processes), mobile sources (e.g., motor vehicles, construction equipment, and aircraft), and area sources (e.g., vehicle and aircraft fuel transfer, storage, and dispensing). The nature and magnitude of the Preferred Alternative is expected to create only localized air quality impacts to the area surrounding the proposed Project Sites. The air quality impact analysis follows the EIAP Air Quality Guidelines for criteria pollutants and GHG emissions. The USAF used the Air Conformity Applicability Model (ACAM) and the Air Emissions Guide for Air Force Mobile Sources (Solutio Environmental Inc., 2021) for the sources not covered by ACAM to analyze the potential air quality impacts associated with the Preferred Alternative, in accordance with AFMAN 32-7002, the EIAP, and the General Conformity Rule (40 CFR 93 Subpart B). The General Conformity Rule applies to the Preferred Alternative as Westover ARB is in a *maintenance* area for the 1971 CO NAAQS and a *nonattainment* area for the 1997 O₃ NAAQS. The ACAM report is available in **Appendix D**.

Construction emissions resulting from the Preferred Alternative were calculated using ACAM. The project emissions are “netted” on an annual basis. The impact analysis must consider the greatest annual emissions associated with the Preferred Alternative. Construction activities are expected to occur in 2024 and 2026.

Current USAF guidance provides methodology for performing an Air Quality EIAP Level II, Quantitative Assessment, which is an insignificance assessment that can determine if an action poses an insignificant impact on air quality (Solutio Environmental Inc., 2020). An air quality impact is considered insignificant if the action does not cause or contribute to exceedance of one or more of the NAAQS. The USAF defines significance indicators for each criteria pollutant according to current air quality conditions.

For *maintenance* or *nonattainment* areas, the General Conformity Rule formally defines *de minimis* (insignificant) levels that must be used as significance indicators. However, General Conformity Rule *de minimis* levels have not been established for *attainment* criteria pollutant emissions. In areas the USAF considers *clearly attainment* (i.e., where all criteria pollutant concentrations are currently less than 95 percent of applicable NAAQS), the significance indicators are 250 tons per year (i.e., the USEPA's Prevention of Significant Deterioration threshold), except for Pb, which is 25 tons per year. Hampden County is *attainment* for all criteria pollutants except for CO and 1997 O₃ NAAQS.

The change in climate conditions caused by GHGs is a global effect. The Preferred Alternative would have no impact on overall global or regional GHG emissions and global climate change. For NEPA disclosure purposes, however, this EA analyzes the potential GHG emissions, as calculated by the ACAM, under the Preferred Alternative, which could contribute to climate change.

3.2.2.1 Preferred Alternative

Criteria Pollutants: Construction of the Preferred Alternative would result in *short-term, insignificant impacts* on air quality. Construction activities would temporarily generate fugitive dust from grading, clearing, and site restoration activities, and criteria pollutant emissions (e.g., volatile organic compounds [VOCs] and nitrogen oxides [NO_x] [as precursors of O₃], CO, PM₁₀, and PM_{2.5} [including its precursor SO₂]) and GHG emissions from the use of diesel-powered and gasoline-powered equipment. The construction workforce commute would also contribute to a short-term increase in emissions. Construction period emissions typically depend on expected material quantities, such as clean fill import and off-site disposal of excess or contaminated excavated material, and equipment/vehicle utilization requirements for each project component. The construction emissions would occur in CY 2024 (paving training apron) and CY 2026 (Taxiway G extension) with majority of construction activities occurring during 2026. The majority of air emissions associated with the Preferred Alternative would be temporary in nature (limited to the duration of construction activities) and would be caused by fuel combustion in vehicles and construction equipment, and by dust generated from clearing, grading, site restoration activities, and equipment and vehicles traveling over unpaved areas.

Following construction of the paved training apron and Taxiway G extension, the airfield improvements would be used as needed to ensure training and airfield operations are conducted efficiently. There would be no change in current air operations at Westover ARB. Furthermore, since the type of training and operational activities, number of personnel, number of flights, and number and type of aircraft stationed at Westover ARB would remain the same as under existing conditions, no change in existing operational emissions would result under the Preferred Alternative.

Table 4 depicts annual netted emissions for the construction years (2024 and 2026) under the Preferred Alternative. All attainment criteria pollutants are *below the significance indicators*.

Table 4: Projected Annual Emissions from Preferred Alternative

Pollutant	Preferred Alternative Emissions (ton/year) ¹			NEPA Significance Indicator (ton/year)	General Conformity De Minimis Threshold (ton/year)	General Conformity Applicability (Yes or No)
	2024	2026	Steady State (Operation - 2027 and beyond)			
VOC	0.094	0.858	0.0	N/A	50	No
NO _x	0.546	4.885	0.0	N/A	100	
CO	0.622	5.493	0.0	N/A	100	
SO _x	0.001	0.015	0.0	250	N/A	
PM ₁₀	1.263	64.554	0.0	250		
PM _{2.5}	0.024	0.202	0.0	250		

Pollutant	Preferred Alternative Emissions (ton/year) ¹			NEPA Significance Indicator (ton/year)	General Conformity De Minimis Threshold (ton/year)	General Conformity Applicability (Yes or No)
	2024	2026	Steady State (Operation - 2027 and beyond)			
Pb	0.000	0.000	0.0	25		
NH ₃	0.001	0.005	0.0	250		
CO ₂ e	149.0	1,505.8	0.0	N/A		
Not in a regulatory area						

Notes:

1. 2024 and 2026 represent construction years.

NO_x = nitrogen oxides, SO_x = sulfur oxides, NH₃ = ammonia, CO₂e = Carbon Dioxide Equivalent, N/A = Not Applicable

Source: ACAM version 5.0.17b, run on May 17, 2023 (**Appendix D**).

As previously stated, a General Conformity Rule applicability analysis was performed for the Preferred Alternative. Westover ARB is designated as *maintenance* for the 1971 CO NAAQS and *nonattainment* for the 1997 O₃ NAAQS. The *de minimis* levels are 100 tons per year for CO, 50 tons per year for VOCs, and 100 tons per year for NO_x, respectively. As the maximum construction year (2026) emissions are expected to produce approximately 5.5 tons of CO emissions, 0.9 tons of VOCs, and 4.9 tons of NO_x, respectively, the maximum annual emissions levels for these pollutants are well below their respective *de minimis* thresholds and no additional General Conformity analysis is required for the Preferred Alternative. Therefore, construction emissions *would not exceed regulatory thresholds or significance indicators*, and the potential air quality impact from all criteria pollutants is *insignificant*.

Greenhouse Gas Emissions and Climate Change: CO₂ represents approximately 99.9974 percent of potential GHG emissions from the Preferred Alternative, while CH₄ and N₂O represent approximately 0.0023 percent and 0.0003 percent, respectively (based on weighted averages of USEPA emission factors for natural gas, gasoline, and diesel in 40 CFR Subpart C of Part 98 Appendix Tables C-1 and C-2).

Table 5 depicts the Preferred Alternative's annual construction (2024 and 2026) GHG emissions increases over the applicable county and national baselines. When compared to the national GHG emissions baseline, the maximum temporary increases in annual GHG emissions would represent approximately 0.00002 percent of the national baseline during 2026. The potential effects of these GHG emissions would have *no long-term impacts* on climate change under the Preferred Alternative.

Table 5: Comparison of Greenhouse Gas Emissions

Alternative	Preferred Alternative GHG Emissions Increase Over County Baseline ¹			Preferred Alternative GHG Emissions Increase Over National Baseline ²		
	2024	2026	Steady State	2024	2026	Steady State
Preferred Alternative	0.005%	0.053%	0%	0.000002 %	0.00002%	0%

Notes:

1. Hampden County, Massachusetts = 2,565,117 metric tons of CO₂e.

2. Annual national GHG emissions = 6,340 million metric tons of CO₂e.

Sources: (USEPA, 2023d); ACAM version 5.0.17b, run on May 17, 2023 (**Appendix D**).

The USAF addresses the potential future impacts of climate change to both current and future USAF facilities by assessing site-specific potential impacts as part of long-range planning, project design, and permitting activities. Potentially relevant long-term climate change areas of concern for the Preferred Alternative include increases in precipitation, heavy rainstorms and flooding, and hotter and drier summers (USEPA, 2016). These potential effects of climate change would have *no long-term impacts* on the Preferred Alternative.

Other Air Quality Considerations: Federal ambient air quality standards do not exist for non-criteria pollutants; therefore, the USAF has not established HAPs significance indicators. HAPs are generally regulated through specific air emission permit provisions for stationary sources and HAP emission limits for mobile sources.

Similarly, there is no specific significance indicator established for assessing a Preferred Alternative's impact on visibility in Class I Federal areas. However, many pollutants responsible for impairing visibility are regulated by NAAQS either directly (e.g., PM_{2.5}) or indirectly (e.g., nitrogen dioxide [NO₂] and SO₂ emissions, which can form visibility-impairing nitrates and sulfates, respectively, once emitted). Because the Preferred Alternative would result in insignificant increases in criteria pollutants, it is unlikely that the Preferred Alternative would result in adverse impacts on visibility in Class I Federal areas.

3.2.2.2 No Action Alternative

Under the No Action Alternative, the proposed airfield improvements at Westover ARB would not be constructed and emissions associated with the Preferred Alternative would not occur. Therefore, there would be no significant impact to air quality associated with the No Action Alternative. Air emissions at the proposed Project Sites would remain the same as compared to existing conditions.

3.3 EARTH RESOURCES

Earth resources include geology, topography, and soils. Geological resources consist of surface and subsurface materials and their properties. Principal geologic factors influencing the ability to support structural development are seismic properties (i.e., potential for subsurface shifting, faulting, or crustal disturbance), soil stability, and topography. Radon is not discussed in this EA as the Preferred Alternative does not include any below-grade inhabitable structures.

The Farmland Protection Policy Act (FPPA) (7 USC 4201 et seq.) of 1981 states that federal agencies must “minimize the extent to which federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses.” The resources protected by the FPPA include prime and unique farmland, which are categorized by the NRCS based on underlying soil characteristics.

Hydric soils are defined as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Under natural conditions, these soils are able to support growth and reproduction of hydrophytic vegetation. Presence of hydric soils is one of the criteria used to identify and delineate wetlands.

The ROI for earth resources is the approximate LODs as shown on **Figure 2**.

3.3.1 Affected Environment

Geology: Westover ARB is located within the Connecticut River valley and on the Worcester plateau, which is characterized by a gently sloping terrain of medium fertile, sandy loams, most of which are underlined by silty deposits of firm glacial till up to 95 feet thick overlying conglomerate and sandstone bedrock (USAF,

2021a; AFCEC, 2023). The US Geological Survey (USGS) 2018 Seismic Hazard Map shows the site is at moderate risk of seismic hazard (i.e., hazard level 3 out of 7) (USGS, 2018).

Topography: The majority of Westover ARB is characterized by gentle slopes; however, the topography is flat towards the northern end of the base in the Dog Patch Training Area and surrounding Runway 05, where Taxiway G is located. Elevations within the cantonment area range from 230 feet above sea level (ASL) in the southern portion of the base to 250 feet ASL in the northern portion of the base (see **Figure 3**). Runway 05 at Westover ARB is 244 feet ASL (USAF, 2021a).

Soils: Westover ARB generally contains relatively deep, excessively drained soils formed on glacial outwash terraces that typically do not contain significant areas of hydric soil inclusions. Due to development, many of the native soil profiles have been disturbed and no longer exist. The developed lands were graded and filled and are now classified within the modern soil taxonomy criteria as Urban Lands. (USAF, 2021a).

The soils in the ROI are relatively sandy and have moderate water infiltration rates. The precise depth to the water table at the proposed Project Sites is unknown, though it is anticipated to vary between 5 to 30 feet below grade (AFRC, 2023a). Two soil map units are identified on the proposed Project Sites (see **Table 6**). While the proposed Project Site at Taxiway G contains only soils classified under the Urban Land map unit, the proposed Project Site at the Dog Patch Training Area contains primarily soils classified as Hinckley loamy sand (see **Figure 4**). Hinckley loamy sand is identified as farmland of statewide importance; however, this land is not currently used for, nor available for use in, agriculture due to its presence on an active ARB. Neither soil map unit is considered a hydric soil.

Table 6: Select Soil Characteristics for the Permanent LODs

Map Unit Name	Acres	Prime/ Unique Farmland	Farmland of Statewide Importance	Hydric	Landform / Description
Hinckley loamy sand, 0 to 3 percent slopes	0.6	No	Yes	No	Outwash deltas, outwash terraces, outwash plains, kame terraces; excessively drained soils, depth to water table is more than 80 inches. Depth to restrictive feature is more than 80 inches.
Urban Land	15.9	No	No	No	N/A

Source: (NRCS, 2023)

Figure 3: Topography at the Proposed Project Sites

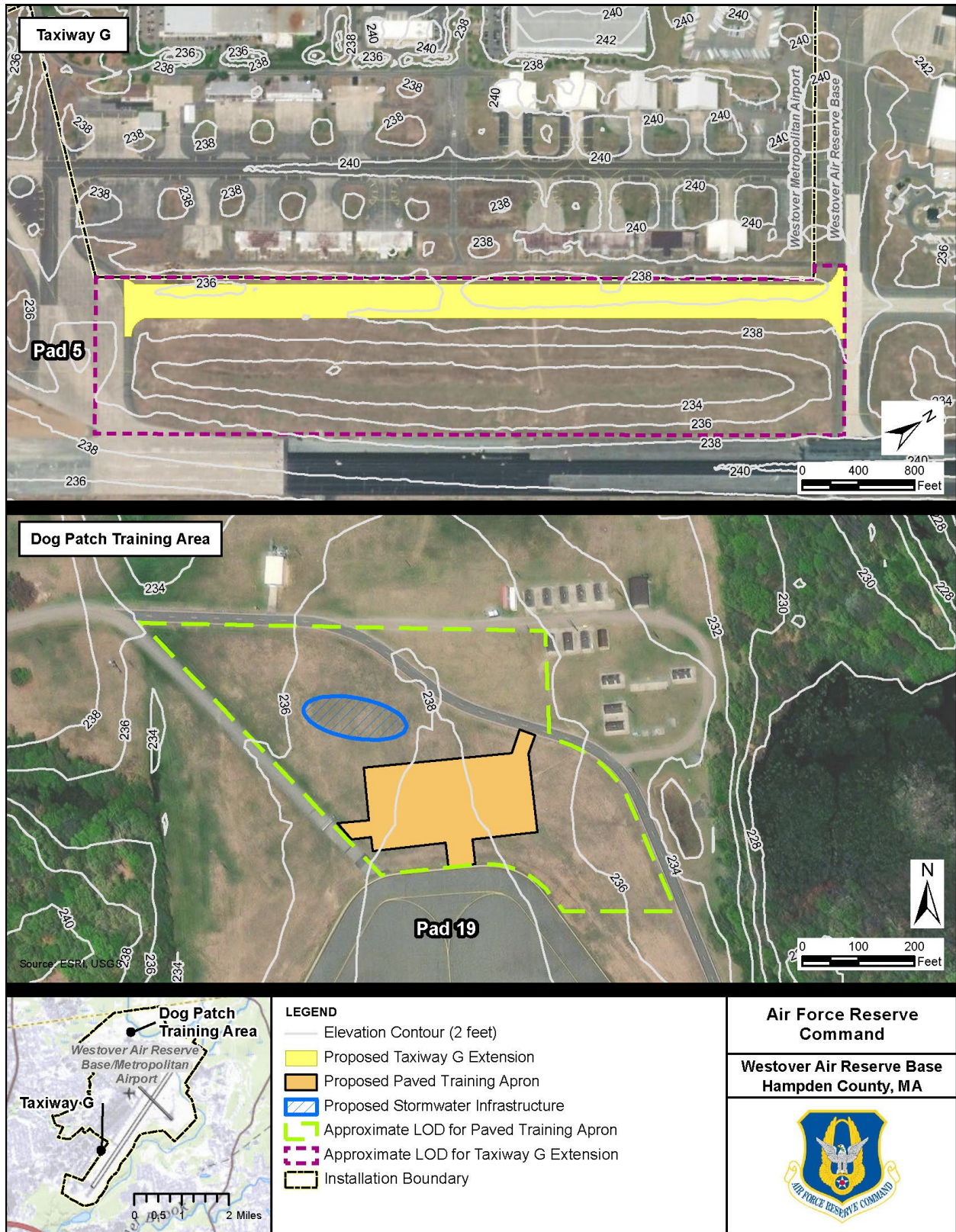
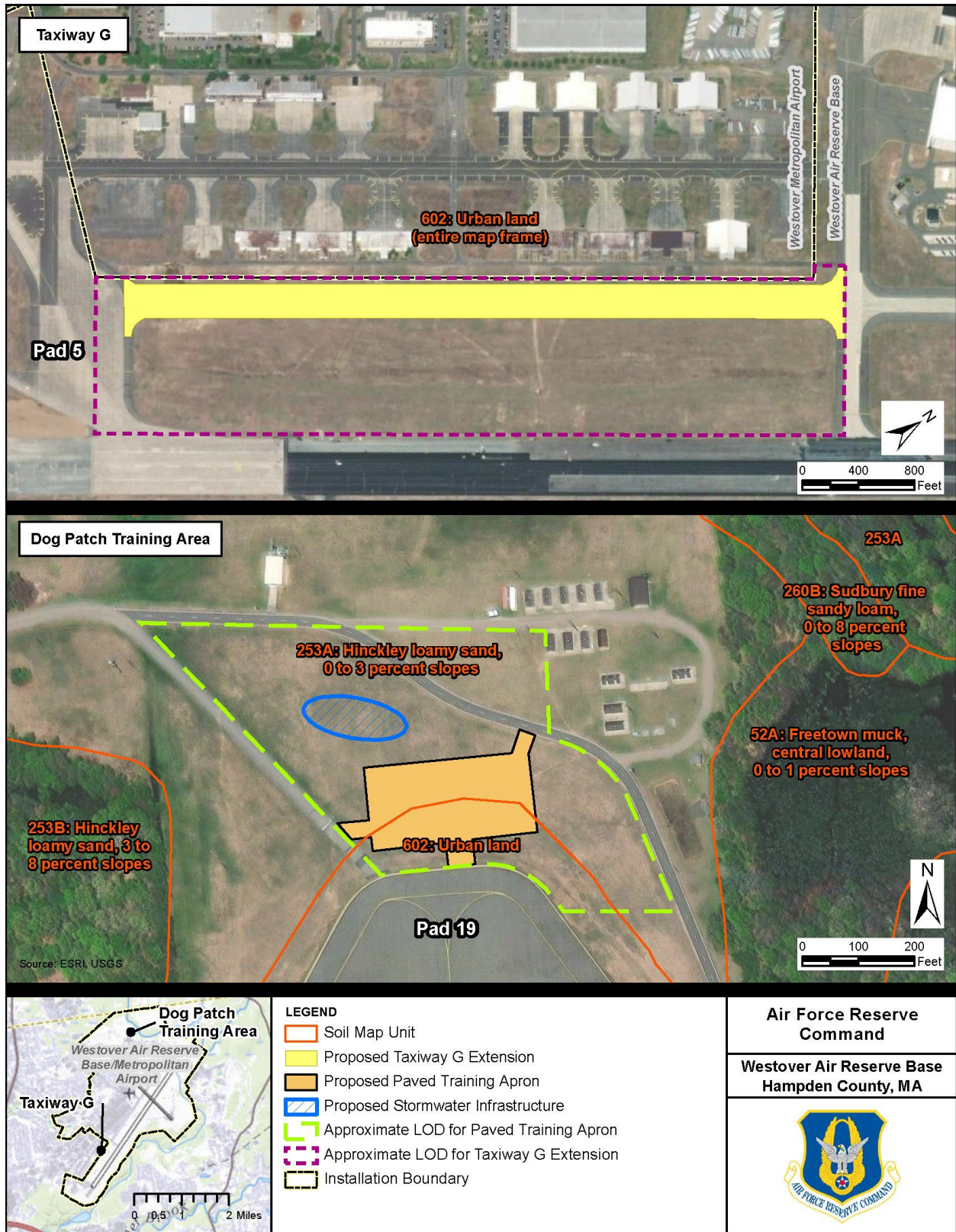


Figure 4: Soils at the Proposed Project Sites



3.3.2 Environmental Consequences

An earth resources impact would be significant if it would 1) expose people or structures to major geological hazards; 2) substantially increase potential occurrences of erosion or sedimentation; or 3) violate the FPPA.

3.3.2.1 Preferred Alternative

Geology: During construction, excavation and soil disturbance/removal would be required up to a depth of 13-18 feet; however, bedrock is not anticipated to be encountered during construction, and no geologic hazards are apparent on the proposed Project Sites. Further, seismic events are not expected to interfere with construction, nor would construction exacerbate the local risk of a seismic event occurring. Additionally, since the Preferred Alternative does not involve vertical construction, there is a low operational risk of seismic events. Therefore, *no impacts* to geology would occur under the Preferred Alternative.

Topography: Although the proposed Project Sites are generally flat, minor grading would be necessary for construction of paved surfaces and the bioretention basin. Any such grading would not meaningfully impact the topography of the proposed Project Sites or affect surface drainage and runoff patterns. *No impacts* to topography would occur under the Preferred Alternative.

Soils: Construction under the Preferred Alternative would disturb up to 17.6 acres. Disturbed soils would be susceptible to runoff and erosion. Since the proposed Project Sites would exceed 1 acre of land disturbance, adherence to Westover ARB's NPDES General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s) would be required. Coverage under this permit would require adherence to Westover ARB's Stormwater Pollution Prevention Plan (SWPPP), which would identify potential sources of pollutants, describe all pollution prevention activities that would be implemented on the site, and establish erosion and sediment controls to manage stormwater discharges and minimize sedimentation to the extent practicable. Construction crews would adhere to best management practices (BMPs) outlined in the SWPPP, and the erosion and sediment controls would be implemented prior to land-disturbing activities and maintained in good working order for the duration of construction. The Preferred Alternative would result in *short-term, less-than-significant adverse impacts* to soil runoff and erosion.

Construction activities would not disturb any soils designated by the NRCS as prime or unique farmland. Although 0.8 acres of soils designated as farmland of statewide importance would be impacted by the Preferred Alternative; these soils are neither currently used as farmland nor available for farming due to their location on an active ARB. No farmland would be taken out of current or future production to facilitate the Preferred Alternative. Therefore, the Preferred Alternative would have *long-term, negligible impacts* on prime farmland soils.

Finally, as part of the site design, the AFRC would ensure the pre-development hydrology of the proposed Project Sites would be maintained to the maximum extent technically feasible. This would be accomplished through site grading, the use of LID features, such as stormwater management features, and through site revegetation to prevent erosion. Implementation of these measures would manage long-term soil erosion and sedimentation during operation of these new hardened areas and would minimize the potential for long-term impacts to soils.

3.3.2.2 No Action Alternative

Under the No Action Alternative, the proposed airfield improvements at Westover ARB would not be constructed and related soil disturbance and removal associated with the Preferred Alternative would not occur. Therefore, there would be no significant impact to earth resources associated with the No Action Alternative.

3.4 WATER RESOURCES

Water resources analyzed in this EA include surface water (including stormwater), wetlands, floodplains, and groundwater. Surface water resources comprise lakes, rivers, and streams and are important for a variety of ecological, economic, recreational, aesthetic, and human health reasons. Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal conditions do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (USACE, 1987). Wetlands serve a variety of functions including flood control, groundwater recharge, maintenance of biodiversity, wildlife habitat, recreational opportunities, and maintenance of water quality. Floodplains are belts of low, level ground on one or both sides of a stream channel and are subject to either periodic or infrequent inundation by flood water. A 100-year floodplain has a 1 percent chance of inundation in any given year. Groundwater can be defined as subsurface water resources that are interlaid in layers of rock and soil and recharged by surface water seepage. Groundwater is important for its use as a potable water source, agricultural irrigation, and industrial applications.

The ROI for surface waters, wetlands, and floodplains includes the boundaries of the proposed Project Sites, as well as the down-gradient waterbodies receiving stormwater runoff within 0.5 mile of the proposed Project Sites. The ROI for groundwater includes the portion of the groundwater basin that underlies the proposed Project Sites.

3.4.1 Affected Environment

Surface Water: Westover ARB has extensive natural and man-made surface drainage. Cooley, Stony, and Willimansett Brooks are the primary drainages of Westover ARB. Most of the water that is discharged is collected from impervious surfaces throughout the base and conveyed via ditches, culverts, and underground stormwater lines which empty into these brooks (USAF, 2015). Westover ARB has published a written stormwater policy to ensure compliance with the base's NPDES General Permit for Stormwater Discharges from MS4s in Massachusetts. This policy requires five criteria be met for new development and redevelopment sites on Westover ARB that disturb one or more acres: 1) LID site planning and design strategies must be implemented unless infeasible; 2) stormwater management system design shall be consistent with, or more stringent than, the requirements of the 2008 Massachusetts Stormwater Handbook; 3) Stormwater management systems on new development shall be designed to meet an average annual pollutant removal equivalent to 90 percent of the average annual load of total suspended solids (TSS) related to the post-construction impervious area on the site and 60 percent of the average annual load of total phosphorus related to the total post-construction impervious surface area of the site; 4) stormwater management systems on re-development sites shall be designed to meet an average annual pollutant removal equivalent to 80 percent of the average annual post-construction load of TSS and 50 percent of the average annual load of total phosphorus related to the total post construction impervious surface area on the site; and 5) because all of the receiving waters are within the watershed of the Long Island Sound, which is impaired for nitrogen, stormwater management BMPs must be optimized for nitrogen removal (AFRC, 2021d). In addition, Westover ARB adheres to a SWPPP, which identifies required erosion and sediment control practices on the base (USAF, 2021b).

