Draft-Final

ENVIRONMENTAL ASSESSMENT
FIRE STRUCTURAL/RESCUE STATION WEST RAMP
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

88th CIVIL ENGINEER GROUP

October 2016

445th AIRLIFT WING

88TH AIR BASE WING

FOR PUBLIC REVIEW

Draft Final
Environmental Assessment
Fire Structural / Rescue Station West Ramp
Wright-Patterson Air Force Base, Ohio

Contract No. FA8601-11-D-0002
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Submitted to:

Wright-Patterson Air Force Base
88th Civil Engineer Group
Installation Management Division

October 2016

Draft Final

FINDING OF NO SIGNIFICANT IMPACT
FIRE STRUCTURAL / RESCUE STATION WEST RAMP
WRIGHT-PATTERSON AIR FORCE BASE, OHIO
October 2016

Pursuant to the Council on Environmental Quality regulations for implementing the procedural provisions of the National Environmental Policy Act (NEPA), 40 Code of Federal Regulations (CFR) 1500 - 1508, Department of Defense Directive (DoDD) 6050.1 and Air Force regulation 32 CFR Part 989, the 88th Civil Engineer Group (88 CEG) Installation Management Division prepared an Environmental Assessment (EA) to construct a Fire Structural / Rescue Station (FS/RS) on the West Ramp at Wright-Patterson Air Force Base (WPAFB, the Base), Ohio. This EA is incorporated by reference into this finding per 40 CFR 1508.13.

Purpose and Need

The purpose of the Proposed Action is to construct a new FS/RS on the West Ramp at WPAFB. A new FS/RS is urgently needed to reduce firefighting response times to the south end of the primary runway (Runway 05Left-23Right [05L-23R]) in Area A at WPAFB, and to correct deficiencies in the existing Fire Station 2 presently located in Facility 34012 (F/34012). Fire Station 2 supports over 121,000 aircraft operations annually. The purpose of locating the new fire station on the West Ramp would be to correct deficiencies in the current station and would improve crash response time for potential incidents on the south end of Runway 05L-23R.

Description of Proposed Action, Alternative A

The 88 CEG is proposing to construct a 13,524 sf FS/RS facility on the West Ramp in Area A at WPAFB. The new facility would be constructed at the site of existing F/34020, which would be partially demolished, preserving the existing concrete slab. Facility 34020 is currently unoccupied and vacant.

Consisting of 23,175 sf, F/34020 was constructed in 1961 and was utilized as a Nose Dock Hangar for the maintenance of KC-135 aircraft. The hangar doors are in bad condition, the door tracks are in disrepair, the floor height is lower than the exterior asphalt, the heating system is in failing condition, and the restrooms do not meet current standards. The current condition of F/34020 makes it a prime candidate for demolition. Approximately 18,169 sf of F/34020 would be demolished prior to construction of the FS/RS facility. Portions of the interior and exterior building components and materials would be demolished and removed from the site. The new FS/RS facility would be constructed on the existing concrete floor slab.

The FS/RS facility would consist of a noncombustible, one-story structure with two high-bay, drive-through apparatus stalls; separate men's and women's restrooms with lockers and showers; separate men's and women's sleeping rooms; a separate captain's sleeping room and restroom; and a day room with a kitchen. The facility would be constructed according to UFC 4-730-10, *Fire Stations*. The existing fire station, F/34012, would be vacated once construction of the new FS/RS is complete. In addition to the new building construction, approximately 26 parking spaces would be required. Existing parking lots in the area of F/34020 may be an option to new parking lot construction.

Alternative B

Alternative B involves adaptive re-use of F/34020 as an alternative to demolition. Facility 34020 would be renovated, modernized, and converted into the new FS/RS facility. The footprint of the Nose Dock Hangar would remain but the existing roll-off doors would be replaced with hangar doors so Aircraft Rescue and Firefighting (ARFF) vehicles could maneuver with ease. Interior renovation of F/34020 would be retrofitted according to UFC 4-730-10, *Fire Stations*.

No Action, Alternative C

Under the No Action Alternative, a new FS/RS facility would not be constructed. The 88 CEG Fire Department would not be able to respond to critical emergencies from F/34012 within the required response times. The response times from the present location would continue to be excessive (greater than 1-minute to the south end of the primary runway), particularly to critical, high-value facilities or aircraft where a few seconds of response time could mean the difference in preventing injuries and major loses.

Alternatives Considered but Eliminated from Further Study

As part of the NEPA process, potential alternatives to the Proposed Action must be evaluated. To be considered reasonable and warrant further detailed analysis, alternatives must be affordable, implementable, and meet the purpose and need for the Proposed Action. One alternative considered involved constructing the FS/RS facility adjacent and east of Bass Lake on the West Ramp. Construction of the FS/RS facility at this location would involve ground disturbance and this location is within a known floodplain. For these reasons, this site was eliminated from further analysis.

A second alternative involved constructing the new FS/RS facility at the location of F/34035, which is adjacent and southwest of the existing Fire Station 2 at F/34012. However, this site would not meet the 1-minute response requirement for responding to critical flight line emergencies nor would this site allow convenient ingress or egress for firefighting vehicles onto the flight line. Therefore, this alternative was eliminated from further analysis.

Identification of Preferred Alternative

The Air Force has identified the Proposed Action (Alternative A) as the preferred alternative. The Proposed Action involves constructing a FS/RS on the West Ramp at F/34020.

Environmental Consequences

Land Use (EA Section 4.1): No short- or long-term impacts to land use would occur from the Proposed Action (Alternative A) or Alternative B because no changes to land use would occur at WPAFB. The No Action (Alternative C) would have no impact on land use.

Air Quality (EA Section 4.2): Implementation of the Proposed Action (Alternative A) would result in minor short-term adverse impact from particulate matter and engine exhaust emissions generated during construction and demolition activities. Impacts would be minor because emissions would be short in duration and are negligible with respect to overall emissions expected for the region. No long-term impact would result from the Proposed Action (Alternative A). No short- or long-term impact to air quality would result from adaptive re-use of F/34020 under Alternative B because only interior renovation of this facility would occur. The No Action (Alternative C) would have no impact on air quality.

Noise (EA Section 4.3): The Proposed Action (Alternative A) or Alternative B would have minor short-term impacts on ambient noise generated from construction and demolition. Impacts would be minor because these activities would be carried out during normal working hours, would be short in duration, with construction/demolition/renovation occurring at different stages. In addition, since personnel would be sleeping in the FS/RS, existing noise levels in the area of the proposed FS/RS could be reduced through incorporation of noise attenuation into the design and construction, such as acoustical architectural design (i.e., room arrangement, solid walls, elimination of windows) and acoustical construction (i.e., sound insulation/acoustical blankets, cavity partitions, reduce window size and/or increase glass thickness). Therefore, no long-term impacts would be expected as a result of the Proposed Action. The No Action (Alternative C) would have no impact on noise.

Geology and Soils (EA Section 4.4): The Proposed Action (Alternative A) would have short-term minor impact to soils during construction and demolition because the existing concrete slab foundation of F/34020 would be utilized during new construction; therefore, minimal ground disturbance would result. Impacts would be minimized by implementing Best Management Practices (BMPs) for erosion and sedimentation controls

during construction activities. The Proposed Action (Alternative A) would have no long-term impact on soil resources. Alternative B would have no short- or long-term impact on soil resources because no ground disturbance would result from adaptive re-use of F/34020. The No Action (Alternative C) would have no impact on soil resources.

Water Resources (EA Section 4.5): The Proposed Action (Alternative A) or Alternatives B and C would have no short- or long-term impacts to groundwater or floodplains. The Proposed Action (Alternative A) would result in negligible short-term impact to surface water because no ground disturbance would be expected as a result of reutilizing the existing concrete foundation slab of F/34020 and BMPs for erosion and sedimentation controls would be implemented. The Proposed Action (Alternative A) would have no long-term impact on surface water. Alternative B would have no short- or long-term impact to surface water because adaptive re-use of F/34020 would only involve interior renovation. No Action (Alternative C) would have no long-term impact on surface water. The Miami Conservancy District (MCD) was consulted regarding the Proposed Action and Alternatives. The MCD responded indicating that as the project is located within the Huffman Retarding Basin, it is subject to restrictions set forth by the MCD in Greene County Deed Book 129, Page 146 on December 16, 1922 and based on their review, it appears the proposed project will not adversely affect the retarding basin.

Biological Resources (EA Section 4.6): The Proposed Action (Alternative A) would have no short- or long-term impact on vegetation, wildlife, threatened/endangered species, or wetlands as the proposed project site is located within the footprint of an existing F/34020 and any construction activities would take place on previously-disturbed areas with no naturally-occurring vegetation. In addition, no impact would result from the Proposed Action (Alternative A) because the FS/RS facility would be constructed on an existing concrete foundation slab; the project site is not located in an area that provides suitable wildlife or threatened or endangered species habitat; the current land use would not change; proposed construction activities are not in close enough proximity to any threatened or endangered species to generate noise-related impacts; and no wetlands exist on the proposed project site or in the immediate vicinity of F/34020. Alternative B would have no short- or long-term impact on vegetation, wildlife, threatened/endangered species, or wetlands because adaptive re-use of F/34020 would only involve interior renovation. The No Action (Alternative C) would have no short- or long-term impact on vegetation, wildlife, threatened/endangered species, or wetlands.

The U.S. Fish and Wildlife Service (USFWS) and Ohio Department of Natural Resources (ODNR) were consulted regarding the Proposed Action and Alternatives. The USFWS responded indicating that due to the project, type, size, and location, they do not anticipate adverse effects to federally endangered, threatened, proposed, or candidate species. The ODNR responded indicating that because there would be no in-water work conducted as part of the project, and as long as no potential habitat would be impacted as a result of the project, threatened or endangered species would not be impacted by the Proposed Action.

Cultural Resources (EA Section 4.7): The Proposed Action (Alternative A) would result in an adverse impact because F/34020 is a National Register of Historic Places (NRHP)-eligible building. Facility 34020 was addressed in a previous 2014 EA titled, Demolish Multiple Buildings – Phase II. In accordance with the Programmatic Agreement Between Wright-Patterson Air Force Base and the Ohio State Historic Preservation Officer Regarding FY 16-20 Demolitions for Physical Plant Reduction at the Wright-Patterson Air Force Base, Ohio, a mitigation plan would be required by the State Historic Preservation Office prior to demolition of F/34020. No new ground disturbance would result from utilizing the existing concrete foundation slab at F/34020. Facility 34012 is not considered a NRHP-eligible building. Alternative B would result in positive and beneficial short- and long-term impact because F/34020 would be renovated and modernized to meet current design standards providing acceptable use by the 88 CEG Fire Department. The No Action (Alternative C) would have no short- or long-term impact to cultural resources.

Infrastructure (EA Section 4.8): The Proposed Action (Alternative A) or Alternative B would result in a short-term temporary increase in use of roadways in and around the construction and/or demolition sites that would cease upon project completion. The No Action (Alternative C) would have no adverse impacts to infrastructure as current infrastructure would remain unchanged.

Health and Safety (EA Section 4.9): The Proposed Action (Alternative A) or Alternative B would have potential minor short-term impacts to workers during construction and demolition activities. Impacts would be minimized by adherence to health and safety regulations and standards. The Proposed Action (Alternative A) and Alternative B would have beneficial long-term impact to personnel in aircraft-related crashes because required response times would be met. The No Action (Alternative C) would result in major adverse short- and long-term impact to the safety of personnel in aircraft-related crashes due to current response time from the existing fire station to the south end of Runway 05L-23R. The response time would remain greater than 1-minute for the 88 CEG Fire Department to respond to ARFF on the south end.

Hazardous Materials/Waste and Environmental Restoration Program (EA Section 4.10): The Proposed Action (Alternative A) or Alternative B would have no short- or long-term impact as hazardous materials/waste used in existing 88 CEG Fire Department operations would not be expected to increase over existing conditions. The Proposed Action (Alternative A) would have no short-term impact on the Environmental Restoration Program (ERP). Although F/34020 is associated with an ERP site, underground storage tank 4020 (UST4020) was removed and chemical concentrations were below limits set by the Bureau of Underground Storage Tank Regulations (BUSTR). In addition, BUSTR issued a no further action (NFA) letter dated March 14, 2014 for the closure of UST4020. No ground disturbance would occur as a result of utilizing the existing concrete foundation slab at F/34020 and no additional ERP sites exist in the immediate vicinity of F/34020. The Proposed Action (Alternative A) would have no long-term impact to ERP sites. Alternative B or the No Action (Alternative C) would have no short- or long-term impact to ERP sites.

Agency Consultation

In accordance with NEPA, 42 U.S.C. §4321 et seq. (1969), informal consultation was solicited with applicable agencies to seek input on the likelihood of environmental or other impacts resulting from the development of the Proposed Action. A summary of the outcome of consultation efforts with pertinent agencies is included as Appendix A of the EA.

Public Notice

A public notice was posted in the *Dayton Daily News* and the *Fairborn Daily Herald* on October 25, 2016. The 30-day comment period was held from October 25, 2016 until November 23, 2016. Comments received during the public comment period will be included in Appendix A of the EA.

Finding of No Significant Impact (FONSI)

The Proposed Action involves constructing a 13,524 sf FS/RS facility on the West Ramp at the site of existing F/34020, which would be partially demolished, preserving the existing concrete slab. The new FS/RS facility would be constructed on the existing concrete floor slab. Based upon my review of the facts and analysis contained in the EA, which is hereby incorporated by reference, I conclude that the Proposed Action (Alternative A) or Alternative B would not have a significant impact on the natural or human environment. An environmental impact statement is not required for this action. This analysis fulfills the requirements of NEPA, the President's Council on Environmental Quality, and 32 CFR 989.

_____ Date: _____

DAVID A. PERKINS
Director, 88th Civil Engineer Group

COVER SHEET

ENVIRONMENTAL ASSESSMENT TO CONSTRUCT A FIRE STRUCTURAL / RESCUE STATION ON THE WEST RAMP AT WRIGHT-PATTERSON AIR FORCE BASE, OHIO

Responsible Agencies: U.S. Air Force (USAF); Wright-Patterson Air Force Base (WPAFB), Ohio

Affected Location: WPAFB, Ohio

Proposed Action: Construct Fire Structural / Rescue Station on West Ramp

Report Designation: Environmental Assessment

Written comments and inquiries regarding this document should be directed to Mr. John Banford, EIAP Program Manager, 88 CEG/CEIEA, 1450 Littrell Road, WPAFB, Ohio, 45433-5209, (937) 257-6482, John.Banford@us.af.mil.

Abstract: The 88th Civil Engineer Group (88 CEG) proposed to construct, operate, and maintain a new fire structural / rescue station (FS/RS) facility on the West Ramp at Wright-Patterson Air Force Base (WPAFB). The new FS/RS facility would be constructed in accordance with current standards specified in Unified Facilities Criteria (UFC) 4-730-10, *Fire Stations*. A new FS/RS is urgently needed to reduce firefighting response times to the south end of the primary runway (Runway 05Left-23Right [05L-23R]) in Area A at WPAFB, and to correct deficiencies in the existing fire station. The location of the new fire station would correct deficiencies in the current station and would improve crash response time for potential incidents on the south end of Runway 05L-23R.

The proposed FS/RS facility would be 13,524 square feet (sf) sited on the West Ramp and would be constructed at the location of existing Facility 34020 (F/34020), approximately 1,500 feet (ft) southwest of the existing fire station. The project would involve the demolition of F/34020 and re-use of the existing concrete foundation slab as the new FS/RS facility foundation. The type of fire station constructed would be a combination structural/Aircraft Rescue and Firefighting (ARFF); a structural fire station provides fire protection to facilities and an ARFF station provides fire protection to flight lines and aircraft. The selected location of the new FS/RS facility would resolve response time issues and create access from the new FS/RS drive-through apparatus bays directly to the flight-line. In addition, the new FS/RS facility would correct multiple deficiencies and include private sleeping quarters for each fire fighter, dining area, training room, and drive-through apparatus bays. The existing fire station located at F/34012 would be vacated upon completion of the new FS/RS

This environmental assessment (EA) evaluates the Proposed Action (Alternative A), an alternative to the Proposed Action (Alternative B), and the No Action (Alternative C). Resources considered in the impact analysis are land use, air quality, noise, geological resources, water resources, biological resources, cultural resources, socioeconomics, infrastructure, health and safety, and hazardous materials and wastes/Environmental Restoration Program sites. Analyses in this document identify minor short-term adverse impacts on air quality and noise resulting from construction activities. The EA was made available to the public on October 25, 2016, for a 30-day review period.

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05L-23R	05Left-23Right
ABW	Air Base Wing
ACAM	Air Conformity Applicability Model
ACM	Asbestos-containing Material
AFB	Air Force Base
AF	Air Force
AFFF	Aqueous Film-Forming Foam
AFI	Air Force Instruction
AFMAN	Air Force Manual
AFOSH	Air Force Occupational and Environmental Safety, Fire Protection, and Health
AFPD	Air Force Policy Directive
AGL	Above Ground Level
AICUZ	Air Installation Compatible Use Zone
APE	Area of Potential Effect
APZ	Accident Potential Zone
AQCR	Air Quality Control Region
ARFF	Aircraft Rescue and Firefighting
AST	Aboveground Storage Tank
AW	Airlift Wing
BASH	Bird/Wildlife Aircraft Strike Hazard
BHE	BHE Environmental, Inc.
BLS	Bureau of Labor Statistics
BMP	Best Management Practice
BUSTR	Bureau of Underground Storage Tank Regulations
CAA	Clean Air Act
CDA	Chemical Disposal Area
CEG	Civil Engineer Group
CEIE	Installation Management Division Environmental Branch
CEIEC	Compliance Section of the Environmental Branch in the Installation Management Division,
CEIEA	Environmental Assets Section of the Environmental Branch in the Installation Management Division,
CENPL	Customer Plans and Programs Section of the Portfolio Optimization Branch in the Engineering Division
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO_2e	Carbon Dioxide Equivalents
CWA	Clean Water Act
CZ	Clear Zone
db	Decibel
dBA	A-weighted Sound Level Measurement
DLSME	Defense Land Systems and Miscellaneous Equipment
DNL	Day-night Average A-weighted Sound Level
DoD	Department of Defense
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIFS	Economic Impact Forecast System
EIS	Environmental Impact Statement
EO	Executive Order
ERP	Environmental Restoration Program
ESA	Endangered Species Act
ESQD	Explosive Safety Quantity Distance
ESZ	Explosive Safety Zone
°F	Degrees Fahrenheit
F&ES	Fire and Emergency Services
F/34020	Facility or Building
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FME	Foreign Materiel Exploitation
FONPA	Finding of No Practical Alternative
FONSI	Finding of No Significant Impact
FS/RS	Fire Structural / Rescue Station
FT	Feet
FY	Fiscal Year
GHG	Greenhouse Gas
gpm	Gallons Per Minute
GWOU	Groundwater Operable Unit
GWP	Global Warming Potential
HC/D	Hazard Class/Division
HMMP	Hazardous Material Management Program
HUD	U.S. Department of Housing and Urban Development
I-675	Interstate 675
ICRMP	Integrated Cultural Resources Management Plan
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
JP-8	Jet Propellant Fuel-8
km	Kilometer
LBP	Lead-based Paint
$\mu g/m^3$	Micrograms Per Cubic Meter
MA	Metropolitan Area
MACT	Maximum Achievable Control Technology
MCD	Miami Conservancy District

MCL	Maximum Contaminant Level
mg/m^3	Milligrams Per Cubic Meter
MOA	Memorandum of Agreement
MSL	Mean Sea Level
MSW	Mixed-Solid Waste
NAA	Nonattainment Area
NAAQS	National Ambient Air Quality Standards
NAVD	North American Vertical Datum
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFA	No Further Action
NHPA	National Historic Preservation Act
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NO_x	Nitrogen Oxides
NO_2	Nitrogen Dioxide
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NSPS	New Source Performance Standard
NSR	New Source Review
O_3	Ozone
OAC	Ohio Administrative Code
ODH	Ohio Department of Health
ODJFS	Ohio Department of Job and Family Services
ODNR	Ohio Department of Natural Resources
OEPA	Ohio Environmental Protection Agency
OHI	Ohio Historic Inventory
ORC	Ohio Revised Code
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
OWD	Office of Workforce Development
Pb	Lead
PBR	Permit-by-rule
PCB	Polychlorinated Biphenyl
$PM_{2.5}$	Particulate Matter with an Aerodynamic Particle Size Less Than 2.5 Micrometers
PM_{10}	Particulate Matter with an Aerodynamic Particle Size Less Than 10 Micrometers
ppb	Parts Per Billion
ppm	Parts Per Million
PSD	Prevention of Significant Deterioration
PTI	Permit-to-install
RAPCA	Regional Air Pollution Control Agency
RICE	Reciprocating Internal Combustion Engine
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SEL	Sound Exposure Level
sf	Square Feet
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SPC	Spill Prevention Coordinator
SPCC	Spill Prevention Control and Countermeasures
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
TMDL	Total Maximum Daily Load
TPH	Total Petroleum Hydrocarbons
tpy	Tons Per Year
TSCA	Toxic Substances Control Act
UEC	Unit Environmental Coordinator
UFC	Unified Facilities Criteria
U.S.	United States
USAF	United States Air Force
USC	U.S. Code
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish & Wildlife Service
USGS	U.S. Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WPAFB	Wright-Patterson Air Force Base

1.0 PURPOSE AND NEED FOR ACTION

This section provides a description of the Proposed Action, a statement of the purpose and need for the Proposed Action, an overview of the organization of the Environmental Assessment (EA), and a summary of the key environmental compliance requirements.

1.1 Purpose and Need

The purpose of the Proposed Action is to construct a new Fire Structural / Rescue Station (FS/RS) at Wright-Patterson Air Force Base (WPAFB) in accordance with current standards, as specified in Unified Facilities Criteria (UFC) 4-730-10, Fire Stations (Department of Defense [DoD] 2006a). A new FS/RS is urgently needed to reduce firefighting response times to the south end of the primary runway (Runway 05Left-23Right [05L-23R]) in Area A at WPAFB, and to correct deficiencies in the existing Fire Station 2 presently located in Facility 34012 (F/34012). Fire Station 2 supports over 121,000 aircraft operations annually. The location of the new fire station would correct deficiencies in the current station and would improve crash response time for potential incidents on the south end of Runway 05L-23R.

1.2 Project Description

The project consists of the design and construction of a 13,524 square foot (sf) FS/RS to be sited on the West Ramp (Air Force [AF] 2015). The new facility would be constructed at the location of existing F/34020, approximately 1,500 feet (ft) southwest of the existing Fire Station 2 at F/34012. The project would involve the demolition of F/34020 and re-use of the existing concrete foundation slab as the new FS/RS facility foundation. The type of fire station constructed would be a combination structural/Aircraft Rescue and Firefighting (ARFF) station; a structural fire station provides fire protection to facilities and an ARFF station provides fire protection to flight lines and aircraft (DoD 2006a). The selected location of the new FS/RS would resolve response time issues and create access from the new FS/RS drive-through apparatus bays directly to the flight-line. In addition, the new FS/RS would correct multiple deficiencies and include private sleeping quarters for each fire fighter, dining area, training room, and drive-through apparatus bays. Additionally, space would be allocated for the 445th Airlift Wing (AW) Fire Department equipment and supply storage. The existing fire station located in F/34012 would be vacated upon completion of the new FS/RS. There are no known plans for relocating missions at F/34012 at this time.

Trial runs from the proposed location of the new FS/RS proved to resolve long response times currently being experienced by the 88th Civil Engineer Group (88 CEG) Fire Department during fire crash and rescue missions. As a result of constructing a new FS/RS, other deficiencies would be resolved such as providing the required training and classroom areas, a medical storage area, increased areas for large ARFF vehicles, and improving a multitude of quality of life deficiencies. The new FS/RS would include square footage needed to accommodate fire department design requirements and comply with required response times.

The Base is located in the southwest portion of the state of Ohio in Greene and Montgomery counties, approximately 10 miles east of the city of Dayton. The Base encompasses 8,145 acres and is classified as non-industrial with mixed development. The Base is subdivided into two areas: Areas A and B. Area A consists primarily of administrative offices and contains an active airfield. Area B is located across State Route 444 to the southwest of Area A and consists primarily of research and development as well as educational functions. **Figure 1-1** presents Areas A and B at WPAFB and the surrounding area.

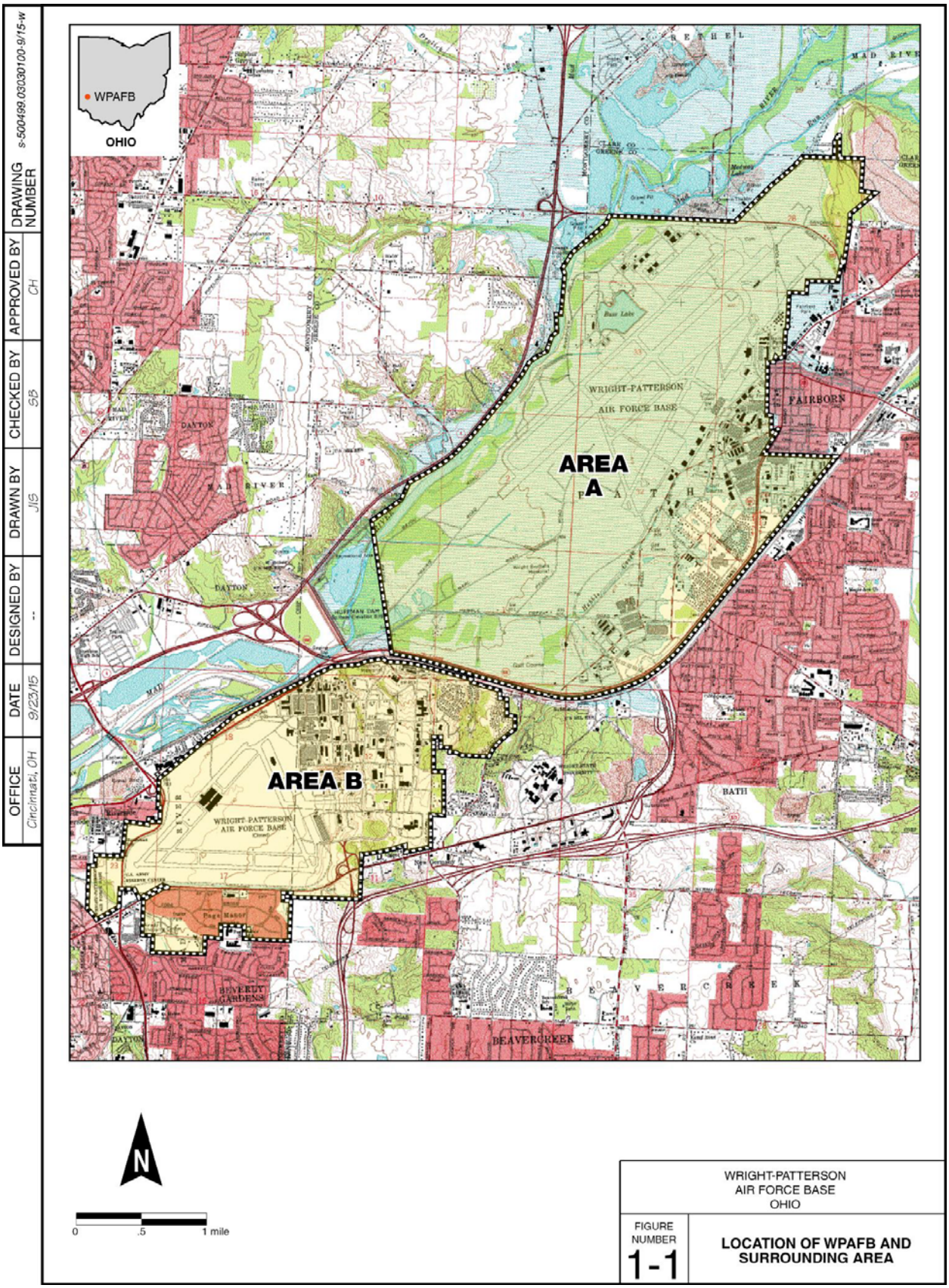
This EA presents the AF proposal to construct a 13,524 sf FS/RS on Mustang Drive along the West Ramp at WPAFB. The proposed project site is presented on **Figure 1-2**. The No Action is also analyzed. If the analysis presented in the EA indicate that implementation of the Proposed Action would not result in significant environmental impacts, a Finding of No Significant Impact (FONSI) would be prepared. A FONSI briefly presents reasons why a Proposed Action would not have a significant effect on the human environment and why an environmental impact statement (EIS) is unnecessary. If significant environmental issues would result that cannot be mitigated to insignificance, an EIS would be required, or the Proposed Action would be abandoned and no action would be taken.

The AF has prepared this EA in accordance with the National Environmental Policy Act (NEPA) of 1969; 40 Code of Federal Regulations (CFR), Parts 1500-1508, the Council on Environmental Quality (CEQ) regulations implementing NEPA; and the AF Environmental Impact Analysis Process (EIAP) [32 CFR Part 989].

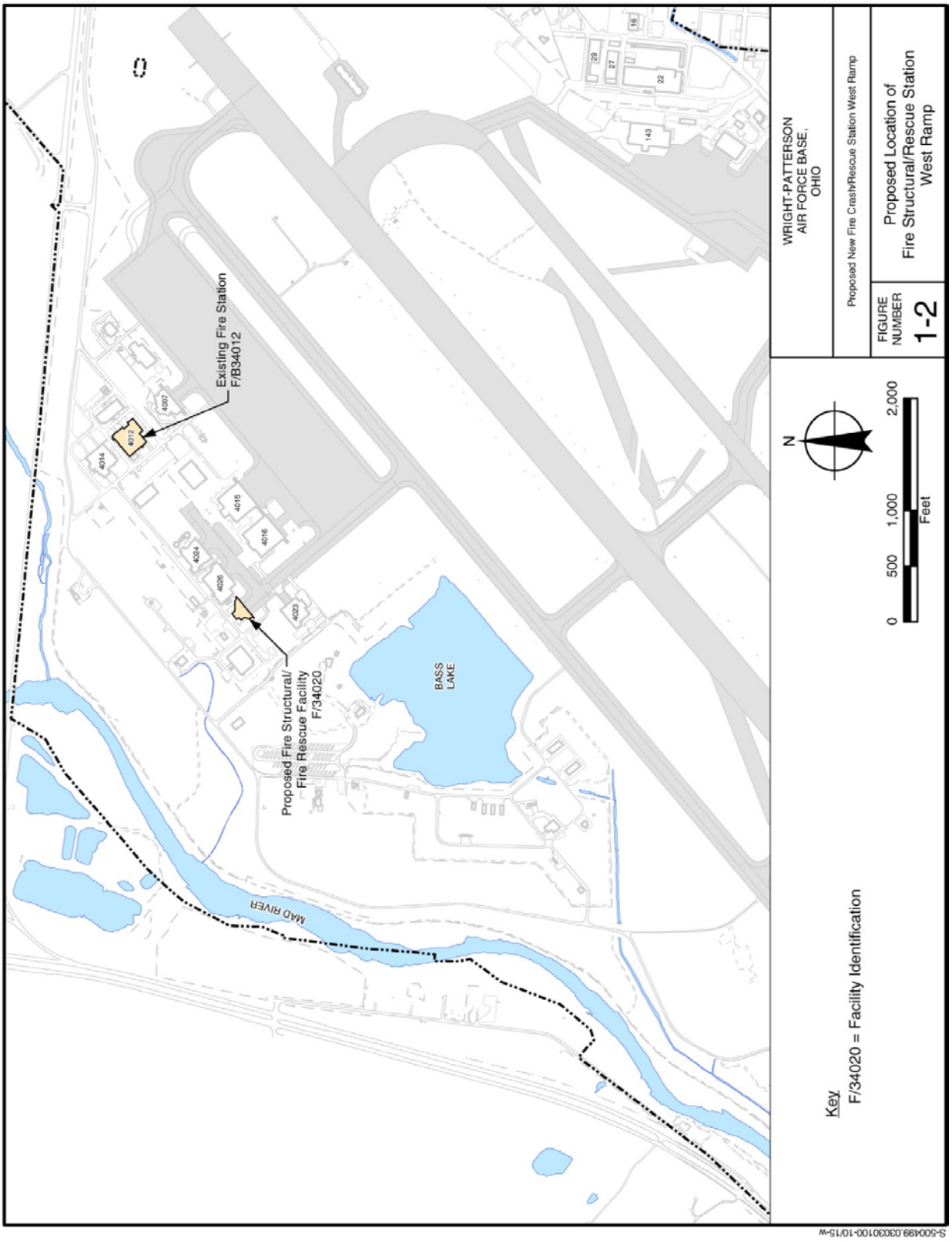
1.3 Scope of Environmental Analysis

Consistent with the CEQ regulations, the EA will be organized into the following sections:

- Section 1, Purpose and Need for Action, includes a background description, purpose and need statement, EA organization and scope of environmental analysis, and regulatory framework;
- Section 2, Description of Proposed Action and alternatives, includes a process for alternatives development, alternatives considered but eliminated, and a comparison of impacts;
- Section 3, Affected Environment, includes a description of the natural and man-made environments within and surrounding WPAFB that may be affected by the Proposed Action and alternatives;
- Section 4, Environmental Impacts, includes definitions and discussions of direct and indirect impacts, and mitigation and monitoring. The section also includes an analysis of the potential cumulative impacts on WPAFB; unavoidable adverse impacts; the relationship between short-term use of the human environment and the maintenance and enhancement of long-term productivity; and irreversible and irretrievable commitments of resources;
- Section 5, List of Preparers;
- Section 6, Consultation and Coordination, contains a list of agencies consulted in the preparation of this document;


WPAFB
OHIO
AREA A
AREA B
WRIGHT-PATTERSON AIR FORCE BASE
FAIRBORN
DAYTON
BEAVERCREEK
BETHEL
BATH
MAD RIVER
N
0
.5
1 mile
WRIGHT-PATTERSON AIR FORCE BASE OHIO
FIGURE NUMBER 1-1
LOCATION OF WPAFB AND SURROUNDING AREA
OFFICE Cincinnati, OH
DATE 9/23/15
DESIGNED BY --
DRAWN BY JIS
CHECKED BY SB
APPROVED BY CH
DRAWING NUMBER s-500499.0303010-9/15-w

1


Existing Fire Station
F/B34012
Proposed Fire Structural/
Fire Rescue Facility
F/34020
BASS
LAKE
MAD RIVER
WRIGHT-PATTERSON
AIR FORCE BASE,
OHIO
Proposed New Fire Crash/Rescue Station West Ramp
FIGURE
NUMBER
1-2
Proposed Location of
Fire Structural/Rescue Station
West Ramp
N
0
500
1,000
2,000
Feet
Key
F/34020 = Facility Identification

- Section 7, References, contains references for studies, data, and other resources used in the preparation of the EA; and
- Appendices, as required.

1.3.1 Issues and Concerns Eliminated from Detailed Study

The NEPA, which is implemented through the CEQ regulations, requires federal agencies to consider alternatives to proposed actions and to analyze impacts of those alternatives. Potential impacts of the proposed alternatives described in this document will be assessed in accordance with the AF EIAP, which requires that impacts to resources be analyzed in terms of their context, duration, and intensity. In order to help the public and decision-makers understand the implications of impacts, they will be described in the short- and long-term, cumulatively, and within context. Environmental issues analyzed in the EA include:

- Land Use;
- Air Quality;
- Noise;
- Geology and Soils;
- Water Resources;
- Biological Resources, including vegetation, wetlands, wildlife, and threatened and endangered species;
- Cultural Resources;
- Socioeconomics;
- Infrastructure;
- Health and Safety;
- Hazardous Materials and Waste; and
- Environmental Restoration Program (ERP).

The AF initially considered a broad range of potential environmental impacts associated with the implementation of the Proposed Action and No Action alternative. The scope of the Proposed Action and alternatives is limited, however, and does not entail land use changes, ground disturbance, or other activities evaluated in NEPA analysis that routinely lead to environmental impacts. Because of the nature of activities being proposed, the potential for environmental impacts on many of the environmental resource areas normally evaluated in an EA in detail does not exist for this project. In accordance with CEQ guidance, all environmental resources were initially considered, but some were subsequently eliminated from further consideration in the EA if a determination was made that there was no potential for impacts. The following issues and concerns were determined to have limited potential for impacts for environmental impacts and therefore are not being evaluated in this EA:

- *Airspace Management.* Proposed project activities would not result in any obstructions to airspace or hazards to airspace management at WPAFB. Therefore, there would be no impacts to airspace management.

- *Land Use.* Proposed project activities would not result in any changes to existing land use designations at WPAFB. Therefore, there would be no impacts to land use.

- *Environmental Justice*. Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that all federal agencies address the effects of policies on minorities and low-income populations and communities, and to ensure that there would be no disproportionately high and adverse human health or environmental effects to minority or low-income populations or communities in the area. The Proposed Action would not adversely change or impact any minority or low-income communities that exist in surrounding off-Base communities because the Proposed Action would be implemented on Base within a highly secured perimeter fence. Therefore, there would be no impacts to off-Base low-income or minority populations.

1.3.2 Notice of Availability

A Notice of Availability (NOA) for the EA and Draft-Final FONSI was published in the *Dayton Daily News* and the *Fairborn Daily Herald*, initiating a 30-day public review period. The Draft-Final EA and FONSI was made available in the Greene County Public Library, Fairborn Branch. An electronic copy of the EA was also provided on the WPAFB Environmental Management website at http://www.wpafb.af.mil/units/cev. During this time period, public comments may be received. The NOA and comments received will be included in **Appendix A**.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

This section provides a detailed description and standards used in selecting the Proposed Action (Alternative A) and an alternative to the Proposed Action (Alternative B); describes the No Action (Alternative C); identifies alternatives eliminated from further consideration; and compares environmental consequences between alternatives.

2.1 Alternatives Selection Standards

Development of reasonable alternatives involved discussions with representatives of the 88 CEG Fire Department (Customer Plans and Program Section of the Portfolio Optimization Branch in the Engineering Division [CENPL]) and the 88 CEG Installation Management Division Environmental Branch (CEIE) to identify a Proposed Action. Several requirements were identified in order to fulfill the purpose of the Proposed Action at WPAFB. The Proposed Action and other alternatives were screened against the following standards:

- Per DoD Instruction Number 6055.06, *DoD Fire and Emergency Services (F&ES) Program* (DoD 2006b), the firefighting response time to facilities must meet the 1-minute aggregate response time (time elapsed from the receipt of the emergency alarm to when the units arrive on scene) requirement for ARFF emergencies.

- Avoidance of construction or existing facility renovations within the 100-year floodplain.

- The new FS/RS must meet the following requirements: UFC 4-730-10, *Fire Stations* (DoD 2006a); UFC 4-010-01, *DoD Minimum Antiterrorism Standards for Buildings* (DoD 2013), Air Force Manual (AFMAN) 32-1084, *Facility Requirements* (AFMAN 2012); and AF *Fire Station Design Guide* (AF 1997). A brief summary of each requirement is as follows:

    - UFC 4-730-10, *Fire Stations* – identifies basic design requirements for military fire stations and will reduce the initial cost of design and reduce costs associated with redesign of facilities that do not meet minimum requirements.

    - UFC 4-010-01, *DoD Minimum Antiterrorism Standards for Buildings* – identifies mandatory antiterrorism standards for new and existing inhabited buildings minimum standoff distance at 20 ft (standoff distance is defined as the distance maintained between a building and the potential location for an explosives detonation).

    - AFMAN 32-1084, *Facility Requirements* – provides guidance for determining space allocations and assigning occupancy of existing AF facilities, specifically referencing UFC 4-730-10 and the requirement to provide covered parking space for special purpose vehicles (i.e., ARFF).

    - AF *Fire Station Design Guide* – provides criteria to evaluate, plan, program, and design standardized fire station facilities and provide a basis for developing main and satellite fire station projects.

- The new fire station must be sited to ensure access to roadways and service entrances and accommodate vehicle sizes anticipated for fire station operations and the potential for future expansion.

- Any alternative evaluated must fully comply with all federal, state, and local laws and regulations, as well as DoD and AF policies, directives, and regulations.

2.2 Proposed Action, Alternative A

The 88 CEG at WPAFB is proposing to construct a 13,524 sf FS/RS facility on the West Ramp in Area A (**Figure 1-2**). The new facility would be constructed at the site of existing F/34020, which would be demolished to preserve the existing concrete slab. Facility 34020 was historically utilized as a Nose Dock Hangar but is currently unoccupied and vacant. **Figure 1-2** presents the location of F/34020 and the location of the proposed new FS/RS facility.

