

Draft

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# Environmental Assessment

## Air Cargo Facility Development Cincinnati/Northern Kentucky International Airport

Prepared For  
U.S. Department of Transportation  
Federal Aviation Administration



September 2018

Prepared by  
Landrum & Brown



This environmental assessment becomes a Federal document when evaluated, signed, and dated by the Responsible FAA Official.

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Responsible FAA Official

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Date





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## Acronyms

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## ACRONYMS

The following is a list of acronyms used in the EA.

AC	Advisory Circular
ACHP	Advisory Council on Historic Preservation
ACS	American Community Survey
AEDT	Aviation Environmental Design Tool
AFBR	Anaerobic Fluidized Bed Reactor
AGB	Aerated Gravel Bed
ALP	Airport Layout Plan
AMU	Adjusted Mitigation Units
APE	Areas of Potential Effects
APU	Auxiliary Power Unit
AST	Aboveground Storage Tank
ATCT	Airport Traffic Control Tower
AvGas	Low-lead aviation gasoline
BA	Biological Assessment
BMPs	Best Management Practices
BO	Biological Opinion
BTU	British Thermal Units
CAA	Clean Air Act of 1970, as amended
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended
CERFA	Community Environmental Response Facilitation Act of 1972
C.F.R	Code of Federal Regulations
CH <sub>4</sub>	Methane
CO	Carbon Monoxide
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2</sub> E	Carbon Dioxide Equivalencies
CREC	Controlled Recognized Environmental Condition
CVG	Cincinnati/Northern Kentucky International Airport
CWA	Clean Water Act of 1972 (Federal Water Pollution Control Act, as amended)
Day	7:00 am to 9:59 pm
dB	Decibel
DNL	Day-Night Average Sound Level
DOW	Kentucky Division of Water
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order

## ACRONYMS

EPA	Environmental Protection Agency
ESA	Endangered Species Act of 1973, as amended
E&A	Environment & Archaeology, LLC
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FICON	Federal Interagency Committee on Noise
FICUN	Federal Interagency Committee on Urban Noise
FIRM	Flood Insurance Rate Maps
FPPA	Farmland Protection Policy Act of 1981
GAO	General Accounting Office
GAV	Ground Access Vehicles
GHG	Greenhouse Gas
GIS	Geographic Information System
GSE	Ground Support Equipment
H <sub>2</sub> O	Water, Water Vapor
HDO	Houston-Donaldson Study Corridor Overlay District
HFCs	Hydrofluorocarbons
HREC	Historical Recognized Environmental Conditions
HSWA	Hazardous and Solid Waste Amendments of 1984
IBCF	Imperiled Bat Conservation Fund
ICAO	International Civil Aviation Organization
ILF	In-Lieu Fee
ITS	Institute of Transportation Studies
Jet A	Jet fuel
KCAB	Kenton County Airport Board
KDFWR	Kentucky Department of Fish and Wildlife resources
KFO	Kentucky Field Office
KHC	Kentucky Heritage Council
KPDES	Kentucky Pollutant Discharge Elimination System
KSNPC	Kentucky State Nature Preserves Commission
KYDEP	Kentucky Department of Environmental Protection
KYOSA	Kentucky Office of State Archaeology
kWh	Kilowatt Hours
KYTC	Kentucky Transportation Council
L <sub>max</sub>	Maximum Noise Level
LWCF	Land and Water Conservation Fund Act of 1965
L&B	Landrum & Brown
MOA	Memorandum of Agreement
MSA	Metropolitan Statistic Area

## ACRONYMS

N <sub>2</sub> O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969, as amended
NFIP	National Flood Insurance Program
NH <sub>3</sub>	Ammonia
NHPA	National Historic Preservation Act of 1966, as amended
Night	10:00 pm to 6:59 am
NKAPC	Northern Kentucky Area Planning Commission
NKMB	Northern Kentucky Mitigation Bank
NKSWMA	Northern Kentucky Solid Waste Management Area
NKU	Northern Kentucky University
NLR	Noise Level Reduction
NMFS	National Marine Fisheries Service
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Oxides of Nitrogen
NPDES	National Pollution Discharge Elimination System
NPL	National Priorities List
NPS	National Park Service
NRHP	National Register of Historic Places
O <sub>3</sub>	Ozone
OKI	Ohio Kentucky Indiana Regional Council on Governments
OPA	Oil Pollution Act of 1990
OTR	Ozone Transport Region
Pb	Lead
PFCs	Perfluorocarbons
PM	Particulate Matter (PM <sub>10</sub> & PM <sub>2.5</sub> )
PPA	Pollution Prevention Act of 1990
RCRA	Resource Conservation and Recovery Act of 1976, as amended
REC	Recognized Environmental Condition
RPZ	Runway Protection Zone
SARA	Superfund Amendments and Reauthorization Act of 1986
SD1	Sanitation District No. 1
SDWA	Safe Drinking Water Act
SF <sub>6</sub>	Sulfur Hexafluoride
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO <sub>2</sub>	Sulfur Dioxide
SPCC	Spill Prevention Control and Countermeasure Program
TBD	To Be Determined

## ACRONYMS

THPO	Tribal Historic Preservation Office
TIS	Traffic Impact Study
TSCA	Toxic Substances Control Act
µg/m <sup>3</sup>	Micrograms per cubic meter
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USCB	United States Census Bureau
USDOl	United States Department of Interior
USDOT	United States Department of Transportation
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compounds

## Glossary of Terms

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## GLOSSARY

The following glossary of terms is provided to aid the reader. Not all the terms provided are used in the EA, but are included to provide context and to assist the reader since many aeronautical terms are very similar.

**Aviation Environmental Design Tool (AEDT)** – A *Federal Aviation Administration* software system that models aircraft performance in space and time to estimate fuel consumption, emissions, noise, and air quality consequences. AEDT is a comprehensive tool that provides information to *Federal Aviation Administration* stakeholders on each of these specific environmental impacts. AEDT facilitates environmental review activities required under *NEPA* by consolidating the modeling of these environmental impacts in a single tool. AEDT 2d is the latest version.

**Air Traffic Control (ATC)** – An FAA service operated for the public, to ensure adequate separation of aircraft and to promote the safe, orderly, and expeditious flow of air traffic. The air traffic facility with jurisdiction over mapped and designated airspace may authorize aircraft to proceed under specified traffic conditions within *controlled airspace*.

**Airport Traffic Control Tower (ATCT)** – An *airport traffic control* facility established on an airport to provide for safe, orderly, and expeditious flow of air traffic arriving at and departing from an airport, including airport surface areas such as runways and taxiways.

**Aircraft Operation** – One landing or one takeoff of an aircraft.

**Airport Elevation** – The highest point on an airport's usable runways, expressed in feet above *mean sea level*.

**Airport Improvement Program (AIP)** – A Federal funding program for airport improvements that provides grants to public agencies — and, in some cases, to private owners and entities — for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems. AIP is periodically reauthorized by Congress with funding appropriated from the Aviation Trust Fund. Proceeds to the Aviation Trust Fund are derived from excise taxes on airline tickets, aviation fuel, etc.

**Airport Layout Plan (ALP)** <sup>1</sup> – One of the key products of a master plan is a set of drawings that provides a graphic representation of the long-term development plan for an airport. The primary drawing in this set is the Airport Layout Plan. Other drawings may also be included, depending on the size and complexity of the individual airport.

**Airport Operations** – The total number of aircraft takeoffs (departures) and landings (arrivals) from an airport.

**Ambient Noise** – The total sum of noise from all sources in a given place and time. *See also Natural Ambient Noise.*

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<sup>1</sup> FAA Advisory Circular 150/5070-6B



**Aquifer** – A subsurface layer of permeable rock, sand, soil or gravel capable of bearing water.

**Attenuation** – An acoustical phenomenon whereby *sound* energy is reduced between the noise source and the receiver. This energy loss can be attributed to atmospheric conditions, terrain, vegetation, other natural features, and man-made features (e.g., sound insulation).

**A-Weighted Decibels (dBA)** – A system for measuring *sound* energy that is designed to represent the response of the human ear to sound. Energy at frequencies more readily detected by the human ear is more heavily weighted in this measurement system, while frequencies less readily detected are assigned lower weights. A-weighted *sound* measurements are commonly used in studies where the human response to *sound* is the object of the analysis.

**Base Leg** – A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline.

**Commuter Aircraft** – Generally, aircraft of designated size or seating capacity (usually 19 or fewer seats) that support scheduled air transportation services for compensation or hire in air commerce, with a frequency of at least five round trip operations per week on at least one route according to a published flight schedule. Commuter aircraft operate pursuant to a *Federal Aviation Administration* air carrier certificates issued under 14 C.F.R Parts 119 and 135 of the *Federal Aviation Regulations*. (See 14 C.F.R. § 119.3, *Definitions*.) *Regional Jets* (RJs) are not “commuters,” because they are large transport category aircraft and fall within the *Federal Aviation Administration’s* air carrier aircraft category.

**Contour** – A contour line of a function of two variable is a curve along which the function has a constant value. For example, a noise contour line is a line of equal or constant noise level on a map. See *Noise Contour Map*.

**Crosswind Leg** – A flight path at right angles to the landing runway off its upwind end.

**Day-Night Average Sound Level (DNL)** – A noise measure used to describe the average *sound* level over a 24-hour period, typically an average day over the course of a year. In computing DNL, an extra weight of ten *decibels* is assigned to noise occurring between the hours of 10:00 p.m. and 7:00 a.m. to account for increased annoyance when ambient noise levels are lower and people are trying to sleep. DNL may be determined for individual locations or expressed in noise contours. This metric is used in NEPA documents for airports in Arizona and all states other than California.

**dBA** - See *A-Weighted Decibel* – **Decibel (dB)** – A unit used to measure the intensity of a sound by comparing it with a given level on a logarithmic scale. *Sound* is energy and is measured by its pressure. Because of the enormous range of *sound* pressures to which the human ear is sensitive, the raw sound pressure measurement is converted to the *decibel* scale for purposes of description and analysis. Because the *decibel* scale is logarithmic, a ten-*decibel* increase in *sound* is perceived as a doubling of sound (or twice as loud) by the human ear.

Distance Measuring Equipment (DME) – A flight instrument that measures the line-of-sight distance of an aircraft from a navigational radio station in *nautical miles*. As a transponder-based radio navigation system, DME measures the *slant-range distance* by timing the propagation delay of very high frequency (VHF) radio signals. Pilots use DME to determine the distance of their aircraft from a land-based transponder, which is typically collocated with a *Very High Frequency Omnidirectional Radio Range (VOR) station*.

Downwind Leg – A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg.

Easement – **The legal right of one party to cross or otherwise use someone else's land for a specified purpose.**

Engine Run-ups – A routine procedure for testing aircraft systems by running one or more engines at a high power setting. Engine run-ups are normally conducted by airline maintenance personnel checking an engine or other on-board system following maintenance.

Enplanements – The number of revenue passengers boarding an aircraft at an airport during a given time period.

Equivalent Sound Level (Leq) – The *A-weighted* energy average *sound* level experienced over a given period of time. The metric is expressed as ten times the log of the total noise energy divided by the number of seconds during the period under consideration.

Executive Order 13807 – The Presidential Executive Order on establishing discipline and accountability in the environmental review and permitting process for infrastructure. This order provides that the federal government will make timely decisions with the goal of completing all federal environmental reviews and authorization decisions for major infrastructure projects within two years, measured from the date of the publication of a notice of intent to prepare an environmental impact statement. The federal lead, cooperating, and participating agencies for each major infrastructure project shall all record any individual agency decision in one record of decision.

Federal Aviation Administration (FAA) – One of several transportation modal federal government agencies under the United States Department of Transportation. The FAA is the Federal agency responsible for insuring the safe and efficient use of the nation's airspace and for supporting the requirements of national defense.

Fixed-Base Operator (FBO) – A business granted the right by an airport to operate at the airport and provide aeronautical services such as hangar space, fuel, flight training, repair, and maintenance to airport users.

Fleet Mix – The collection of differing types of aircraft operating in a particular airport environment.

Flight Track Utilization – The use of established routes for arrival and departure by aircraft to and from the runways at the airport.

General Aviation Aircraft – General aviation (GA) is the term for all civil aviation operations other than scheduled air services and non-scheduled air transport operations for remuneration or hire. GA aircraft generally include those U.S. registered civil aircraft, which operate, for private and non-commercial purposes and whose operations are not governed by 14 C.F.R. Parts 119, 121, 125, or 135. GA aircraft range in size from small single-engine propeller aircraft to large *turbojet* private aircraft.

Geographic Information Systems (GIS) – An information system that is designed for storing, integrating, manipulating, analyzing, and displaying data referenced by spatial or geographic coordinates.

Global Positioning System (GPS) – GPS equipment onboard an aircraft takes advantage of various radio navigation and/or *Global Positioning System* routes to guide the aircraft. GPS is a system of satellites used as reference points to enable navigators equipped with GPS receivers to determine their latitude, longitude, and altitude.

Ground Access Vehicles (GAV) – Any vehicle licensed to operate on Airport roads.

Ground Effect – Noise *attenuation* attributed to absorption or reflection of noise by man-made or natural features on the ground surface.

Itinerant Operation – An aircraft flight that ends at an airport different from where the flight began.

Knots – A unit of measurement of speed measured as the distance in *nautical miles* (6,076.1 feet) covered in one hour. (Approximately equal to 1.15 statute miles per hour.)

Land Use Compatibility – The ability of land uses surrounding the airport to coexist with airport-related activities with minimum conflict.

Landing and Takeoff (LTO) Cycle – The time that an aircraft is in operation at or near an airport. An LTO cycle begins when an aircraft starts its *final approach* (arrival) and ends after the aircraft has made its climb-out (departure).

Ldn - See *DNL*. Ldn is used in place of *DNL* in mathematical equations only.

Leq - See *Equivalent Sound Level*.

Local Operation – An aircraft flight that begins and ends at the same airport.

Localizer – The component of an *Instrument Landing System* that provides lateral course guidance to the runway.

Maximum Noise Level (Lmax) – The maximum *sound* pressure for a given event adjusted toward the frequency range of human hearing.

Mean Sea Level (MSL) – The average height of the surface of the sea for all stages of the tide; used as a reference for elevations; also called sea level datum.

National Environmental Policy Act of 1969 (NEPA) – A United States federal law that establishes the environmental review process for proposed Federal actions.

National Pollutant Discharge Elimination System (NPDES) – Federal requirement under the Clean Water Act (CWA) that any discharge of a non-point source of pollution into waters of the United States be in conformance with any established water quality management plan developed under the Clean Water Act.

Nautical Mile – A measurement of distance equal to one minute of arc on the earth's surface (6,076.1 feet or 1,852 meters).

Natural Ambient Noise – *Ambient Noise*, minus man-made sounds.

NAVAIDs (Navigational Aids) – Any electronic or visual facility used by an aircraft for navigation.

Noise Abatement – A measure or action that minimizes the amount of impact of noise on the environs of an airport. Noise abatement measures include aircraft operating procedures and use or disuse of certain runways or *flight tracks*. *See also Noise Attenuation. Noise abatement reduces sound at the source.*

Noise Contour Map – A map representing average annual noise levels summarized by lines connecting points of equal noise exposure.

Noise Mitigation – A measure or action that minimizes the amount of impact of noise on the environs of an airport. Noise abatement measures include sound insulation, windows, and doors, construction of noise walls. Noise mitigation reduces sound at the receptor.

Profile – The position of the aircraft during an approach or departure in terms of altitude above the runway and distance from the runway end.

Propagation – *Sound* propagation is the spreading or radiating of sound energy from the noise source. It usually involves a reduction in sound energy with increased distance from the source. Atmospheric conditions, terrain, natural objects, and manmade objects affect sound propagation.

Public Use Airport – An airport open to public use without prior permission, and without restrictions within the physical capabilities of the facility. It may or may not be publicly-owned.

Regional Jet – A jet aircraft that falls within the air carrier aircraft category because of size and payload. For use in air commerce, the *regional jet* must be operated pursuant to an air carrier certificate pursuant to an air carrier certificate issued under 14 C.F.R. Parts 119 and 121 of the *Federal Aviation Regulations*. (See 14 C.F.R. § 119.3, for Domestic, Flag, and Supplemental operations). *Regional jets* are not operated as commuter aircraft pursuant to 14 C.F.R. Part 135. *Regional jets* are typically jet aircraft, with approximately 35 to 90 seats. The next-generation *regional jets* are expected to seat 100 passengers.

Run-up – A routine procedure for testing aircraft systems by running one or more engines at a high power setting. *Engine run-ups* are normally conducted by airline maintenance personnel checking an engine or other on board systems following maintenance.

Runway Protection Zone (RPZ) – An area, trapezoidal in shape and centered about the extended runway centerline, designated to enhance the protection of people and property on the ground. It begins 200 feet (60 M) beyond the end of the area usable for takeoff or landing. The RPZ dimensions are functions of the aircraft, type of operation, and visibility minimums. (Formerly known as the clear zone.)

Runway Safety Area (RSA) – A defined surface surrounding the runway prepared or suitable for reducing the risk or damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway.

Runway Threshold – The beginning of that portion of the runway usable for landing.

Single event – One noise event. For many kinds of analysis, the *sound* from single events is expressed using the *Sound Exposure Level* metric.

Slant-Range Distance – The line-of-sight between two points, which are not at the same level relative to a specific datum. Slant-range distance is typically measured between an aircraft and a navigational radio station.

Sound – Sound is the result of vibration in the air. The vibration produces alternating bands of relatively dense and sparse particles of air, spreading outward from the source in the same way as ripples do on water after a stone is thrown into it. The result of the movement is fluctuation in the normal atmospheric pressure or sound waves.

Sound Exposure Level (SEL) – A standardized measure of a *single (sound) event*, expressed in *A-weighted decibels*, that takes into account all sound above a specified threshold set at least ten *decibels* below the maximum level. All sound energy in the event is integrated over one second.

Standard Instrument Departure Procedure (SID) – A planned *Instrument Flight Rules air traffic control* departure procedure published for pilot use in graphic and textual form. SIDs provide transition from the terminal to the en route *air traffic control* structure.

Standard Terminal Arrival Route (STAR) – A planned *instrument flight rules air traffic control* arrivals procedure published for pilot use in graphic and textual form. STARs provide a transition from the en route *air traffic control* structure to an *outer fix* or an *instrument approach* fix in the terminal area.

Statute Mile – A measure of distance equal to 5,280 feet.

Time Above (TA) – The amount of time that *sound* exceeds a given *decibel* level during a 24-hour period (e.g., time in minutes that the sound level is above 75 *decibels*).

Thrust Settings – Settings on jet powered aircraft that control the power applied to the engines.

Traffic Pattern – The traffic flow prescribed for aircraft landing at, taxiing on, or taking off from an airport. The components of a typical traffic pattern are *upwind leg*, *crosswind leg*, *downwind leg*, *base leg*, and *final approach*.

**Turbojet** – An aircraft powered by a jet turbine engine. The term is customarily used in *air traffic control* for all aircraft, without propellers, that are powered by variants of jet engines, including turbofans.

**Turboprop** – An aircraft powered by a turbine engine that drives an aircraft propeller. Aircraft of this type are typically used by airlines on short routes between two relatively close locations.

**Upwind Leg** – A flight path parallel to the approach runway in the direction of approach.

**Vector** – Compass heading instructions issued by *Air Traffic Control* in providing navigational guidance by radar.

**Yearly Day-Night Average Sound Level** – see *DNL*.

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# Chapter One

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# CHAPTER ONE

## INTRODUCTION AND BACKGROUND

This Environmental Assessment (EA), required by the National Environmental Policy Act of 1969 (NEPA), as amended (40 CFR 1500-1508)<sup>1</sup> and prepared in accordance with Federal Aviation Administration (FAA) Orders 1050.1F, *Environmental Impacts: Policies and Procedures* and 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, analyzes the potential environmental effects of a Proposed Action involving the development and operation of an air cargo facility at Cincinnati/Northern Kentucky International Airport (CVG or Airport). The EA is required under NEPA because the project will require federal actions that include FAA's approval of a change to the Airport Layout Plan (ALP) for CVG.

### 1.1 BACKGROUND

CVG is a publicly-owned passenger and air cargo airport operated by the Kenton County Airport Board (KCAB). CVG is located in the northeast section of Boone County, Kentucky, approximately one mile south of the Ohio River and eight miles southwest of downtown Cincinnati. The Airport encompasses approximately 7,753 acres of land and is generally bounded on the north by Interstate 275, to the east by Interstate 71/75, to the west by State Route 237 (KY 237/North Bend Road), and to the south by State Route 18 (KY 18/Burlington Pike). Access to the Airport is provided via Interstate 275, State Route 212 (KY 212), and Donaldson Highway. Exhibit 1-1, *Airport Location* shows the general Airport location and surroundings.

The airfield system consists of four runways, of which include three parallel runways and a crosswind runway. The three parallel runways (18L/36R, 18C/36C, 18R/36L) are oriented in a north-south direction. Runway 9/27, the crosswind runway, is oriented in an east to west direction. The Main Terminal (formerly Terminal 3) is approximately 277,000 square feet and is the only terminal at the Airport. Terminal 1 and 2 were demolished in 2016. The Main Terminal serves the operations of all airlines out of two concourses, Concourse A and Concourse B. CVG also serves as the hub for DHL Worldwide Express Operations.

### 1.2 DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action consists of the development and operation of an air cargo facility at CVG. The proposed site is located on undeveloped land north of Aero Parkway and bordered on the west by Gunpowder Creek and extends east to the existing DHL facility. Exhibit 1-2, *Project Site*, shows the general project area along with the location of the Project Site at the Airport. The Proposed Action includes the following major elements:

- Construct a primary package sortation building and support buildings (i.e., ground package sort building, equipment storage, equipment maintenance, and pilot services). The total building footprint would be up to 3.8 million square feet.

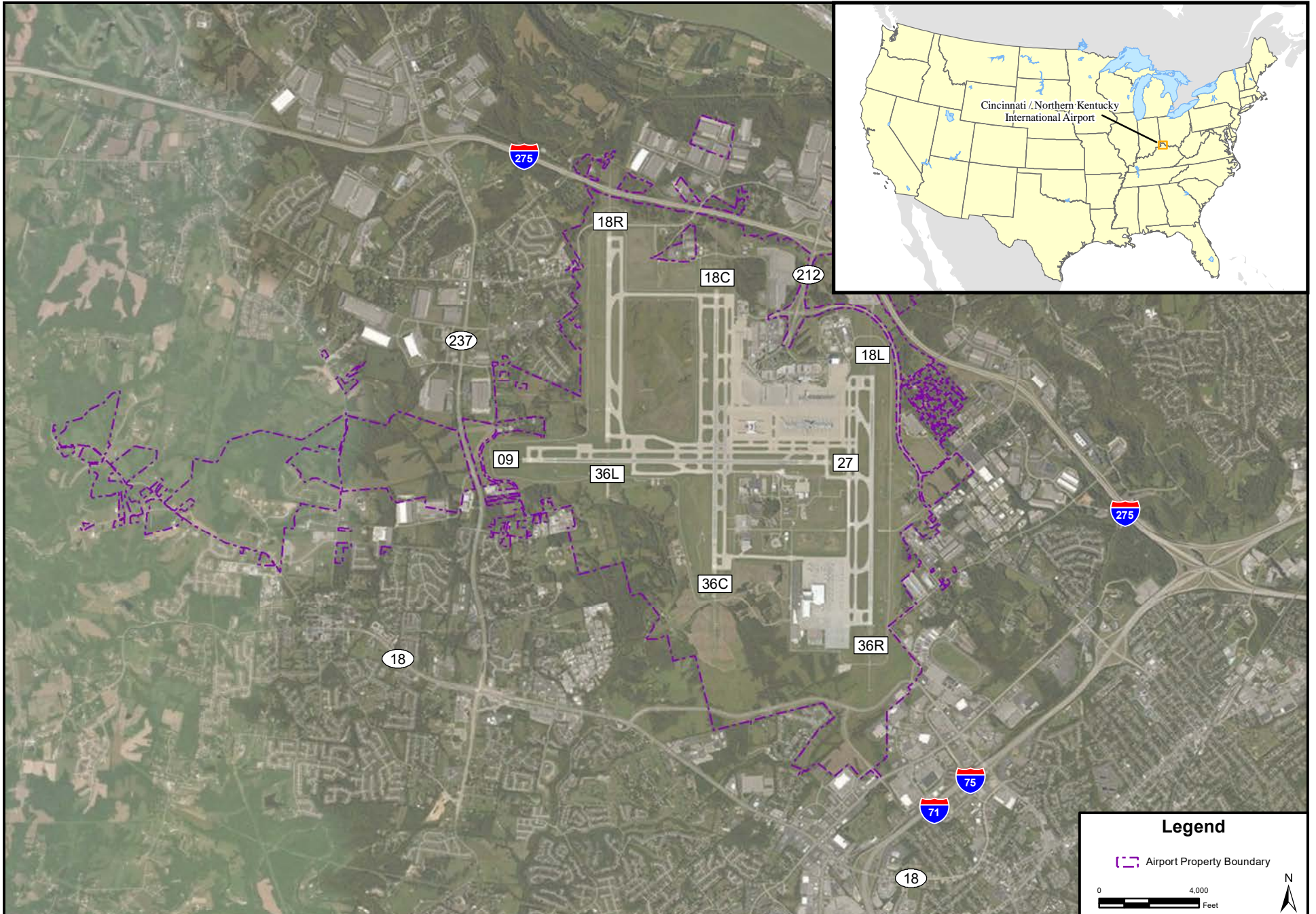
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<sup>1</sup> P.L. 91-190, 42 U.S.C. 4321, et. seq., *National Environmental Policy Act*, 1969, Section 102(2)(c).

- Construct approximately 255-acre concrete aircraft parking apron and apron taxilanes.
- Construct paved employee and visitor vehicle parking garage/lots (approximately 781,000 square feet/96,000 square yards).

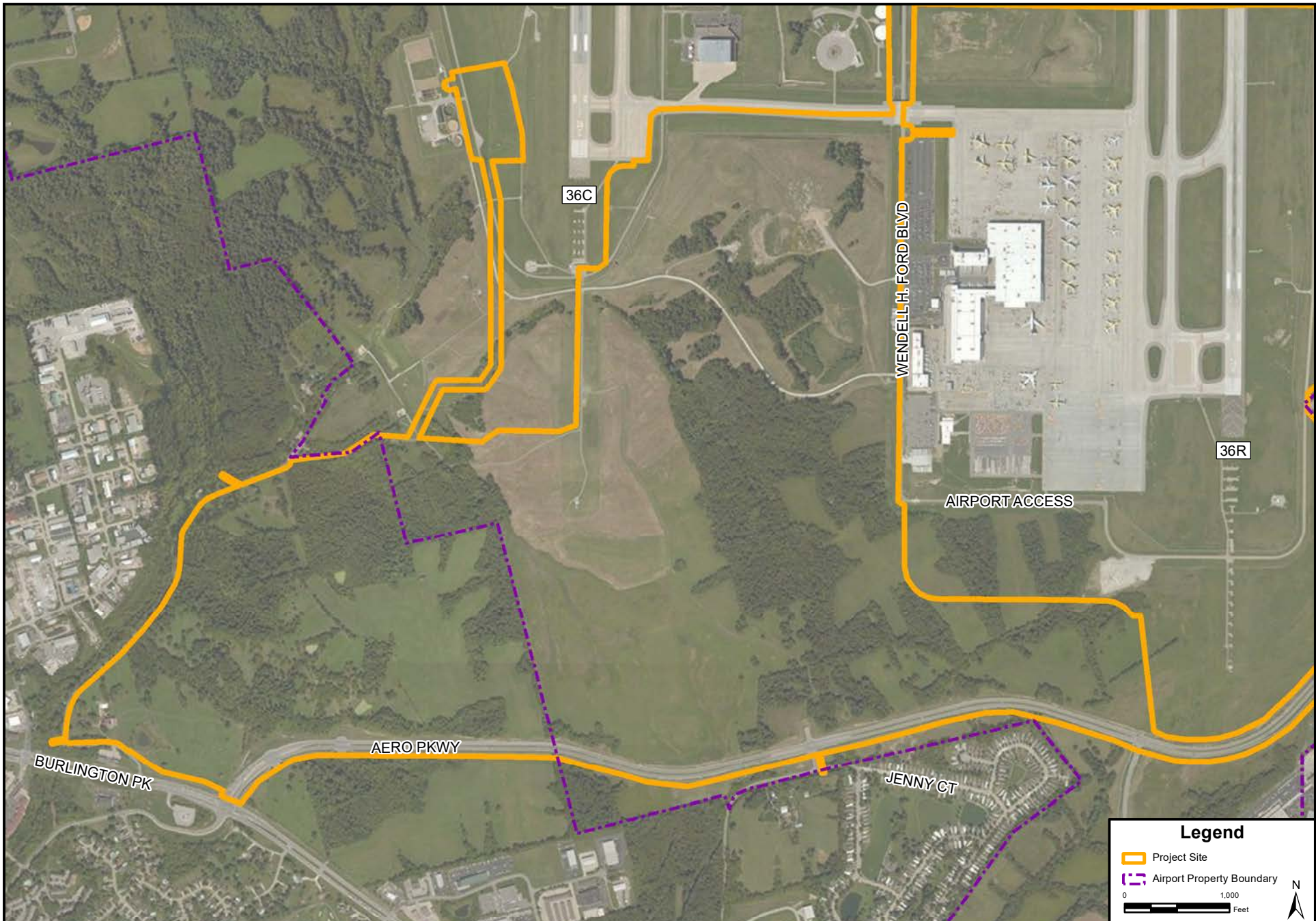
The following are supporting or enabling elements to the Proposed Action major elements:

- Prepare (clear, grub, excavate, embank, and grade) approximately 800 acres of land.
- Extend (approximately 4,200 feet in length by 60 feet wide) Wendell H. Ford Boulevard.
- Construct new on-Airport access roads that provide vehicle and truck access to the new air cargo facility.
- Improve sections of Aero Parkway, an existing four-lane divided highway, to install new entrances, turn lanes, traffic lights, and lighting.
- Transfer all or a portion of off-Airport property (totaling approximately 200 acres) to KCAB.
- Extend utilities to the project site, including electric service, natural gas, water, sanitary sewer, data/communications, and other related infrastructure.
- Modify and/or install new taxiway edge lights and airfield directional signs.
- Install exterior pole-mounted and building-mounted lighting at package sorting buildings, access roads, vehicle parking lots, truck courts, and portions of the aircraft parking aprons.
- Construct new drainage conveyances and detention ponds and/or modify the existing airfield stormwater management system.
- Install security fence and controlled-access vehicle gates and pedestrian gates.
- Expand Airport existing fueling facilities.
- Installation of up to three 60,000-gallon glycol storage tanks.
- Relocate on-Airport road south of Runway 18C/36C.