Cooley Brook is the closest surface water to the Taxiway G extension site, located approximately 0.5 miles east of the proposed Project Site (**Figure 5**). Cooley Brook flows south from extensive wetlands along the southeastern boundary of Westover ARB, to the approximately 16-acre Chicopee Reservoir, ultimately discharging to the Chicopee River to the south. Chicopee Reservoir is not used for drinking water but is used as a bathing beach in Chicopee Memorial State Park. Since Cooley Brook is near Runway 05, it eventually receives most of the airfield's stormwater runoff. This stormwater is first bioremediated via a constructed wetland before discharging into the brook. This bioremediation minimizes or eliminates the potential effects to waterways from contaminants from the airfield (USAF, 2015). Cooley Brook is not

identified as impaired on the Massachusetts Integrated List of Waters (Massachusetts Division of Watershed Management, 2022).

The headwaters to Willimansett Brook are located in the western portion of Westover ARB, approximately 0.5 miles west of the Taxiway G extension site. From the base, Willimansett Brook flows generally westward to the former Mountain Lake, continues westward, and ultimately discharges to the Connecticut River. Willimansett Brook receives stormwater from developed portions of the base in this area, primarily serving office buildings (USAF, 2021a). While portions of the proposed Project Sites contribute stormwater flow to Stony Brook and Cooley Brook, Willimansett Brook does not receive flows from the geographic area that is the subject of this EA. Willimansett Brook is identified as impaired by *E. Coli* on the Massachusetts Integrated List of Waters, but a Total Maximum Daily Load (TMDL) has not been established (Massachusetts Division of Watershed Management, 2022).

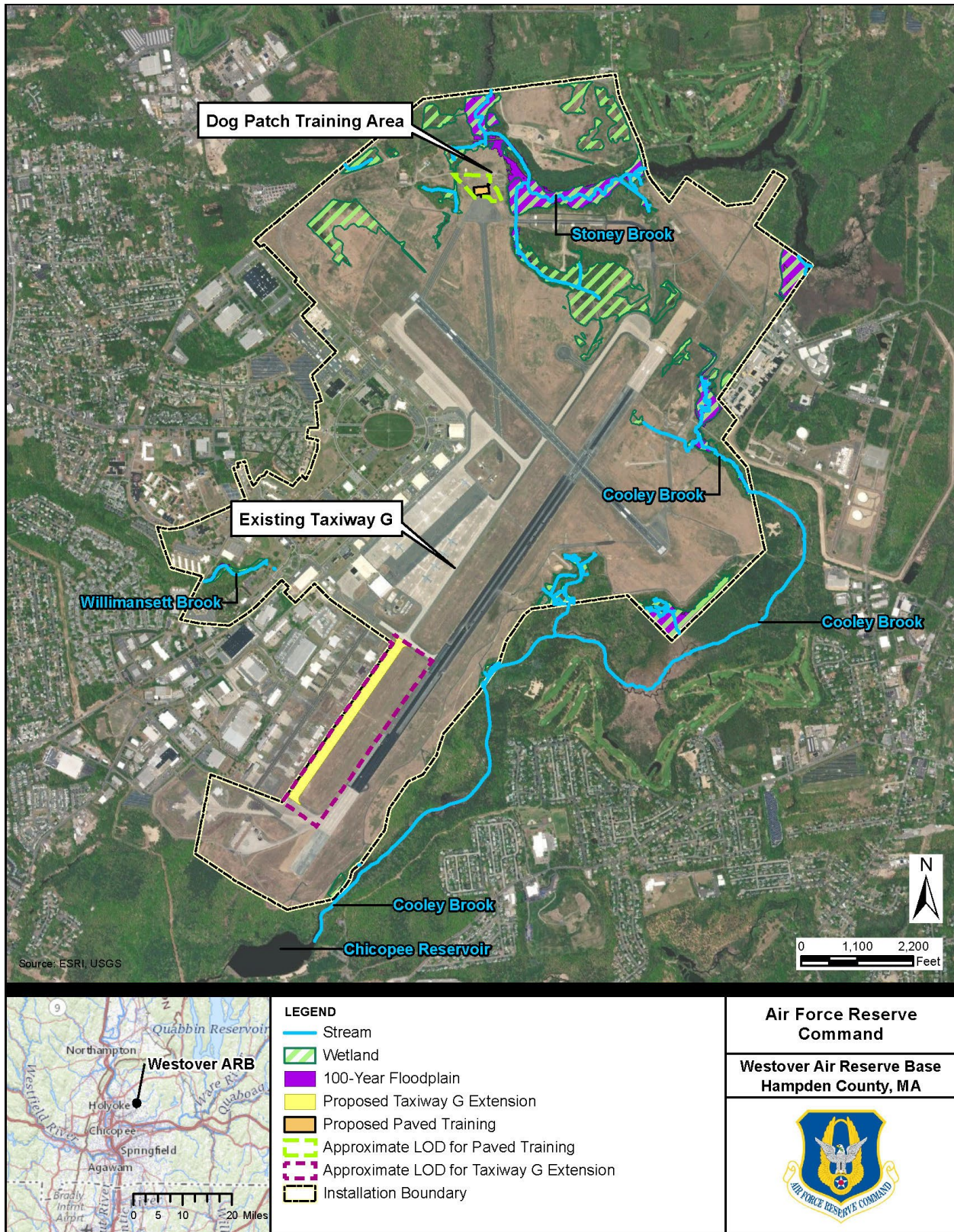
Stony Brook is the closest surface water feature to the paved training apron Project Site, occurring approximately 900 feet east of the proposed Project Site and surrounding the Dog Patch Training Area to the north, east, and west (see **Figure 5**). As the brook enters the base from Wade Lake toward the northeast, it forms a wetland, and then bends toward the north, where it ultimately exits the base north of the Dog Patch Training Area, flowing northward. After exiting the base, Stony Brook flows in a circuitous route, ultimately to the Connecticut River. Stony Brook receives drainage from the base through a variety of sources including a network of stormwater lines, a stormwater outfall, overland flow, and sheet flow from wooded and filled areas (USAF, 2015). Stony Brook is impaired by *E. coli*, turbidity, and non-native macrophytes (water chestnut). However, a TMDL has not been established for Stony Brook (Massachusetts Division of Watershed Management, 2022).

Wetlands: A base-wide survey was conducted in September 2004 to identify and delineate the jurisdictional wetlands present on Westover ARB. Thirty-four wetlands totaling approximately 162 acres were identified, in a variety of landscapes, ranging from forested areas to open grasslands. Wetlands on-base were also validated by a new survey in 2015, but this survey was not accompanied by a USACE jurisdictional determination (USAF, 2015; USAF, 2021a). While no wetlands occur within the LOD, wetlands exist approximately 150 feet to the east and west of the Dog Patch Training Area. No wetlands were identified in proximity to Taxiway G (USAF, 2015).

Floodplains: Federal Emergency Management Agency (FEMA) maps illustrate off-base floodplains associated with Stony Brook in the vicinity of Westover ARB. However, flood zones on the base have not been determined by FEMA (USAF, 2015). Westover ARB has conducted floodplain mapping on the base. No floodplains exist on the proposed Project Sites, although there are floodplains to the east of the proposed location of the paved training apron (**Figure 5**).

Groundwater: The water table located under Westover ARB typically ranges in depth from 5 to 30 feet (shallower near wetlands and streams/ditches on the base, with greater depths in the southern portions of the base) and is greatly influenced by topography. Groundwater beneath the base is contained within a shallow glacial delta outwash plain. The thickness of this unconfined aquifer is generally 25 to 85 feet. The aquifer can yield approximately 100 to 300 gallons of groundwater per minute under normal pumping conditions. However, this shallow groundwater is not used for drinking water at Westover ARB. A deeper confined aquifer located off-base is used as a source of drinking water for nearby residences. The potable water supply for Westover ARB is not sourced from groundwater (USAF, 2015).

Figure 5: Water Resources at Westover ARB



3.4.2 Environmental Consequences

A water resources impact would be significant if it would 1) substantially reduce water availability or interfere with the water supply to existing users; 2) create or contribute to the overdraft of groundwater basins or exceed decreed annual yields of water supply sources; 3) substantially adversely affect surface or groundwater quality; 4) degrade unique hydrologic characteristics; or 5) violate established water resources laws or regulations.

3.4.2.1 Preferred Alternative

Surface Water: While there are no surface waters within the approximate LODs for the Preferred Alternative, both Cooley Brook and Stony Brook are within the ROI for water resources and could be impacted by stormwater runoff from the proposed Project Sites. Proposed construction activities would disturb the soil and could result in increased runoff from the proposed Project Sites without proper erosion and sediment control measures. Construction activities that disturb one or more acres of land are subject to the requirements of the Clean Water Act (CWA); therefore, Westover ARB would comply with the provisions included in its NPDES MS4 permit, since both components of the Preferred Alternative would impact over one acre of land. Stormwater BMPs have been designed in accordance with the 2008 Massachusetts Stormwater Handbook. BMPs are designed to attenuate peak runoff rates from the proposed Project Sites so that post-construction rates are equal to or less than pre-construction rates. BMPs also capture the water quality volume of runoff from the proposed Project Sites. In the Dog Patch Training Area, the water quality depth required is equal to one inch because BMPs exfiltrate to soils with infiltration rate greater than 2.4 inches/hour and due to their proximity to Stony Brook, which is an impaired stream. Pollutant and TSS removal rates would also be achieved through implementation of stormwater BMPs on the proposed Project Sites. In the Taxiway G extension area, stormwater requirements would be met by replacing the existing drain line, reconfiguring the existing storm drains, and creating a shallow swale along the northwest side of the taxiway extension. These modifications to the existing stormwater infrastructure would maximize infiltration and result in no increase in peak flow rates during stormwater events. Therefore, the Preferred Alternative would have *short-term, less-than-significant adverse impacts* on surface waters in the ROI.

While Stony Brook is an impaired stream due to turbidity, the Preferred Alternative would have no potential to exacerbate this issue. Standard erosion and sediment controls would be implemented during construction; therefore, there would be no increase in downstream turbidity. Additionally, no discharges of biological material would occur under the Preferred Alternative that would contain or contribute to *E. coli* contamination at Stony or Willimansett Brooks, nor non-native macrophyte contamination at Stony Brook. Therefore, the Preferred Alternative would have *negligible impacts* on impaired streams under Section 303(d) of the CWA.

Wetlands: Although wetlands are located outside of the LOD, the nearby wetlands could be indirectly impacted by increased erosion and sedimentation during construction. However, these impacts would be temporary and would be minimized or avoided through adherence to standard erosion and sediment controls and the SWPPP. Additionally, as no direct fill or dredging of Waters of the U.S. would occur under the Preferred Alternative, Westover ARB would not be required to obtain a permit under Section 404 or Section 401 of the CWA. Therefore, the Preferred Alternative would have *short-term, less-than-significant adverse impacts* on wetlands in the ROI.

Floodplains: While there are floodplains in the vicinity of the Dog Patch Training Area, the Preferred Alternative would not impact existing floodplains or contribute to any loss with regard to flood control capacity. Therefore, the Preferred Alternative would have *no impact* to floodplains in the ROI.

Groundwater: Maximum excavation depth is anticipated to be 13-18 feet below ground surface to facilitate installation of stormwater infrastructure. Therefore, minor impacts to the shallow unconfined aquifer could be expected. Groundwater is not used for Westover ARB's drinking water and any dewatering of groundwater would be done in accordance with applicable permits and regulations. Additionally, the Preferred Alternative has no potential to impact the deeper, confined aquifer underneath Westover ARB. Potential impacts to groundwater may occur from the accidental spill of petroleum products or other liquids on the sites during construction activities. With implementation of BMPs, such as carrying out routine inspections of equipment, maintaining spill-containment materials on-site, and adhering to site-specific hazardous and toxic materials and waste (HTMW) plans, the potential for impacts to groundwater would be minimized. Additionally, Stormwater BMPs have been designed in compliance with the groundwater recharge standard set by the 2008 Massachusetts Stormwater Handbook. Therefore, the Preferred Alternative would result in *short-term, less-than-significant adverse impacts* to groundwater in the ROI.

3.4.2.2 No Action Alternative

Under the No Action Alternative, the proposed airfield improvements at Westover ARB would not be constructed and related impacts on surface water, wetlands, floodplains, and groundwater associated with the Preferred Alternative would not occur. Therefore, there would be no significant impact to water resources associated with the No Action Alternative.

3.5 BIOLOGICAL RESOURCES

Biological resources addressed in this EA consist of vegetation, wildlife, and special status species. Special status species relevant to this EA are those protected under the federal Endangered Species Act of 1973 (ESA), Bald and Golden Eagle Protection Act of 1940, and Migratory Bird Treaty Act (MBTA) of 1918. Westover ARB is not subject to the Massachusetts Endangered Species Act (MESA), though it strives to remain in compliance with state and local laws governing natural resources – a goal that is published in the base's 2021 Integrated Natural Resources Management Plan (INRMP) (USAF, 2021a).

The ROI for biological resources includes vegetation present within the boundaries of the proposed Project Sites, terrestrial wildlife present on-site or within 0.2 mile of the site boundaries, and aquatic resources present downstream of the site within 0.5 mile (in accordance with the ROI for surface waters; see **Section 3.4**).

3.5.1 Affected Environment

Vegetation: Vegetation communities occurring on Westover ARB include moist wet forests, native grasslands, sedge meadow, and wetland areas. Improved areas of Westover ARB are dominated by turf grasses and various broad-leaf weeds. Notably, Westover ARB has the largest contiguous grasslands in the Connecticut River watershed. In New England, grasslands are a vital but diminishing vegetation community. Prior to European settlement, grasslands were naturally found throughout New England in areas with dry, sandy deposits, tidally flooded areas, and in areas too eroded or wet to support woody growth. Following settlement, grasslands have diminished in quality and quantity due to changes in agricultural practices, wildfire prevention practices, and increasing population (University of Connecticut, 2023; MDCR, 2023). Both the Dog Patch Training Area and the area south of Taxiway G consist of open grassland vegetation (USAF, 2021a). Approximately, 1,200 acres of regionally important open grassland are managed at the Westover ARB. In 2015, Westover ARB completed an EA regarding the management of these grasslands to maximize flight safety, minimize BASH risk, and comply with the revised DAFI 91-212, which requires grasslands within 500 feet of aircraft movement areas to maintain a grass height between 7 and 14 inches to minimize attractiveness of airfield grassland as habitat for large or flocking birds and other wildlife species that contribute to BASH hazard. That EA resulted in recommendations for

herbicides, prescribed fire, and selective mowing to maintain compliance with the Air Force Safety Center standards for grass height. Unimproved areas within both the Dog Patch Training Area and the area south of Taxiway G are maintained at a height between 7 and 14 inches per DAFI 91-212 (USAF, 2015).

Invasive species, such as purple loosestrife (*Lythrum salicaria*), common reed (*Phragmites australis*), Japanese knotweed (*Polygonum cuspidatum*), and Asiatic bittersweet (*Celastrus obiculatus*) occur on the base and are concentrated along the base's north and east boundaries (USAF, 2015). Westover ARB implements a pest management program to control noxious weeds. Treatment methods include mowing, hand pulling, and application of herbicides (USAF, 2021a).

Wildlife: The open grassland environment, wooded and riparian areas, and wetlands make Westover ARB an attractive habitat to a wide diversity of faunal species. Previous surveys at Westover ARB have identified over 70 bird species; mammals such as white-tailed deer (*Odocoileus virginianus*) and coyote (*Canis latrans*); and reptiles/amphibians such as eastern box turtle (*Terrapene carolina*) and various species of salamander (USAF, 2021a). Stony Brook, which occurs approximately 900 feet east of the Dog Patch Training Area, and Cooley Brook, which occurs 0.5 mile east of the Taxiway G extension area provide aquatic habitat for a variety of species, including yellow bullhead (*Ameiurus natalis*), yellow perch (*Perca flavescens*), bluegill (*Lepomis macrochirus*), and largemouth bass (*Micropterus salmoides*) (USAF, 2021a).

Special Status Species: The AFRC queried the USFWS Information for Planning and Consultation (IPaC) database to identify federally listed species with the potential to occur on the proposed Project Sites. IPaC identified one federally listed endangered species, the northern long-eared bat (NLEB; *Myotis septentrionalis*), and one candidate species, the monarch butterfly (*Danaus plexippus*), as having the potential to occur at the proposed Project Sites. Bat surveys conducted at Westover ARB in 2017 failed to identify any NLEBs. No federally listed species have been identified in previous surveys (USAF, 2021a).

The MDFW maintains a list of state-threatened and endangered species, as well as state species of special concern. Currently there are 432 species on this list (MDFW, 2020). Additionally, the MDFW identifies priority habitat within the state based on the known geographical extent of habitat for all state-listed species. The entirety of Westover ARB is located within priority habitat (MDFW, 2023). Westover ARB provides the largest populations in the New England region for two state listed species: the state-endangered upland sandpiper (*Bartramia longicauda*) and the state-threatened grasshopper sparrow (*Ammodramus savannarum*), both of which have been documented breeding on the base (USAF, 2021a). In addition, several other state-listed species have been documented on the base, including the state-threatened vesper sparrow (*Pooecetes gramineus*); the state species of concern eastern meadowlark (*Sturnella magna*), the state-threatened blue-spotted salamander (*Ambystoma laterale*), the state species of concern climbing fern (*Lygodium palmatum*), the state species of concern frosted elfin butterfly (*Callophrys irus*), and the state-endangered phyllira tiger moth (*Apantesis phyllira*). Nesting season for grassland birds typically runs from April 15 to August 1 in Massachusetts (USDA, 2020). Although migratory birds occur in the vicinity of Westover ARB; the base implements a BASH program to help minimize the potential for large or flocking birds to congregate on Westover ARB (USAF, 2021a). In addition, the bald eagle (*Haliaeetus leucocephalus*) has been documented in the area; however, the bald eagle prefers forested habitat near large bodies of water, none of which occurs on Westover ARB (USAF, 2021a). Westover ARB actively manages vegetation to discourage birds of prey from occurring in the vicinity as part of the base's BASH program.

3.5.2 Environmental Consequences

A biological resources impact would be significant if it would 1) substantially reduce regionally or locally important habitat; 2) substantially diminish a regionally or locally important plant or animal species; or 3) adversely affect recovery of a federally protected species.

3.5.2.1 Preferred Alternative

Vegetation: Prior to starting construction, and outside the migratory bird nesting season, areas that would be disturbed by the Preferred Alternative would have their grassland habitat removed from biological production via methods included in Westover ARB's Vegetation Management Plan, which may include ongoing and targeted prescribed burning, mowing, and tilling. This would temporarily clear grassland vegetation within the LOD to prepare for various ground-disturbing activities such as scraping, excavation, grading, and operation of construction equipment and vehicles. No trees would be impacted by the Preferred Alternative as none are present within the LOD. Following construction, temporarily disturbed areas would be revegetated with native grassland plants and managed in accordance with Westover ARB's INRMP and Vegetation Management Plan. The potential spread of weeds or invasive species during construction would be managed in accordance with Westover ARB's pest management program. Overall, the Preferred Alternative would permanently convert up to 17.6 acres, less than 2 percent, of the base's 1,200 acres of regionally important open grassland to pavement (16.1 acres for the Taxiway G extension and 1.5 acres for the paved training apron and associated stormwater infrastructure). The Preferred Alternative would not substantially diminish the populations of any regionally or locally important vegetation species. Therefore, the Preferred Alternative would have *short- and long-term, less-than-significant impacts* on vegetation in the ROI.

Wildlife: The Preferred Alternative would remove the availability of approximately 17.6 acres of grassland habitat for common wildlife species occurring at Westover ARB.¹ Removing the proposed Project Sites from biological production prior to the start of construction would discourage common wildlife species from inhabiting the proposed Project Sites when construction activities are taking place. Moreover, the location of the proposed Project Sites within an existing airfield and in proximity to airfield operations, landscape maintenance, and other activities constitute existing disturbances to wildlife within the ROI. Mobile wildlife species, such as birds and small mammals, would likely relocate to areas of similar habitat near the sites. Although disturbance from construction impacts would constitute an adverse impact, such impacts would occur at the individual level rather than the population or species levels, and would not inhibit the continued presence of common wildlife populations and species near the proposed Project Sites. In addition, the Preferred Alternative would not create any elements that would encourage additional bird activity near Westover ARB, thus avoiding BASH concerns. Therefore, construction of the Preferred Alternative would result in *short-term, less-than-significant adverse impacts* to wildlife.

Once construction is complete, common wildlife species accustomed to disturbances associated with the active airfield would likely return to temporarily impacted areas as revegetation occurs. The permanent conversion of up to approximately 17.6 acres (although likely less after revegetation of temporary impacts) of open grassland vegetation does not constitute a substantial reduction in habitat availability for common wildlife species. Therefore, the Preferred Alternative would have a *long-term, less-than-significant adverse impact* to wildlife.

Special Status Species: The AFRC has determined that the Preferred Alternative would have *no effect* on the federally listed NLEB. The AFRC provided its determination to USFWS on March 8, 2023. USFWS responded stating that no further action was needed, and the requirements of Section 7 of the ESA had been met (**Appendix A**). Consultation with the USFWS under Section 7 of the ESA is not required for the monarch butterfly because it is a candidate species. Potential adverse impacts to the monarch butterfly may result if ground-disturbing activities occurred during this species' active season in Massachusetts, generally between mid-August through early October (MassAudubon, 2023). However, the proposed Project Sites would be removed from biological production by April 15, which proceeds the start of this

¹ Common wildlife species include species that are not protected by federal or state regulations and that are commonly observed at Westover ARB, such as raccoon (*Procyon lotor*), red fox (*Vulpes vulpes*), and white-tailed deer.

species' active season in Massachusetts (mid-August); therefore, this species is not likely to be impacted by construction activities. Additionally, milkweed, this species' larval host plant, is not present on the proposed Project Sites due to these areas being periodically mowed and maintained at a height between 7 to 14 inches to decrease attractiveness to wildlife. Therefore, the Preferred Action could have a *short-term negligible adverse impact* and *no long-term impact* to the monarch butterfly.

Adverse impacts to migratory birds, including those protected by the MBTA and MESA, would occur during implementation of the Preferred Alternative, primarily due to loss of up to 17.6 acres grassland habitat. To minimize adverse impacts to protected bird species, AFRC would remove grassland habitat from biological production in areas that would be disturbed via methods included in Westover ARB's Vegetation Management Plan (i.e., ongoing and targeted prescribed burning, mowing, or tilling) prior to the start of the nesting season for migratory birds (April 15). This would ensure that the Preferred Alternative would not interfere with the breeding activities of protected bird species. AFRC would also conduct field inspections on the LOD prior to construction for nesting or breeding birds. Monitoring of any nesting/breeding activity would also be conducted to determine if restrictions are warranted. With these impact minimization measures, construction activities would not adversely impact bird species and nests, but would have *short-term, negligible adverse impacts* on migratory bird habitats. Once construction is complete, grassland habitat would be partially restored in the Project Sites (i.e., in areas of temporarily impacts), and migratory bird species accustomed to disturbances associated with the active airfield would return to the restored habitat.

The AFRC consulted with the MDFW's Natural Heritage & Endangered Species Program to identify potential concerns relating to state-listed species (**Appendix A**). The MDFW identified six species that would be adversely impacted by the permanent loss of grassland vegetation, including four grassland bird species, one moth, and one butterfly. These species are the upland sandpiper, vesper sparrow, grasshopper sparrow, eastern meadowlark, phyllira tiger moth, and frosted elfin butterfly. Notably, the frosted elfin butterfly's larval host plants, wild indigo (*Baptisia australis*) and wild blue lupine (*Lupinus perennis*), are not present in the vicinity of the proposed Project Sites. While Westover ARB is not subject to MESA, it strives to comply with state and local laws governing natural resources to the maximum extent practicable, a goal that is codified in the INRMP. In accordance with the INRMP, AFRC would endeavor to minimize potential impacts to state-protected species, including by implementing environmental protection measures (EPMs) identified below to the maximum extent practicable. Therefore, the Preferred Alternative would result in *short- and long-term, less-than-significant adverse impacts* to state-protected species.

No impacts to bald eagles would occur as no suitable bald eagle habitat occurs in the ROI.

Environmental Protection Measures

EPMs are non-regulatory measures that AFRC would conduct in order to reduce potential adverse impacts from the Preferred Alternative. AFRC is working with the MDFW Natural Heritage & Endangered Species Program to identify EPMs to reduce potential adverse impacts on the upland sandpiper, vesper sparrow, grasshopper sparrow, eastern meadowlark, frosted elfin butterfly, and phyllira tiger moth. To the maximum extent practicable, AFRC would implement the following EPMs to reduce potential adverse impacts on species protected by MESA, and to advance the base's goal of remaining in compliance with federal, state, and local laws and regulations governing natural resources.

- 1) Conduct a grassland survey across Westover ARB to assess current grasslands on base and identify areas of potential improvement for species of concern, consistent with airfield management requirements.
- 2) Create a long-term grassland management plan identifying actions to increase quantity and quality of warm season grassland cover on Westover ARB. This plan may include measures such as applying soil

amendments and direct seeding desired grassland species (e.g., little bluestem [*Schizachyrium scoparium*]) to areas where grassland cover is in poor condition, and converting areas currently developed or consisting of tree stands to grasslands. This long-term grassland management plan would include an implementation schedule and would be incorporated into Westover ARB's INRMP, which is periodically reviewed and approved by USFWS and MDFW. Potential grassland improvement projects pursuant to this proposed plan are not within the scope of the EA and would require separate environmental analyses in accordance with federal regulations prior to implementation.