2.2.1 Proposed Facility Demolition

Consisting of 23,175 sf, F/34020 was constructed in 1961 and was utilized as a Nose Dock Hangar for the maintenance of KC-135 aircraft. This facility was later retrofitted for a KC-135 fuel cell and ceased being used as a fuel cell hangar in 2006. According to the Ohio Historic Inventory (OHI) form prepared for this facility in 2008, the nose dock hangar enclosed the front portion of large aircraft, such as the KC-135, during maintenance and repairs. Not housing the tail of the aircraft allowed the nose dock hangar to be short in length and low in height (OHI 2008). The OHI form for F/34020 indicates the foundation is poured concrete, the frame is metal/steel, and exterior walls are metal. The hangar-type roof also consists of metal. **Figures 2-1** and **2-2** present photographs of the Nose Dock Hangar (F/34020).

Figure 2-1. North Side of F/34020

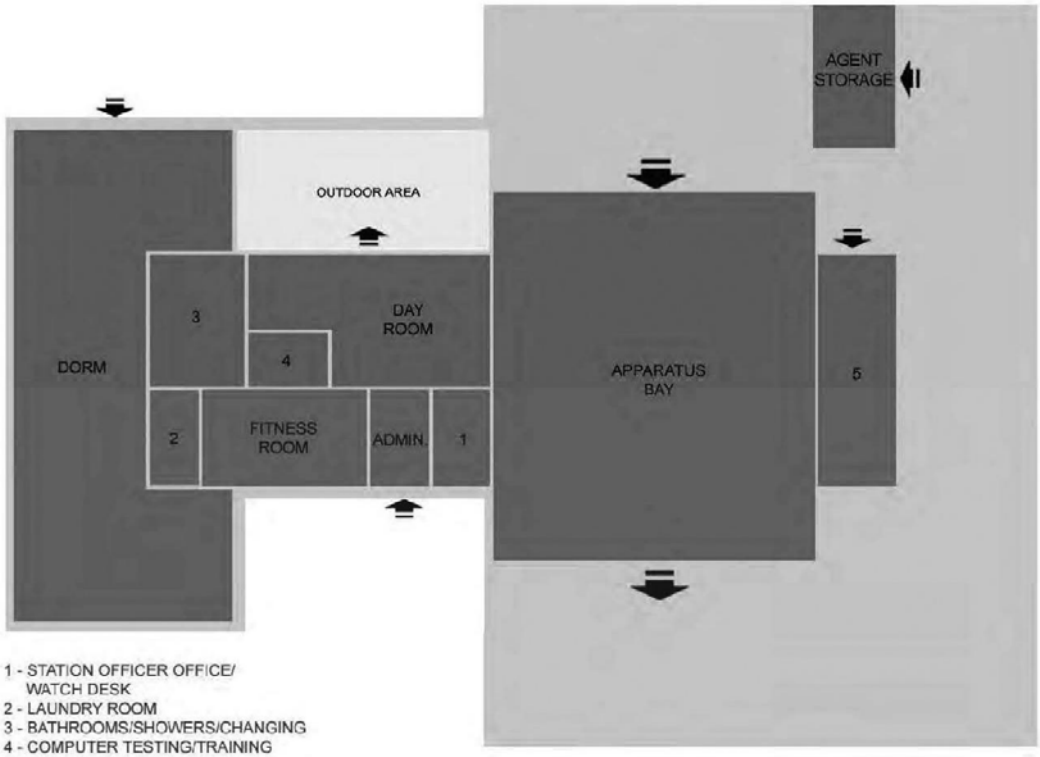
Figure 2-2. South Side of F/34020

According to the Form 813 prepared for F/34020 in 2014, the hangar doors of F/34020 are in bad condition, door tracks are in disrepair, the floor height is lower than the exterior asphalt, the heating system is in failing condition, and the restrooms do not meet current standards (AF 2014). The conditions reported in Form 813 make F/34020 a prime candidate for demolition.

Approximately 18,169 sf of F/34020 would be demolished prior to construction of the FS/RS facility. Portions of the interior and exterior building components and materials would be demolished and removed from the site. The new FS/RS facility would be constructed on the existing concrete floor slab.

2.2.2 Proposed New Construction Activities

The FS/RS facility would consist of a noncombustible, one-story structure with two high-bay, drive-through apparatus stalls; separate men's and women's restrooms with lockers and showers; separate men's and women's sleeping rooms; a separate captain's sleeping room and restroom; and a day room with a kitchen. The facility would be constructed according to UFC 4-730-10, *Fire Stations*. No design drawings have been prepared for the new FS/RS; however, **Figure 2-3** presents a general layout of a typical FS/RS according to UFC 4-730-10. Variation in the general layout would be expected as the existing footprint of F/34020 currently resembles a hangar-style footprint. In addition to the new building construction, approximately 26 parking spaces would be required. Existing parking lots in the area of F/34020 may be an option to new parking lot construction. The existing fire station, F/34012, would be vacated once construction of the new FS/RS is complete. There are no known plans for relocating missions at F/34012 at this time.



OFFICE	DATE	DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
Cincinnati, OH	1/7/16	--	JIS	SB	CH	s-500499.03030100-1/16-w

Source: Dept of Defense, Unified Criteria Facilities 4-730-10, Fire Stations, 15June2006

WRIGHT-PATTERSON AIR FORCE BASE OHIO

FIGURE NUMBER 2-3

GENERAL LAYOUT DIAGRAM OF FS/RS

Equipment such as bulldozers, backhoes, front-end loaders, dump trucks, tractor-trailers, concrete mixers, asphalt vehicles, and generators would be required to support the proposed site preparation and construction activities. Prior to construction activities, plans and documents would be prepared by the contractor to provide environmental controls. Environmental measures under the Proposed Action would be designed to control erosion, sedimentation, and stormwater runoff. All construction debris would be recycled or disposed at an approved landfill in accordance with all applicable federal, state, and local laws and regulations.

To reduce impacts to local and regional air quality, best management practices (BMPs), such as proper maintenance of construction vehicles to reduce combustive emissions, limiting the size of the disturbance area, and watering exposed soils at the beginning and end of daily construction activities, would be implemented to minimize or prevent fugitive dust emissions.

In accordance with Ohio Administrative Code (OAC) Chapter 3745-33, the Ohio Environmental Protection Agency (OEPA) manages the United States Environmental Protection Agency (USEPA) National Pollutant Discharge Elimination System (NPDES). Ohio requires that all construction sites greater than five acres must submit and implement a Sediment and Stormwater Management Plan. This plan requires a design report, all pertinent information from the Sediment and Stormwater Management Plan Checklist, completed Plan Checklist, project specifications, pre-application meeting, and weekly reviews by a Certified Construction reviewer. The Erosion and Sediment Control portion of the plan must include BMPs to reduce or eliminate the potential for erosion and sediment deposition from the construction activities. Prior to the start of construction activities, a notice of intent must be filed with OEPA. Additionally, in accordance with the Sediment and Stormwater Management guideline, post-construction BMPs may be required.

2.3 Alternative B

Alternative B involves adaptive re-use of F/34020 as an alternative to demolition. Facility 34020 would be renovated, modernized, and converted into the new FS/RS facility. The footprint of the Nose Dock Hangar would remain but the existing roll-off doors would be replaced with hangar doors so ARFF vehicles could maneuver with ease. Interior renovation of F/34020 would be retrofitted according to UFC 4-730-10, *Fire Stations*.

2.4 No Action, Alternative C

Under the No Action alternative, a new FS/RS facility would not be constructed at WPAFB. The 88 CEG Fire Department would not be able to respond to critical emergencies with response times from the present location continuing to be excessive (greater than 1-minute), particularly to critical, high-value facilities or aircraft where a few seconds of response time could mean the difference in preventing injuries and major loses.

Although the No Action alternative does not satisfy the purpose and need to reduce firefighting response times to the south end of the primary runway in Area A at WPAFB and to correct deficiencies in the current fire station (including improving crash response time for potential incidents on the south end of Runway 05L-23R), it is included in the environmental analysis to provide a baseline for comparison with the Proposed Action and is analyzed in accordance with CEQ regulations for implementing NEPA. Although the No Action alternative would eliminate unavoidable adverse, short- and long-term impacts associated with the Proposed Action, the No Action alternative would not satisfy selection standard established for this project, resulting in continued long response times.

2.5 Alternatives Eliminated from Further Study

As part of the NEPA process, potential alternatives to the Proposed Action must be evaluated. For alternatives to be considered reasonable and warrant further detailed analysis they must be affordable, implementable, and meet the purpose and need for the proposal based on the project requirements stated in Section 2.1.

One alternative considered involved constructing the FS/RS facility adjacent and east of Bass Lake on the West Ramp. Construction of the FS/RS facility at this location would involve ground disturbance. In addition, the location is within a known floodplain. For these reasons, this alternative site for the FS/RS facility was eliminated from further analysis.

A second alternative considered involved constructing the new FS/RS facility at the location of F/34035, which is adjacent and southwest of the existing Fire Station 2 location at F/34012. However, this site would not meet the 1-minute response requirement for responding to critical flight line emergencies nor would this site allow convenient ingress or egress for firefighting vehicles onto the flight line. Therefore, this alternative was eliminated from further analysis.

2.6 Comparison of Environmental Consequences

The impacts associated with the Proposed Action (Alternative A), Alternative B, and the No Action (Alternative C) are summarized in **Table 2-1**. The information includes a concise definition of the issues addressed and the environmental impacts associated with each alternative. The analysis is based on information discussed in detail in Section 4.0, Environmental Consequences.

Table 2-1. Comparison of Environmental Consequences

Affected Environment	Proposed Action (Alternative A)	Alternative B	No Action (Alternative C)
Land Use	Short-Term: No impact because no changes to land use would occur at or surrounding WPAFB. Long-Term: No impact.	Short-Term: Same as the Proposed Action. Long-Term: No impact.	Short-Term: No impact. Long-Term: No impact.
Air Quality	Short-Term: Minor adverse impact from particulate matter and engine exhaust emissions generated during construction and demolition activities. Impacts would be minor because emissions would be short in duration and are negligible with respect to overall emissions expected for the region. Long-Term: No adverse impact.	Short-Term: No impact from construction because adaptive re-use of F/34020 would involve interior renovation. Minor adverse impacts from particulate matter from equipment engine exhaust. Impacts would be minor because emissions would be short in duration and are negligible with respect to overall emissions expected for the region. Long-Term: No adverse impact.	Short-Term: No impact. Long-Term: No impact.
Noise	Short-Term: Minor adverse impact on ambient noise from construction and demolition activities. Impacts would be minor because these activities would be carried out during normal working hours and would be short in duration. Long-Term: No impact.	Short-Term: Minor adverse impact as ambient noise generated from adaptive re-use of F/34020 would involve interior renovation. Long-Term: No impact.	Short-Term: No impact. Long-Term: No impact.
Geology and Soils	Short-Term: Minor impact to existing soils during construction and demolition activities. The existing concrete slab foundation would be utilized during new construction; therefore, minimal ground disturbance would result. Impacts would be minimized by implementing BMPs for erosion and sedimentation controls during construction activities. Long-Term: No impact.	Short-Term: No impact because no ground disturbance would result from adaptive re-use of F/34020. Long-Term: No impact.	Short-Term: No impact. Long-Term: No impact.
Water Resources Groundwater	Short-Term: No impact. Long-Term: No impact.	Short-Term: No impact. Long-Term: No impact.	Short-Term: No impact. Long-Term: No impact.
Surface Water	Short-Term: Negligible impact because no ground disturbance would be expected as a result of reutilizing the existing concrete foundation slab of F/34020. Impacts would be negligible because BMPs for erosion and sedimentation controls would be implemented. Long-Term: No impact.	Short-Term: No impact because adaptive re-use of F/34020 would involve interior renovation. Long-Term: No impact.	Short-Term: No impact. Long-Term: No impact.
Floodplains	Short-Term: No impact. Long-Term: No impact.	Short-Term: No impact. Long-Term: No impact.	Short-Term: No impact. Long-Term: No impact.

Affected Environment	Proposed Action (Alternative A)	Alternative B	No Action (Alternative C)
Biological Resources Vegetation	Short-Term: No adverse impact as the proposed project site is located within the footprint of an existing facility. Any vegetation disturbance as a result of construction activities would take place on previously disturbed areas with no naturally-occurring vegetation. Long-Term: No impact.	Short-Term: No impact because adaptive re-use of F/34020 would involve interior renovation. Long-Term: Same as short-term.	Short-Term: No impact. Long-Term: No impact.
Wildlife	Short-Term: No impact on wildlife as the new FS/RS facility would be constructed on an existing concrete foundation slab. In addition, the site is not located in an area that provides suitable habitat and the current land use would not change. The proposed demolition and construction activities are not in close enough proximity to any threatened or endangered species to generate noise-related impacts. Long-Term: No impact.	Short-Term: No impact because adaptive re-use of F/34020 would involve interior renovation. Long-Term: Same as short-term.	Short-Term: No impact. Long-Term: No impact.
Threatened and Endangered Species	Short-Term: No impact on threatened and endangered species as the new FS/RS facility would be constructed on an existing concrete foundation slab. In addition, the site is not located in an area that provides suitable habitat to threatened or endangered species. Long-Term: No impact.	Short-Term: No impact because adaptive re-use of F/34020 would involve interior renovation. Long-Term: No impact.	Short-Term: No impact. Long-Term: No impact.
Wetlands	Short-Term: No impact. Long-Term: No impact.	Short-Term: No impact. Long-Term: No impact.	Short-Term: No impact. Long-Term: No impact.
Cultural Resources	Short-Term: Adverse impact because F/34020 is considered a National Register of Historic Places (NRHP)-eligible building. No new ground disturbance would result from utilizing the existing concrete foundation slab; however, a Memorandum of Agreement (MOA) would be required by the State Historic Preservation Office (SHPO) prior to demolition of F/34020. Long-Term: Same as short-term.	Short-Term: Positive and beneficial impact because F/34020 would be renovated and modernized to meet current design standards providing acceptable use by the 88 CEG Fire Department. Long-Term: Same as short-term.	Short-Term: No impact. Long-Term: No impact.
Socioeconomics	Short-Term: Negligible impact on local workforce. Beneficial impact on local economy from revenue generated by construction and demolition activities. Long-Term: No impact.	Short-Term: Similar to the Proposed Action. Long-Term: No impact.	Short-Term: No impact. Long-Term: No impact.
Infrastructure	Short-Term: Negligible impact from utilities as there would be no net increase in personnel or facility operations as existing personnel in F/34012 would move into the new FS/RS. Long-term: No impact.	Short-Term: Same as the Proposed Action. Long-Term: No impact.	Short-Term: No impact. Long-Term: No impact.

Affected Environment	Proposed Action (Alternative A)	Alternative B	No Action (Alternative C)
Health and Safety	Short-Term: Potential minor impacts to workers during construction and demolition activities. Impacts would be minimized by adherence to health and safety regulations and standards.	Short-Term: Similar to the Proposed Action.	Short-Term: Major adverse impact to the safety of personnel in aircraft-related crashes due to current response times from the existing fire station to the south end of Runway 05L-23R. The response time would remain greater than 1-minute for the 88 CEG to respond to ARFF on the south end.
	Long-Term: Beneficial impact on rescue efforts because required response times would be met.	Long-Term: Similar to the Proposed Action.	Long-Term: Same as short-term.
Hazardous Materials/Waste	Short-Term: No impact as hazardous materials/waste used in existing 88 CEG Fire Department operations would not be expected to increase over existing conditions.	Short-Term: Same as the Proposed Action.	Short-Term: No impact.
	Long-Term: No impact.	Long-Term: No impact.	Long-Term: No impact.
Environmental Restoration Program (ERP)	Short-term: Although F/34020 is associated with an ERP site (Underground Storage Tank [UST] 4020), the UST was removed and the Bureau of Underground Storage Tank Regulations (BUSTR) issued a No Further Action (NFA) status for the closure. In addition, no ground disturbance would occur as a result of utilizing the existing concrete foundation slab at F/34020. No other ERP sites exist in the immediate vicinity of F/34020.	Short-Term: No impact.	Short-Term: No impact.
	Long-term: No impact.	Long-Term: No impact.	Long-term: No impact.

3.0 AFFECTED ENVIRONMENT

This section describes the current environmental and socioeconomic conditions most likely to be affected by the Proposed Action or Alternatives and provides a baseline from which to identify and evaluate environmental and socioeconomic changes likely to result from implementation of the Proposed Action or Alternatives.

In compliance with NEPA, CEQ regulations, and 32 CFR Part 989, the description of the affected environment focuses on resources and conditions potentially subject to impacts and include land use, air quality, noise, geology and soils, water resources, biological resources, cultural resources, socioeconomics, infrastructure, health and safety, and hazardous materials and wastes. Analysis of potential environmental effects focuses on resource areas that are appropriate for consideration in light of a proposed action. All resource areas are initially considered, but some may be eliminated from detailed examination because they do not directly apply to a particular proposal. The potentially affected environment is described below.

3.1 Land Use

3.1.1 Definition of the Resource

Land use refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. Natural conditions of property can be described or categorized as unimproved, undeveloped, conservation or preservation area, and natural or scenic area. There is a wide variety of descriptive terms used to categorize land use resulting from human activity including residential, commercial, industrial, agricultural, institutional, and recreational.

Land use planning objectives are two-fold: to ensure orderly growth and ensure compatible uses among adjacent property parcels. Tools supporting land use planning include written master plans/management plans and zoning regulations. In appropriate cases, the locations and extent of proposed actions need to be evaluated for their potential effects on project sites and adjacent land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations.

To address land use with respect to noise and safety associated with aircraft operations, DoD required military departments to establish an Air Installation Compatible Use Zone (AICUZ) program. The goal of AICUZ is to promote compatible land use around air bases by providing information concerning aircraft operations, noise exposure, and accident potential to local governments (WPAFB 1995a, 2001).

One component of the AICUZ study was the development of noise contours. These contours are produced by the computerized Day-Night Average A-Weighted Sound Level (DNL) metric and the NOISEMAP methodology. In the context of aircraft operations, land use compatibility is also described

in the context of noise levels. The AICUZ study included both the conditions that existed at the time the study was prepared as well as a Maximum Mission Scenario that was based on the noise effects of various potentially feasible mission changes.

The Maximum Mission (also known as Mission Capacity) Scenario was established for WPAFB to provide consistency when zoning and land use policies in the community are established. Because the noise contours were based on conservative assumptions regarding future missions, local zoning does not need to be adjusted with changes in missions. Therefore, the noise contours for the Maximum Mission Scenario remain in effect for local community planning purposes. Noise contour analysis is addressed in Section 3.3 of this EA.

The AICUZ program is also intended to reduce the potential for aircraft mishaps in populated areas. As a result of this program, WPAFB has altered basic flight patterns to avoid heavily populated areas. In addition, airfield safety zones were established under AICUZ to minimize the number of people who would be injured or killed if an aircraft crashed. Three safety zones are designated at the end of all active runways: Clear Zone (CZ), Accident Potential Zone (APZ) I, and APZ II.

The CZ represents the most hazardous area. The APZs are outside of the CZs. The APZ I is located immediately beyond the CZ and has a high potential for accidents. The APZ II is immediately beyond APZ I and has measurable potential for accidents. While aircraft accident potential in APZs I and II does not necessarily warrant acquisition by the U.S. Air Force (USAF), land use planning and controls are strongly encouraged for the protection of the public. Compatible land uses are specified for these zones. According to Air Force Instruction (AFI) 32-7063, all new construction is required to comply with the AICUZ.

3.1.2 Existing Conditions

The Base comprises 8,145 acres near Dayton, Ohio, and is divided into Area A and Area B. Area A contains administrative activities, airfield operation, maintenance, and civil engineering activities. Area B focuses on acquisition, education, research, and development. Over 2,500 acres of WPAFB remain undeveloped due to various development constraints.

There is a wide variety of land use classifications on WPAFB. Open Space and Outdoor Recreation represent some of the land constrained from development. Over 2,000 acres of this undeveloped land lies within the natural constraints area, which is composed of areas such as floodplains, lakes, wetlands, or areas with unsuitable soil for building. Also located within the natural constraint area is the 109-acre Huffman Prairie Flying Field containing remnant prairie habitat, which includes several rare plant and animal species.

Human-made constraints also restrict development within the WPAFB boundaries. Included in these types of constraints are archaeological sites and historic buildings, which can be identified sites or those that remain undiscovered. Operational restrictions can also impede development. Noise contours from aircraft operations and explosive safety zones must be considered when looking at developing areas on the Base. Airfield and airspace control surfaces, such as runway approach CZs, are to remain clear of building obstructions. The presence of past waste disposal sites and fire training areas must be considered when siting facilities (WPAFB 1995a).

Land uses around WPAFB vary from heavily urbanized to rural agricultural (**Figure 3-1**). Most of the urbanized areas are west of the Base, with the low-density or agricultural area located east of the Base.

Most of the land surrounding WPAFB that is impacted from Base activities is compatible with Base operations. Progressive land use controls have been the most important factor concerning compatible development within noise and APZs at WPAFB (WPAFB 1995a). Land use in the areas of F/34020 is classified as industrial (**Figure 3-1**).

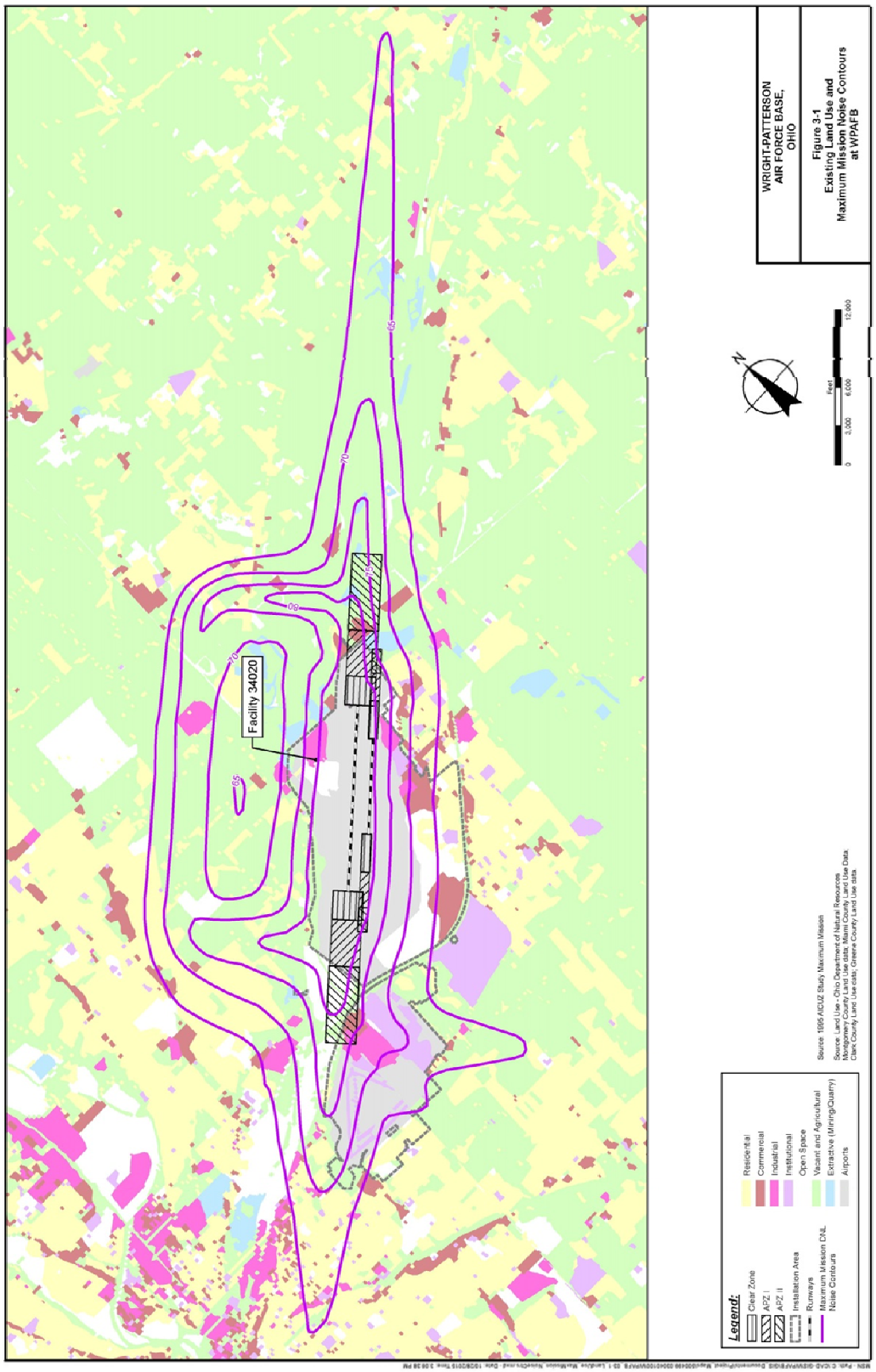
3.2 Air Quality

3.2.1 Definition of the Resource

In accordance with federal Clean Air Act (CAA) requirements, the air quality in a given region or area is measured by the concentration of various pollutants in the atmosphere. The measurements of these "criteria pollutants" in ambient air are expressed in units of parts per million (ppm) or in units of micrograms per cubic meter ($\mu g/m^3$). The air quality in a region is a result not only of the types and quantities of atmospheric pollutants and pollutant sources in an area, but also surface topography, the size of the "air basin," and the prevailing meteorological conditions.

The CAA directed the USEPA to develop, implement, and enforce strong environmental regulations that would ensure clean and healthy ambient air quality. To protect public health and welfare, the USEPA developed numerical concentration-based standards, or National Ambient Air Quality Standards (NAAQS), for pollutants that have been determined to impact human health and the environment. The USEPA established both primary and secondary NAAQS under the provisions of the CAA. The NAAQS are currently established for six criteria air pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (including coarse particulates equal to or less than 10 microns in diameter [PM_{10}] and fine particulates equal to or less than 2.5 microns in diameter [$PM_{2.5}$]), and lead (Pb).

The primary NAAQS represent maximum levels of background air pollution that are considered safe, with an adequate margin of safety to protect public health. Secondary NAAQS represent the maximum pollutant concentration necessary to protect vegetation, crops, and other public resources along with maintaining visibility standards. **Table 3-1** presents the primary and secondary NAAQS.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AIR FORCE BASE,
OHIO
Figure 3-1
Existing Land Use and
Maximum Mission Noise Contours
at WPAFB
Facility 34020
65
70
75
80
85
Legend:
Clear Zone
APZ I
APZ II
Installation Area
Runways
Maximum Mission CNL
Noise Contours
Residential
Commercial
Industrial
Institutional
Open Space
Vacant and Agricultural
Extractive (Mining/Quarry)
Airports
Source: 1999 AICUZ Study Maximum Mission
Source: Land Use - Ohio Department of Natural Resources
Montgomery County Land Use data, Miami County Land Use Data
Clark County Land Use data, Greene County Land Use data
Feet
0
3,000
6,000
12,000

Table 3-1. National Ambient Air Quality Standards

Pollutant	Standard Value [6]		Standard Type
Carbon Monoxide (CO)			
8-hour average	9 ppm	(10 mg/m^3)	Primary
1-hour average	35 ppm	(40 mg/m^3)	Primary
Nitrogen Dioxide (NO_2)			
Annual arithmetic mean	0.053 ppm	(100 µg/m^3)	Primary and Secondary
1-hour average[1]	0.100 ppm	(188 µg/m^3)	Primary
Ozone (O_3)			
8-hour average (2008)[2]	0.075 ppm	(147 µg/m^3)	Primary and Secondary
8-hour average (2015)[2]	0.070 ppm	(137 µg/m^3)	Primary and Secondary
Lead (Pb)			
3-month average[3]		0.15 µg/m^3	Primary and Secondary
Particulate < 10 micrometers (PM_{10})			
24-hour average[4]		150 µg/m^3	Primary and Secondary
Particulate < 2.5 micrometers ($PM_{2.5}$)			
Annual arithmetic mean[4]		12 µg/m^3	Primary
Annual arithmetic mean[4]		15 µg/m^3	Secondary
24-hour average[4]		35 µg/m^3	Primary and Secondary
Sulfur Dioxide (SO_2)			
1-hour average[5]	0.075 ppm	(196 µg/m^3)	Primary
3-hour average[5]	0.50 ppm	(1,307 µg/m^3)	Secondary

Notes:

1 In February 2010, USEPA established a new 1-hr standard at a level of 0.100 ppm, based on the 3-year average of the 98th percentile of the yearly distribution concentration, to supplement the existing annual standard.

2 In March 2008, the USEPA revised the level of the 8-hour standard to 0.075 ppm based on the 3-year average of the annual fourth-highest daily maximum 8-hour concentration. On October 26, 2015, the USEPA finalized a revised lower 8-hour standard at 0.070 ppm. New area designations are anticipated to be identified and finalized by late 2017.

3 In November 2008, USEPA revised the primary lead standard to 0.15 µg/m^3. USEPA revised the averaging time to a rolling 3-month average, not to be exceeded.

4 In December 2012, USEPA revised the level of the annual $PM_{2.5}$ primary standards to 12 µg/m^3, retained the secondary level of the annual $PM_{2.5}$ standard at 15 µg/m^3, and retained the level of the 24-hour $PM_{2.5}$. With regard to primary standards for particles generally less than or equal to 10 µm in diameter (PM_{10}), USEPA retained the 24-hour standard and revoked the annual PM_{10} standard.

5 In June 2010, USEPA established a new 1-hr SO_2 standard at a level of 75 parts per billion (ppb), based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The USEPA is also revoking both the existing 24-hour and annual primary SO_2 standards.

6 Parenthetical value is an approximately equivalent concentration for CO, NO_2, O_3 and SO_2.

ppb = parts per billion ; µg/m^3 (micrograms per cubic meter)
ppm = parts per million; mg/m^3 (milligrams per cubic meter)
mg/m^3 = milligrams per cubic meter
µg/m^3 = micrograms per cubic meter

The criteria pollutant O_3 is not usually emitted directly into the air, but is formed in the atmosphere by photochemical reactions involving sunlight and previously emitted pollutants or "O_3 precursors." These O_3 precursors consist primarily of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) that are directly emitted from a wide range of emissions sources. For this reason, regulatory agencies attempt to limit atmospheric O_3 concentrations by controlling VOC pollutants (also identified as reactive organic gases) and NO_x.

The USEPA has recognized that particulate matter emissions can have different health effects depending on particle size and, therefore, developed separate NAAQS for coarse particulate matter PM_{10} and fine particulate matter $PM_{2.5}$. The pollutant $PM_{2.5}$ can be emitted from emission sources directly as very fine

dust and/or liquid mist or formed secondarily in the atmosphere as condensable particulate matter typically forming nitrate and sulfate compounds. Precursors of condensable $PM_{2.5}$ can include SO_2, NO_x, VOC, and ammonia. Secondary (indirect) emissions vary by region depending upon the predominant emission sources located within the area and determine which precursors are considered significant for $PM_{2.5}$ formation and identified for ultimate control.

The CAA and USEPA delegated responsibility for ensuring compliance with NAAQS to the states and local agencies. As such, each state must develop air pollutant control programs and promulgate regulations and rules that focus on meeting NAAQS and maintaining healthy ambient air quality levels. These programs are detailed in State Implementation Plans (SIPs) that must be developed by each state or local regulatory agency and approved by the USEPA. A SIP is a compilation of regulations, strategies, schedules, and enforcement actions designed to move the state into compliance with all NAAQS. Any changes to the compliance schedule or plan (e.g., new regulations, emissions budgets, controls) must be incorporated into the SIP and approved by the USEPA.

The CAA required that the USEPA draft general conformity regulations. These regulations are designed to ensure that federal actions do not impede local efforts to achieve or maintain attainment with the NAAQS. The General Conformity Rule and the promulgated regulations found in 40 CFR Part 93 exempt certain federal actions from conformity determinations (e.g., contaminated site cleanup and natural disaster response activities). Other federal actions are assumed to conform if total indirect and direct project emissions are below *de minimis* levels presented in 40 CFR 93.153. The threshold levels (in tons of pollutant per year) depend upon the nonattainment status that USEPA has assigned to a region for each NAAQS. Once the net change in nonattainment pollutants is calculated, the federal agency must compare them to the *de minimis* thresholds if a conformity determination is required.

Title V of the CAA Amendments of 1990 requires states and local agencies to implement permitting programs for major stationary sources. A major stationary source is a facility (e.g., plant, base, or activity) that has the potential to emit more than 100 tons annually of any one criteria air pollutant, 10 tons per year (tpy) of a hazardous air pollutant, or 25 tpy of any combination of hazardous air pollutants. However, lower pollutant-specific "major source" permitting thresholds apply in nonattainment areas. For example, the Title V permitting threshold for an "extreme" O_3 nonattainment area is 10 tpy of potential VOC or NO_x emissions. The overall purpose of the Title V rule is to establish regulatory control over large, industrial-type activities and monitor their impact on air quality.

Federal New Source Review (NSR), including Prevention of Significant Deterioration (PSD), is a pre-construction permitting program that requires stringent pollution controls when air emissions increases are "significant" from proposed new major stationary sources or major modifications at existing sources. To be "significant", a proposed project's net emission increase must meet or exceed the rate of emissions listed in 40 CFR 52.21(b)(23)(i) for criteria pollutants; or (1) a proposed project is located within 10

kilometers (km) of any Class I area, and (2) regulated pollutant emissions would cause an increase in the 24-hour average concentration of any regulated pollutant in the Class I area of 1 $\mu g/m^3$ or more [40 CFR 52.21(b)(23)(iii)]. The PSD regulations also define ambient air increments, limiting the allowable increases to any area's baseline air contaminant concentrations, based on the area's designation as Class I, II, or III [40 CFR 52.21(c)].

Greenhouse Gases

Greenhouse gases (GHG) are gases that trap heat in the atmosphere. These emissions are generated by both natural processed and human activities. The accumulation of GHGs in the atmosphere helps regulate the earth's temperature and is believed to contribute to global climate change. The GHGs include water vapor, CO_2, methane, nitrous oxide, O_3, and several hydrocarbons and chlorofluorocarbons. Each GHG has an estimated global warming potential (GWP), which is a function of its atmospheric lifetime and its ability to absorb and radiate infrared energy emitted from the earth's surface. The GWP of a particular gas provides a relative basis for calculating its carbon dioxide equivalents (CO_2e) or the amount of CO_2 equivalent to the emissions of that gas. The CO_2 has a GWP of 1, and is, therefore, the standard by which all other GHGs are measured.

Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance* provides strategic guidance to federal agencies in the management of GHG emissions. On February 18, 2010, the CEQ released *Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*. This guidance advises federal agencies to consider, in scoping their NEPA analysis, whether analysis of the direct and indirect GHG emissions from their proposed actions may provide meaningful information to decision makers and the public.

If a proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of CO_2e GHG emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. The CEQ does not propose this as an indicator of a threshold of significant effects, but rather as an indicator of a minimum level of GHG emission that may warrant some description in the appropriate NEPA analysis for agency actions involving direct emissions of GHGs. The CEQ also notes this indicator serves as a minimum standard for reporting emissions under the CAA. Calculated GHG emissions as a result of the Proposed Action are discussed further in Section 4.2.2.

3.2.2 Existing Conditions

Regional Climate

The climate of this region of Ohio is humid and temperate with warm summers and cold winters. Average minimum and maximum temperatures are between 21 and 36 degrees Fahrenheit (°F) in January and 45 and 85 °F in July. The average annual precipitation is 38.43 inches, with June typically being the

wettest month and October the driest month. The prevailing winds are from the southwest, with average monthly wind speeds between 3 and 7 knots.

Regional Air Quality

Under the authority of the CAA and subsequent regulations, the USEPA has divided the country into geographical regions known as Air Quality Control Regions (AQCRs) to evaluate compliance with the NAAQS. Through the CAA, Congress has stated that the prevention and control of air pollution belongs at the state and local level, thus the USEPA has delegated enforcement of the PSD and Title V programs to the OEPA. The OEPA has adopted the NAAQS by reference, thereby requiring the use of the standards within the state of Ohio.

Wright-Patterson AFB

The Base is located in Greene and Montgomery counties, which are located in the Metropolitan Dayton Intrastate AQCR (40 CFR 81.34). Each AQCR is classified as an attainment area or nonattainment area for each of the criteria pollutants depending on whether it meets or fails to meet the NAAQS for the pollutant. Ambient air quality for the Metropolitan Dayton Intrastate AQCR was formerly classified as an attainment/maintenance area for the 8-hour O_3 (USEPA 2012a); attainment for the NO_2 annual standard and unclassifiable/attainment for the new 1-hour standard NO_2 (USEPA 2012b); attainment for the SO_2 3-hour standard and unclassifiable/attainment for the new 1-hour standard SO_2 established in 2013 (USEPA 2013a); and attainment for the Pb and CO standards. Area designations for the 2015 revised 8-hour O_3 NAAQS are anticipated to be finalized by the end of 2017 (USEPA 2015a).

The ambient air quality for $PM_{2.5}$ is classified as attainment for the 24-hour standard and re-designated to attainment/maintenance for the 1997 annual standard (USEPA 2013b). For the new annual $PM_{2.5}$ NAAQS, the OEPA submitted a report in December 2013 recommending that Montgomery and Greene counties be designated as "unclassified/attainment" (OEPA 2013). This designation was approved by the USEPA effective April 1, 2015 (USEPA 2015b). The USEPA has also approved Ohio SIP revisions implementing the $PM_{2.5}$ NAAQS including OAC Rule 3745-31-01 (WWWW) defining $PM_{2.5}$ precursors to include sulfur dioxide and nitrogen oxides (USEPA 2015c).

Air quality is typically good in the vicinity of WPAFB, and is generally affected only locally by military and civilian vehicle emissions, particulate pollution from vehicle traffic, emissions from wastewater treatment plants, industrial sources, and construction activities. Mobile sources, such as vehicle and aircraft emissions, are generally not regulated at the local level and are not covered under existing stationary source permitting requirements. Stationary emissions sources at WPAFB include natural gas and coal-fired boilers; research and development sources, such as laboratory fume hoods and test cells; paint spray booths; refueling operations; and emergency power generators.

The Base is under the jurisdiction of USEPA Region 5 and the OEPA. The Regional Air Pollution Control Agency (RAPCA), under the jurisdiction of the OEPA, conducts annual compliance inspections at WPAFB. The Base has long had an aggressive program of internal audits and inspections to ensure continual compliance with all applicable air permit terms and conditions. Detailed records are maintained to demonstrate compliance with emission limits, and reports are submitted in a timely manner to the local regulatory agency.

The WPAFB air emissions inventory includes over 1,400 emissions sources. Of these, approximately 1,050 are included in the Base's Title V permit application, which was originally submitted to the OEPA in February 1996 in accordance with CAA requirements. Many of the Title V sources are insignificant, including emergency generators, small boilers, and laboratory fume hoods. There were 29 permitted non-insignificant emissions units identified in the original application, most of which were boilers and paint spray booths. The OEPA finalized the Title V Operating Permit for WPAFB in January 2004 with an effective date of February 17, 2004 (OEPA 2004). A Title V renewal permit application was submitted to the OEPA in May 2008 and is currently under review. The Title V renewal application notified OEPA that the number of permitted non-insignificant emission units was reduced from 29 to 26. A revision to the Title N renewal application was submitted to OEPA on September 11, 2013 to include a coal-to-gas fuel conversion project at the Base central heating plants.

West Ramp Fire Structural/Rescue Station

The existing Fire Station consists of several storage tanks and an emergency generator. All of the storage tanks are stationary sources categorically exempt from requiring an air permit due to their size, content, or a combination of the two qualifying criteria. The emergency generator is required to maintain a valid permit-by-rule (PBR) and is additionally subject to Reciprocating Internal Combustion Engines (RICE) Maximum Achievable Control Technology (MACT) standards (40 CFR 63 Subpart IIII).

Insignificant sources required to be listed in the Title V permit may or may not have permit conditions or reporting requirements depending on the regulatory qualifications that categorizes a source as insignificant. Insignificant sources that were specifically issued a permit-to-install (PTI) must be evaluated prior to commencing work to assure that the terms and conditions of the issued PTI are met. Insignificant sources that are required to have a PBR must be installed to ensure the terms and conditions of the PBR are maintained. Insignificant sources that are *de minimis* or to which only generally applicable requirements apply may undergo additions, removals, and relocations and do not require a modification of the Title V permit provided the changes do not exceed insignificant emission levels.

Insignificant emission levels are defined in OAC rule 3745-77-01(V)(3) to be less than or equal to 5 tpy of any regulated air pollutant other than a Hazardous Air Pollutant and not more than 20 percent of an applicable major source threshold. Changes to insignificant sources are handled as routine administrational changes through air profile updates submitted through Air Services to the OEPA,

Division of Air Pollution Control. All air sources are identified by a four digit number on a yellow sticker affixed to the source. The Air Program Manager at WPAFB requires notification prior to removal or relocation of any air source.

An Air Conformity Applicability Analysis was prepared for the Proposed Action and Alternatives. The analysis is discussed in Section 4 and provided in **Appendix B**.