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The following describes in more detail the conceptual elements of the Proposed Action, as shown in Exhibit 1-3, *Proposed Action-Overview* and Exhibit 1-4, *Proposed Action - Detailed*. **However, the facility's final design, development phasing, and construction schedule have not been finalized at the time of the preparation of this EA.** Therefore, this document assumes a full build out to disclose maximum environmental impacts due to this project.

*Construct a primary package sort building, ground package sort building, and support buildings with total building footprint of up to 3.8 million square feet*

The Proposed Action includes the construction of multiple buildings with approximately 3.8 million square foot total footprint. The facility would sort packages that would move from air-to-air, air-to-ground, and ground-to-air. The project includes the construction of a primary sorting building and ancillary support buildings. The primary sorting building would be located on the south side of the airfield with access from Wendell H. Ford Boulevard and Aero Parkway. The support buildings include space for equipment storage, equipment maintenance, and pilot services.

*Construct approximately 255-acre concrete aircraft parking apron and apron taxilanes*

The Proposed Action includes the construction of an approximately 255-acre aircraft parking apron and apron taxilanes that would provide circulation and parking for up to 77 cargo aircraft. Ground support equipment, unit load devices, staging areas, and fuel and deicing pads would also be implemented.

*Construct paved employee and visitor vehicle parking garage/lots (approximately 781,000 square feet/96,000 square yards)*

The Proposed Action includes the construction of employee vehicle parking, truck courts, and vehicle circulation areas for additional trucks and cars moving to and from the air cargo facility. These areas would additionally include space for employee parking service areas, and trailer staging.

## 1.3 DOCUMENT CONTENT AND ORGANIZATION

This document is organized as follows:

- Chapter Two describes the purpose and need for the Proposed Action
- Chapter Three describes alternatives to the Proposed Action
- Chapter Four describes the affected environment
- Chapter Five describes the potential environmental impacts of the Proposed Action and of the No Action Alternative and recommended avoidance, minimization, and/or mitigation measures
- Chapter Six describes the public involvement that was completed as part of the EA
- Chapter Seven provides a list of those responsible for preparing the EA
- Chapter Eight provides a list of references used in the preparation of the EA

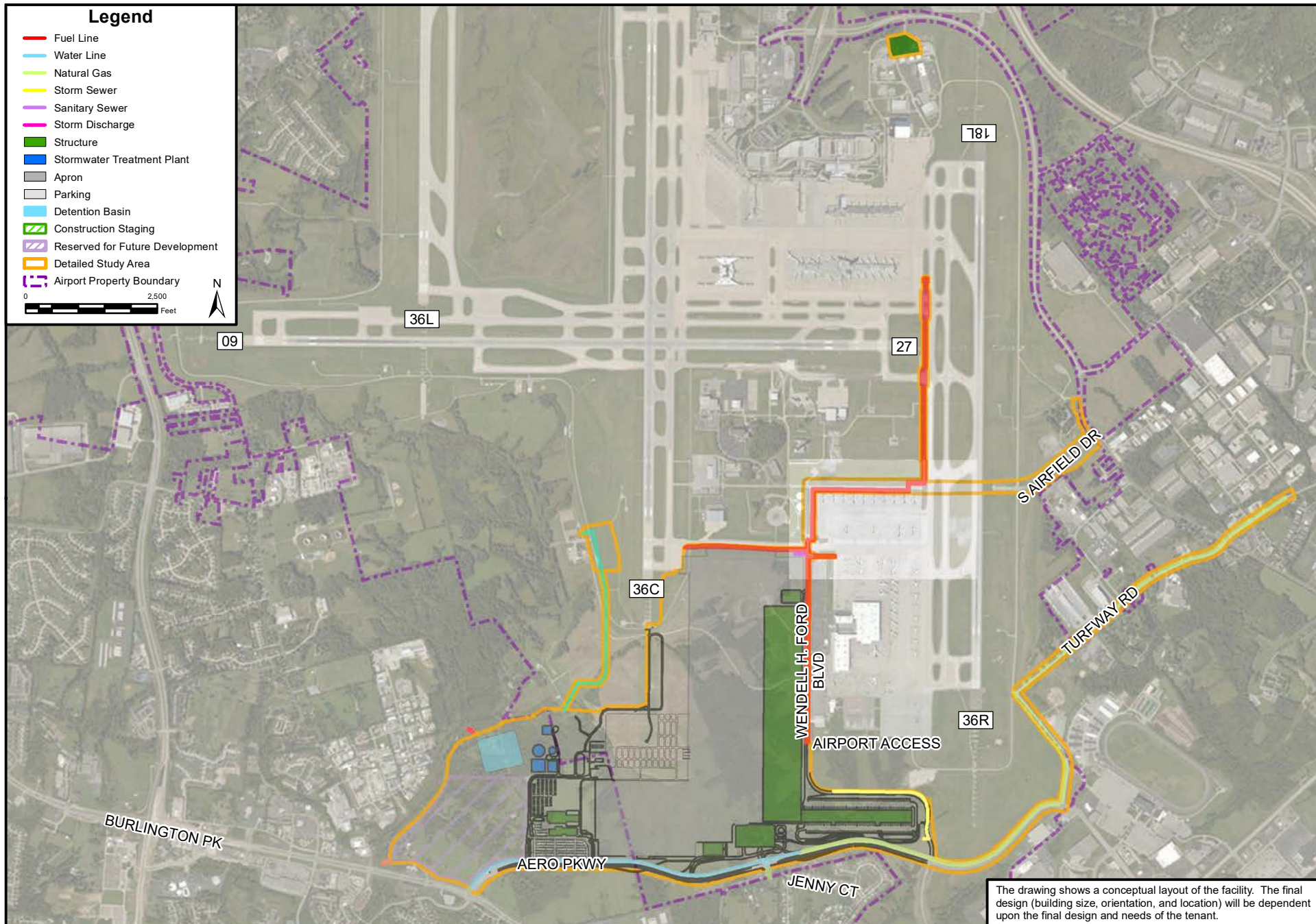
An EA is a disclosure document prepared for the Federal agency (in this case the FAA) responsible for approving a proposed Federal or Federally-funded action, in compliance with the requirements set forth by the Council on Environmental Quality (CEQ) in its regulations implementing NEPA. The purpose of this EA is to investigate, analyze, and disclose the potential impacts of the Proposed Action and its reasonable alternatives. In this case, the FAA is responsible for reviewing and approving actions that pertain to airports and their operation. As such, this EA has been prepared in accordance with FAA Orders 1050.1F and 5050.4B, and consideration to guidance included in the *FAA Environmental Desk Reference for Airport Actions*.

This EA was also prepared pursuant to other laws relating to the quality of the natural and human environments, including:

- The Department of Transportation Act, 49 U.S.C., § 303 (formerly Section 4(f))
- 49 U.S.C., §40114, as amended
- 49 U.S.C., §§47101, et seq.
- Executive Order 11990, Protection of Wetlands
- Executive Order 11988, Floodplain Management
- Executive Order 11593, Protection and Enhancement of the Cultural Environment
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- Federal Aviation Act of 1958 recodified as 49 U.S.C. §§40101, et seq.
- The Airport and Airway Improvement Act of 1982, 49 U.S.C. §47108, as amended
- National Historic Preservation Act, 16 U.S.C. §470(f), as amended
- 36 CFR Part 800, Advisory Council on Historic Preservation
- Archaeological and Historic Preservation Act, 16 U.S.C. §469(a)
- Archaeological Resource Protection Act, 16 U.S.C. §470(aa)
- Farmland Protection Policy Act, 7 U.S.C. §73, and implementing regulations at 7 CFR §658
- Clean Air Act, 42 U.S.C. §§7401, et seq., and implementing regulations at 40 CFR. Parts 51 and 93
- Clean Water Act, 33 U.S.C. §§121, et seq., and implementing regulations at 33 CFR §§325 and 33 CFR §336
- 33 CFR Parts 320-330, Regulatory Programs of the Corps of Engineers
- Endangered Species Act, 16 U.S.C. §661, et seq., as amended
- Other laws, regulations, and policies as applicable

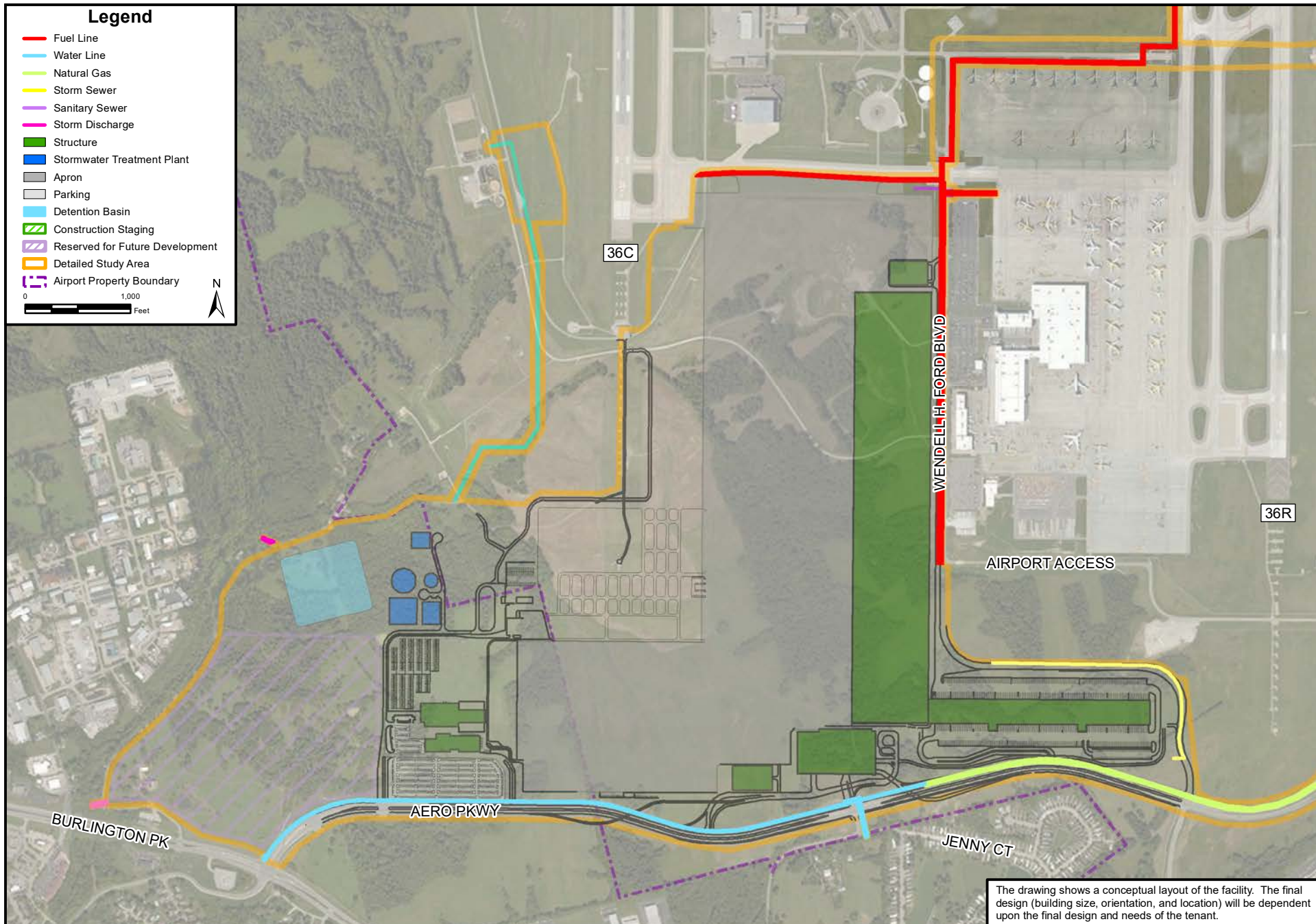
Notice about the subject project was published in The Cincinnati Enquirer on September 26, 2018. Copies of this document are available at the CVG Centre, 77 Comair Blvd, Erlanger, KY 41018. Copies of this document were also made available **at the FAA's Memphis Airports District Office and online at** <http://www.airportprojects.net/CVG-CargoFacility-EA>. Comments received and information on the public meeting will also be included in Appendix A.





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## Chapter Two

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## CHAPTER TWO

### PURPOSE AND NEED

The Kenton County Airport Board (KCAB), which owns and operates the Cincinnati/Northern Kentucky International Airport (CVG or Airport), will enter into a long-term lease with an air cargo service provider for CVG to become a hub location for the provider, requiring the development and operation of an air cargo facility at CVG. The following section discusses the purpose and need for the project. The KCAB has identified needs based on the air cargo service provider's **desired plans for a hub**. This EA analyzes the proposed solutions (purpose) to meet the needs of the identified deficiencies.

#### 2.1 PURPOSE AND NEED

The *purpose* of this project is to provide suitable air cargo facilities at CVG for a hub for large-scale air cargo operations on land presently owned by the KCAB (Sponsor) in a way that would **be consistent with the Airport's long-term plans** and meet the air cargo service provider's existing and future demands.

The *need* for the project is that the existing apron area and facilities at CVG are inadequate to meet the air cargo **service provider's** requirements for a delivery and sortation support facility, while still meeting the safety and design requirements of the Federal Aviation Administration (FAA).

The air cargo service provider has determined in order to meet its operational goals the integration of airside, landside, and sorting facilities is required. This integration offers limited flexibility in the variation of layout, orientation, and proximity to airside and surface transportation facilities. To meet its requirements, the air cargo service provider proposed to KCAB, at a minimum, an on-airport development site that has the following characteristics:

- A minimum of 500 contiguous acres of land;
- Direct access to the DHL cargo facility;
- Direct airfield access;
- Access to major surface transportation corridors (i.e., Interstate 71/75 and Interstate 275);
- Ability for expansion on adjacent land; and
- Constructible such that the facility would have initial operational capability in 2021.

The development of the air cargo facility would require sufficient on-airport land areas that could be co-located with existing and future air and surface transportation infrastructure. The air cargo service provider has indicated that simultaneous operations by numerous cargo aircraft, ground support, loading, and surface vehicles must occur in a highly orchestrated manner within pre-defined time-periods that are predicated on next-day delivery schedules at the **company's** various distribution centers. No existing facilities at CVG fully meet the air cargo **service provider's** operational requirements and business needs. Therefore, there is a critical need for the particular location, size, and orientation of the air cargo sorting/distribution site

that meets the air cargo service provider's operational requirements. Based on the business plan for the development of the proposed air delivery and sortation support facility, the air cargo service provider determined the sorting and distribution facility must be constructed and have initial operational capability in 2021.

The development of the air cargo facility would also **support KCAB's strategic goals** to maintain a competitive cost structure and strong financial position and diversify airline and non-airline net revenue streams.

In addition to the purpose and need of the KCAB and of the air cargo service provider, the FAA also has specific purpose and needs to fulfill federal requirements. These are addressed in the following paragraphs.

### FAA Purpose and Need

The first purpose of the federal actions necessary to implement the Proposed Action is to fulfill FAA's statutory mission to ensure the safe and efficient use of navigable airspace in the U.S. as set forth under 49 United States Code (U.S.C.) § 47101 (a)(1).

The FAA must ensure that the Proposed Action does not derogate the safety of aircraft and airport operations at CVG. Moreover, it is the policy of the FAA under 49 U.S.C. § 47101(a)(6) that airport development projects provide for the protection and enhancement of natural resources and the quality of the environment of the United States.

Additionally, the purpose of the federal actions **in connection with KCAB's request to** modify the existing Airport Layout Plan (ALP) is to ensure the proposed development at the airport does not adversely affect the safety, utility, and efficiency of the airport. Pursuant to 49 U.S.C. § 47107(a)(16), the FAA Administrator (under authority delegated from the Secretary of Transportation) must approve any revision or modification to an ALP before the revision or modification takes effect. The **Administrator's approval reflects a determination** that the proposed alterations to the airport, reflected in the ALP revision or modification, do not adversely affect the safety, utility, or efficiency of the airport.

Therefore, the need for the federal actions is to ensure that CVG operates in the safest manner possible pursuant to 49 U.S.C. § 47101(a)(1).

The second purpose of the federal actions is to fulfill the policy of the United State to support growth and development of air cargo hub airports and intermodal connections on airport property as set forth in U.S.C. § 47101 (a)(4) and (5). Additionally, specific to air cargo, 49 U.S.C. § 40101(b) further directs the FAA Administrator (under authority delegated from the Secretary of Transportation) to consider the following to be in the public interest as to air cargo transportation:

(1) encouraging and developing an expedited all-cargo air transportation system provided by private enterprise and responsive to:

- (A) the present and future needs of shippers;
- (B) the commerce of the United States; and
- (C) the national defense.

(2) encouraging and developing an integrated transportation system relying on competitive market forces to decide the extent, variety, quality, and price of services provided.

FAA approval of the Proposed Action, and the subsequent FAA decisions related to issuing the approvals for the construction and operation of the air cargo facility would **fulfill the agency's obligations and** support United States national policy pursuant to 49 U.S.C. § 47101(a)(4) and (5) and 49 U.S.C § 40101(b).

## 2.2 IMPLEMENTATION PHASING

The air cargo facility would have initial operational capability in 2021. The construction of the sortation building would be completed under a continuous development and construction program dependent on economic and operational requirements. As discussed in Section 1.2, the project includes the construction of approximately 3.8 million square feet of building space.

## 2.3 REQUIRED LAND USE/ENVIRONMENTAL PERMITS AND APPROVALS

### Federal

- FAA approval of modification of the ALP
- Federal environmental approval pursuant to NEPA
- Section 404/401 Permits
- Section 7

### State

- National Pollution Discharge Elimination System Permits (NPDES) administered by the Kentucky Division of Water

### Local

- Boone County Building permits
- Stormwater
- Floodplain
- Zoning
- Cemetery Relocation approvals



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## Chapter Three

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## CHAPTER THREE

### ALTERNATIVES

The Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA) require that the Federal decision-makers perform the following tasks when preparing an Environmental Assessment (EA):

- Evaluate all reasonable alternatives, including alternatives not within the jurisdiction of the Federal agency, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated
- Devote substantial treatment to each alternative considered in detail, including the No Action Alternative and the Proposed Action, so that reviewers may evaluate their comparative merits

This section describes the Proposed Action and alternatives to the Proposed Action, including the No Action Alternative, and evaluates the ability of each to meet the purpose and need described in Chapter Two, *Purpose and Need*. The Proposed Action, described in Section 1.2 of this EA, would fulfill the purpose and need for the project. The No Action Alternative would not meet the purpose and need; however, it is analyzed in the EA pursuant to the requirements of the CEQ, Federal Aviation Administration (FAA) Orders 1050.1F, 5050.4B, and NEPA.

Federal and state guidelines concerning the environmental review process require that all prudent, feasible, reasonable, and practicable alternatives that might accomplish the objectives of a project be identified and evaluated. Federal agencies may consider the applicant's purposes and needs and common sense realities of a given situation in the development of alternatives.<sup>1</sup> Federal agencies may also afford substantial weight to the alternative preferred by the applicant, provided there is no substantially superior alternative from an environmental standpoint.

### 3.1 DEVELOPMENT ALTERNATIVE SITES CONSIDERED FOR FURTHER ENVIRONMENTAL REVIEW

Various development alternative sites for the air cargo facility were considered for further environmental review. If the development alternative site did not meet the stated needs described in Section 2.1 of Chapter Two, the site was eliminated from further detailed environmental review. The following summarizes the development options that were thoroughly considered as alternatives to the Proposed Action at CVG.

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<sup>1</sup> Guidance Regarding NEPA Regulations, CEQ, 48 *Federal Register* 34263 (July 28, 1983).

A multi-step evaluation process took place for this EA to evaluate the various development alternative site locations. The alternatives were evaluated against the following pass or fail criteria, which are drawn from the needs presented in Chapter Two:

- Does the alternative site provide minimum of 500 acres of contiguous land?

In order to efficiently accommodate the operational needs of the air cargo facility, a site of at least 500 acres is needed. Air cargo facilities typically consist at a minimum of warehouse, aircraft apron, and ground support equipment (GSE) areas. A cargo warehouse is typically comprised of truck docks and doors on the landside portion of the building. On the airside of the building, vehicles have direct access to the apron and aircraft. The aircraft apron provides area for aircraft parking adjacent to the air cargo warehouse building and provides sufficient space for the vehicle, GSE, and unit load device operation and storage. This space must be large enough to accommodate freighter aircraft, aircraft tugs, cargo containers and trailers, cargo vehicles, and fueling vehicles. In addition, apron space is needed for cargo sortation, large tractor trailers, and potentially space for aircraft tail-to-tail cargo transfer and bypass containers. GSE is the support equipment at airports located on the apron. The equipment is located on the apron to support the operations of the aircraft, including ground power operations, tugs, dollies, and loading devices. GSE storage areas are also needed to park and stage GSE when not in use. These areas are often located on the apron in close proximity to aircraft parking area.

The space required for each of these areas (warehouse, apron, and GSE areas) depends on the existing and forecasted air cargo volume of the air cargo service provider. The air cargo service provider has determined, through extensive planning efforts, a minimum of 500 acres of contiguous land is needed to operate an efficient air cargo facility at CVG.

- Does the alternative site provide direct access to the DHL cargo facility?

It is preferred that the air cargo facility be located in proximity to the existing DHL cargo facility. The air cargo service provider has various business arrangements with DHL. It is expected the two entities would continue to maintain such arrangements in the future. A successful air cargo operation is predicated upon the efficient interaction of a number of businesses with different operating requirements and facility needs. These businesses have different levels of involvement based on the nature of the cargo and the geographies through which the cargo moves. In an ideal environment, most of these operations would be co-located on the airport, creating an efficient, integrated, air cargo community. Operating costs are lower, economies of scale can be achieved, and international goods can be cleared faster and with fewer problems.

- Does the alternative site provide direct airfield access?

To minimize aircraft taxi distances and delays, the site should have direct access to taxiway(s) that allow aircraft to move efficiently between the cargo facility site and the arrival/departure runways. The airfield access should have minimal taxi times and minimal runway crossings. Flight delays have a substantial impact on delivering packages on time. Based on analysis conducted by the Institute of Transportation Studies (ITS), University of California, Berkley, the cost of flight delay per package is approximately \$0.77 for a 15-minute flight delay and approximately \$3.92 for a 60-minute flight delay. **Because the air cargo service provider's business is time sensitive, it is imperative the site have direct airfield access to minimize taxi distances and potential delays to aircraft operations.**

- Does the alternative site provide access to major surface transportation corridors (i.e. Interstates 71/75 and Interstate 275)?

Sites were evaluated based on their proximity and access to the surrounding interstate roadway system. The air cargo service provider plans to conduct a sort operation at CVG. As a result, delivery trucks would enter and exit the site numerous times a day. Again, **because the air cargo service provider's business is driven by time definite delivery, the site needs easy access to Interstates 71/75 and Interstate 275 to eliminate potential delays from traffic on the local roadways.**

- Does the alternative site allow for expansion on adjacent land?

The cargo carrier has identified the need to have additional land in the future as operational needs require expansion of the facility. Sites were evaluated based on the availability of available adjacent land to accommodate future growth.

- Does the alternative site allow for construction and operation of the facility in 2021?

**The cargo service provider's business model requires the ability to construct and become operational in 2021. Sites that would not allow that would be eliminated from consideration.**

The following discussion documents the various development sites that were analyzed in the alternatives analysis and the recommendation of the alternative for further detailed environmental review in this EA. The three alternative sites evaluated are shown on Exhibit 3-1, *Alternative Sites*. A summary of the alternatives analysis conducted as a part of this EA process is provided at the end of this section in Table 3-1. Each alternative site is included in the table along with a determination if the alternative would be carried forward for further environmental analysis.

### 3.1.1 ALTERNATIVE A (WEST SITE)

Alternative A would locate the proposed facility west of Runway 9/27. This site is approximately 320 acres and is located to the west of North Bend Road and outside of the Runway 9/27 Runway Protection Zone (RPZ).

- Does the alternative site provide minimum of 500 acres of contiguous land?
  - No, this site only has 320 acres.
- Does the alternative site provide direct access to the DHL cargo facility?
  - No, this site is the farthest site from DHL of all the alternative sites.
- Does the alternative site provide direct airfield access?
  - No, this site currently has no airfield access and to do so would require tunneling North Bend Road under a new taxiway. While feasible, even if a new taxiway was constructed, aircraft would access the airfield at the westernmost location, which is not efficient from a taxi time perspective.
- Does the alternative site provide access to major surface transportation corridors (i.e., Interstates 71/75 and Interstate 275)?
  - Yes, North Bend Road has access to Interstate 275.
- Does the alternative site allow for expansion on adjacent land?
  - Yes, but through the purchase of private land.
- Does the alternative site allow for operation of the facility in 2021?
  - No, the need to construct a tunnel for a section of North Bend Road (a public roadway) to allow the construction of an access taxiway would add substantial complexity to the design, approval, and construction process, which would be an impediment to completion and operation of the cargo facility by 2021.

Conclusion: Alternative A could provide access to Interstate 275, a major surface transportation corridor. Additionally, the land area is prime for development as it is located on Airport-owned property and is adjacent to land that could be acquired for expansion. Conversely, the site lacks access to the DHL cargo facility and does not provide 500 acres of contiguous land. The site also provides limited airfield access as tunneling North Bend Road under a new taxiway would be required and would add complexity and time to construction. In conclusion, this alternative site would not meet criteria representing the purpose and need. Therefore, this alternative site was eliminated from further review.

### 3.1.2 ALTERNATIVE B (MIDFIELD SITE)

Alternative B would locate the proposed facility north of Runway 9/27, between Runway 18R/36L and Runway 18C/36C. This site is approximately 460 acres and divided on the north by Taxiway A.

- Does the alternative site provide minimum of 500 acres of contiguous land?
  - No, this site only has 460 acres.
- Does the alternative site provide direct access to the DHL cargo facility?
  - No, this site would require crossing two runways (18C/36C and 9/27) to access DHL.





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- Does the alternative site provide direct airfield access?
  - Yes, this site offers access to Runways 18R/36L, 18C/36C, and 9/27.
- Does the alternative site provide access to major surface transportation corridors (i.e., Interstates 71/75 and Interstate 275)?
  - Yes, Interstate 275 is located directly north of the site and could be accessed via Loomis Road, which is currently two lanes or potentially a new Interstate 275 interchange.
- Does the alternative site allow for expansion on adjacent land?
  - No, the location has no adjacent land for expansion. There is a small parcel north of Taxiway A, but grade changes and the need to expand an existing tunnel make it difficult to access.
- Does the alternative site allow for operation of the facility in 2021?
  - Yes. However, if it is determined that roadway improvements and construction of a new interchange at Interstate 275 is necessary, this would add substantial complexity to the design, approval, and construction process, which would be an impediment to completion and operation of the cargo facility by 2021.

Conclusion: Alternative B would not provide adequate access to Interstate 275, a major surface transportation corridor, without widening roads and the potential need to construct a new interchange. Additionally, the land area is prime for development as it is located on Airport-owned property and provides direct airfield access. However, the site is not large enough to accommodate existing and potential expansion; it lacks direct access to the DHL cargo facility, and would require aircraft to cross two runways to access the DHL facility. Further, the potential need for a new interchange at Interstate 275 would add substantial complexity to the project, which would affect the ability to begin operating the facility in 2021. In conclusion, this alternative site would not meet the criteria representing the purpose and need. Therefore, this alternative site was eliminated from further review.

### 3.1.3 ALTERNATIVE C (PROPOSED ACTION)

Alternative C (Proposed Action) is approximately 500 acres and is located north of Aero Parkway between Runway 18C/36C and Runway 18L/36R. The Proposed Action is described in Section 1.2 and shown in Exhibit 1-2.

- Does the alternative site provide minimum of 500 acres of contiguous land?
  - Yes, this site is approximately 500 acres.
- Does the alternative site provide direct access to the DHL cargo facility?
  - Yes, this site is located adjacent to DHL.
- Does the alternative site provide direct airfield access?
  - Yes, this site has access to Runway 18C/36C and short taxi times to Runways 18L/36R and 9/27.
- Does the alternative site provide access to major surface transportation corridors (i.e., Interstates 71/75 and Interstate 275)?
  - Yes, the site can access Interstate 71/75 via Aero Parkway, a 4-lane divided highway.

- Does the alternative site allow for expansion on adjacent land?
  - Yes, but through purchase of private land.
- Does the alternative site allow for operation of the facility in 2021?
  - Yes, there are no known impediments to completion by 2021.

Conclusion: Alternative C would provide access to Interstate 71/75 and 275, major surface transportation corridors. The site also provides approximately 500 acres of contiguous land, with the potential for expansion on adjacent land. The site also has direct access to the DHL cargo facility and direct airfield access. In conclusion, this alternative site would meet the purpose and need. Therefore, this alternative site was selected for further review.

Table 3-1, provides a summary of the alternatives analysis conducted as part of this EA process. The elements of each alternative are described in the table along with a determination if the alternative would be carried forward for further environmental analysis.

Table 3-1  
DEVELOPMENT ALTERNATIVES ANALYSIS SUMMARY

Alternative	Meet the Screening Criteria?						Carried Forward for Detailed Environmental Review?
	<i>500 acres of contiguous land</i>	<i>Direct access to DHL facility</i>	<i>Direct airfield access</i>	<i>Access to major surface transportation corridors</i>	<i>Expansion on adjacent land</i>	<i>Operation of facility in 2021</i>	
A (West Site)	No	No	No	Yes	Yes	No	No
B (Midfield Site)	No	No	Yes	Yes	No	No	Yes
C (Proposed Action)	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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## 3.2 ALTERNATIVES CARRIED FORWARD FOR DETAILED ENVIRONMENTAL REVIEW

As a result of the evaluations previously described, the only development alternative carried forward for further evaluation is the Proposed Action (Alternative C). As discussed previously, the No Action alternative will also be carried forward as required by FAA Orders 1050.1F, 5050.4B, and NEPA. Exhibit 3-2, *Alternatives Carried Forward for Detailed Environmental Review*, shows both the No Action and Proposed Action areas.