3.5.2.2 No Action Alternative

Under the No Action Alternative, the proposed airfield improvements at Westover ARB would not be constructed and related impacts on vegetation, wildlife, and special status species associated with the Preferred Alternative would not occur. Therefore, there would be no significant impact on biological resources associated with the No Action Alternative.

3.6 CULTURAL RESOURCES

Cultural resources are historic properties as defined by the NHPA; cultural items as defined by the Native American Graves Protection and Repatriation Act; archaeological resources as defined by the Archaeological Resources Protection Act; sacred sites as defined by EO 13007, *Indian Sacred Sites*, to which access is afforded under the American Indian Religious Freedom Act; and collections and associated records as defined by 36 CFR 79.

Historic properties covered by the NHPA include any prehistoric or historic district, site, building, structure, or object with known or potential significance with regard to pre- or post-American history, architecture, archaeology, engineering, or culture. Section 106 of the NHPA requires federal agencies to consider the effect an undertaking may have on historic properties. The Preferred Alternative is considered an undertaking and is required to comply with Section 106, including consultation with the Massachusetts SHPO. All Section 106 correspondence with the SHPO for the Preferred Alternative is provided in **Appendix B**.

Consistent with Section 106 of the NHPA, DoDI 4710.02, DAFI 90-2002, and AFMAN 32-7003, the AFRC is also consulting with nine federally recognized tribes that are historically affiliated with Westover ARB and the surrounding area regarding the potential for the Preferred Alternative to affect properties of cultural, historical, or religious significance to the tribes. The AFRC initiated consultation with each tribe via letter on 23 August 2023; a record of this consultation is provided in **Appendix C**. To date, tribes have identified no properties of cultural, historical, or religious significance on the proposed Project Site.

The ROI for cultural resources is the area of potential effects (APE) as defined by the NHPA. The AFRC has defined two separate APEs for the paved training apron and the Taxiway G extension. The APE for the Taxiway G extension is limited to the existing grassy lot approximately 3,716 feet north-northeast by 850 feet east-southeast that lies between concrete pads, taxiways, and the runway. The APE for the paved training apron is limited to the existing grassy lots in between roads and the existing training area on the north end of the base, and around a concrete pad (Pad 19) at the end of joining taxiways. The APEs are generally restricted to the LODs, as the Preferred Alternative does not involve vertical construction and no visual impacts would occur to historic properties.

3.6.1 Affected Environment

The paved training apron APE lies between a concrete pad, roadways, and tree lines. A southern portion of this area around the concrete pad falls within Urban Land soils that have been heavily disturbed and

altered. The remainder of the APE falls within Hinckley loamy sand soils (**Section 3.3**). Modern-day underground utilities, including power, communication, and water, also traverse the APE (**Section 3.7**). The Dog Patch Training Area was assessed for archaeological sensitivity as part of a 1981 Reconnaissance Survey of the base and was found to be within an area with a high level of potential archaeological sites but also a moderate level of previous disturbance. Subsequent surveys on Westover ARB redefined areas of sensitivity to exclude the paved training apron Project Site. There are three previously recorded archaeological sites in the vicinity of the Dog Patch Training Area (**Appendix B**).

The entirety of the Taxiway G extension APE falls within Urban Land soils and is characterized as highly disturbed and altered. The area is traversed by modern-day underground utilities (**Section 3.7**). The Taxiway G extension Project Site is not within an area previously determined to be archaeologically sensitive due to extensive prior impacts from agricultural activities and subsequent development of the base. The nearest previously recorded historic archaeological site is over 1,000 feet away from the APE (**Appendix B**).

Finally, on April 6, 2023, an archaeologist conducted a walkover visual inspection in addition to placing hand-held soil cores throughout both APEs to identify intact and previously disturbed soil locations in the ROI. This survey confirmed the APEs to be previously disturbed/altered.

3.6.2 Environmental Consequences

A cultural resources impact would be significant if it would constitute an unresolved adverse effect as defined in Section 106 of the NHPA (36 CFR 800.5): alteration, directly or indirectly, of any of the characteristics of a historic property that qualify it for inclusion in the NRHP in a manner that would diminish the integrity of its location, design, setting, materials, workmanship, feeling, or association.

3.6.2.1 Preferred Alternative

The Preferred Alternative would have *no effect*, direct or indirect, on historic properties, as no known historic properties, either above ground or archaeological, occur within the ROI. The Preferred Alternative does not involve vertical construction and is limited to additional pavement construction consistent with the existing airfield. AFRC provided its effect determination to SHPO in accordance with Section 106 of the NHPA on July 17, 2023. No response was received.

Although there are no known archaeological sites, there is the potential for inadvertent archaeological discoveries while conducting ground-disturbing activities. Should any unanticipated cultural resources be encountered during construction, or other activities associated with the Preferred Alternative, Westover ARB would immediately cease work and report the discovery to the Massachusetts SHPO and federally recognized tribes for consultation on how to proceed.

3.6.2.2 No Action Alternative

Under the No Action Alternative, the proposed airfield improvements at Westover ARB would not be constructed and related impacts on cultural resources associated with the Preferred Alternative would not occur. Therefore, there would be no significant impact on cultural resources associated with the No Action Alternative.

3.7 UTILITIES

Utilities include water storage facilities, treatment plants, and delivery systems; supplemental power generation, transmission, and distribution facilities, including, but not limited to, wind turbines, generators,

substations, and power lines; natural gas transmission and distribution facilities; sewage collection systems and treatment plants; and communication systems.

The ROI for utilities includes all areas and end users within Westover ARB that may be impacted from temporary utility disruptions or an increased demand on utilities. No off-base utility changes would occur.

3.7.1 Affected Environment

An overhead electrical medium voltage distribution line runs along the north side of an access road located north of Taxiway G and supplies power to hangars along the north side of the road. There is a water line and fire hydrants along the south side of the access road, which serve the hangars. The water main is outside of the Taxiway G Extension LOD. The sanitary sewer line serving the hangars is located beneath the access road. These utilities are all served from the systems to the north and do not extend south into the Taxiway G Extension LOD.

Communications lines and electrical utilities for the airfield's glide slope antenna are buried underneath the airfield within the LOD for the Taxiway G extension (**Figure 6**). A medium voltage feeder owned by Chicopee Electric Light (CEL) is located in a duct bank that is routed around the southern side of the runway. The feeder crosses under the runway near the west end and currently extends to a sectionalizing switch near the south side of the access road. Electrical wiring for airfield lighting is also located within the LOD.

Additional electrical infrastructure associated with the glide slope antenna is located within the Taxiway G extension LOD on the south side of the access road near the existing hangars. The infrastructure consists of a medium voltage sectionalizing switch; pad-mounted transformer; diesel-fired emergency backup generator; and small CMU building that contains the switchgear, electrical panels, an automatic transfer switch, and communication boxes. A secondary circuit in a duct also runs from the CMU building to the glide slope antenna.

The airfield's stormwater system flows from north to south in three lines of drainage drop inlets. One of the lines is located within the LOD for Taxiway G. All lines flow toward a central location that discharges off-base via an oil-water separator.

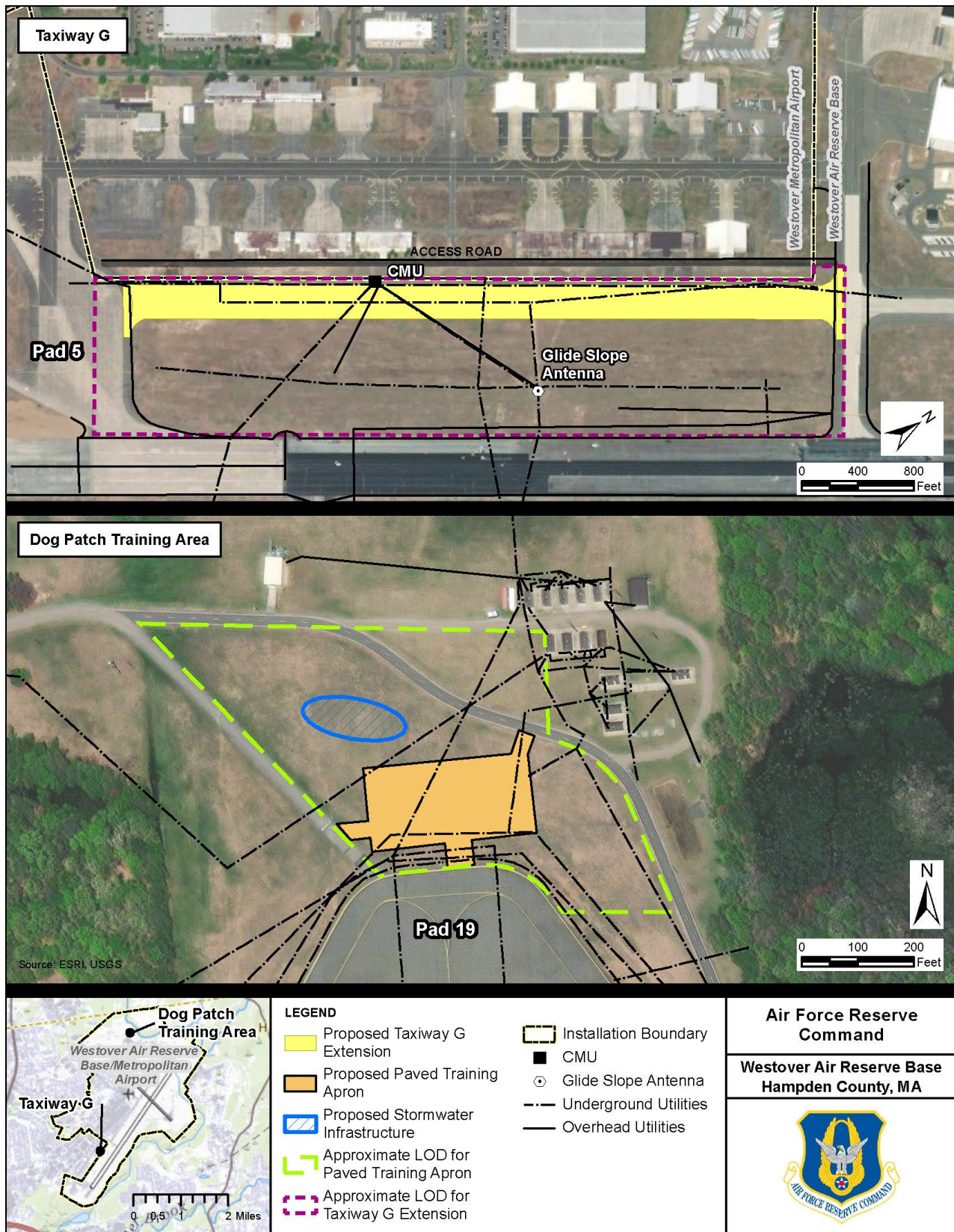
Utility infrastructure located within the LOD for the paved training apron includes communications lines, water service lines, stormwater drainage, and underground electrical lines (**Figure 6**). These utilities connect the structures within the Dog Patch Training Area to the rest of the base to the south.

There is no natural gas distribution system near Taxiway G or the Dog Patch Training Area.

3.7.2 Environmental Consequences

A utilities impact would be significant if it would result in prolonged or permanent service disruptions to other utility end users, substantially increase utility demand so as to burden utility providers or reduce local utility supply to the surrounding communities.

Figure 6: Utility Systems in the Vicinity of the Proposed Project Sites



3.7.2.1 Preferred Alternative

Construction of the Preferred Alternative would involve the relocation or abandonment of utility systems in the vicinity of the Taxiway G extension LOD. Notably, a portion of the medium voltage feeder on the north side of the runway would be relocated. Existing lighting circuits would be rewired and secondary circuits in the airfield would be rerouted in existing ducts and in new ducts along the Taxiway G extension. In addition, the CMU building would be demolished, and both the medium-voltage electrical equipment and the backup generator would be relocated. CEL would relocate the sectionalizing switch and transformer and install new medium voltage conductors. The water main serving the fire hydrants along the south side of the access road would not be impacted as it is outside of the approximate LOD. Drop inlets would also be installed with the Taxiway G extension to replace the existing stormwater line that runs through the Taxiway G extension LOD.

Implementation of the Preferred Alternative would not increase overall utility usage at Westover ARB. Temporary service disruptions to electrical, communications, and airfield lighting would occur during the construction of the Taxiway G extension; however, these disruptions would be minimized by ensuring that existing utilities remain operational until the new utilities are ready to be connected. Modification of service lines connecting to the glide slope antenna would also require downtime on the Instrument Landing System. Construction phasing would be coordinated with Air Operations to minimize disruptions to the ILS. No other utilities would be disrupted during construction, and end users would be given advance notice of anticipated service disruptions. Relocated electrical lines owned by CEL would be installed per CEL requirements, and CEL would relocate the sectionalizing switch and transformer and install new medium voltage conductors.

Although the construction of the paved training apron would not result in any disruptions to aboveground utilities, underground communications and water service lines would need to be avoided during construction. Due to the shallow depth of excavation for the apron (i.e., about 1 foot), construction of the paved training apron would not result in any disruptions to the usage of utilities. Therefore, the Preferred Alternative would have *short-term, negligible impact* on on-base utilities during construction of Taxiway G and the paved training apron. No service disruptions would occur for off-base end users.

Once construction is complete, training activities and the number of personnel stationed at Westover ARB would remain the same. As a result, there would be no change in demand for communications, water, natural gas, or sewer services. There would be a negligible increase in electricity usage from operating new lighting for the paved training apron and Taxiway G extension. Therefore, the Preferred Alternative would have *long-term, negligible impacts* on utility usage/demand after the paved training apron and Taxiway G extension were completed.

3.7.2.2 No Action Alternative

Under the No Action Alternative, the proposed airfield improvements at Westover ARB would not be constructed and related utility disruptions associated with the Preferred Alternative would not occur. Therefore, there would be no significant impact on utilities associated with the No Action Alternative.

3.8 SOCIOECONOMICS & ENVIRONMENTAL JUSTICE

Socioeconomics refer to the attributes of the human environment, and include demographic and economic characteristics such as age, race, income, and employment. Additionally, EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, directs federal agencies to consider the potential adverse impacts of their activities on children.

Environmental Justice (EJ) is the consideration of low-income and minority populations. EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs federal agencies to consider the potential adverse impacts of their activities on EJ communities, and requires that impacts that may disproportionately affect these communities be addressed. The CEQ has established criteria for identifying EJ communities of concern with respect to race and income: minority populations exist where the percentage of minorities exceeds 50 percent or is meaningfully greater than in the general population of the larger surrounding area, and low-income populations exist where there is a substantial discrepancy between a community and surrounding communities with regard to income and poverty status (CEQ, 1997). Information used to aid in the identification of EJ communities can be obtained from the U.S. Census Bureau or via the USEPA's Environmental Justice Screening and Mapping Tool. This tool provides socioeconomic data for Census block groups, based on data from the 2020 American Community Survey (USEPA, 2022).

The ROI for socioeconomic and EJ is Chicopee, Massachusetts. Adjacent communities would be most likely to experience impacts from the Preferred Alternative, both with regard to changes in socioeconomic characteristics and potential disproportionate impacts.

3.8.1 Affected Environment

Socioeconomic and EJ data for the ROI, Hampden County, and the state of Massachusetts are presented in **Table 7**.

Table 7: Socioeconomic and EJ Data

Demographic Indicators	ROI	Hampden County	State of Massachusetts
Socioeconomic Indicators			
Total Population	55,560	465,825	7,029,917
Population Change (2010-2020)	0.5%	0.5%	7.4%
Median Household Income	\$52,702	\$57,623	\$84,385
Unemployment Rate	6.5%	6.2%	5.1%
Population Under 18 Years	22%	25%	23%
EJ Indicators			
Population Below Poverty Level	14.6%	15.7%	9.8%
Minority Population	28.1%	35.1%	30.4%

Sources: (U.S. Census Bureau, 2020b; U.S. Census Bureau, 2020a; USEPA, 2022)

The state of Massachusetts had a population increase of 7.4 percent from 2010 to 2020, which is the same as the increase in the U.S. population over the same period (U.S. Census Bureau, 2020b; U.S. Census Bureau, 2010). The populations of Hampden County and the ROI only increased 0.5 percent from 2010 to 2020. Median household income in the ROI is slightly lower than Hampden County, while the median

income of the state of Massachusetts is approximately \$27,000 higher than that of Hampden County. The unemployment rate is slightly higher in the ROI and Hampden County compared to the unemployment rate in the state of Massachusetts (USEPA, 2022). In Hampden County, the largest industries by employment are educational services, and health care and social assistance; retail trade; and manufacturing (U.S. Census Bureau, 2020a).

No individuals, including children, currently live on or occupy the proposed Project Sites. The occurrence of children in the vicinity of the proposed Project Sites would not be a frequent or regular presence as it is on an active ARB with restricted entry. The percentage of the population under age 18 in the ROI is similar to Hampden County and the state of Massachusetts.

Westover ARB is bordered by suburban residential areas to the east and west. There are also numerous retail and restaurant locations along Memorial Drive, approximately 1.5 miles west of Westover ARB. Given that there would not be any change to personnel at Westover ARB, no impact to these socioeconomic components is expected and they are dismissed from further analysis.

The poverty level in the ROI (14.6 percent) is comparable to Hampden County (15.7 percent) but higher than the state (9.8 percent). The minority population is lower than 50 percent in the ROI; additionally, the minority population percentage in the ROI is slightly lower than those of both Hampden County and the state of Massachusetts. Therefore, the ROI is not considered an EJ community of concern with respect to income or race. The AFRC confirmed these results using the USEPA's Environmental Justice Screening and Mapping Tool (USEPA, 2022).

3.8.2 Environmental Consequences

A socioeconomic impact would be significant if it would 1) substantially alter the location and distribution of the local population or 2) change current economic conditions in the ROI in a way that would be notable and harmful for surrounding communities and residents.

3.8.2.1 Preferred Alternative

Implementation of the Preferred Alternative would not adversely affect socioeconomic conditions in the ROI. Proposed construction activities would likely be completed by local contractors, temporarily increasing employment opportunities, personal incomes, and material purchases within the nearby communities. If non-local contractors support construction, direct economic benefits associated with expenditures on lodging, food, and retail would accrue to the local community. Tax revenues associated with direct and indirect construction expenditures would also benefit local economic conditions. Therefore, the Preferred Alternative would have a *short-term, beneficial impact* on the economic conditions of surrounding communities during construction activities.

Once construction is complete, the new improved areas would be incorporated into the airfield's military and civilian operations at Westover ARB. There would be no change to the type of training activities, number or personnel, number of flights, or number or type of aircraft stationed at Westover ARB. Therefore, there would be *no long-term or ongoing impacts* to socioeconomic conditions in the ROI.

3.8.2.2 No Action Alternative

Under the No Action Alternative, the proposed airfield improvements at Westover ARB would not be constructed and related impacts on socioeconomics associated with the Preferred Alternative would not occur. Therefore, there would be no significant impact on socioeconomic conditions in the ROI associated with the No Action Alternative.

3.9 HAZARDOUS AND TOXIC MATERIALS AND WASTE

This section describes the use and presence of hazardous materials and the generation of hazardous waste at the proposed Project Sites. The ROI for HTMW is the proposed Project Sites.

HTMW are generally defined as materials or substances that pose a risk (through either physical or chemical reactions) to human health or the environment. Regulated hazardous substances are identified through a number of federal laws and regulations. The most comprehensive list is contained in 40 CFR Part 302, and identifies quantities of these substances that, when released to the environment, require notification to a federal government agency. Hazardous wastes, defined in 40 CFR 261.3, are considered hazardous substances. Generally, hazardous wastes are discarded materials (solids or liquids) not otherwise excluded by 40 CFR 261.4 that exhibit a hazardous characteristic (i.e., ignitable, corrosive, reactive, or toxic), or are specifically identified within 40 CFR Part 261. Petroleum products are specifically exempted from 40 CFR Part 302, but some are also generally considered hazardous substances due to their physical characteristics (especially fuel products), and their ability to impair natural resources. Waste oil is classified as a hazardous waste in Massachusetts and is regulated under Massachusetts Hazardous Waste Regulations found at 310 CMR 30.000.

The DoD Environmental Restoration Program (ERP) was established to provide for the cleanup of environmental contamination at DoD installations. Eligible ERP sites include those contaminated by past defense activities that require cleanup under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and certain corrective actions required by the Resource Conservation and Recovery Act (RCRA). Non-ERP sites are remediated under the Compliance-Related Cleanup Program.

3.9.1 Affected Environment

Hazardous materials at Westover ARB are used, handled, stored, and managed in accordance with AFMAN 32-7002, *Environmental Compliance and Pollution Prevention, Hazardous Material Management, Chapters 3 and 5*. Westover ARB maintains a Hazardous Waste Management Plan (HWMP), which contains procedures for managing hazardous wastes in accordance with applicable DoD, federal, and state regulations and requirements. Westover ARB also maintains a spill plan (i.e., Spill Prevention and Countermeasure [SPCC] & Facility Response Plan), which is implemented in conjunction with the HWMP to address incident response and emergency responsibilities resulting from spills or discharges of HTMW (USAF, 2021a).

The operation of aircraft, vehicles, and equipment requires the use of various hazardous materials, including fuels, solvents, lubricants, and caustics. If released, these materials have the potential to harm the environment by impacting air, soil, or water quality. The activity at the base that poses the greatest potential threat to the local environment is the transfer and storage of petroleum, oils, and lubricants (POL). The base has implemented several environmental programs (e.g., spill control and response, hazardous waste management, and storm water pollution prevention) that have been successful in controlling hazardous materials and waste releases to the environment (USAF, 2021a).

The HWMP outlines procedures for the proper accumulation, collection, transportation, and disposal of hazardous wastes. It is designed to ensure that hazardous wastes are disposed in a legal and timely manner as required by the RCRA of 1976 and the Solid Waste Disposal Act of 1980. Westover ARB generates greater than 1,000 kilograms of hazardous waste per month and is, therefore, classified as a large-quantity generator (LQG). However, Westover ARB is not a permitted treatment, storage, or disposal facility. Therefore, as a LQG, Westover ARB can accumulate wastes for a maximum period of 90 days. Within this period, the base must ship its wastes to a permitted treatment, storage, or disposal facility. A

USEPA hazardous waste generator number has been issued to Westover ARB for the use of tracking hazardous waste (USAF, 2021a).

The base spill plan (i.e., SPCC & Facility Response Plan) describes preventive actions that are designed to lower the potential for hazardous material spills and prevent them from entering the environment. The SPCC & Facility Response Plan also presents required notification procedures and detailed responses to releases that might occur. In addition, Westover ARB implements an Enterprise, Environmental, Safety, Occupational Health-Management Information System (EESOH-MIS), which provides tracking for hazardous materials.). The purpose of the EESOH-MIS is to minimize and organize the use of hazardous materials, thus reducing hazardous waste generation. Furthermore, all hazardous materials used are assessed to determine if less-toxic alternative materials could be utilized during industrial processes. Materials are inventoried and then allocated for use at the base's industrial shops on an as-needed basis. Any unused portion of the material is returned to the central inventory, where it can be made available for other users (USAF, 2021a).

The majority of the wastes generated on Westover ARB are the result of C-5M aircraft maintenance, especially degreasing operations. The base transports approximately 60 to 80 percent of its hazardous wastes to the Defense Logistics Agency Disposition Services for final disposal by a private contractor. Otherwise, waste is disposed of directly by the base through a private contractor. POL transfer and storage operations (receiving, storing, and dispensing of jet petroleum-8 [JP-8] fuel) take place throughout the base. Westover ARB has a hydrant fueling system that is comprised of a single new fueling center, consisting of two aboveground storage tanks and an associated pumphouse, which are the primary POL transfer areas. Average annual throughput of JP-8 is approximately 8 million gallons. Spills that occur on the flight line are generally small in nature. However, if a large release occurs along the flight line, drainage from the spill area will eventually flow to one of two 35,000-gallon oil/water separators. Accidental JP-8 spills occurring at the refueler loading and unloading area are also protected from entering the stormwater system by oil/water separators. Wastes generated by POL operations include fuel-contaminated water and fuel-contaminated absorbent. Releases vary from inadvertent releases of small quantities of fuel, which cannot be avoided, to more catastrophic releases (100 gallons or larger). Releases of any quantity of fuel at Westover ARB are extremely infrequent. Waste petroleum products, including used oil, diesel, JP-8, purging fluid, and hydraulic fluid, are recycled through a Defense Logistics Agency-Disposition Services contract (USAF, 2021a).

Westover ARB began environmental restoration efforts under the ERP in 1981. ERP sites can adversely affect the local natural environment if contaminants are able to migrate into surface waters, or if they are conveyed through groundwater. During the original records search in 1982, 15 ERP sites were identified. Since that initial study, an additional eight sites were added to the ERP. During the course of the investigations, nine of the ERP sites were determined to pose no threat to human health, and no further actions are required at those nine sites. Additionally, two sites have been removed from consideration. Of the 21 original Installation Restoration Program sites, 18 have been closed out in accordance with the Massachusetts Contingency Plan, which implements portions of the Massachusetts Superfund Law (USAF, 2021a).