3.3 Noise

3.3.1 Definition of the Resource

Noise is defined as an undesirable sound that interferes with communication, is intense enough to damage hearing, or is annoying. Human response to noise varies according to the source type, characteristics of the source, distance between source and receptor, receptor sensitivity, and time of day. Sound is measured with instruments that record instantaneous sound levels in decibels (dB); decibels characterize sound levels sensed by the human ear. "A-weighted" decibels (dBA) incorporate an adjustment of the frequency content of a noise event to represent the way in which the average human ear responds to a noise event. Sound levels analyzed in this EA are A-weighted.

Single-event noise, such as an overflight, is described by the sound exposure level (SEL). Cumulative noise levels, resulting from multiple single-events, are used to characterize community noise effects from aircraft or airfield environment, and are measured in the DNL metric, as described in Section 3.1.1. A general discussion of these metrics is provided below and a detailed explanation is provided in **Appendix C**.

Sound Exposure Level

The SEL measurement describes a noise event, such as an aircraft overflight, comprising a period of time when an aircraft is approaching a receptor and noise levels are increasing, the instant when the aircraft is closest to the receptor and the maximum noise level is experienced, and the period of time when the aircraft moves away from the receptor resulting in decreased noise levels. An SEL accounts for both loudness and duration of a noise event.

The SEL metric is useful when calculating the noise effects of aircraft flyovers. Frequency, magnitude, and duration vary according to aircraft type, engine type, and power setting. Individual aircraft noise data are collected for various types of aircraft and engines at different power settings at various phases of flight. These values form the basis for the individual-event noise descriptors at any location, and are adjusted to the location by applying appropriate corrections for temperature, humidity, altitude, and variations from standard aircraft operating profiles and power settings. **Table 3-2** provides SEL values (averages) at various altitudes for aircraft operating directly overhead at various speeds and power settings depending on aircraft type.

Table 3-2. SEL dB Values for Aircraft Operating in the Vicinity of WPAFB

Altitude (feet AGL)	C-5 [1]	C-17 [1]	KC-135R [1]	F-16C [1]
200	118.5	107.6	102.3	100.9
500	111.7	100.2	95.9	94.4
1,000	105.8	93.4	90.8	89.0
2,000	98.9	85.1	85.1	82.9
3,150	93.4	79.1	80.8	78.4
5,000	86.5	73.0	76.0	73.3

Notes: 1 = Day based on steady, level flight , using Omega 10.9 aircraft profile data from actual overflight noise measurements; Omega 10.9 is a standalone DoD noise-modeling program that allows the user to retrieve data from the NOISEMAP database; AGL = above ground level.

Day-Night Average A-Weighted Sound Level

The DNL noise metric incorporates a "penalty" for nighttime noise events to account for increased annoyance. The DNL is the energy-averaged sound level measured over a 24-hour period, with a 10 dB penalty assigned to noise events occurring between 10:00 p.m. and 7:00 a.m. The DNL values are obtained by averaging aircraft single event SEL values for a given 24-hour period.

The DNL is the preferred noise metric of U.S. Department of Housing and Urban Development (HUD), Federal Aviation Administration (FAA), USEPA, and DoD for modeling aircraft noise in airport environs.

Most people are exposed to sound levels of DNL 50 to 55 dBA or higher on a daily basis. Studies show that about 90 percent of the population is not significantly bothered by outdoor sound levels below DNL of 65 dBA (U.S. Department of Transportation [USDOT] 1980). Studies of community annoyance in response to numerous types of environmental noise show that DNL correlates well with impact assessments and that there is a consistent relationship between DNL and the level of annoyance. The "Schultz Curve" (discussed in **Appendix C**) shows the relationship between DNL noise levels and the percentage of the population predicted to be highly annoyed.

Noise Criteria and Regulations

Federal and local governments have established noise guidelines and regulations for the purpose of protecting citizens from potential hearing damage and from various other adverse physiological, psychological, and social effects associated with noise.

According to USAF, FAA, and HUD criteria, residential units and other noise-sensitive land uses are "clearly unacceptable" in areas where the noise exposure exceeds DNL of 75 dBA, "normally unacceptable" in regions exposed to noise between the DNL of 65 to 75 dBA, and "normally acceptable" in areas exposed to noise where the DNL is 65 dBA or less. The Federal Interagency Committee on Noise developed land-use compatibility guidelines for noise in terms of DNL (USDOT 1980). The DNL is the metric used by the USAF in determining noise impacts of military airfield operations for land use planning.

The USAF land use compatibility guidelines (relative to DNL values) are documented in the *AICUZ Program Handbook* (USAF 1999). Four noise zones are used in AICUZ studies to identify noise impacts from aircraft operations. These noise zones range from DNL of 65 to 80 dBA and above. For example, it is recommended that no residential uses, such as homes, multifamily dwellings, dormitories, hotels, and mobile home parks, be located where the noise is expected to exceed a DNL of 65 dBA.

If sensitive structures are located in areas within a DNL of 65 to 75 dBA, noise-sensitive structures should be designed to achieve a DNL of 25 to 30 dBA interior noise reduction. Noise-sensitive structures might include schools, concert halls, hospitals, and nursing homes. Elevated noise levels in these structures can interfere with speech, causing annoyance or communication difficulties. Some commercial and industrial uses are considered acceptable where the noise level exceeds DNL of 65 dBA. For outdoor activities, USEPA recommends DNL of 55 dBA as the sound level below which there is no reason to suspect that the general population will be at risk from any of the effects of noise (USEPA 1974).

Response to Noise Events

Noise annoyance is defined by USEPA as any negative subjective reaction to noise by an individual or group. The DNL is an accepted unit for quantifying annoyance to humans by general environmental noise, including aircraft noise. **Table 3-3** describes the percentage of people who were "highly annoyed" when exposed to various levels of noise measured in DNL. The data shown provides a perspective on the level of annoyance that might be anticipated. For example, 15 to 25 percent of persons exposed on a long-term basis to DNL of 65 to 69 dBA are expected to be highly annoyed by noise events.

Table 3-3. Percentage of Population Highly Annoyed by Noise Zones

DNL	Percentage of Persons Highly Annoyed	
	Low	High
65–69 dBA	15	25
70–74 dBA	25	37
75–79 dBA	37	52
80 + dBA	61	61

Source: USAF 2000

Notes: dBA = A-weighted decibel; DNL = Day-Night Average A-Weighted Sound Level

The effects of noise on sleep are of concern, primarily in ensuring suitable residential environments. The DNL incorporates consideration of sleep disturbance by assigning a 10 dBA penalty to nighttime noise events (10:00 p.m. to 7:00 a.m.). More typically, single noise events, not average sound levels, correlate with sleep disturbance. A discussion of the relationships between the occurrence of awakening and SEL is presented in **Appendix C**. Most of these relationships do not reflect habituation and, as such, do not address long-term sleep disturbance effects.

3.3.2 Existing Conditions

Existing noise contours were analyzed using results from DoD-approved noise models in the vicinity of WPAFB. The noise contour analysis for WPAFB is presented in the *1995 AICUZ Study for Wright-Patterson AFB, Ohio* (WPAFB 1995a). Based on reasonable assumptions at the time of the 1995 AICUZ Study, a Maximum Mission/Maximum Capacity Scenario was analyzed and incorporated a potential increase in F-16, F-15, C-141, and C-5 aircraft operations. Although other aircraft have been utilized at WPAFB, the Maximum Mission Model was intended to capture the maximum feasible operational capacity of the airfield and support activities. Within the limits of accuracy of the model itself, it was meant to provide a good-faith "worst-case" baseline for the surrounding communities' zoning and land-use decisions, thus limiting encroachment and preserving the capacity of the Base to host additional flying missions.

The most recent noise study for WPAFB was conducted in 2008 to confirm that C-5 aircraft noise levels were within the Maximum Mission/Maximum Capacity Scenario. This analysis confirmed that noise levels were within the Maximum Mission/Maximum Capacity contours established in 1995 (WPAFB 2011a). Since then, the 445th AW has replaced the C-5 aircraft with the C-17. The conversion of the C-5 to the C-17 occurred throughout fiscal year 11 (FY11) and is now complete. The C-17 is a newer and more flexible airlift aircraft. Due to a quieter engine, the noise levels in the vicinity of WPAFB have been reduced and are also within the Maximum Mission/Maximum Capacity Scenario. Because the Maximum Mission Scenario noise contours have been, and are currently, used for noise compatibility planning around the Base, these contours are used as the baseline for the noise analysis in this EA. **Figure 3-1** depicts the baseline noise contours presented in the 1995 AICUZ Study (WPAFB 1995a).

No noise-sensitive receptors were identified in the AICUZ. There have been no recent complaints regarding aircraft noise. According to the AICUZ study, the proposed FS/RS project area is located in a range of noise zones averaging from 75 to 80 dBA. These ranges represent existing conditions to which potential noise levels from construction and/or demolition activities can be compared.

3.4 Geology and Soils

3.4.1 Definition of the Resource

Geological resources consist of the earth's surface and subsurface materials. Topography pertains to the general shape and arrangement of a land surface, including its height and the position of its natural and human-made features.

Geology is the study of the earth's composition and provides information on the structure and configuration of surface and subsurface features. Hydrogeology extends the study of the subsurface to water-bearing structures. Hydrogeological information helps in the assessment of groundwater quality and quantity and its movement.

Soils are the unconsolidated materials overlying bedrock or other parent material. Soils are described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink-swell potential, and erosion potential affect their abilities to support certain applications or uses.

3.4.2 Existing Conditions

Topography and Geology

The highest land surface elevations on Base are in Area B and occur along a bedrock ridge that extends from the southeast corner of Area B to the Wright Memorial. The majority of the Base is on the broad alluvial plain of the Mad River Valley, which overlies Ordovician-age Richmond shale and limestone bedrock (WPAFB 2001). The land surface elevation Base-wide range from approximately 760 to 980 ft above mean sea level (MSL) (WPAFB 2001).

The Base is within the glaciated till plain region of southwestern Ohio, an area within the Central Lowlands Physiographic Province. The Central Lowlands province is characterized by low rolling hills, level plains, and flat alluvial valleys (WPAFB 2015a).

Natural Hazards

The state of Ohio is characterized by a low level of seismic activity (U.S. Geological Survey [USGS] 2010). The Dayton, Ohio, area does not typically experience earthquakes because of its location in relation to fault zones (Hansen 2002). Auglaize and Shelby counties located in northwest Ohio (approximately 45 miles from Greene County) had a series of historic earthquakes in the late 1800s to mid-1900s (Hansen 2002), with the greatest instrumented magnitude recorded between 5.0 and 5.4 (USGS 2010). On July 23, 2010, a 5.0 magnitude earthquake originating along the Quebec-Ontario border was felt in Dayton and surrounding areas.

Soils

Surface soil at WPAFB formed on unconsolidated deposits, primarily alluvium, glacial outwash, glacial till, and loess (WPAFB 2015a). Development and substantial earthmoving activities have altered the natural soil characteristics at WPAFB, making precise classifications difficult. The U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) mapped most of WPAFB as urban land complexes. Major soil complexes represented at WPAFB include Warsaw-Fill, Sloan-Fill, Miamian-Urban, Fox-Urban, Linwood Muck, Westland-Urban, and Warsaw-Urban.

The predominant soil type in the vicinity of the proposed FS/RS site (F/34020) is the Warsaw-Fill land complex. Warsaw-Fill land complex soils are described as approximately 2 to 5 ft of fill material overlying well-drained soils that formed in loam glacial outwash over sand and gravel at a depth of 24 to 60 inches. Permeability is moderate in the upper portions and high in the underlying sand and gravel (USDA 1978).

3.5 Water Resources

3.5.1 Definition of the Resource

Water resources include groundwater, surface water, and floodplains. Evaluation of water resources examines the quantity and quality of the resource and its demand for various purposes.

Groundwater

Groundwater consists of the subsurface hydrologic resources and is an essential resource often used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater can be described in terms of its depth from the surface, aquifer or well capacity, water quality, surrounding geologic composition, and recharge rate.

Surface Water

Surface water resources consist of lakes, rivers, and streams. Storm water is an important component of surface water systems because of its potential to introduce sediments and other contaminants that could degrade lakes, rivers, and streams. Storm water flows, which may be exacerbated by high proportions of impervious surfaces associated with buildings, roads, parking lots, and airfields are important to the management of surface water. Storm water systems convey precipitation away from developed sites to appropriate receiving surface waters. Higher densities of development, such as those found in Area B, require greater degrees of storm water management because of the higher proportions of impervious surfaces that occur from buildings, parking lots, and roadways.

Floodplains

Floodplains are areas of low-level ground present along rivers, stream channels, or coastal waters and might be subject to periodic or infrequent inundation due to rain or melting snow. Flood potential is evaluated by the Federal Emergency Management Agency (FEMA), which defines the 100-year floodplain for the Mad River as 813.4 ft, above MSL. The 100-year floodplain is the area that has a 1 percent chance of inundation by a flood event in a given year. Portions of Area A are located within the 100-year floodplain of the Mad River; however, Area B is not within the 100-year Mad River floodplain.

Executive Order 11988 (May 1977), *Floodplain Management*, requires federal agencies to determine whether a proposed action would occur within a floodplain and typically involves consultation of appropriate FEMA Flood Insurance Rate Maps. Executive Order 11988 directs federal agencies to avoid floodplains unless the agency determines that there is no practicable alternative. Where the only practicable alternative is to site in a floodplain, a specific step-by-step process must be followed to comply with EO 11988 outlined in the FEMA document *Further Advice on EO 11988 Floodplain Management*.

All floodplain-related construction activities must be coordinated with the Miami Conservancy District (MCD) for approval. The MCD, through the *Land Use Agreement* (dated January 7, 2000) and the MCD

Policy and Procedure for Permits in Retarding Basins, regulates all construction on land within the Huffman Dam Retardation Basin and more than 5 ft below the spillway elevation of 835 ft, above MSL.

Executive Order 13690 (January 2015), *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input*, amends EO 11988 and provides three approaches that federal agencies can use to establish flood elevation and hazard area for consideration in their decision-making: climate-informed science approach, adding 2-3 ft of elevation to the 100-year floodplain, and using the 500-year floodplain. The intent of EO 13690 is to reduce the risk and cost of future flood disasters by ensuring that federal investments in and affecting floodplains are constructed to better withstand the impacts of flooding (FEMA 2015).

3.5.2 Existing Conditions

Groundwater

The Base is located in the Great Miami River Valley, which is filled with glacial deposits of sand and gravel. The glacial outwash deposits are very permeable and exhibit high transmissivity and hydraulic conductivity. The resulting aquifer system, called the Miami Valley Buried Aquifer, is a highly productive source of water for the people in southwest Ohio. The USEPA designated the Miami Valley Buried Aquifer system as a sole-source aquifer in 1988, requiring USEPA Region 5 approval on all new projects to ensure continued use as a drinking water supply (53 Federal Register 15876). The buried aquifer system provides drinking water for more than 1.6 million people in southwest Ohio (Debrewer et al. 2000).

Groundwater can also be found in large volumes in the Silurian-age (415 to 465 million years ago) limestone and dolomite bedrock underneath the buried valley aquifer system. Private wells and smaller public systems typically use this bedrock aquifer because, though not as productive as the buried aquifer, it is adequate for such uses (MCD 2002). Underneath the limestone and dolomite bedrock is Ordovician-age (465 to 510 million year ago) bedrock shales and limestones of the Richmond Group. The lower bedrock aquifer system generally produces less than 5 gallons per minute (gpm) and is only productive enough for livestock use.

The buried valley aquifers coincide with the present Great Miami River and its tributaries. Water underground generally follows the same flows as surface waters with upland areas serving as recharge areas and groundwater divides (MCD 2002). At WPAFB, the Mad River follows the course of the Mad River Buried Aquifer, part of the Miami Valley Buried Aquifer system. South of Huffman Dam (a flood control dam that is managed by the MCD), a till zone divides the Mad River Buried Aquifer into an upper water table unit and a lower confined unit. However, north of the dam and in other parts of the buried valley aquifer, till zones occur less frequently as discontinuous, less-permeable zones within the more permeable outwash deposits (WPAFB 1995b).

Most of the wells in the outwash deposits yield between 750 and 1,500 gpm, but can vary from less than 200 to more than 4,000 gpm (WPAFB 1995b). The City of Dayton groundwater production wells at Huffman Dam are screened at depths of over 100 ft below ground surface.

General groundwater flow in the area of F/34020 is in a radial pattern to the north, east, and west; however, flow is predominantly in a westerly direction toward the Mad River. This flow pattern is most likely due to the proximity of the area to Bass Lake located approximately 600 ft south of F/34020. Average depth to groundwater is approximately 10 ft below ground surface within Operable Unit 11 (OU11).

Surface Water

The Base is in the Mad River Valley. The Mad River originates approximately 40 miles north of Springfield, Ohio, flows south and southwest past WPAFB to its confluence with the Great Miami River in Dayton, Ohio, and flows into the Ohio River. Sustained flow of the Mad River originates from groundwater discharge of glacial deposits upstream of Huffman Dam. The Mad River approaches WPAFB from the north and flows along the western border of Area A. The OEPA has divided the Mad River watershed into five areas: headwaters; Mad River between Kings and Chapman Creeks; Buck Creek; Mad River from Chapman to Mud Creeks; and the lower Mad River (Mud Creek to the Great Miami River). Mud Creek enters the Mad River 2,000 ft north of the SR 235 bridge, near the northwest corner of Area A. The Base lies adjacent to the northernmost portion of the lower Mad River segment.

The OEPA has identified the lower segment of the Mad River, which flows through WPAFB, as an impaired water under Section 303(d) of the Clean Water Act (CWA) for not meeting aquatic life and recreation use standards (OEPA 2010). The USEPA has established the total maximum daily load of effluent (TMDL) for the Mad River in the *Mad River Total Maximum Daily Loads for Sediment and Turbidity* (USEPA 2007). A TMDL specifies the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and allocates pollutant loadings among point and nonpoint pollutant sources.

The TMDL for the Mad River watershed has been set at 120 percent of natural sediment loading. According to the report, the natural sediment loading in the basin is approximately 894 tons/square mile/year based on an annual average.

The WPAFB Storm Water Management Plan (SWMP) and the Storm Water Pollution Prevention Plan (SWPPP) (prepared to comply with the CWA and the Ohio Water Pollution Control Act) provides descriptions of storm drainage areas and their associated outfalls, potential storm water pollution sources, and material management approaches to reduce potential storm water contamination (WPAFB 2011b, 2011c). The SWPPP was last updated in September 2011 while the SWMP was last updated in April

2011. An OEPA industrial permit NPDES 1IO00001) and a municipal NPDES General permit (OHQ000002) cover the WPAFB storm water program (WPAFB 2011c).

The SWPPP and SWMP provide specific BMPs to prevent surface water contamination from activities such as construction, storing and transferring of fuels, storage of coal, use of deicing fluids, storage and use of lubrication oils and maintenance fluids, solid and hazardous waste management, and use of deicing chemicals (WPAFB 2001).

There are 20 defined drainage or "Outfall Areas" on Base (WPAFB 2011c). There are 24 NPDES discharge monitoring points on Base that are addressed under the NPDES permit (**Figure 3-2**). All storm water from WPAFB flows into the Mad River.

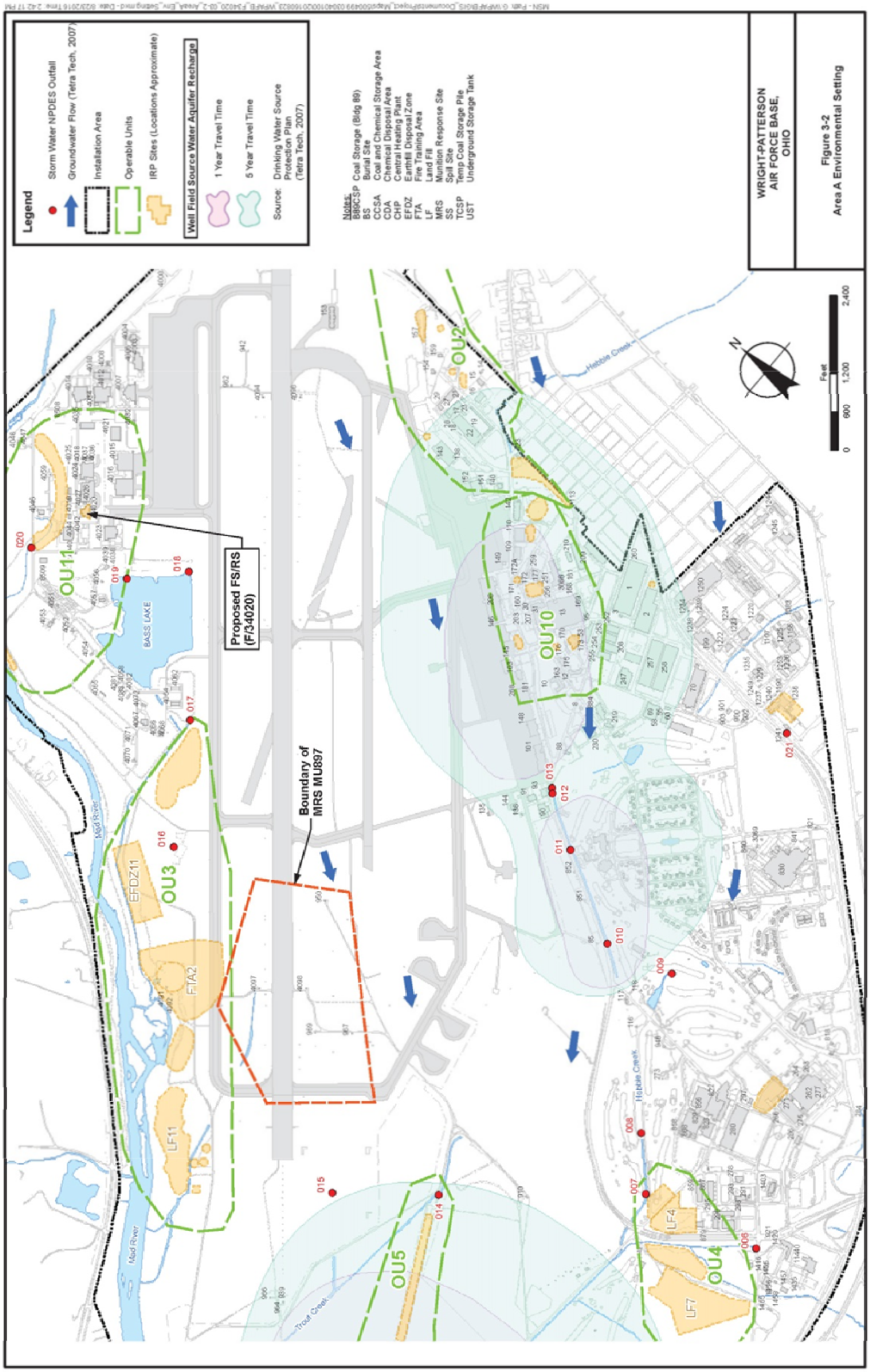
Regionally, the Mad River is located adjacent to the northwestern boundary of Area A and flows northeast to southwest (**Figure 3-3**). Surface water in the WPAFB area includes the Mad River, Trout Creek, Hebble Creek, Bass Lake, Twin Lakes, Gravel Lake, and wetland areas. These surface water features are recharged by both precipitation and groundwater. Trout Creek and Hebble Creek provide drainage of surface water runoff at WPAFB.

The majority of the West Ramp (adjacent and east/northeast and southeast/south of Bass Lake, approximately 1,200 ft south of the project area) drains to Bass Lake through Outfall 18. Drainage from the West Ramp includes an approximate 150-acre aircraft parking area where aircraft deicing, fueling, and minor maintenance occur. Storm water runoff from this area passes through oil-water separator (OWS) 3-WRAMP prior to discharging to Bass Lake at Outfall 18, located on the southeast corner of Bass Lake. The remainder of the West Ramp area drains to Outfall 19 (discharging to the northeast corner of Bass Lake) with activities in this area being performed primarily indoors. Sampling at Outfalls 18 and 19 is routinely performed for but is not exclusive of the following parameters: VOCs, oil/grease, benzene, toluene, ethylbenzene, xylenes, propylene glycol, and ammonia (WPAFB 2011c).

Trout Creek is located in the western portion of Area A and discharges to the Mad River north of Huffman Dam. Hebble Creek passes through the southwestern portion of Area A and discharges to the Mad River several hundred ft north of Huffman Dam. Gravel Lake, Twin Lake East and Twin Lake West are located in the southwest portion of Area A in OU5. These lakes were created as a result of gravel quarrying activities at WPAFB. Currently, the lakes are maintained as recreational areas for Base personnel and their families.

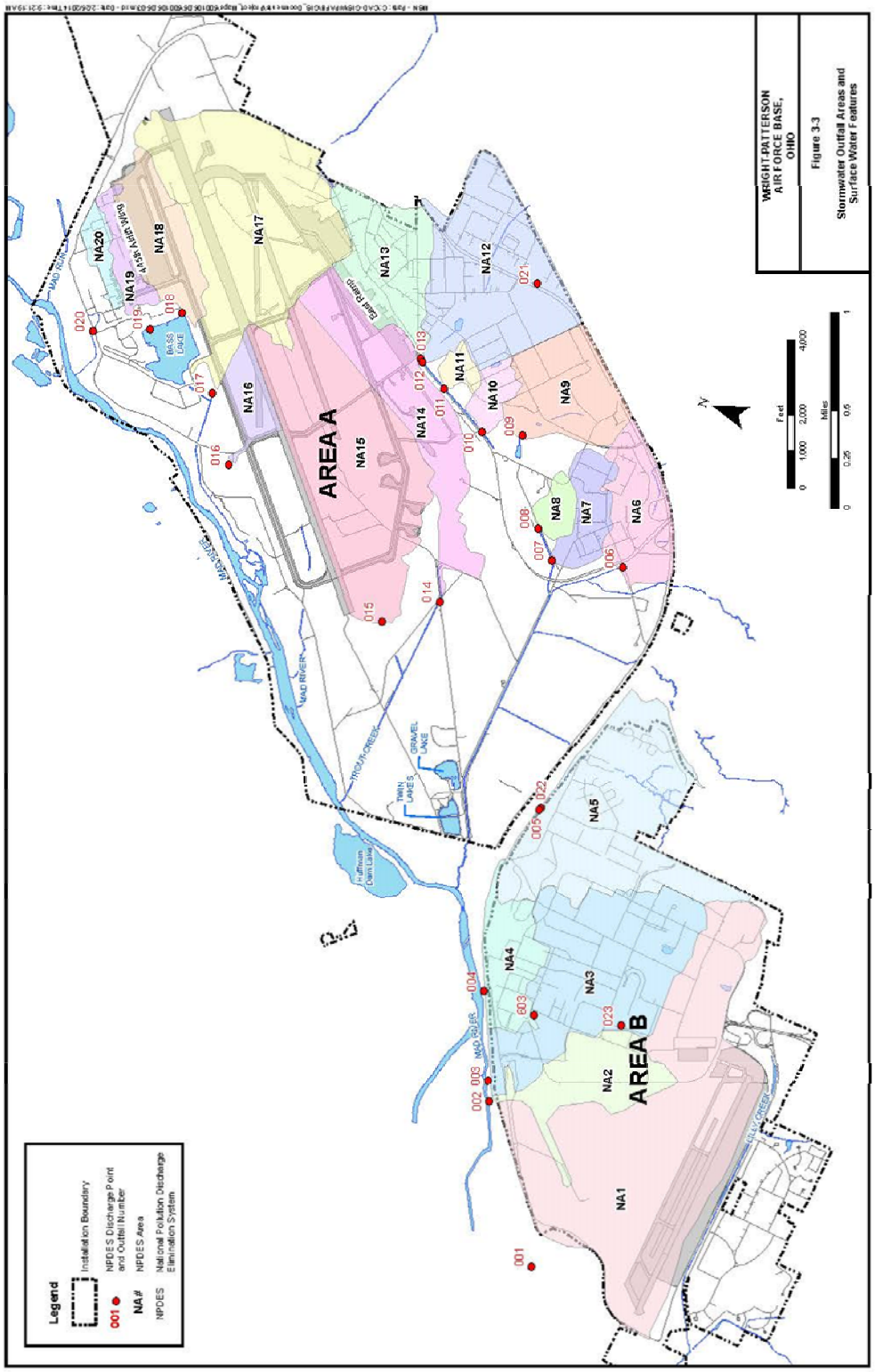
Floodplains

Floodplain management on WPAFB includes floodplain protection (EO 11988, EO13690), floodplain boundary determination, and assessment of proposed actions within floodplains. Floodplain protection and assessment of proposed actions is the responsibility of the 88 CEG EIAP. Federal actions occurring


Legend
Storm Water NPDES Outfall
Groundwater Flow (Tetra Tech, 2007)
Installation Area
Operable Units
IRP Sites (Locations Approximate)
Well Field Source Water Aquifer Recharge
1 Year Travel Time
5 Year Travel Time
Source: Drinking Water Source Protection Plan (Tetra Tech, 2007)
Notes
Coal Storage (Bldg 89)
Burial Site
Coal and Chemical Storage Area
Chemical Disposal Area
Central Heating Plant
Earthfill Disposal Zone
Fire Training Area
Land Fill
Munitions Response Site
Spill Site
Temp Coal Storage Pile
Underground Storage Tank
WRIGHT-PATTERSON AIR FORCE BASE, OHIO
Figure 3-2
Area A Environmental Setting
Feet
0
600
1,200
2,400
Proposed FS/RS (FJ34020)
Boundary of MRS MU897
OU1
OU2
OU3
OU4
OU5
OU10
OU11
BASS LAKE
Mad River
Hebble Creek
Trout Creek
EFDZ11
FTA2
LF11
LF4
LF7

1

1


WRIGHT-PATTERSON AIR FORCE BASE, OHIO
Figure 3-3
Stormwater Outfall Areas and Surface Water Features
AREA A
AREA B
NA1
NA2
NA3
NA4
NA5
NA6
NA7
NA8
NA9
NA10
NA11
NA12
NA13
NA14
NA15
NA16
NA17
NA18
NA19
NA20
MAD RIVER
TRIBUTARY CREEK
GRAVEL LAKE
TWIN LAKES
BASS LAKE
Huffman Dam Lake
Legend
Installation Boundary
NPDES Discharge Point and Outfall Number
NPDES Area
National Pollution Discharge Elimination System
Feet
Miles
N

within flood zones require a finding of no practical alternative (FONPA). Floodplain boundary maps are housed in the WPAFB GIS database.

A large portion of WPAFB and most of Area A lies within the Mad River floodplain. The 10-year floodplain is at 804.7 ft above MSL and the 100-year floodplain is at 813.4 ft above MSL (North American Vertical Datum [NAVD] 1988). Land surface elevation at F/34020 is approximately 816 ft above MSL, which is above the 10- and 100-year floodplain elevations.

The MCD was contacted regarding the Proposed Action and Alternatives. The MCD responded indicating that as the project is located within the Huffman Retarding Basin, it is subject to those restrictions as set forth by the MCD in Greene County Deed Book 129, Page 146 on December 16, 1922. Additionally, the MCD indicated that it appears the proposed project will not adversely affect the retarding basin. Correspondence with the MCD is included in **Appendix A**.

3.6 Biological Resources

3.6.1 Definition of the Resource

Biological resources include native or naturalized plants and animals, and the habitats, such as wetlands, forests, and grasslands, in which they exist. Sensitive and protected biological resources include plant and animal species listed as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS) or a state.

Wetlands are an important natural system and habitat because of the diverse biologic and hydrologic functions they perform. These functions include water quality improvement, groundwater recharge and discharge, pollution mitigation, nutrient cycling, wildlife habitat detention, and erosion protection. Wetlands are protected as a subset of the "the waters of the United States" under Section 404 of the CWA.

The term "waters of the United States" has a broad meaning under the CWA and besides navigable water, incorporates deepwater aquatic habitats and wetlands. The U.S. Army Corps of Engineers defines wetlands as "those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR Part 328).

Under the Endangered Species Act (ESA) (16 U.S. Code [USC] 1536), an "endangered species" is defined as any species in danger of extinction throughout all or a large portion of its range. A "threatened species" is defined as any species likely to become an endangered species in the foreseeable future.

The USFWS also maintains a list of species considered to be candidates for possible listing under the ESA. Although candidate species receive no statutory protection under the ESA, the USFWS has attempted to advise government agencies, industry, and the public that these species are at risk and might warrant protection under the Act.

The Ohio Department of Natural Resources (ODNR), Division of Wildlife may restrict the taking or possession of native wildlife threatened with statewide extirpation and maintains a list of endangered species (Ohio Revised Code [ORC] 1531.25). Additionally, ODNR maintains a list of plant species native to the state and in danger of extirpation or are threatened with becoming endangered. These plants are protected pursuant to ORC Chapter 1518.

3.6.2 Existing Conditions

Vegetation

The Base contains four general types of natural vegetative communities including forest, old fields, prairie, and wetlands. Areas that may be impacted by the Proposed Action are primarily disturbed areas. These include maintained areas that are frequently mowed such as right-of-ways, lawns, and recreational areas, and have been designated by the Base as turf and landscaped areas.

The Base has been awarded the Arbor Day Foundation's Tree City USA designation for fourteen years (WPAFB 2012). The Tree City USA award originates from the National Arbor Day Foundation, an organization founded in 1976 dedicated to tree plantings, conservation, and promotion of community forestry. Benefits of being a Tree City designee include creating a framework for action, education, a positive public image, and citizen pride.

Wildlife

The Base is home to a variety of wildlife. Previously conducted surveys documented the presence of 23 mammals, 118 birds, 8 reptiles, 6 amphibians, 36 fishes, 14 mussels, 35 butterflies, 8 moths, 15 odonates (dragonflies/damselflies), 6 carrion beetles, and 3 crayfish on the Base (WPAFB 2015a). The project area at F/34020 is located within a heavily disturbed area on Base and those species occurring in such areas are common species to the Base and surrounding area.

Because birds as well as mammals pose a hazard to airfield and aircraft operations, the Air Force has established bird air strike hazard and wildlife management plans. The Base implements a comprehensive Bird/Wildlife Aircraft Strike Hazard (BASH) plan that involves prevention, monitoring, and reduction of bird/wildlife hazards (WPAFB 2015a).

Threatened and Endangered Species

Endangered and threatened species on the Base are protected under the ESA. In addition, Air Force Policy Directive (AFPD) 32-70 and AFI 32-7064 require all Air Force installations to protect species

classified as federally or state endangered or threatened. The Endangered Species Management Plan (BHE Environmental [BHE] 2001), which has been incorporated into the Integrated Natural Resources Management Plan (INRMP), provides species-specific protection and conservation measures to protect known special status species occurring on the Base (WPAFB 2015a). Threatened and endangered species known to occur or have occurred on WPAFB are presented in **Table 3-4**.

Table 3-4. Federally and State-Listed Species of Animals, Insects, and Plants Recorded at WPAFB

Common Name		Status	
		Federal	State of Ohio
Mammals	Indiana bat	Endangered	Endangered
	Northern long-eared bat	Threatened	Species of Concern
Birds	King rail	-	Endangered
	Common tern	Bird of Conservation Concern	Endangered
	Upland sandpiper	Bird of Conservation Concern	Endangered
Reptiles	Eastern massasauga rattlesnake	Proposed Threatened	Endangered
	Smooth green snake	-	Endangered
Mussel	Clubshell	Endangered	Endangered
Plants	Fringe-tree	-	Threatened
	Ear-leaf foxglove	-	Endangered
	Whorled water-milfoil	-	Endangered

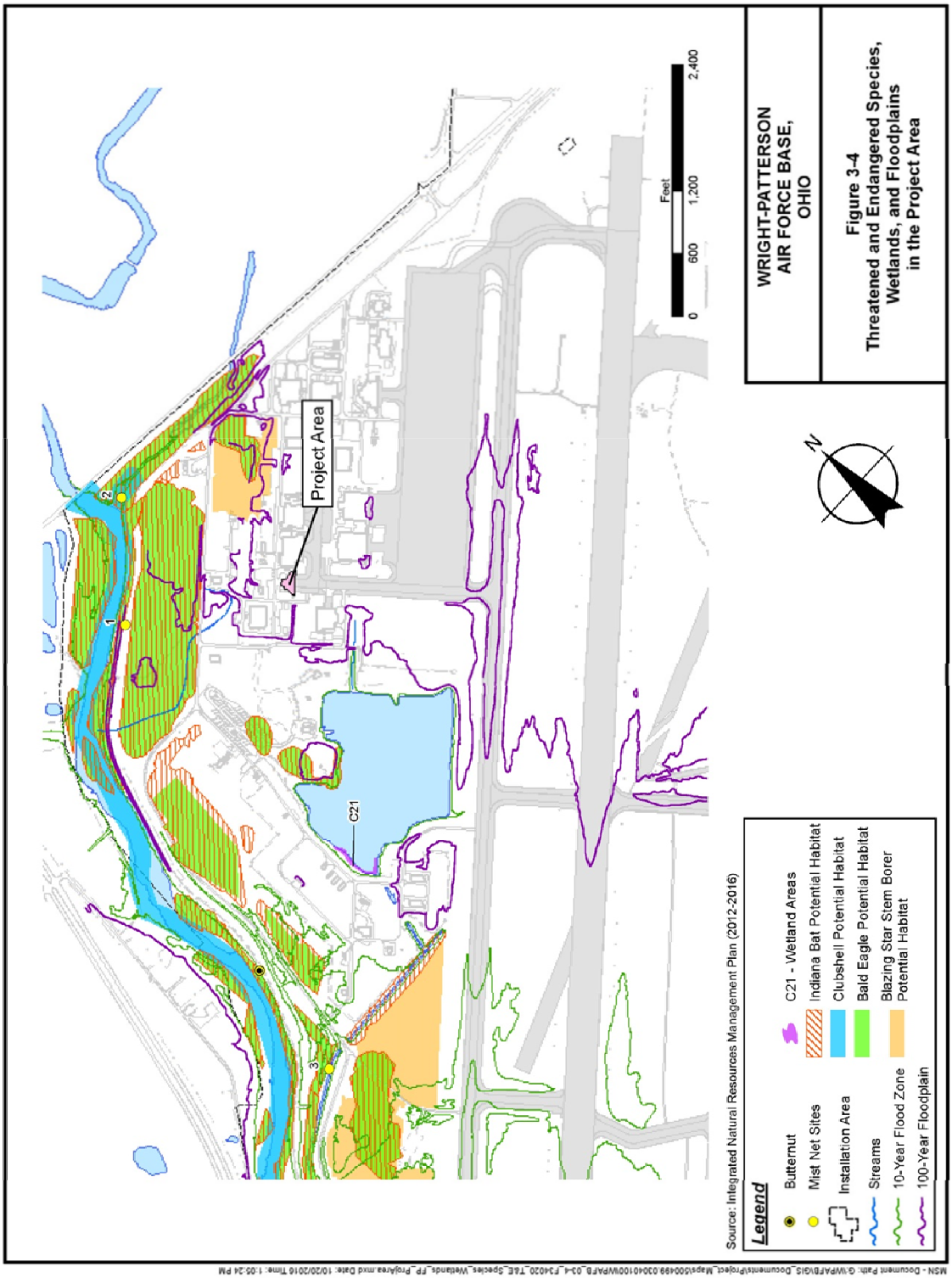
Locations of threatened and/or endangered species known to occur at WPAFB in Area A are presented on **Figure 3-4**.

As part of this EA, consultation with the ODNR was conducted to request Ohio Natural Heritage Program information for state- and federally-listed threatened and endangered plants and animals in the vicinity of the project area. The ODNR provided comments in a letter dated May 12, 2016. The ODNR reported the following Natural Heritage Database rare species at or within a one-mile radius of the project area (correspondence with the ODNR is presented in **Appendix A**):

- Upland sandpiper, state endangered
- Indiana bat, state endangered, federal endangered
- Badger, state species of concern
- Tongue-tied minnow, state threatened

The USFWS was also contacted as part of this EA to request known presence or absence of federal- and state-listed species that may be located within the project vicinity. The USFWS responded indicating that due to the project, type, size, and location, they do not anticipate adverse effects to federally endangered, threatened, proposed, or candidate species. Correspondence with the USFWS is presented in **Appendix A**.

1


Project Area
C21
Feet
0
600
1,200
2,400
N
WRIGHT-PATTERSON
AIR FORCE BASE,
OHIO
Figure 3-4
Threatened and Endangered Species,
Wetlands, and Floodplains
in the Project Area
Legend
Butternut
Mist Net Sites
Installation Area
Streams
10-Year Flood Zone
100-Year Floodplain
C21 - Wetland Areas
Indiana Bat Potential Habitat
Clubshell Potential Habitat
Bald Eagle Potential Habitat
Blazing Star Stem Borer
Potential Habitat
Source: Integrated Natural Resources Management Plan (2012-2016)

Wetlands/Jurisdictional Waters

Executive Order 11990, *Protection of Wetlands*, May 24, 1977, directs federal agencies to consider alternatives to avoid adverse effects on and incompatible development in wetlands. Federal agencies are directed to avoid new construction in wetlands, unless the agency finds there is no practicable alternative to construction in the wetland, and the proposed construction incorporates all possible measures to limit harm to the wetland.