### ALTERNATIVE C (PROPOSED ACTION)

*Construct a primary package sort building, ground package sort building, and support buildings with total building footprint up to 3.8 million square feet*

The Proposed Action includes the construction of a multiple buildings up to 3.8 million square feet of total building footprint. The facility would sort packages that would move from air-to-air, air-to-ground and ground-to-air. The project includes the construction of a primary sorting building and ancillary support buildings. The primary sorting building would be located on the south side of the airfield with access from Aero Parkway. The support buildings include space for equipment storage, equipment maintenance, and pilot services.

*Construct approximately 255-acre concrete aircraft parking apron and apron taxilanes*

The Proposed Action includes the construction of an approximately 255-acre aircraft parking apron and apron taxilanes which would provide circulation and parking for up to 77 cargo aircraft. Ground support equipment, unit load devices, staging areas, and fuel and de-icing pads would also be implemented.

*Construct paved employee and visitor vehicle parking garage/lots (approximately 781,000 square feet/96,000 square yards)*

The Proposed Action includes the construction of employee vehicle parking, truck courts, and vehicle circulation areas for additional trucks and cars moving to and from the air cargo facility. These areas would additionally include space for employee parking service areas, unit load devices, and trailer staging.

### NO ACTION ALTERNATIVE

Under the No Action Alternative, no development not already approved by the FAA for NEPA purposes would occur and there would not be physical impacts to any environmental resources. Because there would be no development, this alternative would not address any of the purpose and need criteria. Therefore, it is not an alternative that meets the purpose and need. However, a No Action Alternative must be included in the evaluation of environmental impacts pursuant to CEQ Regulation 40 CFR 1502.14(d). The purpose of the No Action is to serve as a baseline against which impacts from the other alternatives are assessed for significance.

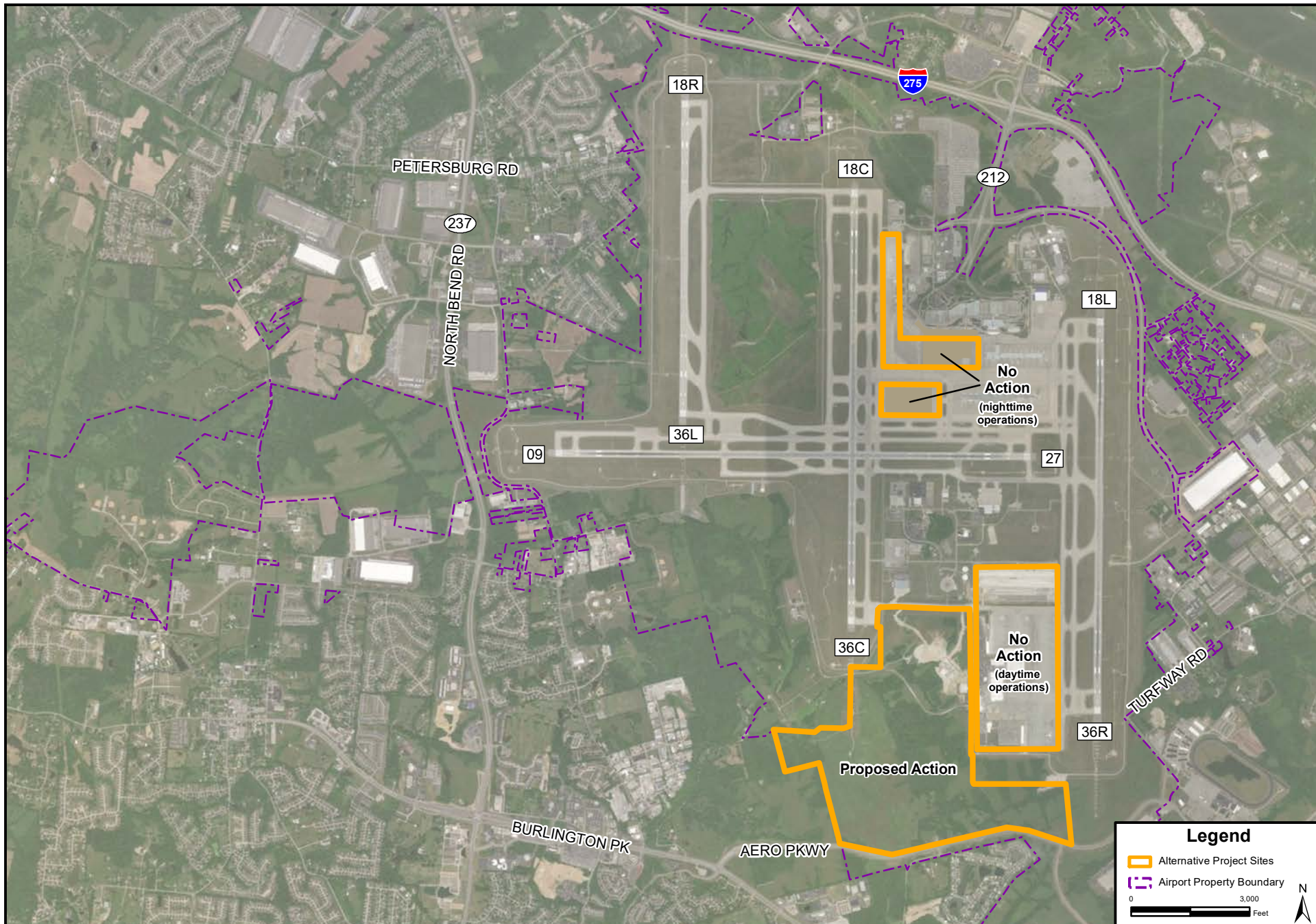
In order to define the No Action Alternative for this EA, it is important to understand if it is feasible for the Airport to meet the forecasted activity and, if so, with what

inefficiencies. This is done by: (1) identifying facilities that could be used to meet the forecasted activity, (2) identifying operational measures that may be implemented due to the lack of new facilities, and (3) identify the effect of the inherently inefficient operating environment. These are described below:

- (1) Use of Facilities – Existing facilities and areas, located at various locations at CVG, could be used to accommodate the sorting needs of the air cargo service provider in the short-term but not fully in the long-term. In the short-term, using existing facilities would be highly inefficient and require the air cargo service provider to move equipment and packages across different locations on the airfield, potentially resulting in delays to delivery times of packages. For this EA it is assumed, in the No Action, the air cargo service provider would continue to utilize the existing DHL facilities (sort building and aircraft apron) during the daytime (7:00 a.m. – 9:59 p.m.), as it does today and that the existing DHL facilities would continue to provide adequate capacity. During the nighttime (10:00 p.m. – 6:59 a.m.), existing vacant cargo buildings and apron area, located on the north side of the terminal area, would need to be used to accommodate the sort operation and aircraft parking, assuming these **buildings meet the air cargo service provider's sortation configuration and overall capacity requirements.**
- (2) Operational Measures – Additional operational measures would be needed to accommodate the nighttime operations. This would include use of additional tugs, more hand sorting (which would require more employees), longer truck idling times, longer taxi times, and busses transferring employees from existing parking facilities to the sort facilities.
- (3) Inefficiencies in the System – A split operation across several locations on the airport means duplication of certain functions, less than ideal parking for trucks and employees, more truck idling and longer truck trips, and more aircraft idling times. It also does not allow the air cargo service provider to develop a tailored, purpose-built, state of the art facility that provides necessary throughput capabilities.

While the description above may be theoretically feasible, it is not reasonable that an cargo service provider would plan to operate in this manner. However, the purpose of this exercise is to understand if the air cargo service provider could operate without constructing new facilities. Based on the discussion above, it is determined the forecasted activity by the air cargo service provider in 2021 could be accommodated at CVG under the No Action condition, but there would be significant inefficiencies associated with the operation. Some of those inefficiencies may have a negative effect on environmental conditions.

Selection of the No Action alternative would inhibit the **KCAB's** obligation and commitment to provide its airport users with sufficient infrastructure and maintain a high level of service. This alternative would not accommodate **the air cargo facility's** expected demand by failing to provide land area available for development. However, as discussed above, the No Action alternative is required by the CEQ to be evaluated in an EA. As such, this alternative will be carried forward in the EA, assuming the air cargo service provider would operate under these conditions, and used as the baseline against which the Proposed Action will be evaluated.



**Legend**

- Alternative Project Sites
- Airport Property Boundary

0 3,000 Feet

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## Chapter Four

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## CHAPTER FOUR

### AFFECTED ENVIRONMENT

Federal Aviation Administration (FAA) Order 5050.4B states the affected environment section of an Environmental Assessment (EA) should succinctly describe only those environmental resources the Proposed Action and its reasonable alternatives, are likely to affect. The amount of information on potentially affected resources should **be based on the expected impact and be commensurate with the impact's** importance. FAA Order 1050.1F and the 1050.1F Desk Reference provide information on identifying resources for evaluation in the EA.

The following describes the area around Cincinnati/Northern Kentucky International Airport (CVG or Airport). This is followed by discussions of the resources that may potentially be impacted, which include: air quality; biological resources; climate, hazardous materials, historic, architectural, archeological, and cultural resources, land use, socioeconomic conditions, natural resources and energy supply, noise and compatible land use, visual effects, and water resources. In accordance with FAA Order 5050.4B, the other resource categories are not discussed in this chapter due to lack of presence of the resource in the project. These resource categories are coastal resources, farmland, and wild and scenic rivers. Chapter Five, *Environmental Consequences*, includes a discussion about all of the resource categories, whether there are impacts of the category or not.

#### 4.1 PROPOSED ACTION SETTING

CVG is an international airport located on approximately 7,753 acres of land within Boone County, Kentucky. The Proposed Action is located on the southern portion of the Airport, north of Aero Parkway between Runway 18C/36C and Runway 18L/36R. The Proposed Action would occur on property currently owned by the Kenton County Airport Board (KCAB) and two private parcels totaling approximately 200 acres. Exhibit 1-2, *Proposed Action*, shows the location of the Proposed Action site. Site features include a combination of grassed areas and undeveloped wooded areas. The private parcels currently have vacant structures located on the property.

For the purposes of this EA, two study areas have been defined. The General Study Area (GSA) depicts the area surrounding the Airport. A further refined Detailed Study Area (DSA) depicts the areas that may be physically disturbed with the development of the Proposed Action. Both study areas are shown on Exhibit 4-1, *Study Areas*.

The GSA covers approximately 60,000 acres and is defined as the area where both direct and indirect impacts may result from the development of the Proposed Action. The GSA boundary lines were squared off to follow roadways and other identifiable features where available.

The DSA covers approximately 800 acres and is defined as the areas where direct impacts may result from the Proposed Action. The DSA boundaries were developed using the description of the Proposed Action.

## 4.2 RESOURCES POTENTIALLY AFFECTED

### 4.2.1 AIR QUALITY

#### Regulatory Setting

An airport air quality assessment requires consideration under both the Clean Air Act of 1970, as Amended (CAA), and the National Environmental Policy Act of 1969, as Amended (NEPA). These two federal laws require distinct analyses and may be separately applicable to an airport project.

The CAA establishes standards and programs to evaluate, achieve, and maintain acceptable air quality in the United States. In accordance with CAA requirements, the United States Environmental Protection Agency (EPA) established the National Ambient Air Quality Standards (NAAQS), for six common air pollutants (known as **"criteria air pollutants"**) that are potentially harmful to human health and welfare.<sup>1</sup>

The EPA considers the presence of the following six criteria pollutants to be indicators of air quality:

- \* Carbon monoxide (CO);
- \* Nitrogen dioxide (NO<sub>2</sub>);
- \* Ground-level Ozone (O<sub>3</sub>);
- \* Sulfur dioxide (SO<sub>2</sub>);
- \* Particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>);<sup>2</sup> and,
- \* Lead (Pb);<sup>3</sup>

Since 1975, lead emissions have been in decline due in part to the introduction of catalyst-equipped vehicles and the decline in production of leaded gasoline. In general, an analysis of lead is limited to projects that emit significant quantities of the pollutant (*e.g.*, lead smelters) and is generally not applied to transportation projects. For lead, a major source, as defined by EPA for a Nonattainment New Source Review permitting program would emit over 100 tons per year.

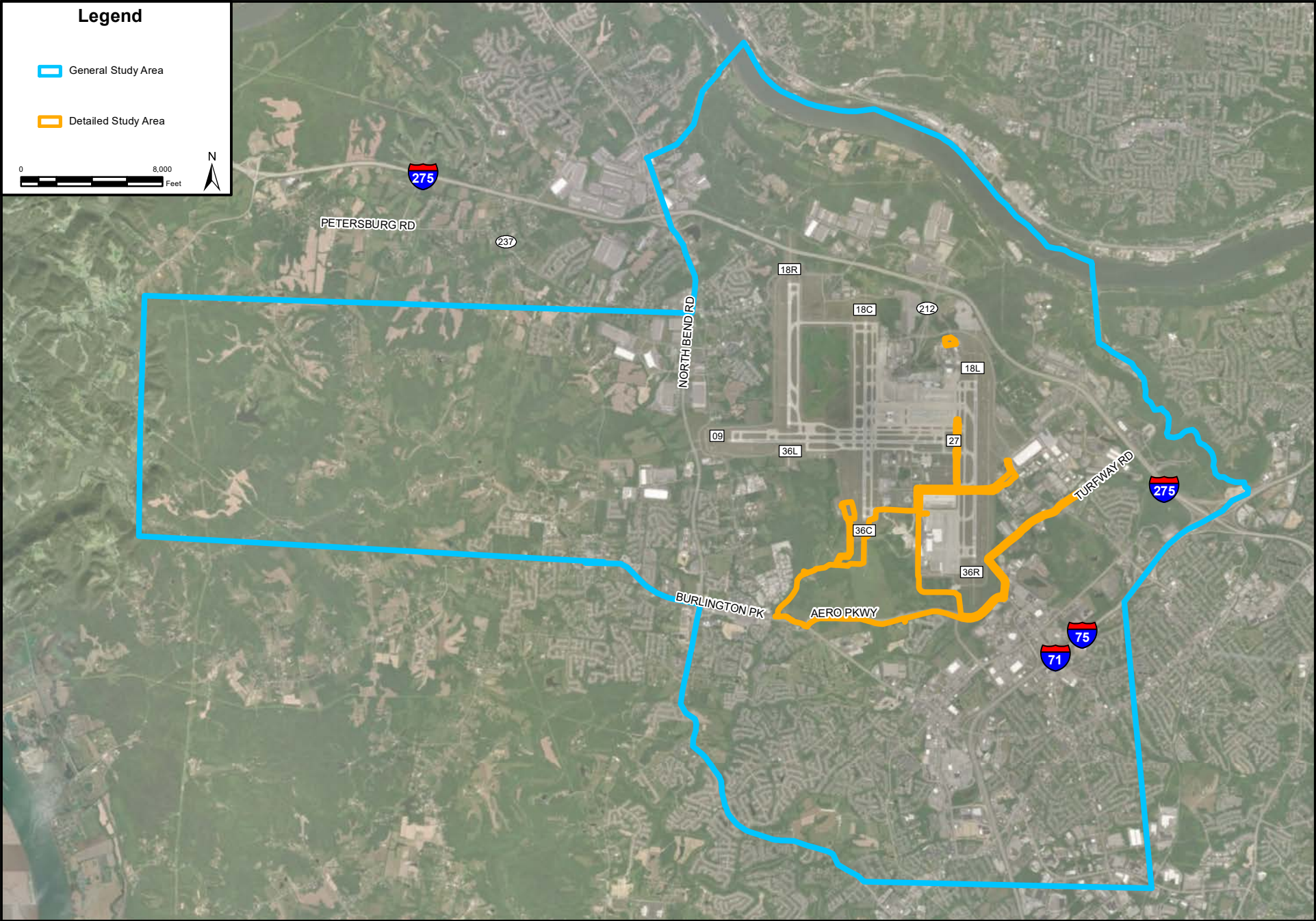
The NAAQS are summarized in Table 4-1. For each of the criteria pollutants, the EPA established primary standards intended to protect public health, and secondary standards to protect other aspects of public welfare, such as preventing materials damage, preventing crop and vegetation damage, and assuring good visibility. Areas of the country where air pollution levels consistently exceed these standards may be designated nonattainment by the EPA.

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<sup>1</sup> EPA, 40 C.F.R. § 50, National Primary and Secondary Ambient Air Quality Standards (NAAQS).

<sup>2</sup> PM<sub>10</sub> and PM<sub>2.5</sub> are airborne inhalable particles that are less than ten micrometers (coarse particles) and less than 2.5 micrometers (fine particles) in diameter, respectively.

<sup>3</sup> Airborne lead in urban areas is primarily emitted by vehicles using leaded fuels.



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Table 4-1  
NATIONAL AMBIENT AIR QUALITY STANDARDS

POLLUTANT		PRIMARY/ SECONDARY	AVERAGING TIME	LEVEL	FORM
Carbon Monoxide (CO)		Primary	8 hour	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		Primary and Secondary	Rolling 3-month average	0.15 µg/m3 (1)	Not to be exceeded
Nitrogen Dioxide (NO2)		Primary	1 hour	100 ppb	98 <sup>th</sup> percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Primary and Secondary	1 year	53 ppb (2)	Annual Mean
Ozone (O3)		Primary and Secondary	8 hour	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particulate Matter	PM2.5	Primary	1 year	12.0 µg/m³	Annual mean, averaged over 3 years
		Secondary	1 year	15.0 µg/m³	Annual mean, averaged over 3 years
	PM10	Primary and Secondary	24 hour	35 µg/m³	98 <sup>th</sup> percentile, averaged over 3 years
		Primary and Secondary	24 hour	150 µg/m³	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO2)		Primary	1 hour	75 ppb (4)	99 <sup>th</sup> percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Secondary	3 hour	0.5 ppm	Not to be exceeded more than once per year

- (1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5  $\mu\text{g}/\text{m}^3$  as a calendar quarter average) also remain in effect.
- (2) The level of the annual NO<sub>2</sub> standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.
- (3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O<sub>3</sub> standards additionally remain in effect in some areas. Revocation of the previous (2008) O<sub>3</sub> standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.
- (4) The previous SO<sub>2</sub> standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet one year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO<sub>2</sub> standards or is not meeting the requirements of a SIP call under the previous SO<sub>2</sub> standards (40 C.F.R. § 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

Notes: ppm is parts per million; ppb is parts per billion, and  $\mu\text{g}/\text{m}^3$  is micrograms per cubic meter.

Source: EPA, 40 C.F.R. § 50, National Primary and Secondary Ambient Air Quality Standards (NAAQS) accessed August 2018.

A nonattainment area is a homogeneous geographical area<sup>4</sup> (usually referred to as an air quality control region) that is in violation of one or more NAAQS and has been designated as nonattainment by the EPA. Some regulatory provisions, for instance the CAA General Conformity regulations, apply only to areas designated as nonattainment or maintenance.

A maintenance area describes the air quality designation of an area previously designated nonattainment by the EPA and subsequently re-designated attainment after emissions are reduced. Such an area remains designated as maintenance for a period up to 20 years at which time the state can apply for re-designation to attainment, provided that the NAAQS were sufficiently maintained throughout the maintenance period.

### Affected Environment

The Airport is located within Boone County, Kentucky, which is included in the Metropolitan Cincinnati Interstate Air Quality Region. The EPA previously determined that **Boone County's** levels of the eight-hour concentration of ozone exceeded the federal standards defining healthful air quality and was therefore designated as nonattainment for ozone. However, on July 5, 2017, the EPA determined the area had attained the standard and the region was designated to attainment. The area now operates under a maintenance plan for ozone.

## 4.2.2 BIOLOGICAL RESOURCES

### Regulatory Setting

The United States Congress passed the Endangered Species Act of 1973, as Amended (ESA) 16 U.S.C. §1531 *et seq.*, in 1973 to conserve those species that are endangered or threatened with extinction (federally-listed species). Under ESA, Section 7, the FAA is required to consult with the United States Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) to ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat.

### Affected Environment

The affected environment or action area for biological resources is defined per 50 C.F.R. § 402.02 as "*all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.*"

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<sup>4</sup> A homogeneous geographical area, with regard to air quality, is an area, not necessarily bounded by state lines, where the air quality characteristics have been shown to be similar over the whole area. This may include several counties, encompassing more than one state, or may be a very small area within a single county.

Biological surveys and habitat assessments were completed in August 21, October 29 and 30, 2015, September 21, 22, and 23, 2016, February 2017, March 14 and 15, 2017, September 7, 2017, and January 22 and 23, 2018 for the DSA. The purpose of these surveys was to determine the presence or absence of federal or state-listed species and if potential habitat for both federal and state-listed species existed in the proposed development area at CVG. The following ground cover/vegetation types are located on the DSA: old field, urban/industrial turf, Upland mixed deciduous forest, post-agricultural disturbed forest, hayfield, hickory woodland, beech forest, palustrine emergent wetland, palustrine forested wetland, palustrine scrub/shrub wetland, and upland scrub/shrub.

#### 4.2.2.1 THREATENED AND ENDANGERED SPECIES

According to the USFWS, the following federal listed species of plants and animals, shown in Table 4-2, may be found in Boone County, Kentucky.

Table 4-2  
FEDERAL THREATENED AND ENDANGERED SPECIES

TAXONOMIC GROUP	COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS
Mammal	Gray bat	<i>Myotis grisescens</i>	Endangered
Mammal	Indiana bat	<i>Myotis sodalis</i>	Endangered
Mammal	Northern long-eared bat	<i>Myotis septentrionalis</i>	Threatened
Mussels	Clubshell	<i>Pleurobema clava</i>	Endangered
Mussels	Fanshell	<i>Cyprogenia stegaria</i>	Endangered
Mussels	Northern Riffleshell	<i>Epioblasma torulosa rangiana</i>	Endangered
Mussels	Orangefoot pimpleback	<i>Plethobasus cooperianus</i>	Endangered
Mussels	<b>Purple cat's paw</b>	<i>Epioblasma obliquata</i>	Endangered
Mussels	Rabbitsfoots	<i>Quadrula cylindrica cylindrica</i>	Threatened
Mussels	Ring pink	<i>Obovaria retusa</i>	Endangered
Mussels	Rough pigtoe	<i>Pleurobema plenum</i>	Endangered
Mussels	Sheepnose	<i>Plethobasus cyphus</i>	Endangered
Mussels	Spectaclecase mussel	<i>Cumberlandia monodonta</i>	Endangered
Plants	Running buffalo clover	<i>Trifolium stoloniferum</i>	Endangered

Source: USFWS Information for Planning and Conservation (IPaC) website, <https://ecos.fws.gov/ipac/location/LS34QCWHZZDTZCOJ4LG4CW3T3E/resources>, Accessed May 17, 2018

#### 4.2.2.2 STATE DESIGNATED THREATENED, ENDANGERED, OR SPECIAL STATUS SPECIES

In addition to the USFWS information, the Kentucky Department of Fish & Wildlife Resources and the Kentucky State Nature Preserves Commission (KSNPC) were contacted to obtain information on threatened and endangered species. The list of species monitored by the KSNPC that may be found within Boone County is provided in Appendix C, *Section 7 Consultation*.



#### 4.2.2.3 SURVEY FINDINGS

No federally-protected or state-protected plant or animal species were observed in the areas surveyed. The habitat surveys found potentially suitable habitat for three federal threatened and endangered species: , the Indiana bat, the northern long eared bat, and running buffalo clover. Approximately 244 acres of potential summer habitat for the two bat species is located within the DSA. In accordance with Section 7 of the ESA, a Biological Assessment was prepared to analyze the potential impacts of the Proposed Action on the Indiana bat and northern long-eared bat. Running buffalo clover surveys were conducted during the flowering period within the project areas identified as potential habitat during the habitat surveys. No running buffalo clover was identified during the surveys. Suitable habitat was not present for any of the other federal species in the DSA. See Appendix C for additional information on the Biological Assessment and the field surveys.

#### 4.2.3 CLIMATE

Per FAA Order 1050.1F, the discussion of potential climate impacts should be documented in a separate section of the NEPA document, distinct from air quality.<sup>5</sup> Where the proposed action or alternative(s) would result in an increase in greenhouse gases (GHG) emissions, the emissions should be assessed either qualitatively or quantitatively.

GHGs are gases that trap heat in the earth's atmosphere. Both naturally occurring and man-made GHGs primarily include water vapor (H<sub>2</sub>O), carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>). Sources that require fuel or power at an airport are the primary sources that would generate GHGs. Aircraft are probably the most often cited air pollutant source, but they produce the same types of emissions as ground access vehicles.

Research has shown there is a direct correlation between fuel combustion and GHG emissions. In terms of U.S. contributions, the General Accounting Office (GAO) reports that "domestic aviation contributes about three percent of total carbon dioxide emissions, according to EPA data," compared with other industrial sources including the remainder of the transportation sector (20 percent) and power generation (41 percent).<sup>6</sup> The International Civil Aviation Organization (ICAO) estimates that GHG emissions from aircraft account for roughly three percent of all anthropogenic GHG emissions globally.<sup>7</sup> Climate change due to GHG emissions is a global phenomenon, so the affected environment is the global climate.<sup>8</sup>

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<sup>5</sup> FAA, April 2015, Order 1050.1F Paragraph 4-1. Climate is considered a separate section from Air Quality.

<sup>6</sup> *Aviation and Climate Change*. GAO Report to Congressional Committees, (2009).

<sup>7</sup> Alan Melrose, "European ATM and Climate Adaptation: A Scoping Study," in *ICAO Environmental Report*. (2010).

<sup>8</sup> As explained by the EPA, "greenhouse gases, once emitted, become well mixed in the atmosphere, meaning U.S. emissions can affect not only the U.S. population and environment but other regions of the world as well; likewise, emissions in other countries can affect the United States." Climate Change Division, Office of Atmospheric Programs, EPA, *Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act 2-3* (2009).

#### 4.2.4 DEPARTMENT OF TRANSPORTATION ACT, SECTION 4(F)

##### Regulatory Setting

Section 4(f) of the United States Department of Transportation (USDOT) Act of 1966 (49 U.S.C. § 303) protects publicly owned parks, recreational areas, wildlife and waterfowl refuges of national, state, or local significance, and public and private historic sites of national, state, or local significance. Section 4(f) provides that the Secretary of Transportation may approve a transportation program or project requiring the use of publicly owned land of a public park, recreation area, or wildlife or waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance, only if there is no feasible and prudent alternative to using that land and the program or project includes all possible planning to minimize harm resulting from the use. Section 4(f) applies only to transportation modal agencies within the USDOT. If the FAA is engaged with a non-USDOT agency on the NEPA review of a proposed project involving Section 4(f), the FAA must take the lead on Section 4(f) compliance.

Section 6(f) of the Land and Water Conservation Fund Act of 1965 (LWCFA), 16 U.S.C. § 4601-8(f), prohibits the conversion of property acquired or developed with LWCFA grants for uses other than public outdoor recreation without the approval of the **United States Department of Interior's** (USDOT) National Park Service (NPS). The USDOT has delegated most review, consultation and assessment of Section 6(f) impacts and conversions to specified state recreation offices. When acquisition is required, Section 6(f) directs the USDOT to assure that replacement lands of at least equal fair market value and of reasonably equivalent usefulness and location are provided as a condition of such conversions. Consequently, where conversions of Section 6(f) lands are proposed for airport projects, replacement lands are required.

##### Affected Environment

A review of records maintained by the National Park Service (NPS), the Kentucky Heritage Council (KHC), Boone County, and the Northern Kentucky Area Planning Commission (NKAPC) was conducted to identify known Section 4(f) resources in the GSA. Potential Section 4(f) properties within and around the GSA are shown in Exhibit 4-2, *Potential Section 4(f) Resources* and listed in Table 4-3. Potential historic sites are discussed in Section 4.2.6. No LWCF lands are located within the GSA.<sup>9</sup> Therefore, LWCF Section 6(f) lands are not discussed further in this EA.

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<sup>9</sup> Land and Water Conservation Fund Coalition, 2017, Map of LWCF Funding Through Federal Land Management Agencies and State & Local Assistance Program - Resources. Available on-line: <https://www.lwcfcoalition.com/tools/>. Accessed June 2017.

Table 4-3

## POTENTIAL SECTION 4(f) RESOURCES

MAP ID	Name	Resource Type
1	A.J. Aylor House	Historic Structure
2	Allie Corn House	Historic Structure
3	Clinton Blankenbaker House	Historic Structure
4	Dr. Gladys Rouse Office and House	Historic Structure
5	Florence Fire Station	Historic Structure
6	Florence Hotel	Historic Structure
7	Frank S. Milburn Machine Shop	Historic Structure
8	Hebron Deposit Bank	Historic Structure
9	Henry and Agnes Rolsen House	Historic Structure
10	Hopeful Lutheran Church	Historic Structure
11	John Delehunty House	Historic Structure
12	Roberts, Thomas Zane, House and Workshop	Historic Structure
13	W.F. and Florence McKim House	Historic Structure
14	W.T. Delph House	Historic Structure
15	Williams, W. L., House	Historic Structure
16	Burlington Historic District	Historic District
17	Ephraim Uitz House	Historic District
18	Gaines, Benjamin R., Farm	Historic District
19	Anderson Ferry House	Historic Structure
20	Joel Garnett House	Historic Structure
21	Kottmeyer House	Historic Structure
22	Marietta Graves House	Historic Structure
23	Robert Chambers House	Historic Structure
24	Sperti Farm	Historic Structure
25	Boone Cliffs	Park / Recreation
26	Boone County Pee Wee Football	Park / Recreation
27	Boone Woods Park	Park / Recreation
28	Camp Ernst Lake	Park / Recreation
29	Camp Ernst YMCA	Park / Recreation
30	Carder Dolwick Nature Preserve	Park / Recreation
31	England Idlewild Park	Park / Recreation
32	Florence Family Aquatic Center	Park / Recreation
33	Florence Nature Park	Park / Recreation
34	Fox Run Park	Park / Recreation
35	Gunpowder Creek Nature Park	Park / Recreation
36	Niblack Memorial Park	Park / Recreation
37	Oakbrook Park	Park / Recreation
38	<b>Pete's Park</b>	Park / Recreation
39	Skate Park	Park / Recreation
40	Stringtown Park	Park / Recreation
41	Walnut Creek Park	Park / Recreation
42	World of Golf	Park / Recreation
43	Boone Links Golf Course	Park / Recreation
44	Florence Community Plaza	Park / Recreation
45	Lincoln Woods Park	Park / Recreation
46	Florence Lions Park	Park / Recreation

Source: U.S. National Park Service, National Register of Historic Places, Kentucky Heritage Council, Boone County, Landrum & Brown analysis, 2017.