The three remaining sites are referred to as Landfill A, Landfill B, and the East Ramp Sites. Landfills A and B are both undergoing annual inspections, while Landfill B is also undergoing biennial long-term sampling of groundwater, surface water, sediment, and monitoring of landfill gas. The third remaining ERP site is referred to as the "East Ramp Sites;" there is ongoing remediation at two sites on the East Ramp (E-2 and E-7 aircraft parking locations). At these locations, there were leaks into the subsurface sandy formation from the underground pipeline which supplied JP-8 fuel for the aircraft. The remediation is currently being performed through 1) a Multi-Phase Extraction High Intensity Treatment using a vacuum truck to remove product and groundwater from installed monitoring wells, and 2) Monitored Natural Attenuation. The

remediation work is reviewed each year in a Restoration Strategy Workshop by members of Air Force Civil Engineer Center, the Defense Logistics Agency, and by contractors (USAF, 2021a). None of the remaining ERP sites occur within or adjacent to the proposed Project Sites (Westover ARB, n.d.).

In 1970, the USAF began using aqueous film forming foam (AFFF) as a firefighting agent to extinguish petroleum fires. This foam contains perfluorooctane sulfonate (PFOS), perfluorobutane sulfonate, and Perfluorooctanoic acid (PFOA) which are included in a class of synthetic fluorinated chemicals used in industrial and consumer products, including defense-related applications. This class of compounds is also referred to as per- and polyfluorinated alkyl substances (PFAS). Releases of AFFF to the environment routinely occurred during fire training, equipment maintenance, storage, and use at USAF installations. Manufacturers have reformulated AFFF to eliminate PFAS and the USAF has implemented an enterprise-wide program to remove PFAS-based AFFF from their inventory and replace it with formulations based on shorter carbon chains, which may be less persistent and bio-accumulative in the environment. While PFAS are not regulated as hazardous materials/waste, the USEPA has issued lifetime health advisory levels for PFOS and PFOA in drinking water and Massachusetts has issued maximum contaminant levels for PFOS and PFOA (MDEP, 2023).

There is no known soil contamination on the proposed Project Sites. A PFOS/PFAS Site Investigation at Westover ARB in 2021 identified five potential AFFF release sites, none of which were within the Project Sites. However, the investigation found that PFOS/PFAS contamination is present in surface and groundwater above screening levels at those release sites, four of which are up-gradient, with respect to groundwater, from the proposed Project Sites. One release site is within approximately 600 feet up-gradient from the proposed Taxiway G Project Site (AFCEC, 2021). Therefore, there is potential for the groundwater and/or soil in the Project Sites to be contaminated with PFOS/PFAS. Additionally, the CMU building was constructed in 1977 and has the potential to contain asbestos-containing material (ACM), fluorescent lamps containing mercury, polychlorinated biphenyls (PCB)-containing light ballasts, and lead-based paint (AFRC, 2023a).

3.9.2 Environmental Consequences

An HTMW impact would be significant if it would 1) interrupt, delay, or impede ongoing cleanup efforts; or 2) create new or substantial human or environmental health risks (e.g., soil or groundwater contamination).

3.9.2.1 Preferred Alternative

Implementation of the Preferred Alternative at Westover ARB would not add any new hazardous materials that exceed the base's current hazardous waste management capacity. The Preferred Alternative would not increase the maximum daily consumption of Jet-A fuel, and no additional hazardous waste storage tanks would be required. Westover ARB would continue to be classified as an LQG and generate hazardous wastes during various operation and maintenance activities. Existing procedures for the centralized management of the procurement, handling, storage, and issuance of hazardous materials through the base HAZMART are adequate to accommodate the Preferred Alternative.

Prior to conducting demolishing the CMU building, AFRC would conduct a survey to identify hazardous materials (e.g., ACMs, PCB) and remove or encapsulate them to avoid the release of HTMW into the environment. Operation of construction equipment and vehicles under the Preferred Alternative would create the potential for discharge, spills, and contamination from commonly used products, such as diesel fuel, gasoline, oil, antifreeze, and lubricants, at the proposed Project Sites. However, all HTMW discovered, generated, or used during construction would be handled, containerized, and disposed of in accordance with Westover ARB's HWMP, SPCC & Facility Response Plan and applicable local, state, and federal regulations. Likewise, all generated project wastes and excavated material, including soil and groundwater,

would be sampled for potential PFAS and managed accordingly based on applicable federal and state regulations. Finally, the Preferred Alternative would have no potential to interfere with any of Westover ARB's ERP sites. Therefore, the Preferred Alternative would have the potential for *short-term, less-than-significant adverse impacts* from HTMW during construction. There would be *no impact* from HTMW during operation of the Preferred Alternative.

3.9.2.2 No Action Alternative

Under the No Action Alternative, the proposed airfield improvements at Westover ARB would not be constructed and no hazardous wastes or toxic materials associated with the Preferred Alternative would be potentially generated or released. Therefore, there would be no significant impact on HTMW associated with the No Action Alternative.

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4.0 CUMULATIVE EFFECTS

4.1 INTRODUCTION

The AFRC identified and reviewed past, present, and reasonably foreseeable actions that have or are planned to occur within the Preferred Alternative's ROI, including Westover ARB and the surrounding off-base areas. Past and present projects are generally addressed within the environmental baseline of the ROI for each resource area; thus, this analysis focuses on reasonably foreseeable future actions in the ROI. The AFRC analyzed the potential for the Preferred Alternative to have cumulative effects with these other reasonably foreseeable actions.

Baseline conditions in the ROI generally include trending development, with a focus on improving airfield circulation and expansion or upgrades of outdated training facilities and infrastructure. These projects are listed in **Table 8** and **Figure 7**.

Table 8: Reasonably Foreseeable Actions at Westover ARB

Project Name	Project Type	Description
1. Repair Runway 05/23 and Overruns	Institutional; Infrastructure	A project is currently underway to repair paved sections of runway 05/23 and its overruns.
2. Construct Overruns to Runway 15/33	Institutional; Infrastructure	Construction of a paved 500-foot extension and overrun is planned for the north side of Runway 15/33.
3. Construct McMillan Gate	Institutional	Construction of a new gate is planned for the northern corner of the Training District.
4. Airfield Subdistrict Projects	Institutional	Three project alternatives have been proposed for the Airfield Subdistrict which include various combinations of demolishing, expanding, refurbishing, or constructing Runway 15/33, the rapid runway repair site, an assault strip, helicopter landing zones, and Pad 19 markings.
5. Training Subdistrict Projects	Institutional	Three project alternatives have been proposed for the Training Subdistrict which include various combinations of constructing, improving, expanding, and demolishing training facilities on Westover ARB.
6. Walmart Expansion Project	Commercial	A 6,315 SF addition and additional parking would be constructed to facilitate Walmart's online grocery pick-up service at 591 Memorial Drive.

1: Repair Runway 05/23 and Overruns
2: Construct Overruns to Runway 15/33
3: Construct McMillan Gate
4: Airfield Subdistrict Projects
5: Training Subdistrict Projects
6: Walmart Expansion Project

Dog Patch Training Area

Existing Taxiway G

Source: ESRI, USGS

0 1,400 2,800 Feet

LEGEND

- Proposed Taxiway G Extension
- Proposed Paved Training Apron
- Approximate LOD for Paved Training Apron
- Approximate LOD for Taxiway G Extension
- Installation Boundary
- Reasonably Forseeable Actions
- Airfield Subdistrict
- Training Subdistrict

Air Force Reserve Command

Westover Air Reserve Base
Hampden County, MA

Westover ARB

Quabbin Reservoir

Northampton

Holyoke

Chicopee

Springfield

Agawam

Brady Airfield

0 5 10 20 Miles

0 1,400 2,800 Feet

4.2 EVALUATION OF CUMULATIVE EFFECTS

4.2.1 Air Quality and Climate

Construction of the Preferred Alternative and reasonably foreseeable actions would generate air emissions from the use of construction equipment and vehicles. Construction emissions would be temporary and minor. Emissions from the Preferred Alternative and other reasonably foreseeable actions would not exceed regulatory thresholds or exacerbate pollutant concentrations that are not in attainment, as project-specific compliance with applicable regulatory requirements and implementation of BMPs would further minimize air emissions. These impacts would be *short-term and less-than-significant* due to the temporary and localized nature of construction.

4.2.2 Earth Resources

The Preferred Alternative and reasonably foreseeable actions would not appreciably alter geological or topographic conditions in the ROI. Bedrock is not anticipated to be encountered during construction, and the base topography is generally flat. Any grading would not meaningfully impact the topography of the proposed Project Sites or affect surface drainage and runoff patterns. Construction under the Preferred Alternative would disturb soils and create the potential for runoff and erosion. However, through project specific BMPs, the AFRC would ensure the Preferred Alternative's cumulative impact on soils when considered with other reasonably foreseeable actions is minimized to the greatest extent practicable. With the adherence to applicable construction stormwater permits and Westover ARB's written stormwater policy for each AFRC project, there would be *long-term and less-than-significant adverse* cumulative impacts to soils.

4.2.3 Water Resources

The Preferred Alternative and reasonably foreseeable actions would result in *short-term, less-than-significant adverse impacts* on water resources from increased erosion and sedimentation during construction activities from soil disturbance and stormwater runoff. The Preferred Alternative and reasonably foreseeable actions would not be constructed within any wetlands or floodplains and impacts to the impairment status of Willimansett Brook and Stoney Brook would be *negligible*.

4.2.4 Biological Resources

The Preferred Alternative and reasonably foreseeable actions would result in *short- and long-term, less-than-significant adverse impacts* on biological resources. The Preferred Alternative would permanently convert up to 17.6 acres of regionally important open grassland areas to pavement, however, the conversion of 17.6 acres of grassland does not constitute a substantial reduction in habitat availability for common wildlife species since it comprises less than 2 percent of the grassland managed at Westover ARB. In accordance with the INRMP, AFRC would endeavor to minimize potential impacts to state-protected species, including by implementing EPMs identified in **Section 3.5.2.1** to the maximum extent practicable. The AFRC is working with the MDFW Natural Heritage & Endangered Species Program to identify measures to mitigate the potentially significant impacts the Preferred Alternative may have on the upland sandpiper, vesper sparrow, grasshopper sparrow, eastern meadowlark, frosted elfin butterfly, and phyllira tiger moth due to the loss of grassland area. Potential impacts to grassland associated with the reasonably foreseeable projects would be coordinated with the MDFW Natural Heritage & Endangered Species program to identify requisite minimization measures.

Most foreseeable actions involve construction and new development, however, while wildlife would be temporarily impacted by human activity, species would not experience any long-term effects after construction has been completed.

4.2.5 Cultural Resources

Implementation of the Preferred Alternative and reasonably foreseeable actions would not result in any effects on historic and cultural resources in the ROI. No significant cultural resources occur within the proposed Project Sites, and the Preferred Alternative and other projects would not introduce any structures to the visual landscape that would be incongruent with the existing viewshed. There is potential for archaeological discoveries while conducting ground-disturbing activities during construction; however, in the event that archaeological materials are inadvertently discovered during construction activities, the AFRC would cease work immediately and notify the appropriate authorities, minimizing the potential for significant adverse impacts on previously unknown cultural resources.

4.2.6 Utilities

Short- and long-term, less-than-significant adverse impacts to utilities may occur during construction and operation of the Preferred Alternative and reasonably foreseeable actions. Implementation of the Preferred Alternative would not increase overall utility usage at Westover ARB. Temporary service disruptions to electrical, communications, and airfield lighting would occur during the construction of the Taxiway G extension; however, these disruptions would be minimized by ensuring that existing utilities remain operational until the new utilities are ready to be connected. Additional buildings requiring new utilities, in combination with the Preferred Alternative, would also increase the utility demand on Westover ARB, although it would not substantially burden local utility providers or supply.

4.2.7 Socioeconomics & Environmental Justice

In the long term, the Preferred Alternative, when taken in consideration with reasonably foreseeable actions, would result in *beneficial impacts* on the local economy. Collective expenditures by temporary construction workforces would benefit local accommodation, food, and retail industries, as well as accrue local fiscal benefits from associated sales tax revenues. There would be no cumulative effects to the population growth rate or available housing as the Preferred Alternative would not affect these socioeconomic factors.

As no EJ communities of concern with respect to race or income are present within the ROI, there is no potential for the Preferred Alternative and reasonably foreseeable actions to disproportionately impact EJ communities.

4.2.8 Hazardous and Toxic Materials and Waste

Short-term, less-than-significant adverse impacts on HTMW would occur during construction of the Preferred Alternative and reasonably foreseeable future actions. Construction activities could result in potential discharge, spills, and contamination, as well as encounters with soil contamination. Existing procedures for the centralized management of the procurement, handling, storage, and issuance of hazardous materials through EESOH-MIS are adequate to accommodate the Preferred Alternative and reasonably foreseeable actions. Further, the Preferred Alternative and reasonably foreseeable actions would have no potential to interfere with any of Westover ARB's ERP sites.

5.0 LIST OF PREPARERS

5.1 AIR FORCE PREPARERS

Name	Title
John Moriarty	Environmental Flight Chief, 439th Airlift Wing
John Richardson	NEPA Manager
John Cody	Natural and Cultural Resources Manager
Champanine Saviengvong	Air Quality Manager

5.2 AECOM PREPARERS

Name	Role	Degree	Years of Experience
Carrie Kyzar	Project Manager, EA review and oversight	M.S. in Environmental Management B.S. in Environmental Science	21
Michael Busam	Deputy Project Manager, EA preparation	B.S. in Environmental Science and Policy	8
Jennifer Warf	Quality Assurance/Quality Control, EA review and oversight	M.S. in Environmental Studies B.A. in Zoology	20
Benjamin Obenland	Preparation of EA sections	B.S. in Environmental Science and Policy	4
Tara Boyd	Preparation of EA sections	B.A. in Environmental Science and Global Sustainability	2
Allison Carr	Preparation of maps and figures	Master of City Planning B.A. in Geography	3
Fang Yang	Preparation of Air Quality section	M.S. Atmospheric Science B.S. Physics	33

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APPENDIX A:
CONSULTATION WITH FEDERAL, STATE, AND LOCAL AGENCIES

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Sample Consultation Letter



DEPARTMENT OF THE AIR FORCE AIR FORCE RESERVE COMMAND



July 13, 2023

John Moriarty
Environmental Flight Chief
439th Airlift Wing
250 Patriot Avenue, Box 35
Westover ARB, MA 01022

Luke Garrison, Director
Julie Seltsam-Wilps, Deputy Director
Federal Aviation Administration
New England Region
Airports Division (ANE)
1200 District Avenue
Burlington, MA 01803

Dear Mr. Garrison and Ms. Seltsam-Wilps:

The United States (U.S.) Air Force Reserve Command (AFRC) is preparing an Environmental Assessment (EA) to evaluate the potential environmental impacts resulting from the construction of airfield improvements at Westover Air Reserve Base (ARB) in Hampden County, Massachusetts (Proposed Action). The proposed airfield improvements include two primary activities: 1) construction of area paved training apron, and 2) extension of an existing taxiway. Westover ARB is located within the City of Chicopee, approximately 1.1 miles north of Springfield, Massachusetts. The Proposed Action would take place within two previously disturbed areas within the existing Westover ARB airfield (**Attachment 1**).

Executive Order 12372 *Intergovernmental Review of Federal Programs* requires intergovernmental notifications prior to making any detailed statement of environmental impacts. Through the process of Interagency and Intergovernmental Coordination for Environmental Planning (IICEP), the proponent must notify concerned federal, state, and local agencies and allow them sufficient time to evaluate potential environmental impacts of a proposed action. Comments from these agencies are subsequently incorporated into the Environmental Impact Analysis Process (EIAP). A list of relevant federal, state, and local agencies and associated correspondence is provided in **Attachment 2**.

Westover ARB is home to the 439th Airlift Wing and their C-5M aircraft. The 439th Airlift Wing has the mission of providing worldwide air movement of troops, supplies, equipment, and medical patients. Westover ARB currently lacks the infrastructure necessary to meet training requirements and conduct airfield operations required to support the C-5M aircraft. Westover ARB requires a paved training apron capable of supporting the ground equipment necessary to conduct training, and a new concrete taxiway surface necessary to accommodate maintenance activities and allow more efficient movement of the C-5M aircraft to the runway. The purpose of this Proposed Action, therefore, is to make airfield improvements to better accommodate training capabilities and airfield operations at Westover ARB in support of the C-5M aircraft. The Proposed Action is to improve training and flying operations. The 439th Airlift Wing is currently reliant on temporary use of alternative runways and vacant areas that vary in availability to conduct required training.

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The EA will analyze the potential range of environmental impacts that could result from the Proposed Action (i.e., the Preferred Alternative) and the No Action Alternative. The Preferred Alternative includes construction at two locations within the Westover ARB airfield (**Attachment 1**). A paved training apron and associated stormwater feature would be constructed within the Dog Patch Training Area. Construction of the paved training apron would create approximately 1.1 acres of impervious surface. A 0.2-acre bioretention basin would be constructed to the north of the paved training apron to collect runoff. The Dog Patch Training Area currently consists of grassland interspersed with roads and existing training infrastructure (**Attachment 1**). The Taxiway G Extension would involve constructing a new concrete taxiway surface between the existing Taxiway G and Pad 5 within the Westover ARB airfield. This extension would create approximately 15 acres of impervious surface. Stormwater management options are currently under evaluation and are anticipated to include installation of new drain lines and surface grading in areas adjacent to the runway extension. The site is currently covered by a warm season grassland, over previously disturbed soils and existing underground utilities. Existing underground utilities at the site would be relocated or abandoned in place.

The No Action Alternative, which reflects the status quo, will be analyzed as a baseline for comparison of potential effects from the Proposed Action. Under the No Action Alternative, Westover ARB and personnel would not have training and maintenance areas for assigned and transient C-5M aircraft.

The EA will be prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code 4321, *et seq.*), the Council on Environmental Quality NEPA Implementing Regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508), and the Air Force Environmental Impact Analysis Process (32 CFR 989).

As part of this EA, we request your assistance in identifying any potential areas of environmental impact to be assessed in this analysis. If you have any specific items of interest about this Proposed Action, please contact Mr. John Moriarty, Environmental Flight Chief, 439th Airlift Wing, by email to john.moriarty.1@us.af.mil or by mail to 250 Patriot Avenue, Box 35, Westover ARB, MA within 30 days of receipt of this letter.

Sincerely,

MORIARTY.JOH
N.B.1228530170

Digitally signed by
MORIARTY.JOH.N.B.1228530170
Date: 2023.07.17 11:19:49 -04'00'

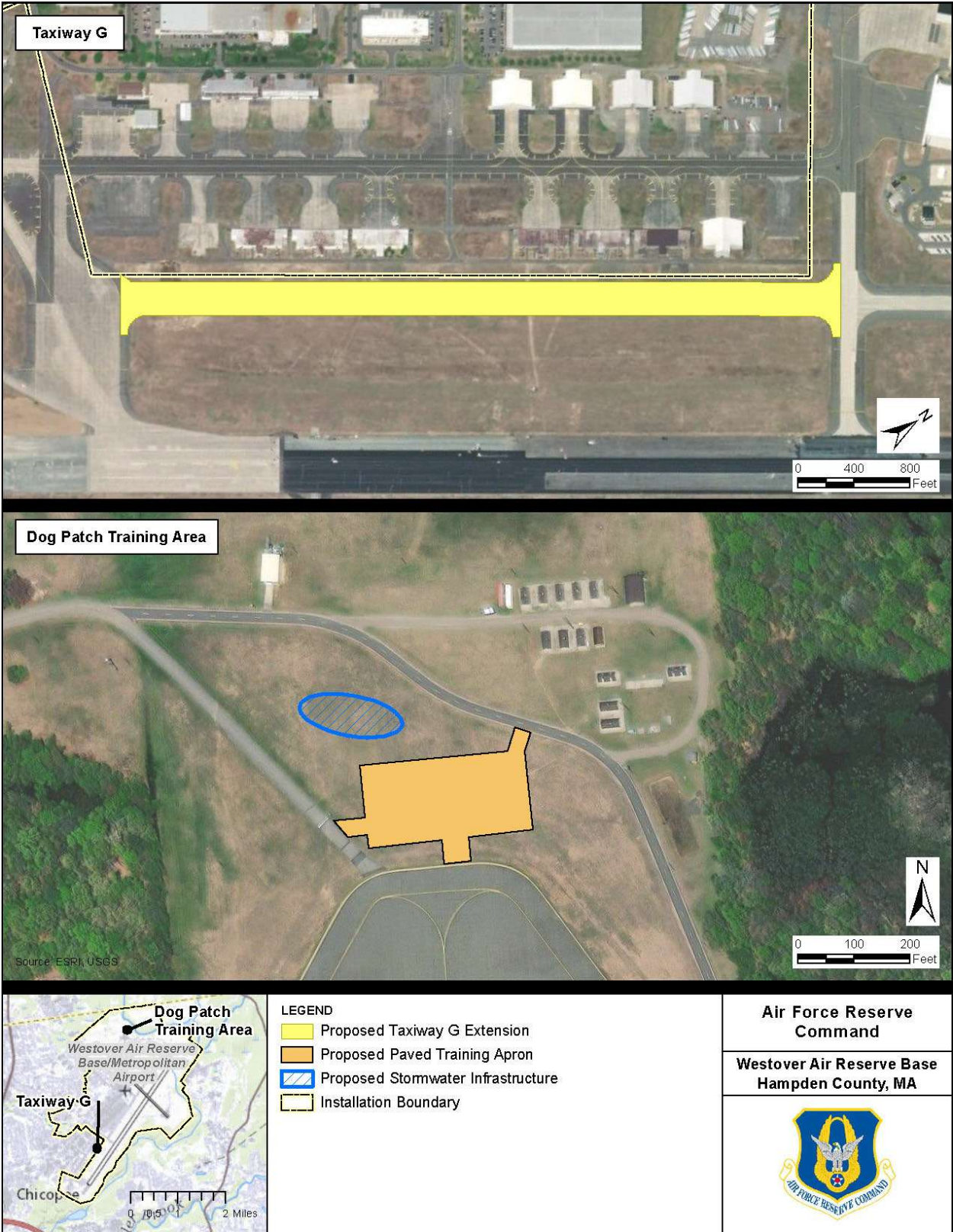
JOHN MORIARTY,
Chief, Environmental Flight

Attachment:

1. Figure 1: Proposed Airfield Improvements at Westover ARB
2. Stakeholder Consultation List

Sample Consultation Letter

Figure 1: Proposed Airfield Improvements at Westover ARB



Sample Consultation Letter

Agencies and Other Individuals Consulted

Federal Agencies

U.S. Fish & Wildlife Service

Northeast Regional Office
300 Westgate Center Drive
Hadley, MA 01035-9589
Email: northeast@fws.gov

U.S. Fish and Wildlife Service

New England Ecological Services Field Office
70 Commercial Street
Suite 300
Concord, NH 03301
POC: Margaret (Meg) Harrington, Fish and
Wildlife Biologist
Email: margaret_harrington@fws.gov

Federal Aviation Administration

New England Region
Airports Division (ANE)
1200 District Avenue
Burlington, MA 01803
POC: Luke Garrison, Director; Julie Seltsam-
Wilps, Deputy Director
Email: luke.garrison@faa.gov;
julie.a.seltsam@faa.gov

Environmental Protection Agency

Region 1
5 Post Office Square - Suite 100
Boston, MA 02109-3912
POC: David Cash, Regional Administrator
Email: Cash.David@epa.gov

U.S. Army Corps of Engineers

696 Virginia Road
Concord, MA 01742
Email: cenae-pa@usace.army.mil

U.S. Department of Agriculture, Natural Resources Conservation Service

Massachusetts State Office
451 West Street
Amherst, MA 01002-2995
POC: Dan Wright, State Conservationist
Email: daniel.wright@usda.gov

State Agencies

Commission on Indian Affairs

100 Cambridge Street, Suite 300
Boston, MA 02114
POC: John "Jim" Peters, Jr, Executive Director
Email: john.peters@mass.gov

Massachusetts Historical Commission

Secretary of the Commonwealth
220 Morrissey Boulevard
Boston, MA 02125-3314
POC: Ms. Brona Simon, SHPO
Email: mhc@sec.state.ma.us

The Executive Office of Transportation

10 Park Plaza, Suite 3170
Boston, MA 02116
Email: massdotenvironmental@dot.state.ma.us

Massachusetts Department of Environmental Protection

Western Region
436 Dwight Street
Springfield, MA 01103
POC: Catherine Skiba, HR; Kathleen Fournier,
Communications Director
Email: Catherine.skiba@mass.gov;
Kathleen.fournier@mass.gov

Massachusetts Division of Fisheries & Wildlife

Natural Heritage & Endangered Species
Program
1 Rabbit Hill Road
Westborough, MA 01581
POC: Amy Hoenig, Senior Endangered Species
Review Biologist
Email: Amy.Hoenig@mass.gov

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Massachusetts Division of Fisheries & Wildlife

Western Wildlife District
341 East Street
Belchertown, MA 01007
POC: Joe Rogers, District Manager
Email: Joseph.E.Rogers@mass.gov
Mass.Wildlife@mass.gov

Massachusetts Department of Conservation and Recreation

Division of Planning and Engineering
251 Causeway Street, Suite 900
Boston, MA 02114-2104
Email: mass.parks@mass.gov
(617) 626-1250