The CWA sets the basic structure for regulating discharges of pollutants to U.S. waters. Section 404 of the CWA establishes a federal program to regulate the discharge of dredge and fill material into waters of the United States, including wetlands. The National Wetlands Inventory, a department within USFWS; USEPA; and the NRCS help in identifying wetlands.

Forty wetlands covering approximately 19.8 acres were identified at WPAFB in 2009 (WPAFB 2015a). Twenty-three wetlands were identified in Area A and 17 wetlands in Area B. The nearest wetland (C21) to the project area is approximately 2,400 ft south of F/34020 (**Figure 3-4**). Wetland C21 is approximately 0.5 acres in size and is a Category 2, palustrine, aquatic bed, wetland located on the shore of Bass Lake. Wetland C21 provides limited cover for larval and juvenile fish present in Bass Lake and the dense aquatic vegetation provides habitat for aquatic invertebrates that serve as food for fish as well as for shorebird feeding habitat (WPAFB 2015a).

The total jurisdictional stream length reported on Base in 2010 was 61,358 linear feet and included 13 jurisdictional streams in Area A (6 perennial, 6 intermittent, 1 intermittent/perennial) and 13 jurisdictional streams in Area B (1 perennial, 2 intermittent/perennial, 5 intermittent, 1 ephemeral/intermittent, 4 ephemeral) (WPAFB 2015a).

3.7 Cultural Resources

3.7.1 Definition of the Resource

As defined by 36 CFR 800.16, historic property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP) maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to a Native American tribe or Native Hawaiian organization and that meet the NRHP criteria. Several federal laws and regulations govern protection of cultural resources, including the National Historic Preservation Act (NHPA) (1966), the Archaeological and Historic Preservation Act (1974), the American Indian Religious Freedom Act (1978), the Archaeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (1990).

Native American tribes define cultural resources very broadly as the resources necessary for the survival and maintenance of their way of life. Ethnographic resources include plants and animals, ceremonial

sites, tribal historic sites, and areas of sacred geography possessing mythic/spiritual significance.

Typically, cultural resources are subdivided into archeological resources (prehistoric or historic sites where human activity has left physical evidence of that activity but no structures remain standing) or architectural resources (buildings or other structures or groups of structures, or designed landscapes that are of historic or aesthetic significance). Archaeological resources comprise areas where human activity has measurably altered the earth or deposits of physical remains are found (e.g., arrowheads and bottles).

Architectural resources include standing buildings, bridges, dams, and other structures of historic or aesthetic significance. Generally, architectural resources must be more than 50 years old to be considered for the NRHP. More recent structures might warrant protection if they have potential as Cold War-era resources. Structures less than 50 years in age, and particularly DoD structures in the category of Cold War-era, are evaluated under explicit guidance of the National Park Service Bulletin 22.

The Base is obliged to consider the effects of construction for the proposed addition on any historic properties. In doing so, WPAFB must first define the Area of Potential Effects (APE). According to 36 CFR 800.16(d), the APE is defined as:

> *The geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of the undertaking and may be different for different kinds of effects caused by the undertaking.*

In accordance with Section 106 of the NHPA, determinations regarding the potential effects of an undertaking on historic properties are presented to the State Historic Preservation Office (SHPO).

3.7.2 Existing Conditions

The Base owns over 250 historic buildings, several that are individually eligible for inclusion on the NRHP and most of which are located in one of three NRHP-eligible historic districts. The Integrated Cultural Resources Management Plan (ICRMP) for WPAFB, prepared in consultation with the SHPO, indicates F/34020 is not located within a Historic District nor is it individually eligible for listing on the NRHP. However, twenty buildings, including F/34020, were part of an assessment conducted in 2008 that included an evaluation of buildings constructed from 1957 to 1961 that were at or close to 50 years of age. Facility 34020 was determined eligible for the NRHP as part of a Strategic Air Command 4043rd Strategic Wing Multiple Resources Group (WPAFB 2011d).

Facility 34020 was addressed in a previous EA titled, Demolish Multiple Buildings – Phase II (WPAFB 2014a). At the time of the Demolition EA, F/34020 was scheduled for demolition in FY 2015. The mitigation for F/34020 would be addressed in a mitigation plan as outlined in the *Programmatic Agreement Between Wright-Patterson Air Force Base and the Ohio State Historic Preservation Officer*

Regarding FY 16-20 Demolitions for Physical Plant Reduction at the Wright-Patterson Air Force Base, Ohio. Therefore, consultation with the SHPO for the proposed construction of the FS/RS is considered complete.

3.8 Infrastructure

3.8.1 Definition of the Resource

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly human-made, with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as "urban" or developed. The availability of infrastructure and its capacity to support growth are generally regarded as essential to economic growth of an area.

The infrastructure components to be discussed in this section include transportation systems, utilities (electrical power, natural gas, liquid fuel, and water supply), pollution prevention, solid waste, sanitary and wastewater systems, heating and cooling, communications, and airfield pavement.

Solid waste management primarily concerns itself with the availability of landfills to support a population's residential, commercial, and industrial needs. Alternative means of waste disposal might involve waste-to-energy programs or incineration. In some localities, landfills are designed specifically for, and are limited to, disposal of construction and demolition debris. Recycling programs for various waste categories (e.g., glass, metals, and papers) reduce reliance on landfills for disposal.

3.8.2 Existing Conditions

The infrastructure information contained in this section was obtained from the WPAFB General Plan (WPAFB 2001) and provides a brief overview of each infrastructure component and comments on its existing general condition.

Transportation System. The Base is circled by a network of transportation facilities that provide ground access to the installation. These facilities include State Route (SR) 4, SR 844, and SR 235, which all border the installation and are classified as principal urban arterials. These arterials connect the Base to Interstates 675, 75, and 70, providing the installation with critical surface transportation access in all directions.

State Route 844 provides a route from Gate 15A to Interstate 675 (I-675), which is located east of the Base. Interstate 675 provides direct access to I-70, which is approximately 9 miles to the north; U.S. 35, which is approximately 5 miles to the south; and I-75, which is approximately 15 miles to the southwest. State Route 235 provides access from Gate 26A to SR-4 and I-70. Traffic enters Area B through Gates 1B from Springfield Street, 19B from National Road, and 22B off of I-675.

Electrical Power. Dayton Power & Light provides WPAFB with electrical power (WPAFB 2001). The Base receives power via two substations, which is delivered by over 500 miles of primary electrical lines on Base. These aboveground and underground transmission lines are owned by WPAFB (WPAFB 2001). The electrical distribution system on Base is designed to meet the needs of a much larger base population so the demands of service are within the system's capacity (WPAFB 2001). The overall condition of the system is adequate in providing the power to the current Base population.

Natural Gas. The natural gas at WPAFB is supplied by Vectren. The on-Base natural gas system, which is owned by WPAFB, contains over 130,000 linear ft of underground piping and 11 distribution subsystems (WPAFB 2001). Vectren owns a distribution line that goes past the Wright Memorial area. The natural gas system is the principal heating option for housing areas and outlying areas of the Base. It feeds some individual buildings and the four satellite heating plants.

Liquid Fuel. The liquid fuel system at WPAFB is delivered primarily by tank trucks with an alternate capability for pipeline delivery. Defense Logistics Agency-Energy is responsible for determining mode of delivery. The Base operates approximately 85 underground storage tanks (USTs) and 175 aboveground storage tanks (ASTs), which store a variety of fuels such as Jet Fuel-8 (JP-8), gasoline, and diesel.

Water Supply. The water supply and distribution system at WPAFB consists of two Base-owned and operated water collection, treatment, storage, and distribution systems (WPAFB 2001). One system services Wright Field (Area B) and The Woods (formerly referred to as Woodland Hills). The second system services Area A and Patterson Field. The only portion of the Base that does not use the WPAFB water distribution system is the Page Manor housing area. Page Manor receives water from the Montgomery County Sanitary Sewer District (WPAFB 2001). The Base utilizes approximately 3.2 million gallons of drinking water per day.

Pollution Prevention. Air Force Instruction 32-7080, *Pollution Prevention Program*, implements the regulatory mandates in the Emergency Planning and Community Right-to-Know Act, Pollution Prevention Act of 1990; EO 12856, *Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements*; EO 12873, *Federal Acquisition, Recycling, and Waste Prevention*; and EO 12902, *Energy Efficiency and Water Conservation at Federal Facilities.* Air Force Instruction 32-7080 prescribes the establishment of Pollution Prevention Management Plans. The 88 CEG fulfills this requirement with the following plans (WPAFB 2001):

- Integrated Solid Waste Management Plan
- Storm Water Pollution Prevention Plan
- Hazardous Waste Management Plan
- Hazardous Material Emergency Planning and Response Plan
- The Spill Prevention Control and Countermeasure Plan

These plans ensure that WPAFB maintains a waste reduction program and meets the requirements of the CWA; NPDES permit program; and Federal, state, and local requirements for spill prevention control and countermeasures.

***Solid Waste*.** Municipal solid waste at WPAFB is managed in accordance with the guidelines specified in AFI 32-7042, *Solid and Hazardous Waste Compliance*. This AFI incorporates by reference the requirements of Subtitle D, 40 CFR 240 through 244, 257, and 258, and other applicable Federal regulations, AFIs, and DoD Directives. In general, AFI 32-7042 establishes the requirement for installations to have a solid waste management program that incorporates the following: a solid waste management plan; procedures for handling, storage, collection, and disposal of solid waste; recordkeeping and reporting; and pollution prevention.

The Base operates a Qualified Recycling Program that is run by 88 CEG/Compliance Section of the Environmental Branch in the Installation Management Division (CEIEC). The recycling center is located in F/10293 on Patterson Field. The recycling program includes aluminum, glass, paper, plastics, oil, and ferrous and nonferrous materials (WPAFB 2001).

The Base has a contract for solid waste pick-up and disposal of all refuse on the base (WPAFB 2001). The contractor removes refuse from military family housing and industrial areas on the Base.

***Sanitary Sewer and Wastewater Systems*.** The sanitary sewer collection system at WPAFB is owned by the Base and consists of 43 miles of pipelines. The wastewater produced on the north side of Patterson Field is discharged to the Fairborn treatment plant, northwest of the Base. The wastewater produced on the remainder of Patterson Field, Wright Field, and Page Manor is served by the City of Dayton treatment system.

The Base produces an average of 3.5 million gallons per day of sewage. The overall condition of the system is adequate in the collection of wastewater. The current system is designed to accommodate a Base population that is approximately 50 percent larger (WPAFB 2001).

***Heating and Cooling*.** Coal operations have been discontinued at the Base and former coal plants have been converted to natural gas. The Base is heated with several natural gas-fired central heating plants. The two largest central heating plants provide approximately 80 percent of the annual heating requirements for WPAFB; one of these plants serves Area A and the other serves Area B. Several satellite heating plants serve smaller areas on the Base. These plants operate on natural gas and provide approximately four percent of the Base's overall heating needs. The remaining 16 percent of the Base's overall heating is met by natural gas furnaces in individual buildings (WPAFB 2001).

Communications. The communications system at WPAFB provides support to the 445 AW and its associate units. The communications system consists of telephone, local computer systems, long-haul communications, and land mobile radio systems (WPAFB 2001). There are over 100 miles of communication cable ducts on Base (WPAFB 2001). The Base's communications and information utility infrastructure is in good condition. There are improvements planned for the Base that would enable it to meet any known future communication requirements (WPAFB 2001).

3.9 Health and Safety

3.9.1 Definition of the Resource

A safe environment is one in which there is no, or an optimally reduced, potential for death, serious bodily injury or illness, or property damage. Human health and safety addresses workers' health and safety during construction and demolition activities as well as public health and safety during and following construction and demolition activities.

Demolition and construction site safety requires adherence to regulatory requirements imposed for the benefit of employees. Construction site safety includes implementation of engineering and administrative practices that aim to reduce risks of illness, injury, death, and property damage. The health and safety of onsite military and civilian workers are safeguarded by numerous DoD and military branch specific regulations designed to comply with standards issued by the federal Occupational Safety and Health Administration (OSHA), USEPA, and state occupational safety and health agencies. These standards specify health and safety requirements, the amount and type of training required for workers, the use of personal protective equipment, administrative controls, engineering controls, and permissible exposure limits for workplace stressors.

Necessary elements for an accident-prone situation or environment include the presence of the hazard itself together with the exposed (and possibly susceptible) population. The degree of exposure depends primarily on the proximity of the hazard to the population. Activities that can be hazardous include transportation, maintenance and repair activities, and the creation of highly noisy environs. The proper operation, maintenance, and repair of vehicles and equipment carry important safety implications. Any facility or human-use area with potential explosive or other rapid oxidation processes creates unsafe environments for nearby populations. Extremely noisy environments can also mask verbal or mechanical warning signals such as sirens, bells, or horns.

Air Force Manual (AFMAN) 91-201, *Explosives Safety Standards*, established a central source for explosives safety criteria. It applies to everyone involved in explosives operations of any kind at Air Force, Air National Guard, and Air Force Reserve-owned or leased facilities. Explosives are classified based on their reactions to specific influences. The explosives hazard class is further subdivided into "division", based on the character and predominance of the associated hazards and their potential for

causing personnel casualties or property damage. Explosives Hazard Class/Division 1.4 designates a moderate fire with no significant blast or fragment hazard (Sandia 2010).

Explosive safety zones (ESZs) are required for areas where ordnance is stored or handled. The ESZs are typically determined based upon the net explosive weight of the ordnance to be stored or handled and the blast resistance properties of the magazine. Explosive Safety Quantity Distance (ESQD) arcs that delineate the extents of each ESZ are constructed. The ESZ and ESQD requirements are specified in AFMAN 91-201.

3.9.2 Existing Conditions

Contractor Safety

All contractors performing construction activities are responsible for following ground safety regulations and for worker compensation programs, and are required to conduct construction activities in a manner that does not pose any risk to workers or personnel. Industrial hygiene programs address exposure to hazardous materials, use of personal protective equipment, and availability of Safety Data Sheets. Industrial hygiene is the responsibility of contractors, as applicable. Contractor responsibilities are to review potentially hazardous workplace operations; to monitor exposure to workplace chemical (e.g., asbestos, lead, hazardous materials), physical (e.g., noise propagation), and biological (e.g., infectious waste) agents; to recommend and evaluate controls (e.g., ventilation, respirators) to ensure personnel are properly protected or unexposed; and to ensure a medical surveillance program is in place to perform occupational health physicals for those workers subject to any accidental chemical exposures.

Military Personnel Safety

Each branch of the military has its own policies and regulations that act to protect its workers, despite their work location. The AFI 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program*, which implements AFPD 91-3, *Occupational Safety and Health*, governs the recognition, evaluation, control, and protection of AF personnel from occupational health and safety hazards. The purpose of the AFOSH Program is to minimize the loss of AF personnel from occupational death, injuries, or illnesses by managing risks.

The health and safety of personnel at WPAFB is adversely affected by the deficiencies of the existing Fire Station 2 and F/34012. Personnel must contend with lack of adequate training and classroom space, medical storage area, and quality of life deficiencies (sleeping quarters, dining area, training room, drive-through apparatus bays). These design deficiencies present health and safety concerns to the personnel working in the existing fire station at F/34012.

Public Safety

The 88 CEG Fire Department at WPAFB provides fire, crash, rescue, and structural fire protection at the Base. The emergency services department provides WPAFB with fire suppression, crash response,

emergency medical response, hazardous substance protection, and emergency response planning and community health and safety education through the dissemination of public safety information to the installation. The 88 CEG Fire Department abides by a general safety policy relating to the performance of all activities at the Base. Individuals, supervisors, managers, and commanders are expected to give full support to safety efforts and safety awareness and strict compliance with established safety standards are expected.

Munitions and Explosives Safety

Although there are munitions storage and ESZs in the vicinity of the airfield and West Ramp, the proposed location of the FS/RS is outside of any ESZs.

3.10 Hazardous Materials/Wastes and Environmental Restoration Program Sites

3.10.1 Definition of the Resource

The AFPD 32-70, *Environmental Quality*, establishes the policy that the USAF is committed to

- Cleaning up environmental damage resulting from its past activities
- Meeting all environmental standards applicable to its present operations
- Planning its future activities to minimize environmental impacts
- Managing responsibly the irreplaceable natural and cultural resources it holds in public trust
- Eliminating pollution from its activities wherever possible

Hazardous material is defined as any substance with physical properties of ignitability, corrosivity, reactivity, or toxicity that might cause an increase in mortality, serious irreversible illness, and incapacitating reversible illness, or that might pose a substantial threat to human health or the environment. Hazardous waste is defined as any solid, liquid, contained gaseous, or semi-solid waste; or any combination of wastes that pose a substantial present or potential hazard to human health or the environment.

Evaluation of hazardous materials and wastes focuses on USTs and ASTs and the storage, transport, and use of fuels, petroleum, oils, and lubricants. Evaluation might also extend to generation, storage, transportation, and disposal of hazardous wastes when such activity occurs at or near the project site of a proposed action. In addition to being a threat to humans, the improper release of hazardous materials and wastes can threaten the health and well-being of wildlife species, botanical habitats, soil systems, and water resources. In the event of release of hazardous materials or wastes, the extent of contamination varies based on type of soil, topography, and water resources.

Special hazards are those substances that might pose a risk to human health, but are not regulated as contaminants under the hazardous waste statutes. Included in this category are asbestos-containing material (ACM), radon, lead-based paint (LBP), polychlorinated biphenyls (PCBs), and unexploded ordnance. The presence of special hazards or controls over them might affect, or be affected by, a

proposed action. Information on special hazards describing their locations, quantities, and condition assists in determining the significance of a proposed action.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA) and the Toxic Substances Control Act (TSCA), defines hazardous materials. The Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act, which was further amended by the Hazardous and Solid Waste Amendments, defines hazardous wastes. In general, both hazardous materials and wastes include substances that, because of their quantity, concentration, physical, chemical, or infectious characteristics, might present substantial danger to public health or welfare or the environment when released or otherwise improperly managed.

Through its ERP, the DoD evaluates and cleans up sites where hazardous wastes have been spilled or released to the environment. The ERP provides a uniform, thorough methodology to evaluate past disposal sites, to control the migration of contaminants, to minimize potential hazards to human health and the environment, and to clean up contamination. Knowledge of past ERP activities provides a useful gauge of the condition of soils, water resources, and other resources that might be affected by contaminants. It also aids in identification of properties and their usefulness for given purposes (e.g., activities dependent on groundwater usage might be foreclosed where a groundwater contaminant plume remains to complete remediation).

3.10.2 Existing Conditions

Hazardous Materials

Air Force Instruction 32-7086, *Hazardous Materials Management*, establishes procedures and standards that govern management of hazardous materials throughout the USAF. It applies to all USAF personnel who authorize, procure, issue, use, or dispose of hazardous materials, and to those who manage, monitor, or track any of those activities. The Base utilizes a hazardous material management program (HMMP) through which hazardous materials are controlled from procurement through storage and issue to disposal. Hazardous and toxic material procurements at WPAFB are approved and tracked by the Bio-environmental Engineering Office. The Installation Management Division supports and monitors environmental permits, hazardous material and hazardous waste storage, spill prevention and response, and participation on the Base Environmental Protection Committee. The Hazardous Substance Steering Committee is a network of safety, environmental and logistics experts who work with hazardous material Issue Point Managers, Unit Environmental Coordinators (UECs), and other hazardous material users to ensure safe and compliant hazardous material management throughout the Base (WPAFB 2006).

Hazardous Waste

The 88 CEG maintains a Hazardous Waste Management Plan (WPAFB 2009) as directed by AFI 32-7042, *Solid and Hazardous Waste Compliance*. This plan prescribes the roles and responsibilities of all

members of WPAFB with respect to the waste stream inventory, waste analysis plan, hazardous waste management procedures, training, emergency response, and pollution prevention. The plan establishes the procedures to comply with applicable federal, state, and local standards for solid waste and hazardous waste management.

Wastes generated at WPAFB include waste flammable solvents, contaminated fuels and lubricants, paint/coating, stripping chemicals, waste oils, waste paint-related materials, mixed-solid waste (MSW), and other miscellaneous wastes. Management of hazardous waste is the responsibility of each waste-generating organization and the Compliance Division (88 CEG/CEIEC). The Base produces more than 1,000 kilograms of hazardous waste per month and is considered a large quantity hazardous waste generator.

Stored Fuels

Stored fuels present a potential threat to the environment, which is mitigated at WPAFB through spill prevention control and countermeasures (SPCC). The WPAFB SPCC Plan (WPAFB 2008) describes practices used to minimize the potential for stored fuel spills, prevent spilled materials from migrating off the base, and ensure that the cause of any spill is corrected. The WPAFB Oil and Hazardous Substance Integrated Contingency Plan (WPAFB 2005) describes emergency planning, notification and spill response practices. Collectively, the SPCC Plan, with a focus on spill prevention, and the Integrated Contingency Plan, with a focus on spill response, provides a comprehensive strategy for preventing stored fuel releases to the environment.

The Spill Prevention Coordinator (SPC) is the primary point of contact for the SPCC Program. The SPC works closely with Tank Managers, UECs, and WPAFB emergency response personnel to implement the SPCC Plan. Required SPCC training, standard operating procedures, inspections, and record keeping are coordinated by the SPC.

Asbestos-Containing Materials

The AFI 32-1052, *Facilities Asbestos Management,* provides the direction for asbestos management at USAF installations. This instruction incorporates by reference applicable requirements of 29 CFR 669 et seq., 29 CFR 1910.1025, 29 CFR 1926.58, 40 CFR 61.3.80, Section 112 of the CAA, and other applicable AFIs and DoD Directives. Air Force Instruction 32-1052 requires bases to develop an Asbestos Management Plan to maintain a permanent record of the status and condition of ACM in installation facilities, as well as documenting asbestos-management efforts. In addition, the instruction requires installations to develop an asbestos operating plan detailing how the installation accomplishes asbestos-related projects. Asbestos is regulated by the USEPA with the authority promulgated under OSHA, 29 U.S.C. 669, et seq. Section 112 of the CAA regulates emissions of asbestos fibers to ambient air. The USEPA policy is to leave asbestos in place if disturbance or removal could pose a health threat.

The 88 CEG/CEIEC has developed standard contract specifications for the removal and disposal of ACM. These specifications incorporate all applicable USEPA, OSHA, and USDOT requirements. The Ohio Department of Health (ODH) must license contractors, and all asbestos-abatement work must be done under the onsite supervision of an ODH-designated "competent person." Work area monitoring for airborne asbestos fibers is accomplished by an industrial hygienist certified by the American Board of Industrial Hygiene. Industrial hygienists must also be certified by the ODH. Laboratory analyses of air samples and of bulk samples must be accomplished in a certified and accredited laboratory.

Non-friable Category I ACM can be disposed of in a sanitary landfill. All Category II or any friable Category I asbestos must be disposed of in a USEPA-approved landfill. The ACM-abatement contractors are responsible for obtaining all required permits from regulatory agencies and for OEPA and ODH notification requirements (WPAFB 2001). The Base has implemented an Asbestos Management Plan to minimize risk from friable ACM in buildings where the material remains. Additional sampling is usually required in buildings scheduled for renovation or demolition (WPAFB 2001). As part of the Proposed Action or Alternative B, F/34020 would be sampled for ACM prior to demolition or renovation.

Lead-Based Paint

The Residential Lead-Based Paint Hazard Reduction Act of 1992, Subtitle B, Section 408 (commonly called Title X), passed by Congress on October 28, 1992, regulates the use and disposal of LBP on federal facilities. Federal agencies are required to comply with applicable federal, state, and local laws relating to LBP activities and hazards.

The USAF policy and guidance establishes LBP management at USAF facilities. The policy incorporates, by reference, the requirements of 29 CFR 1910.120, 29 CFR 1926, 40 CFR 50.12, 40 CFR 240 through 280, the CAA, and other applicable federal regulations. Additionally, the policy requires each installation to develop and implement a facility management plan for identifying, evaluating, managing, and abating LBP hazards.

More than 95 percent of WPAFB facilities were constructed prior to 1980 and contain LBP. Lead concentrations are generally low with the exception of paints used on outdoor structures such as water towers. The HUD action level is 5,000 ppm. However, even when concentrations are below this, OSHA Lead Construction Standard (29 CFR 1926.62) must be followed. All workers performing lead abatement or removal or any other lead disturbance are required to have a lead workers license issued by the ODH. Licensing is not required if the contract involves mechanical demolition. Contractors containerize LBP wastes which are disposed of under contract. As part of the Proposed Action or Alternative B, F/34020 would be sampled for LBP prior to demolition or renovation.

Environmental Restoration Program

The ERP is a subcomponent of the Defense Environmental Restoration Program that became law under SARA (formerly the Installation Restoration Program [IRP]). The ERP requires each DoD installation to identify, investigate, and clean up hazardous waste disposal or release sites. The Base began its IRP in 1981 with the investigation of possible locations of hazardous waste contamination. In 1988, WPAFB entered into a Consent Order with the OEPA. In October 1989, WPAFB was placed on the USEPA's National Priorities List, a list of sites that are considered to be of special interest and require immediate attention (WPAFB 2001).

The Base currently has identified 67 ERP sites, two regional groundwater sites, and several areas of concern per the Air Force Restoration Information Management System. The Base has grouped the majority of confirmed or suspected sites requiring investigation and characterization in 11 geographically-based OUs, designated as OUs 1 through 11 (IT 1999). In addition to the 11 OUs, WPAFB addressed base-wide issues of groundwater and surface water contamination by creating the Groundwater Operable Unit (GWOU) under the Basewide Monitoring Program. The GWOU is monitored by agreement with the OEPA and USEPA under the Long-Term Groundwater Monitoring Program. Principal groundwater contaminants beneath WPAFB include benzene, toluene, ethylbenzene, xylene, trichloroethene, and tetra-chloroethene (WPAFB 2007).

As shown on **Figure 3-2**, F/34020 is within OU11. The ERP site, underground storage tank 4020 (UST4020), is at F/34020. The UST at this location was used from 1956 to 1986 to store waste JP-4 fuel and hydraulic fluid that was removed from an oil/water separator. The 250-gallon UST was removed when a leak was discovered in 1986 (WPAFB 1998). Following the discovery of the leak, the contents were pumped out and the tank was removed in 1986.

During a Phase II – Stage 2 Investigation, four soil borings were drilled around the perimeter of the UST, and 12 soil samples were collected and analyzed for total petroleum hydrocarbons (TPH) and aromatic VOCs. The TPH were detected at 7 to 164 ppm; xylene was detected in one sample at a depth of 13 ft at a concentration of 37 ppm; and toluene was detected in one surface soil sample at 0.045 ppm. Contaminant concentrations did not exceed Bureau of Underground Storage Tank Regulations (BUSTR) acceptable concentrations for VOCs or TPH, with the exception of one soil sample that slightly exceeded the BUSTR Category 1 standards for xylene and TPH. Groundwater sample results did not exceed maximum contaminant levels (MCLs), therefore, groundwater was determined to have not been impacted. The UST removal and subsequent soil/groundwater sampling was considered to be the final action for UST4020 (WPAFB 1998).

Although a risk assessment was not conducted for the UST4020 site, the concentration of contaminants detected (TPH, toluene, and xylene) did not exceed BUSTR cleanup criteria with the exception of one sample at a depth of 13 to 15 ft; the concentration of TPH was detected at 164 ppm and xylene was

detected at 37 ppm, both exceeding BUSTR Category 1 criteria for TPH (105 ppm) and xylene (28 ppm) (WPAFB 1998). The UST4020 site was included in the Record of Decision (ROD) for 41 No Action Sites, therefore, no additional sampling or long-term monitoring was required (WPAFB 1998). In addition, the UST4020 site received a No Further Action (NFA) status from BUSTR in a letter dated March 14, 2014. A copy of the BUSTR NFA letter is included in **Appendix D**.

It is also noted that historical information indicates that there was a release of aqueous film-forming foam (AFFF) in the vicinity of F/34020. This site is to be included in an upcoming Site Inspection (SI) of AFFF sites.

The proposed FS/RS project site is also located approximately 300 ft south of a subsurface disposal area (Chemical Disposal Area [CDA]). The CDA was included in the OU11 field investigation; based on results of that investigation, it was determined that no significant risk or threat to public health and the environment existed and no further action was proposed (IRP Management Action Plan Update; WPAFB 2007). The CDA is included in the ROD for 41 No Action Sites (WPAFB 1998). In addition, the proposed construction activities at the FS/RS project site should not impact the criteria of waste placement, slope stability, or other ancillary structures, if any, at the CDA.

4.0 ENVIRONMENTAL CONSEQUENCES

This section describes the potential consequences associated with implementing the Proposed Action (Alternative A), Alternative B, or the No Action (Alternative C). In **Sections 4.1** to **4.11**, each alternative is evaluated for its potential to affect physical, biological, and socioeconomic resources in accordance with 40 CFR 1508.8. Potential impacts for each resource area are described in terms of their significance. Significant impacts are those that would result in substantial changes to the environment or socioeconomic resources (as defined by 40 CFR 1508.27) and should receive the greatest attention in the decision-making process.

The thresholds of change for the intensity of impacts are defined as follows:

- *Negligible*, the impact is localized and not measureable or at the lowest level of detection;
- *Minor*, the impact is localized and slight but detectable;
- *Moderate*, the impact is readily apparent and appreciable;
- *Major*, the impact is severely adverse or highly noticeable and considered to be significant; or
- *Beneficial,* the impact is considered positive for the resource area.

4.1 Land Use

4.1.1 Evaluation Criteria

Potential impacts on land use are based on the level of land use sensitivity in areas affected by a proposed action and compatibility of proposed actions with existing conditions. A land use impact would be adverse if it met the following criteria:

- Inconsistency or noncompliance with existing land use plans or policies
- Precluded the viability of existing land use
- Precluded continued use or occupation of an area
- Incompatibility with adjacent land use to the extent that public health or safety is threatened
- Conflict with planning criteria established to ensure the safety and protection of human life and property

4.1.2 Proposed Action, Alternative A

No short-or long-term adverse effects on land use are expected because no changes to land use would occur at or surrounding WPAFB as a result of implementing the Proposed Action. Therefore, there would be no significant impacts to land use resources.

4.1.3 Alternative B

Similar to the Proposed Action, there would be no short- or long-term adverse effects on land use because no changes to land use would occur at or surrounding WPAFB as a result of implementing Alternative B. Therefore, there would be no significant impacts to land use resources.

4.1.4 No Action, Alternative C

The No Action alternative would have no impact on land use over current conditions.

4.2 Air Quality

4.2.1 Evaluation Criteria

The environmental consequences to local and regional air quality conditions near a proposed federal action are determined based upon the increases in regulated pollutant emissions relative to existing conditions and ambient air quality. For the purposes of this EA, the impact in NAAQS "attainment" areas would be considered significant if the net increases in pollutant emissions from the federal action would result in any one of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Expose sensitive receptors to substantially increased pollutant concentrations
- Exceed any Evaluation Criteria established by a SIP

As mentioned in Section 3.2, the area including WPAFB is classified as a moderate maintenance area for O_3 and $PM_{2.5}$, and is designated as an unclassified/attainment area for all other criteria pollutants.

Impacts on air quality in NAAQS "nonattainment" areas are considered significant if the net changes in project-related pollutant emissions result in any of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard
- Increase the frequency or severity of a violation of any ambient air quality standard
- Delay the attainment of any standard or other milestone contained in the SIP

Because WPAFB is located in an area designated as attainment/maintenance for O_3 and $PM_{2.5}$, a conformity applicability analysis is required to determine whether the Proposed Action or Alternatives are subject to the Conformity Rule. With respect to the General Conformity Rule, effects on air quality would be considered significant and, therefore, subject to an evaluation to determine compliance with the General Conformity Rule, if:

- The proposed federal action does not relate to transportation plans, programs, and projects developed, funded, or approved under Title 23 U.S.C. or the Federal Transit Act, and
- The Proposed Action-related direct and indirect emissions exceed *de minimis* threshold levels established in 40 CFR 93.153(b) for individual nonattainment pollutants or for pollutants for which the area has been re-designated as a maintenance area.

The *de minimis* threshold emission rates were established by the USEPA in the General Conformity Rule to focus analysis requirements on those federal actions with the potential to have "significant" air quality impacts. **Table 4-1** presents the *de minimis* thresholds for each regulated pollutant. The *de minimis* thresholds shown in **Table 4-1** vary depending on the severity of the nonattainment area classification.

Table 4-1. Conformity *de minimis* Emission Thresholds

Pollutant	Status	Classification	*de minimis* Limit (tpy)
Ozone (measured as NO_x or VOCs)	Nonattainment	Extreme	10
		Severe	25
		Serious	50
		Moderate/marginal (inside ozone transport region)	50 (VOCs)/100 (NO_x)
		All others	100
	Maintenance	Inside ozone transport region	50 (VOCs)/100 (NO_x)
		Outside ozone transport region	100
Carbon Monoxide (CO)	Nonattainment/ maintenance	All Nonattainment Areas (NAA's) and Maintenance Areas	100
Particulate Matter (PM_{10})	Nonattainment	Serious	70
		Moderate	100
	Maintenance	All Areas	100
Particulate Matter ($PM_{2.5}$)	Nonattainment/ maintenance	Direct Emissions	100
		SO_2 precursors	100
		NO_x precursors	100
		VOC or Ammonia precursors (if significant)	100
Sulfur Dioxide (SO_2)	Nonattainment/ maintenance	All NAA's and Maintenance Areas	100
Nitrogen Oxides (NO_x)	Nonattainment/ maintenance	All NAA's and Maintenance Areas	100
Lead (Pb)	Nonattainment/ maintenance	All NAA's and Maintenance Areas	25

Source: 40 CFR 93.153 (b)
tpy: tons per year

In addition to the *de minimis* emission thresholds, federal PSD regulations define air pollutant emissions to be significant if the source is within 10 km of any federal Class I area (e.g., wilderness area greater than 5,000 acres or national park greater than 6,000 acres) and emissions would cause an increase in the concentration of any regulated pollutant in the Class I area of 1 $\mu g/m^3$ or more [40 CFR 52.21(b) (23) (iii)]. Although PSD rules apply only to stationary sources of emissions, for the purposes of this EA, such an impact to a Class I area would be considered adverse.

Air Quality Regulations Applicable to the Proposed Action and Alternatives

Stationary Sources and New Source Review. Local and regional pollutant impacts resulting from direct and indirect emissions from stationary emission sources under the Proposed Action are addressed through federal and state permitting program requirements under NSR regulations (40 CFR 51 and 52). Local stationary source permits are issued by OEPA and enforced by RAPCA. As noted previously, WPAFB has appropriate permits in place and has met all applicable permitting requirements and conditions for existing stationary devices. The Proposed Action or Alternatives may be subject to minor source permitting requirements. Storage tanks are stationary sources that may be categorically exempt from

requiring an air permit due to their size, content, or a combination of the two qualifying criteria. Emergency generators are required to at least maintain a valid PBR. Collectively, the project is unlikely to be subject to NSR/PSD unless the aggregate emissions exceed certain thresholds. The Base should evaluate the project for any permitting requirements prior to commencing construction.

National Emissions Standards for Hazardous Air Pollutants. Because WPAFB has the potential to emit more than 25 tpy of hazardous air pollutants, certain hazardous air pollutant-emitting activities on Base are subject to regulation under National Emissions Standards for Hazardous Air Pollutants (NESHAP) rules promulgated in 40 CFR Parts 61 and 63. These NESHAP require implementation of emissions control measures and detailed recordkeeping and reporting to show compliance applicable rules for select operations. Specific NESHAP to which activities at WPAFB are subject include:

- 40 CFR 63 Subpart GG, Aerospace NESHAP
- 40 CFR 63 Subpart ZZZZ, RICE MACT
- 40 CFR 63 Subpart DDDDD, Industrial, Commercial, and Institutional Boilers (Boiler MACT)
- 40 CFR 61 Subpart M, Asbestos Remediation

In addition, WPAFB would also be subject to the Defense Land Systems and Miscellaneous Equipment (DLSME) NESHAP when that rule is promulgated. This rule would cover military surface coating operations other than those subject to the Aerospace and Shipbuilding NESHAP. The intent is to simplify compliance for DoD facilities that are currently forced to comply with multiple overlapping, and sometimes conflicting, NESHAP, including the Miscellaneous Metal Parts and Products Coating NESHAP, Plastic Parts and Products Coating NESHAP, Metal Furniture Coating NESHAP, Large Appliance Coating NESHAP, and Fabric and Other Textiles Coating NESHAP. The USEPA currently has no date set for publication of a draft DLSME NESHAP. Neither the Proposed Action nor any of the Alternatives are subject to NESHAP requirements.

New Source Performance Standards (NSPS). The USEPA promulgated NSPS rules under 40 CFR Part 60 to require minimum levels of controls for specific categories of newly installed or modified stationary sources. The NSPS applies to any new or modified stationary source within a specific category regardless of installed location. States that have been granted primacy over these rules have adopted those rules into the SIP. The NSPS for diesel emergency generators are found in 40 CFR Subpart IIII. If a new emergency generator is to be installed as part of the Proposed Action or Alternatives, then compliance with Subpart IIII can be assured by requiring the purchase of an engine certified by the manufacturer to meet the NSPS standards.

Fugitive Dust Regulations. The OAC rule 3745-15-07 declares dust escaped from any source that causes damage to property to be a public nuisance. Pursuant to OAC rule 3745-17-08(A)(2), the OEPA Director may require any source that causes or contributes to such a nuisance to submit and implement a control plan that employs reasonably available control measures to prevent fugitive dust from becoming airborne.

The fugitive emissions from the demolition and construction activities associated with site preparation activities have the potential to become a nuisance per OEPA regulations. The Base would include mitigation steps in the project to preempt any emissions from the construction and demolition phases of the Proposed Action or any Alternative from becoming a nuisance.

Greenhouse Gases. The GHG emissions from the Proposed Action or any Alternative have been quantified to the extent feasible for information and comparison purposes. As previously indicated, the CEQ guidance indicates the reference point of 25,000 metric tons of direct or indirect CO_2e GHG emissions provides agencies with a useful indicator. The GHG emissions from the construction and demolition activities primarily include CO_2 and methane components. The main source of the GHG emissions are from fuel combustion used in construction equipment, material deliveries, refuse removal, and worker commuting.

The GHG emissions in terms of CO_2e emission levels were estimated and reported in **Appendix B** at approximately 1,723 metric tons (1,899 long tons) for the Proposed Action and 1,108 metric tons (1,222 long tons) for Alternative B. This emission total includes emissions from both components CO_2 and methane. These GHG emission levels fall below the CEQ guidance reference point for warranting further consideration.

Conformity. Because NAAQS maintenance areas for two criteria pollutants are affected by the Proposed Action or any Alternative, the USAF must comply with the federal General Conformity Rule. An analysis has been completed to ensure that, given the changes in direct and indirect emissions of the O_3 precursors (NO_x and VOCs), direct $PM_{2.5}$, and $PM_{2.5}$ precursors (SO_2 and NO_x), the Proposed Action or any Alternative would be in conformity with CAA requirements. The Conformity Determination requirements specified in the General Conformity Rule can be avoided if the project pollutant rate increase resulting from any Alternative is below *de minimis* threshold levels for each pollutant of interest. For purposes of determining conformity in these attainment/maintenance areas, AFI 32-7404 paragraph 3.4.2 states that the proponent shall perform a General Conformity Applicability Analysis using the Air Conformity Applicability Model (ACAM) or other USAF approved automated air quality impact tool. Projected regulated pollutant emissions associated with the Proposed Action and each Alternative were estimated using ACAM version 5.0.2. The ACAM summary and detail reports are provided in **Appendix B**.

The emission calculations assume that the existing West Ramp Fire/Rescue operational utilization will remain the same from before and after the proposed changes. It is further assumed that no changes would occur with WPAFB existing personnel and equipment. The emissions calculated for the annual emissions from the proposed demolition, renovation, and construction activities are compared with the *de minimis* level thresholds.