#### 4.2.5 HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION

##### Regulatory Setting

Primary laws passed governing the handling and disposal of hazardous materials, solid waste and pollution prevention include: Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Resource Conservation and Recovery Act (RCRA), Pollution Prevention Act (PPA), Toxic Substances Control Act (TSCA), and the Oil Pollution Act (OPA).

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): The CERCLA of 1980, 42 U.S.C. §§ 9601 – 9675, was amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 and the Community Environmental Response Facilitation Act (CERFA) of 1992. The purpose of CERCLA is to conduct an increasingly complex series of evaluations of federally-listed suspected hazardous waste sites to determine if those sites pose sufficient threats to human health and the environment to become eligible for federally-funded investigation and clean up under Superfund.

Resource Conservation and Recovery Act (RCRA): The RCRA of 1987, 42 U.S.C. §§ 6901 – 6992k, is intended to provide "cradle to grave" management of hazardous and solid wastes and regulation of underground storage tanks (USTs) containing chemical and petroleum products. The RCRA allows the EPA to set standards for entities producing, storing, handling, transporting, and disposing of hazardous waste. The RCRA was amended with the Hazardous and Solid Waste Amendments of 1984 (HSWA) that addressed corrective actions and permitting of hazardous waste issues.

Pollution Prevention Act (PPA): The PPA of 1990, 42 U.S.C. §§ 13101 – 13109, established that it is the national policy of the United States that, whenever feasible: (1) pollution should be prevented or reduced at the source; (2) pollution that cannot be prevented should be recycled in an environmentally safe manner; (3) pollution that cannot be prevented or recycled should be treated in an environmentally-safe manner; and (4) disposal or other release into the environment should be employed only as a last resort, and should be conducted in an environmentally-safe manner.

Toxic Substances Control Act (TSCA): The TSCA of 1976, 42 U.S.C. §§ 2601 – 2697, states that it is the policy of the United States that: (1) adequate data should be developed with respect to the effect of chemical substances and mixtures on health and the environment, and that the development of such data should be the responsibility of those who manufacture and those who process such chemical substances and mixtures; (2) adequate authority should exist to regulate chemical substances and mixtures that create an unreasonable risk of injury to health or the environment, and to take action with respect to chemical substances and mixtures which are imminent hazards; and (3) authority over chemical substances and mixtures should be exercised in such a manner as not to impede unduly or create unnecessary economic barriers to technological innovation while fulfilling the primary purpose of the TSCA to assure that such innovation and commerce in such chemical substances and mixtures do not create an unreasonable risk of injury to health or the environment.

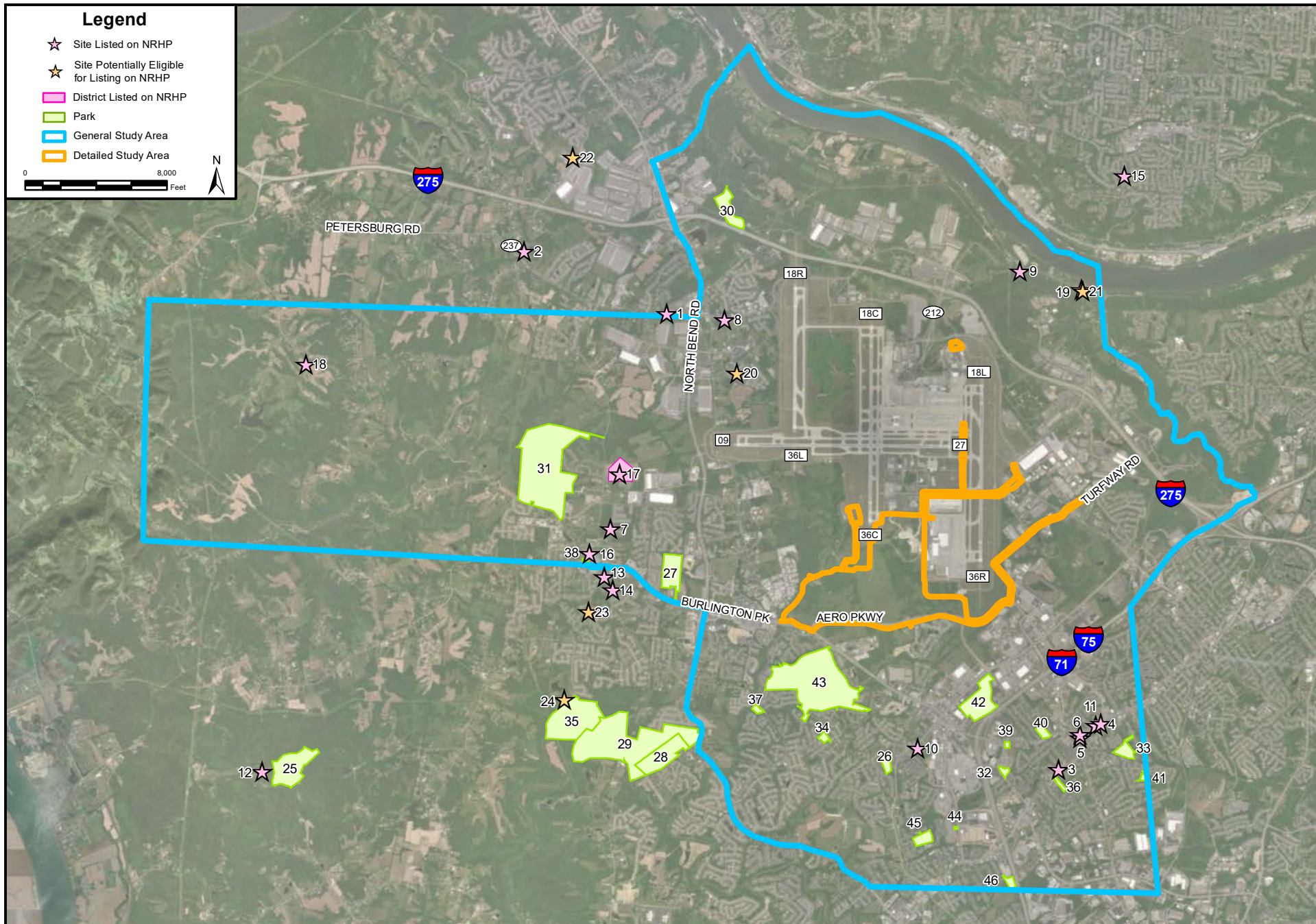
Oil Pollution Act (OPA): The OPA of 1990, 33 U.S.C. §§ 2701 - 2762 was established to improve the nation's ability to prevent and respond to oil spills by establishing provisions that expand the federal government's ability, and provide the money and resources necessary to respond to oil spills. The OPA provided new requirements for contingency planning by both government and industry. The Oil Pollution Prevention Regulation (40 C.F.R. Part 112) was amended to incorporate requirements of the OPA, and now forms the basis of the EPA's Oil Spill Prevention, Control, and Countermeasure (SPCC) program. The SPCC program seeks to prevent oil spills from certain aboveground storage tanks (ASTs) and USTs.

### Affected Environment

#### Hazardous Materials

Phase I Environmental Site Assessments (ESAs) were completed to evaluate potential hazardous substances contamination on the DSA. The Phase I ESAs are provided in Appendix D, *Hazardous Materials*. The Phase I ESAs did not reveal evidence of a recognized environmental condition (REC) or Conditional RECs (CRECs) in the DSA. While there are records of potential ground contaminating events in the DSA, there is no potential for encountering hazardous substances and/or groundwater during construction activities as these are considered historical recognized environmental conditions (HRECs) and it has been determined no further action is required..

Furthermore, there are no properties listed on the National Priority List (NPL) or Resource Conservation and Recovery Act (RCRA) solid waste management units within the DSA.



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## Solid Waste

The solid waste at CVG is managed by the Northern Kentucky Solid Waste Management Area (NKSWMMA), which serves approximately 261,000 people in Boone, Kenton, and Campbell Counties.<sup>10</sup> NKSWMMA utilized three landfills for waste disposal in 2016: Bavarian (Boone County, Kentucky), Epperson (Grant County, Kentucky), Rumpke (Pendleton County, Kentucky). In addition to landfills, a variety of recycling, composting, and buy-back programs were utilized to handle solid waste.

According to the KCAB, approximately 7,708 tons of solid waste was generated by the airport and its tenants in 2017. The three largest generators of solid waste were the Airport, Delta Air Lines, and DHL. All 7,708 tons of waste were collected and transported by Rumpke Waste Collection and Disposal Systems to landfills in Colerain Township, Ohio and Pendleton County, Kentucky.

### 4.2.6 HISTORIC, ARCHITECTURAL, ARCHEOLOGICAL, AND CULTURAL RESOURCES

#### Regulatory Setting

The National Historic Preservation Act of 1966 (NHPA) (54 U.S.C. § 300101 *et seq.*) Section 106, *Protection of Historic Properties* requires federal agencies to take into account the effects of their undertakings on properties that are listed on or determined eligible for inclusion in the National Register of Historic Places (NRHP), and requires federal agencies to consult with the State Historic Preservation Office (SHPO), Tribal Historic Preservation Officers (THPO), and other parties to develop and evaluate alternatives or modifications to the undertaking that could avoid, minimize, or mitigate adverse effects on historic properties. The independent federal agency overseeing federal historic preservation and tribal programs, the Advisory Council on Historic Preservation (ACHP), is afforded a reasonable opportunity to comment on such undertakings subject to Section 106. The ACHP typically reserves its comments either for complex consultations in which it has had previous involvement or for consultations wherein a federal agency seeks ACHP comment on unresolved consultation issues. Section 106 of NHPA is the principal statute concerning such resources. It requires consideration of direct and indirect impacts from federal actions on historic, architectural, archeological, and other cultural resources.

This project also falls under the purview of the Kentucky Heritage Council (KHC) which serves as the SHPO and is responsible for the identification, protection and preservation of prehistoric resources and historic buildings, sites and cultural resources throughout Kentucky.

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<sup>10</sup> *Northern Kentucky Solid Waste Management Area Plan – 5 Year Update 2018-2022, 2016.*



## Affected Environment

The Area of Potential Effects (APE) is “the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties” (36 C.F.R. § 800.16(d)). For purposes of Section 106, the term “historic properties” can include architectural, archeological, or cultural resources. The determination of the APE considers the character of a project area and the potential for resources to be found.

The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking (36 C.F.R. § 800.16(d)). The APE must include all direct and reasonably foreseeable indirect effects. Although the NHPA regulations do not define the term “indirect effect,” the criteria of adverse effects cover reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative (36 C.F.R. § 800.5(a)(1)).

For this undertaking, impacts to historic resources associated with visual impacts or changes in setting, could cause direct and indirect effects. As a result of this effort the FAA defined two APEs - a Direct APE and an Indirect APE as shown on Exhibit 4-3, *Direct and Indirect Areas of Potential Effect*. The Indirect APE covers approximately 1,300 acres and is defined as the area where both direct and indirect impacts may result from the development of the Proposed Action. The Direct APE covers approximately 900 acres and is defined as the area where direct impacts may result from the Proposed Action. The Direct APE boundary was developed using the area of physical disturbance. The KHC concurred with FAA delineation of the APE via email on May 21, 2018 (see Appendix E, *Section 106 Consultation*).

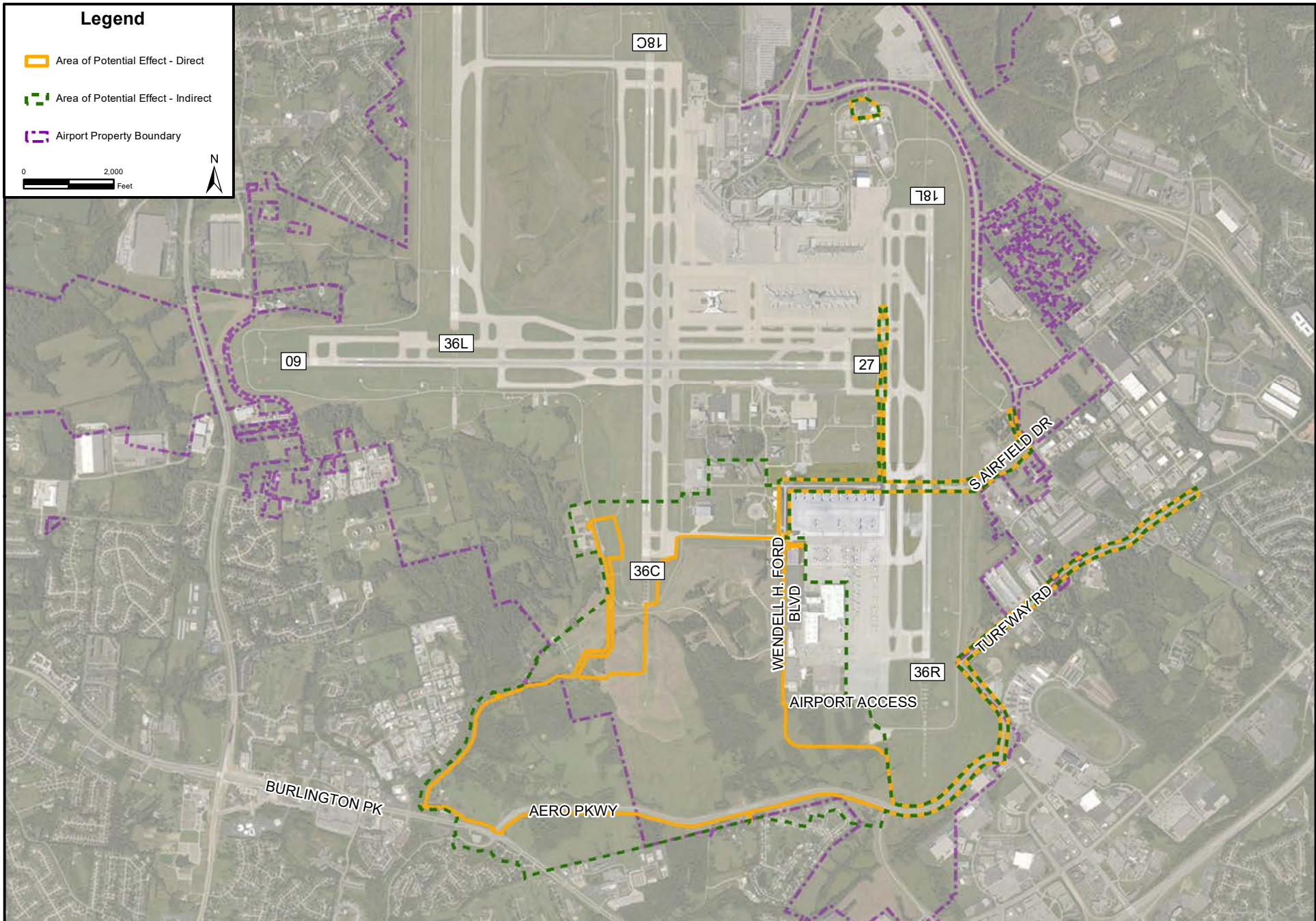
Architectural, Phase I, and Phase II archeological surveys were conducted for the proposed undertaking in compliance with Section 106 of the NHPA and KHC guidelines. The purpose of the investigation was to identify any historic properties located within the Direct APE that are listed or eligible for listing in the NRHP. Historic properties may include buildings or structures, sites, objects, and even districts of importance in prehistory or history. The cultural resources investigation consisted of a records search and literature review, as well as an archeological pedestrian survey of the Direct APE. The background research included a review of the Kentucky Office of State Archaeology (KYOSA), the KHC, historical aerials from Boone County Online GIS website, and historic United States Geological Survey (USGS) maps.

Qualified archeologists conducted pedestrian surveys dating back to 1983. As described in the FAA Order 1050.1F Desk Reference, the steps taken to identify archeological sites must be identified.<sup>11</sup> The pedestrian survey was conducted in accordance to KHC pedestrian survey standards which allow a person to achieve 100 percent coverage of a corridor 20 meters (66 feet) wide in a single pass. In addition, surveys were conducted for aboveground resources within the Direct APE.

Twenty-one archeological sites and one structure have been identified within the Direct APE. Nineteen of these sites were not recommended for listing in the NRHP. Table 4-4 provides the evaluated sites within the Direct APE.

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<sup>11</sup> FAA, 2015, *1050.1F Desk Reference*.



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Table 4-4  
EVALUATED SITES WITHIN THE DIRECT APE

ASM SITE NUMBER	DESCRIPTION	NRHP STATUS RECOMMEND- ATION
15Be327	Previously Recorded Historic Residence/Farmstead/Dump	Ineligible
15Be685	Unaffiliated Prehistoric Lithic Scatter	Ineligible
15Be686	Unaffiliated Prehistoric Lithic	Ineligible
15Be688	Historic Residence/Farmstead	Ineligible
15Be689	Historic Residence/Farmstead	Ineligible
15Be690	Unaffiliated Prehistoric Lithic Scatter	Ineligible
15Be691	Historic Residence/Farmstead	Ineligible
15Be692	Historic Cemetery	Ineligible
15Be693	Unaffiliated Prehistoric Lithic Scatter	Ineligible
15Be694	Historic Residence/Farmstead	Potentially Eligible
15Be695	Unaffiliated Prehistoric Lithic Scatter	Ineligible
15Be696	Unaffiliated Prehistoric Lithic Scatter	Ineligible
15Be697	Historic Residence/Farm	Potentially Eligible
15Be698	Unaffiliated Prehistoric Lithic Scatter	Ineligible
15Be699	Unaffiliated Prehistoric Lithic Scatter	Ineligible
15Be700	Unaffiliated Prehistoric Lithic Scatter with Historic Component	Ineligible
15Be701	Unaffiliated Prehistoric Lithic Scatter with Historic Component	Ineligible
15Be702	Unaffiliated Prehistoric Lithic Scatter	Ineligible
15Be715	Historic Cemetery	Ineligible
15Be716	Historic Residence/Farmstead-Associated with BE176	Ineligible
Be716	Historic Residence/Farmstead-Associated with 15BE176	Ineligible
15Be717	Historic Residence/Farmstead	Potentially Eligible*

\* Phase II archeological work on this site could not be completed due to safety concerns regarding asbestos contamination on the site. Therefore, the site is recommended as potentially eligible for the NRHP.

Source: Environment & Archaeology, LLC

#### 4.2.7 LAND USE

##### Regulatory Setting

Special guidance relevant to land use is given in the NEPA implementing regulations, which require **consideration of “[p]ossible conflicts between the proposed action and the objectives of Federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned.”** The impacts on land use may include indirect impacts such as the disruption of communities, relocation, induced socioeconomic impacts, and impacts to land uses protected under USDOT Act Section 4(f). The regulations recognize that certain inconsistencies may exist between the proposed federal action and any approved state or local plan or law. Where an inconsistency exists, the NEPA document should describe the extent to which the agency would reconcile its action with the plan or law. (See 40 C.F.R. § 1506.2(d).)

## Affected Environment

The DSA is located on the southern edge of the Airport in a predominantly commercial area. The land uses immediately adjacent to the DSA are a mix of commercial and residential uses and undeveloped Airport property. There is a residential area located south of the DSA on the south side of Aero Parkway and west of the DSA on the west side of Limaburg-Creek Road. The DSA has frontage on Aero Parkway, which provides automobile access. Exhibit 4-4, *Existing Land Use*, shows the location of the DSA and the surrounding land uses.

The on-Airport portion of the DSA is **located within an area that is zoned as "Airport"** district and is part of the Houston-Donaldson Study Corridor Overlay District (HDO). The Airport zoning designation allows airport development and commercial, office and industrial uses. The HDO is an overlay zoning district that applies additional conditions related to design and signage while maintaining the provisions of the underlying Airport zoning district.

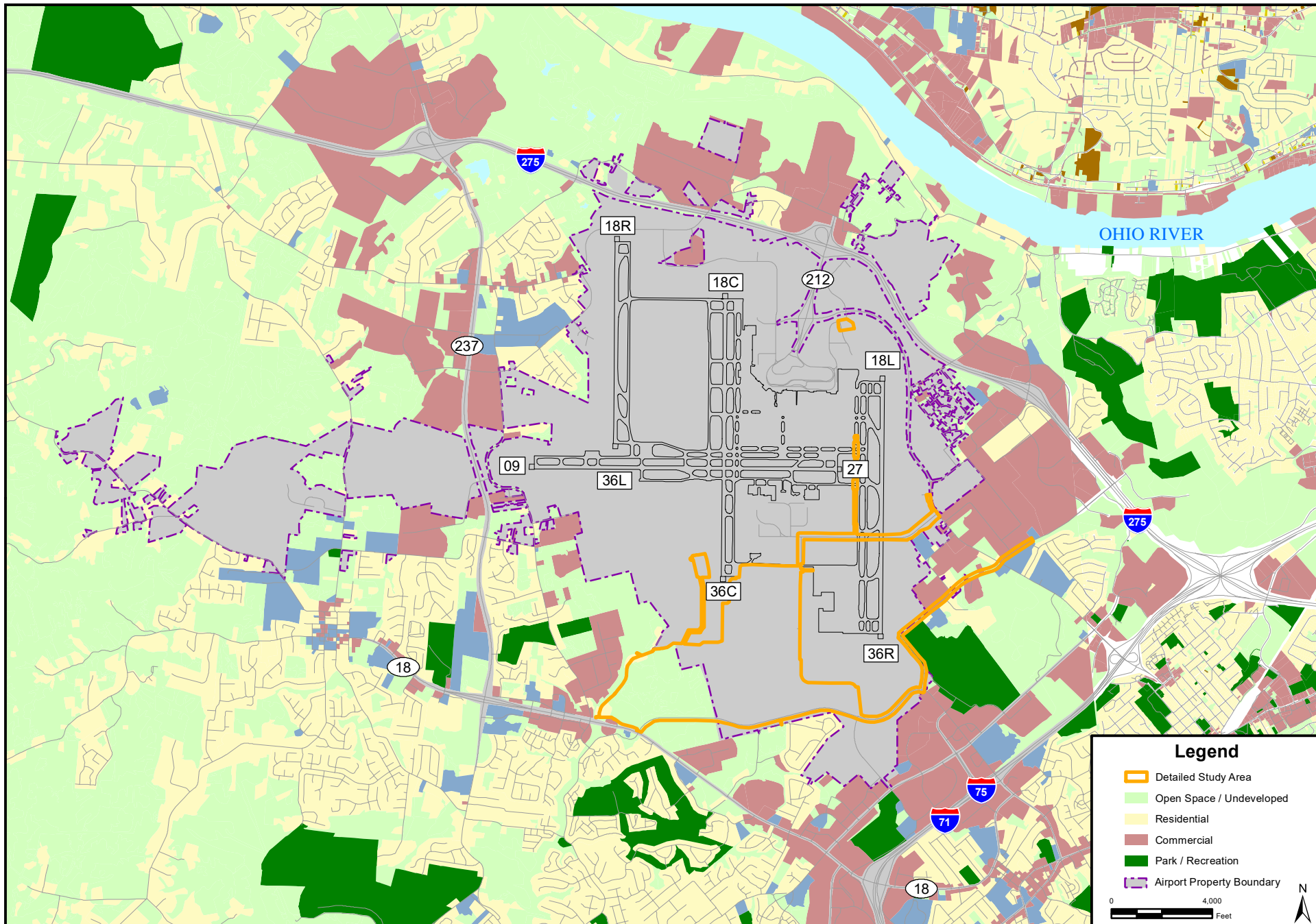
The off-Airport portion of the DSA is currently zoned C-4 – Commercial, I-1 – Industrial, and A-2 – Agricultural Estate. According to the Boone County Comprehensive Plan, the C-4 designation is land designed for "locally oriented commercial services, either retail, recreational or office uses, in areas located near or adjacent to interstate highways and arterial roads. These areas are either currently or expected to experience rapid growth due to the population projections and recommended land uses in the Boone County Comprehensive Plan and in other **land use studies.**" The I-1 designation is land designed for "**different types of small** to large scale light manufacturing, warehouse, distribution and related service uses, which require direct **accessibility to a regional transportation system.**" The A-2 **designation is land designated to** "provide low density residential development and on a limited basis agricultural uses or agricultural related uses in the context of a rural environment."

### 4.2.8 NATURAL RESOURCES AND ENERGY SUPPLY

#### Regulatory Setting

As an impact category, natural resources and energy supply provides an evaluation **of a project's consumption of natural resources and use of energy supplies.** As set forth in 40 C.F.R. §§1502.14 and 1502.16(e)-(f), CEQ Regulations require that, when evaluating the environmental consequences of a proposed action and its alternatives, **a federal agency's environmental consequences analysis must include, among other things,** energy requirements and the conservation potential of various alternatives and mitigation measures, and natural or depletable resource requirements and the conservation potential of various alternatives and mitigation measures. The following section describes the existing conditions for natural resources and energy supply at CVG.





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## Affected Environment

Duke Energy supplies the Airport's electricity and natural gas, Boone County Water District and the Northern Kentucky Water District supply the Airport's water utilities, Sanitation District 1 and 2 support the Airport's stormwater and sewage utilities, Cincinnati Bell provides the Airport's internet service, and Delta Fuel Storage Tanks supplies the Airport's aircraft fuel.<sup>12</sup> Based on information provided by KCAB staff, in 2016 the Airport's electric usage was approximately 63,500,000-kilowatt hours, water usage was approximately 17,300,000 cubic feet, and natural gas usage was approximately 142,000 million British thermal units.

### 4.2.9 NOISE AND NOISE-COMPATIBLE LAND USE

#### 4.2.9.1 NOISE

## Regulatory Setting

For aviation noise analyses, the FAA has determined that the cumulative noise energy exposure of individuals resulting from aviation activities must be established in terms of Yearly Day-Night Average Sound Level (DNL), the FAA's primary noise metric. To evaluate aircraft noise, the FAA has a required computer model, the Aviation Environmental Design Tool (AEDT) that simulates aircraft activity at an airport. AEDT replaced the Integrated Noise Model, and the Emissions and Dispersion Modeling System as the required tool for environmental modeling of FAA actions to determine if significant noise impacts would result. AEDT 2d is the latest version.<sup>13</sup>

The FAA uses the 14 C.F.R. Part 150, *Airport Noise Compatibility Planning*, land use compatibility guidelines to determine compatibility with most land uses. These guidelines are consistent with land use compatibility guidelines developed by other federal agencies such as the EPA and the United States Department of Housing and Urban Development.<sup>14,15</sup> A DNL of 65 decibels (dB) is the noise level at which noise-sensitive land uses (residences, churches, schools, libraries, and nursing homes) become significantly impacted. Below 65 DNL, all land uses are determined to be compatible with airport noise. Special consideration is given to noise sensitive areas within Section 4(f) properties (including, noise sensitive areas within national parks, national wildlife and waterfowl refuges and historic sites, including traditional cultural properties) where the land use compatibility guidelines in 14 C.F.R. Part 150 are not relevant to the value, significance, and enjoyment of the area in question.

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<sup>12</sup> Cincinnati/Northern Kentucky International Airport – 2035 Master Plan Update, *Chapter 4 - Airport Inventory*.

<sup>13</sup> FAA, 2017, Aviation Environmental Design Tool, Version 2d. Available on-line at: [https://aedt.faa.gov/2d\\_information.aspx](https://aedt.faa.gov/2d_information.aspx) Accessed 2017.

<sup>14</sup> Federal Interagency Committee on Urban Noise (FICUN), 1980, *Guidelines for Considering Noise in Land Use Planning and Control*.

<sup>15</sup> Federal Interagency Committee on Noise (FICON), 1992, *Federal Agency Review of Selected Airport Noise Analysis Issues*, August.



### Affected Environment

The 65 DNL, 70 DNL, and 75 DNL Existing noise exposure contours are shown on Exhibit 4-5, *Existing Noise Exposure Contours*. The Existing Noise Exposure contours were based on data from January 2017 through December 2017, as it was the latest data available at the time the noise contours were prepared. Table 4-5 summarizes the area within each noise contour level for the existing noise exposure contour. A DNL noise contour does not represent the noise levels present on any specific day, but represents the energy-average of all 365 days of operation during the year. Noise contour patterns extend from an airport along each extended runway centerline, reflective of the flight tracks used by all aircraft. The relative distance of a contour from an airport along each route is a function of the frequency of use of each runway end for total arrivals and departures, as well as its use at night, and the type of aircraft assigned to it.

Table 4-5

AREAS WITHIN EXISTING NOISE EXPOSURE CONTOURS (IN SQUARE MILES)

CONTOUR RANGE	EXISTING
65-70 DNL	4.0
70-75 DNL	1.8
75 + DNL	1.1
65 + DNL	7.0

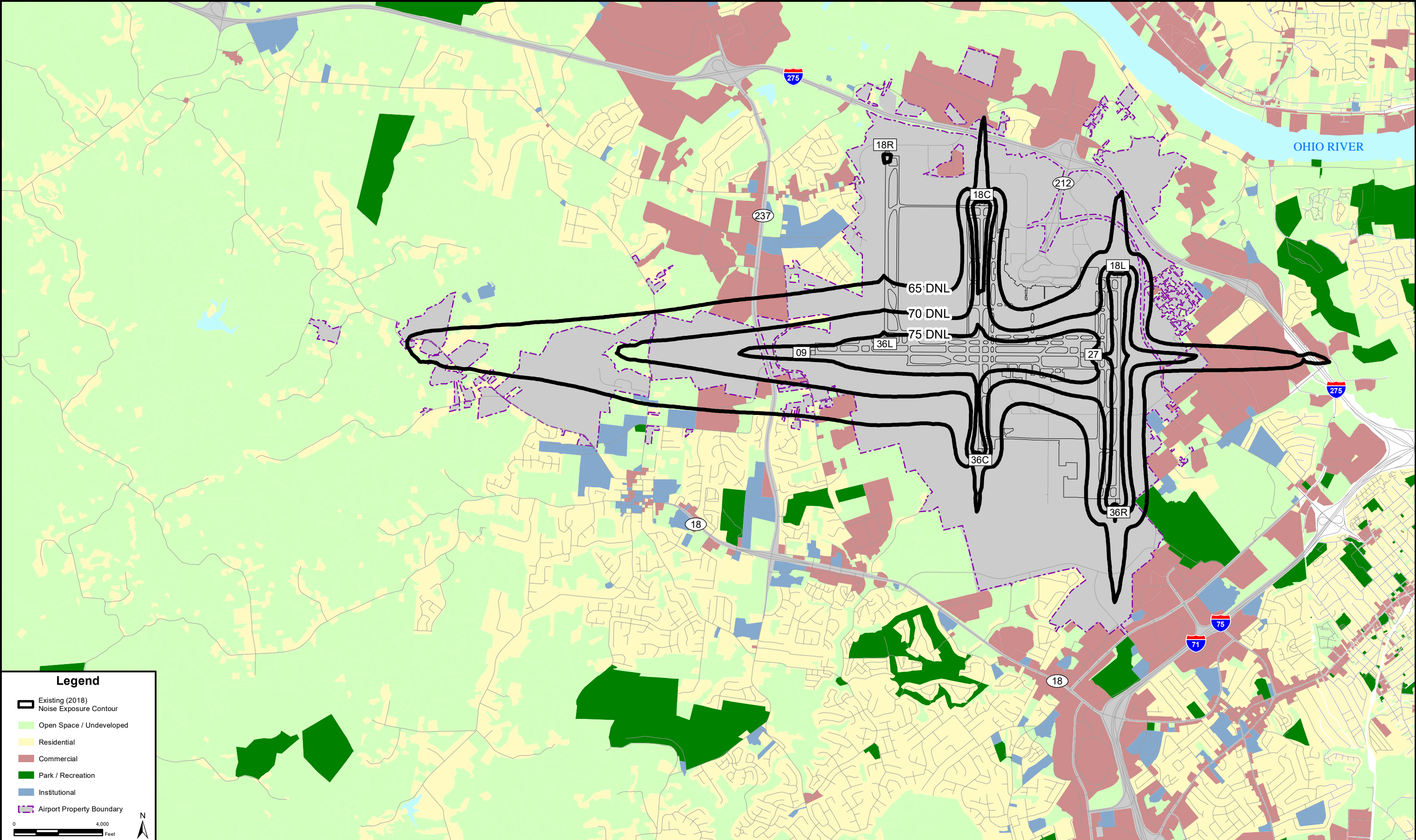
Source: Landrum & Brown, 2018.