Massachusetts Department of Fish & Game

251 Causeway St., Suite 400
Boston, MA 02114
POC: Mark Tisa, Director
Email: mark.tisa@mass.gov

Massachusetts Department of Public Health

250 Washington Street
Boston, MA 02108-4619

Massachusetts Environmental Policy Act Office

100 Cambridge Street, Suite 900
Boston, MA 02114
POC: Rick Bourre
Email: richard.bourre@state.ma.us

Local/Regional Agencies

Pioneer Valley Planning Commission

60 Congress Street
Springfield, MA 01104-3419
POC: Kimberly H. Robinson, Executive Director
Email: krobison@pvpc.org

Chicopee Planning Department

274 Front Street
4th Floor
Chicopee, MA 01013
POC: Lee M. Pouliot
Email: lpouliot@chicopeema.gov

Chicopee Community Development Department

38 Center Street
Chicopee, MA 01013
POC: Julia Dias, Operations Manager
Email: jdias@chicopeema.gov

Chicopee Historical Commission

Chicopee City Hall
17 Springfield Street
Chicopee, MA 01013
POC: Joshua Clark, Chair

Mayor John L. Vieau

17 Springfield Street
Chicopee, MA 01013
Email: mayorvieau@chicopeema.gov

Westover Airport

255 Padgette Street
Chicopee, MA 01022
POC: Andy Widor, Airport Manager
Email: operations@westoverairport.com

Native American Tribes

Delaware Tribe of Indians

125 Dorry Lane
Grants Pass, OR 97527
POC: Larry Heady, Tribal Historic Preservation Officer (THPO)
Email: lheady@delawaretribe.org

Mashantucket Pequot Indian Tribe

110 Pequot Trail
Mashantucket, CT 06338
POC: Michael E. Johnson, Acting THPO
Email: MEJohnson@mpn-nsn.gov

Mohegan Tribe of Indians of Connecticut

13 Crow Hill Road
Uncasville, CT 06382
POC: James Quin, THPO
Email: jqinn@moheganmail.com

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Narragansett Indian Tribe

4425 S. County Trail
Charlestown, RI 02813
POC: John Brown, Tribal Preservation Officer
Email: tashtesook@aol.com

Seneca Cayuga Tribe of Oklahoma

P.O. Box 45322
Grove, OK 74345
POC: William Tarrant, THPO
Email: wtarrant@sctribe.com

St. Regis Mohawk

Bldg 71 Margaret Terrance Memorial Way
Akwesasne, NY 13655
POC: Darren Bonaparte, THPO Director
Email: darren.bonaparte@srmt-nsn.gov

Stockbridge-Munsee Community

86 Spring Street
Williamstown, MA 01267
POC: Jeff Bendremer, THPO
Email: thpo@mohican-nsn.gov

Wampanoag Reservation**Wampanoag Tribal Council of Gay Head**

20 Black Brook Road
Aquinnah, MA 02535
POC: Cheryl Andrews-Maltais, Chairperson
Email: chairwoman@wampanoagtribe-nsn.gov

Mashpee Wampanoag Tribe

438 Great Neck Road South
Mashpee, MA 02649
POC: David Weeden, THPO/Director
Email: 106Review@mwtribe-nsn.gov; Cc
David.Weeden@mwtribe-nsn.gov



MASSWILDLIFE

DIVISION OF FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581

p: (508) 389-6300 | f: (508) 389-7890

[MASS.GOV/MASSWILDLIFE](https://www.mass.gov/masswildlife)

August 18, 2023

Mr. John Moriarty
Environmental Flight Chief, 439th Airlift Wing
250 Patriot Ave, Box 35
Westover ARB

RE: Environmental Assessment Preparation for Airfield Improvements
Extension of Taxiway G & Training Apron within Dog Patch Training Area
Westover Air Reserve Base (ARB), Chicopee, MA
NHESP Project: # 23-8563

Dear Mr. Moriarty:

The Massachusetts Division of Fisheries and Wildlife's (MassWildlife) Natural Heritage & Endangered Species Program has prepared comments to inform the preparation and development of the Environmental Assessment (EA) at Westover ARB in Chicopee, MA (the Property). The Division is in receipt of the July 2023 intergovernmental notification letter regarding the proposed Taxiway G Extension and Training Apron (Proposed Action). We appreciate the opportunity to provide comments regarding the potential environmental impacts associated with the project and look forward to continuing consultation with the 439th Airlift Wing to minimize and mitigate impacts to state-listed species and unique natural communities associated with the Proposed Action.

MassWildlife is the agency responsible for the protection and management of the inland fish and wildlife resources of the Commonwealth. The mission of MassWildlife also includes conserving and protecting endangered, threatened and species of special concern pursuant to the Massachusetts Endangered Species Act (MESA; M.G.L. c. 131A) and its implementing regulations (321 CMR 10.00) through the Natural Heritage & Endangered Species Program.

The purpose of MESA is to conserve and protect state-listed rare species and their habitats. The MESA prohibits the unauthorized Take of any state-listed species, which is defined "in reference to animals, to harass, harm, pursue, hunt, shoot, hound, kill, trap, capture, collect, process, disrupt the nesting, breeding, feeding or migratory activity or attempt to engage in any such conduct, or to assist such conduct, and in reference to plants, to collect, pick, kill, transplant, cut or process or attempt to engage or to assist in any such conduct" (M.G.L. c. 131A § 1). The MESA regulations further provide that "the disruption of nesting, feeding or migratory activity may result from, but is not limited to, the modification, degradation or destruction of habitat" (321 CMR 10.02).

According to the Massachusetts Natural Heritage Atlas, the Property is mapped as Priority Habitat for state-listed species including Massachusetts state-listed plants, avian species, and lepidoptera. The Proposed Action is located within habitat for the following species:

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Scientific Name	Common Name	Taxonomic Group	MESA Status
<i>Ammodramus savannarum</i>	Grasshopper Sparrow	Vertebrate Animal	Threatened
<i>Poocetes gramineus</i>	Vesper Sparrow	Vertebrate Animal	Threatened
<i>Bartramia longicauda</i>	Upland Sandpiper	Vertebrate Animal	Endangered
<i>Sturnella magna</i>	Eastern Meadowlark	Vertebrate Animal	Special Concern
<i>Callophrys irus</i>	Frosted Elfin	Invertebrate Animal	Special Concern
<i>Apantesis phyllira</i>	Phyllira Tiger Moth	Invertebrate Animal	Endangered

Westover ARB supports the largest contiguous inland variant of sandplain grassland in western Massachusetts. The sandplain grassland natural community occurs on xeric soils dominated by graminoids (e.g., little bluestem), forbes, sparse shrubs and areas of bare soil. These inland grasslands require maintenance and management to prevent succession and control invasive plant species. Westover ARB's grasslands are critically important for MESA-listed grassland birds that are primarily small bodied, non-flocking bird species. The Property is significant on both a regional and state level as Westover ARB grasslands support the only known population of Phylleria Tiger Moth in the New England region. Westover ARB's vegetation management regime continues to restore and expand warm season grassland habitat by incorporating prescribed fire and herbicide in conjunction with mowing.

The Proposed Action (i.e., Preferred Alternative) estimates a permanent loss (i.e., Take) of ± 16.3 acres of sandplain grassland habitat: Taxiway G Extension (± 15 ac), Training Apron (± 1.1 ac), & Bioretention Basin (± 0.2 ac). Therefore, MassWildlife recommends that the EA demonstrate that the Proposed Action has avoided, minimized and mitigated impacts to state-listed species by: (a) adequately assess alternatives to both temporary and permanent impacts to the state-listed species, (b) demonstrate that an insignificant portion of the local population will be impacted, and (c) develop a plan that provides a long-term net benefit to the conservation of the state-listed species impacted by the project.

MassWildlife recommends that the EA's evaluation of alternatives seek to reduce the permanent loss of grassland habitat as part of the Proposed Action. For example, alternatives within the EA should evaluate minimization of new impervious surface, the removal of existing excess pavement with restoration to grassland habitats, as well as shifting the bioretention basin to an area that is suboptimal habitat for grassland species. In addition to permanent impacts, the EA should calculate the anticipated temporary impacts to grassland habitats including but not limited to those associated with grade modifications, construction, staging, etc. Additionally, measures to minimize disturbance and mortality to grassland bird species during the nesting season should include a time of year restriction from May 15 – July 31 for all work impacting grassland habitats. Finally, based upon the anticipated permanent loss of grassland habitat, MassWildlife recommends the EA include a plan to provide a long-term net benefit to the conservation of state-listed species impacted by the Proposed Action developed in consultation with the Division. Long-term net benefit conservation measures may include but are not limited to, additional grassland restoration and enhancement, protection and management of grasslands, or conservation and research funding.

MassWildlife is available for continued consultation regarding the project to identify concerns related to state-listed species and their habitats and to provide feedback for a long-term net benefit plan for unavoidable impacts to state-listed species and their habitats resulting from the Proposed Action.

MassWildlife appreciates the communication and consultation to date regarding the Proposed Action and the opportunity to comment on this project. If you have any questions about this letter, please contact Amy Hoenig, Senior Endangered Species Review Biologist, at (508) 389-6364 or Amy.Hoenig@mass.gov.

Sincerely,

A handwritten signature in black ink, reading "Everose Schlüter". The signature is fluid and cursive, with the first name "Everose" and last name "Schlüter" clearly distinguishable.

Everose Schlüter, Ph.D.
Assistant Director

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APPENDIX B:
NATIONAL HISTORIC PRESERVATION ACT SECTION 106
CONSULTATION

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DEPARTMENT OF THE AIR FORCE
AIR FORCE RESERVE COMMAND



May 31, 2023

Submitted via electronic transmission

Ms. Brona Simon
State Archaeologist/SHPO
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125

Subject: Request for consultation on proposed airfield improvements at Westover Air Reserve Base (ARB), Chicopee, Hampden County, Massachusetts

Dear Ms. Simon,

The purpose of this letter is to officially invite the Massachusetts Historical Commission (MHC) to enter into consultation with Westover Air Reserve Base (ARB), and to give you an opportunity to review a proposed action in which the MHC may have an interest.

The United States (U.S.) Air Force Reserve Command (AFRC) is preparing an Environmental Assessment (EA) to evaluate the potential environmental impacts resulting from the construction of airfield improvements at Westover ARB in Hampden County, Massachusetts (Proposed Action). The proposed airfield improvements include two primary activities: 1) construction of a paved training apron, and 2) extension of an existing taxiway. Westover ARB is located within the City of Chicopee, approximately 1.77 kilometers (1.1 miles) north of Springfield, Massachusetts. The Proposed Action would take place within two previously disturbed areas within the existing Westover ARB airfield (Attachment 1: Figure 1).

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (54 U.S.C. § 306108), Westover ARB invites the MHC to consult on the Proposed Action as the State Historic Preservation Office (SHPO) for Massachusetts.

Construction began on the Westover ARB (formerly known as the Northeast Air Base) in early 1940 primarily by workers employed through the Works Progress Administration (WPA) and Civilian Conservation Corps. Prior to this, the land use was primarily agricultural. The current base size of 2,386 acres is roughly half the size of the initial acreage. The layout has also changed since its inception. Westover ARB was inventoried in 1995 and determined to be an eligible district for listing on the National Register of Historic Places (NRHP) (Jones et al. 1995). However, a Section 106 Determination of Eligibility for the NRHP was completed for the base in 2011 that determined the entirety of the base was no longer considered eligible for listing on the NRHP due to alterations and demolitions, although several buildings and hangars within a historic core were determined to be individually eligible for listing on the NRHP. These include buildings 1502 and 1520 as well as hangars, buildings 7071, 7072, 7073, 7075, and 7087 (Ferguson 2011). Additional

information was provided to the MHC in 2016 regarding these buildings. After review, the MHC concurred with the finding that Westover ARB is no longer an historic district and that the specific buildings retain their individual eligibility (MHC 2017). Westover ARB's 2017 Integrated Cultural Resources Management Plan (ICRMP) also aggregates and defines areas of archaeological sensitivity within the base recommended by previous surveys (Westover ARB 2017).

The Proposed Action includes construction at two locations within the Westover ARB airfield (Attachment 1: Figure 1), the Dog Patch Training Area and Taxiway G Extension Area. Neither proposed action area falls within previously recorded sites, or adjacent to the historic core of Westover ARB containing individually eligible structures (Attachment 1: Figure 2). However, the Dog Patch Training Area was determined to have moderate potential for Prehistoric Site Location with areas of higher potential directly to the east and west of the Proposed Action area (Cox 1981).

Taxiway G Extension Area

The Taxiway G extension involves constructing a new concrete taxiway surface between the existing Taxiway G and Pad 5 within the Westover ARB airfield. This extension would create approximately 15 acres of impervious surface. Stormwater management options are currently under evaluation and are anticipated to include installation of new drain lines and surface grading in areas adjacent to the runway extension. Anticipated depth to disturbance is not expected to exceed 122 centimeters (48 inches) for the taxiway pavement construction but will extend to an estimated depth of 5.5 meters (18 feet) for stormwater drainage installation. The site is currently covered by a warm season grassland, over previously disturbed soils and existing underground utilities. Existing underground utilities at the site would be relocated or abandoned in place. Plate 1 illustrates underground utilities in the Taxiway G Extension Area.

The Area of Potential Effects (APE) for the Taxiway G extension is limited to the existing grassy lot approximately 1,133 meters (3,716 feet) north-northeast by 260 meters (850 feet) east-southeast that lies between concrete pads, taxiways, and the runway (Attachment 1: Figures 3, 4, 5, and 6). The entirety of this area falls within Urban Land soils (Attachment 2). There is no set stratigraphy for this soil series. This portion of the APE has been heavily disturbed and altered, as it was previously utilized by the original Westover ARB layout (Attachment 1: Figure 6) and is traversed by modern-day underground utilities. Site photographs of this area are provided in Attachment 3: Figures 8 and 9.

The project area for the Taxiway G extension is not within an area previously determined to be archaeologically sensitive due to extensive prior impacts from agricultural activities and subsequent development of the base. There is one previously recorded historic archaeological site (CHI.HA.1) approximately [REDACTED] of the APE. The site is situated [REDACTED] and consists of two undecorated whiteware sherds and one milled quartz shatter (Reams 2010). [REDACTED]

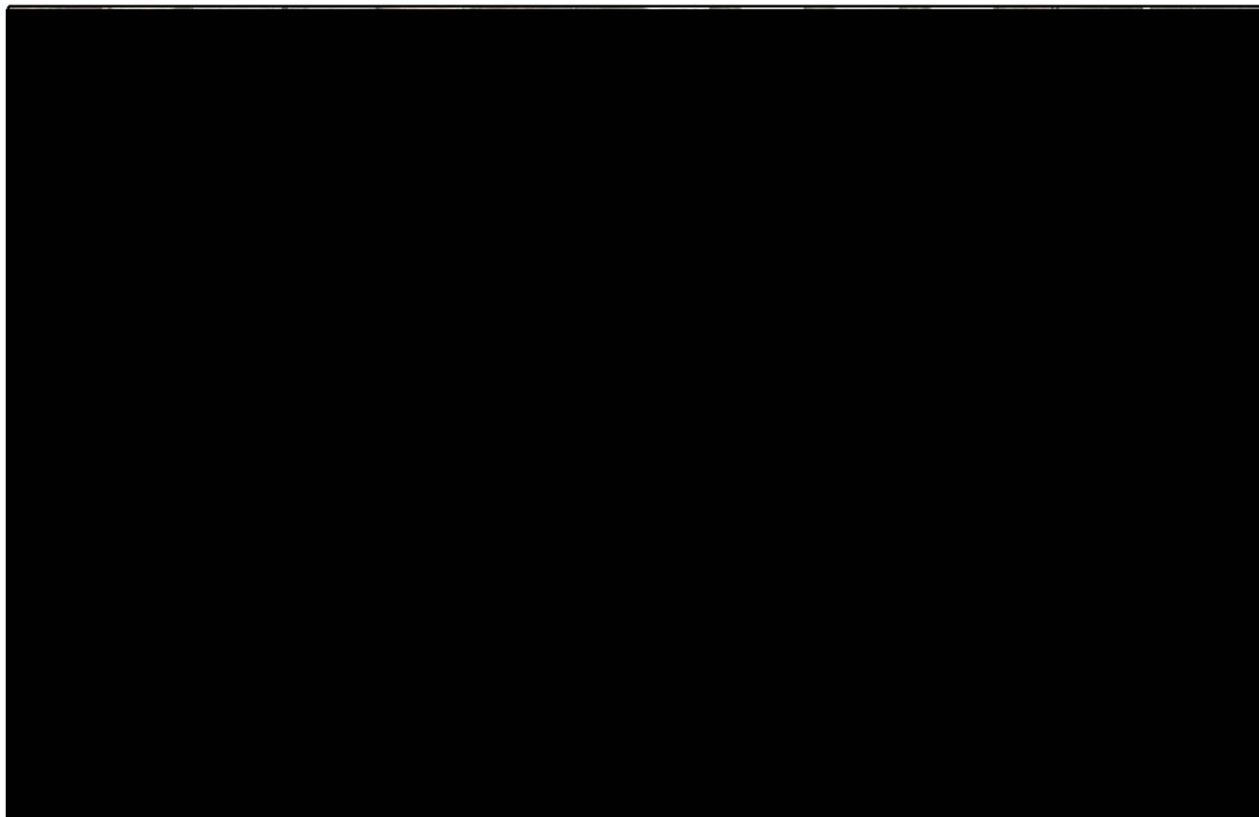


Plate 1: Underground utilities within Taxiway G Extension Area

On April 6, 2023, AECOM Archaeologist Nicholas Smith, on behalf of the AFRC, conducted a walkover visual inspection in addition to placing hand-held soil cores to identify intact and previously disturbed soil locations within the project APE. Thirty-three soil probes were taken within the APE spaced along three transects at 100-meter (328-foot) intervals (Plate 2). Soils were consistent across the area with the average topsoil extending to a depth of 10 to 16 centimeters (4 to 6 inches) and exhibiting a dark grayish brown (10YR 4/2) to very dark grayish brown (10YR 3/2) loamy sand (Table 1). Two probes in close proximity to drainage catch basins revealed a topsoil that extended to 28 and 46 centimeters (11 and 18 inches). Underneath topsoil was a soil horizon consistently displaying yellowish brown (10YR 5/6) coarse sand with dense fine gravels. Probes extended anywhere from 13 to 50 centimeters (5 to 20 inches) in depth before reaching impenetrable gravels, with the majority terminating between 20 and 30 centimeters (8 to 12 inches). No third horizon was seen within any probes. Attachment 3, Figures 10 and 11 illustrate typical profiles seen within soil probes.



Plate 2: Soil Probe Locations within Taxiway G Extension Area APE

Table 1: Soil Profiles of Taxiway G Extension Area Probe

Probe	Soil Profile
1	0-10 cm: 10YR 4/2 dark grayish brown loamy sand 10-18 cm: 10YR 5/6 yellowish brown gravelly coarse sand
2	0-9 cm: 10YR 4/2 dark grayish brown loamy sand 9-13 cm: 10YR 5/6 yellowish brown gravelly coarse sand
3	0-11 cm: 10YR 4/2 dark grayish brown loamy sand 11-23 cm: 10YR 5/6 yellowish brown gravelly coarse sand
4	0-12 cm: 10YR 4/2 dark grayish brown loamy sand 12-19 cm: 10YR 5/6 yellowish brown gravelly coarse sand
5	0-14 cm: 10YR 4/2 dark grayish brown loamy sand 14-26 cm: 10YR 5/6 yellowish brown gravelly coarse sand
6	0-15 cm: 10YR 4/2 dark grayish brown loamy sand 15-28 cm: 10YR 5/6 yellowish brown gravelly coarse sand
7	0-12 cm: 10YR 4/2 dark grayish brown loamy sand 12-28 cm: 10YR 5/6 yellowish brown gravelly coarse sand
8	0-46 cm: 10YR 4/2 dark grayish brown loamy sand 46-50 cm: 10YR 5/6 yellowish brown gravelly coarse sand
9	0-28 cm: 10YR 4/2 dark grayish brown loamy sand 28-41 cm: 10YR 5/6 yellowish brown gravelly coarse sand
10	0-12 cm: 10YR 4/2 dark grayish brown loamy sand 12-26 cm: 10YR 5/6 yellowish brown gravelly coarse sand
11	0-11 cm: 10YR 3/2 very dark grayish brown loamy sand 11-23 cm: 10YR 5/6 yellowish brown gravelly coarse sand

Probe	Soil Profile
12	0-15 cm: 10YR 3/2 very dark grayish brown loamy sand 15-28 cm: 10YR 5/6 yellowish brown gravelly coarse sand
13	0-14 cm: 10YR 3/2 very dark grayish brown loamy sand 14-26 cm: 10YR 5/6 yellowish brown gravelly coarse sand
14	0-10 cm: 10YR 3/2 very dark grayish brown loamy sand 10-22 cm: 10YR 5/6 yellowish brown gravelly coarse sand
15	0-11 cm: 10YR 3/2 very dark grayish brown loamy sand 11-21 cm: 10YR 5/6 yellowish brown gravelly coarse sand
16	0-16 cm: 10YR 4/2 dark grayish brown loamy sand 16-31 cm: 10YR 5/6 yellowish brown gravelly coarse sand
17	0-14 cm: 10YR 4/2 dark grayish brown loamy sand 14-29 cm: 10YR 5/6 yellowish brown gravelly coarse sand
18	0-14 cm: 10YR 4/2 dark grayish brown loamy sand 14-27 cm: 10YR 5/6 yellowish brown gravelly coarse sand
19	0-13 cm: 10YR 4/2 dark grayish brown loamy sand 13-28 cm: 10YR 5/6 yellowish brown gravelly coarse sand
20	0-13 cm: 10YR 4/2 dark grayish brown loamy sand 13-29 cm: 10YR 5/6 yellowish brown gravelly coarse sand
21	0-15 cm: 10YR 4/2 dark grayish brown loamy sand 15-30 cm: 10YR 5/6 yellowish brown gravelly coarse sand
22	0-16 cm: 10YR 4/2 dark grayish brown loamy sand 16-30 cm: 10YR 5/6 yellowish brown gravelly coarse sand
23	0-11 cm: 10YR 4/2 dark grayish brown loamy sand 11-21 cm: 10YR 5/6 yellowish brown gravelly coarse sand
24	0-16 cm: 10YR 4/2 dark grayish brown loamy sand 16-29 cm: 10YR 5/6 yellowish brown gravelly coarse sand
25	0-15 cm: 10YR 4/2 dark grayish brown loamy sand 15-26 cm: 10YR 5/6 yellowish brown gravelly coarse sand
26	0-14 cm: 10YR 4/2 dark grayish brown loamy sand 14-27 cm: 10YR 5/6 yellowish brown gravelly coarse sand
27	0-13 cm: 10YR 4/2 dark grayish brown loamy sand 13-26 cm: 10YR 5/6 yellowish brown gravelly coarse sand
28	0-12 cm: 10YR 4/2 dark grayish brown loamy sand 12-26 cm: 10YR 5/6 yellowish brown gravelly coarse sand
29	0-11 cm: 10YR 4/2 dark grayish brown loamy sand 11-25 cm: 10YR 5/6 yellowish brown gravelly coarse sand
30	0-15 cm: 10YR 3/2 very dark grayish brown loamy sand 15-29 cm: 10YR 5/6 yellowish brown gravelly coarse sand
31	0-13 cm: 10YR 3/2 very dark grayish brown loamy sand 13-25 cm: 10YR 5/6 yellowish brown gravelly coarse sand
32	0-14 cm: 10YR 3/2 very dark grayish brown loamy sand 14-27 cm: 10YR 5/6 yellowish brown gravelly coarse sand
33	0-11 cm: 10YR 3/2 very dark grayish brown loamy sand 11-23 cm: 10YR 5/6 yellowish brown gravelly coarse sand

Dog Patch Training Area

A paved training apron and associated stormwater feature would be constructed within the Dog Patch Training Area. Construction of the paved training apron would create approximately 1.1 acres of impervious surface that will have an anticipated depth of disturbance of 30 centimeters (12 inches). A 0.2-acre bioretention basin would be constructed to the north of the paved training apron to collect runoff that will have an anticipated depth of disturbance of 2.1 meters (7 feet). The Dog Patch Training Area currently consists of grassland interspersed with roads and existing training infrastructure (Attachment 3: Figures 12-15).

The direct APE for the paved training apron is limited to the existing grassy lots in between roads and the existing training area on the north end of the base, and around a concrete pad (Pad 19) at the end of joining taxiways (Attachment 1: Figures 3, 4, 5, and 6). The survey area is approximately 260 meters (850 feet) north-south by 305 meters (1,000 feet) west-east that lies between a concrete pad, roadways, and tree lines. A southern portion of this area around the concrete pad falls within Urban Land soils that have been heavily disturbed and altered. The remainder of the survey area falls within Hinckley loamy sand soils (Attachment 2). While the concrete pad is seen on the initial layout the roads and training facilities to the north do not appear until 1990s aerial imagery. Modern-day underground utilities, including power, communication, and water also traverse the lot. Plate 3 below illustrates underground utilities in the Dog Patch Training Area.