4.2.2 Proposed Action, Alternative A

Direct and Indirect Emissions

Demolition Activities. The Proposed Action (Alternative A) involves constructing a new facility at the site of existing F/34020, which would be demolished to preserve the existing concrete slab. All interior and exterior building components and materials would be demolished and removed from the site. The demolition activities included in this part of the analysis include building deconstruction and refuse material removal. Demolition activities would result in direct emissions of criteria pollutants from the equipment engine exhaust and particulate matter emitted as fugitive dust from deconstruction activities, and the movement of material and equipment. Indirect emissions would result from privately-owned vehicles used by construction workers commuting and heavy duty delivery trucks for material and equipment movements. Emissions would be of a temporary nature. Emission estimates were calculated using default emission factors, construction equipment estimates, and personnel estimates available in the USAF ACAM. **Table 4-2** lists the total emissions for the demolition while the detailed emission calculations and assumptions are presented in **Appendix B**.

Table 4-2. Criteria Pollutant Emissions at WPAFB Associated with the Proposed Action (Alternative A)

Construction Activity	VOC Emissions (tpy)	NO_x Emissions (tpy)	$PM_{2.5}$ Emissions (tpy)	SO_2 Emissions (tpy)
Demolition of F/34020	0.145	1.057	0.049	0.002
Construction of FS/RS Facility	2.610	10.657	0.508	0.019
Total Annual Emissions	2.755	11.714	0.557	0.021

Note: Tpy = tons per year

Construction Activities. The Proposed Action (Alternative A) involves construction of a new FS/RS facility to consist of a noncombustible, one-story structure with two high-bay, drive-through apparatus stalls; separate men's and women's restrooms with lockers and showers; separate men's and women's sleeping rooms; a separate captain's sleeping room and restroom; and a day room with kitchen. The facility would be constructed according to UFC 4-730-10, *Fire Stations*. Specific construction activities include building erection, miscellaneous trenching as needed, and surface coating. Construction activities would result in direct emissions of criteria pollutants from the equipment engine exhaust, off-gassing of surface coatings, and particulate matter emitted as fugitive dust from excavating activities and the movement of material and equipment. These emissions would be of a temporary nature. Indirect emissions would result from privately-owned vehicles used by construction workers for commuting and heavy duty delivery trucks for material and equipment movements. Emission estimates were calculated using default emission factors, construction equipment estimates, and personnel estimates available in the USAF ACAM. **Table 4-2** lists the total emissions for the construction activities. The detailed emission calculations and assumptions are presented in **Appendix B**.

Analysis. For the purpose of this analysis, all of the phased construction activities were assumed to be completed within one calendar year to provide a worst-case scenario (40 CFR 93.153[b]). This analysis was assumed to be conservative enough that potential deviations from the plans or schedule would be covered by this EA. Also, there is not anticipated to be any recurring emissions as a result of the Proposed Action (Alternative A) because it is assumed the level of fire and rescue activity would not change from current conditions.

The information presented in **Table 4-2** shows that NO_x, VOC, SO_2, and $PM_{2.5}$ emissions are projected to increase emissions temporarily during construction and demolition of the Proposed Action (Alternative A). The Proposed Action (Alternative A) would not result in a net emission increase above conformity *de minimis* limits listed in 40 CFR 93.153 (b) when evaluated on a worst-case annual basis. This result is contingent upon the accuracy of the assumptions used as input to the ACAM and the accuracy of the ACAM default settings. Any substantial changes to the scope of the project may require a reanalysis of the conformity applicability determination. Because the annual emissions expected from the Proposed Action (Alternative A) would not exceed *de minimis* levels, the General Conformity Rule does not apply and can be deemed to be in conformity with the Ohio SIP. **Appendix B** provides the ACAM details for the Proposed Action (Alternative A).

According to 40 CFR 81 Subpart D, no Class I visibility areas are located within 10 km of WPAFB. The closest federal Class I area is Mammoth Cave National Park in Kentucky, 320 km to the south. Therefore, air emissions from the Proposed Action or Alternative B or C would not affect any Class I area.

The Proposed Action (Alternative A) is not projected to result in net emissions increases for any pollutants on a recurring basis and is projected to be below the General Conformity *de minimis* thresholds. As a result, air quality impacts would not be impacted in a substantial manner when compared with current conditions. This result is contingent upon the accuracy of assumptions made in deriving the emission calculations. The short-term impacts from construction and demolition activities have the potential to cause a nuisance as defined by OEPA. It is recommended that WPAFB reduce these short-term impacts by observing reasonably available control measures to minimize the impact to neighboring communities during project execution. Such mitigation may include:

- Maintain a written Dust Control Plan onsite
- Apply water or other dust control chemicals to roads and surfaces as applicable
- Cover open bodied trucks during the transport of material
- Promptly remove debris from paved surfaces to minimize and prevent re-suspension
- Plan material and equipment delivery routes to minimize contact of dust with nearby occupants

4.2.3 Alternative B

Alternative B involves renovating, modernizing, and converting F/34020. The footprint of F/34020 would not change, however, the existing roll-off doors would be replaced with hangar doors so ARFF vehicles could easily maneuver. Interior renovation of F/34020 would be retrofitted according to UFC 4-730-10, *Fire Stations*. Specific construction activities include interior building construction and surface coating. Construction activities would result in direct emissions of criteria pollutants from the equipment engine exhaust, off-gassing of surface coatings, and particulate matter emitted as fugitive dust from the movement of material and equipment. Similar to the Proposed Action (Alternative A), emissions resulting from Alternative B would be of a temporary nature. Indirect emissions would result from privately-owned vehicles used by construction workers for commuting and heavy duty delivery trucks for material and equipment movements. Emission estimates were calculated using default emission factors, construction equipment estimates, and personnel estimates available in the USAF ACAM. **Table 4-3** lists the total emissions for the construction activities. The detailed emission calculations and assumptions are presented in **Appendix B**.

Table 4-3. Criteria Pollutant Emissions at WPAFB Associated with Alternative B

Construction Activity	VOC Emissions (tpy)	NO_x Emissions (tpy)	$PM_{2.5}$ Emissions (tpy)	SO_2 Emissions (tpy)
Renovation of F/34020	2.262	8.341	0.388	0.014
Total Annual Emissions	2.262	8.341	0.388	0.014

Note: Tpy = tons per year

As indicated above, Alternative B emissions are projected to increase temporarily during renovation but would not result in a net emission increase above conformity *de minimis* limits listed in 40 CFR 93.153(b) when evaluated on a worst-case annual basis. Similar to the Proposed Action (Alternative A), the analysis results are contingent upon the accuracy of ACAM input assumptions accuracy of the ACAM default settings. Any substantial changes to the scope of the project may require a reanalysis of the conformity applicability determination. Because the annual emissions expected from Alternative B would not exceed *de minimis* levels, the General Conformity Rule does not apply and can be deemed to be in conformity with the Ohio SIP. **Appendix B** presents the ACAM details for Alternative B.

4.2.4 No Action, Alternative C

The No Action alternative would have no adverse impact on air quality.

4.3 Noise

4.3.1 Evaluation Criteria

Noise impact analyses typically evaluate potential changes to existing noise environments that would result from implementation of a proposed action. Potential changes in the noise environment can be

beneficial (i.e., if they reduce the number of sensitive receptors exposed to unacceptable noise levels), negligible (i.e., if the total area exposed to unacceptable noise levels is essentially unchanged), or adverse (i.e., if they result in increased noise exposure to unacceptable noise levels).

4.3.2 Proposed Action, Alternative A

The Proposed Action would result in minor short-term impacts on ambient noise from construction and demolition activities. Impacts would be minor because these activities would be carried out during normal working hours (between 7:00 a.m. and 5:00 p.m.), would be short in duration, with construction and demolition occurring at different stages.

The locations of the proposed and existing fire stations are within the 75 to 80 dBA noise contours. The AFI 32-7063 indicates commercial/retail trade and personal/business service categories are compatible with noise levels without restriction up to 70 dB DNL and are incompatible with noise levels above 80 dB DNL. Commercial/retail or personal/business categories exposed to noise levels between 70-80 dB DNL require noise level reduction measures implemented during design and construction of a new facility. Since personnel would be sleeping in the FS/RS, existing noise levels in the area of the proposed FS/RS could be reduced through incorporation of noise attenuation into the design and construction, such as acoustical architectural design (i.e., room arrangement, solid walls, elimination of windows) and acoustical construction (i.e., sound insulation/acoustical blankets, cavity partitions, reduce window size and/or increase glass thickness). Therefore, no long-term impacts would be expected as a result of the Proposed Action and there would be no significant impacts to noise resources.

4.3.3 Alternative B

Implementation of Alternative B would result in minor short-term adverse impacts as ambient noise generated from adaptive re-use of F/34020 would involve minor interior renovation. Similar to Alternative A, no long-term impacts would be expected as a result of Alternative B. Therefore, there would be no significant impacts to noise resources.

4.3.4 No Action, Alternative C

The No Action alternative would have no adverse impact on noise.

4.4 Geology and Soils

4.4.1 Evaluation Criteria

Protection of unique geological features, minimization of soil erosion, and the siting of facilities in relation to potential geologic hazards are considered when evaluating potential impacts of a proposed action on geological resources. Generally, impacts can be avoided or minimized if proper construction techniques, erosion control measures, and structural engineering design are incorporated into project development.

Effects on geology and soils would be adverse if they would alter the lithology, stratigraphy, and geological structure that control groundwater quality, distribution of aquifers and confining beds, and groundwater availability; or change the soil composition, structure or function within the environment.

4.4.2 Proposed Action, Alternative A

Minor short-term impacts to existing soils would be expected during construction and demolition activities. The existing concrete slab foundation would be utilized during new construction; therefore, minimal ground disturbance would result. Impacts would be minimized by implementing BMPs for erosion and sedimentation controls during demolition and construction activities. Therefore, there would be no significant impacts to geology and soil resources.

4.4.3 Alternative B

No short- or long-term impacts to geology or soils would be expected as a result of implementation of Alternative B because no ground disturbance would result from the adaptive re-use of F/34020. Therefore, there would be no significant impacts to geology and soil resources.

4.4.4 No Action, Alternative C

The No Action alternative would have no impact on geology or soil resources.

4.5 Water Resources

4.5.1 Evaluation Criteria

Evaluation criteria for impacts on water resources are based on water availability, quality, and use; existence of floodplains; and associated regulations. Impacts would be adverse if proposed activities result in one or more of the following:

- Reduces water availability or supply to existing users
- Overdrafts groundwater basins
- Exceeds safe annual yield of water supply sources
- Affects water quality adversely
- Endangers public health by creating or worsening health hazard conditions
- Threatens or damages unique hydrologic characteristics
- Violates established laws or regulations adopted to protect water resources

4.5.2 Proposed Action, Alternative A

The F/34020 is located approximately 816 ft above MSL, which is above the Mad River 100-year floodplain elevation of 813.4 ft above MSL. No short- or long-term impacts to groundwater or floodplains would be expected because no earthwork would be conducted. The existing foundation would be utilized as part of the Proposed Action. In addition, there would be no net loss or gain to the flood control capacity of the Huffman Dam Retarding Basin, which consists of the area upstream and Huffman Dam and within the spillway elevation of 835 ft above MSL. Due to reutilization of the existing

concrete foundation slab at F/34020, short-term negligible impacts to surface water would be expected because no ground disturbance would result during construction. However, any potential impacts from demolition or construction activities would be managed by implementing BMPs for erosion and sedimentation controls. Therefore, there would be no significant impacts to water resources.

4.5.3 Alternative B

Similar to the Proposed Action, implementation of Alternative B would result in no impact to water resources as this alternative involves the adaptive re-use of F/34020. However, as a precautionary measure, potential erosion or sedimentation would be minimized by implementing BMPs. Therefore, there would be no significant impacts to water resources.

4.5.4 No Action, Alternative C

The No Action alternative would have no adverse impact to water resources.

4.6 Biological Resources

Biological resources that could be impacted by the proposed project include vegetation, wildlife, threatened and endangered species, and wetlands; water availability, quality and use; existence of floodplains; and associated regulations.

4.6.1 Evaluation Criteria

Evaluation criteria for impacts on biological resources are based on:

- Importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource;
- Proportion of the resource that would be affected relative to its occurrence in the region;
- Sensitivity of the resource to the proposed activities; and
- Duration of ecological ramifications.

The impacts on biological resources would be adverse if species or habitats of high concern are negatively affected over relatively large areas. Impacts are also considered adverse if disturbances cause reductions in population size or distribution of a species of high concern.

As a requirement under the ESA, federal agencies must provide documentation that ensures that agency actions do not jeopardize the continued existence of any threatened or endangered species. If a federal action "may affect" a listed species, the federal action agency must consult with the USFWS as described under Section 7 of the ESA to authorize any incidental take that is likely to occur, and to ensure that the take will not jeopardize the continued existence of the species.

4.6.2 Proposed Action, Alternative A

As part of this EA, consultation with the ODNR was conducted by requesting Ohio Natural Heritage Program information for state- and federal-listed threatened and endangered plants and animals on Base (see Section 3.6.2). In addition to the Natural Heritage Database results, the ODNR, Division of Wildlife (DOW) had the following comments regarding fish and wildlife, as presented in **Table 4-4** (**Appendix A**).

Table 4-4. ODNR, Division of Wildlife Species Comments

Fish / Wildlife Species	Status*	Comment	Recommendation
Streams, Wetlands and other Water Resources	N/A		Avoided and minimized to fullest extent possible, and utilize BMPs to minimize erosion and sedimentation.
Indiana bat	E, FE	If suitable tree habitat occurs within the project area, trees should be conserved. If no tree removal is proposed, this project is not likely to impact this species.	If suitable trees must be cut, cutting should occur between October 1 and March 31. If suitable trees must be cut in summer months, net survey should be conducted between June 1 and August 15, prior to cutting.
Clubshell Rayed Bean Snuffbox Black Sandshell Fawnsfoot	E, FE E, FE E, FE E T	Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact these species.	
Tonguetied Minnow	T	Due to the location, and that there is no in-water work proposed in a perennial stream, this project is not likely to impact this or other aquatic species.	
Spotted Turtle	T	Due to the location, the type of habitat at the project site and within the vicinity of the project area, and the type of work proposed, this project is not likely to impact this species.	
Kirtland's Snake	T	Due to the location, the type of habitat present at the project site and within the vicinity of the project area, and the type of work proposed, this project is not likely to impact this species.	
Eastern Massasauga	E, FC	Due to the location, the type of habitat present at the project site and within the vicinity of the project area, and the type of work proposed, this project is not likely to impact this species.	

Fish / Wildlife Species	Status*	Comment	Recommendation
Upland Sandpiper	E	If this type of habitat will not be impacted, this project is not likely to impact this species.	If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 to July 31.
Northern Harrier	E	If this habitat will not be impacted, the project is not likely to impact this species.	If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 15 to August 1.

*E = State Endangered; T = State Threatened; P = State Potentially Threatened; SC = State Species of Concern; SI = State Special Interest; FE = Federal Endangered; FT = Federal Threatened; FCS = Federal Species of Concern; FC = Federal Candidate Species.

In addition to the DOW comments noted above, the Division of Water Resources indicated that the project appears to be located within the Special Flood Hazard Area (SFHA) (i.e., one-percent-annual-chance or 100-year floodplain) of the Mad River and that compliance with National Flood Insurance Program floodplain development performance standards may be required for this project (EO 11988). The Division of Water recommended to contact the Greene County Floodplain Manager for additional information regarding local floodplain management requirements.

Vegetation

The Proposed Action would result in no short-term adverse impact to vegetation as the proposed project site is located within the footprint of the existing F/34020. Any vegetation disturbance as a result of construction activities would take place on previously disturbed areas with no naturally-occurring vegetation. No long-term impacts to vegetation would be expected from implementation of the Proposed Action.

Wildlife and Threatened and Endangered Species

No short- or long-term impacts to wildlife and threatened and endangered species would be expected as the new FS/RS facility would be constructed on an existing concrete foundation slab. In addition, the project site is not located in an area that provides suitable habitat and the current land use is not expected to change. Proposed construction and demolition activities are not in close proximity to any wildlife or threatened or endangered species; therefore, there would no adverse impacts from noise generated during proposed construction and demolition activities.

Wetlands

No short- or long-term adverse impacts to wetlands would be expected as a result of implementing the Proposed Action because no wetlands exist within the project area.

4.6.3 Alternative B

Implementation of Alternative B would result in no short- or long-term impacts to vegetation, wildlife, threatened and endangered species, or wetlands because the adaptive re-use of F/34020 would only involve interior renovation. Therefore, there would be no significant impacts to biological resources.

4.6.4 No Action, Alternative C

The No Action alternative would have no adverse impact to biological resources.

4.7 Cultural Resources

4.7.1 Evaluation Criteria

Adverse impacts on cultural resources might include physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that are out of character with the property or alter its setting; neglecting the resource to the extent that it deteriorates or is destroyed; or the sell, transfer, or lease of the property out of agency ownership (or control) without adequate legally enforceable restrictions or conditions to ensure preservation of the property's historic significance.

4.7.2 Proposed Action, Alternative A

There would be an adverse impact to F/34020 as this facility is a NRHP-eligible structure that would be partially demolished prior to constructing the new 13,524 sf FS/RS facility. Under the Proposed Action, however, no new ground disturbance would result from utilizing the existing concrete foundation slab.

In addition, F/34020 was previously addressed in a Demolition EA (WPAFB 2014a). At the time of the Demolition EA, F/34020 was scheduled for demolition in FY 2015. The mitigation for F/34020 would be addressed in a mitigation plan as outlined in a *Programmatic Agreement Between Wright-Patterson Air Force Base and the Ohio State Historic Preservation Officer Regarding FY 16-20 Demolitions for Physical Plant Reduction at the Wright-Patterson Air Force Base, Ohio* (WPAFB 2015b). Therefore, consultation with the SHPO for the proposed construction of the FS/RS facility is considered to be complete.

4.7.3 Alternative B

Implementation of Alternative B would result in positive and beneficial impact because the NRHP-eligible structure, F/34020, would be renovated and modernized to meet current design standards providing acceptable use by the 88 CEG Fire Department. Similar to the Proposed Action, an MOA would be required by SHPO prior to renovation/modernization of F/34020.

4.7.4 No Action, Alternative C

The No Action alternative would have no effect on cultural resources.

4.8 Infrastructure

4.8.1 Evaluation Criteria

Impacts on infrastructure are evaluated for their potential to disrupt or improve existing levels of service and additional needs for energy and water consumption, sanitary sewer systems, and transportation patterns and circulation. Impacts might arise from physical changes to circulation, construction activities, introduction of construction-related traffic on local roads or changes in daily or peak-hour traffic volumes, and energy needs created by either direct or indirect workforce and population changes related to Base activities.

4.8.2 Proposed Action, Alternative A

Transportation Systems

There would be a temporary increase in use of roadways in and around the construction and demolition sites as a result of construction traffic. Construction equipment would be driven to the project location and would be kept on site during the duration of the project. All damaged transportation infrastructure from construction and demolition activities would be repaired.

There would also be a temporary closure of the normal access route to adjacent buildings in the vicinity of F/34020 as a result of the Proposed Action. Upon completion of the Proposed Action construction activities, access to normal travel routes or parking lots in the vicinity of F/34020 would revert back to original routes.

The Proposed Action would affect traffic generation in the areas of the construction and demolition site and the adjacent cities to WPAFB (Fairborn, Riverside) over the short-term. Increases in traffic volumes and adverse impacts to traffic flow on-site would be likely due to additional traffic entering, leaving, and cycling throughout the construction and demolition area as a result of contractors performing construction/demolition activities. In particular, there would be an overall increase in the volume of truck equipment traffic as a result of construction and demolition activities.

Utilities

Short-term negligible impacts to utilities would be expected as a result of the Proposed Action because no net increase in personnel or facility operations would result from existing personnel in F/34012 moving into the new FS/RS.

Natural Gas

The Proposed Action would result in a negligible, if any, net change in the natural gas system. Although a new building would be constructed, natural gas usage would be offset because the current fire station would be vacated. Therefore, no adverse impact to natural gas demand would occur as a result of the Proposed Action.

Liquid Fuels

Under the Proposed Action, the liquid fuels system would be unchanged. Motorized equipment and vehicle operations are estimated to remain nearly unchanged under the Proposed Action. Therefore, there would be negligible effects on the liquid fuels system as a result of the Proposed Action.

Water Supply

Under the Proposed Action, the water supply would be relatively unchanged. The demand for water supply system usage would remain unchanged as a new building would be added and a building would be vacated resulting in no net loss or gain to water demand. Therefore, there would be no adverse impact to the water supply system as a result of the Proposed Action.

Pollution Prevention

It is anticipated that the Proposed Action would not affect the Pollution Prevention Program at WPAFB. Quantities of hazardous material and chemical purchases, off-Base transport of hazardous waste, disposal of MSW, and energy consumption would continue at levels similar to current levels.

Solid Waste

In considering the basis for evaluating the level of impacts on solid waste, several items are considered. These items include evaluating the degree to which the proposed construction and demolition projects would affect the existing solid waste management program and capacity of the area landfill.

Solid waste generated from the proposed construction and demolition sites would consist of demolition debris. Contractors are required to recycle construction waste to the greatest extent possible as part of Base policy, and any recycled waste would be diverted from landfills.

Long-term changes in solid waste generation due to the proposed construction and demolition activities would be minor. Therefore, the Proposed Action would have a minor, adverse impact on the solid waste management program at WPAFB.

Sanitary Sewer and Wastewater Systems

The Proposed Action would result in no net change to the use of the sanitary sewer system because constructing a new building would be offset by demolishing an existing building. Therefore, no adverse impact to the sanitary sewer system would result from the Proposed Action.

Heating and Cooling

The Proposed Action would not result in a net change in the heating and cooling system because constructing a new building would be offset by demolishing the existing building. Therefore, no adverse impact to the heating and cooling systems would result from the Proposed Action.

Communications

The Proposed Action would not result in a net change in communications systems due to adding a new building and demolishing an existing building. Therefore, no adverse impacts on the communications system would result from the Proposed Action.

4.8.3 Alternative B

Similar to the Proposed Action, Alternative B would result in no net changes to baseline infrastructure. Therefore, there would be no significant impacts to infrastructure.

4.8.4 No Action, Alternative C

Under the No Action alternative, there would be no change in baseline conditions and no buildings would be constructed or demolished. Therefore, no adverse impacts to WPAFB's infrastructure would occur as energy and maintenance costs would continue to remain relatively unchanged to future maintenance and energy costs.

4.9 Health and Safety

4.9.1 Evaluation Criteria

Impacts on health and safety are evaluated for their potential to jeopardize the health and safety of Base personnel as well as the surrounding public. The AF regulations and procedures promote a safe work environment and guard against hazards to the public. The WPAFB programs and day-to-day operations are accomplished according to applicable Air Force federal and state health and safety standards.

4.9.2 Proposed Action, Alternative A

Potential short-term minor adverse impacts to workers could occur during construction and demolition activities. Impacts would be minimized by adherence to health and safety regulations and standards. Long-term beneficial impacts to health and safety would result from the Proposed Action as response times would be met. Therefore, there would be no significant impacts to health and safety.

4.9.3 Alternative B

Alternative B would result in the similar short-term minor adverse impacts as compared to the Proposed Action. Impacts would be minimized by adherence to health and safety regulations and standards. Long-term beneficial impacts to health and safety would result from Alternative B as response times would be met. Therefore, there would be no significant impacts to health and safety.

4.9.4 No Action, Alternative C

The No Action alternative would result in major short- and long-term adverse impact to the safety of AF personnel in aircraft-related crashes due to current response time from the existing fire station to the south end of Runway 05L-23R.Response times would remain greater than the 1-minute minimum required response time for the 88 CEG Fire Department to respond to ARFF on the south end.

4.10 Hazardous Materials/Waste and Environmental Restoration Program Sites

4.10.1 Evaluation Criteria

Impacts to hazardous material management would be considered adverse if the federal action resulted in noncompliance with applicable federal and state regulations, or increased the amounts generated or procured beyond current WPAFB waste management procedures and capacities.

Impacts on pollution prevention would be considered adverse if the federal action resulted in worker, resident, or visitor exposure to these materials, or if the action generated quantities of these materials beyond the capability of current management procedures. Impacts on the ERP would be considered adverse if the federal action disturbed (or created) contaminated sites resulting in negative effects on human health or the environment. Impacts on the ERP would be considered adverse if the federal action disturbed (or created) contaminated sites resulting in negative effects on human health or the environment.

4.10.2 Proposed Action, Alternative A

No short- or long-term impact would be expected as hazardous materials/waste used in existing 88 CEG Fire Department operations would not be expected to increase over existing conditions. In addition, no impact to ERP sites would be expected because the former UST 4020 was removed and remaining contamination was below BUSTR limits. No ground disturbance would occur as a result of utilizing the existing concrete foundation slab at F/34020. In addition, CDA is the nearest ERP site to F/34020 (300 ft north) and would not be impacted as no ground disturbance would occur. Therefore, there would be no significant impacts to hazardous materials/waste or ERP sites.

4.10.3 Alternative B

No short- or long-term impacts would be expected as a result of implementing Alternative B because adaptive re-use of F/34020 would only involve interior renovation and similar to the Proposed Action, would not involve ground disturbance. Therefore, there would be no significant impacts to hazardous materials/waste or ERP sites.

4.10.4 No Action, Alternative C

The No Action alternative would have no impact to hazardous materials/waste or ERP sites over current conditions.

4.11 Cumulative Impacts

Cumulative impacts on environmental resources result from incremental effects of proposed actions when combined with other past, present, and reasonably foreseeable future projects in the project area. Cumulative impacts can result from individually minor but collectively substantial actions undertaken over a period of time by various agencies (federal, state, and local) or individuals. Informed decision-

making is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the foreseeable future.

4.11.1 Past, Present, and Reasonably Foreseeable Actions in the Project Area

This section discusses the potential for cumulative impacts caused by implementation of the Proposed Action when combined with other past, present, and reasonably foreseeable actions occurring in the project area. The project area is defined as Area A near the West Ramp and in the vicinity of F/34020.

4.11.2 Past and Present Actions

An EA was conducted in the vicinity of the West Ramp and F/34020 that analyzed environmental consequences resulting from constructing a 58,500 sf addition on the north side of the Foreign Materiel Exploitation (FME) facility located at F/34023, which is located adjacent and south of the proposed FS/RS project site. As part of the proposed action that analyzed constructing the FME addition, an expansion of the parking lot on the west side of F/34023 was also analyzed (WPAFB 2014b). A FONSI/ FONPA was signed in September 2014; however, construction has not yet commenced. No additional past or present actions are noted as being relevant to the current Proposed Action.

4.11.3 Reasonably Foreseeable Future Actions

Projects proposed for the reasonably foreseeable future that are relevant to the project area include the following ancillary projects for WPAFB. However, these projects would be temporary in nature and would not be recurring events. In addition, the timeframes and budgets for each proposed project listed below can only be estimated or are uncertain. Although short-term adverse effects could be possible if these projects were to occur in conjunction with the Proposed Action, long-term cumulative impacts are not expected to result from these reasonably foreseeable future actions.

Entry Control Facility Reconfiguration and Base Perimeter Fence Relocation – Proposed plans include reconfiguring and relocating the following existing nine entry control facilities (gates) located in Area A: Gate 1A (F/30250), 8A, 9A, 12A, 15A (F/10921), 16A, 26A (F/34000), 38A, and 39A. This ancillary project was addressed in a previous WPAFB EIS. This project would not be expected to impact the Proposed Action.

Demolish Multiple Buildings, Phase II – The demolition of approximately 53 buildings in Areas A and B was analyzed in an EA. The demolition project is part of an Air Force initiative to reduce the amount of physical plant that WPAFB spends money on by 20 percent by the year 2020. The proposed demolitions would take place from FY14 through FY20 and possibly beyond. Based on preliminary information, the nearest building proposed for demolition (F/34026) is located adjacent and east of the FS/RS project site. Facility 34026 is preliminarily scheduled for demolition in 2016. Cumulative impacts would be expected if demolition of F/34020 and/or construction of the new FS/RS facility at F/34020 is conducted within the time-frame of demolition of this building however, impacts would be temporary.

Primary Runway Pavement Replacement – The primary and secondary runways at WPAFB were constructed in the late 1940's and have undergone several overlays/repairs in previous years. The primary runway needs to be replaced due to the current deteriorated condition. The following actions would be conducted as part of the primary runway pavement replacement project in Area A: demolish and replace pavement on the primary runway; replace/repair and/or align pavement on Taxiways A, B, C, and D; reconstruct Taxiways 18 and 20; install a portable batch plant and haul road; construct a temporary vehicle inspection lot; and purchase land access rights in the approach-departure clearance surface area for both runways (primary and secondary) to mitigate encroachment and ensure the necessary margin of safety for flight operations. Duration of the pavement replacement project and associated taxiways would be approximately two years, with existing flight operations being transferred onto the secondary runway. The runway replacement project would enable WPAFB to safely continue to support a wide range of aircraft. Neither the FS/RS project nor the runway replacement project would be on-going or recurring projects. Should some activities on these projects occur simultaneously, short-term cumulative impacts on air quality and noise due to demolition and construction associated with the FS/RS could occur; however, the contribution from the FS/RS would be minimal. Therefore, this project is not expected to result in any cumulative impacts associated with the Proposed Action.

4.12 Irreversible and Irretrievable Commitment of Resources

The NEPA requires that EAs include identification of any irreversible and irretrievable commitment of resources that would be involved in the implementation of the Proposed Action. Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (i.e., energy and minerals) that cannot be replaced within a reasonable timeframe. Irretrievable resource commitments involve the loss of value of an affected resource that cannot be restored as a result of the Proposed Action (i.e., extinction of a threatened or endangered species or the disturbance of a cultural site).

The irreversible and irretrievable commitments of resources that would result from implementation of the Proposed Action involve the consumption of material resources used for construction, energy resources, and human labor resources. The use of these resources is considered to be permanent.

Material Resources. Material resources used for the Proposed Action include building materials and miscellaneous supplies. Most of the materials that would be consumed are not in short supply, would not limit other unrelated construction activities, and would not be considered significant.

Energy Resources. Energy resources used for the Proposed Action would be irretrievably lost. This includes petroleum-based products (such as gasoline, diesel, and natural gas) and electricity. During construction and demolition activities, gasoline and diesel would be used for the operation of construction vehicles. During operation of the proposed new FS/RS facility, natural gas would be used for heating.

Electricity would also be used during operation and maintenance of the proposed new FS/RS facility. Consumption of these energy resources would not place a significant demand on their availability in the region; therefore, less than significant impacts would be expected.

Human Resources. The use of human resources for construction and demolition, operation, and maintenance activities is considered an irretrievable loss only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Proposed Action represents employment opportunities and is considered beneficial.

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Appendix A

Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) Correspondence and Notice of Availability (NOA)

Miami Conservancy District Consultation Letters:

1. **WPAFB Request – 04Apr16**

2. **MCD Response – 11Apr16**

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 88TH AIR BASE WING (AFMC)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

4 April 2016

88 CEG/CEIEA
1450 Littrell Road, Building 22
Wright-Patterson AFB OH 45433-5209

Mr. Kurt Rinehart
Miami Conservancy District
38 E. Monument Avenue
Dayton, OH 45402

Dear Mr. Rinehart:

The 88th Civil Engineer Group (88th CEG) at Wright-Patterson Air Force Base (WPAFB, Base) is preparing an Environmental Assessment (EA) to evaluate the impacts of constructing a new fire structural/rescue station (FS/RS) facility on the West Ramp. The new FS/RS facility would be sited at the location of existing Facility 34020 (F/34020), which is approximately 1,500 feet (ft) southwest of the current West Ramp Fire Station (F/34012). The project involves the partial demolition of F/34020 and re-use of the existing concrete slab foundation for the new FS/RS facility foundation. The new fire station would be a combination structural/Aircraft Rescue and Firefighting (ARFF) facility. The preferred location of the new FS/RS would resolve response time issues and create access from the new FS/RS drive-through apparatus bays directly to the flight-line on the south end of Runway 05Left-23Right (05L-23R). In addition, the new FS/RS would correct multiple building design deficiencies and include private sleeping quarters for each fire fighter, dining area, training room, and drive-through apparatus bays. The existing fire station at F/34012 would be vacated upon completion of the new FS/RS with all existing personnel relocated to the new FS/RS facility.

The new FS/RS facility must meet the following requirements: Unified Facilities Criteria (UFC) 4-730-10, *Fire Stations*; Department of Defense (DoD) Instruction 6055.06, *DoD Fire and Emergency Services (F&ES) Program*; UFC 4-010-01, *DoD Minimum Antiterrorism Standards for Buildings*; Air Force Manual (AFMAN) 32-1084, *Facility Requirements*; and Air Force *Fire Station Design Guide*. Per DoD Instruction Number 6055.06, *DoD Fire and Emergency Services (F&ES) Program*, the firefighting response time to Base facilities must meet a 1-minute response requirement for ARFF emergencies. Additionally, the new fire station must be sited to ensure access to roadways and service entrances and accommodate vehicle sizes anticipated for fire station operations and the potential for future expansion.

Proposed Action

The Proposed Action involves the construction of an approximate 13,524 square foot (sf) facility at the site of existing F/34020, which would be partially demolished (approximately 18,169 sf) to preserve the existing concrete slab. The existing F/34020 was historically utilized as a Nose Dock Hangar but is currently unoccupied and vacant. Figure 1 presents the location of WPAFB and the surrounding area. Figure 2 presents F/34020 and the location of the proposed new FS/RS facility.

The new FS/RS facility would be a noncombustible, one-story structure with two high-bay, drive-through apparatus stalls; separate men's and women's restrooms with lockers and showers; separate men's and women's sleeping rooms; a separate captain's sleeping room and restroom; and a day room with a kitchen. The new FS/RS facility would be constructed according to UFC 4-730-10, *Fire Stations*. The current fire station located at F/B34012 would be vacated once construction of the new FS/RS is complete.

Equipment such as bulldozers, backhoes, front-end loaders, dump trucks, tractor-trailers, concrete mixers, asphalt vehicles, and generators would be required to support the proposed site preparation and construction activities. Prior to construction activities, plans and documents would be prepared by the contractor to provide environmental controls. Environmental measures under the Proposed Action would be designed to control erosion, sedimentation, and stormwater runoff. All construction debris from the demolition of F/34020 would be recycled or disposed at an approved landfill in accordance with all applicable federal, state, and local laws and regulations.

Alternative B involves adaptive re-use of F/34020 as an alternative to demolition. Facility 34020 would be renovated, modernized, and converted into the new FS/RS facility with the building design conforming to UFC 4-730-10, *Fire Stations*. The footprint of F/34020 (former Nose Dock Hangar) would remain but the existing roll-off doors would be replaced with hangar doors so ARFF vehicles could maneuver with ease.

Under the No Action Alternative (Alternative C), a new FS/RS facility would not be constructed. The 445th Airlift Wing Fire Department (tenant under 88th CEG) would not be able to respond to critical emergencies. The response times from the present location (F/34012) would continue to be excessive (greater than 1minute), particularly to critical, high-value facilities or aircraft where a few seconds of response time could mean the difference in preventing injuries and major losses. In addition, the No Action Alternative does not satisfy the purpose and need of correcting building design deficiencies in the current fire station.

Facility 34020 is located at an elevation of approximately 816 ft mean sea level (MSL), which is above the 100-year floodplain elevation of 813.4 MSL. The facility is below the Huffman Dam spillway elevation of 835 ft MSL; however, no impacts to the Huffman Retarding Basin would be expected from implementation of the Proposed Action or Alternative B. No net gain or net loss for the retarding basin storage capacity would be expected because the existing concrete foundation slab at F/34020 would be re-used (Figure 3). In addition, no excavation or ground disturbance would be performed as part of utilizing the existing concrete slab at F/34020 and the footprint of the new FS/RS facility would not increase over the existing concrete slab footprint. Additionally, no adverse impact to surface waters would be expected to result from runoff during demolition/renovation activities associated with the Proposed Action or Alternative B; however, any potential impacts would minimized by implementing Best Management Practices (BMPs) for erosion and sedimentation controls.

Thank you for your consideration. Please return your comments to me at the above address. If you have questions, please contact me at (937) 257-4857 or by email at Darryn.Warner@us.af.mil.