The shape of the noise contours north and south of the Airport reflect the predominant daytime use of Runways 18C/36C and 18L/36R and the dominant south/west flow of the Airport. During the daytime, the primary west/south flow of the Airport consists generally of arrivals from the north to Runways 18L, 18C, and 27, and departures to the south and west from Runways 18L, 18C, and 27. As a result, the noise contour is spiked to the north (indicating predominantly arrival operations) and more rounded and larger to the south (indicating predominantly departure operations). During the nighttime, Runway 27 is the preferred departure runway, creating the larger contour to the west of the Airport.

#### 4.2.9.2 NOISE-COMPATIBLE LAND USE

##### Regulatory Setting

The FAA has created guidelines regarding the compatibility of land uses with various aircraft noise levels measured using the DNL metric. These guidelines are defined in Appendix A to 14 C.F.R. Part 150. The land use compatibility table is reproduced in Table 4-6. These guidelines show the compatibility parameters for residential, public (schools, churches, nursing homes, hospitals, and libraries), commercial, institutional, and recreational land uses. All land uses exposed to noise levels below the DNL 65 dB noise contour are generally considered compatible with airport operations.



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Table 4-6

## LAND USE COMPATIBILITY GUIDELINES – 14 C.F.R. PART 150

LAND USE	YEARLY DAY-NIGHT AVERAGE SOUND LEVEL (DNL) IN DECIBELS					
	BELOW 65	65-70	70-75	75-80	80-85	OVER 85
<u>RESIDENTIAL</u>						
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
<u>PUBLIC USE</u>						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental 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
<u>COMMERCIAL USE</u>						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and 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
<u>MANUFACTURING AND PRODUCTION</u>						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
<u>RECREATIONAL</u>						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Table 4-6, *Continued*

## LAND USE COMPATIBILITY GUIDELINES - 14 C.F.R. PART 150

- (1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often 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 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 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.
- (7) Residential buildings require an NLR of 30.
- (8) Residential buildings not permitted.

Notes:

1. The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.
2. SLUCM=Standard Land Use Coding Manual.
3. Y (Yes)=Land Use and related structures compatible without restrictions.
4. N (No)=Land Use and related structures are not compatible and should be prohibited.
5. NLR=Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
6. 25, 30, or 35=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 structure.

Source: 14 C.F.R. § 150 *Airport Noise Compatibility Planning*, Appendix A, Table 1.

### Affected Environment

There are no public schools, churches, nursing homes, hospitals, or libraries within any of the contours. Summaries of the residential population and housing units affected by noise levels exceeding 65 DNL for the Existing Noise Exposure Contours are provided in Table 4-7. For more information on the noise exposure contours see Appendix F, *Noise and Noise Compatible Land Use*.

Table 4-7

#### EXISTING INCOMPATIBILITIES

EXISTING CONDITIONS	65-70 DNL	70-75 DNL	75+DNL	TOTAL
<b>RESIDENCES</b>				
Mitigated <sup>1</sup>	15	0	0	15
Unmitigated	7	0	0	7
Previously Offered but Refused	5	0	0	5
Never Offered Mitigation <sup>2</sup>	2	0	0	2
Total	22	0	0	22
<b>ESTIMATED POPULATION</b>				
Mitigated <sup>1</sup>	42	0	0	42
Unmitigated	21	0	0	21
Previously Offered but Refused	15	0	0	15
Never Offered Mitigation <sup>2</sup>	6	0	0	6
Total	63	0	0	63
<b>NOISE-SENSITIVE FACILITIES (NSF)</b>				
Schools	0	0	0	0
Churches	0	0	0	0
Nursing Homes	0	0	0	0
Hospitals	0	0	0	0
Libraries	0	0	0	0

1. Residences were mitigated through previous Part 150 Studies conducted by KCAB

2. Residence was either built after Part 150 mitigation program, never in the 65 DNL of an official Noise Exposure Map, or an ineligible property.

Notes: Population numbers are estimates based on the 2010 U.S. Census average household size per number of housing units.

Source: Landrum & Brown, 2018.

## 4.2.10 SOCIOECONOMIC CONDITIONS, ENVIRONMENTAL JUSTICE, AND CHILDREN'S HEALTH AND SAFETY RISKS

### 4.2.10.1 SOCIOECONOMICS

Socioeconomics is an umbrella term used to describe aspects of a project that are either social or economic in nature. A socioeconomic analysis evaluates how elements of the human environment such as population, employment, housing, and public services might be affected by the Proposed Action and alternatives.

## Regulatory Setting

Section 1508.14 of the CEQ Regulations requires all federal agencies to conduct a socioeconomic analysis in the event that economic or social and natural environmental effects are interrelated as a result of the proposed action and alternative(s). This would include an evaluation of how elements of the human environment such as population, employment, housing, and public services might be affected by the proposed action and alternative(s).

The Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970, 42 U.S.C. § 61 *et seq.*, and implementing regulations found at 49 C.F.R. Part 24, provides standards if acquisition of real property or displacement of people would occur as a result of implementing the proposed action.

## Affected Environment

### Economic Activity and Income

CVG functions as the largest airport in the Greater Cincinnati and Northern Kentucky area and is the eighth largest cargo airport in the U.S. by tonnage. The economic activity that CVG generates is a major contributor to **the region's economy**, contributing nearly \$4.4 billion in annual total economic impact to the region.<sup>16</sup>

### Employment

In addition to serving the Metropolitan Statistical Area (MSA) as a hub for passenger air transportation and air cargo shipping, CVG contributes to the regional economy through its operations and the operations of supporting industries. Employers who maintain staff on-site have nearly 13,500 workers, including airlines, tenants, other businesses and the KCAB.<sup>17</sup> Additionally, more than 31,100 jobs in the region are directly or indirectly related to the Airport and its services. Those workers earn **\$1.3 billion in wages and salaries**. **CVG's state and local tax contribution** is approximately \$25 million.

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<sup>16</sup> <https://www.cvgairport.com/docs/default-source/stats/cvg-fact-sheet.pdf?sfvrsn=4>, accessed February 8, 2018.

<sup>17</sup> Ibid.

## Population and Housing

The GSA contains 33 census block groups that surround the Airport—32 in Boone County and one in Kenton County. Demographic data of the population within the GSA is shown in Table 4-8.

Table 4-8  
GSA DEMOGRAPHIC DATA

Category	Value
Population & Housing	
Total Population	67,700
Total Housing Units	24,913
Age Groups	
4 years old and under	6.9%
5 – 17 years old	16.2%
18 – 64 years old	63.5%
65 years old and older	13.4%
Race	
White alone	91.5%
Black or African American alone	3.4%
American Indian and Alaska Native alone	0.4%
Asian alone	1.2%
Some other race alone	0.9%
Two or more races	2.0%
Ethnicity	
Hispanic or Latino	4.6%
Not Hispanic or Latino	95.4%
Poverty*	
Individuals living below poverty level	8.4%
Families living below poverty level	6.1%

Source: American Community Survey 2012-2016 5-Year Estimate<sup>18</sup>; Landrum & Brown analysis, 2018.

\*Note: The HHS poverty guideline level in 2016 for a family/household of one was \$11,880 and for a household/family of four was \$24,300.<sup>19</sup>

<sup>18</sup> American Community Survey 2010-2014 5-Year Estimate, U.S. Census Bureau. Available on-line: [https://factfinder.census.gov/faces/nav/jsf/pages/community\\_facts.xhtml](https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml). Accessed August 2017.

<sup>19</sup> 2014 Poverty Guidelines, U.S. Department of Health and Human Services. Available on-line: <https://aspe.hhs.gov/2014-poverty-guidelines>. Accessed on August 28, 2017.



The average household size, median household income, median family income, and per capita for each census tract block group within the GSA is shown in Table 4-9.

Table 4-9

## GSA DEMOGRAPHIC DATA BY CENSUS BLOCK GROUP

Census Tract	Block Group	Average Household Size	Median Household Income	Median Family Income*	Per Capita
642.00	1	2.85	\$58,750	\$63,359	\$25,354
701.00	1	2.01	\$31,864	\$42,241	\$21,862
701.00	2	3.19	\$37,083	\$63,173	\$19,197
701.00	3	2.76	\$50,313	\$42,340	\$20,594
701.00	4	2.28	\$32,679	\$26,146	\$17,920
701.00	5	2.30	\$40,476	\$53,984	\$21,885
702.00	1	1.67	\$42,159	\$53,828	\$57,665
702.00	2	2.46	\$56,172	\$96,731	\$28,473
702.00	3	2.93	\$46,838	\$62,672	\$17,572
702.00	4	2.34	\$51,271	\$32,708	\$22,103
702.00	5	1.91	\$32,807	\$50,966	\$21,100
703.01	1	1.64	\$42,098	\$52,721	\$23,543
703.05	1	2.40	\$54,238	\$67,461	\$28,125
703.05	2	2.17	\$71,548	\$71,466	\$42,184
703.05	3	1.92	\$51,750	\$66,458	\$28,928
703.08	3	2.35	\$73,703	\$74,899	\$32,728
703.11	1	2.51	\$36,033	\$42,619	\$15,968
703.11	2	2.73	\$48,587	\$51,979	\$22,393
703.12	1	3.03	\$95,032	\$29,612	\$27,168
703.12	2	2.17	\$45,563	\$67,143	\$24,190
703.13	1	2.78	\$79,688	\$85,568	\$31,413
703.13	2	2.80	\$86,641	\$83,000	\$33,701
703.14	1	3.07	\$72,642	\$76,250	\$26,804
703.14	2	2.58	\$67,083	\$73,902	\$30,088
704.01	2	2.71	\$91,792	\$99,024	\$38,522
704.02	1	3.14	\$82,692	\$73,359	\$27,295
704.02	2	2.41	\$91,029	\$89,934	\$39,764
704.02	3	3.11	\$74,922	\$70,223	\$26,176
704.02	4	3.27	\$72,009	\$85,833	\$26,304
705.02	2	2.85	\$55,119	\$66,094	\$25,108
705.03	1	2.14	\$47,093	\$56,523	\$28,900
705.03	2	2.46	\$51,392	\$68,984	\$27,335
705.04	2	2.94	\$78,347	\$85,238	\$29,555

Source: American Community Survey 2012-2016 5-Year Estimate; Landrum & Brown analysis, 2018.

\* American Community Survey 2010-2014 5-Year Estimate, most recent data available.

## Public Services and Social Conditions

Residents of communities in the GSA have a wide range of public services available. Public services include such facilities as educational institutions, medical services, and emergency response services.

- **Educational Institutions:** Boone County is encompassed by two school districts, including the Boone County Unified School District and the Walton-Verona Independent School District. In the GSA, there are seven elementary schools, three middle schools, and three high schools within Boone County.<sup>20,21</sup>
- **Medical Services:** Boone County has one hospital, St. Elizabeth – Florence, which is located in the GSA. Kenton County has one hospital, St. Elizabeth – Covington, which is located approximately 11 miles east of the Airport.
- **Emergency Response Services:** Boone County is comprised of seven fire protection districts, including the fire protection districts of Belleview-McVille, Burlington, Florence, Point Pleasant, Union, and Walton. Between the seven fire protection districts, there are a total of 14 fire stations, including one located on Airport property.<sup>22</sup> Additionally, there are eight police departments within Boone County, including one located on Airport property. Furthermore, there are a total of 23 fire stations and 14 police departments within Kenton County.<sup>23</sup>

### 4.2.10.2 ENVIRONMENTAL JUSTICE

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. *Fair treatment* means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental, and commercial operations or policies. *Meaningful Involvement* means that:

- People have an opportunity to participate in decisions about activities that may affect their environment and/or health;
- **The public's contribution can influence the regulatory agency's decision;**
- Their concerns will be considered in the decision making process; and,
- The decision makers seek out and facilitate the involvement of those potentially affected.

<sup>20</sup> About Boone County Schools, Boone County Schools. Available on-line: <http://www.boone.k12.ky.us/administrativeDepartment.aspx?aid=18>. Accessed on August, 2017.

<sup>21</sup> Directory, Walton-Verona Independent Schools. Available on-line: <http://www.wv.kyschools.us/cms/One.aspx?portalId=324341&pageId=760781>. Accessed on August, 2017.

<sup>22</sup> Boone County GIS. Available on-line: <http://www.boonecountygis.com/>. Accessed on August, 2017.

<sup>23</sup> Kenton County GIS. Available on-line:

<https://linkgis.org/mapviewer/index.html?slayer=0&exprnum=1&research=&submit=Open+the+Map>  
Accessed May 17, 2017.

## Regulatory Setting

Title VI of the Civil Rights Act of 1964 as amended, 42 U.S.C. §§ 2000d – 2000d-7, **states that, “No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance.” Title VI expressly prohibits any discrimination** in federally funded programs and projects, including those sponsored by the FAA.

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, requires all federal agencies to address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.

USDOT Order 5610.2(a) defines a minority population as any readily identifiable group of minority persons living in geographic proximity to a proposed USDOT program, policy or activity including, if circumstances warrant, geographically dispersed or transient persons (such as migrant workers or Native Americans) who will be similarly affected by the proposed program, policy, or activity.

Requirements for meaningful public involvement by minority and low-income populations are addressed in Paragraph 2-5.2.b of FAA Order 1050.1F. As stated in the Order, the FAA must provide for meaningful public involvement by minority and low-income populations. In accordance with USDOT Order 5610.2(a), this public involvement must provide an opportunity for minority and low income populations to provide input on the analysis, including demographic analysis that identifies and addresses potential impacts on these populations that may be disproportionately high and adverse. The public involvement process can also provide information on subsistence patterns of consumption of fish, vegetation, or wildlife. This information should be disclosed to potentially affected populations for proposed actions and alternative(s) that are likely to have a substantial effect and for Comprehensive Environmental Response, Compensation, and Liability Act sites.

## Affected Environment

**The Census Bureau’s American Community Survey (ACS) 2012-2016 5-Year Estimate was used to identify environmental justice populations within the project’s GSA.** The environmental justice populations include minority and/or low-income populations. Minority population refers to any readily identifiable group of minority persons (Black, Hispanic or Latino, Asian American, American Indian, Alaskan Native, Native Hawaiian, other Pacific Islander, or other non-White populations). Low income is defined as a person whose median household income is at or below the Department of Health and Human Services poverty guidelines.

The AEDT Version 2d used the GSA to identify census block groups composed of 50 percent or more minority populations (composed primarily of Hispanic or Latino population and American Indian populations) and/or 50 percent or more low income populations. Table 4-10 lists the percent low-income and percent minority for the census block groups in the GSA.

Table 4-10

## GSA DEMOGRAPHIC DATA BY CENSUS BLOCK GROUP

Census Tract	Block Group	Percent of Population Living Below Poverty Level	Percent Minority Population	Environmental Justice Population Present?
642.00	1	11.9	11.7	No
701.00	1	5.3	19.7	No
701.00	2	26.3	5.1	No
701.00	3	4.9	5.8	No
701.00	4	15.8	22.8	No
701.00	5	11.1	10.6	No
702.00	1	13.6	9.1	No
702.00	2	6.3	25.0	No
702.00	3	12.8	25.9	No
702.00	4	7.8	7.8	No
702.00	5	34.0	22.9	No
703.01	1	16.4	16.3	No
703.05	1	8.9	20.1	No
703.05	2	3.7	2.2	No
703.05	3	8.5	0.0	No
703.08	3	4.5	9.1	No
703.11	1	37.6	1.8	No
703.11	2	17.2	17.1	No
703.12	1	5.0	1.3	No
703.12	2	8.5	24.5	No
703.13	1	1.4	8.7	No
703.13	2	2.1	5.4	No
703.14	1	6.0	12.1	No
703.14	2	3.5	12.7	No
704.01	2	1.7	7.5	No
704.02	1	0.0	18.3	No
704.02	2	0.5	2.1	No
704.02	3	8.4	13.4	No
704.02	4	1.4	0.0	No
705.02	2	8.2	2.3	No
705.03	1	3.4	17.3	No
705.03	2	7.3	3.2	No
705.04	2	11.1	14.3	No

Source: American Community Survey 2012-2016 5-Year Estimate; AEDT 2d; Landrum & Brown analysis, 2018.

None of the census block groups exceeded the 50 percent threshold for poverty level. Additionally, none of the census block groups exceeded the 50 percent threshold for minority populations. Therefore, this analysis did not identify environmental justice populations located within the GSA.

#### 4.2.10.3 CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISKS

##### Regulatory Setting

Pursuant to EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, federal agencies are directed to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children. Environmental health risks and safety risks include risks to health or to safety that are attributable to products or substances that a child is likely to come in contact with or ingest, such as air, food, drinking water, recreational waters, soil, or products they might use or be exposed to.

##### Affected Environment

Schools and day care centers are locations where the potential for a child to be exposed to environmental health risks is increased because a higher concentration of children are located in one place during the day. Currently the following schools and day care centers are within the GSA:

- Burlington Elementary School
- Immaculate Heart of Mary School
- Stephens Elementary School
- Conner Middle School
- Goodridge Elementary School
- Boone County Area Vocational School
- Conner High School
- A.M. Yealey Elementary School
- Ockerman Elementary School
- Ockerman Middle School
- St. Paul School
- Heritage Assembly School
- R.A. Jones Middle School
- Collins Elementary School
- Florence Elementary School
- Boone County High School
- Mary Queen of Heaven School
- **St. Henry's High School**
- Penguin Playschool
- Discover Zone Child Care
- Rainbow Child Care Center
- Y-Kids Child Care
- Crossroads Preschool
- Christ United Methodist Kids Day Out

However, as stated in Section 4.2.9, *Noise and Noise-Compatible Land Use*, there are no public schools, within any of the noise contours.

#### 4.2.11 VISUAL EFFECTS

##### Regulatory Setting

FAA Order 1050.1F states that the Visual Effects environmental impacts category deals with the extent to which the proposed action would have the potential to either 1) produce light emissions that create annoyance or interfere with normal activities; or 2) affect the nature of the visual resources or visual character of the area, including the importance, uniqueness and aesthetic value of the affected visual resources, including by contrasting with, or detracting from, the visual resources and/or the visual character of the existing environment or blocking or obstructing the views of visual resources, including whether those resources would still be viewable from other

locations.<sup>24</sup> Although there are no federal special purpose laws or requirements specific to light emissions and visual effects, there are special purpose laws and requirements that may be relevant. In addition to NEPA, laws protecting resources that may be affected by visual effects include sensitive wildlife species, Section 106 of the NHPA, Section 4(f) of the USDOT Act, and Section 6(f) of the LWCFA.

### Affected Environment

#### LIGHT EMISSIONS

CVG is currently illuminated by various types of lighting on the airfield and landside facilities. Lighting that emanates from the airfield includes runway, apron, and navigational lighting such as, hold position lights, stop-bar lights, and runway and taxiway signage. Airfield lighting is located along taxiways and ramps for guidance during periods of low visibility, and to assist aircraft movement on the airfield. Aircraft lighting, such as landing lights, position and navigation lights, beacon lights, and vehicle lighting are other types of light sources on the airfield. Lights for landside facilities include buildings, roadways, and parking facilities. CVG is located in an urbanized area which is comprised of other development that is also lighted and contributes to the overall light emissions in the area.

#### VISUAL RESOURCES/VISUAL CHARACTER

As previously discussed, the DSA is located on the southern edge of the Airport in a predominantly commercial area. The land uses immediately adjacent to the DSA are a mix of commercial uses and undeveloped Airport property. There is a residential area located south of the DSA on the south side of Aero Parkway and west of the DSA on the west side of Limaburg-Creek Road. The DSA features include a combination of grassed areas, streams, and undeveloped wooded areas.

#### 4.2.12 WATER RESOURCES

##### Regulatory Setting

Water resources are surface waters and groundwater that are vital to society; they are important in providing drinking water and in supporting recreation, transportation and commerce, industry, agriculture, and aquatic ecosystems. Surface water, groundwater, floodplains, and wetlands do not function as separate and isolated components of the watershed, but rather as a single, integrated natural system.

**Federal Clean Water Act:** The 1972 Federal Water Pollution Control Act, 33 U.S.C. § 1251 *et seq.*, also known as the Clean Water Act (CWA), is intended to restore and **maintain the chemical, physical, and biological integrity of the Nation's waters.**

The CWA establishes the basic structure for regulating the discharge of pollutants into waters of the U.S., including jurisdictional surface waters, through Section 404 permit and Section 401 certification processes as well as the Section 402 permit process. Section 401 of the CWA (33 U.S.C. § 1341) requires any federal license or permit applicant to obtain a water quality certification if any proposed project activity

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<sup>24</sup> FAA, 2015, Order 1050.1F, *Environmental Impacts: Policies and Procedures*, Exhibit 4-1, page 4-10.

may result in a discharge of pollutants into waters of the United States. This certification assures that the discharge would comply with the applicable effluent limitations and water quality standards. Section 301 of the CWA (33 U.S.C. § 1311) prohibits discharges to waters of the United States except with a permit. As a condition of the permit, application of the best practicable control technology currently available is required.

Section 402 establishes a framework for regulating stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) to ensure water quality standards are attained. All discharges to waters of the Commonwealth require a permit through the Kentucky Pollutant Discharge Elimination System (KPDES). If the proposed action or alternative(s) has the potential to discharge pollutants into waters of the United States through a point source, a KPDES permit will likely need to be obtained.

**Safe Drinking Water Act (SDWA):** The SDWA, 42 U.S.C. §§ 300(f) – 300j-26, was established to protect the health of the public by ensuring that a safe drinking water supply exists. The Sole Source Aquifer Program, authorized by Section 1424(e) of the SDWA, requires the EPA to review any federally financially-assisted projects that have the potential to contaminate a sole source aquifer or its recharge area. The Kentucky Energy and Environment Cabinet, Division of Water works to ensure public health protection through primacy of SDWA and the provision of potable water. Potable water is defined as finished water, after treatment, that is safe and satisfactory for drinking and cooking. Public water and water distribution systems in Kentucky are regulated by the Kentucky Energy and Environment Cabinet, Division of Water (DOW).

If the potential exists for contamination of an aquifer designated by the EPA as a sole or principal drinking water resource within the project area, the FAA is required to consult with the EPA regional office, tribal, state, or local officials as required by Section 1424(e) of the SDWA.

**Fish and Wildlife Coordination Act of 1980:** If a proposed action would impound, divert, drain, control, or otherwise modify the waters of any stream or other body of water, the Fish and Wildlife Coordination Act, 16 U.S.C. §§ 661 – 667d, is applicable, unless the project is for the impoundment of water covering an area of less than ten acres. The Fish and Wildlife Coordination Act requires the FAA to consult with the USFWS and the applicable state agency to identify means to prevent loss or damage to wildlife resources resulting from a proposed action. Separate from, but related to this Act is the Magnuson-Stevens Fishery Conservation and Management Act, which governs United States marine fisheries management. The act mandates the identification of Essential Fish Habitat for managed species, as well as measures to conserve and enhance the habitat necessary for fish to carry out their life cycles.

EO 11990, Protection of Wetlands and DOT Order 5660.1A, Preservation of **the Nation's Wetlands**: EO 11990 states federal actions must "... avoid to the extent possible the long and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative." EO 11990 states that agencies shall provide leadership and shall take action to minimize the destruction, loss or degradation of wetlands. Agencies are also responsible for preserving and enhancing the natural and beneficial values of wetlands.

USDOT has implemented EO 11990 through policies and procedures documented in **DOT Order 5660.1A, Preservation of the Nation's Wetlands**. USDOT Order 5660.1A requires that transportation facilities and projects should be planned, constructed, and operated to **assure the protection, preservation, and enhancement of the nation's** wetlands to the fullest extent practicable, and establishes procedures for implementation of the policy.

EO 11988, Floodplain Management and DOT Order 5650.2, Floodplain Management and Protection: EO 11988 directs federal agencies to take actions to reduce the risk of flood loss, minimize flood impacts on human safety, health and welfare, and restore and preserve floodplain natural and beneficial values. To do this, the Order bans approving activities in a floodplain unless:

- (1) No practicable alternative exists; and
- (2) **Measures to minimize adverse impacts to the floodplain's natural and beneficial values** are included.

USDOT Order 5650.2 contains policies and procedures for carrying out EO 11988. Based on USDOT Order 5650.2, if an action includes development within a floodplain, **the analysis shall indicate if the encroachment would be a "significant encroachment,"** that is, whether it would cause one or more of the following impacts:

- (1) The action would have a considerable probability of loss of human life;
- (2) The action would likely have substantial encroachment- associated costs or extent, including interrupting aircraft service or loss of a vital transportation facility (e.g., flooding of a runway or taxiway; important navigational aid out of service due to flooding, etc.); or
- (3) The action would cause notable adverse impacts on natural and beneficial floodplain values.

Moreover, the National Flood Insurance Act requires any community participating in the National Flood Insurance Program (NFIP), a voluntary floodplain management **program, follow the community's Federal Emergency Management Agency (FEMA)** approved floodplain management regulations. FEMA coordinates with the Kentucky Energy and Environment Cabinet, Division of Water (DOW) on the designation of floodplain boundaries within the Commonwealth of Kentucky. DOW delegates the responsibility of adopting floodplain regulations to the Boone County, which regulates development within the floodway and, through an administrative process, concurs with the latest FEMA map revisions. Chapter 151 of the Kentucky Revised Statutes is the state statute that addresses the development of floodplain areas.



### Affected Environment

The Airport lies within the Ohio River Drainage Basin. Surface drainage flows from the Airport by numerous conveyances, such as ditches, creeks, and streams, and eventually enters the Ohio River or one of its impoundments. The majority of the developed Airport is located at a topographical high point, split between outfalls of two watersheds. Runoff from the northern portion of the Airport discharges from a detention basin into Elijah Creek, while the southern portion of the Airport discharges from the Southwest Detention Facility to Gunpowder Creek.

#### 4.2.12.1 WETLANDS AND STREAMS

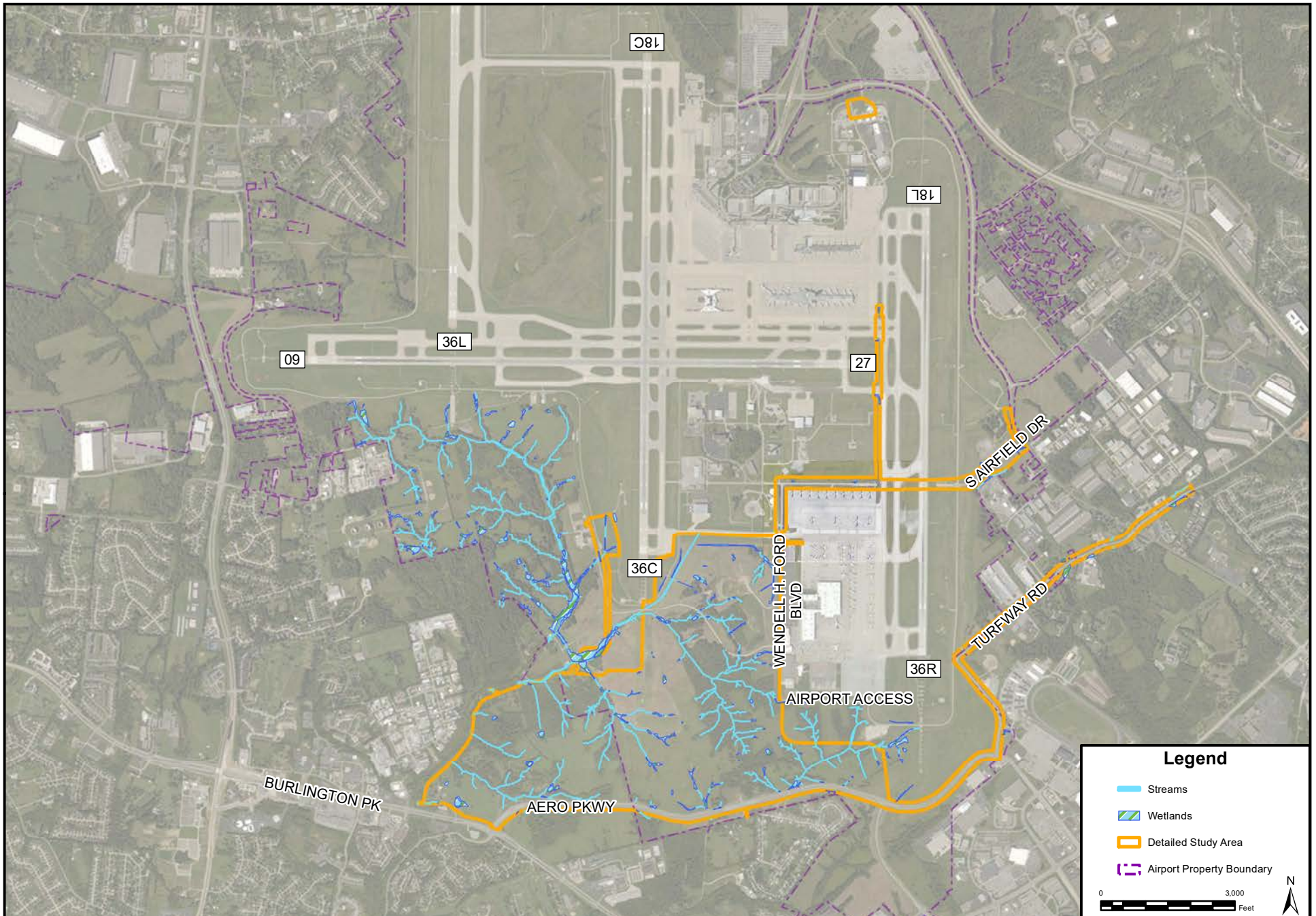
Wetland and stream delineations occurred in August and October 2015, September 2016, and February and March 2017. Linear footage of streams within the DSA consisted of 12,698 feet of ephemeral streams, 44,249 feet of intermittent streams, and 7,296 feet of perennial streams. The delineated wetlands amounted to 11.24 acres of palustrine emergent wetland, 0.08 acres of scrub-shrub wetlands, 0.51 acres of palustrine forested wetland, 0.27 acre of open water/wetland areas, and 1.48 acres of ponds. Table 4-11 present a summary of the wetlands and streams located within the DSA. The wetlands and streams are shown on Exhibit 4-6, *Wetlands and Streams*. More detailed information regarding the wetlands and streams is located in Appendix G, *Water Resources*.