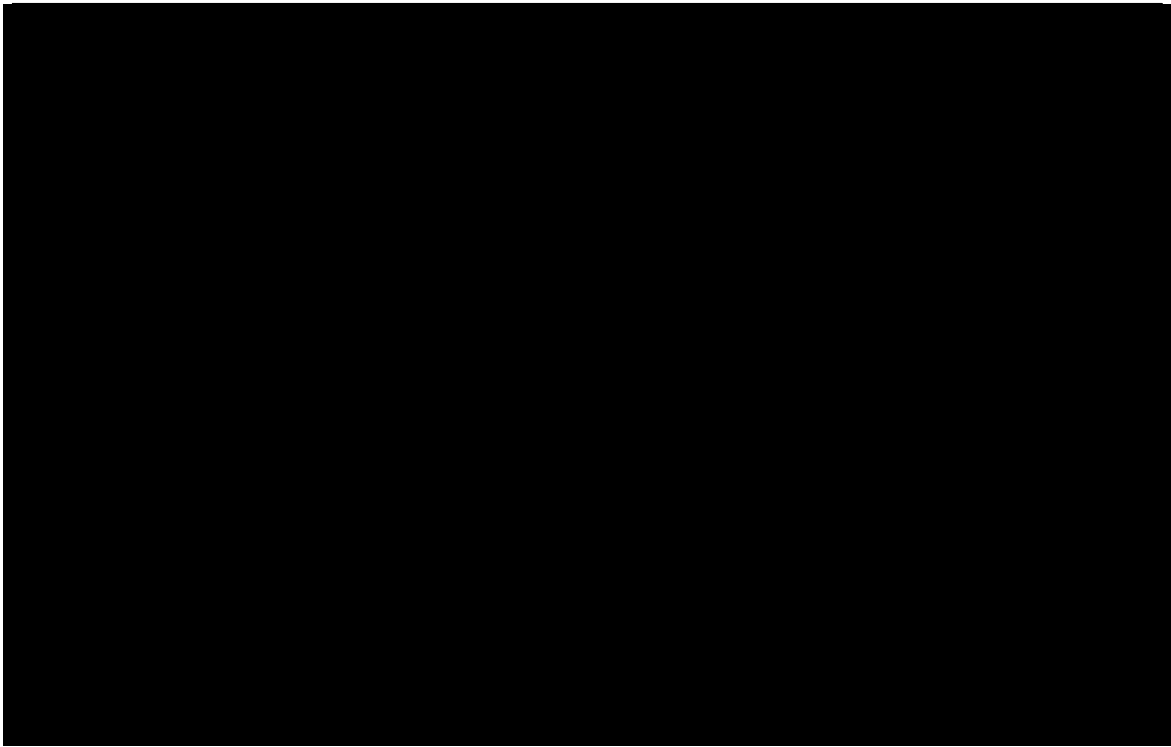


Plate 3: Underground utilities within Dog Patch Training Area

The Dog Patch Training Area was assessed for archaeological sensitivity as part of a 1981 Reconnaissance Survey of the Air Force Base and fell within Area F of this survey and within an area assigned a rank of 3, meaning that it has a high level of site potential but also a moderate level

of previous disturbance (Cox 1981). Ground disturbances occurring prior to this 1981 sensitivity assessment would have included not only base roadway and utility construction but leveling and grading, as the once hilly terrain has now been graded level. Plate 4 illustrates levels of archaeological sensitivity, with higher levels of sensitivity directly east and west of the impact areas. These areas fall under a sensitivity rank of 2, meaning that they have a low level of site potential but minimal disturbance. Plate 5 illustrates the terrain from the USGS Chicopee 1933 topographic map.

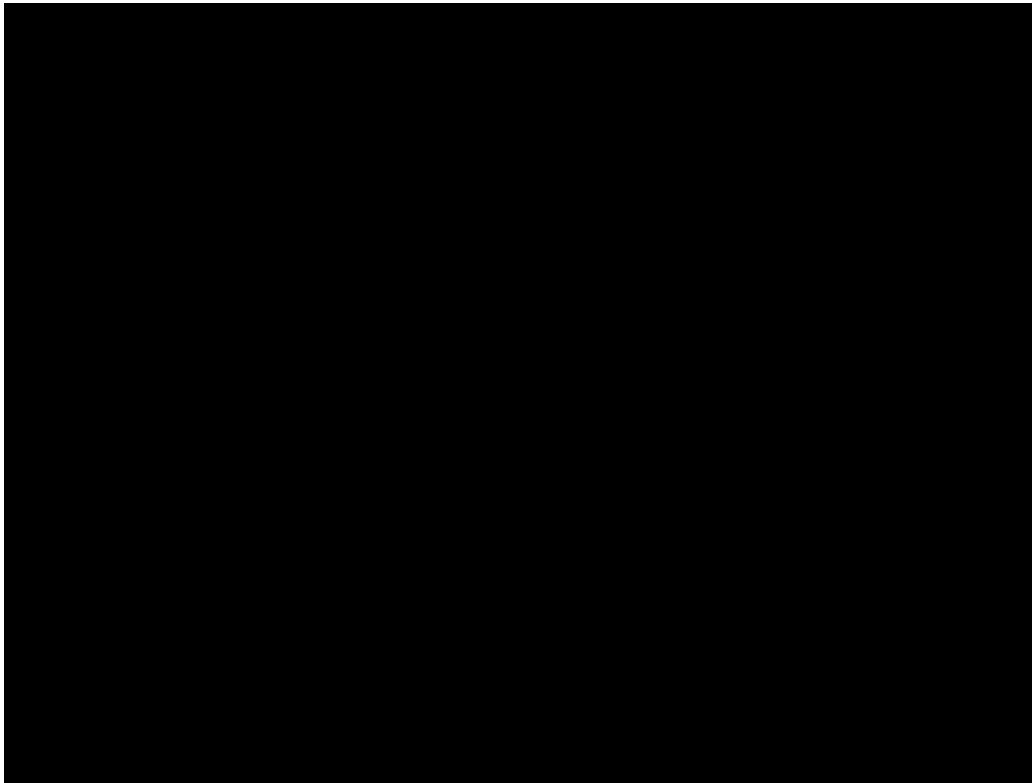


Plate 4: Sensitivity Assessment from 1981, illustrating the Proposed Action (colored purple) in the Dog Patch Training Area, within Sensitivity Scale Ranking of 3, (excerpt of Figure 17) (Cox 1981)

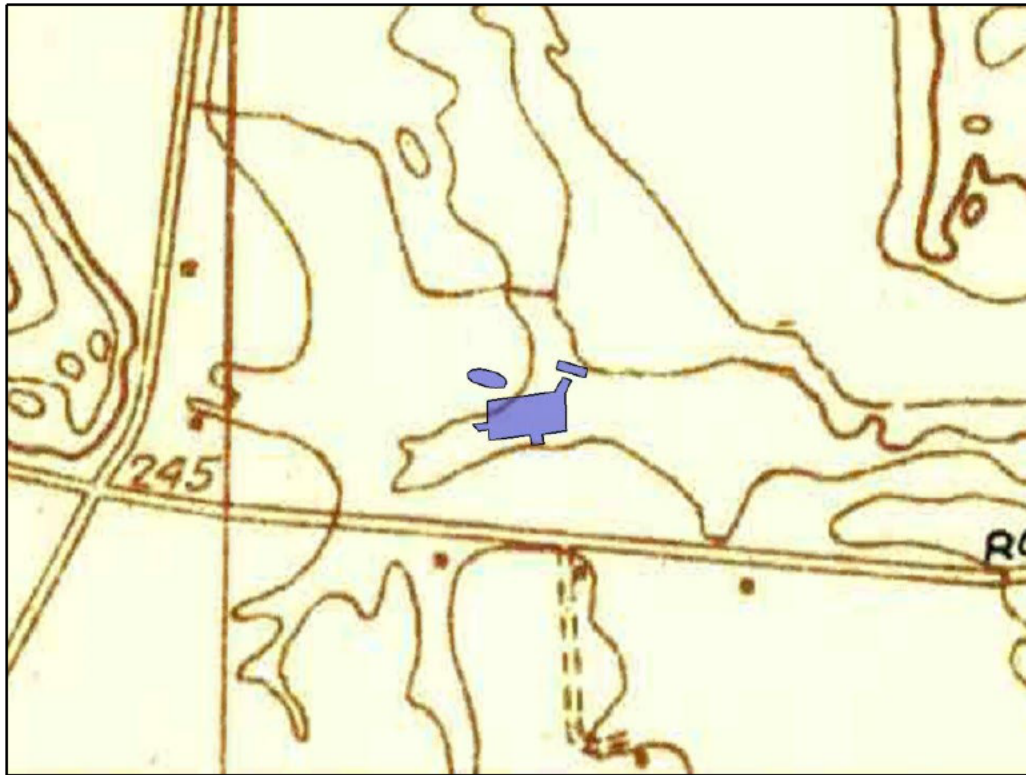


Plate 5: Proposed Action in the Dog Patch Training Area on historic topographic map (USGS, Chicopee, 1933)

There are three previously recorded archaeological sites in the vicinity of the Dog Patch Training Area (Attachment 1: Figure 7). The Small Arms Range Parcel site (19-HD-219) lies [REDACTED] of the APE. The site is situated within a [REDACTED] consists of historic material (glass bottles and bullets), quartz shatter, and a quartzite flake (Mowchan and Cox 1989). A lithic scatter site referred to as the Drop Zone Site (19-HD-223) lies approximately [REDACTED] of the APE. The location of this site is estimated since the original survey provided poor location data. The Stony Brook Site (19-HS-208) lies [REDACTED] of the APE (Plate 6). The site was situated [REDACTED] and consisted of historic material (bullets, nails, tile fragments, bricks, and a button) and a single felsite flake (Jones et al. 1995). A second flake was recovered during a revisit by Reams in 2010 (Reams 2010). The site area has since been converted into a wetland.

Areas of archaeological sensitivity were updated after several more surveys were conducted since the original 1981 assessment. The intensive survey of the Small Arms Range Site (19-HD-219) found that much of the area consisted of previous disturbances. One piece of quartzite chipping debris was discovered in a stripped area during pedestrian walkover. A second piece of quartz chipping debris was discovered in a northern shovel test pit, within a layer of fill material. This site was determined to lack integrity due to disturbances (Mowchan and Cox 1989). The site was revisited once again in 1995 as part of a Cultural Resources Reconnaissance Survey of the base by Boston University, which determined the site no longer retains any integrity due to disturbances associated with construction of the arms range and gravelling operations. This same survey could not locate the Drop Zone Site (19-HD-223) due to poor locational data (Jones, et al. 1995).

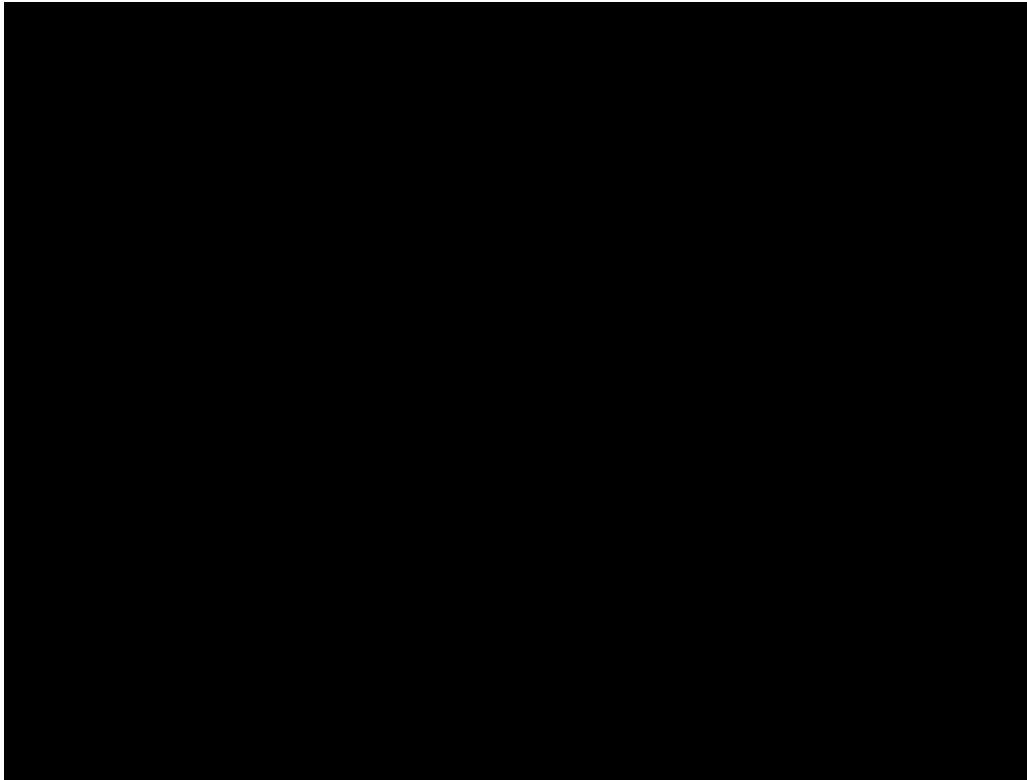


Plate 6: Sensitivity Assessment, illustrating the Proposed Action (colored purple) in the Dog Patch Training Area after 2010 surveys, (excerpt of Attachment 1: Figure 2) (Reams 2010)

Historic aerial imagery from 1957 does not show any roads running through the Dog Patch Training Area. By 1958 a two-track can be seen running diagonally through the area connecting to the turnaround. The layout appears to remain the same in 1967 and 1971 aerials. It isn't until the 1985 aerials that this two-track becomes a paved road but remains the lone road in the area. In 1997 aerial imagery, the roadway along the northern edge of the grassy area appears along with the rounded roadway to the northeast. Several buildings are also seen in this northeast portion of the training area. By the 2003 aerials the north-south roadway first appears between the training area and the wooded area bordering Stony Brook. Aerial imagery from 2004 shows a minor expansion of the buildings in the training area while the 2012 and 2013 aerials show another expansion of buildings along with an upgrade to the roadways (NETR 1957, 1958, 1967, 1971, 1985, 1997, 2001, 2003, 2004, 2005, 2008, 2010, 2012, 2014, and 2018).

On April 6, 2023, AECOM Archaeologist Nicholas Smith, on behalf of the AFRC, conducted a walkover visual inspection in addition to placing hand-held soil cores to identify intact and previously disturbed soil locations in the Dog Patch Training Area project APE. Thirty soil probes were taken within the APE spaced along a staggered 50-meter (164-foot) grid system with supplemental probes placed in areas of direct impact (Plate 7). Soils were consistent across the area with the average topsoil extending to a depth of 10 to 15 centimeters (4 to 6 inches) and exhibiting a dark grayish brown (10YR 4/2) to very dark grayish brown (10YR 3/2) loamy sand (Table 2). Five probes near underground utilities revealed a topsoil that extended to 24 to 38

centimeters (9 to 15 inches). Underneath topsoil was a soil horizon consistently displaying yellowish brown (10YR 5/6) coarse sand with half displaying dense fine gravels. This horizon is consistent with the Bw2 and BC layers expected to be seen in Hinckley soils. Probes extended anywhere from 18 to 57 centimeters (7 to 22 inches) in depth before reaching impenetrable gravels, with the majority terminating between 20 and 30 centimeters (8 to 12 inches). No third horizon was seen within any probes. Attachment 3, Figures 16 and 17 illustrate typical profiles seen within soil probes. Plate 7 illustrates soil probe locations and Table 2 lists soil profiles from each probe.



Plate 7: Soil Probe Locations within Dog Patch Training Area APE

Table 2: Soil Profiles of Dog Patch Training Area Probes

Probe	Soil Profile
1	0-11 cm: 10YR 4/2 dark grayish brown sandy loam 11-24 cm: 10YR 5/6 yellowish brown gravelly coarse sand
2	0-13 cm: 10YR 3/2 very dark grayish brown sandy loam 13-27 cm: 10YR 5/6 yellowish brown gravelly coarse sand
3	0-14 cm: 10YR 4/2 dark grayish brown sandy loam 14-23 cm: 10YR 5/6 yellowish brown gravelly coarse sand
4	0-12 cm: 10YR 3/2 very dark grayish brown sandy loam 12-26 cm: 10YR 5/6 yellowish brown gravelly coarse sand
5	0-14 cm: 10YR 4/2 dark grayish brown sandy loam 14-25 cm: 10YR 5/6 yellowish brown gravelly coarse sand
6	0-24 cm: 10YR 3/3 dark brown sandy loam 24-42 cm: 10YR 5/6 yellowish brown gravelly coarse sand

Probe	Soil Profile
7	0-10 cm: 10YR 3/2 very dark grayish brown sandy loam 10-21 cm: 10YR 5/6 yellowish brown gravelly coarse sand
8	0-13 cm: 10YR 3/2 very dark grayish brown sandy loam 13-25 cm: 10YR 5/6 yellowish brown gravelly coarse sand
9	0-11 cm: 10YR 4/2 dark grayish brown sandy loam 11-23 cm: 10YR 5/6 yellowish brown gravelly coarse sand
10	0-33 cm: 10YR 3/3 dark brown sandy loam 33-49 cm: 10YR 5/6 yellowish brown gravelly coarse sand
11	0-15 cm: 10YR 3/2 very dark grayish brown sandy loam 15-24 cm: 10YR 5/6 yellowish brown gravelly coarse sand
12	0-11 cm: 10YR 4/2 dark grayish brown sandy loam 11-22 cm: 10YR 5/8 yellowish brown gravelly coarse sand
13	0-14 cm: 10YR 4/2 dark grayish brown sandy loam 14-21 cm: 10YR 5/6 yellowish brown gravelly coarse sand
14	0-38 cm: 10YR 3/3 dark brown sandy loam 38-57 cm: 10YR 5/6 yellowish brown gravelly coarse sand
15	0-15 cm: 10YR 4/2 dark grayish brown sandy loam 15-28 cm: 10YR 5/6 yellowish brown gravelly coarse sand
16	0-31 cm: 10YR 4/2 dark grayish brown sandy loam 31-45 cm: 10YR 5/6 yellowish brown gravelly coarse sand
17	0-27 cm: 10YR 3/3 dark brown sandy loam 27-38 cm: 10YR 5/6 yellowish brown gravelly coarse sand
18	0-15 cm: 10YR 4/2 dark grayish brown sandy loam 15-29 cm: 10YR 5/6 yellowish brown gravelly coarse sand
19	0-11 cm: 10YR 4/2 dark grayish brown sandy loam 11-21 cm: 10YR 5/6 yellowish brown gravelly coarse sand
20	0-15 cm: 10YR 4/2 dark grayish brown sandy loam 15-29 cm: 10YR 5/6 yellowish brown gravelly coarse sand
21	0-10 cm: 10YR 4/2 dark grayish brown sandy loam 10-18 cm: 10YR 5/6 yellowish brown gravelly coarse sand
22	0-12 cm: 10YR 3/3 dark brown sandy loam 12-29 cm: 10YR 5/6 yellowish brown gravelly coarse sand
23	0-14 cm: 10YR 3/3 dark brown sandy loam 14-30 cm: 10YR 5/6 yellowish brown gravelly coarse sand
24	0-12 cm: 10YR 4/2 dark grayish brown sandy loam 12-27 cm: 10YR 5/6 yellowish brown gravelly coarse sand
25	0-13 cm: 10YR 4/2 dark grayish brown sandy loam 13-23 cm: 10YR 5/6 yellowish brown gravelly coarse sand
26	0-10 cm: 10YR 4/2 dark grayish brown sandy loam 10-19 cm: 10YR 5/6 yellowish brown gravelly coarse sand
27	0-14 cm: 10YR 4/2 dark grayish brown sandy loam 14-29 cm: 10YR 5/6 yellowish brown gravelly coarse sand
28	0-10 cm: 10YR 4/2 dark grayish brown sandy loam 10-23 cm: 10YR 5/6 yellowish brown gravelly coarse sand
29	0-12 cm: 10YR 4/2 dark grayish brown sandy loam 12-25 cm: 10YR 5/6 yellowish brown gravelly coarse sand
30	0-11 cm: 10YR 4/2 dark grayish brown sandy loam 11-22 cm: 10YR 5/6 yellowish brown gravelly coarse sand

No previously recorded archaeological sites have been recorded within either of the project APEs. Historic aerial imagery, historic maps, and topographic maps indicate that the proposed work will fall within the footprint of previous development and agricultural activity before that. The Taxiway G Extension Area APE is listed as Urban Land soils, and a portion of the Dog Patch Training Area APE is partially listed as Urban Land soils. The remainder of the Dog Patch Training Area APE soil probes indicated that while they are listed as Hinckley series soils, the majority of the APE has been disturbed through the same previous development (roadways, taxiways, standing structures, and a large number of underground utilities) and agricultural activity. Historic topographic maps also indicate this APE as having a sloping terrain unlike the flat land currently observed.

The project area for the Dog Patch Training Area was first determined in 1981 (Cox 1981) to have moderate sensitivity for the extent of direct impacts with moderate-high sensitivity to the west and east. Additional surveys in 1995 (Jones et al. 1995) and 2010 (Reams 2010) revisited the base and re-defined areas for archaeological sensitivity. One of the closest identified sites, 19-HD-219, was determined to lack integrity due to disturbances. Site 19-HD-223 was unable to be relocated during subsequent surveys. The Jones 1994 survey stated that the MHC placed Site 19-HD-223 in the same location as Site 19-HD-219; however, the Jones 1994 survey was unable to confirm this on site (Jones et al 1995). While the precise location of 19-HD-223 could not be identified, areas of high sensitivity identified by Cox in 1981 are not in the current project area. In the 2010 survey for the US Forest Service, Reams recommended an area directly west of the Dog Patch Training Area as sensitive for Pre-Contact and historic archaeological sites (Attachment 1: Figure 2). A series of concrete foundations were identified on the west side of Granby Road that align with structures on a 1936 WPA map and push the sensitivity for historic archaeological sites in the area, while the previously recorded Pre-Contact sites to the west provide basis for Pre-Contact sensitivity. This was also deemed an area with a minimal amount of previous disturbances (Reams 2010).

Soil testing confirmed the APE lands as disturbed/altered. The proposed actions do not involve vertical construction and are limited to additional pavement construction consistent with the existing airfield. Therefore, AECOM recommends that this project will have **No Effect** on historic sites, structures, or buildings. No additional work is recommended for the proposed project area APEs in regard to archaeological or historic resources.

The AFRC invites the MHC to consult on this proposed action, as well as on any NHPA Section 106 concerns with the proposed Westover ARB airfield improvement project. Please provide your response to Mr. John Moriarty, Environmental Flight Chief, 439th Airlift Wing, by email to john.moriarty.1@us.af.mil or by mail to 250 Patriot Avenue, Box 35, Westover ARB, MA. I look forward to receiving any input you may have regarding this endeavor.