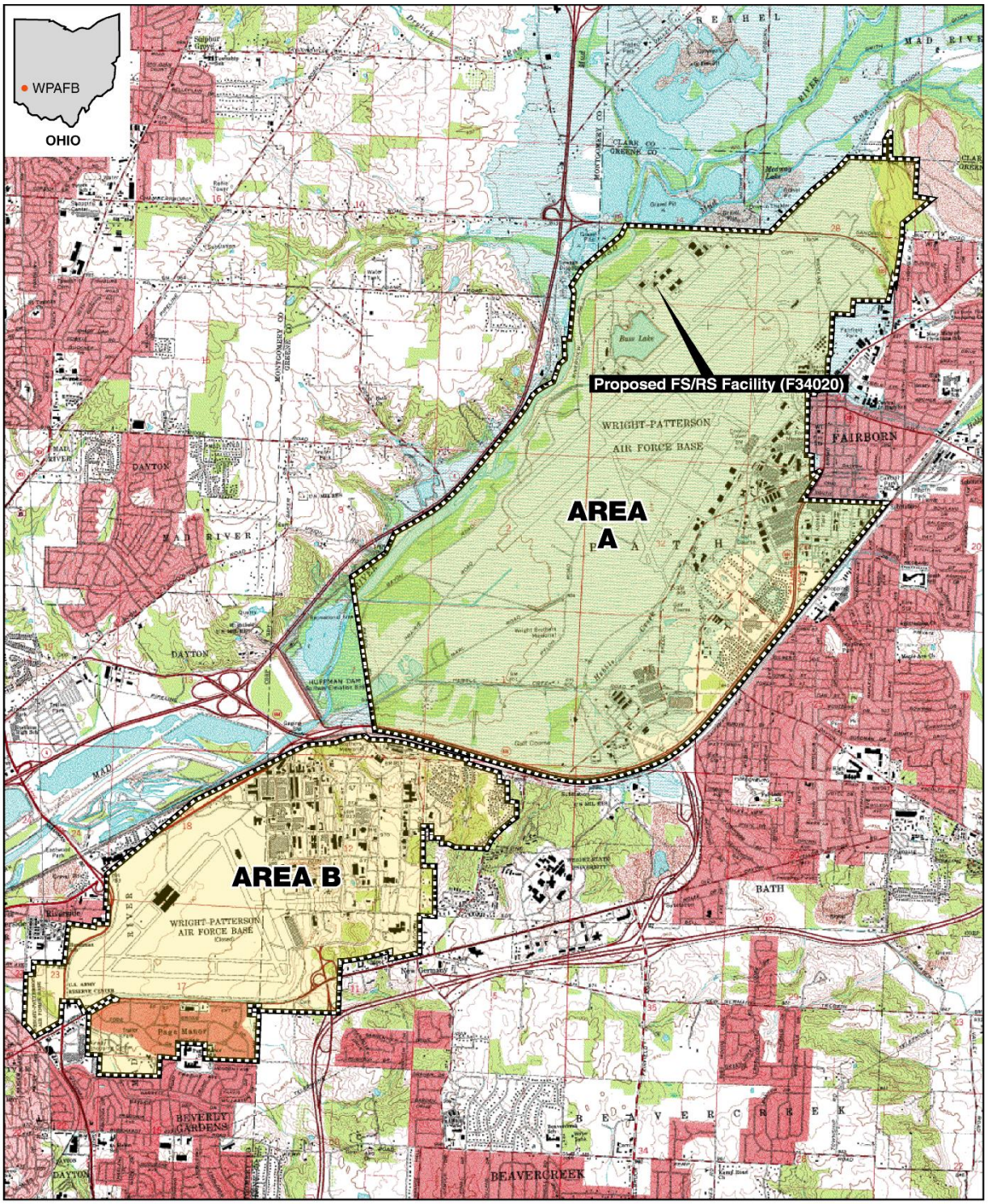
Sincerely,

Darryn Warner
Natural Resources Program Manager
Environmental Assets Section
Environmental Branch

cc: John Banford (88 CEG/CEIEA, WPAFB)
Cynthia A. Hassan (CB&I)

Attachments: Figure 1 – Location of WPAFB and Surrounding Area
Figure 2 – Proposed Location of FS/RS West Ramp
Figure 3 – Floodplain Contours in the F/34020 Project Area

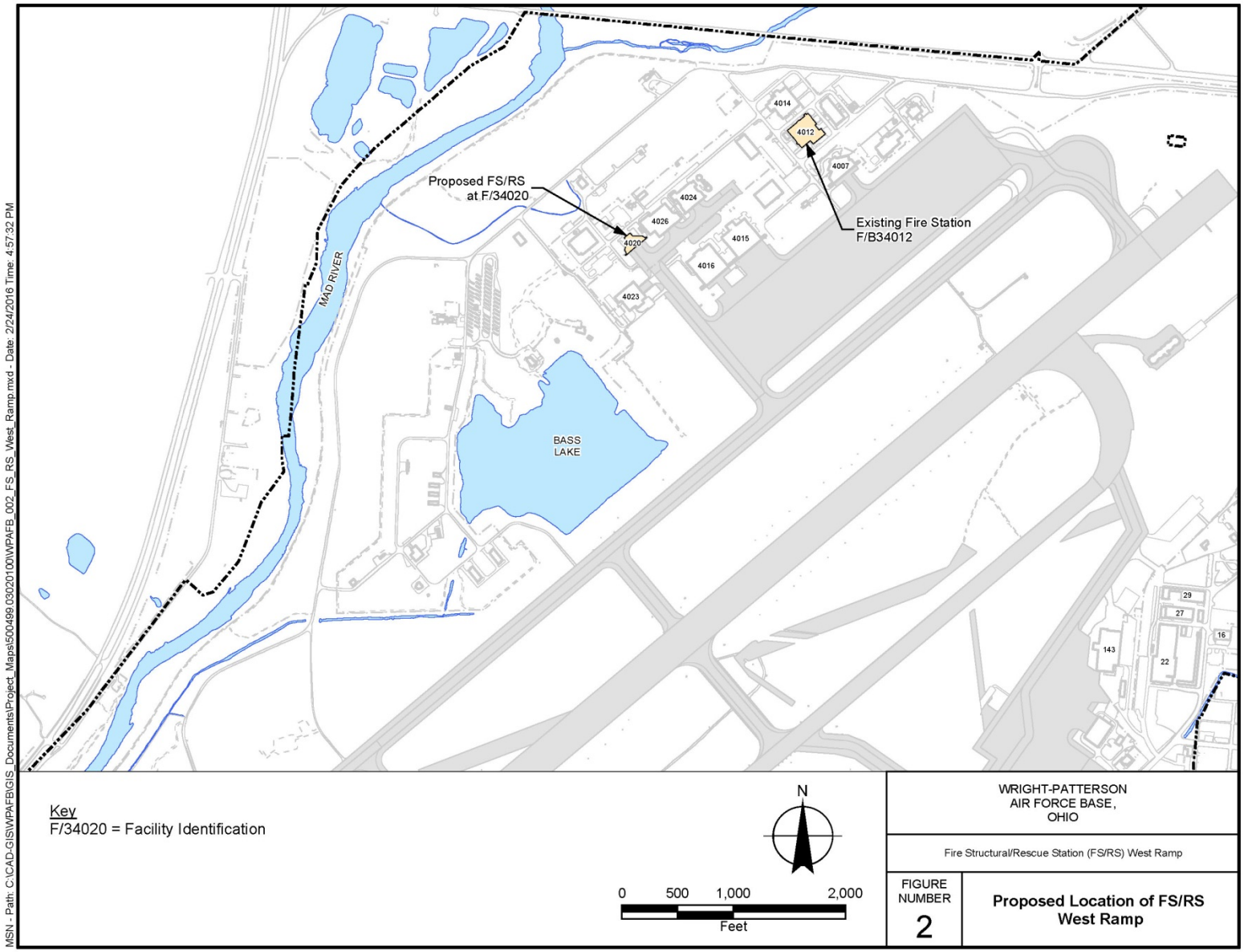
OFFICE	DATE	DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
Cincinnati, OH	10/26/15	--	JIS	SB	CH	s-500499.03020100-10/15-w



WRIGHT-PATTERSON
AIR FORCE BASE
OHIO

FIGURE NUMBER 1

LOCATION OF WPAFB AND SURROUNDING AREA


Proposed FS/RS
at F/34020
Existing Fire Station
F/B34012
MAD RIVER
BASS
LAKE
4012
4014
4007
4024
4026
4020
4015
4016
4023
29
27
16
143
22
Key
F/34020 = Facility Identification
N
0
500
1,000
2,000
Feet
WRIGHT-PATTERSON
AIR FORCE BASE,
OHIO
Fire Structural/Rescue Station (FS/RS) West Ramp
FIGURE
NUMBER
2
Proposed Location of FS/RS
West Ramp
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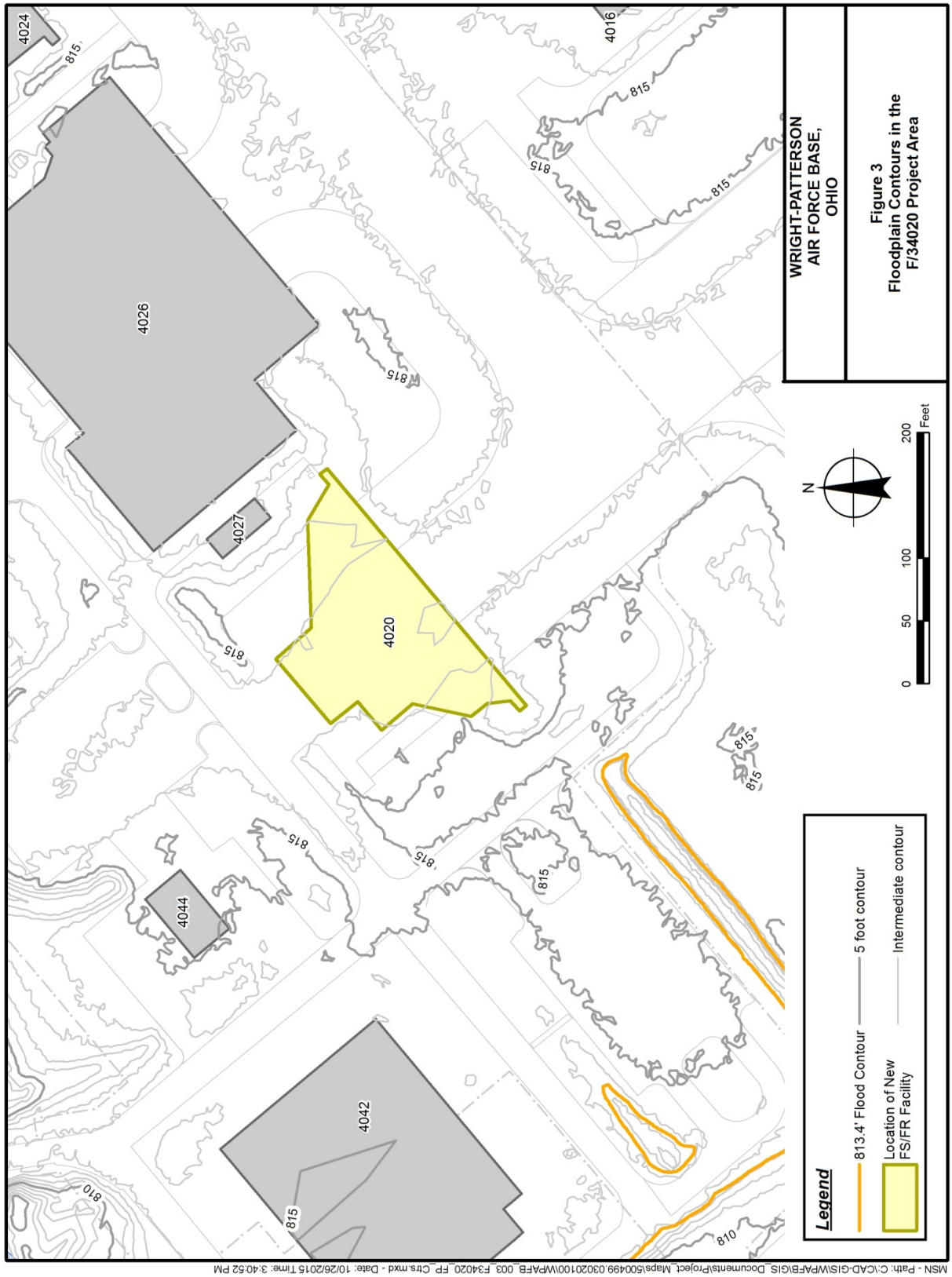
WRIGHT-PATTERSON
AIR FORCE BASE,
OHIO
Figure 3
Floodplain Contours in the
F/34020 Project Area
Legend
813.4' Flood Contour
5 foot contour
Location of New
FS/FR Facility
Intermediate contour
N
0
50
100
200
Feet
4024
4026
4027
4020
4044
4042
4016
815
810
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MCD
MIAMI CONSERVANCY DISTRICT

38 E. Monument Ave.
Dayton, OH 45402
(937) 223-1271

April 11, 2016

Mr. Darryn Warner
88 ABW/CEIEA
1450 Littrell Road, Building 22
Wright-Patterson AFB, OH 45433-5209

Re: Huffman Retarding Basin, WPAFB, Fire/Rescue station

Dear Mr. Warner:

We have reviewed the proposed action involving constructing a new fire structural/rescue station (FS/RS) in Area A at WPAFB.

As the project is located within the Huffman Retarding Basin, it is subject to those restrictions as set forth by the Miami Conservancy District (MCD) in Greene County Deed Book 129, Page 146 on December 16, 1922.

Based on our review it appears the proposed project will not adversely affect the retarding basin.

Thank you for your cooperation and the opportunity to review the project. If you have any further questions please contact me at (937) 223-1278, ext. 3230 or by email at rfarrier@mcdwater.org.

Sincerely,

Roxanne H. Farrier
Property Administrator

cc: Kurt Rinehart

U.S. Fish & Wildlife Service Consultation Letters:

1. **WPAFB Request – 04Apr16**

2. **USFWS Response – 14Apr16**

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 88TH AIR BASE WING (AFMC)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

4 April 2016

88 CEG/CEIEA
1450 Littrell Road, Building 22
Wright-Patterson AFB OH 45433-5209

Mr. Dan Everson
Field Office Supervisor
U.S. Fish and Wildlife Service
Ohio Ecological Services Field Office
4625 Morse Road, Suite 104
Columbus, OH 43230

Dear Mr. Everson:

The 88th Civil Engineer Group (88th CEG) at Wright Patterson Air Force Base (WPAFB, Base) is preparing an Environmental Assessment (EA) in accordance with the requirements of the National Environmental Policy Act (NEPA) to evaluate the impacts of constructing a new fire structural/rescue station (FS/RS) facility on the West Ramp. The new FS/RS facility would be sited at the location of existing Facility 34020 (F/34020), which is approximately 1,500 feet (ft) southwest of the current West Ramp Fire Station (F/34012). The project involves the partial demolition of F/34020 and re-use of the existing concrete slab foundation for the new FS/RS facility foundation. The new fire station would be a combination structural/Aircraft Rescue and Firefighting (ARFF) facility. The preferred location of the new FS/RS would resolve response time issues and create access from the new FS/RS drive-through apparatus bays directly to the flight-line on the south end of Runway 05Left-23Right (05L-23R). In addition, the new FS/RS would correct multiple building design deficiencies and include private sleeping quarters for each fire fighter, dining area, training room, and drive-through apparatus bays. The existing fire station at F/34012 would be vacated upon completion of the new FS/RS with all existing personnel relocated to the new FS/RS facility.

The new FS/RS facility must meet the following requirements: Unified Facilities Criteria (UFC) 4-730-10, *Fire Stations*; Department of Defense (DoD) Instruction 6055.06, *DoD Fire and Emergency Services (F&ES) Program*; UFC 4-010-01, *DoD Minimum Antiterrorism Standards for Buildings*; Air Force Manual 32-1084, *Facility Requirements*; and Air Force *Fire Station Design Guide*. Per DoD Instruction Number 6055.06, *DoD Fire and Emergency Services (F&ES) Program*, the firefighting response time to Base facilities must meet a 1-minute response requirement for ARFF emergencies. Additionally, the new fire station must be sited to ensure access to roadways and service entrances and accommodate vehicle sizes anticipated for fire station operations and the potential for future expansion.

By way of this letter, WPAFB is seeking informal consultation with the U.S. Fish and Wildlife Service in compliance with Section 7 of the Endangered Species Act regarding the proposal.

The geographic location of the proposed project area is Greene County (North 39°50’ 15.0744”, West 84° 2’ 52.3987”).

Proposed Action

The Proposed Action involves the construction of an approximate 13,524 square foot (sf) facility at the site of existing F/34020, which would be partially demolished (approximately 18,169 sf) to preserve the existing concrete slab. The existing F/34020 was historically utilized as a Nose Dock Hangar but is currently unoccupied and vacant. Figure 1 presents the location of WPAFB and the surrounding area. Figure 2 presents F/34020 and the location of the proposed new FS/RS facility.

The new FS/RS facility would be a noncombustible, one-story structure with two high-bay, drive-through apparatus stalls; separate men's and women's restrooms with lockers and showers; separate men's and women's sleeping rooms; a separate captain's sleeping room and restroom; and a day room with a kitchen. The new FS/RS facility would be constructed according to UFC 4-730-10, *Fire Stations*. The current fire station located at F/34012 would be vacated once construction of the new FS/RS is complete.

Equipment such as bulldozers, backhoes, front-end loaders, dump trucks, tractor-trailers, concrete mixers, asphalt vehicles, and generators would be required to support the proposed site preparation and construction activities. Prior to construction activities, plans and documents would be prepared by the contractor to provide environmental controls. Environmental measures under the Proposed Action would be designed to control erosion, sedimentation, and stormwater runoff. All construction debris from the demolition of F/34020 would be recycled or disposed at an approved landfill in accordance with all applicable federal, state, and local laws and regulations.

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Under the No Action Alternative (Alternative C), a new FS/RS facility would not be constructed. The 445th Airlift Wing Fire Department (tenant under 88th CEG) would not be able to respond to critical emergencies. The response times from the present location (F/34012) would continue to be excessive (greater than 1 minute), particularly to critical, high-value facilities or aircraft where a few seconds of response time could mean the difference in preventing injuries and major losses. In addition, the No Action Alternative does not satisfy the purpose and need of correcting building design deficiencies in the current fire station.

The WPAFB actively manages for two federally-listed species (Indiana bat and clubshell mussel), one proposed threatened species (eastern massasauga rattlesnake), and four species listed as endangered by the state of Ohio (smooth green snake, upland sandpiper, king rail, and blazing star stem borer). However, none of the species actively managed for on Base have been recorded in the proposed FS/RS project area. No critical habitat has been designated or proposed for WPAFB. Based on our review of the USFWS *Ohio Federally-Listed Threatened, Endangered, Proposed, and Candidate Species' County Distribution* list (November 9, 2015) (http://www.fws.gov/midwest/Endangered/lists/ohio-spp.html), no other threatened, endangered, proposed, or candidate species are known to or may occur in the project area. No critical habitat has been designated or proposed for WPAFB.

Because the project area is not within suitable habitat nor will any potential habitat be disturbed, no listed species would be directly or indirectly impacted (Figure 3). Furthermore, there are no impacts to trees and/or wetlands or other native habitat that supports the above listed species. WPAFB has therefore determined the proposed project will have no effect on listed species and further consultation with your office is not necessary. Your written concurrence with this determination of no effect is, however, requested.

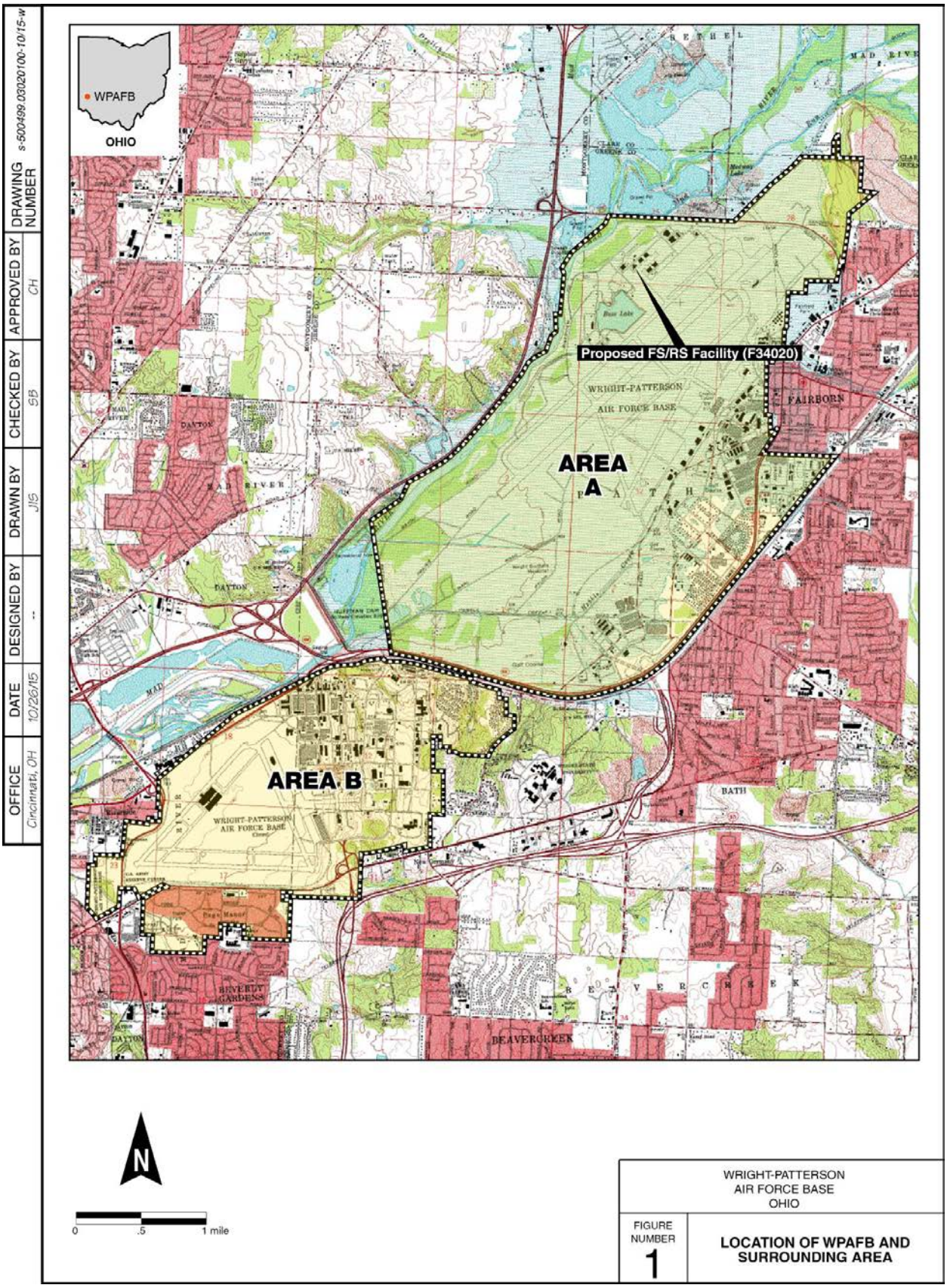
Thank you for your assistance. If there are any questions or additional detail is needed, please contact me by telephone at 937-257-4857 or by e-mail at darryn.warner@us.af.mil.

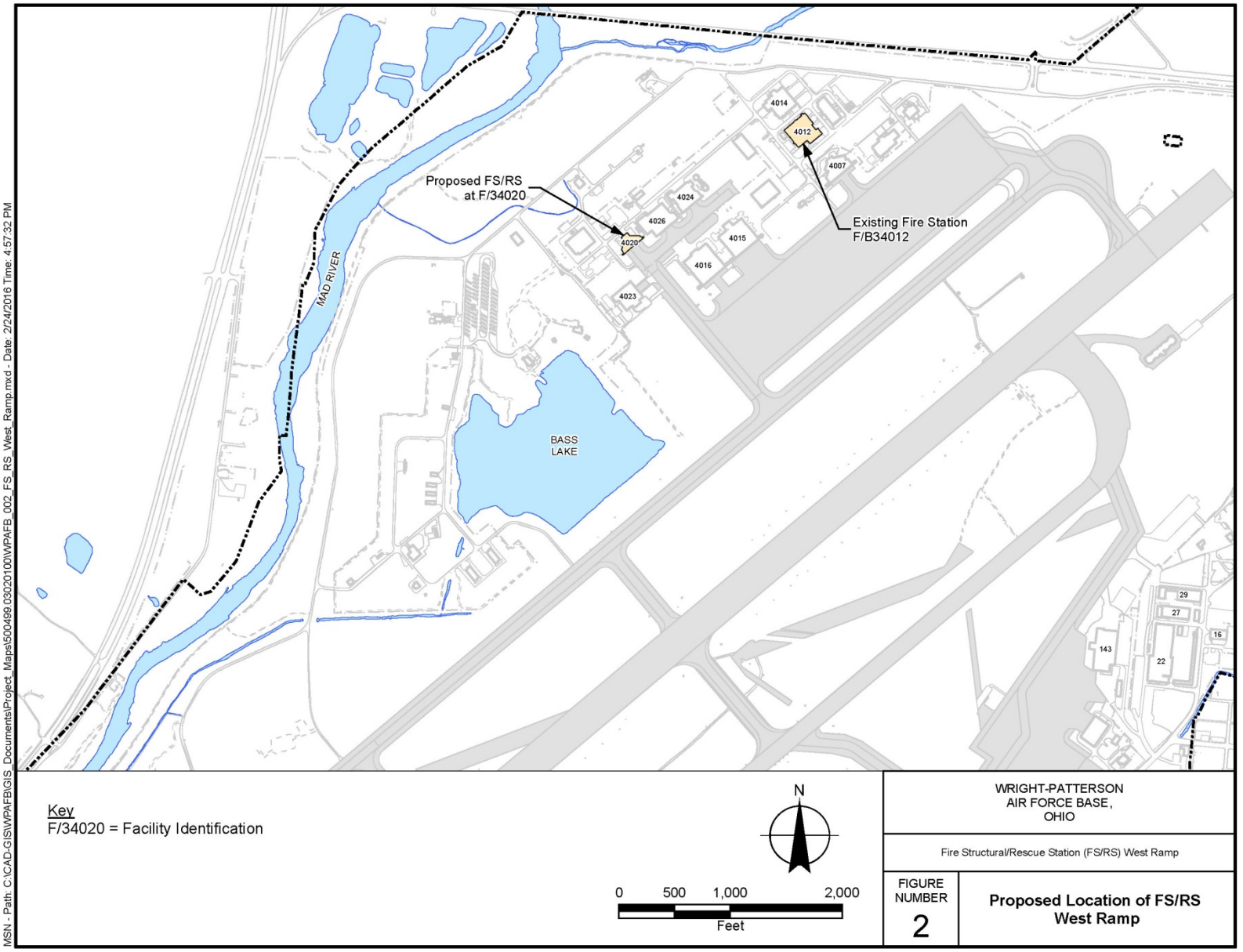
Sincerely

DARRYN M. WARNER
Natural Resources Program Manager
Environmental Assets Section
Environmental Branch

cc:
John Banford (88 CEG/CEIEA, WPAFB)
Cynthia A. Hassan (CB&I Federal Services, LLC)

Attachments:
Figure 1 – Location of WPAFB and Surrounding Area
Figure 2 – Proposed Location of FS/RS West Ramp
Figure 3 – Threatened and Endangered Species, Wetlands, and Floodplains in the Project Area


WPAFB
OHIO
Proposed FS/RS Facility (F34020)
AREA A
AREA B
WRIGHT-PATTERSON AIR FORCE BASE
DAYTON
FAIRBORN
BATH
BEAVERCREEK
BIVERVIEW GARDENS
N
0
.5
1 mile
OFFICE
Cincinnati, OH
DATE
10/26/15
DESIGNED BY
--
DRAWN BY
JJS
CHECKED BY
SB
APPROVED BY
CH
DRAWING NUMBER
s-500499.03020100-10/15-w
WRIGHT-PATTERSON AIR FORCE BASE OHIO
FIGURE NUMBER
1
LOCATION OF WPAFB AND SURROUNDING AREA



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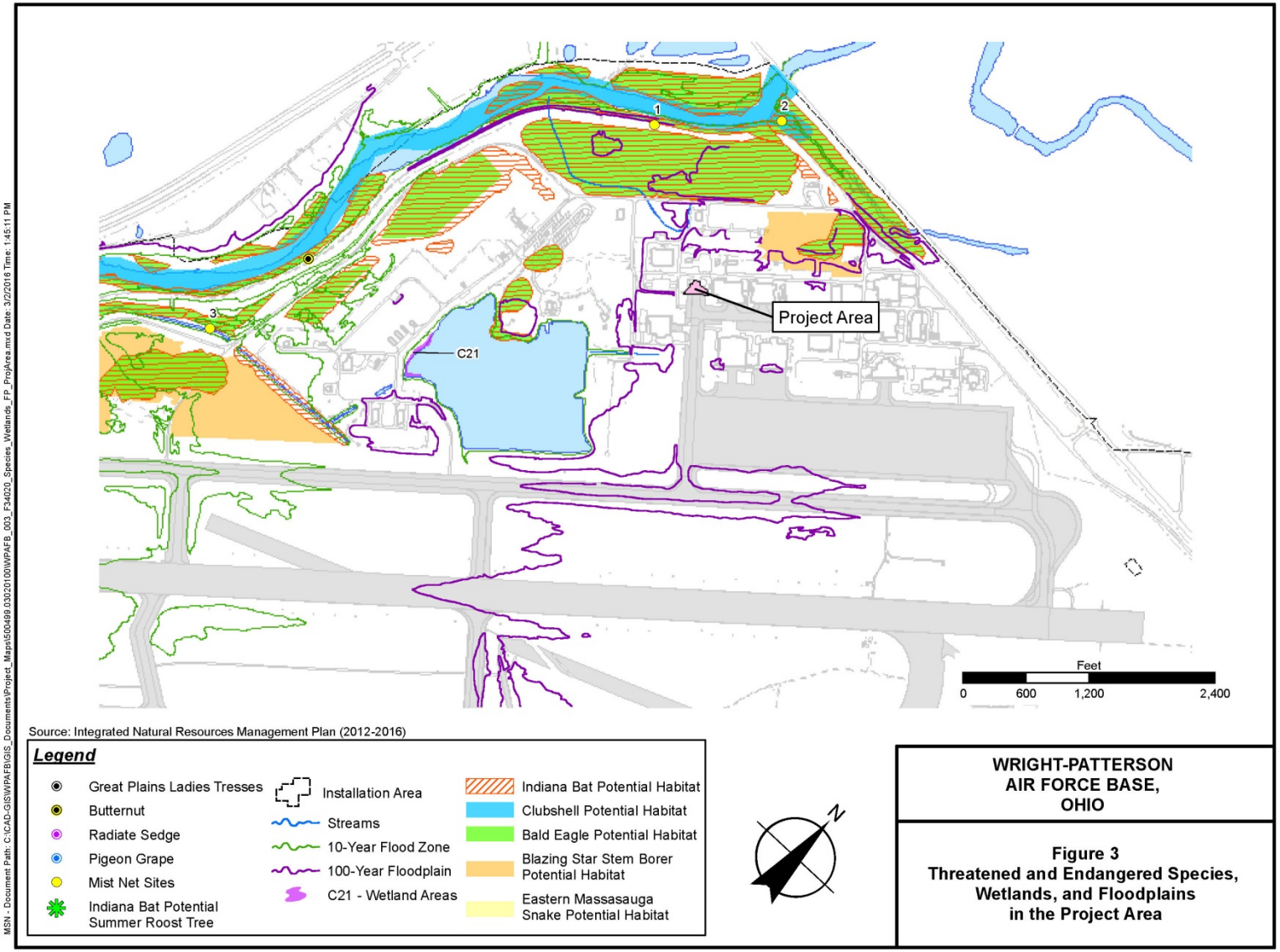
1
2
3
C21
Project Area
Feet
0
600
1,200
2,400
Source: Integrated Natural Resources Management Plan (2012-2016)
Legend
Great Plains Ladies Tresses
Butternut
Radiate Sedge
Pigeon Grape
Mist Net Sites
Indiana Bat Potential Summer Roost Tree
Installation Area
Streams
10-Year Flood Zone
100-Year Floodplain
C21 - Wetland Areas
Indiana Bat Potential Habitat
Clubshell Potential Habitat
Bald Eagle Potential Habitat
Blazing Star Stem Borer Potential Habitat
Eastern Massasauga Snake Potential Habitat
N
WRIGHT-PATTERSON AIR FORCE BASE, OHIO
Figure 3
Threatened and Endangered Species, Wetlands, and Floodplains in the Project Area
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From:	WARNER, DARRYN M GS-13 USAF AFMC 88 CEG/CEIEA
To:	BANFORD, JOHN R CIV USAF AFMC 88 CEG/CEIEC; Hassan, Cindy
Cc:	Burns, Stephanie A
Subject:	FW: New Fire Structural / Rescue Station (FS/RS) on West Ramp, Greene Co. OH
Date:	Thursday, April 14, 2016 10:59:02 AM
Attachments:	image001.jpg image002.png

FYI

From: susan_zimmermann@fws.gov [mailto:susan_zimmermann@fws.gov] **On Behalf Of** Ohio, FW3
Sent: Thursday, April 14, 2016 8:11 AM
To: WARNER, DARRYN M GS-13 USAF AFMC 88 CEG/CEIEA <darryn.warner@us.af.mil>
Cc: Megan Seymour <megan_seymour@fws.gov>
Subject: New Fire Structural / Rescue Station (FS/RS) on West Ramp, Greene Co. OH

TAILS# 03E15000-2016-TA-0933

Dear Mr. Warner,

We have received your recent correspondence requesting information about the subject proposal. There are no Federal wilderness areas, wildlife refuges or designated critical habitat within the vicinity of the project area.

FEDERALLY LISTED, PROPOSED, AND CANDIDATE SPECIES COMMENTS: Due to the project, type, size, and location, we do not anticipate adverse effects to federally endangered, threatened, proposed, or candidate species. Should the project design change, or during the term of this action, additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, consultation with the Service should be initiated to assess any potential impacts.

If you have questions, or if we can be of further assistance in this matter, please contact our office at (614) 416-8993 or ohio@fws.gov.

Sincerely,

Dan Everson
Field Supervisor

Ohio Department of Natural Resources Consultation Letters:

1. **WPAFB Request – 04Apr16**

2. **ODNR Response – 12May16**

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 88TH AIR BASE WING (AFMC)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

4 April 2016

88 CEG/CEIEA
1450 Littrell Road, Building 22
Wright-Patterson AFB OH 45433-5209

Mr. John Kessler
john.kessler@dnr.state.oh.us
ODNR Office of Real Estate
2045 Morse Road, Building E-2
Columbus, OH 43229-6693
P: (614) 265-6621

Dear Mr. Kessler:

The purpose of this letter is to request an environmental review and information from the Natural Heritage Program for State and Federally-listed threatened or endangered plants and animals in the vicinity of the West Ramp in Area A at Wright-Patterson Air Force Base (WPAFB, Base). The 88th Civil Engineer Group (88th CEG) at WPAFB is preparing an Environmental Assessment (EA) to evaluate the impacts of constructing a new fire structural/rescue station (FS/RS) facility on the West Ramp. The new FS/RS facility would be sited at the location of existing Facility 34020 (F/34020), which is approximately 1,500 feet (ft) southwest of the current West Ramp Fire Station (F/34012). The project involves the partial demolition of F/34020 and re-use of the existing concrete slab foundation for the new FS/RS facility foundation. The new fire station would be a combination structural/Aircraft Rescue and Firefighting (ARFF) facility. The preferred location of the new FS/RS would resolve response time issues and create access from the new FS/RS drive-through apparatus bays directly to the flight-line on the south end of Runway 05Left-23Right (05L-23R). In addition, the new FS/RS would correct multiple building design deficiencies and include private sleeping quarters for each fire fighter, dining area, training room, and drive-through apparatus bays. The existing fire station at F/B34012 would be vacated upon completion of the new FS/RS with all existing personnel relocated to the new FS/RS facility.

The new FS/RS facility must meet the following requirements: Unified Facilities Criteria (UFC) 4-730-10, *Fire Stations*; Department of Defense (DoD) Instruction 6055.06, *DoD Fire and Emergency Services (F&ES) Program*; UFC 4-010-01, *DoD Minimum Antiterrorism Standards for Buildings*; Air Force Manual (AFMAN) 32-1084, *Facility Requirements*; and Air Force *Fire Station Design Guide*. Per DoD Instruction Number 6055.06, *DoD Fire and Emergency Services (F&ES) Program*, the firefighting response time to Base facilities must meet a 1-minute response requirement for ARFF emergencies. Additionally, the new fire station must be sited to ensure access to roadways and service entrances and accommodate vehicle sizes anticipated for fire station operations and the potential for future expansion.

Proposed Action

The Proposed Action involves the construction of an approximate 13,524 square foot (sf) facility at the site of existing F/34020, which would be partially demolished (approximately 18,169 sf) to preserve the existing concrete slab. The existing F/34020 was historically utilized as a Nose Dock Hangar but is currently unoccupied and vacant. Figure 1 presents the location of WPAFB and the surrounding area. Figure 2 presents F/34020 and the location of the proposed new FS/RS facility.

The new FS/RS facility would be a noncombustible, one-story structure with two high-bay, drive-through apparatus stalls; separate men's and women's restrooms with lockers and showers; separate men's and women's sleeping rooms; a separate captain's sleeping room and restroom; and a day room with a kitchen. The new FS/RS facility would be constructed according to UFC 4-730-10, *Fire Stations*. The current fire station located at F/34012 would be vacated once construction of the new FS/RS is complete.

Equipment such as bulldozers, backhoes, front-end loaders, dump trucks, tractor-trailers, concrete mixers, asphalt vehicles, and generators would be required to support the proposed site preparation and construction activities. Prior to construction activities, plans and documents would be prepared by the contractor to provide environmental controls. Environmental measures under the Proposed Action would be designed to control erosion, sedimentation, and stormwater runoff. All construction debris from the demolition of F/34020 would be recycled or disposed at an approved landfill in accordance with all applicable federal, state, and local laws and regulations.

Alternative B involves adaptive re-use of F/34020 as an alternative to demolition. Facility 34020 would be renovated, modernized, and converted into the new FS/RS facility with the building design conforming to UFC 4-730-10, *Fire Stations*. The footprint of F/34020 (former Nose Dock Hangar) would remain but the existing roll-off doors would be replaced with hangar doors so ARFF vehicles could maneuver with ease.

Under the No Action Alternative (Alternative C), a new FS/RS facility would not be constructed. The 445th Airlift Wing Fire Department (tenant under 88th CEG) would not be able to respond to critical emergencies. The response times from the present location (F/34012) would continue to be excessive (greater than 1minute), particularly to critical, high-value facilities or aircraft where a few seconds of response time could mean the difference in preventing injuries and major losses. In addition, the No Action Alternative does not satisfy the purpose and need of correcting building design deficiencies in the current fire station.

The Base has determined that the construction of F/34020 would not affect threatened or endangered species known to occur or have occurred at WPAFB (Figure 3). This determination is based on significant development having occurred in the proposed project area.

The Natural Heritage Data Request Form is attached. We would appreciate any information from your database that applies to our project area. Please let us know if you concur with the no effect determination. Please contact me at (937) 257-4857 or by email at Darryn.Warner@us.af.mil if you have questions. Thank you for your consideration.

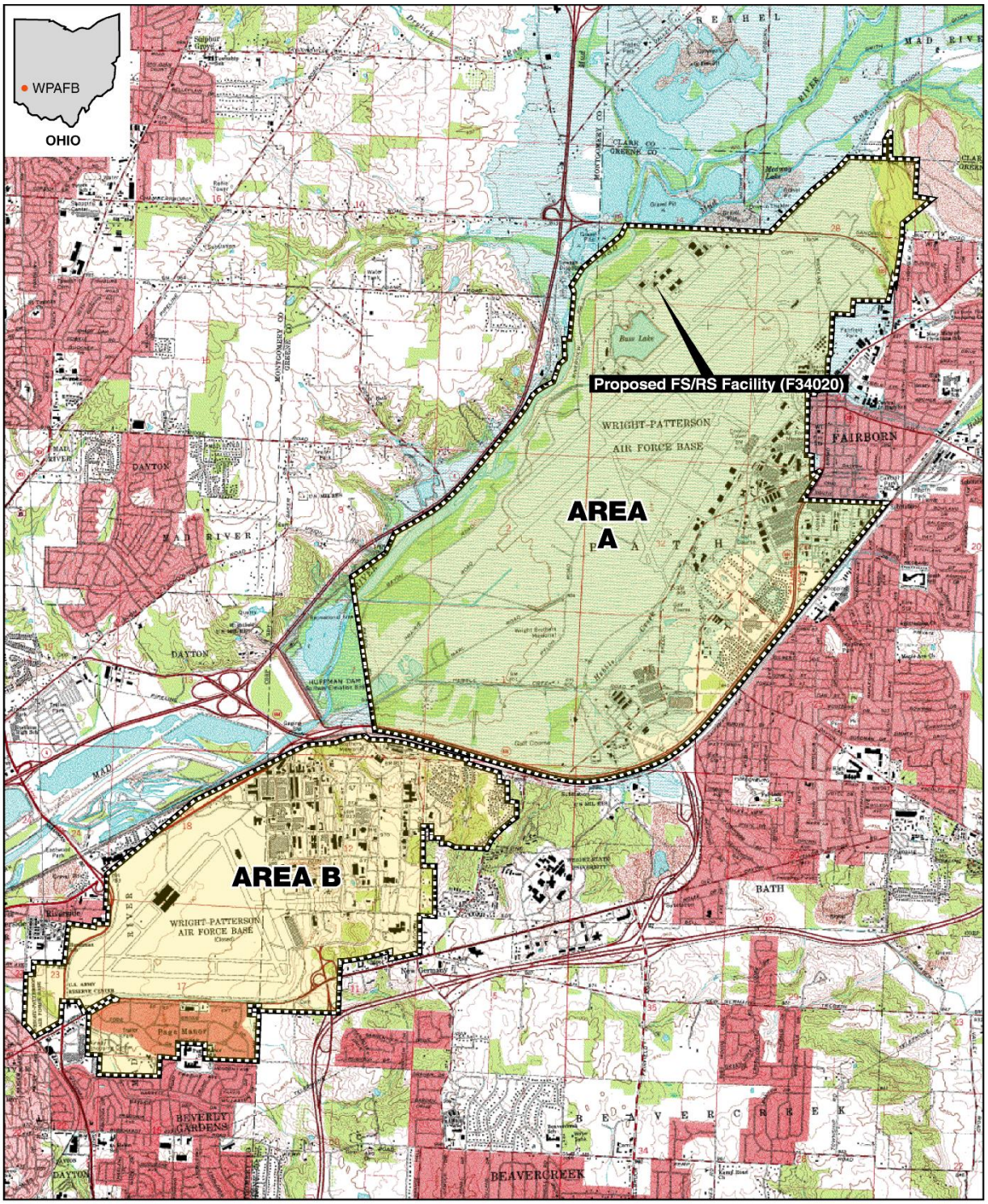
Sincerely,

Darryn Warner
Natural Resources Program Manager
Environmental Assets Section
Environmental Branch

cc: John Banford (88 CEG/CEIEA, WPAFB)
Cynthia A. Hassan (CB&I)

Attachments: Natural Heritage Data Request Form
Figure 1 – Location of WPAFB and Surrounding Area
Figure 2 – Proposed Location of FS/RS West Ramp
Figure 3 – Threatened and Endangered Species, Wetlands, and Floodplains in the Project Area

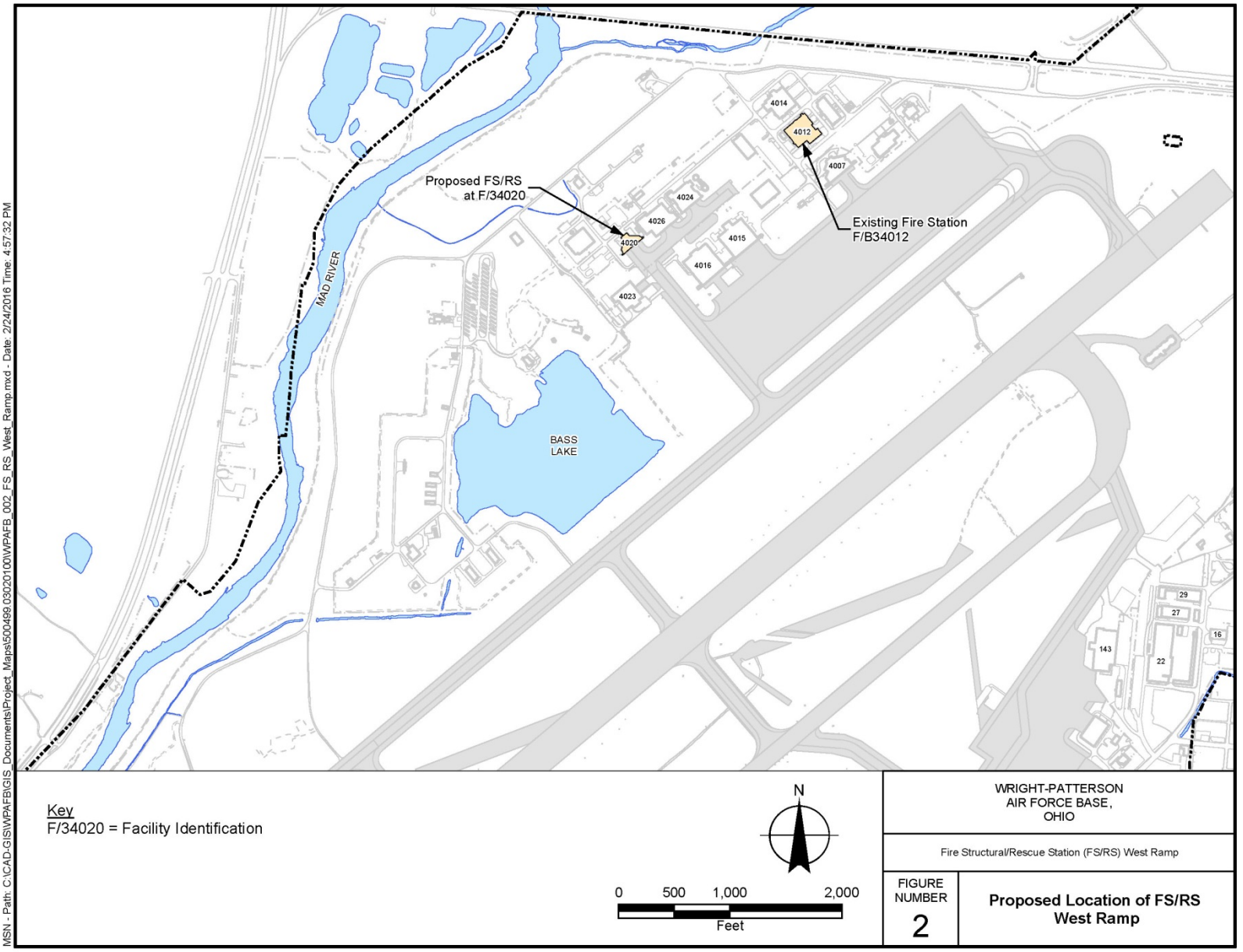
OFFICE	DATE	DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
Cincinnati, OH	10/26/15	--	JIS	SB	CH	s-500499.03020100-10/15-w