Table 4-11  
STREAMS AND WETLANDS LOCATED WITHIN THE DSA

STREAMS		
	Linear Feet	Acreage
Ephemeral	12,698	0.68
Intermittent	43,849	4.74
Intermittent - Culverted	400	0.08
Perennial	4,869	1.95
Perennial - Culverted	2,427	0.58
Total	64,243	8.03
WETLANDS		
	Linear Feet	Acreage
Palustrine Emergent Wetland (PEM)	NA	11.24
Palustrine Scrub-Shrub Wetland (PSS)	NA	0.08
Palustrine Forested Wetland (PFO)	NA	0.51
Palustrine Unconsolidated Bottom Wetland (PUB)	NA	0.27
Pond	NA	1.48
Total	NA	13.58

PEM = Palustrine Emergent Wetland, PSS = Palustrine Scrub-Shrub Wetland, PFO = Palustrine Forested Wetland, PUB = Palustrine Unconsolidated Bottom Wetland

Source: Wetland and Stream Delineation Report Kenton County Airport Board CVG Air Cargo Hub Development Project ACOE Louisville District ID No. LRL-2018-00268 Boone County, Kentucky



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#### 4.2.12.2 FLOODPLAINS

The 100-year flood has been adopted by FEMA as the base flood for floodplain management purposes. Floodplains are valued for their natural flood and erosion control, enhancement of biological productivity, and socioeconomic benefits and functions. The Flood Insurance Rate Maps (FIRM) prepared by FEMA were used to establish the boundary of the 100-year floodplain in the area to be either directly or indirectly affected by the Proposed Action. The DSA is depicted on FEMA Flood Insurance Rate Map (FIRM) Panel 120 of 325, Map Number: 21015C0120C as reproduced in Exhibit 4-7, *Floodplains*. The southeast corner of the DSA contains 11 acres of high flood risk subject to inundation by the one percent annual-chance flood event.

#### 4.2.12.3 SURFACE WATERS

The main sources of hydrology to the DSA are precipitation, surface runoff from adjacent properties, and various streams (see Exhibit 4-6). In general, surface water is collected and migrated across the DSA in an east to west direction.

The two primary sources of drinking water in Kenton County are the Ohio River and the Licking River. Water is pumped from the rivers to one of three treatment plants where the water is cleaned, tested, and pumped into the distribution system. The Ohio River is located to the north and west of CVG and several tributaries flow from CVG property into the Ohio River. Topography within the DSA is gently sloping, and located within the Gunpowder Creek watershed (HUC 05090203). The DOW defines Gunpowder Creek as a warm-water aquatic habitat. The streams are not identified as a Special Resource Water. In Kentucky, stormwater discharges are regulated by the Kentucky Pollutant Discharge Elimination System (KPDES) as administered by the DOW. CVG currently holds an individual KPDES Permit (Permit No. KY0083864) for industrial activity.

#### 4.2.12.4 GROUNDWATER

The geology of the DSA is predominantly limestone which yields 100 to 500 gallons of water per day from wells in valleys or on broad ridges, but almost no water from drilled wells on narrow ridges or hilltops.<sup>25</sup> There are no public or private drinking water wells or wells used for agricultural purposes within a half-mile radius of the DSA.<sup>26</sup>

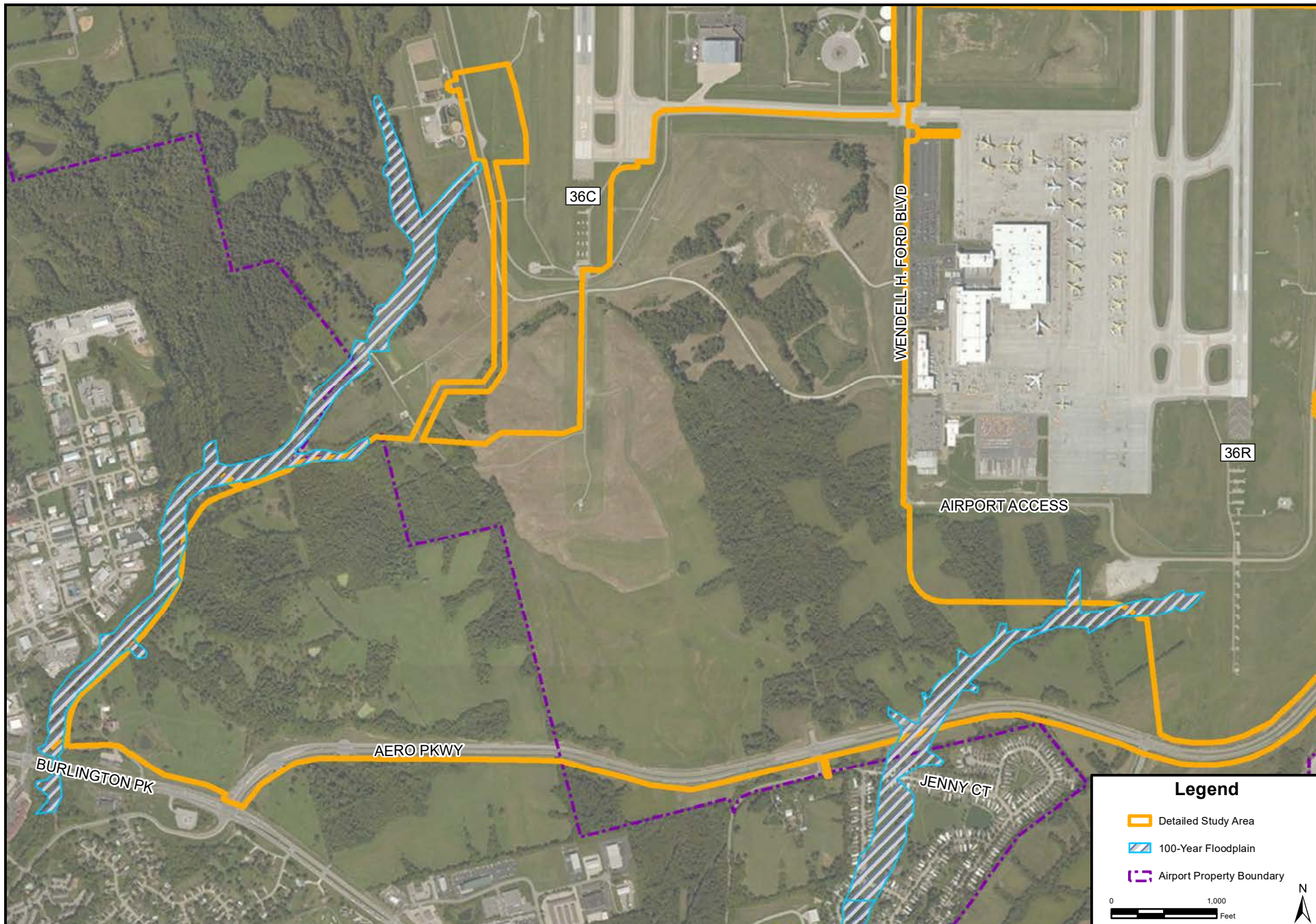
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<sup>25</sup> Kentucky Geological Survey; Groundwater Resources of Boone County, Kentucky; 2004

<sup>26</sup> Kentucky Geological Survey; Water Well Records Search Results, Kentucky Groundwater Data Repository; Online at: <http://kgs.uky.edu/kgsweb/datasearching/water/waterwellsearch.asp>; Accessed: February 22, 2017

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## Chapter Five

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# CHAPTER FIVE

## ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

This chapter presents the assessment of potential environmental impacts resulting from implementation of the Proposed Action and the No Action. The analysis presented in this chapter includes considerations of direct, indirect, and cumulative impacts and their significance and possible conflicts with the objectives of federal, regional, state, tribal, and local land use plans, policies, and controls for the area concerned. This chapter also presents a discussion of mitigation measures, where applicable, to avoid and minimize potential adverse environmental impacts of the Proposed Action.

### 5.1 ANALYSIS YEARS

The following analysis discloses the impacts for the construction of the entire air cargo facility in 2021 to disclose maximum environmental impacts due to this project. The year 2021 is used as a basis for analysis because 2021 is the projected implementation year of the Proposed Action. In addition, 2026 is used as a basis for analysis, for air quality, climate, and noise and noise-compatible land use, because it represents a condition five years beyond the opening year where the facility would experience an increase in operations.

### 5.2 ENVIRONMENTAL RESOURCES NOT AFFECTED

As discussed in Chapter Four, the following environmental resources are not present within the project area and would not be affected by the Proposed Action or No Action:

- Coastal resources: There are no coastal zones in the state of Kentucky.
- Farmlands: The Proposed Action does not include the conversion of any important farmlands to non-agricultural use.
- Wild and scenic rivers: A review of the Wild and Scenic Rivers System list<sup>1</sup> indicated that there are no designated State or National Scenic Rivers within Boone County. The nearest Wild and Scenic River to the Cincinnati/Northern Kentucky International Airport (CVG or Airport) is the Little Miami River located northeast in Ohio, approximately 20 miles from the Airport.

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<sup>1</sup> Department of the Interior, 2018, National Wild and Scenic Rivers System. Available on-line at: <https://www.rivers.gov/kentucky.php> Accessed June 2018.

### 5.3 ENVIRONMENTAL RESOURCES POTENTIALLY AFFECTED

The remaining portion of this chapter is focused on those environmental resources that may potentially be affected by the Proposed Action or No Action. These resources are evaluated in detail in this chapter of the EA. Construction impacts are analyzed within each applicable environmental resource category. This chapter of the EA is organized to address the following topics:

- Section 5.4: Air Quality
- Section 5.5: Biological Resources
- Section 5.6: Climate
- Section 5.7: Department of Transportation (DOT) Act: Section 4(f) Resources
- Section 5.8: Hazardous Materials, Solid Waste, and Pollution Prevention
- Section 5.9: Historical, Architectural, Archeological, and Cultural Resources
- Section 5.10: Land Use
- Section 5.11: Natural Resources and Energy Supply
- Section 5.12: Noise and Noise-Compatible Land Use
- Section 5.13: Socioeconomics, Environmental Justice, and **Children's Environmental Health and Safety Risks**
- Section 5.14: Visual Effects
- Section 5.15: Water Resources
- Section 5.16: Cumulative Impacts

## 5.4 AIR QUALITY

This section presents the analysis of potential for significant adverse air quality impacts resulting from the No Action and the Proposed Action. The analysis of significant adverse air quality impacts was prepared using the latest version of the Aviation Environmental Design Tool (AEDT), Version 2d to develop emissions inventories.

As discussed in Section 4.2.1, Affected Environment, Boone County operates under a maintenance plan for ozone. Therefore, General Conformity regulations apply. The General Conformity Rule under the Clean Air Act of 1970 (CAA) establishes minimum values, referred to as the *de minimis* thresholds, for the criteria and precursor pollutants<sup>2</sup> for the purpose of:

- Identifying federal actions with project-related emissions that are clearly negligible (*de minimis*);
- Avoiding unreasonable administrative burdens on the sponsoring agency, and;
- Focusing efforts on key actions that would have potential for significant air quality impacts.

The *de minimis* rates vary depending on the severity of the nonattainment area and further depend on whether the general federal action is located inside an ozone transport region.<sup>3</sup> EPA defines *de minimis* as emissions that are so low as to be considered insignificant and negligible. An evaluation relative to the General Conformity Rule (the Rule), published under 40 Code of Federal Regulations (C.F.R.) Part 93,<sup>4</sup> is required only for general federal actions that would cause emissions of the criteria or precursor pollutants, and are:

- Federally-funded or federally-approved;
- Not a highway or transit project<sup>5</sup>;
- Not identified as an exempt project<sup>6</sup> under the CAA;

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<sup>2</sup> Precursor pollutants are pollutants that are involved in the chemical reactions that form the resultant pollutant. Ozone precursor pollutants are NO<sub>x</sub> and VOC, whereas PM<sub>2.5</sub> precursor pollutants include NO<sub>x</sub>, VOC, SO<sub>2</sub>, and ammonia (NH<sub>3</sub>).

<sup>3</sup> The ozone transport region is a single transport region for ozone (within the meaning of Section 176A(a) of the CAA), comprised of the States of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and the Consolidated Metropolitan Statistical Area that includes the District of Columbia, as given at Section 184 of the CAA.

<sup>4</sup> EPA, 40 C.F.R. Part 93, Subpart B, *Determining Conformity of General Federal Actions to State or Federal Implementation Plans*, July 1, 2006.

<sup>5</sup> Highway and transit projects are defined under Title 23 United States Code and the Federal Transit Act.

<sup>6</sup> The Proposed Project is not listed as an action exempt from a conformity determination pursuant to 40 C.F.R. § 93.153(c). An exempt project is one that the EPA has determined would clearly have no impact on air quality at the facility, and any net increase in emissions would be so small as to be considered negligible.

- Not a project identified on the approving federal agency's Presumed to Conform list;<sup>7</sup> and,
- Located within a nonattainment or maintenance area.

When the action requires evaluation under the General Conformity regulations, the net total direct and indirect emissions due to the federal action may not equal or exceed the relevant *de minimis* thresholds unless:

- An analytical demonstration is provided that shows the emissions would not exceed the National Ambient Air Quality Standards (NAAQS); or
- Net emissions are accounted for in the State Implementation Plan (SIP) planning emissions budget; or
- Net emissions are otherwise accounted for by applying a solution prescribed under 40 C.F.R. § 93.158.

The federal *de minimis* thresholds established under the CAA are provided in Table 5-1. Conformity to the *de minimis* thresholds is relevant only with regard to those pollutants and the precursor pollutants for which the area is nonattainment or maintenance. Notably, there are no *de minimis* thresholds to which a federal agency would compare ozone emissions. This is because ozone is not directly emitted from a source. Rather, ozone is formed through photochemical reactions involving emissions of the precursor pollutants, nitrogen oxides (NO<sub>x</sub>) and volatile organic compounds (VOC), in the presence of abundant sunlight and heat. Therefore, emissions of ozone on a project level are evaluated based on the rate of emissions of the ozone precursor pollutants, NO<sub>x</sub> and VOC. The Airport is located within Boone County, Kentucky, which operates under a maintenance plan for ozone. As a result, conformity to the *de minimis* threshold is relevant only with regard to the ozone precursor pollutants therefore only NO<sub>x</sub> and VOC emissions are presented and evaluated for the No Action and Proposed Action. Appendix B, *Air Quality* presents all of the pollutants emissions for both the No Action and Proposed Action.

If the General Conformity evaluation for this air quality assessment were to show that any of the applicable thresholds were equaled or exceeded due to the Proposed Action, more detailed analysis to demonstrate conformity would be required. This is referred to as a General Conformity Determination.<sup>8</sup> Conversely, if the General Conformity evaluation were to show that none of the relevant thresholds were equaled or exceeded, the Proposed Action would be presumed to conform to the applicable SIPs and no further analysis would be required under the CAA. Appendix B presents the inputs and methodology used to prepare the inventory for this EA.

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<sup>7</sup> The provisions of the CAA allow a federal agency to submit a list of actions demonstrated to have low emissions that would have no potential to cause an exceedance of the NAAQS and are presumed to conform to the **CAA conformity regulations**. This list would be referred to as the "Presumed to Conform" list. The FAA Presumed to Conform list was published in the Federal Register on February 12, 2007 (72 FR 6641-6656) and includes airport projects that would not require evaluation under the General Conformity regulations.

<sup>8</sup> 40 C.F.R. § 93.153.

Table 5-1  
DE MINIMIS THRESHOLDS

CRITERIA AND PRECURSOR POLLUTANTS	TYPE AND SEVERITY OF NONATTAINMENT AREA	TONS PER YEAR THRESHOLD
Ozone (VOC or NO <sub>x</sub> ) <sup>1</sup>	Serious nonattainment	50
	Severe nonattainment	25
	Extreme nonattainment	10
	Other areas outside an ozone transport region	100
Ozone (NO <sub>x</sub> ) <sup>1</sup>	Marginal and moderate nonattainment inside an ozone transport regions (OTR) <sup>2</sup>	100
	Maintenance	100
Ozone (VOC) <sup>1</sup>	Marginal and moderate nonattainment inside an ozone transport region <sup>2</sup>	50
	Maintenance within an ozone transport region <sup>2</sup>	50
	Maintenance outside an ozone transport region <sup>2</sup>	100
Carbon monoxide (CO)	All nonattainment & maintenance	100
Sulfur dioxide (SO <sub>2</sub> )	All nonattainment & maintenance	100
Nitrogen dioxide (NO <sub>2</sub> )	All nonattainment & maintenance	100
Coarse particulate matter (PM <sub>10</sub> )	Serious nonattainment	70
	Moderate nonattainment and maintenance	100
Fine particulate matter (PM <sub>2.5</sub> ) (VOC, NO <sub>x</sub> , NH <sub>3</sub> , and SO <sub>x</sub> ) <sup>3</sup>	All nonattainment and maintenance	100
Lead (Pb)	All nonattainment and maintenance	25

<sup>1</sup> The rate of increase of ozone emissions is not evaluated for a project-level environmental review because the formation of ozone occurs on a regional level and is the result of the photochemical reaction of NO<sub>x</sub> and VOC in the presence of abundant sunlight and heat. Therefore, EPA considers the increasing rates of NO<sub>x</sub> and VOC emissions to reflect the likelihood of ozone formation on a project level.

<sup>2</sup> An OTR is a single transport region for ozone, comprised of the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and the Consolidated Metropolitan Statistical Area that includes the District of Columbia.

<sup>3</sup> **For the purposes of General Conformity applicability, VOC's and NH<sub>3</sub> emissions are only considered PM<sub>2.5</sub> precursors in nonattainment areas where either a State or EPA has made a finding that the pollutants significantly contribute to the PM<sub>2.5</sub> problem in the area. In addition, NO<sub>x</sub> emissions are always considered a PM<sub>2.5</sub> precursor unless the State and EPA make a finding that NO<sub>x</sub> emissions from sources in the State do not significantly contribute to PM<sub>2.5</sub> in the area. Refer to 74 FR 17003, April 5, 2006.**

Sources: 40 C.F.R. § 93.153(b)(1) & (2).

## 5.4.1 NO ACTION

## 5.4.1.1 Future (2021) No Action

The operational emissions inventory for the Future (2021) No Action is shown in Table 5-2.

Table 5-2

## OPERATIONAL EMISSIONS INVENTORY – FUTURE (2021) NO ACTION

SOURCE	ANNUAL EMISSIONS (SHORT TONS PER YEAR)	
	VOC	NO <sub>x</sub>
Aircraft Takeoffs and Landings	8.2	200.7
APUs	0.2	5.3
Aircraft Taxiing	17.2	13.5
GSE	30.1	100.1
Stationary Sources	0.4	7.1
Ground Access Vehicles (GAVs)	3.3	10.3
<i>2021 No Action - Operational Total</i>	<i>59.4</i>	<i>337.0</i>

Note: Operational activities were modeled under the assumption that the development was operational during 365 days in 2021 to account for the maximum annual operational emissions.

Because conformity to the *de minimis* threshold for Boone County is relevant only with regard to the ozone precursor pollutants, only NO<sub>x</sub> and VOC emissions are presented and evaluated in this report.

Source: Landrum & Brown analysis, 2018

## 5.4.1.2 Future (2026) No Action

The operational emissions inventory for the Future (2026) No Action is shown in Table 5-3.

Table 5-3

## OPERATIONAL EMISSIONS INVENTORY – FUTURE (2026) NO ACTION

SOURCE	ANNUAL EMISSIONS (SHORT TONS PER YEAR)	
	VOC	NO <sub>x</sub>
Aircraft Takeoffs and Landings	14.8	354.3
APUs	0.3	10.0
Aircraft Taxiing	21.6	22.3
GSE	54.3	122.4
Stationary Sources	0.4	7.1
GAVs	4.9	15.1
<i>2026 No Action - Operational Total</i>	<i>96.3</i>	<i>531.1</i>

Note: Operational activities were modeled under the assumption that the development was operational during 365 days in 2021 to account for the maximum annual operational emissions.

Because conformity to the *de minimis* threshold for Boone County is relevant only with regard to the ozone precursor pollutants, only NO<sub>x</sub> and VOC emissions are presented and evaluated in this report.

Source: Landrum & Brown analysis, 2018

## 5.4.2 PROPOSED ACTION

## 5.4.2.1 Future (2021) Proposed Action

The operational emissions inventory for the Future (2021) Proposed Action is shown in Table 5-4.

Table 5-4

## OPERATIONAL EMISSIONS INVENTORY – FUTURE (2021) PROPOSED ACTION

SOURCE	ANNUAL EMISSIONS (SHORT TONS PER YEAR)	
	VOC	NO <sub>x</sub>
Aircraft Takeoffs and Landings	8.2	200.7
APUs	0.2	5.3
Aircraft Taxiing	15.2	12.2
GSE	24.1	80.1
Stationary Sources	1.8	32.5
GAVs	3.7	8.8
<i>2021 Proposed Action - Operational Total</i>	<i>53.2</i>	<i>339.6</i>

Note: Operational activities were modeled under the assumption that the development was operational during 365 days in 2026 to account for the maximum annual operational emissions.

Because conformity to the *de minimis* threshold for Boone County is relevant only with regard to the ozone precursor pollutants, only NO<sub>x</sub> and VOC emissions are presented and evaluated in this report.

Source: Landrum & Brown analysis, 2018

## 5.4.2.2 Future (2026) Proposed Action

The operational emissions inventory for the Future (2026) Proposed Action is shown in Table 5-5.

Table 5-5

## OPERATIONAL EMISSIONS INVENTORY – FUTURE (2026) PROPOSED ACTION

SOURCE	ANNUAL EMISSIONS (SHORT TONS PER YEAR)	
	VOC	NO <sub>x</sub>
Aircraft Takeoffs and Landings	16.7	404.2
APUs	0.4	11.3
Aircraft Taxiing	24.7	26.0
GSE	48.9	110.1
Stationary Sources	1.8	32.5
GAVs	6.0	13.2
<i>2026 Proposed Action - Operational Total</i>	<i>98.5</i>	<i>597.2</i>

Note: Operational activities were modeled under the assumption that the development was operational during 365 days in 2026 to account for the maximum annual operational emissions.

Because conformity to the *de minimis* threshold for Boone County is relevant only with regard to the ozone precursor pollutants, only NO<sub>x</sub> and VOC emissions are presented and evaluated in this report.

Source: Landrum & Brown analysis, 2018

### 5.4.3 TOTAL EMISSIONS

The emissions inventories prepared for the Proposed Action were compared to the emissions inventories prepared for the No Action of the same future year to disclose the potential increase in emissions caused by the Proposed Action. The comparison of the emission inventories, which included an inventory of construction and operational emissions, was used for the evaluation of General Conformity as required under the CAA (including the 1990 Amendments). Because conformity to the *de minimis* threshold is relevant only with regard to the ozone precursor pollutants, only NO<sub>x</sub> and VOC emissions are presented and evaluated in this report. Table 5-6 evaluates the annual net impact of emissions that would be caused by the implementation Proposed Action. The annual net impact of emissions was calculated by subtracting the emissions of the No Action from those of the Proposed Action. As shown in Table 5-6 shows that neither of the relevant federal thresholds were equaled or exceeded for the Future (2021) Proposed Action or the Future (2026) Proposed Action.

In 2019 and 2020, there is an increase in net emissions due to construction activities associated with the Proposed Action. In 2021, there is an increase in net emissions of NO<sub>x</sub> and VOCs due to construction activities and usage of stationary sources associated with the Proposed Action. In 2026, there is an increase in net emissions of NO<sub>x</sub> and VOCs due to increased aircraft activity and taxiing levels associated with the Proposed Action.

The air quality assessment demonstrates that the Proposed Action would not cause an increase in air emissions above the applicable *de minimis* thresholds. Therefore, the Proposed Action conforms to the SIP and the CAA and would not create any new violation of the NAAQS, delay the attainment of any NAAQS, nor increase the frequency or severity of any existing violations of the NAAQS. As such, no adverse impact on local or regional air quality is expected by construction of the Proposed Action. No further analysis or reporting is required under the CAA or National Environmental Policy Act (NEPA).



Table 5-6  
TOTAL ANNUAL EMISSIONS

SOURCE	ANNUAL EMISSIONS (SHORT TONS)	
	VOC	NO <sub>x</sub>
<i>Federal de minimis Threshold</i>	<i>100</i>	<i>100</i>
<b>2019</b>		
Construction - Proposed Action	23.7	28.8
<i>2019 Proposed Action Subtotal</i>	<i>23.7</i>	<i>28.8</i>
<i>2019 Proposed Action Net Emissions</i>	<i>23.7</i>	<i>28.8</i>
<b>2020</b>		
Construction - Proposed Action	57.7	62.0
<i>2020 Proposed Action Subtotal</i>	<i>57.7</i>	<i>62.0</i>
<i>2020 Proposed Action Net Emissions</i>	<i>57.7</i>	<i>62.0</i>
<b>2021</b>		
Aircraft Takeoffs and Landings - No Action	8.2	200.7
APUs - No Action	0.2	5.3
Aircraft Taxiing - No Action	17.2	13.5
GSE - No Action	30.1	100.1
Stationary Sources - No Action	0.4	7.1
GAVs - No Action	3.3	10.3
<i>2021 No Action Subtotal</i>	<i>59.4</i>	<i>337.0</i>
Aircraft Takeoffs and Landings - Proposed Action	8.2	200.7
APUs - Proposed Action	0.2	5.3
Aircraft Taxiing - Proposed Action	15.2	12.2
GSE - Proposed Action	24.1	80.1
Stationary Sources - Proposed Action	1.8	32.5
GAVs - Proposed Action	3.7	8.8
Construction - Proposed Action	9.7	13.3
<i>2021 Proposed Action Subtotal</i>	<i>62.9</i>	<i>352.9</i>
<i>2021 Proposed Action Net Emissions</i>	<i>3.4</i>	<i>15.8</i>
<b>2026</b>		
Aircraft Takeoffs and Landings - No Action	14.8	354.3
APUs - No Action	0.3	10.0
Aircraft Taxiing - No Action	21.6	22.3
GSE - No Action	54.3	122.4
Stationary Sources - No Action	0.4	7.1
GAVs - No Action	4.9	15.1
<i>2026 No Action Subtotal</i>	<i>96.3</i>	<i>531.1</i>
Aircraft Takeoffs and Landings - Proposed Action	16.7	404.2
APU - Proposed Action	0.4	11.3
Aircraft Taxiing - Proposed Action	24.7	26.0
GSE - Proposed Action	48.9	110.1
Stationary Sources - Proposed Action	1.8	32.5
GAVs - Proposed Action	6.0	13.2
<i>2026 Proposed Action Subtotal</i>	<i>98.5</i>	<i>597.2</i>
<i>2026 Proposed Action Net Emissions</i>	<i>2.1</i>	<i>66.1</i>

Note: Numbers may not sum due to rounding.

The net impact of emissions was calculated by subtracting the emissions of the No Action from those of the Proposed Action.

Source: Landrum & Brown analysis, 2018

#### 5.4.4 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

The Proposed Action does not exceed the applicable thresholds of significance for any pollutants; therefore, no mitigation measures are required. However, the following minimization measures and best management practices are being provided to further minimize air quality impacts from the Proposed Action.

While the Proposed Action would not exceed the applicable threshold of significant for particulate matter, construction of the Proposed Action would result in a short-term increase of particulate matter (airborne fugitive dust) emissions from vehicle movement and soil excavation in and around the construction site. KCAB would ensure that measures would be taken to reduce fugitive dust emissions by adhering to guidelines included in FAA Advisory Circular (AC), *Standards for Specifying Construction of Airports*.<sup>9</sup> In addition, KCAB would follow 401 KAR 63:010 standards for construction of the Proposed Action.

Methods of controlling dust and other airborne particles will be implemented to the maximum possible extent and may include, but would not be limited to, the following:

- Exposing the minimum area of erodible earth;
- Applying temporary mulch with or without seeding;
- Using water sprinkler trucks;
- Using covered haul trucks;
- Using dust palliatives or penetration asphalt on haul roads; and,
- Using plastic sheet coverings.

### 5.5 BIOLOGICAL RESOURCES

This section presents the analysis of potential impacts to Endangered Species Act (ESA)-listed species as a result of the No Action and the Proposed Action.

#### 5.5.1 NO ACTION

The No Action includes no physical development on the Airport. Therefore, the implementation of the No Action would have no effect on any federal or state threatened or endangered species, no effect on any biotic or critical habitat supporting a federal or state endangered or threatened species, and would not result in the development, conversion, or removal of any existing habitat.

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<sup>9</sup> FAA AC, 2014, *Standards for Specifying Construction of Airports*, Item P-156, *Temporary Air and Water Pollution, Soil Erosion, and Siltation Control*, AC 150/5370-10G.