Sincerely,

MORIARTY.JOHN.
B.1228530170

Digitally signed by
MORIARTY.JOHN.B.1228530170
Date: 2023.07.12 08:55:07 -04 00

JOHN MORIARTY,
Chief, Environmental Flight

Attachments:

1. Maps of APE, Proposed Action Areas, and Sites and Sensitivity Areas
2. Soil Maps of the APE
3. Project Area Photos

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Attachment 1: Maps of APEs, Proposed Action Areas, and Sites/Sensitive Areas

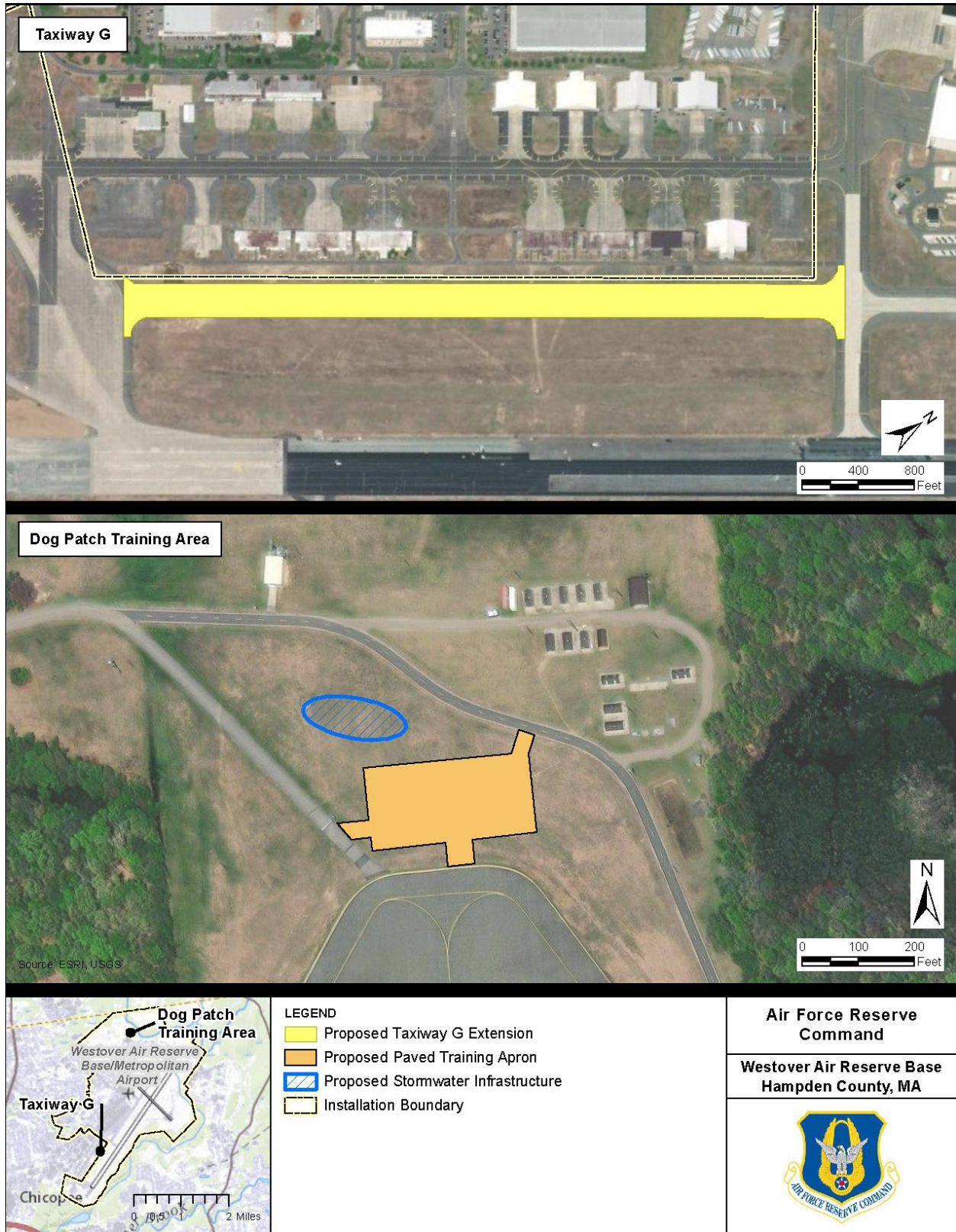


Figure 1: Proposed Action Direct Impact Areas

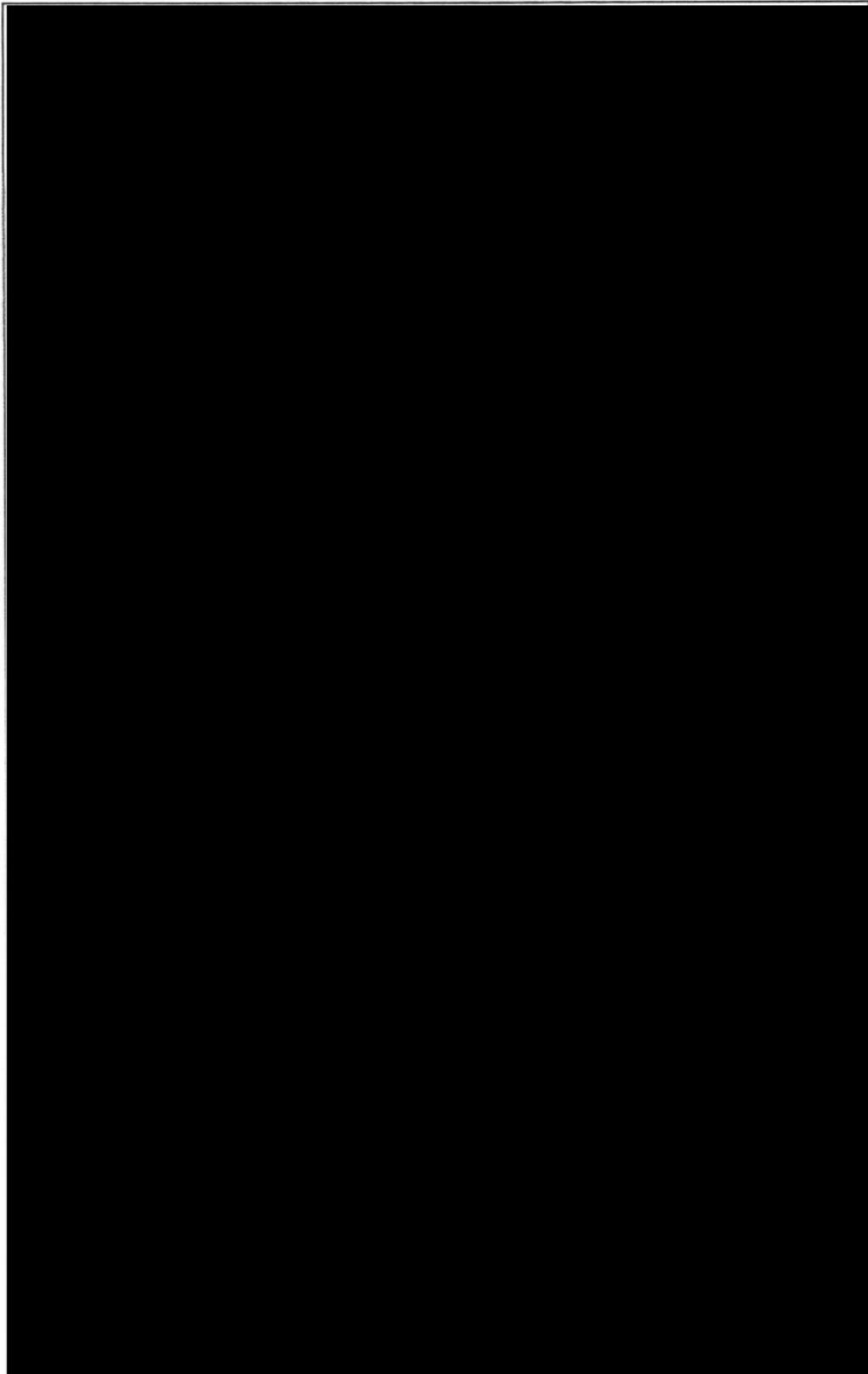


Figure 2: Archaeological Sites and Areas of Archaeological Sensitivity (Reams 2010)

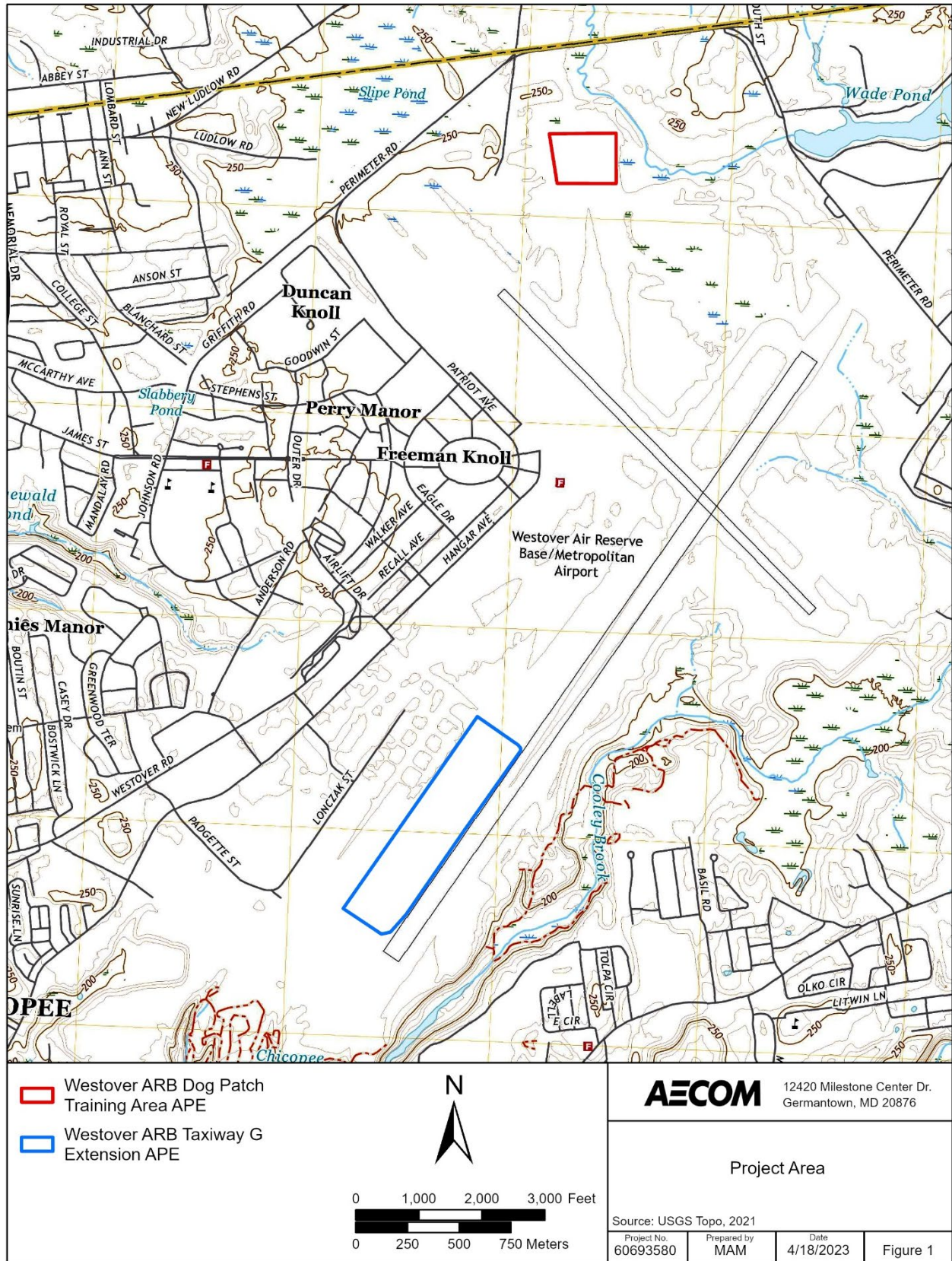


Figure 3: USGS Map Showing the Proposed Action APEs



Figure 4: Aerial Map Showing the Proposed Action APEs

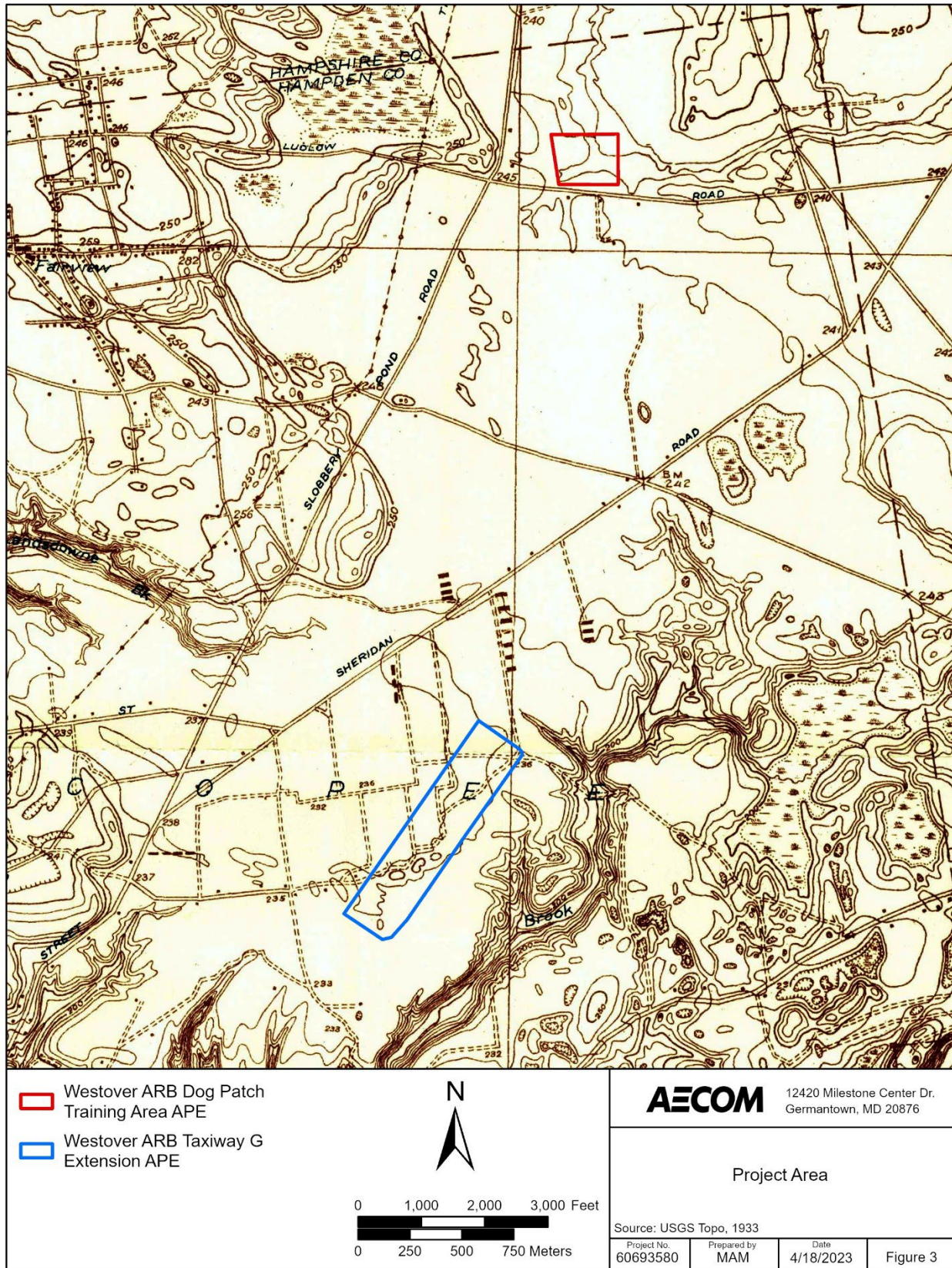


Figure 5: USGS, (1933) Chicopee, MA Showing the Proposed Action APEs

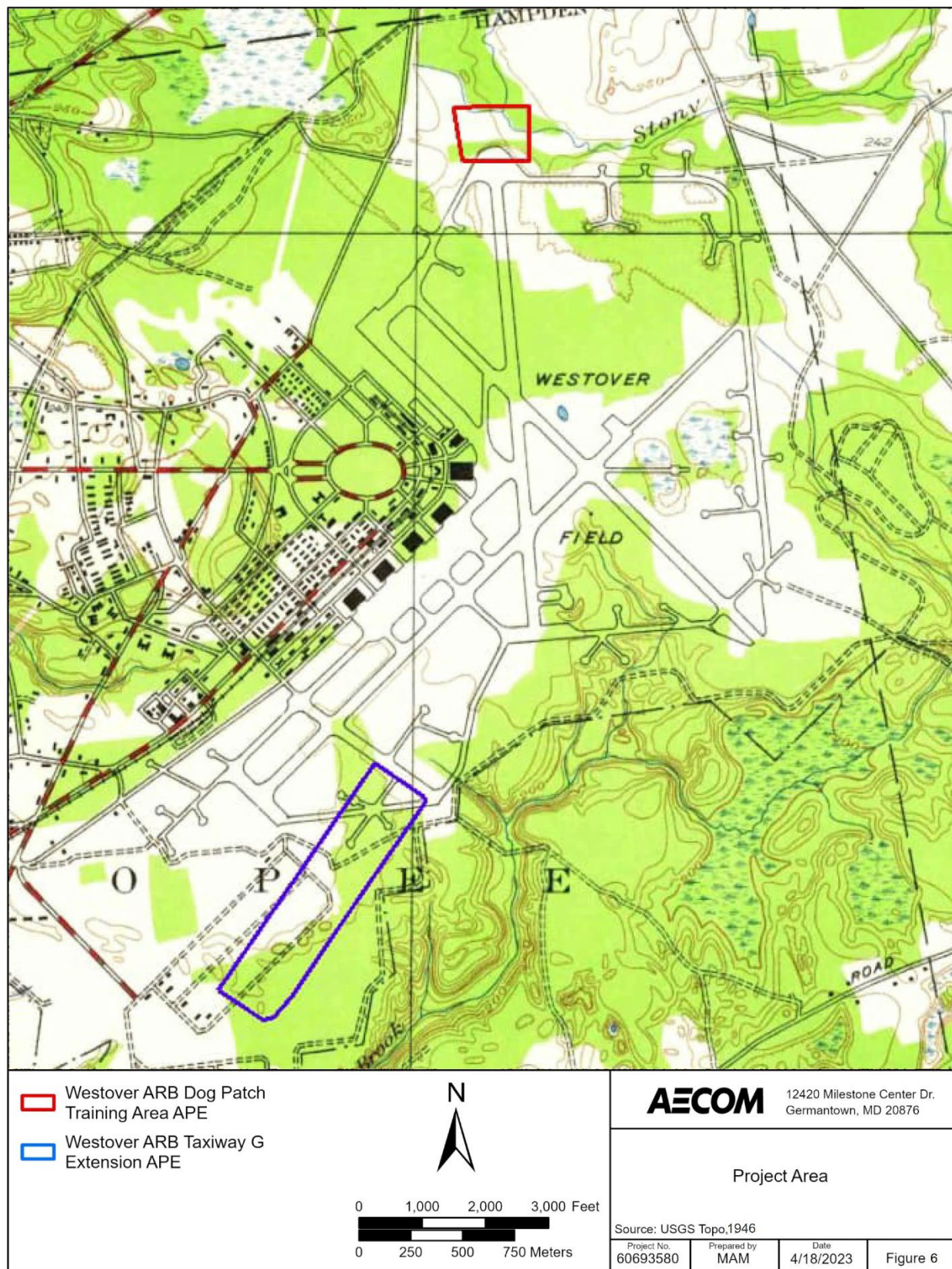


Figure 6: USGS, (1946) Springfield North, MA Showing the Proposed Action APEs

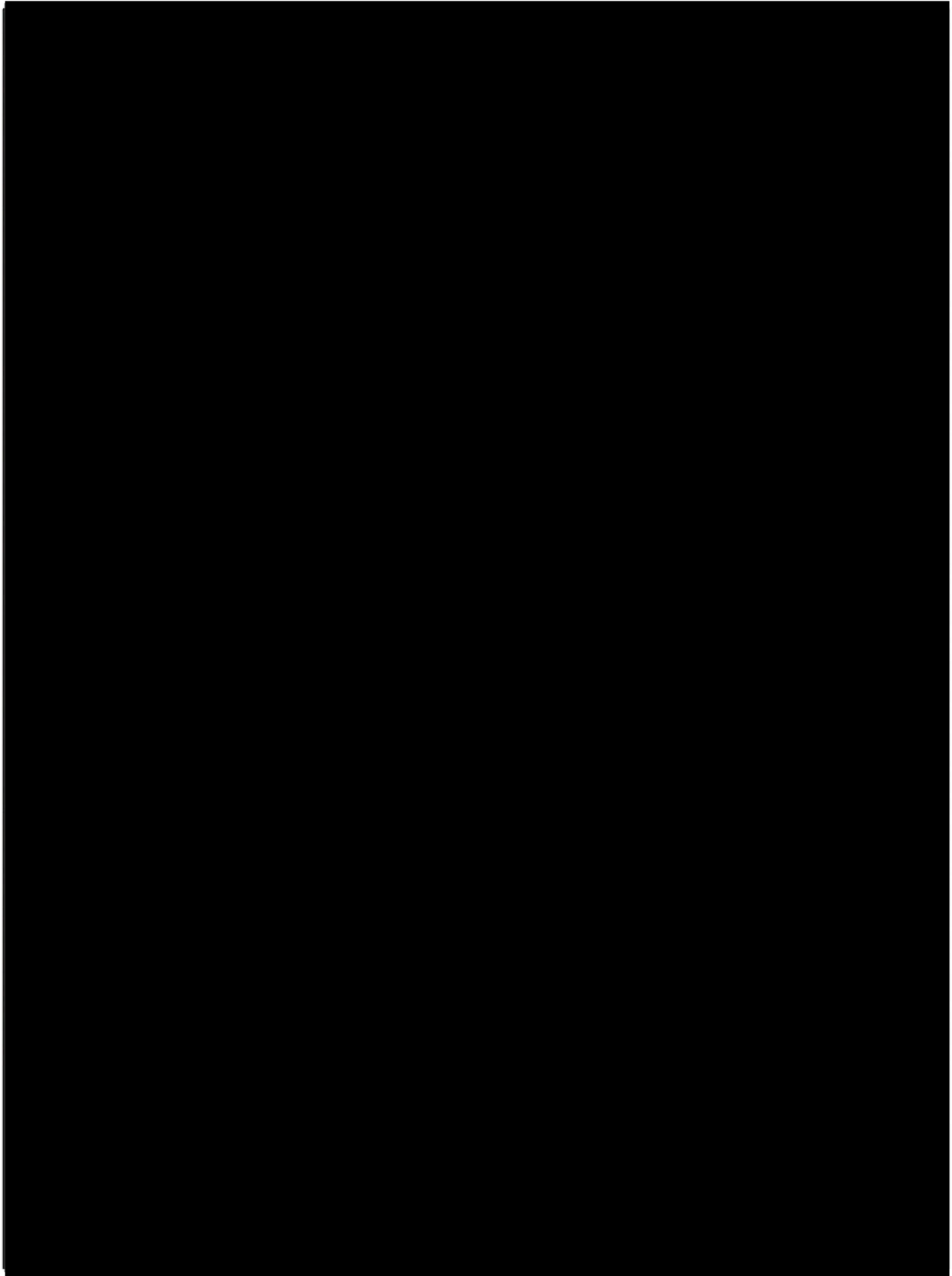


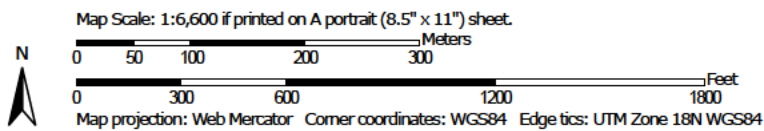
Figure 7: Aerial Map Showing Previously Recorded Sites near the Dog Patch Training Area Survey Area

Attachment 2: Soil Maps of the APE

Soil Map—Hampden County, Massachusetts, Central Part
(Westover ARB Taxiway G Extension)



Soil Map may not be valid at this scale.



Natural Resources
Conservation Service


Web Soil Survey
National Cooperative Soil Survey

4/17/2023
Page 1 of 3


Soil Map—Hampden County, Massachusetts, Central Part
(Westover ARB Taxiway G Extension)


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 1:25,000.

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: Hampden County, Massachusetts, Central Part

Survey Area Data: Version 16, Sep 9, 2022

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

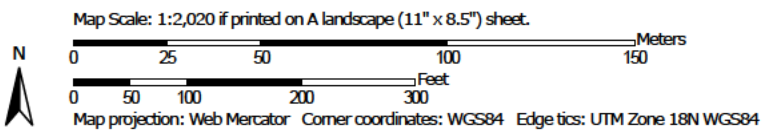
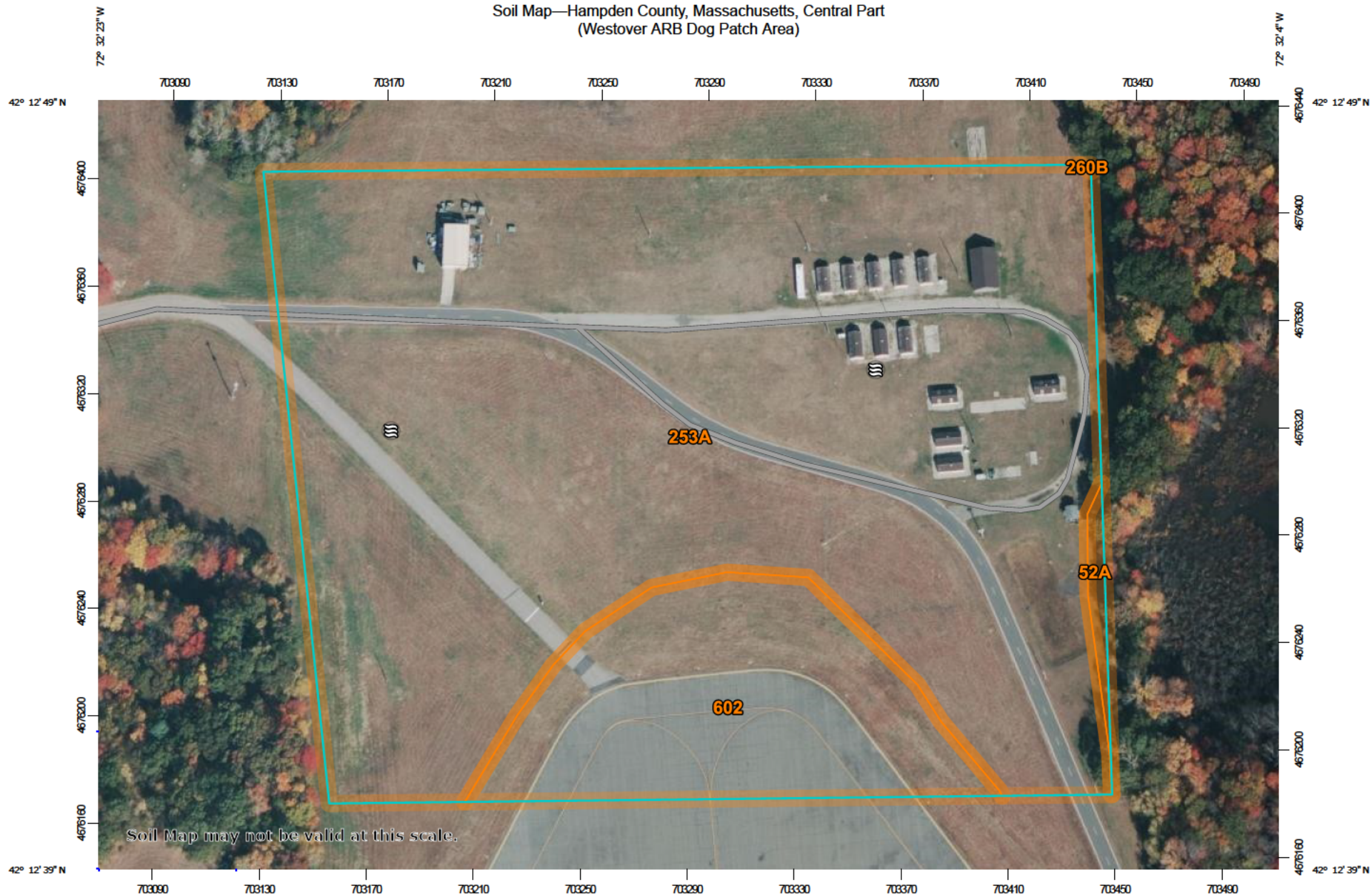
Date(s) aerial images were photographed: Oct 15, 2020—Oct 31, 2020

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
602	Urban land	73.3	100.0%
Totals for Area of Interest		73.3	100.0%

Soil Map—Hampden County, Massachusetts, Central Part
(Westover ARB Dog Patch Area)



Natural Resources
Conservation Service


Web Soil Survey
National Cooperative Soil Survey

4/17/2023
Page 1 of 3


Soil Map—Hampden County, Massachusetts, Central Part
(Westover ARB Dog Patch Area)

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 1:25,000.