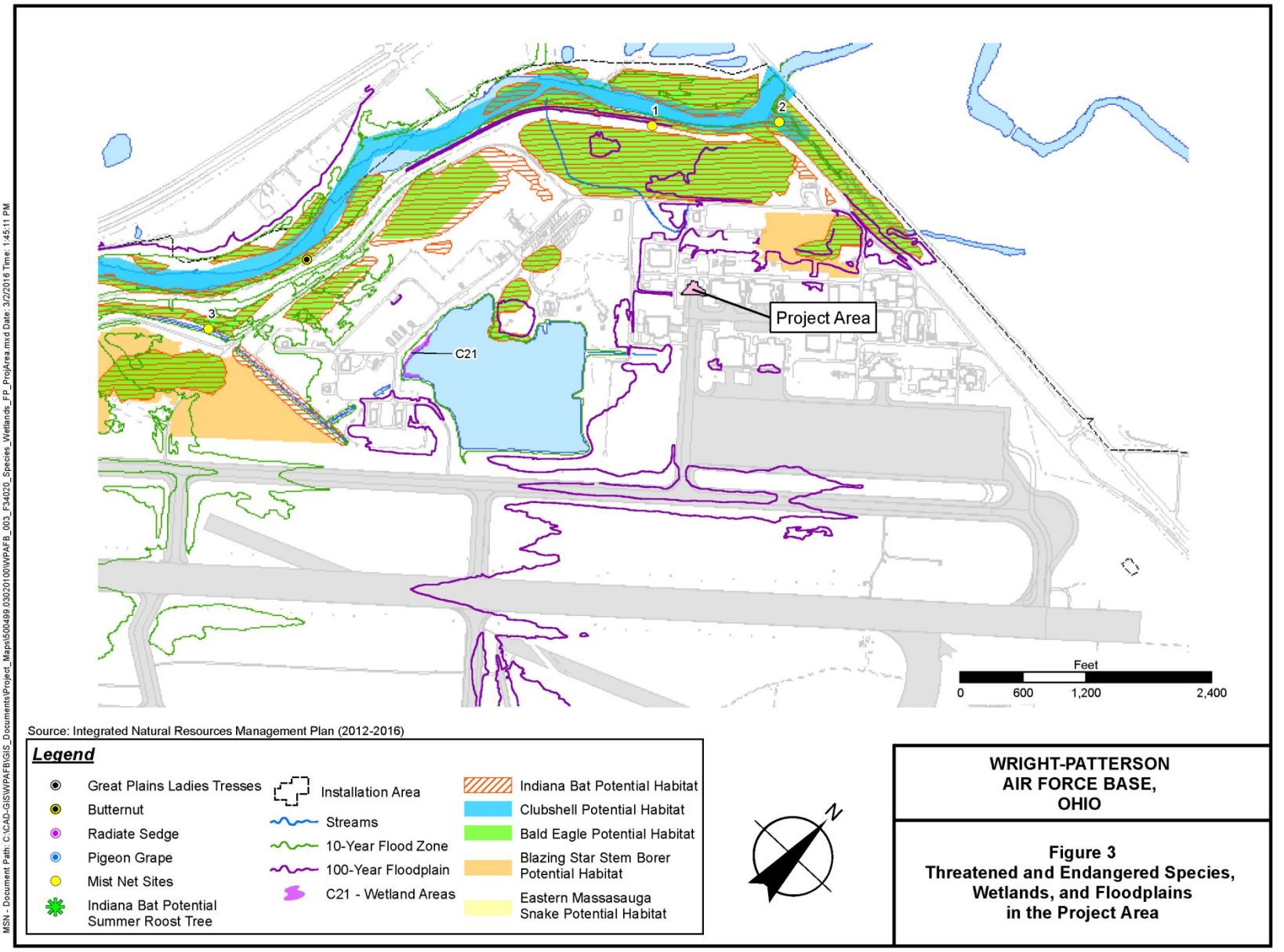


WRIGHT-PATTERSON
AIR FORCE BASE
OHIO

FIGURE NUMBER 1

LOCATION OF WPAFB AND SURROUNDING AREA


Proposed FS/RS
at F/34020
Existing Fire Station
F/B34012
MAD RIVER
BASS
LAKE
4014
4012
4007
4024
4026
4020
4015
4016
4023
29
27
16
143
22
Key
F/34020 = Facility Identification
N
0
500
1,000
2,000
Feet
WRIGHT-PATTERSON
AIR FORCE BASE,
OHIO
Fire Structural/Rescue Station (FS/RS) West Ramp
FIGURE
NUMBER
2
Proposed Location of FS/RS
West Ramp
MSN - Path: C:\CAD-GIS\WPAFBGIS_Documents\Project_Maps\500499.03020100\WPAFB_002_FS_RS_West_Ramp.mxd - Date: 2/24/2016 Time: 4:57:32 PM


1
2
3
C21
Project Area
Feet
0
600
1,200
2,400
Source: Integrated Natural Resources Management Plan (2012-2016)
Legend
Great Plains Ladies Tresses
Butternut
Radiate Sedge
Pigeon Grape
Mist Net Sites
Indiana Bat Potential Summer Roost Tree
Installation Area
Streams
10-Year Flood Zone
100-Year Floodplain
C21 - Wetland Areas
Indiana Bat Potential Habitat
Clubshell Potential Habitat
Bald Eagle Potential Habitat
Blazing Star Stem Borer Potential Habitat
Eastern Massasauga Snake Potential Habitat
N
WRIGHT-PATTERSON AIR FORCE BASE, OHIO
Figure 3
Threatened and Endangered Species, Wetlands, and Floodplains in the Project Area
MSN - Document Path: C:\CAD-GIS\WPAFB\GIS_Documents\Project_Maps\500499.03020100\WPAFB_003_F34020_Species_Wetlands_FP_ProjArea.mxd Date: 3/2/2016 Time: 1:45:11 PM

Ohio Department of Natural Resources
DIVISION OF WILDLIFE

DNR 5203 (R0915)

NATURAL HERITAGE DATA REQUEST FORM

ODNR Division of Wildlife
Ohio Natural Heritage Program
2045 Morse Rd., Bldg. G-3
Columbus, OH 43229-6693
Phone: 614-265-6818
Email: obdrequest@dnr.state.oh.us

INSTRUCTIONS:

Please complete all the information on both sides of this form, sign (required) and email it to the address given above. Please provide a description of the work to be performed at the project site, and a map detailing your project site boundaries. If you have GIS capabilities or request a GIS response, please also submit a shapefile of your project site (unbuffered). Data requests will be completed within approximately 30 days, usually sooner. There is currently no charge to process requests.

WHAT WE PROVIDE:

As applicable to your project, the Ohio Natural Heritage Database (ONHD) will provide records for state and federally listed plants and animals, high quality plant communities, geologic features, breeding animal concentrations, scenic rivers, protected natural areas (managed areas), and significant unprotected natural areas (conservation sites). A one mile radius around the project site will automatically be searched. Because the ONHD contains sensitive information, it is our policy to provide only the data needed to complete your project.

Please note that this information is provided without comment on potential impacts to the species and their habitats, and therefore does not constitute coordination with ODNR under NEPA, the Fish & Wildlife Coordination Act, the Federal Water Pollution Control Act and other laws. If your project requires ODNR coordination, please submit it for a more extensive environmental review to environmentalreviewrequest@dnr.state.oh.us. Additional information on the environmental review process is available at http://realestate.ohiodnr.gov/environmental-review. If you have questions, please contact John Kessler at 614-265-6621 or john.kessler@dnr.state.oh.us. A ONHD search is included as part of the environmental review process.

Date: 4Apr2016 **Company name:** Wright-Patterson Air Force Base

Name of person response letter should be addressed to:
Mr. ☑ **Ms.** ☐ Darryn Warner / Natural Resources Program Manager

Address: 1450 Littrell Road, Building 22

City/State/Zip: WPAFB, Ohio 45433-5209

Phone: 937-257-4857

E-mail address: *darryn.warner@us.af.mil*

Project Name: EA to Construct New Fire Structural/Rescue Station (FS/RS) West Ramp

Project Site Address: Area A, Wright-Patterson Air Force Base

Project County: Greene

Project City or Township: Bath

Project site is located on the following USGS 7.5 minute topographic quad(s):
Fairborn, OH

Project latitude and longitude: North 39 50' 15.0744" / West 84 2' 52.3987"

Description of work to be performed at the project site:
Partial demolition (approximately 18,169 square feet) of Facility 34020 (F/34020) to the concrete slab; Construction of a 13,524 square foot FS/RS facility at F/34020 on the existing concrete foundation slab.

How do you want your data reported? (Both formats provide the same data. The manual search is most appropriate for small scale projects or for those without GIS capabilities. With this option we will send you a list of records and a map showing their location. If you request a GIS shapefile, we will send you a shapefile of data layers. You will then need to make your own map and list of data for your report. You must have GIS capabilities. If you choose this option, please email your project shapefile with your request. If you do not make a selection, a manual search will be performed. Please choose only one option below.)

☑ **Printed list and map (manual search)** **OR** ☐ **GIS shapefile (computer search)**

Other than the standard data (see "what we provide" at top of form), additional information you require:
For the Indiana bat, include information within a 5-mile radius of the project area.

How will the information be used?
The name, status, and location of each species will be published in an environmental assessment (EA) that is being performed to satisfy requirements under the National Environmental Policy Act (NEPA).

The chief of the Division of Wildlife has determined that the release of the ONHD information you have requested could be detrimental to the conservation of a species or unique natural feature. Pursuant to section 1531.04 of the Ohio Revised Code, this information is not subject to section 149.43 of the Revised Code. By signing below, you certify that the data provided will not be disclosed, published, or distributed beyond the scope of your specific project.

Signature _____ **Date:** 04Apr2016

Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR JAMES ZEHRINGER, DIRECTOR

Office of Real Estate
Paul R. Baldridge, Chief
2045 Morse Road – Bldg. E-2
Columbus, OH 43229
Phone: (614) 265-6649
Fax: (614) 267-4764

May 12, 2016

Darryn M. Warner
Department of the Air Force
88 CEG/CEIEA
1450 Littrell Rd. Bldg. 22
WPAFB, OH 45433

Re: 16-236; EA to Construct New Fire Structural/Rescue Station (FS/RS) West Ramp

Project: The proposed project involves the construction of a new fire structural/rescue station (FS/RS) facility on the West Ramp.

Location: The proposed project is located Bath Township, Greene County, Ohio.

The Ohio Department of Natural Resources (ODNR) has completed a review of the above referenced project. These comments were generated by an inter-disciplinary review within the Department. These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the National Environmental Policy Act, the Coastal Zone Management Act, Ohio Revised Code and other applicable laws and regulations. These comments are also based on ODNR's experience as the state natural resource management agency and do not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

Natural Heritage Database: The Natural Heritage Database has the following data at or within a one mile radius of the project area:

Upland sandpiper (*Bartramia longicauda*), E
Indiana bat (*Myotis sodalis*), E, FE
Badger (*Taxidea taxus*), SC
Tonguetied minnow (*Exoglossum laurae*), T

The review was performed on the project area you specified in your request as well as an additional one mile radius. Records searched date from 1980. This information is provided to inform you of features present within your project area and vicinity. Additional comments on some of the features may be found in the pertinent sections below.

Please note that Ohio has not been completely surveyed and we rely on receiving information from many sources. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Although all types of plant communities have been surveyed, we only maintain records on the highest quality areas.

Statuses are defined as: E = state endangered; T = state threatened; P = state potentially threatened; SC = state species of concern; SI = state special interest; A = species recently added to state inventory, status not yet determined; X = presumed extirpated in Ohio; FE = federal endangered, FT = federal threatened, FSC = federal species of concern, FC = federal candidate species.

Fish and Wildlife: The Division of Wildlife (DOW) has the following comments.

The DOW recommends that impacts to streams, wetlands and other water resources be avoided and minimized to the fullest extent possible, and that best management practices be utilized to minimize erosion and sedimentation.

The project is within the range of the Indiana bat (*Myotis sodalis*), a state endangered and federally endangered species. The following species of trees have relatively high value as potential Indiana bat roost trees to include: shagbark hickory (*Carya ovata*), shellbark hickory (*Carya laciniosa*), bitternut hickory (*Carya cordiformis*), black ash (*Fraxinus nigra*), green ash (*Fraxinus pennsylvanica*), white ash (*Fraxinus americana*), shingle oak (*Quercus imbricaria*), northern red oak (*Quercus rubra*), slippery elm (*Ulmus rubra*), American elm (*Ulmus americana*), eastern cottonwood (*Populus deltoides*), silver maple (*Acer saccharinum*), sassafras (*Sassafras albidum*), post oak (*Quercus stellata*), and white oak (*Quercus alba*). Indiana bat roost trees consists of trees that include dead and dying trees with exfoliating bark, crevices, or cavities in upland areas or riparian corridors and living trees with exfoliating bark, cavities, or hollow areas formed from broken branches or tops. However, Indiana bats are also dependent on the forest structure surrounding roost trees. If suitable habitat occurs within the project area, the DOW recommends trees be conserved. If suitable habitat occurs within the project area and trees must be cut, the DOW recommends cutting occur between October 1 and March 31. If suitable trees must be cut during the summer months, the DOW recommends a net survey be conducted between June 1 and August 15, prior to any cutting. Net surveys should incorporate either nine net nights per square 0.5 kilometer of project area, or four net nights per kilometer for linear projects. If no tree removal is proposed, this project is not likely to impact this species.

The project is within the range of the clubshell (*Pleurobema clava*), a state endangered and federally endangered mussel, the rayed bean (*Villosa fabalis*), a state endangered and federally endangered mussel, and the snuffbox (*Epioblasma triquetra*), a state endangered and federally endangered mussel, the black sandshell (*Ligumia recta*), a state threatened mussel, and the fawnsfoot (*Truncilla donaciformis*), a state threatened mussel. Due to the location, and that there is no in-water work proposed in a perennial stream, this project is not likely to impact these species.

The project is within the range of the tonguetied minnow (*Exoglossum laurae*), a state threatened fish. Due to the location, and that there is no in-water work proposed in a perennial stream, this project is not likely to impact this or other aquatic species.

The project is within the range of the spotted turtle (*Clemmys guttata*), a state threatened species. This species prefers fens, bogs and marshes, but also is known to inhabit wet prairies, meadows, pond edges, wet woods, and the shallow sluggish waters of small streams and ditches. Due to the location, the type of habitat at the project site and within the vicinity of the project area, and the type of work proposed, this project is not likely to impact this species.

The project is within the range of the Kirtland's snake (*Clonophis kirtlandii*), a state threatened species. This secretive species prefers wet fields and meadows. Due to the location, the type of

habitat at the project site and within the vicinity of the project area, and the type of work proposed, this project is not likely to impact this species.

The project is within the range of the eastern massasauga (*Sistrurus catenatus*), a state endangered and a federal candidate snake species. The eastern massasauga uses a range of habitats including wet prairies, fens, and other wetlands, as well as adjacent drier upland habitat. Due to the location, the type of habitat at the project site and within the vicinity of the project area, and the type of work proposed, this project is not likely to impact this species.

The project is within the range of the upland sandpiper (*Bartramia longicauda*), a state endangered bird. Nesting upland sandpipers utilize dry grasslands including native grasslands, seeded grasslands, grazed and ungrazed pasture, hayfields, and grasslands established through the Conservation Reserve Program (CRP). If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 to July 31. If this type of habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the northern harrier (*Circus cyaneus*), a state endangered bird. This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds a nest out of sticks on the ground, often on top of a mound. Harriers hunt over grasslands. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 15 to August 1. If this habitat will not be impacted, this project is not likely to impact this species.

Due to the potential of impacts to federally listed species, as well as to state listed species, we recommend that this project be coordinated with the U.S. Fish & Wildlife Service.

Water: The Division of Water Resources has the following comment.

Based upon the site map identifying the location of the proposed development, the project appears to be located within the Special Flood Hazard Area (SFHA) (*i.e.*, one-percent-annual-chance or 100-year floodplain) of the Mad River as shown on Flood Insurance Rate Map (FIRM) panel: Greene County, Ohio and Incorporated Areas FIRM, Community Panel Number 39057C0010D, Effective March 17, 2011. Compliance with National Flood Insurance Program floodplain development performance standards may be required for this project [Executive Order 11988]. For additional information regarding local floodplain management requirements, please contact Greene County's designated Floodplain Manager: Al Kuzma, Green County Building Department, at (937) 562-7427 or Akuzma@co.greene.oh.us .

ODNR appreciates the opportunity to provide these comments. Please contact John Kessler at (614) 265-6621 if you have questions about these comments or need additional information.

John Kessler
ODNR Office of Real Estate
2045 Morse Road, Building E-2
Columbus, Ohio 43229-6693
John.Kessler@dnr.state.oh.us

Notice of Availability (NOA)

PUBLIC NOTICE
Notice of Availability

Draft-Final Environmental Assessment Fire Structural/Rescue Station West Ramp Wright-Patterson Air Force Base

Beginning October 25, 2016 through November 23, 2016, the United States Air Force will accept comments on the Environmental Assessment (EA) to construct a Fire Structural / Rescue Station on the West Ramp at Wright-Patterson Air Force Base (AFB), Ohio. The results, as found in the EA, show that the Proposed Action of constructing a 13,524 square foot fire structural / rescue station facility would not have an adverse impact on the environment—indicating that a Finding of No Significant Impact (FONSI) would be appropriate. The public is invited to review the documents at the Greene County Public Library, Fairborn Branch, located at 1 East Main Street, Fairborn, OH 45324-4701, (937) 878-9383 or to access the documents on-line at http://www.wpafb.af.mil/units/cev. Written comments and inquiries can be mailed to:
88 ABW / Public Affairs, 5135 Pearson Road, Bldg 10, Room 252, WPAFB, Ohio 45433. 88abw.pa@us.af.mil.

Appendix B

Clean Air Act
Air Conformity Applicability Model Report

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 Instruction 32-7040, Air Quality Compliance And Resource Management; 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: WRIGHT-PATTERSON AFB
County(s): Greene
Regulatory Area(s): Dayton-Springfield, OH

b. Action Title: Environmental Assessment for Fire Structural / Rescue Station West Ramp

c. Project Number/s (if applicable): Contract No. FA8601-11-D-0002; Task Order 0034

d. Projected Action Start Date: 3 / 2016

e. Action Description:

Proposed Action, Alternative A
The 445th AW at WPAFB is proposing to construct a 18,073 sf FS/RS facility on the West Ramp in Area A. The new facility would be constructed at the site of existing F/34020, which would be demolished to preserve the existing concrete slab. Facility 34020 was historically utilized as a Nose Dock Hangar but is currently unoccupied and vacant. Facility 34020 would be demolished prior to construction of the FS/RS facility. All interior and exterior building components and materials would be demolished and removed from the site. The new FS/RS facility would be constructed on the existing concrete floor slab. The FS/RS facility would consist of a noncombustible, one-story structure with two high-bay, drive-through apparatus stalls; separate men's and women's restrooms with lockers and showers; separate men's and women's sleeping rooms; a separate captain's sleeping room and restroom; and a day room with a kitchen. The facility would be constructed according to UFC 4-730-10, Fire Stations. The existing fire station, F/B34012, would be vacated once construction of the new FS/RS is complete.

Alternative B
Alternative B involves adaptive re-use of F/34020 as an alternative to demolition. Facility 34020 would be renovated, modernized, and converted into the new FS/RS facility. The footprint of the Nose Dock Hangar would remain but the existing roll-off doors would be replaced with hangar doors so ARFF vehicles could maneuver with ease. Interior renovation of F/34020 would be retrofitted according to UFC 4-730-10, Fire Stations.

Alternative C, No Action Alternative

f. Point of Contact:

Name: Timothy J. Rust
Title: Senior Environmental Engineer
Organization: CB&I Federal Services, LLC
Email: tim.rust@cbifederalservices.com
Phone Number: 513-782-4888

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.

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

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary for Proposed Action (Alternative A):

2016

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Dayton-Springfield, OH			
VOC	2.755	100	No
NOx	11.714	100	No
CO	7.819	N/A	N/A
SOx	0.021	100	No
PM 10	0.902	N/A	N/A
PM 2.5	0.557	100	No
Pb	0.000	N/A	N/A
NH3	0.005	N/A	N/A

2017 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Dayton-Springfield, OH			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000	N/A	N/A
SOx	0.000	100	No
PM 10	0.000	N/A	N/A
PM 2.5	0.000	100	No
Pb	0.000	N/A	N/A
NH3	0.000	N/A	N/A

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.

Timothy J. Rust, Senior Environmental Engineer — November 20, 2015

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: WRIGHT-PATTERSON AFB
County(s): Greene
Regulatory Area(s): Dayton-Springfield, OH

- Action Title: Environmental Assessment for Fire Structural / Rescue Station West Ramp

- Project Number/s (if applicable): Contract No. FA8601-11-D-0002; Task Order 0034

- Projected Action Start Date: 3 / 2016

- Action Purpose and Need:

The purpose of the Proposed Action is to construct a new Fire Structural / Rescue Station (FS/RS) at Wright-Patterson Air Force Base (WPAFB) in accordance with current standards, as specified in Unified Facilities Criteria (UFC) 4-730-10, Fire Stations (Department of Defense [DoD] 2006a). A new FS/RS is urgently needed to reduce firefighting response times to the south end of the primary runway (Runway 05L-23R) in Area A at WPAFB, and to correct deficiencies in the existing Fire Station 2 presently located in Facility B34012 (F/B34012). The location of the new fire station would correct deficiencies in the current station and would improve crash response time for potential incidents on the south end of Runway 05L-23R.

- Action Description:

Proposed Action, Alternative A
The 445th AW at WPAFB is proposing to construct a 18,073 sf FS/RS facility on the West Ramp in Area A. The new facility would be constructed at the site of existing F/34020, which would be demolished to preserve the existing concrete slab. Facility 34020 was historically utilized as a Nose Dock Hangar but is currently unoccupied and vacant. Facility 34020 would be demolished prior to construction of the FS/RS facility. All interior and exterior building components and materials would be demolished and removed from the site. The new FS/RS facility would be constructed on the existing concrete floor slab. The FS/RS facility would consist of a noncombustible, one-story structure with two high-bay, drive-through apparatus stalls; separate men's and women's restrooms with lockers and showers; separate men's and women's sleeping rooms; a separate captain's sleeping room and restroom; and a day room with a kitchen. The facility would be constructed according to UFC 4-730-10, Fire Stations. The existing fire station, F/B34012, would be vacated once construction of the new FS/RS is complete.

Alternative B
Alternative B involves adaptive re-use of F/34020 as an alternative to demolition. Facility 34020 would be renovated, modernized, and converted into the new FS/RS facility. The footprint of the Nose Dock Hangar would remain but the existing roll-off doors would be replaced with hangar doors so ARFF vehicles could maneuver with ease. Interior renovation of F/34020 would be retrofitted according to UFC 4-730-10, Fire Stations.

Alternative C, No Action Alternative

- Point of Contact

Name: Timothy J. Rust
Title: Senior Environmental Engineer
Organization: CB&I Federal Services, LLC
Email: tim.rust@cbifederalservices.com
Phone Number: 513-782-4888

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity List for Proposed Action (Alternative A):

Activity Type		Activity Title
2.	Construction / Demolition	Demolition of Facility 34020
3.	Construction / Demolition	Construction of FS/RS Facility

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: Greene
Regulatory Area(s): Dayton-Springfield, OH

- Activity Title: Demolition of Facility 34020

- Activity Description:
All interior and exterior building components and materials would be demolished and removed from the site. The new FS/RS facility would be constructed on the existing concrete floor slab.

- Activity Start Date
Start Month: 3
Start Month: 2016

- Activity End Date
Indefinite: False
End Month: 4
End Month: 2016

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.145012
SO_x	0.002033
NO_x	1.057013
CO	0.751640
PM 10	0.195307

Pollutant	Total Emissions (TONs)
PM 2.5	0.049115
Pb	0.000000
NH_3	0.000586

2.1 Demolition Phase

2.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 1
Start Year: 2016

- Phase Duration
Number of Month: 2
Number of Days: 0

2.1.2 Demolition Phase Assumptions

- General Demolition Information
Area of Building to be demolished (ft^2): 23175

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Height of Building to be demolished (ft): 30

- Default Settings Used: No

- Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Concrete/Industrial Saws Composite	1	8
Cranes Composite	1	8
Excavators Composite	1	8
Other Construction Equipment Composite	5	8
Rubber Tired Dozers Composite	1	1
Tractors/Loaders/Backhoes Composite	2	6

- Vehicle Exhaust

Average Hauling Truck Capacity (yd^3): 20

Average Hauling Truck Round Trip Commute (mile): 20

- 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

- Worker Trips Vehicle Mixture (%)

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

2.1.3 Demolition Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Concrete/Industrial Saws Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.0756	0.0006	0.4589	0.3936	0.0336	0.0336	0.0068	58.463
Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.1136	0.0013	0.9387	0.4263	0.0387	0.0387	0.0102	128.62
Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.0987	0.0013	0.6602	0.5212	0.0332	0.0332	0.0089	119.58
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.0719	0.0012	0.5679	0.3602	0.0233	0.0233	0.0064	122.56
Rubber Tired Dozers Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.2591	0.0024	2.0891	0.9833	0.0858	0.0858	0.0233	239.09
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.0610	0.0007	0.4069	0.3689	0.0258	0.0258	0.0055	66.797

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2
LDGV	000.454	000.007	000.460	004.567	000.012	000.010		000.029	00362.109
LDGT	000.590	000.009	000.806	006.674	000.013	000.012		000.030	00473.039
HDGV	001.158	000.016	002.440	023.503	000.032	000.028		000.045	00779.244
LDDV	000.166	000.003	000.193	002.601	000.005	000.004		000.008	00359.102
LDDT	000.431	000.005	000.632	005.592	000.008	000.007		000.008	00537.952
HDDV	000.629	000.014	006.872	002.247	000.295	000.271		000.028	01527.789
MC	002.474	000.008	000.783	014.471	000.028	000.025		000.051	00397.014

2.1.4 Demolition Phase Formula(s)

- Fugitive Dust Emissions per Phase

$PM10_{FD} = (0.00042 * BA * BH) / 2000$

$PM10_{FD}$: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft^3)
BA: Area of Building to be demolished (ft^2)
BH: Height of Building to be demolished (ft)
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

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

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish (ft^2)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards ($1\ yd^3 / 27\ ft^3$)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
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. Construction / Demolition

3.1 General Information & Timeline Assumptions

- Activity Location
County: Greene
Regulatory Area(s): Dayton-Springfield, OH

- Activity Title: Construction of FS/RS Facility

- Activity Description:
The FS/RS facility would consist of a noncombustible, one-story structure with two high-bay, drive-through apparatus stalls; separate men's and women's restrooms with lockers and showers; separate men's and women's sleeping rooms; a separate captain's sleeping room and restroom; and a day room with a kitchen. The facility would be constructed according to UFC 4-730-10, Fire Stations.

- Activity Start Date
Start Month: 3
Start Month: 2016

- Activity End Date
Indefinite: False
End Month: 12
End Month: 2016

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	2.609829
SO_x	0.018950
NO_x	10.657470
CO	7.067089
PM 10	0.706729

Pollutant	Total Emissions (TONs)
PM 2.5	0.507454
Pb	0.000000
NH_3	0.004229

3.1 Trenching/Excavating Phase

3.1.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date
Start Month: 6

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Start Quarter: 1
Start Year: 2016

- Phase Duration
Number of Month: 2
Number of Days: 0

3.1.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information
Area of Site to be Trenched/Excavated (ft^2): 10000
Amount of Material to be Hauled On-Site (yd^3): 0
Amount of Material to be Hauled Off-Site (yd^3): 0

- Trenching 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	2	8
Other General Industrial Equipmen Composite	1	8
Tractors/Loaders/Backhoes Composite	1	8

- Vehicle Exhaust
Average Hauling Truck Capacity (yd^3): 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 Trenching / Excavating Phase Emission Factor(s)

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

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

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2
LDGV	000.571	000.007	000.611	005.327	000.015	000.013		000.034	00374.453
LDGT	000.753	000.010	001.052	008.179	000.016	000.014		000.034	00499.382
HDGV	001.394	000.015	003.008	027.382	000.038	000.034		000.046	00771.102
LDDV	000.258	000.003	000.313	003.440	000.007	000.006		000.008	00380.123
LDDT	000.572	000.005	000.839	007.049	000.008	000.008		000.008	00591.967
HDDV	000.760	000.014	008.333	002.689	000.377	000.347		000.028	01547.058
MC	002.511	000.008	000.792	015.200	000.028	000.025		000.049	00396.701

3.1.4 Trenching / Excavating 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 (yd^3)
$HA_{OffSite}$: Amount of Material to be Hauled Off-Site (yd^3)
HC: Average Hauling Truck Capacity (yd^3)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd^3)
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_{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

3.2 Building Construction Phase

3.2.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 3
Start Quarter: 2
Start Year: 2016

- Phase Duration
Number of Month: 9
Number of Days: 0

3.2.2 Building Construction Phase Assumptions

- General Building Construction Information
Building Category: Commercial or Retail
Area of Building (ft^2): 18073
Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Aerial Lifts Composite	3	6
Air Compressors Composite	3	8
Cranes Composite	2	4
Excavators Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Other Construction Equipment Composite	5	8
Other General Industrial Equipmen Composite	5	8
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	2	6

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- 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

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC

POVs	50.00	50.00	0	0	0	0	0

- Vendor Trips

Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

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

3.2.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Aerial Lifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.0397	0.0003	0.2481	0.1800	0.0150	0.0150	0.0035	34.721
Air Compressors Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.0704	0.0007	0.4729	0.3207	0.0318	0.0318	0.0063	63.607
Cranes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.1136	0.0013	0.9387	0.4263	0.0387	0.0387	0.0102	128.62
Excavators Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.0987	0.0013	0.6602	0.5212	0.0332	0.0332	0.0089	119.58
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.0427	0.0006	0.2815	0.2189	0.0136	0.0136	0.0038	54.395
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.0580	0.0006	0.4369	0.2862	0.0240	0.0240	0.0052	60.992
Other Construction Equipment Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.0719	0.0012	0.5679	0.3602	0.0233	0.0233	0.0064	122.56
Other General Industrial Equipmen Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.1266	0.0016	1.0121	0.4730	0.0425	0.0425	0.0114	152.23
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.0610	0.0007	0.4069	0.3689	0.0258	0.0258	0.0055	66.797
Welders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.0482	0.0003	0.2173	0.1950	0.0168	0.0168	0.0043	25.602

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

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2**
LDGV	000.454	000.007	000.460	004.567	000.012	000.010		000.029	00362.109
LDGT	000.590	000.009	000.806	006.674	000.013	000.012		000.030	00473.039
HDGV	001.158	000.016	002.440	023.503	000.032	000.028		000.045	00779.244
LDDV	000.166	000.003	000.193	002.601	000.005	000.004		000.008	00359.102
LDDT	000.431	000.005	000.632	005.592	000.008	000.007		000.008	00537.952
HDDV	000.629	000.014	006.872	002.247	000.295	000.271		000.028	01527.789
MC	002.474	000.008	000.783	014.471	000.028	000.025		000.051	00397.014

3.2.4 Building Construction Phase Formula(s)

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- 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

$VMT_{VE} = BA * BH * (0.32 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.32 / 1000): Conversion Factor ft^3 to trips (0.32 trip / 1000 ft^3)
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: Worker Trips 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

- Vender Trips Emissions per Phase

$VMT_{VT} = BA * BH * (0.05 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.05 / 1000): Conversion Factor ft^3 to trips (0.05 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender 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

3.3 Architectural Coatings Phase

3.3.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date
Start Month: 9
Start Quarter: 1
Start Year: 2016

- Phase Duration
Number of Month: 2
Number of Days: 0

3.3.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category: Non-Residential
Total Square Footage (ft^2): 96000
Number of Units: N/A

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

- 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

3.3.3 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2
LDGV	000.454	000.007	000.460	004.567	000.012	000.010		000.029	00362.109
LDGT	000.590	000.009	000.806	006.674	000.013	000.012		000.030	00473.039
HDGV	001.158	000.016	002.440	023.503	000.032	000.028		000.045	00779.244
LDDV	000.166	000.003	000.193	002.601	000.005	000.004		000.008	00359.102
LDDT	000.431	000.005	000.632	005.592	000.008	000.007		000.008	00537.952
HDDV	000.629	000.014	006.872	002.247	000.295	000.271		000.028	01527.789
MC	002.474	000.008	000.783	014.471	000.028	000.025		000.051	00397.014

3.3.4 Architectural Coatings Phase Formula(s)

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- Worker Trips Emissions per Phase

$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

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

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

- Off-Gassing Emissions per Phase

$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)
2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

WPAFB - EA Fire Structural/Rescue Station West Ramp
Calculation of Project Air Pollutant Emissions - Alternative A
Summary of GHG Emissions from Construction Project Activities

Construction Phase Name	Phase ID	CO2 (ton/yr)	CH4 (ton/yr)	CO2e (ton/yr)
Demolition of Facility 34020	2.0	189.08	0.012	189.38
Construct New FS/RS Building	3.0	1,706.84	0.12	1,709.97
Summary of 2016 GHG Emissions		**1,895.93**	**0.137**	**1,899.35**

2.1 Demolition Phase

Equipment Name	Number Of Equipment	Hours Per Day	Day Per Month	Months	CO2 (lb/hour)	CH4 (lb/hour)	CO2 (ton/yr)	CH4 (ton/yr)	CO2e (ton/yr)
Concrete/ Industrial Saws Composite	1	8	20	2	58.463	0.0068	9.35	0.0011	9.38
Cranes Composite	1	8	20	2	128.62	0.0102	20.58	0.0016	20.62
Excavators Composite	1	8	20	2	119.58	0.0089	19.13	0.0014	19.17
Other Construction Equipment Composite	5	8	20	2	122.56	0.0064	98.05	0.0051	98.18
Rubber Tired Dozers Composite	1	1	20	2	239.09	0.0233	4.78	0.0005	4.79
Tractors/ Loaders/ Backhoes Composite	2	6	20	2	66.797	0.0055	16.03	0.0013	16.06

Vehicle Exhaust Category	Material Hauled Onsite (yard3)	Material Hauled Offsite (yard3)	Vehicle Capacity (yard3)	Avg. Trip (mile)	CO2 (g/mile)	CH4 (g/mile)	CO2 (ton/yr)	CH4 (ton/yr)	CO2e (ton/yr)
HDDV	0	6437.5	20	20	1527.789	0.028	10.84	0.00020	10.85

Vehicle Exhaust Category	Number Of Workers	Vehicle Mix and Trip Mile	Day Per Month	Months	CO2 (g/mile)	CH4 (g/mile)	CO2 (ton/yr)	CH4 (ton/yr)	CO2e (ton/yr)
LDGV	14	20	20	2	362.109	0.029	4.47	0.00036	4.48
LDGT	14	20	20	2	473.039	0.030	5.84	0.00037	5.85

3.1 Trenching/Excavating Phase

Equipment Name	Number Of Equipment	Hours Per Day	Day Per Month	Months	CO2 (lb/hour)	CH4 (lb/hour)	CO2 (ton/yr)	CH4 (ton/yr)	CO2e (ton/yr)
Excavators Composite	2	8	20	2	119.58	0.0089	38.27	0.0028	38.34
Other Construction Equipment Composite	1	8	20	2	122.56	0.0064	19.61	0.0010	19.64
Tractors/ Loaders/ Backhoes Composite	1	8	20	2	66.797	0.0055	10.69	0.0009	10.71

Vehicle Exhaust Category	Material Hauled Onsite (yard3)	Material Hauled Offsite (yard3)	Vehicle Capacity (yard3)	Avg. Trip (mile)	CO2 (g/mile)	CH4 (g/mile)	CO2 (ton/yr)	CH4 (ton/yr)	CO2e (ton/yr)
HDDV	0	0	20	20	1527.789	0.028	0.00	0.00000	0.00

Vehicle Exhaust Category	Number Of Workers	Vehicle Mix and Trip Mile	Day Per Month	Months	CO2 (g/mile)	CH4 (g/mile)	CO2 (ton/yr)	CH4 (ton/yr)	CO2e (ton/yr)
LDGV	5	20	20	2	374.453	0.034	1.65	0.00015	1.66
LDGT	5	20	20	2	499.382	0.034	2.20	0.00015	2.21

3.2 Building Construction Phase

Equipment Name	Number Of Equipment	Hours Per Day	Day Per Month	Months	CO2 (lb/hour)	CH4 (lb/hour)	CO2 (ton/yr)	CH4 (ton/yr)	CO2e (ton/yr)
Aerial Lifts Composite	3	6	20	9	34.721	0.0035	56.25	0.0057	56.39
Air Compressors Composite	3	8	20	9	63.607	0.0063	137.39	0.0136	137.73
Cranes Composite	2	4	20	9	128.62	0.0102	92.61	0.0073	92.79
Excavators Composite	1	6	20	9	119.58	0.0089	64.57	0.0048	64.69
Forklifts Composite	2	6	20	9	54.395	0.0038	58.75	0.0041	58.85
Generator Sets Composite	1	8	20	9	60.992	0.0052	43.91	0.0037	44.01
Other Construction Equipment Composite	5	8	20	9	122.56	0.0064	441.22	0.0230	441.79
Other General Industrial Equipmen Composite	5	8	20	9	152.23	0.0114	548.03	0.0410	549.05
Tractors/ Loaders/ Backhoes Composite	1	8	20	9	66.797	0.0055	48.09	0.0040	48.19
Welders Composite	2	6	20	9	25.602	0.0043	27.65	0.0046	27.77

Vehicle Exhaust Category	Building Area (ft2)	Building Height (ft)	Delivery Vehicle Trips	Avg. Trip (mile)	CO2 (g/mile)	CH4 (g/mile)	CO2 (ton/yr)	CH4 (ton/yr)	CO2e (ton/yr)
HDDV (Hauling)	18,073	30	174	20	1527.789	0.028	5.86	0.000107	5.86
HDDV (Vendor)	18,073	30	27	40	1527.789	0.028	1.82	0.000033	1.82

Vehicle Exhaust Category	Number Of Workers	Vehicle Mix and Trip Mile	Day Per Month	Months	CO2 (g/mile)	CH4 (g/mile)	CO2 (ton/yr)	CH4 (ton/yr)	CO2e (ton/yr)
LDGV	32	20	20	9	362.109	0.029	45.99	0.00368	46.08
LDGT	32	20	20	9	473.039	0.030	60.08	0.00381	60.17

3.3 Architectural Coating Phase

Vehicle Exhaust Category	Number Of Workers	Vehicle Mix and Trip Mile	Day Per Month	Months	CO2 (g/mile)	CH4 (g/mile)	CO2 (ton/yr)	CH4 (ton/yr)	CO2e (ton/yr)
LDGV	3	20	20	2	362.109	0.029	0.96	0.00008	0.96
LDGT	3	20	20	2	473.039	0.030	1.25	0.00008	1.25

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 Instruction 32-7040, Air Quality Compliance And Resource Management; 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: WRIGHT-PATTERSON AFB
County(s): Greene
Regulatory Area(s): Dayton-Springfield, OH

b. Action Title: Environmental Assessment for Fire Structural / Rescue Station West Ramp

c. Project Number/s (if applicable): Contract No. FA8601-11-D-0002; Task Order 0034

d. Projected Action Start Date: 4 / 2016

e. Action Description:

Proposed Action, Alternative A
The 445th AW at WPAFB is proposing to construct a 18,073 sf FS/RS facility on the West Ramp in Area A. The new facility would be constructed at the site of existing F/34020, which would be demolished to preserve the existing concrete slab. Facility 34020 was historically utilized as a Nose Dock Hangar but is currently unoccupied and vacant. Facility 34020 would be demolished prior to construction of the FS/RS facility. All interior and exterior building components and materials would be demolished and removed from the site. The new FS/RS facility would be constructed on the existing concrete floor slab. The FS/RS facility would consist of a noncombustible, one-story structure with two high-bay, drive-through apparatus stalls; separate men's and women's restrooms with lockers and showers; separate men's and women's sleeping rooms; a separate captain's sleeping room and restroom; and a day room with a kitchen. The facility would be constructed according to UFC 4-730-10, Fire Stations. The existing fire station, F/B34012, would be vacated once construction of the new FS/RS is complete.