## 5.5.2 PROPOSED ACTION

### Federally Listed (ESA) Species

Section 7(a)(2) of the ESA requires federal agencies to insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any federally-listed endangered or threatened species or result in the destruction or adverse modification of critical habitat.

#### *Gray Bat*

Gray bats inhabit caves year-round. In the winter, the gray bat hibernates in deep vertical caves. In the summer, they roost in caves scattered along rivers. No karst topography<sup>10</sup> occurs within the Detailed Study Area (DSA) and no caves were identified within or adjacent to the DSA during the habitat surveys on February 16, 2017, September 5 through 8, 2017, and May 22 through 25, 2018. The DSA does not contain the required habitat for the gray bat. Therefore, the FAA has determined the Proposed Action would have *no effect* on the gray bat.

#### *Mussels*

There are seven mussel species with the potential to be located within the DSA: Clubshell (*Pleurobema clava*), Fanshell (*Cyprogenia stegaria*), Orangefoot pimpleback (*Plethobasus cooperianus*), Pink Mucket (*Lampsilis orbiculata*), Ring pink (*Obovaria retusa*), Rough pigtoe (*Pleurobema plenum*), and Sheepnose (*Plethobasus cyphus*). However, the habitat requirements for the seven mussel species are not found within the DSA. Therefore, the FAA has determined the Proposed Action would have *no effect* on the seven mussel species.

#### *Running Buffalo Clover*

Based on habitat assessments, suitable habitat for running buffalo clover (RBC) was present within the DSA. As a result, RBC presence-absence surveys were completed during the flowering period of May 22 through May 25, 2018. No RBC was identified during the species-specific surveys. Therefore, the FAA has determined the Proposed Action would have *no effect* on the RBC species.

#### *Indiana bat*

The DSA contains potential habitat for the endangered Indiana bat. No known hibernacula, swarming, or summer habitat is present in Boone County. It is anticipated indirect and direct impacts to the Indiana bat would occur with the Proposed Action. Indirect impacts include noise and vibration, night lighting, collision, and water quality. Direct impacts would occur due to the removal of the forested habitat. Approximately 244 acres of forested habitat is present within the DSA, all of which would be removed prior to the construction of the air cargo facility. The removal of forested habitat in the DSA would likely have a negative impact on

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<sup>10</sup> A terrain, generally underlain by limestone or dolomite, in which the topography is chiefly formed by the dissolving of rock and which may be characterized by sinkholes, sinking streams, closed depressions, subterranean drainage, and caves.

the Indiana bat commuting, roosting, and foraging habitat. Therefore, the FAA has determined the Proposed Action *may affect, is likely to adversely affect* the Indiana bat. Mitigation measures are identified in Section 5.5.3 for the Indiana bat.

#### *Northern long-eared bat*

Northern long-eared bat habitat closely resembles Indiana bat habitat; however, the northern long-eared bat appears to be more flexible in roost tree selection. As a result, the impacts to the northern long-eared bat are the same as those for the Indiana bat previously described. It is anticipated indirect and direct impacts to the Indiana bat would occur with the Proposed Action. Indirect impacts include noise and vibration, night lighting, collision, and water quality. Direct impacts would occur due to the removal of the forested habitat. Approximately 244 acres of forested habitat is present within the DSA, all of which would be removed prior to the construction of the air cargo facility. The removal of forested habitat in the DSA would likely have a negative impact on the northern long-eared commuting, roosting, and foraging habitat. Therefore, the FAA has determined the Proposed Action *may affect, is likely to adversely affect* the northern long-eared bat. Mitigation measures are identified in Section 5.5.3 for the northern long-eared bat.

#### Migratory Bird Treaty Act Species

Potential habitat for Migratory Bird Treaty Act Species is present within the DSA. However, due to the mobile nature of the species and the surrounding suitable habitat for these species, no impacts are expected on the migratory bird species from the construction of the Proposed Action. Therefore, the Proposed Action would not reduce the viability of the Migratory Bird Species population. In addition, the DSA does not contain supportive nesting or breeding habitat for the bald eagle with respect to the Bald and Golden Eagle Protection Act.

#### Determination of Effects

A Biological Assessment (BA) was prepared to be used by the FAA in its consultation with the United States Fish and Wildlife Service (USFWS). The analysis included an evaluation of the DSA for potential impacts to ESA-listed threatened and endangered species and associated critical habitat under the jurisdiction of the USFWS. Based on the analysis, the FAA has made the following findings.

- **The Proposed Action “*May affect, is likely to adversely affect*” the Indiana bat.**
- The Proposed Action “***May affect, is likely to adversely affect***” the northern long-eared bat.

**FAA’s finding was submitted to the USFWS on July 20, 2018.** (See Appendix D, *Section 7 Consultation* for the BA and Section 7 consultation).

### 5.5.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

The DSA is located outside of known forest-dwelling bat habitat; however, the USFWS Kentucky Field Office (KFO) designates the area as Potential Habitat. Impacts to Potential Habitat requires mitigation per guidelines of the KFO *Revised Conservation Strategy for Forest-Dwelling Bats* into the Imperiled Bat Conservation Fund (IBCF). The current rate for mitigation for the February to March timeframe is \$1,710/acre, and the current mitigation rate for April to May is \$3,420/acre. The IBCF mitigation rate/acre is updated in August of each year. Total tree removal for the Proposed Action would be 244 acres. Payment into the IBCF will be made prior to tree clearing per the mitigation multipliers by habitat type and season in the *Revised Conservation Strategy for Forest-Dwelling Bats*.

The clearing, grading, and site preparation for the project is expected to last approximately 18 months. Efforts will be made to avoid removing trees in June and July. This contribution to the IBCF is expected to promote the survival and recovery of Indiana and northern long-eared bats through the protection and management of existing forested habitat to support potential maternity populations, particularly those that would expand existing conservation ownerships.

## 5.6 CLIMATE

Although there are no federal standards for aviation-related GHG emissions, it is well-established that GHG emissions can affect climate.<sup>11</sup> The Council on Environmental Quality (CEQ) has indicated that climate should be considered in NEPA analyses. The following provides an estimate of GHG emissions. This report used the carbon dioxide equivalent (CO<sub>2</sub>E) method to show relative impacts on climate change of different chemical species. The resulting CO<sub>2</sub>E is provided for information only because no federal NEPA standard for the significance of GHG emissions from individual projects on the environment has been established. Table 5-7 provides the CO<sub>2</sub>E emissions inventory for the construction and operational activities for both the No Action and Proposed Action.

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<sup>11</sup> See *Massachusetts v. E.P.A.*, 549 U.S. 497, 508-10, 521-23 (2007).

Table 5-7  
TOTAL ANNUAL GHG EMISSIONS

SOURCE	ANNUAL EMISSIONS (METRIC TONS)
	CO <sub>2</sub> E
<b>2019</b>	
Construction - Proposed Action	17,216.6
<i>2019 Proposed Action Net Emissions</i>	<i>17,216</i>
<b>2020</b>	
Construction - Proposed Action	40,988.5
<i>2020 Proposed Action Net Emissions</i>	<i>40,988.5</i>
<b>2021</b>	
Aircraft Takeoffs and Landings - No Action	27,144.4
Aircraft Taxiing - No Action	8,796.2
GAVs - No Action	2,493.0
<i>2021 No Action Subtotal</i>	<i>38,433.7</i>
Aircraft Takeoffs and Landings - No Action	27,144.4
Aircraft Taxiing - Proposed Action	8,526.6
GAVs - Proposed Action	2,238.4
Construction - Proposed Action	9,356.9
<i>2021 Proposed Action Subtotal</i>	<i>47,266.3</i>
<i>2021 Proposed Action Net Emissions</i>	<i>8,832.6</i>
<b>2026</b>	
Aircraft Takeoffs and Landings - No Action	44,423.4
Aircraft Taxiing - No Action	13,746.8
GAVs - No Action	5,062.9
<i>2026 No Action Subtotal</i>	<i>63,233.0</i>
Aircraft Takeoffs and Landings - Proposed Action	50,508.1
Aircraft Taxiing - Proposed Action	16,817.6
GAVs - Proposed Action	4,882.2
<i>2026 Proposed Action Subtotal</i>	<i>72,207.9</i>
<i>2026 Proposed Action Net Emissions</i>	<i>8,974.8</i>

CO<sub>2</sub>E: Carbon Dioxide equivalent

Notes: GHG emissions for stationary sources, GSE, and APUs are not reported because AEDT does not have the capability of calculating GHG emissions for these emission sources.

Numbers may not sum due to rounding.

The net impact of emissions was calculated by subtracting the emissions of the No Action from those of the Proposed Action.

Source: Landrum & Brown analysis, 2018

### 5.6.1 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

The FAA has not identified specific factors to consider in making a significance determination for GHG emissions; therefore, no mitigation measures are required to mitigate the potential increase in GHGs attributed to the Proposed Action. However, for NEPA reviews of proposed FAA actions that would result in increased emissions of GHGs, consideration should be given to whether there are areas within the scope of a project where such emissions could be reduced. GHG emissions reduction can come from measures such as changes to more fuel efficient equipment, delay reductions, use of renewable fuels, and operational changes.

## 5.7 DEPARTMENT OF TRANSPORTATION (DOT) ACT: SECTION 4(F) RESOURCES

This section presents the analysis of potential impacts to the U.S. Department of Transportation (USDOT) Act, Section 4(f) resources as a result of the No Action and the Proposed Action. Section 4(f) of the USDOT Act of 1966 (49 United States Code (U.S.C.) § 303) protects significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites. Section 4(f) provides that the Secretary of Transportation (Secretary) may approve a transportation project requiring the use of publicly owned land of a public park, recreation area, or land of an historic site of national, state, or local significance, only if there is no feasible and prudent alternative to using that land and the project includes all possible planning to minimize harm resulting from the use.

Section 6(f) of the National Park Service (NPS) Land and Water Conservation Fund (LWCF) Act contains provisions for the protection of federal investments in land and water resources. The LWCF Act discourages the conversion of parks or recreational facilities to other uses. As stated in Section 4.2.4 of this Draft EA, there are no LWCF lands within the General Study Area (GSA) for this EA, thus there are no LWCF lands that would be affected by the Proposed Action.

Two types of impacts to a Section 4(f) resource, physical or constructive use, can occur from a Proposed Action.<sup>12</sup> As described in FAA Order 5050.4B, a determination is made by the FAA if the Proposed Action or a reasonable alternative would eliminate or severely degrade the intended use of the Section 4(f) resource. That is, would the Proposed Action or alternative physically or constructively use (i.e., substantially impair the use) that resource? The responsible FAA official should determine if mitigation is satisfactory to the agency having jurisdiction over the protected resource. If mitigation is unsatisfactory, more detailed, impact analysis is likely needed.

A physical use would occur if the Proposed Action or alternative(s) would involve an actual physical taking of Section 4(f) property through purchase of land or a permanent easement, physical occupation of a portion or all of the property, or alteration of structures or facilities on the property.

With respect to a physical use of historic sites, the Secretary may make a finding of *de minimis* only if—

- A. the Secretary has determined, in accordance with the consultation process required under Section 106 of the National Historic Preservation Act (16 U.S.C. 470f), that—
  - o the transportation program or project will have no adverse effect on the historic site; or
  - o there will be no historic properties affected by the transportation program or project;

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<sup>12</sup> FAA, 2006, Order 5050.4B, National Environmental Policy Act Implementing Instructions for Airport Actions, Table 7-1, page 7.1-2.

- B. the finding of the Secretary has received written concurrence from the applicable State historic preservation officer or tribal historic preservation officer (and from the Advisory Council on Historic Preservation if the Council is participating in the consultation process); and
- C. the finding of the Secretary has been developed in consultation with parties consulting as part of the Section 106 process.

With respect to physical use of parks, recreation areas, or wildlife or waterfowl refuges, the Secretary may make a finding of *de minimis* only if—

- A. the Secretary has determined, after public notice and opportunity for public review and comment, that the transportation program or project will not adversely affect the activities, features, and attributes of the park, recreation area, or wildlife or waterfowl refuge eligible for protection under this section; and
- B. the finding of the Secretary has received concurrence from the officials with jurisdiction over the park, recreation area, or wildlife or waterfowl refuge.<sup>13</sup>

The concept of constructive use is that a project that does not physically use land in a park, for example, may still, by means of noise, air pollution, water pollution, or other impacts, dissipate its aesthetic value, harm its wildlife, restrict its access, and take it in every practical sense. Constructive use occurs when the impacts of a project on a Section 4(f) property are so severe that the activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired. A *de minimis* impact determination is not appropriate for constructive use of a Section 4(f) property because constructive use is defined as substantial impairment, and substantial impairment cannot be considered a *de minimis* impact. The analysis in this EA uses the DNL from Section 5.12 to determine if a constructive use of the property would occur from the Proposed Action.

### 5.7.1 NO ACTION

#### Physical Use

As no physical changes to the Airport would occur under the No Action, implementation of the Future (2021) No Action or Future (2026) No Action would not result in a physical use of Section 4(f) resources.

#### Constructive Use

The noise exposure of the potential Section 4(f) resources under the Future (2021) No Action and Future (2026) No Action are provided in Table 5-8. As shown, there are four potential Section 4(f) resources within the 65+ DNL contours for the Future (2021) No Action and Future (2026) No Action.

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<sup>13</sup> USDOT Act of 1966 (49 U.S.C. § 303).



Table 5-8

SUMMARY OF NOISE EXPOSURE AT POTENTIAL SECTION 4(F) RESOURCES  
– NO ACTION

MAP ID	POTENTIAL SECTION 4(F) RESOURCE	FUTURE (2021) NO ACTION	FUTURE (2026) NO ACTION
17	Ephraim Uitz House and Farmstead	65-70 DNL & 70-75 DNL	65-70 DNL & 70-75 DNL
20	Joel Garnett House	<65 DNL	65-70 DNL
31	England Idlewild Park	65-70 DNL & 70-75 DNL	65-70 DNL & 70-75 DNL
42	World of Golf	<65 DNL	65-70 DNL

Source: Landrum &amp; Brown analysis, 2018.

Ephraim Uitz House<sup>14</sup> – The Ephraim Uitz House is a National Register of Historic Places (NRHP) eligible property located in Burlington, KY owned by Melvin E. Elslager. The property is significant under Criteria C<sup>15</sup> because it is a good example of distinct architectural style (a double cell plan type and Federal style). The property is also significant under Criterion A<sup>16</sup> because it is a good example of what a traditional farm would look and function like in the period of significance (1842 – 1940). The property is currently in use as a residence and working farm.

Joel Garnett House<sup>17</sup> – The Joel Garnett House is an NRHP eligible property located on Conner Road near Hebron, Kentucky. It is recommended for listing on the NRHP under Criteria C because it is a good example of distinct architectural style (hall-parlor). The property is currently in use as a residence and working farm.

England Idlewild Park<sup>18</sup> – England Idlewild Park is approximately 290 acres and consists of wooded areas, open areas, and wetlands. The park offers three fishing ponds that are regularly stocked with bluegill and catfish, three large shelters, 24-Hole Championship Disc Golf Course, baseball and softball fields, basketball courts, soccer fields, a dog park, unpaved mountain bike trails, paved hiking trails with fitness stations, picnic tables, a playground, and England Idlewild Bike Park. The park is owned by KCAB and managed by Boone Country Parks and Recreation.

World of Golf<sup>19</sup> – World of Golf is located in Florence, KY and has an 18-hole golf course, miniature golf, practice range, indoor range, golf simulator and Divots Grill. It is owned by the City of Florence and operated by Landrum Golf Management.

<sup>14</sup> <https://npgallery.nps.gov/pdfhost/docs/NRHP/Text/88003276.pdf>, Accessed, July 5, 2018

<sup>15</sup> This criterion applies to properties significant for their physical design or construction, including such elements as architecture, landscape architecture, engineering, and artwork.

<sup>16</sup> To be considered for listing under Criterion A, a property must be associated with one or more events important in the defined historic context and it must retain historic integrity.

<sup>17</sup> [https://www.bcpl.org/cbc/doku.php/joel\\_garnett\\_house](https://www.bcpl.org/cbc/doku.php/joel_garnett_house),  
[https://www.boonecountyky.org/document\\_center/PlanningCommission/ArchitecturalSurvey.pdf](https://www.boonecountyky.org/document_center/PlanningCommission/ArchitecturalSurvey.pdf),  
Accessed July 5, 2018

<sup>18</sup> [https://www.boonecountyky.org/departments/parks/england\\_idlewild\\_park\\_and\\_dog\\_park.aspx](https://www.boonecountyky.org/departments/parks/england_idlewild_park_and_dog_park.aspx),  
Accessed, July 5, 2018

<sup>19</sup> <https://cincinnatiusa.com/things-to-do/attractions/world-golf>, Accessed, July 5, 2018

### 5.7.2 PROPOSED ACTION

#### Physical Use

Three archeological sites were determined to be eligible for listing on the NRHP under Criteria D (see Section 5.8, Historical Architectural, Archeological, and Cultural Resources) and would be directly impacted by the Proposed Action. However, based on guidance provided in the FAA Order 1050.1F Desk Reference, Section 4(f) does not apply because these NRHP sites are important chiefly for data recovery and not important for preservation in place. Therefore, implementation of the Future (2021) Proposed Action or the Future (2026) Proposed Action would not result in the physical use of any Section 4(f) resource to other purposes.

#### Constructive Use

The noise exposure of the potential Section 4(f) resources under the Future (2021) Proposed Action and Future (2026) Proposed Action is provided in Table 5-9. The World of Golf would shift from being entirely outside the 65 DNL under the Future (2021) No Action to partially within the 65-70 DNL under the Future (2026) No Action. The other three resources would continue to be within the same contour band under both the Future (2021) No Action and Future (2021) Proposed Action. Similarly, each of these resources continue to be within the same contour band under both the Future (2026) No Action and Future (2026) Proposed Action. These noise levels would not substantially impair the properties because the activities, features, and attributes that qualify the properties for protection under Section 4(f) would not be affected by the implementation of the Proposed Action. In addition, the Future (2021) Proposed Action and the Future (2026) Proposed Action would not cause significant air pollutant emissions, water pollutants, or other environmental impacts that could affect the properties. Therefore, the Proposed Action would not result in a constructive use of the properties.

Table 5-9

#### SUMMARY OF NOISE EXPOSURE AT POTENTIAL SECTION 4(F) RESOURCES – COMPARISON OF NO ACTION AND PROPOSED ACTION

MAP ID	POTENTIAL SECTION 4(F) RESOURCE	2021 NO ACTION	2021 PROPOSED PROJECT	2026 NO ACTION	2026 PROPOSED PROJECT
17	Ephraim Uitz House and Farmstead	65-70 DNL & 70-75 DNL	65-70 DNL & 70-75 DNL	65-70 DNL & 70-75 DNL	65-70 DNL & 70-75 DNL
20	Joel Garnett House	<65 DNL	<65 DNL	65-70 DNL	65-70 DNL
31	England Idlewild Park	65-70 DNL & 70-75 DNL	65-70 DNL & 70-75 DNL	65-70 DNL & 70-75 DNL	65-70 DNL & 70-75 DNL
42	World of Golf	<65 DNL	<65 DNL	65-70 DNL	65-70 DNL

Source: Landrum & Brown analysis, 2018.

### 5.7.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

The Proposed Action does not exceed the applicable thresholds of significance. No Section 4(f) protected resources would experience a physical or constructive use resulting from implementation of the Proposed Action for the future years 2021 or 2026. Therefore, no mitigation measures are required.

## 5.8 HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION

This section assesses the potential exposure to hazardous materials, describes the potential for solid waste, and presents pollution prevention measures that would occur as a result of the No Action and Proposed Action.

### 5.8.1 NO ACTION

#### Hazardous Materials/Waste

There would be no change to hazardous materials/waste described in Section 4.2.5 for the No Action. In addition, no sites involving fuel storage, handling, or dispensing of fuels would be affected by the No Action.

#### Solid Waste

The No Action assumes the proposed air cargo facility would not be constructed and therefore would not result in construction debris. It is assumed the air cargo service provider would operate at existing facilities and therefore an increase in operation would occur under the No Action. Therefore, the volume of solid waste generated at the Airport would also increase. Approximately 91,000 tons of solid waste would be generated in the No Action in 2021 and approximately 152,500 tons in 2026.

### 5.8.2 PROPOSED ACTION

#### Hazardous Materials

The DSA has remained largely undeveloped. Surveys found asbestos containing materials within the areas previously used for residences. No other recognized environmental conditions (REC) or Controlled REC (CREC) were observed in the DSA. During construction, contractor staging areas would be located at various locations in the DSA. The staging areas would likely include portable above ground storage tanks for fuel storage. The construction contractor(s) would be required to implement pollution prevention, spill prevention, and response plans documenting the measures that would be taken to prevent accidental releases to the environment and, should they occur, the actions that would be undertaken to minimize the environmental impact. In addition, the contractor would be required to implement site-specific pollution prevention plans (i.e., Spill Prevention Control and Countermeasures Plan) that reduce the potential for substantial impacts associated with regulated materials. Should construction activities discover underground storage tanks, waste materials, or other sources of environmental contamination, regulatory authorities would be notified and the necessary site remediation completed. All hazardous substances and wastes used or generated by the contractors, the Airport, or the tenants would be stored, labeled, and disposed of in accordance with federal and state laws.

The use of fuel, deicing fluids, and other regulated substances necessary for routine operations at the Airport would increase due to the increase in operations at the Airport and development of the air cargo facility. The storage, use, transportation,

and disposal of hazardous materials and other regulated substances is governed by federal, state, and local regulations. These regulations, combined with existing technologies and work practices developed to properly manage these substances, substantially reduce the risks of causing environmental contamination from the construction and operation of the Proposed Project. Therefore, the Proposed Action is not likely to result in significant impacts from hazardous materials or environmental contamination.

### Solid Waste

Solid wastes associated with construction of the Proposed Action are expected to be comprised of waste materials typical of earthwork and paving projects. The volume of solid waste is expected to be minor during construction as most of the earthwork would involve moving dirt from one area to another area within the DSA to achieve the proper grade. Recycling of paper and plastic products could substantially reduce the amount of the construction-related solid wastes. Construction waste not diverted, recycled, or re-used would be transported to and disposed of in local permitted construction/demolition facilities or in accordance with applicable state and local requirements. Therefore, no significant construction-related solid waste impacts would occur.

The number of aircraft operations at the Airport are forecasted to increase with the Proposed Action in 2026. The forecast increase in aircraft operations would similarly increase the volume of solid waste generated at the Airport. In addition, operation of the air cargo facility would generate municipal solid wastes requiring offsite disposal. The estimated volume of solid waste generated from the air cargo facility in 2021 is approximately 91,000 tons. The estimated volume of solid waste generated from the air cargo facility in 2026 is approximately 171,600 tons. This volume of solid waste can be accommodated at the existing landfill facilities without substantially compromising capacity. According to information provided by Bavarian Trucking in 2017, the remaining capacity at the landfill is approximately 7.6 million tons. The Rumpke Landfill, in Pendleton County, 2017 Solid Waste 5-Year Plan indicates the remaining capacity at the landfill is 6 million tons.<sup>20</sup> Therefore, the Proposed Project, in conjunction with area recycling activities, would not significantly impact the capacity of the solid waste systems.

### 5.8.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

Although significant solid waste impacts would not occur with the Proposed Action, measures to minimize the solid waste stream, such as source reduction and recycling strategies, would be developed and implemented by the air cargo service provider through the development of a Recycling and Waste Management Program. This minimization measure consists of the KCAB, the air cargo service provider, on-Airport businesses, and waste handlers working together to develop and implement source reduction strategies to achieve reductions in solid waste disposal volumes generated at CVG. The specifics of this cooperative effort and the costs associated with it will be developed during the development of lease agreements between the KCAB and the air cargo service provider.

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<sup>20</sup> Pendleton County, KY 2017 Comprehensive Plan Update, November 27, 2017

## 5.9 HISTORICAL, ARCHITECTURAL, ARCHEOLOGICAL, AND CULTURAL RESOURCES

This section presents the analysis of potential impacts to Historical, Architectural, Archeological, and Cultural Resources as a result of the No Action and the Proposed Action. The FAA conducted the required consultation with the Kentucky Heritage Council (KHC) under the National Historic Preservation Act of 1966, as amended (NHPA). FAA initiated consultation on July 12, 2018, with the KHC and consulting parties to provide ongoing opportunities for informal and formal review of the **project's potential effect on historic resources**. The Area of Potential Effect (APE) for direct and indirect impacts is described in Section 4.2.6, Historical, Architectural, Archeological, and Cultural Resources, and shown on Exhibit 4-3. The KHC concurred **with FAA's delineation of the APE via email on July 20, 2018** (See Appendix E, *Section 106 Consultation*).

### 5.9.1 NO ACTION

No physical development would occur for the No Action. Therefore, no impacts to historical, architectural, archeological, or cultural resources would occur.

### 5.9.2 PROPOSED ACTION

This section describes the potential impacts, including direct and indirect effects, upon historical, architectural, archeological, and cultural resources due to the Proposed Action. Exhibit 4-3, in Chapter Four of this EA, depicts the Direct and Indirect APE.

#### Direct Effects

Architectural, Phase I, and Phase II archeological surveys were conducted for the proposed undertaking in compliance with Section 106 of the NHPA and guidelines set forth by the KHC and are discussed in Section 4.2.6, *Historical, Architectural, Archeological, and Cultural Resources*. The purpose of the surveys was to identify any historic properties located within the Direct APE that are listed or eligible for listing in the NRHP. 36 C.F.R. § 800.16(l)(1) defines the term Historic property as *"any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places 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 an Indian tribe or Native Hawaiian organization and that meet the National Register criteria."*<sup>21</sup>

In total, there are 19 known archeological sites, three cemeteries, and one structure within the Direct APE that would be removed as part of the Proposed Action. The FAA has determined that 16 of the archeological sites, the three cemeteries, and the one structure are not eligible for inclusion in the NRHP. Two archeological sites (15Be694 and 15Be697) were determined eligible for inclusion in the NRHP. As a result, the FAA made the finding of No Adverse Effect on Historic Properties on

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<sup>21</sup> 36 C.F.R. § 800.16(l)(1) Definition – Historic Property.

20 historic properties and an Adverse Effect on Historic Properties on archeological sites 15Be694 and 15Be697 due to the proposed undertaking in the Direct APE. An additional archeological site (15Be717) was determined to have unsafe conditions to complete the Phase II archeological survey on the site. As a result, this site has been determined to be potentially eligible for the NRHP and FAA determined the proposed undertaking would have an Adverse Effect on Historic Properties. Section 106 Consultation is ongoing with the KHC and will be provided in the Final EA in Appendix E.

### Indirect Effects

FAA also designated an Indirect Effects APE that includes areas around CVG that experience airport noise from aircraft over flights and would experience potential impacts to the view of historic properties. FAA has determined there are two historic properties within the Indirect Effects APE (Ephraim Uitz House and the Joel Garnett House), which are eligible for listing in the NRHP. The Ephraim Uitz House was previously recommended as historically significant and eligible for listing in the NRHP under Criteria A (Association with Events) and Criteria C (Embodiment of Distinctive Architectural Characteristics). The Joel Garnett House was previously recommended as eligible for the NRHP under Criteria C.

In the Future (2021) No Action and Future (2026) No Action noise exposure contours, the Ephraim Uitz House would be exposed to noise levels of 65-70 DNL and the farmstead property would be partially within the 70-75 DNL. Under the Future (2021) Proposed Action and Future (2026) Proposed Action, the Ephraim Uitz House would continue to be exposed to 65-70 DNL and the farmstead property would continue to be partially within the 70-75 DNL. These noise levels would not significantly change **the property's setting or diminish the integrity of the property's** significant features because it would maintain its existing architecture and setting and maintain the association with past events. In addition, the Future (2021) Proposed Action and Future (2026) Proposed Action would not cause significant air pollutant emissions or water pollutants that could affect these structures (See Section 5.4 *Air Quality* and Section 5.15 *Water Resources* for additional information). Therefore, the FAA finds No Adverse Effect from the proposed undertaking on the Ephraim Uitz House and farmstead within the Indirect Effects APE.

In the Future (2021) No Action noise exposure contours, the Joel Garnett House would be exposed to noise levels less than 65 DNL. Under the Future (2021) Proposed Action, the Joel Garnett House would continue to be exposed to noise levels less than 65 DNL. In the Future (2026) No Action noise exposure contours, the Joel Garnett House would be exposed to noise levels of 65-70 DNL. Under the Future (2026) Proposed Action, the Joel Garnett House would continue to be exposed to noise levels of 65-70 DNL. These noise levels would not significantly change **the property's setting or diminish the integrity of the property's** significant features because it would maintain its existing architecture. In addition, the Future (2021) Proposed Action and Future (2026) Proposed Action would not cause significant air pollutant emissions or water pollutants that could affect these structures (See Section 5.4 *Air Quality* and Section 5.15 *Water Resources* for additional information). Therefore, the FAA finds No Adverse Effect from the proposed undertaking on the Joel Garnett House within the Indirect Effects APE.

### 5.9.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

A Memorandum of Agreement (MOA) is being prepared between the FAA, KCAB, and the KHC for the Adverse Effect on sites 15Be694, 15Be697, and 15Be717. A Mitigation Plan is being developed for sites 15Be694 and 15Be697 by the FAA, KCAB, and in consultation with the KHC, specifying the Data Recovery Plan, which is sometimes called Phase III. Phase III data recovery takes place when there will be an adverse effect to a site listed in or eligible for listing in the National Register and mitigation by excavation of all or portions of the site becomes necessary. The MOA will be submitted to the Advisory Council indicating how the adverse effects on the eligible site will be mitigated. The data recovery plan will be appended to or referenced in the MOA. Once accepted by the Advisory Council, the FAA is responsible for carrying out the data recovery plan. The data recovery plan will determine how fieldwork is to be conducted, as well as the structure and content of the mitigation report. The MOA will also include alternate mitigation for site 15Be717 due to the Phase II archeological work on this site not able to be completed due to safety concerns regarding asbestos contamination on the site.

#### Unanticipated Discovery Plan

If previously undocumented buried cultural resources are identified by contractors during construction activities, all work in the immediate vicinity of the discovery would stop until the find can be confirmed by a professional archaeologist and evaluated for its significance. The air cargo service provider will notify KCAB staff of the find and it will be **KCAB's** responsibility to notify the FAA, KHC, and tribal officer if undocumented resources are found. If human remains are uncovered, per Kentucky Revised Statutes 72.020, the local coroner and law enforcement agency must be notified.