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: Hampden County, Massachusetts, Central Part

Survey Area Data: Version 16, Sep 9, 2022

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

Date(s) aerial images were photographed: Oct 15, 2020—Oct 31, 2020

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
52A	Freetown muck, central lowland, 0 to 1 percent slopes	0.1	0.6%
253A	Hinckley loamy sand, 0 to 3 percent slopes	14.7	83.4%
260B	Sudbury fine sandy loam, 0 to 8 percent slopes	0.0	0.0%
602	Urban land	2.8	16.0%
Totals for Area of Interest		17.6	100.0%

Attachment 3: Project Area Photos



Figure 8: Overview of Taxiway G Extension Area APE from southern end facing north-northeast



Figure 9: Overview of Taxiway G Extension Area APE from western edge facing northeast



Figure 10: Typical soil probe profile from Taxiway G Extension Area APE



Figure 11: Typical soil probe profile from Taxiway G Extension Area APE



Figure 12: Overview of Dog Patch Training Area APE from southern end facing northeast



Figure 13: Overview of Dog Patch Training Area APE from eastern edge facing northwest



Figure 14: Overview of Dog Patch Training Area APE from southern end facing north



Figure 15: Overview of Dog Patch Training Area APE from eastern edge facing west



Figure 16: Typical soil probe profile from Dog Patch Training Area APE



Figure 17: Typical soil probe profile from Dog Patch Training Area APE

APPENDIX C:

NATIVE AMERICAN CONSULTATION

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Sample Native American Consultation Letter



DEPARTMENT OF THE AIR FORCE AIR FORCE RESERVE COMMAND



18 August 2023

Colonel Gregory D. Buchanan
Commander, 439th Airlift Wing
975 Patriot Avenue
Westover Air Reserve Base MA 01022

Ms. Cheryl Andrews-Mattais
Chairperson
Wampanoag Tribe of Gay Head
20 Black Brook Road
Aquinnah, MA 02535

Dear Ms. Andrews-Mattais

The purpose of this letter is to officially invite your tribe to enter into consultation with Westover Air Reserve Base (ARB), and to give you an opportunity to review a proposed action in which your tribe may have an interest.

The United States (U.S.) Air Force Reserve Command (AFRC) is preparing an Environmental Assessment (EA) to evaluate the potential environmental impacts resulting from the construction of airfield improvements at Westover ARB in Hampden County, Massachusetts (Proposed Action). The proposed airfield improvements include two primary activities: 1) construction of a paved training apron, and 2) extension of an existing taxiway. Westover ARB is located within the City of Chicopee, approximately 1.77 kilometers (1.1 miles) north of Springfield, Massachusetts. The Proposed Action would take place within two previously disturbed areas within the existing Westover ARB airfield (see Attachment 1, Appendix 1: Figure 1).

Pursuant to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (54 U.S.C. § 306108), Westover ARB invites your tribe to consult on the Proposed Action as a sovereign nation. This consultation is required under Department of Defense Instruction 4710.02, which implements the Annotated Department of Defense American Indian and Alaska Native Policy dated 27 October 1999; the National Historic Preservation Act; the Native American Graves Protection and Repatriation Act; American Indian Religious Freedom Act; Archaeological Resource Protection Act; NEPA; EO 13007, Indian Sacred Sites; EO 13175, Consultation and Coordination with Indian Tribal Governments; Executive Memorandum dated November 5, 2009, Memorandum on Tribal Consultation; AFI 90-2002, Air Force Interactions with Federally Recognized Tribes; and AFI 32-7065, Cultural Resources Management Program.

Sample Native American Consultation Letter

Soil testing confirmed the Area of Potential Effects (APE) lands as disturbed/alterd. The proposed actions do not involve vertical construction and are limited to additional pavement construction consistent with the existing airfield. Therefore, AFRC projects that this project will have **No Effect** on historic sites, structures, or buildings. No additional work is recommended for the proposed project area APEs in regard to archaeological or historic resources.

The AFRC invites your tribe to consult on this proposed action within 15 days of receipt of this project notification, as well as on any NHPA Section 106 concerns with the proposed Westover ARB airfield improvement project. Please provide your response to Mr. John Moriarty, P.E., Installation Tribal Liaison Officer, 439th Airlift Wing, by email to john.moriarty.1@us.af.mil or by mail to 250 Patriot Avenue, Box 35, Westover ARB, MA. I look forward to receiving any input you may have regarding this endeavor.

Sincerely

A handwritten signature in black ink, appearing to read 'Gregory D. Buchanan', with a long, sweeping horizontal line extending to the right.

GREGORY D. BUCHANAN, Colonel, USAF

Attachment:

Section 106 Project Review for Proposed Airfield Improvements at Westover Air Reserve Base (ARB), Chicopee, Hampden County, Massachusetts

APPENDIX D:
AIR CONFORMITY APPLICABILITY MODEL REPORTS

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AIR CONFORMITY APPLICABILITY MODEL REPORT

RECORD OF CONFORMITY ANALYSIS (ROCA)

1. General Information: The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

a. Action Location:

Base: WESTOVER JARB

State: Massachusetts

County(s): Hampden

Regulatory Area(s): Springfield, MA; Springfield (Western MA), MA

b. Action Title: Construct airfield improvements at Westover Air Reserve Base (ARB)

c. Project Number/s (if applicable):

d. Projected Action Start Date: 6 / 2024

e. Action Description:

The United States (U.S.) Air Force Reserve Command (AFRC) proposes to construct airfield improvements at Westover ARB to better accommodate training capabilities and airfield operations in support of the 439th Airlift Wing and their C-5M aircraft.

f. Point of Contact:

Name: Caitlin Shaw

Title: Contractor

Organization: AECOM

2. Analysis: Total combined direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the "worst-case" and "steady state" (net gain/loss upon action fully implemented) emissions. General Conformity under the Clean Air Act, Section 1.76 has been evaluated for the action described above according to the requirements of 40 CFR 93, Subpart B.

Based on the analysis, the requirements of this rule are: ☐ applicable
☒ not applicable

Conformity Analysis Summary:

2024

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Springfield, MA			
VOC	0.094		
NOx	0.546		
CO	0.622	100	No
SOx	0.001		
PM 10	1.263		
PM 2.5	0.024		
Pb	0.000		
NH3	0.001		
CO2e	149.0		

AIR CONFORMITY APPLICABILITY MODEL REPORT

RECORD OF CONFORMITY ANALYSIS (ROCA)

Springfield (Western MA), MA			
VOC	0.094	50	No
NO_x	0.546	100	No
CO	0.622		
SO_x	0.001		
PM 10	1.263		
PM 2.5	0.024		
Pb	0.000		
NH₃	0.001		
CO_{2e}	149.0		

2025

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Springfield, MA			
VOC	0.000		
NOx	0.000		
CO	0.000	100	No
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		
Springfield (Western MA), MA			
VOC	0.000	50	No
NOx	0.000	100	No
CO	0.000		
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		

2026

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Springfield, MA			
VOC	0.858		
NOx	4.885		
CO	5.493	100	No
SOx	0.015		
PM 10	64.554		
PM 2.5	0.202		
Pb	0.000		
NH3	0.005		
CO2e	1505.8		
Springfield (Western MA), MA			
VOC	0.858	50	No
NOx	4.885	100	No
CO	5.493		
SOx	0.015		

AIR CONFORMITY APPLICABILITY MODEL REPORT RECORD OF CONFORMITY ANALYSIS (ROCA)

PM 10	64.554		
PM 2.5	0.202		
Pb	0.000		
NH3	0.005		
CO2e	1505.8		

2027 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Springfield, MA			
VOC	0.000		
NOx	0.000		
CO	0.000	100	No
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		
Springfield (Western MA), MA			
VOC	0.000	50	No
NOx	0.000	100	No
CO	0.000		
SOx	0.000		
PM 10	0.000		
PM 2.5	0.000		
Pb	0.000		
NH3	0.000		
CO2e	0.0		

None of estimated emissions associated with this action are above the conformity threshold values established at 40 CFR 93.153 (b); Therefore, the requirements of the General Conformity Rule are not applicable.

Caitlin Shaw

Caitlin Shaw, Contractor

7/14/2023
DATE

AIR CONFORMITY APPLICABILITY MODEL REPORT

RECORD OF CONFORMITY ANALYSIS (ROCA)

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location

County: Hampden

Regulatory Area(s): Springfield, MA; Springfield (Western MA), MA

- Activity Title: Paved Training Area

- Activity Description:

Emissions from paved training area construction activities.

- Activity Start Date

Start Month: 6

Start Month: 2024

- Activity End Date

Indefinite: False

End Month: 7

End Month: 2024

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.093993
SO _x	0.001494
NO _x	0.546418
CO	0.622098
PM 10	1.263291

Pollutant	Total Emissions (TONs)
PM 2.5	0.023801
Pb	0.000000
NH ₃	0.000633
CO ₂ e	149.0

2.1 Site Grading Phase

2.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date

Start Month: 6

Start Quarter: 1

Start Year: 2024

- Phase Duration

Number of Month: 2

Number of Days: 0

2.1.2 Site Grading Phase Assumptions

- General Site Grading Information

Area of Site to be Graded (ft²): 62290.8

Amount of Material to be Hauled On-Site (yd³): 0

Amount of Material to be Hauled Off-Site (yd³): 9438

- Site Grading Default Settings

Default Settings Used: Yes

AIR CONFORMITY APPLICABILITY MODEL REPORT

RECORD OF CONFORMITY ANALYSIS (ROCA)

Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Graders Composite	1	6
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	6
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust

Average Hauling Truck Capacity (yd³): 20 (default)

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH ₄	CO _{2e}
Emission Factors	0.0714	0.0014	0.3708	0.5706	0.0167	0.0167	0.0064	132.90
Other Construction Equipment Composite								
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH ₄	CO _{2e}
Emission Factors	0.0461	0.0012	0.2243	0.3477	0.0079	0.0079	0.0041	122.61
Rubber Tired Dozers Composite								
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH ₄	CO _{2e}
Emission Factors	0.1747	0.0024	1.1695	0.6834	0.0454	0.0454	0.0157	239.47
Tractors/Loaders/Backhoes Composite								
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH ₄	CO _{2e}
Emission Factors	0.0348	0.0007	0.1980	0.3589	0.0068	0.0068	0.0031	66.875

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	NH ₃	CO _{2e}
LDGV	000.275	000.002	000.208	003.078	000.009	000.008		000.023	00321.751
LDGT	000.344	000.003	000.367	004.228	000.011	000.010		000.024	00416.075
HDGV	000.689	000.005	001.063	015.719	000.026	000.023		000.045	00765.298
LDDV	000.125	000.003	000.133	002.438	000.004	000.004		000.008	00310.607
LDDT	000.269	000.004	000.383	004.203	000.007	000.007		000.008	00442.096
HDDV	000.419	000.013	004.563	001.553	000.164	000.151		000.027	01459.762
MC	002.220	000.003	000.794	012.935	000.028	000.025		000.054	00400.093

2.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

AIR CONFORMITY APPLICABILITY MODEL REPORT

RECORD OF CONFORMITY ANALYSIS (ROCA)

$$PM10_{FD} = (20 * ACRE * WD) / 2000$$

PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF_{POL}: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
HA_{OnSite}: Amount of Material to be Hauled On-Site (yd³)
HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³)
HC: Average Hauling Truck Capacity (yd³)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

$$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$$

V_{POL}: Vehicle Emissions (TONs)
VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$$VMT_{WT} = WD * WT * 1.25 * NE$$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

$$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$$

V_{POL}: Vehicle Emissions (TONs)
VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF_{POL}: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

AIR CONFORMITY APPLICABILITY MODEL REPORT RECORD OF CONFORMITY ANALYSIS (ROCA)

2.2 Paving Phase

2.2.1 Paving Phase Timeline Assumptions

- Phase Start Date

Start Month: 6
Start Quarter: 1
Start Year: 2024

- Phase Duration

Number of Month: 2
Number of Days: 0

2.2.2 Paving Phase Assumptions

- General Paving Information

Paving Area (ft²): 56628

- Paving Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Cement and Mortar Mixers Composite	4	6
Pavers Composite	1	7
Paving Equipment Composite	1	8
Rollers Composite	1	7
Tractors/Loaders/Backhoes Composite	1	7

- Vehicle Exhaust

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

2.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Graders Composite								
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH ₄	CO _{2e}
Emission Factors	0.0714	0.0014	0.3708	0.5706	0.0167	0.0167	0.0064	132.90
Other Construction Equipment Composite								
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH ₄	CO _{2e}
Emission Factors	0.0461	0.0012	0.2243	0.3477	0.0079	0.0079	0.0041	122.61

AIR CONFORMITY APPLICABILITY MODEL REPORT

RECORD OF CONFORMITY ANALYSIS (ROCA)

Rubber Tired Dozers Composite								
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH ₄	CO _{2e}
Emission Factors	0.1747	0.0024	1.1695	0.6834	0.0454	0.0454	0.0157	239.47
Tractors/Loaders/Backhoes Composite								
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH ₄	CO _{2e}
Emission Factors	0.0348	0.0007	0.1980	0.3589	0.0068	0.0068	0.0031	66.875

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	NH ₃	CO _{2e}
LDGV	000.275	000.002	000.208	003.078	000.009	000.008		000.023	00321.751
LDGT	000.344	000.003	000.367	004.228	000.011	000.010		000.024	00416.075
HDGV	000.689	000.005	001.063	015.719	000.026	000.023		000.045	00765.298
LDDV	000.125	000.003	000.133	002.438	000.004	000.004		000.008	00310.607
LDDT	000.269	000.004	000.383	004.203	000.007	000.007		000.008	00442.096
HDDV	000.419	000.013	004.563	001.553	000.164	000.151		000.027	01459.762
MC	002.220	000.003	000.794	012.935	000.028	000.025		000.054	00400.093

2.2.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)

NE: Number of Equipment

WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)

EF_{POL}: Emission Factor for Pollutant (lb/hour)

2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$$VMT_{VE} = PA * 0.25 * (1 / 27) * (1 / HC) * HT$$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

PA: Paving Area (ft²)

0.25: Thickness of Paving Area (ft)

(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd³ / 27 ft³)

HC: Average Hauling Truck Capacity (yd³)

(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)

HT: Average Hauling Truck Round Trip Commute (mile/trip)

$$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$$

V_{POL}: Vehicle Emissions (TONs)

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds

EF_{POL}: Emission Factor for Pollutant (grams/mile)

VM: Vehicle Exhaust On Road Vehicle Mixture (%)

2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$$VMT_{WT} = WD * WT * 1.25 * NE$$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)

WD: Number of Total Work Days (days)

AIR CONFORMITY APPLICABILITY MODEL REPORT

RECORD OF CONFORMITY ANALYSIS (ROCA)

WT: Average Worker Round Trip Commute (mile)

1.25: Conversion Factor Number of Construction Equipment to Number of Works

NE: Number of Construction Equipment

$$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$$

V_{POL} : Vehicle Emissions (TONs)

VMT_{VE} : Worker Trips Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds

EF_{POL} : Emission Factor for Pollutant (grams/mile)

VM: Worker Trips On Road Vehicle Mixture (%)

2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

$$VOC_P = (2.62 * PA) / 43560$$

VOC_P : Paving VOC Emissions (TONs)

2.62: Emission Factor (lb/acre)

PA: Paving Area (ft²)

43560: Conversion Factor square feet to acre (43560 ft² / acre)² / acre)

3. Construction / Demolition

3.1 General Information & Timeline Assumptions

- Activity Location

County: Hampden

Regulatory Area(s): Springfield, MA; Springfield (Western MA), MA

- Activity Title: Taxiway G Extension

- Activity Description:

Emissions from taxiway G extension construction activities.

- Activity Start Date

Start Month: 4

Start Month: 2026

- Activity End Date

Indefinite: False

End Month: 12

End Month: 2026

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.857904
SO _x	0.014979
NO _x	4.885311
CO	5.492938
PM 10	64.554135

Pollutant	Total Emissions (TONs)
PM 2.5	0.202412
Pb	0.000000
NH ₃	0.005190
CO _{2e}	1505.8

3.1 Site Grading Phase

AIR CONFORMITY APPLICABILITY MODEL REPORT RECORD OF CONFORMITY ANALYSIS (ROCA)

3.1.1 Site Grading Phase Timeline Assumptions

- Phase Start Date

Start Month: 4
Start Quarter: 1
Start Year: 2026

- Phase Duration

Number of Month: 9
Number of Days: 0

3.1.2 Site Grading Phase Assumptions

- General Site Grading Information

Area of Site to be Graded (ft²):	718740
Amount of Material to be Hauled On-Site (yd³):	0
Amount of Material to be Hauled Off-Site (yd³):	108900

- Site Grading Default Settings

Default Settings Used: Yes
Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	1	8
Graders Composite	1	8
Other Construction Equipment Composite	1	8
Rubber Tired Dozers Composite	1	8
Scrapers Composite	2	8
Tractors/Loaders/Backhoes Composite	3	8

- Vehicle Exhaust

Average Hauling Truck Capacity (yd³): 20 (default)
Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

3.1.3 Site Grading Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH ₄	CO ₂ e
Emission Factors	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								

AIR CONFORMITY APPLICABILITY MODEL REPORT

RECORD OF CONFORMITY ANALYSIS (ROCA)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH ₄	CO _{2e}
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH ₄	CO _{2e}
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH ₄	CO _{2e}
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH ₄	CO _{2e}
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH ₄	CO _{2e}
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	NH ₃	CO _{2e}
LDGV	000.275	000.002	000.208	003.078	000.009	000.008		000.023	00321.751
LDGT	000.344	000.003	000.367	004.228	000.011	000.010		000.024	00416.075
HDGV	000.689	000.005	001.063	015.719	000.026	000.023		000.045	00765.298
LDDV	000.125	000.003	000.133	002.438	000.004	000.004		000.008	00310.607
LDDT	000.269	000.004	000.383	004.203	000.007	000.007		000.008	00442.096
HDDV	000.419	000.013	004.563	001.553	000.164	000.151		000.027	01459.762
MC	002.220	000.003	000.794	012.935	000.028	000.025		000.054	00400.093

3.1.4 Site Grading Phase Formula(s)

- Fugitive Dust Emissions per Phase

$$PM10_{FD} = (20 * ACRE * WD) / 2000$$

PM10_{FD}: Fugitive Dust PM 10 Emissions (TONs)

20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)

ACRE: Total acres (acres)

WD: Number of Total Work Days (days)

2000: Conversion Factor pounds to tons

- Construction Exhaust Emissions per Phase

$$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$$

CEE_{POL}: Construction Exhaust Emissions (TONs)

NE: Number of Equipment

WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)

EF_{POL}: Emission Factor for Pollutant (lb/hour)

2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$$VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

HA_{OnSite}: Amount of Material to be Hauled On-Site (yd³)

HA_{OffSite}: Amount of Material to be Hauled Off-Site (yd³)

HC: Average Hauling Truck Capacity (yd³)

(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)

AIR CONFORMITY APPLICABILITY MODEL REPORT

RECORD OF CONFORMITY ANALYSIS (ROCA)

HT: Average Hauling Truck Round Trip Commute (mile/trip)

$$V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$$

V_{POL} : Vehicle Emissions (TONs)

VMT_{VE} : Vehicle Exhaust Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds

EF_{POL} : Emission Factor for Pollutant (grams/mile)

VM: Vehicle Exhaust On Road Vehicle Mixture (%)

2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$$VMT_{WT} = WD * WT * 1.25 * NE$$

VMT_{WT} : Worker Trips Vehicle Miles Travel (miles)

WD: Number of Total Work Days (days)

WT: Average Worker Round Trip Commute (mile)

1.25: Conversion Factor Number of Construction Equipment to Number of Works

NE: Number of Construction Equipment

$$V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$$

V_{POL} : Vehicle Emissions (TONs)

VMT_{WT} : Worker Trips Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds

EF_{POL} : Emission Factor for Pollutant (grams/mile)

VM: Worker Trips On Road Vehicle Mixture (%)

2000: Conversion Factor pounds to tons

3.2 Paving Phase

3.2.1 Paving Phase Timeline Assumptions

- Phase Start Date

Start Month: 4

Start Quarter: 1

Start Year: 2026

- Phase Duration

Number of Month: 9

Number of Days: 0

3.2.2 Paving Phase Assumptions

- General Paving Information

Paving Area (ft²): 653400

- Paving Default Settings

Default Settings Used: Yes

Average Day(s) worked per week: 5 (default)

- Construction Exhaust (default)

Equipment Name	Number Of Equipment	Hours Per Day
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AIR CONFORMITY APPLICABILITY MODEL REPORT

RECORD OF CONFORMITY ANALYSIS (ROCA)

Pavers Composite	1	8
Paving Equipment Composite	2	8
Rollers Composite	2	6

- Vehicle Exhaust

Average Hauling Truck Round Trip Commute (mile): 20 (default)

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 20 (default)

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

3.2.3 Paving Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour) (default)

Excavators Composite								
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH ₄	CO _{2e}
Emission Factors	0.0559	0.0013	0.2269	0.5086	0.0086	0.0086	0.0050	119.70
Graders Composite								
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH ₄	CO _{2e}
Emission Factors	0.0676	0.0014	0.3314	0.5695	0.0147	0.0147	0.0061	132.89
Other Construction Equipment Composite								
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH ₄	CO _{2e}
Emission Factors	0.0442	0.0012	0.2021	0.3473	0.0068	0.0068	0.0039	122.60
Rubber Tired Dozers Composite								
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH ₄	CO _{2e}
Emission Factors	0.1671	0.0024	1.0824	0.6620	0.0418	0.0418	0.0150	239.45
Scrapers Composite								
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH ₄	CO _{2e}
Emission Factors	0.1495	0.0026	0.8387	0.7186	0.0334	0.0334	0.0134	262.81
Tractors/Loaders/Backhoes Composite								
	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	CH ₄	CO _{2e}
Emission Factors	0.0335	0.0007	0.1857	0.3586	0.0058	0.0058	0.0030	66.872

- Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO _x	NO _x	CO	PM 10	PM 2.5	Pb	NH ₃	CO _{2e}
LDGV	000.275	000.002	000.208	003.078	000.009	000.008		000.023	00321.751
LDGT	000.344	000.003	000.367	004.228	000.011	000.010		000.024	00416.075
HDGV	000.689	000.005	001.063	015.719	000.026	000.023		000.045	00765.298
LDDV	000.125	000.003	000.133	002.438	000.004	000.004		000.008	00310.607
LDDT	000.269	000.004	000.383	004.203	000.007	000.007		000.008	00442.096
HDDV	000.419	000.013	004.563	001.553	000.164	000.151		000.027	01459.762
MC	002.220	000.003	000.794	012.935	000.028	000.025		000.054	00400.093

3.2.4 Paving Phase Formula(s)

- Construction Exhaust Emissions per Phase

$$CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$$

AIR CONFORMITY APPLICABILITY MODEL REPORT

RECORD OF CONFORMITY ANALYSIS (ROCA)

CEE_{POL}: Construction Exhaust Emissions (TONs)

NE: Number of Equipment

WD: Number of Total Work Days (days)

H: Hours Worked per Day (hours)

EF_{POL}: Emission Factor for Pollutant (lb/hour)

2000: Conversion Factor pounds to tons

- Vehicle Exhaust Emissions per Phase

$$\text{VMT}_{\text{VE}} = \text{PA} * 0.25 * (1 / 27) * (1 / \text{HC}) * \text{HT}$$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

PA: Paving Area (ft²)

0.25: Thickness of Paving Area (ft)

(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd³ / 27 ft³)

HC: Average Hauling Truck Capacity (yd³)

(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd³)

HT: Average Hauling Truck Round Trip Commute (mile/trip)

$$\text{V}_{\text{POL}} = (\text{VMT}_{\text{VE}} * 0.002205 * \text{EF}_{\text{POL}} * \text{VM}) / 2000$$

V_{POL}: Vehicle Emissions (TONs)

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds

EF_{POL}: Emission Factor for Pollutant (grams/mile)

VM: Vehicle Exhaust On Road Vehicle Mixture (%)

2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase

$$\text{VMT}_{\text{WT}} = \text{WD} * \text{WT} * 1.25 * \text{NE}$$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)

WD: Number of Total Work Days (days)

WT: Average Worker Round Trip Commute (mile)

1.25: Conversion Factor Number of Construction Equipment to Number of Works

NE: Number of Construction Equipment

$$\text{V}_{\text{POL}} = (\text{VMT}_{\text{WT}} * 0.002205 * \text{EF}_{\text{POL}} * \text{VM}) / 2000$$

V_{POL}: Vehicle Emissions (TONs)

VMT_{VE}: Worker Trips Vehicle Miles Travel (miles)

0.002205: Conversion Factor grams to pounds

EF_{POL}: Emission Factor for Pollutant (grams/mile)

VM: Worker Trips On Road Vehicle Mixture (%)

2000: Conversion Factor pounds to tons

- Off-Gassing Emissions per Phase

$$\text{VOC}_P = (2.62 * \text{PA}) / 43560$$

VOC_P: Paving VOC Emissions (TONs)

2.62: Emission Factor (lb/acre)

PA: Paving Area (ft²)

43560: Conversion Factor square feet to acre (43560 ft² / acre)² / acre)