Alternative B
Alternative B involves adaptive re-use of F/34020 as an alternative to demolition. Facility 34020 would be renovated, modernized, and converted into the new FS/RS facility. The footprint of the Nose Dock Hangar would remain but the existing roll-off doors would be replaced with hangar doors so ARFF vehicles could maneuver with ease. Interior renovation of F/34020 would be retrofitted according to UFC 4-730-10, Fire Stations.

Alternative C, No Action Alternative

f. Point of Contact:

Name: Timothy J. Rust
Title: Senior Environmental Engineer
Organization: CB&I Federal Services, LLC
Email: tim.rust@cbifederalservices.com
Phone Number: 513-782-4888

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.

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

Based on the analysis, the requirements of this rule are: _____ applicable
__X__ not applicable

Conformity Analysis Summary for Alternative B:

2016

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Dayton-Springfield, OH			
VOC	2.262	100	No
NOx	8.341	100	No
CO	4.965	N/A	N/A
SOx	0.014	100	No
PM 10	0.388	N/A	N/A
PM 2.5	0.388	100	No
Pb	0.000	N/A	N/A
NH3	0.003	N/A	N/A

2017 - (Steady State)

Pollutant	Action Emissions (ton/yr)	GENERAL CONFORMITY	
		Threshold (ton/yr)	Exceedance (Yes or No)
Dayton-Springfield, OH			
VOC	0.000	100	No
NOx	0.000	100	No
CO	0.000	N/A	N/A
SOx	0.000	100	No
PM 10	0.000	N/A	N/A
PM 2.5	0.000	100	No
Pb	0.000	N/A	N/A
NH3	0.000	N/A	N/A

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.

Timothy J. Rust, Senior Environmental Engineer November 20, 2015

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

1. General Information

- Action Location

Base: WRIGHT-PATTERSON AFB
County(s): Greene
Regulatory Area(s): Dayton-Springfield, OH

- Action Title: Environmental Assessment for Fire Structural / Rescue Station West Ramp

- Project Number/s (if applicable): Contract No. FA8601-11-D-0002; Task Order 0034

- Projected Action Start Date: 4 / 2016

- Action Purpose and Need:

The purpose of the Proposed Action is to construct a new Fire Structural / Rescue Station (FS/RS) at Wright-Patterson Air Force Base (WPAFB) in accordance with current standards, as specified in Unified Facilities Criteria (UFC) 4-730-10, Fire Stations (Department of Defense [DoD] 2006a). A new FS/RS is urgently needed to reduce firefighting response times to the south end of the primary runway (Runway 05L-23R) in Area A at WPAFB, and to correct deficiencies in the existing Fire Station 2 presently located in Facility B34012 (F/B34012). The location of the new fire station would correct deficiencies in the current station and would improve crash response time for potential incidents on the south end of Runway 05L-23R.

- Action Description:

Proposed Action, Alternative A
The 445th AW at WPAFB is proposing to construct a 18,073 sf FS/RS facility on the West Ramp in Area A. The new facility would be constructed at the site of existing F/34020, which would be demolished to preserve the existing concrete slab. Facility 34020 was historically utilized as a Nose Dock Hangar but is currently unoccupied and vacant. Facility 34020 would be demolished prior to construction of the FS/RS facility. All interior and exterior building components and materials would be demolished and removed from the site. The new FS/RS facility would be constructed on the existing concrete floor slab. The FS/RS facility would consist of a noncombustible, one-story structure with two high-bay, drive-through apparatus stalls; separate men's and women's restrooms with lockers and showers; separate men's and women's sleeping rooms; a separate captain's sleeping room and restroom; and a day room with a kitchen. The facility would be constructed according to UFC 4-730-10, Fire Stations. The existing fire station, F/B34012, would be vacated once construction of the new FS/RS is complete.

Alternative B
Alternative B involves adaptive re-use of F/34020 as an alternative to demolition. Facility 34020 would be renovated, modernized, and converted into the new FS/RS facility. The footprint of the Nose Dock Hangar would remain but the existing roll-off doors would be replaced with hangar doors so ARFF vehicles could maneuver with ease. Interior renovation of F/34020 would be retrofitted according to UFC 4-730-10, Fire Stations.

Alternative C, No Action Alternative

- Point of Contact

Name: Timothy J. Rust
Title: Senior Environmental Engineer
Organization: CB&I Federal Services, LLC
Email: tim.rust@cbifederalservices.com
Phone Number: 513-782-4888

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

- Activity List for Alternative B:

Activity Type		Activity Title
2.	Construction / Demolition	Renovate Facility 34020

2. Construction / Demolition

2.1 General Information & Timeline Assumptions

- Activity Location
County: Greene
Regulatory Area(s): Dayton-Springfield, OH

- Activity Title: Renovate Facility 34020

- Activity Description:
Facility 34020 would be renovated, modernized, and converted into the new FS/RS facility. The footprint of the Nose Dock Hangar would remain but the existing roll-off doors would be replaced with hangar doors so ARFF vehicles could maneuver with ease. Interior renovation of F/34020 would be retrofitted according to UFC 4-730-10, Fire Stations.

- Activity Start Date
Start Month: 4
Start Month: 2016

- Activity End Date
Indefinite: False
End Month: 11
End Month: 2016

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	2.261633
SO_x	0.013707
NO_x	8.341255
CO	4.965146
PM 10	0.388391

Pollutant	Total Emissions (TONs)
PM 2.5	0.387961
Pb	0.000000
NH_3	0.003021

2.1 Building Construction Phase

2.1.1 Building Construction Phase Timeline Assumptions

- Phase Start Date
Start Month: 4
Start Quarter: 1
Start Year: 2016

- Phase Duration
Number of Month: 8
Number of Days: 0

2.1.2 Building Construction Phase Assumptions

- General Building Construction Information

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

Building Category: Office or Industrial
Area of Building (ft^2): 23175
Height of Building (ft): 30
Number of Units: N/A

- Building Construction Default Settings
Default Settings Used: No
Average Day(s) worked per week: 5

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Aerial Lifts Composite	2	8
Air Compressors Composite	1	8
Cranes Composite	1	6
Forklifts Composite	2	6
Generator Sets Composite	1	8
Other General Industrial Equipmen Composite	8	8
Rubber Tired Loaders Composite	1	4
Tractors/Loaders/Backhoes Composite	1	8
Welders Composite	2	8

- Vehicle Exhaust
Average Hauling Truck Round Trip Commute (mile): 20

- 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

- Worker Trips Vehicle Mixture (%)

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

- Vendor Trips
Average Vendor Round Trip Commute (mile): 40

- Vendor Trips Vehicle Mixture (%)

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

2.1.3 Building Construction Phase Emission Factor(s)

- Construction Exhaust Emission Factors (lb/hour)

Aerial Lifts Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2
Emission Factors	0.0397	0.0003	0.2481	0.1800	0.0150	0.0150	0.0035	34.721
Air Compressors Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2
Emission Factors	0.0704	0.0007	0.4729	0.3207	0.0318	0.0318	0.0063	63.607
Cranes Composite								
	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	CH_4	CO_2

Emission Factors	0.1136	0.0013	0.9387	0.4263	0.0387	0.0387	0.0102	128.62
Forklifts Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.0427	0.0006	0.2815	0.2189	0.0136	0.0136	0.0038	54.395
Generator Sets Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.0580	0.0006	0.4369	0.2862	0.0240	0.0240	0.0052	60.992
Other General Industrial Equipmen Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.1266	0.0016	1.0121	0.4730	0.0425	0.0425	0.0114	152.23
Rubber Tired Loaders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.0982	0.0012	0.7113	0.4556	0.0374	0.0374	0.0088	108.61
Tractors/Loaders/Backhoes Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.0610	0.0007	0.4069	0.3689	0.0258	0.0258	0.0055	66.797
Welders Composite								
	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**CH_4**	**CO_2**
Emission Factors	0.0482	0.0003	0.2173	0.1950	0.0168	0.0168	0.0043	25.602

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

	VOC	**SO_x**	**NO_x**	**CO**	**PM 10**	**PM 2.5**	**Pb**	**NH_3**	**CO_2**
LDGV	000.454	000.007	000.460	004.567	000.012	000.010		000.029	00362.109
LDGT	000.590	000.009	000.806	006.674	000.013	000.012		000.030	00473.039
HDGV	001.158	000.016	002.440	023.503	000.032	000.028		000.045	00779.244
LDDV	000.166	000.003	000.193	002.601	000.005	000.004		000.008	00359.102
LDDT	000.431	000.005	000.632	005.592	000.008	000.007		000.008	00537.952
HDDV	000.629	000.014	006.872	002.247	000.295	000.271		000.028	01527.789
MC	002.474	000.008	000.783	014.471	000.028	000.025		000.051	00397.014

2.1.4 Building Construction 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

$VMT_{VE} = BA * BH * (0.42 / 1000) * HT$

VMT_{VE}: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.42 / 1000): Conversion Factor ft^3 to trips (0.42 trip / 1000 ft^3)
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: Worker Trips 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

- Vender Trips Emissions per Phase

$VMT_{VT} = BA * BH * (0.38 / 1000) * HT$

VMT_{VT}: Vender Trips Vehicle Miles Travel (miles)
BA: Area of Building (ft^2)
BH: Height of Building (ft)
(0.38 / 1000): Conversion Factor ft^3 to trips (0.38 trip / 1000 ft^3)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

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

V_{POL}: Vehicle Emissions (TONs)
VMT_{VT}: Vender 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

2.2 Architectural Coatings Phase

2.2.1 Architectural Coatings Phase Timeline Assumptions

- Phase Start Date

Start Month: 9
Start Quarter: 1
Start Year: 2016

- Phase Duration

Number of Month: 2
Number of Days: 0

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

2.2.2 Architectural Coatings Phase Assumptions

- General Architectural Coatings Information
Building Category:
Total Square Footage (ft^2): 96000
Number of Units: N/A

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

- 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 Architectural Coatings Phase Emission Factor(s)

- Worker Trips Emission Factors (grams/mile)

	VOC	SO_x	NO_x	CO	PM 10	PM 2.5	Pb	NH_3	CO_2
LDGV	000.454	000.007	000.460	004.567	000.012	000.010		000.029	00362.109
LDGT	000.590	000.009	000.806	006.674	000.013	000.012		000.030	00473.039
HDGV	001.158	000.016	002.440	023.503	000.032	000.028		000.045	00779.244
LDDV	000.166	000.003	000.193	002.601	000.005	000.004		000.008	00359.102
LDDT	000.431	000.005	000.632	005.592	000.008	000.007		000.008	00537.952
HDDV	000.629	000.014	006.872	002.247	000.295	000.271		000.028	01527.789
MC	002.474	000.008	000.783	014.471	000.028	000.025		000.051	00397.014

2.2.4 Architectural Coatings Phase Formula(s)

- Worker Trips Emissions per Phase
$VMT_{WT} = (1 * WT * PA) / 800$

VMT_{WT}: Worker Trips Vehicle Miles Travel (miles)
1: Conversion Factor man days to trips (1 trip / 1 man * day)
WT: Average Worker Round Trip Commute (mile)
PA: Paint Area (ft^2)
800: Conversion Factor square feet to man days (1 ft^2 / 1 man * day)

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

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

- Off-Gassing Emissions per Phase
$VOC_{AC} = (AB * 2.0 * 0.0116) / 2000.0$

VOC_{AC}: Architectural Coating VOC Emissions (TONs)
BA: Area of Building (ft^2)

DETAIL AIR CONFORMITY APPLICABILITY MODEL REPORT

2.0: Conversion Factor total area to coated area (2.0 ft^2 coated area / total area)
0.0116: Emission Factor (lb/ft^2)
2000: Conversion Factor pounds to tons

WPAFB - EA Fire Structural/Rescue Station West Ramp
Calculation of Project Air Pollutant Emissions - Alternative B
Summary of GHG Emissions from Construction Project Activities

Construction Phase Name	Phase ID	CO2 (ton/yr)	CH4 (ton/yr)	CO2e (ton/yr)
Renovate Facility 34020	2.0	1,219.44	0.10	1,221.85
Summary of 2016 GHG Emissions		**1,219.44**	**0.097**	**1,221.85**

3.2 Building Construction Phase

Equipment Name	Number Of Equipment	Hours Per Day	Day Per Month	Months	CO2 (lb/hour)	CH4 (lb/hour)	CO2 (ton/yr)	CH4 (ton/yr)	CO2e (ton/yr)
Aerial Lifts Composite	2	8	20	8	34.721	0.0035	44.44	0.0045	44.55
Air Compressors Composite	1	8	20	8	63.607	0.0063	40.71	0.0040	40.81
Cranes Composite	1	6	20	8	128.62	0.0102	61.74	0.0049	61.86
Forklifts Composite	2	6	20	8	54.395	0.0038	52.22	0.0036	52.31
Generator Sets Composite	1	8	20	8	60.992	0.0052	39.03	0.0033	39.12
Other General Industrial Equipmen Composite	8	8	20	8	152.23	0.0114	779.42	0.0584	780.88
Rubber Tired Loaders Composite	1	4	20	8	108.61	0.0088	34.76	0.0028	34.83
Tractors/ Loaders/ Backhoes Composite	1	8	20	8	66.797	0.0055	42.75	0.0035	42.84
Welders Composite	2	8	20	8	25.602	0.0043	32.77	0.0055	32.91

Vehicle Exhaust Category	Building Area (ft2)	Building Height (ft)	Delivery Vehicle Trips	Avg. Trip (mile)	CO2 (g/mile)	CH4 (g/mile)	CO2 (ton/yr)	CH4 (ton/yr)	CO2e (ton/yr)
HDDV (Hauling)	23,175	30	222	20	1527.789	0.028	7.48	0.000137	7.48
HDDV (Vendor)	23,175	30	35	40	1527.789	0.028	2.36	0.000043	2.36

Vehicle Exhaust Category	Number Of Workers	Vehicle Mix and Trip Mile	Day Per Month	Months	CO2 (g/mile)	CH4 (g/mile)	CO2 (ton/yr)	CH4 (ton/yr)	CO2e (ton/yr)
LDGV	24	20	20	9	362.109	0.029	34.49	0.00276	34.56
LDGT	24	20	20	9	473.039	0.030	45.06	0.00286	45.13

3.4 Architectural Coating Phase

Vehicle Exhaust Category	Number Of Workers	Vehicle Mix and Trip Mile	Day Per Month	Months	CO2 (g/mile)	CH4 (g/mile)	CO2 (ton/yr)	CH4 (ton/yr)	CO2e (ton/yr)
LDGV	3	20	20	2	362.109	0.029	0.96	0.00008	0.96
LDGT	3	20	20	2	473.039	0.030	1.25	0.00008	1.25

Appendix C

Noise Terminology and Analysis Methodology

This Appendix presents a detailed discussion of noise and its effects on people and the environment. An assessment of aircraft noise requires a general understanding of how sound is measured and how it affects people in the natural environment. The purpose of this appendix is to address public concerns regarding aircraft noise impacts.

Section C.1 is a general discussion on the properties of noise. Section C.2 summarizes the noise metrics discussed throughout this Environmental Assessment (EA). Section C.3 provides Federal land use compatibility guidelines that are used in applying aircraft noise impacts to land use planning in the airport environment.

C.1 GENERAL

Noise, often defined as unwanted sound, is one of the most common environmental issues associated with aircraft operations. Of course, aircraft are not the only source of noise in an urban or suburban surrounding, where interstate and local roadway traffic, rail, industrial, and neighborhood sources also intrude on the everyday quality of life. Nevertheless, aircraft are readily identifiable to those affected by their noise, and typically are singled out for special attention and criticism. Consequently, aircraft noise problems often dominate analyses of environmental impacts.

Sound is a physical phenomenon, and consists of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Whether that sound is interpreted as pleasant or unpleasant depends largely on the listener's current activity, past experience, and attitude toward the source of that sound. It is often true that one person's music is another person's noise.

The measurement and human perception of sound involves two basic physical characteristics, intensity and frequency. The intensity is a measure of the strength or amplitude of the sound vibrations and is expressed in terms of sound pressure. The higher the sound pressure, the more energy carried by the sound and the louder is the perception of that sound. The second important physical characteristic is sound frequency which is the number of times per second the air vibrates or oscillates. Low-frequency sounds are characterized as rumbles or roars, while high-frequency sounds are typified by sirens or screeches.

The loudest sounds which can be detected comfortably by the human ear have intensities which are 1,000,000,000,000 times larger than those of sounds which can just be detected. Because of this vast range, any attempt to represent the intensity of sound using a linear scale becomes very unwieldy. As a result, a logarithmic unit known as the decibel (dB) is used to represent the intensity of a sound. Such a representation is called a sound level.

Because of the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. However, some simple rules of thumb are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. For example:

$$60 \text{ dB} + 60 \text{ dB} = 63 \text{ dB}, \text{ and}$$

$$80 \text{ dB} + 80 \text{ dB} = 83 \text{ dB}$$

The total sound level produced by two sounds of different levels is usually only slightly more than the higher of the two. For example:

$$60.0 \text{ dB} + 70.0 \text{ dB} = 70.4 \text{ dB}$$

Because the addition of sound levels behaves differently than that of ordinary numbers, such addition is often referred to as "decibel addition" or "energy addition." The latter term arises from the fact that what we are really doing when we add decibel values is first converting each decibel value to its corresponding acoustic energy, then adding the energies using the normal rules of addition, and finally converting the total energy back to its decibel equivalent.

An important facet of decibel addition arises later when the concept of time-average sound levels is introduced to explain Day-Night Average Sound Level (DNL). Because of the logarithmic units, the time-average sound level is dominated by the louder levels that occur during the averaging period. As a simple example, consider a sound level which is 100 dB and lasts for 30 seconds, followed by a sound level of 50 dB which also lasts for 30 seconds. The time-average sound level over the total 60-second period is 97 dB, not 75 dB.

A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually pain at still higher levels.

The minimum change in the time-average sound level of individual events which an average human ear can detect is about 3 dB. A change in sound level of about 10 dB is usually perceived by the average person as a doubling (or halving) of the sound's loudness, and this relation holds true for loud sounds and for quieter sounds.

Sound frequency is pitch measured in terms of hertz (Hz). The normal human ear can detect sounds which range in frequency from about 20 Hz to about 15,000 Hz. All sounds in this wide range of frequencies, however, are not heard equally well by the human ear, which is most sensitive to frequencies in the 1,000 to 4,000 Hz range. To account for the varied frequency sensitivity of people, we use the A-weighted scale that approximates the average, healthy human ear. The A-weighting de-emphasizes the low and high frequency portion of the noise signal and emphasizes the mid-frequency portion. Sound levels measured using A-weighting are most properly called A-weighted sound levels while sound levels measured without any frequency weighting are most properly called sound levels. However, since most environmental impact analysis documents deal only with A-weighted sound levels, the adjective "A-weighted" is often omitted, and A-weighted sound levels are referred to simply as sound levels. In some instances, the author will indicate that the levels have been A-weighted by using the abbreviation dBA or dB(A), rather than the abbreviation dB, for decibel. As long as the use of A-weighting is understood to be used, there is no difference implied by the terms "sound level" and "A-weighted sound level" or by the units dB, dBA, and dB(A). The A-weighting function de-emphasizes higher and especially lower frequencies to which humans are less sensitive. Because the A-weighting is closely related to human hearing characteristics, it is appropriate to use A-weighted sound levels when assessing potential noise effects on humans and many terrestrial wildlife species. In this document, all sound levels are A-weighted and are reported in dB.

Sound levels do not represent instantaneous measurements but rather averages over short periods of time. Two measurement time periods are most common: 1 second and 1/8 of a second. A measured

sound level averaged over 1 second is called a slow response sound level; one averaged over 1/8 of a second is called a fast response sound level. Most environmental noise studies use slow response measurements, and the adjective "slow response" is usually omitted. It is easy to understand why the proper descriptor "slow response A-weighted sound level" is usually shortened to "sound level" in environmental impact analysis documents.

C.2 NOISE METRICS

A "metric" is defined as something "of, involving, or used in measurement." As used in environmental noise analyses, a metric refers to the unit or quantity that measures or represents the effect of noise on people. Noise measurements typically have involved a confusing proliferation of noise metrics as individual researchers have attempted to understand and represent the effects of noise. As a result, past literature describing environmental noise or environmental noise abatement has included many different metrics. Recently, however, various Federal agencies involved in environmental noise mitigation have agreed on common metrics for environmental impact analyses documents, and both the Department of Defense (DOD) and the Federal Aviation Administration (FAA) have specified those which should be used for Federal aviation noise assessments. These metrics are as follows.

C.2.1 Maximum Sound Level

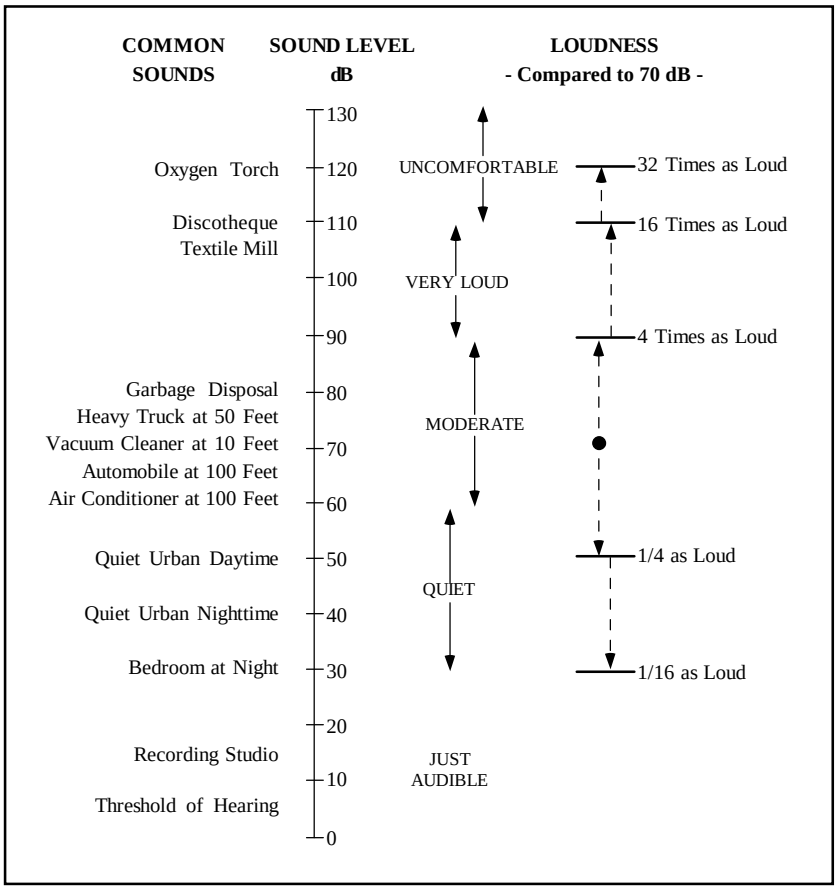
The highest A-weighted sound level measured during a single event in which the sound level changes value as time goes on (e.g., an aircraft overflight) is called the maximum A-weighted sound level or maximum sound level, for short. It is usually abbreviated by ALM, L_{max}, or L_{Amax}. The typical A-weighted levels of common sounds are shown in Figure C-1. The maximum sound level is important in judging the interference caused by a noise event with conversation, TV or radio listening, sleep, or other common activities.

C.2.2 Sound Exposure Level

Individual time-varying noise events have two main characteristics: (1) a sound level which changes throughout the event, and (2) a period of time during which the event is heard. Although the maximum sound level, described above, provides some measure of the intrusiveness of the event, it alone does not completely describe the total event. The period of time during which the sound is heard is also significant. The sound exposure level (abbreviated SEL or LAE) combines both of these characteristics into a single metric.

Sound exposure level is a logarithmic measure of the total acoustic energy transmitted to the listener during the event. Mathematically, it represents the sound level of the constant sound that would, in one second, generate the same acoustic energy as did the actual time-varying noise event. Since aircraft overflights usually last longer than one second, the SEL of an overflight is usually greater than the maximum sound level of the overflight.

Sound exposure level is a composite metric which represents both the intensity of a sound and its duration. It does not directly represent the sound level heard at any given time, but rather provides a measure of the net impact of the entire acoustic event. It has been well established in the scientific community that SEL measures this impact much more reliably than just the maximum sound level. Because the SEL and the maximum sound level are both A-weighted sound levels expressed in dBs, there is sometimes confusion between the two, so the specific metric used should be clearly stated.



Source: Harris 1979

Figure C-1. Typical A-Weighted Sound Levels of Common Sounds

Day-Night Average Sound Level

Time-average sound levels are the measurements of sound levels which are averaged over a specified length of time. These levels provide a measure of the average sound energy during the measurement period.

For the evaluation of community noise effects, and particularly aircraft noise effects, the day-night average sound level (abbreviated DNL or L_{dn}) is used. Day-night average sound level averages aircraft sound levels at a location over a complete 24-hour period, with a 10-dB adjustment added to those noise events which take place between 10:00 p.m. and 7:00 a.m. (local time) the following morning. This 10 dB "penalty" represents the added intrusiveness of sounds which occur during normal sleeping hours, both because of the increased sensitivity to noise during those hours and because ambient sound levels during nighttime are typically about 10 dB lower than during daytime hours.

Ignoring the 10 dB nighttime adjustment for the moment, DNL may be thought of as the continuous A-weighted sound level which would be present if all of the variations in sound level which occur over a 24-hour period were smoothed out so as to contain the same total sound energy.

DNL provides a single measure of overall noise impact, but does not provide specific information on the number of noise events or the individual sound levels which occur during the day. For example, a DNL of 65 dB could result from a very few noisy events, or a large number of quieter events.

As noted earlier for SEL, DNL does not represent the sound level heard at any particular time, but rather represents the total sound exposure. Scientific studies and social surveys which have been conducted to appraise community annoyance to all types of environmental noise have found the DNL to be the best measure of that annoyance. Its use is endorsed by the scientific community (American National Standards Institute [ANSI] 1980, 1988; U.S. Environmental Protection Agency [USEPA] 1974; Federal Interagency Committee on Urban Noise [FICUN] 1980; Federal Interagency Committee on Noise [FICON] 1992).

There is, in fact, a remarkable consistency in the results of attitudinal surveys about aircraft noise conducted in different countries to find the percentages of groups of people who express various degrees of annoyance when exposed to different levels of DNL. This is illustrated in Figure C-2, which summarizes the results of a large number of social surveys relating community responses to various types of noises, measured in DNL.

Figure C-2 is taken from Schultz (1978) and shows the original curve fit. A more recent study has reaffirmed this relationship (Fidell et al. 1991). Figure C-3 shows an updated form of the curve fit in comparison with the original (Finegold et al. 1992). The updated fit, which does not differ substantially from the original, is the current preferred form. In general, correlation coefficients of 0.85 to 0.95 are found between the percentages of groups of people highly annoyed and the level of average noise exposure. The correlation coefficients for the annoyance of individuals are relatively low, however, on the order of 0.5 or less. This is not surprising, considering the varying personal factors which influence the manner in which individuals react to noise. Nevertheless, findings substantiate that community annoyance to aircraft noise is represented quite reliably using DNL.

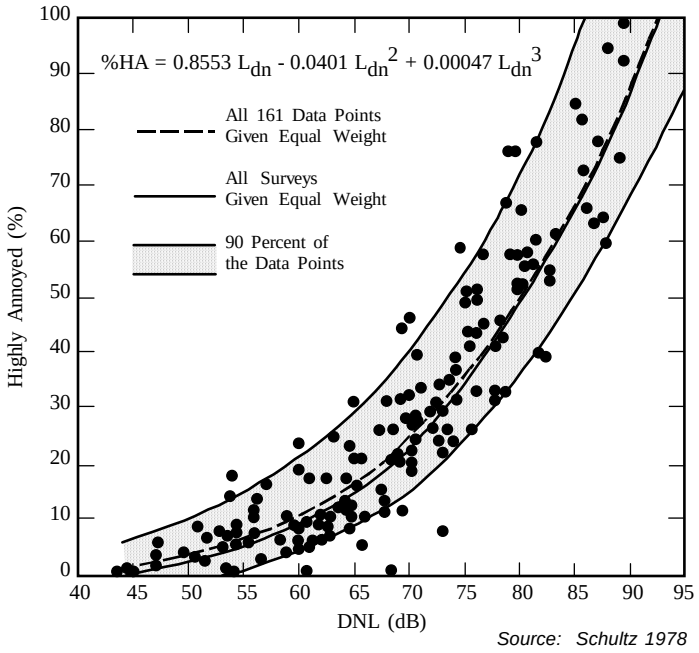
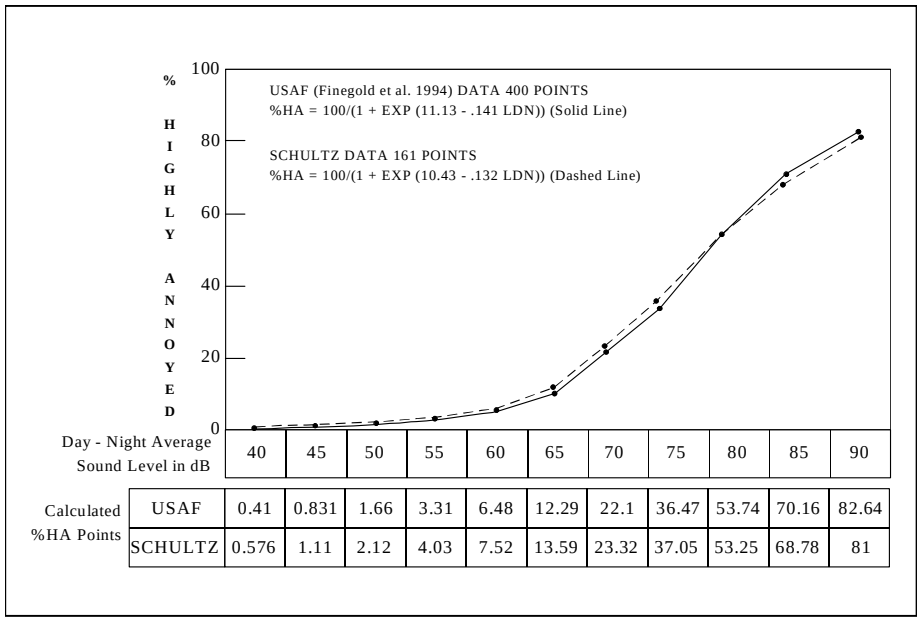


Figure C-2. Community Surveys of Noise Annoyance



Day - Night Average Sound Level in dB		40	45	50	55	60	65	70	75	80	85	90
Calculated %HA Points	USAF	0.41	0.831	1.66	3.31	6.48	12.29	22.1	36.47	53.74	70.16	82.64
	SCHULTZ	0.576	1.11	2.12	4.03	7.52	13.59	23.32	37.05	53.25	68.78	81

Sources: Schultz 1978 and Finegold et al. 1994

Figure C-3. Response of Communities to Noise and Comparison of Original Schultz 1978 and Current USAF Curve Fits

This relation between community annoyance and time-average sound level has been confirmed, even for infrequent aircraft noise events. A National Aeronautics and Space Administration (NASA) study reported the reactions of individuals in a community to daily helicopter overflights, ranging from 1 to 32 per day (Fields and Powell 1985). The stated reactions to infrequent helicopter overflights correlated quite well with the daily time-average sound levels over this range of numbers of daily noise events.

The use of DNL has been criticized recently as not accurately representing community annoyance and land-use compatibility with aircraft noise. Much of that criticism stems from a lack of understanding of the basis for the measurement or calculation of DNL. One frequent criticism is based on the inherent feeling that people react more to single noise events and not as much to "meaningless" time-average sound levels.

Time-average noise metric, such as DNL, takes into account both the noise levels of all individual events which occur during a 24-hour period and the number of times those events occur. As described briefly above, the logarithmic nature of the decibel unit causes the noise levels of the loudest events to control the 24-hour average.

As a simple example of this characteristic, consider a case in which only one aircraft overflight occurs in daytime during a 24-hour period, creating a sound level of 100 dB for 30 seconds. During the remaining 23 hours, 59 minutes, and 30 seconds of the day, the ambient sound level is 50 dB. The DNL for this 24-hour period is 65.5 dB. Assume, as a second example that 10 such 30-second overflights occur in daytime hours during the next 24-hour period, with the same ambient sound level of 50 dB during the remaining 23 hours and 55 minutes of the day. The DNL for this 24-hour period is 75.4 dB. Clearly, the averaging of noise over a 24-hour period does not ignore the louder single events and tends to emphasize both the sound levels and number of events. This is the basic concept of a time-average sound metric, and specifically the DNL.

C.3 LAND-USE COMPATIBILITY

As noted above, the inherent variability between individuals makes it impossible to predict accurately how any individual will react to a given noise event. Nevertheless, when a community is considered as a whole, its overall reaction to noise can be represented with a high degree of confidence. As described above, the best noise exposure metric for this correlation is the DNL. In June 1980, an ad hoc FICUN published guidelines for considering noise in land use planning (FICUN 1980). These guidelines related DNL to compatible land uses in urban areas. The committee was composed of representatives from the DOD, Department of Transportation, Department of Housing and Urban Development; USEPA; and the Veterans Administration. Since the issuance of these guidelines, Federal agencies have generally adopted these guidelines to make recommendations to the local communities on land use compatibilities.

The FAA included the committee's guidelines in the Federal Aviation Regulations (USDOT 1984). These guidelines are reprinted in Table C-1, along with the explanatory notes included in the regulation. Although these guidelines are not mandatory (see Notes in Table C-1), they provide the best means for evaluating noise impact in airport communities. In general, residential land uses normally are not compatible with outdoor DNL (L_{dn} values) above 65 dB, and the extent of land areas and populations exposed to DNL of 65 dB and higher provides the best means for assessing the noise impacts of alternative aircraft actions.

In 1990, the FICON was formed to review the manner in which aviation noise effects are assessed and presented. This group released its report in 1992 and reaffirmed the use of DNL as the best metric for this purpose (FICON 1992).

Analyses of aircraft noise impacts and compatible land uses around DOD facilities are normally made using NOISEMAP (Moulton 1992). This computer-based program calculates DNL at many points on the ground around an airfield and draws contours of equal levels for overlay onto land-use maps of the same scale. The program mathematically calculates the DNL of all aircraft operations for a 24-hour period, taking into consideration the number and types of aircraft, their flight paths and engine thrust settings, and the time of day (daytime or nighttime) that each operation occurs.

Day-night average sound levels may also be measured directly around an airfield, rather than calculated with NOISEMAP; however, the direct measurement of annualized DNL is difficult and costly since it requires year-round monitoring or careful seasonal sampling. NOISEMAP provides an accurate projection of aircraft noise around airfields.

NOISEMAP also has the flexibility of calculating sound levels at any specified ground location so that noise levels at representative points under flight paths can be ascertained. NOISEMAP is most accurate for comparing "before and after" noise impacts which would result from proposed airfield changes or alternative noise control actions, so long as the various impacts are calculated in a consistent manner.

Table C-1. Land Use Compatibility Guidelines with Yearly

LAND USE	YEARLY DAY-NIGHT AVERAGE SOUND LEVELS IN DECIBELS					
	BELOW 65	65-70	70-75	75-80	80-85	OVER 85
Residential						
Residential, other than mobile homes and transient lodgings	*Y*	*N(1)*	*N(1)*	*N*	*N*	*N*
Mobile home parks	*Y*	*N*	*N*	*N*	*N*	*N*
Transient lodgings	*Y*	*N(1)*	*N(1)*	*N(1)*	*N*	*N*
Public Use						
Schools	*Y*	*N(1)*	*N(1)*	*N*	*N*	*N*
Hospitals & nursing homes	*Y*	*25*	*30*	*N*	*N*	*N*
Churches, auditoria, & concert halls	*Y*	*25*	*30*	*N*	*N*	*N*
Government services	*Y*	*Y*	*25*	*30*	*N*	*N*
Transportation	*Y*	*Y*	*Y(2)*	*Y(3)*	*Y(4)*	*Y(4)*
Parking	*Y*	*Y*	*Y(2)*	*Y(3)*	*Y(4)*	*N*
Commercial Use						
Offices, business, & professional	*Y*	*Y*	*25*	*30*	*N*	*N*
Wholesale & retail-building materials, hardware, and farm equipment	*Y*	*Y*	*Y(2)*	*Y(3)*	*Y(4)*	*N*
Retail trade-general	*Y*	*Y*	*25*	*30*	*N*	*N*
Utilities	*Y*	*Y*	*Y(2)*	*Y(3)*	*Y(4)*	*N*
Communication	*Y*	*Y*	*25*	*30*	*N*	*N*
Manufacturing and Production						
Manufacturing, general	*Y*	*Y*	*Y(2)*	*Y(3)*	*Y(4)*	*N*
Photographic & optical	*Y*	*Y*	*25*	*30*	*N*	*N*
Agriculture (except livestock) & forestry	*Y*	*Y(6)*	*Y(7)*	*Y(8)*	*Y(8)*	*Y(8)*
Livestock farming & breeding	*Y*	*Y(6)*	*Y(7)*	*N*	*N*	*N*
Mining & fishing, resource production & extraction	*Y*	*Y*	*Y*	*Y*	*Y*	*Y*
Recreational						
Outdoor sports arenas & spectator sports	*Y*	*Y(5)*	*Y(5)*	*N*	*N*	*N*
Outdoor music shells, amphitheaters	*Y*	*N*	*N*	*N*	*N*	*N*
Nature exhibits & zoos	*Y*	*Y*	*N*	*N*	*N*	*N*
Amusements, parks, resorts, & camps	*Y*	*Y*	*Y*	*N*	*N*	*N*
Golf courses, riding stables, & water recreation	*Y*	*Y*	*25*	*30*	*N*	*N*

Key:
Y (Yes) = Land use and related structures compatible without restrictions.
N (No) = Land use and related structures are not compatible and should be prohibited.
NLR = Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25 or 30 = Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structures.
Notes:
(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor-to-indoor NLR of at least 25 and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide an NLR of 20 dB; thus, the reduction requirements often are stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problems.
(2) Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
(3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.
(4) Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal level is low.
(5) Land-use compatible, provided special sound reinforcement systems are installed.
(6) Residential buildings require an NLR of 25 dB.
(7) Residential buildings require an NLR of 30 dB.
(8) Residential buildings not permitted.

Source: FAA 1985 and USDOT 1984

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Appendix D

BUSTR No Further Action Letter – UST4020

Department of Commerce
Division of State Fire Marshal
John R. Kasich, Governor
Andre T. Porter, Director

March 14, 2014

ZACHARY OLDS
WRIGHT PATTERSON AFB
88 ABW/CEIEA
1450 LITTRELL RD, BLDG 22
WPAFB, OHIO 45433

SITE: WPAFB
BLDG 34020 (UST 333/334)
WPAFB OH
GREENE COUNTY
RELEASE #29010074-N00001

RE: NO FURTHER ACTION STATUS REGARDING CORRECTIVE ACTION REQUIREMENTS

Dear Mr. Olds:

The Bureau of Underground Storage Tank Regulations (BUSTR) has reviewed all information submitted for this release. Based on this information, BUSTR requires no further action (NFA) involving corrective action under Ohio Administrative Code (OAC) 1301:7-9-13, effective July 1, 2012.

Thank you for your cooperation. The submitted information for this release is available from BUSTR as a public record. If you have any questions, please contact our office at (614) 752-7938.

Sincerely,

Kelly J. Gill
Corrective Action Supervisor

xc: Site File
Erin Madison (Versar)

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