## 5.10 LAND USE

This section presents the analysis of potential land use incompatibility of the No Action and the Proposed Action, including potential conflicts with surrounding land uses and zoning with the comprehensive plans of the surrounding communities.

The FAA has not established a significance threshold for land use. The determination that significant impacts exist in the land use impact category is normally dependent on the significance of other impacts. Potential impacts on noise compatible land use are discussed in Section 5.12, Noise and Noise Compatible Land Use. Potential impacts related to potential for disruptions to communities or relocation of residences or businesses is discussed in Section 5.13, Socioeconomics, Environmental Justice, **and Children's** Environmental Health and Safety Risks. Regarding consistency with state and/or local plans, an inconsistency with surrounding land uses and zoning by itself does not automatically result in a significant impact.

### 5.10.1 NO ACTION

No physical development would occur under the No Action. Therefore, no impacts to land use would occur.

### 5.10.2 PROPOSED ACTION

The DSA is located on the southern edge of the Airport in a predominantly commercial area. Currently, the DSA is both on-Airport property and off-Airport property. At the time of the preparation of this document, the air cargo service provider is the owner of the off-Airport property. Negotiations are underway to transfer all of the off-Airport land to the KCAB. Once the ownership of the off-Airport land is transferred to the KCAB, the development would be considered compatible land use. The land **would be zoned as "Airport" district and would be part of the Houston-Donaldson Study Corridor Overlay District.**<sup>22</sup> The development proposed for the on-Airport property is considered a compatible land use.

In addition, the Proposed Action would not create a new wildlife attractant or create an obstruction to navigation airspace per 14 CFR Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*. Therefore, no impacts to land use would occur with implementation of the Proposed Action.

### 5.10.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

The Proposed Project would not result in significant land use impacts. Therefore, there is no mitigation required or proposed.

## 5.11 NATURAL RESOURCES AND ENERGY SUPPLY

This section presents the analysis of potential impacts to natural resources and energy supplies as a result of the No Action and the Proposed Action. The supply of natural resources may be impacted by a construction project because the use of dirt, rock, or gravel could diminish or deplete the supply of those and other natural resources. In addition, the operation of an airport requires energy in the form of electricity, natural gas, aviation fuel, diesel fuel, and gasoline. There are two primary sources of energy consumption at an airport – stationary facilities and aircraft operations. Stationary facilities use utility energy (electricity and natural gas) to provide lighting, cooling, heat, and hot water to buildings, the airfield, and parking areas. Aircraft operations and GSE consume fuel energy including jet fuel (Jet A), low-lead aviation gasoline (AvGas), unleaded gasoline, and diesel fuel to operate the aircraft and power GSE.

### 5.11.1 NO ACTION

#### Natural Resources

Resources such as sand, gravel, stone, concrete, asphalt water, wood, metals, plastic, and other resources are used for airport construction and maintenance. No new facilities would be constructed that would consume natural resources or other construction materials for the No Action. It is expected that small amounts of these materials would be used for general maintenance activities.

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<sup>22</sup> Boone County Zoning Regulations, Boone County Planning Commission, December 4, 2013.



## Electricity

There would be no increase in demand for electricity for the No Action. No facilities or lighting would be constructed in the No Action. Existing electricity resources would continue to power the existing facilities and accommodate the forecast demand for aircraft operations.

## Natural Gas

There would be no increase in demand for natural gas for the No Action. No new facilities would be constructed that would require natural gas due to the No Action. Natural gas resources would continue to power the existing facilities and accommodate the forecast demand for aircraft operations.

## Fuel Consumption

Aviation fuel demand at the Airport is a function of the number of operations at CVG and how they operate. This includes the length of time the aircraft are operating while on the ground and during takeoff and climb out, and the fuel required for the aircraft to reach the flight destination. Aircraft fuel, typically Jet-A or AvGas is provided to airport users by various suppliers that obtain and sell fuel through existing contracts and on an as-needed basis. No new facilities would be constructed that would increase the demand for fuel for the No Action. Current forecasts project growth in aircraft operations at CVG and additional aircraft movements would likely increase fuel consumption. In addition to aircraft fuel, diesel fuel and gasoline are also used to power GSE and other service vehicles at CVG. The fuel requirement for GSE is roughly related to the number of aircraft operations that are serviced, which affects the number of GSE units and the amount of time in which they operate. Aircraft operations are projected to increase for the No Action, which would result in an increase in fuel usage for GSE.

### 5.11.2 PROPOSED ACTION

The Proposed Action would include the construction of new facilities. Operation of these proposed facilities would require the use of electricity, natural gas, and water. Electricity is used to power and light the buildings and to light the parking areas. Natural gas is used for gas-fired water heaters, kitchen equipment, and other gas-fired appliances. The Proposed Action would increase the amount of electricity, natural and natural gas consumed at CVG. Energy conservation features would be incorporated into the design of the proposed projects where feasible.

The objective of the assessment is to determine whether the Proposed Action would have the potential to exceed the local energy supply as compared to the No Action. The FAA has not established a significance threshold for natural resources and energy supply; however, per FAA Order 1050.1F, the analysis should consider situations in which the proposed action or alternative(s) would have the potential to cause demand to exceed available or future supplies of these resources. The analysis includes a discussion of the future demands for energy and natural resources, including changes in demand for utility services, fuel consumption, and consumable materials for operation and construction activities. The assessment also determined whether there

would be a requirement for the use of rare natural resources that could potentially deplete the supply of natural resources in the area.

## Electricity

The Proposed Action would include the construction of new facilities. Operation of these proposed facilities would require the use of electricity to power and light the buildings and to light the parking areas. The Proposed Action would increase the amount of electricity consumed at CVG. Estimates of electricity usage were provided by the air cargo service provider and based on the proposed facilities to be constructed. The estimates did not include the use of LED lighting in order to present the maximum potential demand for electricity. It is estimated that proposed facility would require approximately 55,000-kilowatt hours (kWh) per year. The electric utility, Duke Energy Kentucky, was contacted to determine if the utility has the capacity to meet the estimated increase in demand. Duke Energy Kentucky confirmed they have sufficient capacity to supply the potential increase in electricity demand from the Proposed Action.<sup>23</sup> Therefore, while implementing the Proposed Action would potentially increase the demand for electricity, the potential demand would not exceed the existing and future supplies.

## Natural Gas

As a result of implementing the Proposed Action, additional natural gas would be needed to provide for the proposed facilities. During construction, it is not anticipated there would be any additional need for natural gas. The estimated increase in natural gas demand due to the Proposed Action is 410 million British thermal units (BTU).<sup>24</sup> While implementing the Proposed Action would potentially increase the demand for natural gas, the potential demand would not exceed the available current and future supplies due to existing and future natural gas capacity. The natural gas utility, Duke Energy Kentucky, was contacted to determine if the utility has the capacity to meet the estimated increase in demand. Duke Energy Kentucky stated they have sufficient capacity to supply the potential increase in natural gas demand due to implementing the Proposed Action.<sup>25</sup> However, a new gas line would need to be installed along Aero Parkway. The potential impacts of this new gas line are included as an element of the Proposed Action and included in the DSA. Physical impacts are assessed in Section 5.5, Biological Resources; Section 5.8, Historic, Architectural, Archeological, and Cultural Resources; and Section 5.15, Water Resources of this EA.

## Fuel Consumption

No change in the number of aircraft operations would occur in the Future (2021) Proposed Action when compared to the No Action as it is assumed aircraft operations would be accommodated with existing facilities. In the Future (2026) Proposed Action, additional aircraft operations would be accommodated by the proposed air cargo facility, resulting in an increase in fuel consumption. However, due to availability of fuel in the region, any increase in demand is expected to be minimal and would not exceed the existing supplies. During construction, it is anticipated

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<sup>23</sup> Meeting with Duke Energy, May 2, 2018

<sup>24</sup> One BTU of heat is equal to 1/180 of the heat required to raise the temperature of one pound of water from 32 degrees Fahrenheit to 212 degrees Fahrenheit at a constant pressure of one atmosphere.

<sup>25</sup> Meeting with Duke Energy, May 2, 2018

there would be increased demand for diesel fuel for construction vehicles. Table 5-10 presents the fuel consumption for the Proposed Action compared to the No Action Alternative for each future year.

Table 5-10  
Fuel Consumption

	Future (2021) No Action	Future (2021) Proposed Action	Future (2026) No Action	Future (2026) Proposed Action
Fuel Usage (gallons/day)	48,083	48,083	59,437	61,582

Source: AEDT version 2d, Landrum & Brown analysis, 2018.

## Natural Resources

There would be no increased demand for natural resources due to the Proposed Action as compared to the No Action for operational purposes. However, as a result of implementing the Proposed Action, proposed construction activities would require natural resources such as steel, gravel, sand, aggregate, concrete, asphalt, water, and other construction materials. These materials are not in short supply in the Greater Cincinnati and Northern Kentucky area and consumption of these materials is not expected to deplete or cause a shortage of existing supplies.

### 5.11.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

Demand for energy or natural resources identified due to the Proposed Action would not exceed current or future supplies. The Proposed Action does not exceed the applicable thresholds of significance; therefore, no mitigation measures are required.

## 5.12 NOISE AND NOISE-COMPATIBLE LAND USE

This section presents the analysis of aircraft noise exposure to surrounding communities as a result of the No Action and the Proposed Action. Additional information on the background and characteristics of noise are provided in Appendix F, *Noise*. The impact of airport-related noise levels upon the surrounding area is presented in terms of the number and type of noise-sensitive land uses located within the noise contours for the Proposed Action and the No Action for both 2021 and 2026. This is in accordance with FAA Order 1050.1F guidance, which specifies that an operational impact analysis should be prepared for the year of anticipated project implementation and five years after implementation.<sup>26</sup>

The analysis of noise exposure around CVG was prepared using the latest version of the AEDT, Version 2d. Inputs to the AEDT include number of aircraft operations during the time period evaluated, the types of aircraft flown, time of day aircraft operations occur, runway definition, how frequently each runway is used for arriving and departing aircraft, the routes of flight used when arriving to and departing from the runways, the proportional use of those flight routes, and the length of the trips. The AEDT calculates noise exposure for the area around the airport and outputs contours of equal noise exposure using the Day-Night Average Sound Level (DNL) metric. For this EA, equal noise contours for the levels of DNL 65, 70, and 75 dB were calculated and represent average-annual day conditions.

### 5.12.1 NO ACTION

#### 5.12.1.1 Future (2021) No Action

Exhibit 5-1, *Future (2021) No Action Noise Exposure Contours* reflects the Future (2021) No Action average-annual noise contours at CVG. The 65+ DNL of the Future (2021) No Action Noise Exposure Contour encompasses approximately 11.2 square miles. The Future (2021) No Action Noise Exposure Contour is larger than the Existing Noise Exposure Contour due to the forecasted increase in aircraft operations, which includes general growth in aviation demand and the expected increase in cargo operations that would occur with or without the Proposed Action.

The Future (2021) No Action Noise Exposure Contour retains a similar shape as the Existing Noise Exposure contour because runway use patterns and flight tracks are expected to remain similar.

There are no public schools, churches, nursing homes, hospitals, or libraries within any of the contours. Summaries of the residential population and housing units affected by noise levels exceeding 65 DNL for the Future (2021) No Action Noise Exposure Contours are provided in Table 5-11.

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<sup>26</sup> FAA, 2015, 1050.1F Desk Reference, *Environmental Impacts: Policies and Procedures*, 11. Noise and Noise-Compatible Land Use, 11.3 Environmental Consequences.

Table 5-11

## FUTURE (2021) NO ACTION INCOMPATIBILITIES

FUTURE (2021) NO ACTION	65-70 DNL	70-75 DNL	75+ DNL	TOTAL
RESIDENCES				
Mitigated <sup>1</sup>	174	2	0	176
Unmitigated	85	4	0	89
Previously Offered but Refused	31	2	0	33
Never Offered Mitigation <sup>2</sup>	54	2	0	56
Total	259	6	0	265
ESTIMATED POPULATION				
Mitigated <sup>1</sup>	466	6	0	472
Unmitigated	236	12	0	248
Previously Offered but Refused	84	6	0	91
Never Offered Mitigation <sup>2</sup>	151	6	0	157
Total	702	18	0	720
NOISE-SENSITIVE FACILITIES (NSF)				
Schools	0	0	0	0
Churches	0	0	0	0
Nursing Homes	0	0	0	0
Hospitals	0	0	0	0
Libraries	0	0	0	0

1. Residences were mitigated through previous Part 150 Studies conducted by KCAB.

2. Residence was either built after Part 150 mitigation program, never in the 65 DNL of an official Noise Exposure Map, or an ineligible property.

Notes: Population numbers are estimates based on the 2010 U.S. Census average household size per number of housing units.

Source: Landrum & Brown, 2018.

### 5.12.1.2 Future (2026) No Action

The Future (2026) No Action Noise Exposure Contour, showing 65, 70, and 75 DNL levels, is presented on Exhibit 5-2, *Future (2026) No Action Noise Exposure Contours*. The 65+ DNL of the Future (2026) No Action Noise Exposure Contour encompasses approximately 13.3 square miles. The Future (2026) No Action Noise Exposure Contour retains a similar shape as the Future (2021) No Action Noise Exposure Contour, but is larger due to the forecasted increase in aircraft operations. There are no public schools, churches, nursing homes, hospitals, or libraries within any of the contours. Summaries of the residential population and housing units affected by noise levels exceeding 65 DNL for the Future (2026) Noise Exposure Contours are provided in Table 5-12.

Table 5-12

#### FUTURE (2026) NO ACTION INCOMPATIBILITIES

FUTURE (2026) NO ACTION	65-70 DNL	70-75 DNL	75+DNL	TOTAL
<b>RESIDENCES</b>				
Mitigated <sup>1</sup>	233	4	0	237
Unmitigated	172	4	0	176
Previously Offered but Refused	43	2	0	45
Never Offered Mitigation <sup>2</sup>	129	2	0	131
Total	405	8	0	413
<b>ESTIMATED POPULATION</b>				
Mitigated <sup>1</sup>	621	11	0	632
Unmitigated	411	12	0	423
Previously Offered but Refused	115	6	0	122
Never Offered Mitigation <sup>2</sup>	296	6	0	301
Total	1,032	23	0	1,055
<b>NOISE-SENSITIVE FACILITIES (NSF)</b>				
Schools	0	0	0	0
Churches	0	0	0	0
Nursing Homes	0	0	0	0
Hospitals	0	0	0	0
Libraries	0	0	0	0

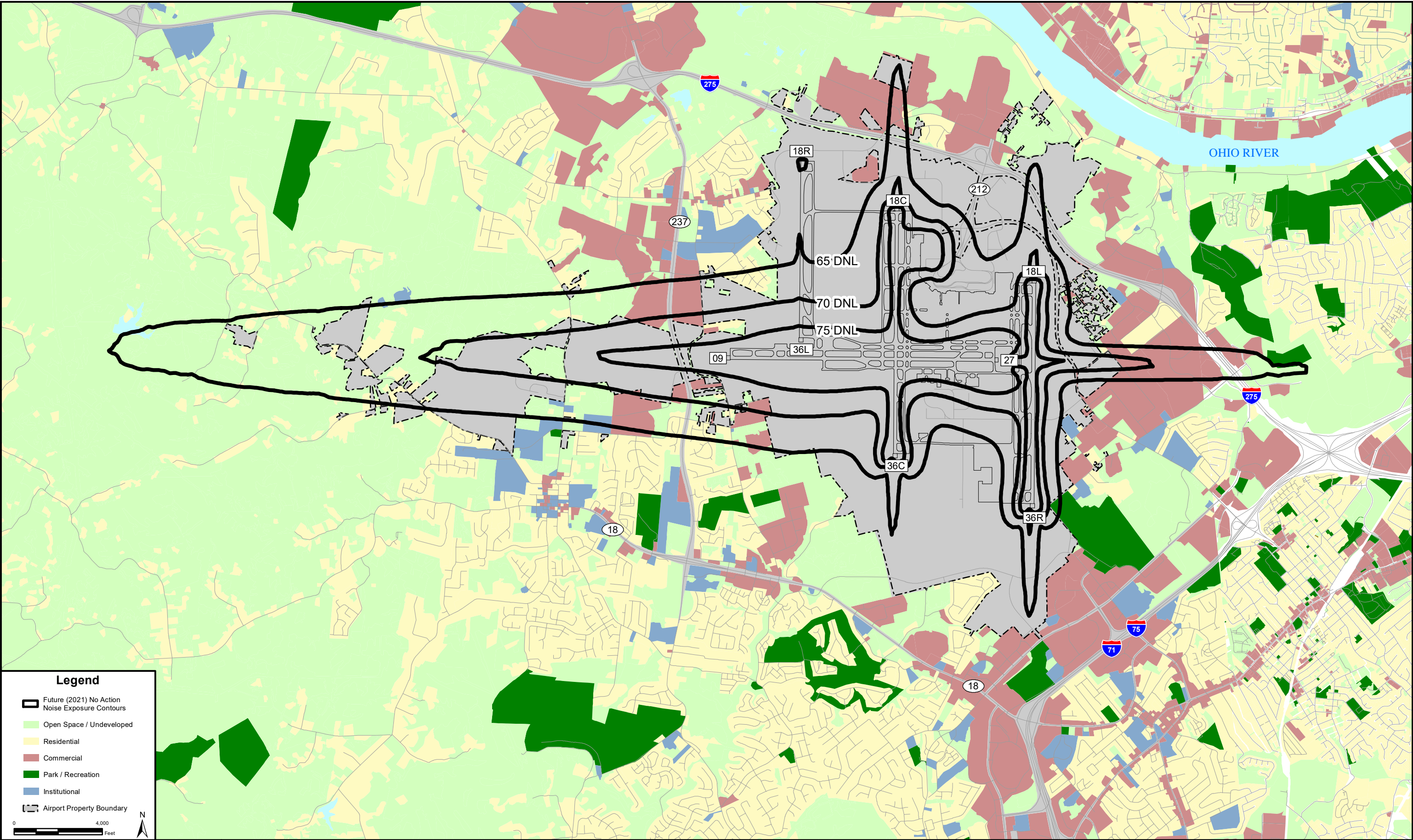
1. Residences were mitigated through previous Part 150 Studies conducted by KCAB.

2. Residence was either built after Part 150 mitigation program, never in the 65 DNL of an official Noise Exposure Map, or an ineligible property.

Notes: Population numbers are estimates based on the 2010 U.S. Census average household size per number of housing units.

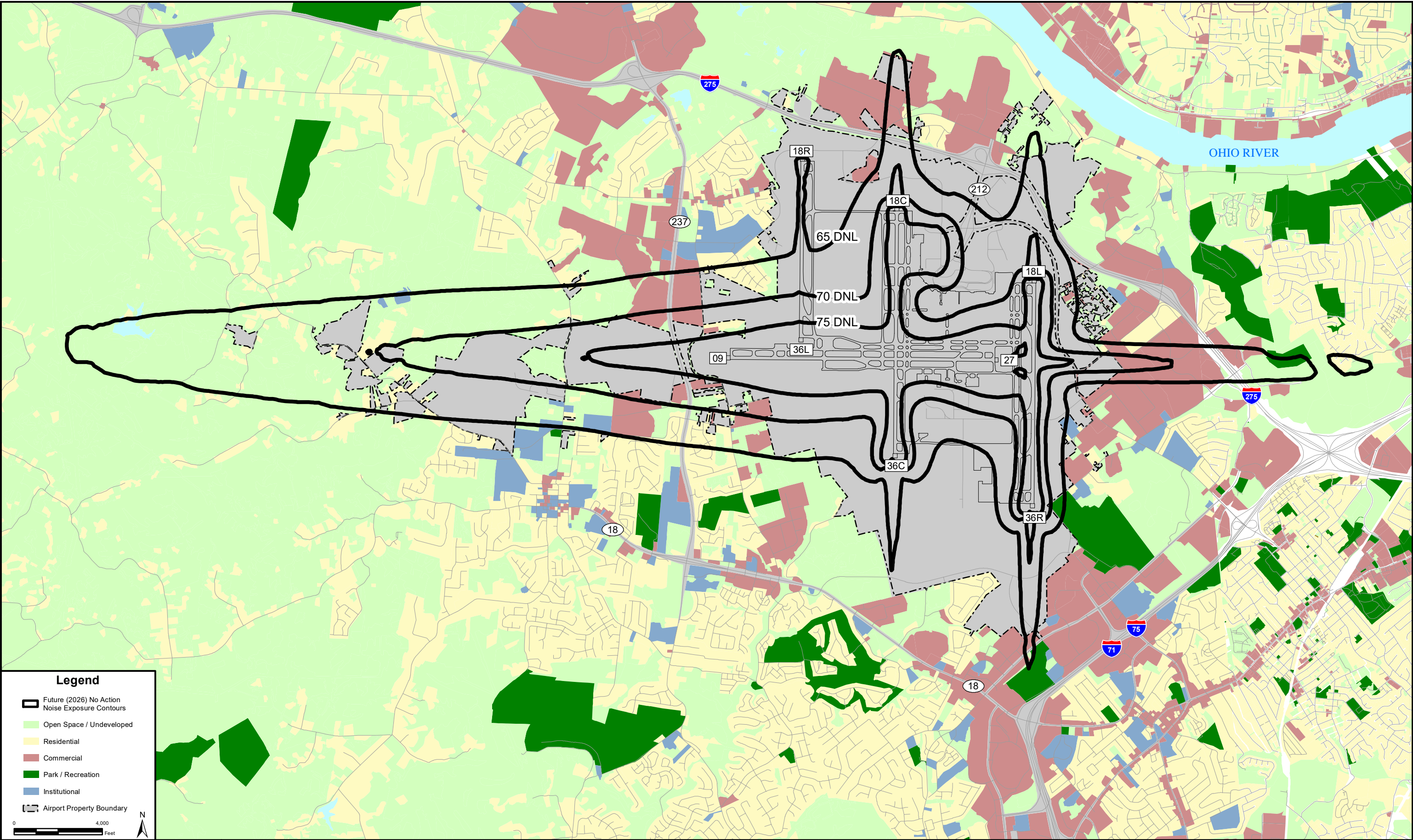
Source: Landrum & Brown, 2018.





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## 5.12.2 PROPOSED ACTION

### 5.12.2.1 Future (2021) Proposed Action

The Future (2021) Proposed Action Noise Exposure Contour, showing 65, 70, and 75 DNL levels, is presented on Exhibit 5-3, *Future (2021) Proposed Action Noise Exposure Contours*. The 65+ DNL of the Future (2021) Proposed Action Noise Exposure Contour encompasses approximately 11.2 square miles. Summaries of the residential population and housing units affected by noise levels exceeding 65 DNL for the Future (2021) Proposed Action Noise Exposure Contours are provided in Table 5-13.

Table 5-13

#### FUTURE (2021) PROPOSED ACTION INCOMPATIBILITIES

FUTURE (2021) PROPOSED ACTION	65-70 DNL	70-75 DNL	75+DNL	TOTAL
<b>RESIDENCES</b>				
Mitigated <sup>1</sup>	174	2	0	176
Unmitigated	85	4	0	89
Previously Offered but Refused	31	2	0	33
Never Offered Mitigation <sup>2</sup>	54	2	0	56
Total	259	6	0	265
<b>ESTIMATED POPULATION</b>				
Mitigated <sup>1</sup>	466	6	0	472
Unmitigated	236	12	0	248
Previously Offered but Refused	84	6	0	91
Never Offered Mitigation <sup>2</sup>	151	6	0	157
Total	702	18	0	720
<b>NOISE-SENSITIVE FACILITIES (NSF)</b>				
Schools	0	0	0	0
Churches	0	0	0	0
Nursing Homes	0	0	0	0
Hospitals	0	0	0	0
Libraries	0	0	0	0

1. Residences were mitigated through previous Part 150 Studies conducted by KCAB.

2. Residence was either built after Part 150 mitigation program, never in the 65 DNL of an official Noise Exposure Map, or an ineligible property.

Notes: Population numbers are estimates based on the 2010 U.S. Census average household size per number of housing units.

Source: Landrum & Brown, 2018.

The Future (2021) Proposed Action Noise Exposure Contour is similar in shape and size to the Future (2021) No Action Noise Contour. There would be no change to the number of arrivals and departure, nor would there be any change to runway use or flight tracks. Under the Future (2021) No Action, run-ups would occur on the north airfield to the east of Runway 18C. Under the Future (2021) Proposed Action, run-ups would occur at the proposed cargo facility on the south airfield. Therefore, the size of the Future (2021) Proposed Action noise contour increases within the south airfield between Runway 36C and Runway 36R and decreases within the north airfield east of Runway 18C.

A noise impact would be considered to be significant if there were an increase of 1.5 decibel (dB) or more over noise-sensitive facilities within the 65 DNL contour when comparing the No Action and Proposed Action of the same corresponding year.<sup>27</sup> The Future (2021) Proposed Action, compared to the Future (2021) No Action, and the area of 1.5 DNL increase within the 65 DNL is shown on Exhibit 5-4, *Future (2021) No Action Noise Exposure Contours Compared to Future (2021) Proposed Action Noise Exposure Contours*. The 1.5 dB increase area remains over compatible Airport-owned land. Therefore, no significant noise impacts would occur with the Proposed Action. As shown in Table 5-14, there are no new residences or Noise Sensitive Facilities (NSF) exposed to 65 DNL.

Table 5-14

NEW RESIDENCES AND NOISE-SENSITIVE FACILITIES EXPOSED TO 65 DNL IN THE FUTURE (2021) PROPOSED ACTION NOISE EXPOSURE CONTOUR

NEWLY IN FUTURE (2021) PROPOSED ACTION	65-70 DNL	70-75 DNL	75+DNL	TOTAL
<b>RESIDENCES</b>				
Mitigated <sup>1</sup>	0	0	0	0
Unmitigated	0	0	0	0
Previously Offered but Refused	0	0	0	0
Never Offered Mitigation <sup>2</sup>	0	0	0	0
Total	0	0	0	0
<b>ESTIMATED POPULATION</b>				
Mitigated <sup>1</sup>	0	0	0	0
Unmitigated	0	0	0	0
Previously Offered but Refused	0	0	0	0
Never Offered Mitigation <sup>2</sup>	0	0	0	0
Total	0	0	0	0
<b>NOISE-SENSITIVE FACILITIES (NSF)</b>				
Schools	0	0	0	0
Churches	0	0	0	0
Nursing Homes	0	0	0	0
Hospitals	0	0	0	0
Libraries	0	0	0	0

1. Residences were mitigated through previous Part 150 Studies conducted by KCAB.

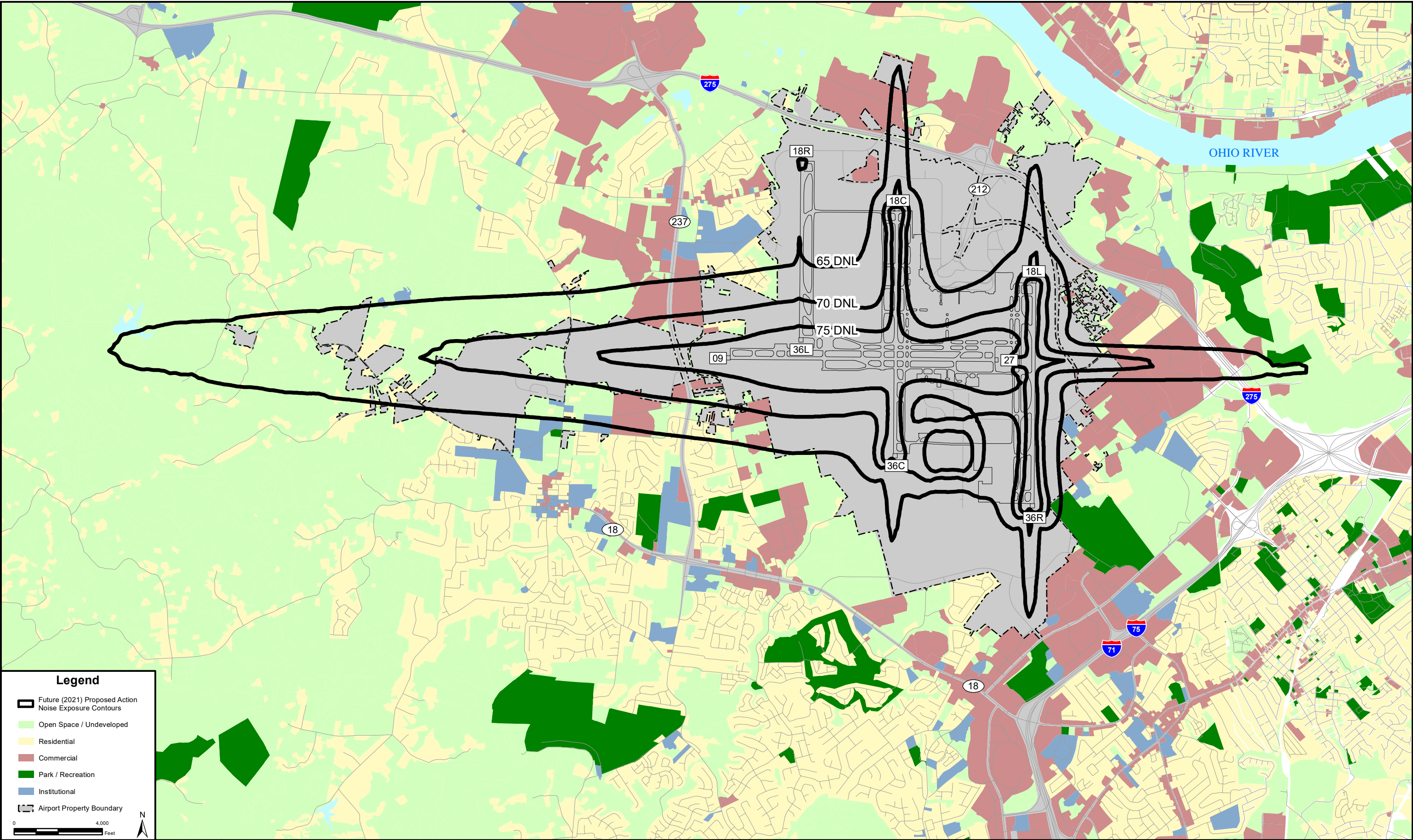
2. Residence was either built after Part 150 mitigation program, never in the 65 DNL of an official Noise Exposure Map, or an ineligible property.

Notes: Population numbers are estimates based on the 2010 U.S. Census average household size per number of housing units.

Source: Landrum & Brown, 2018.

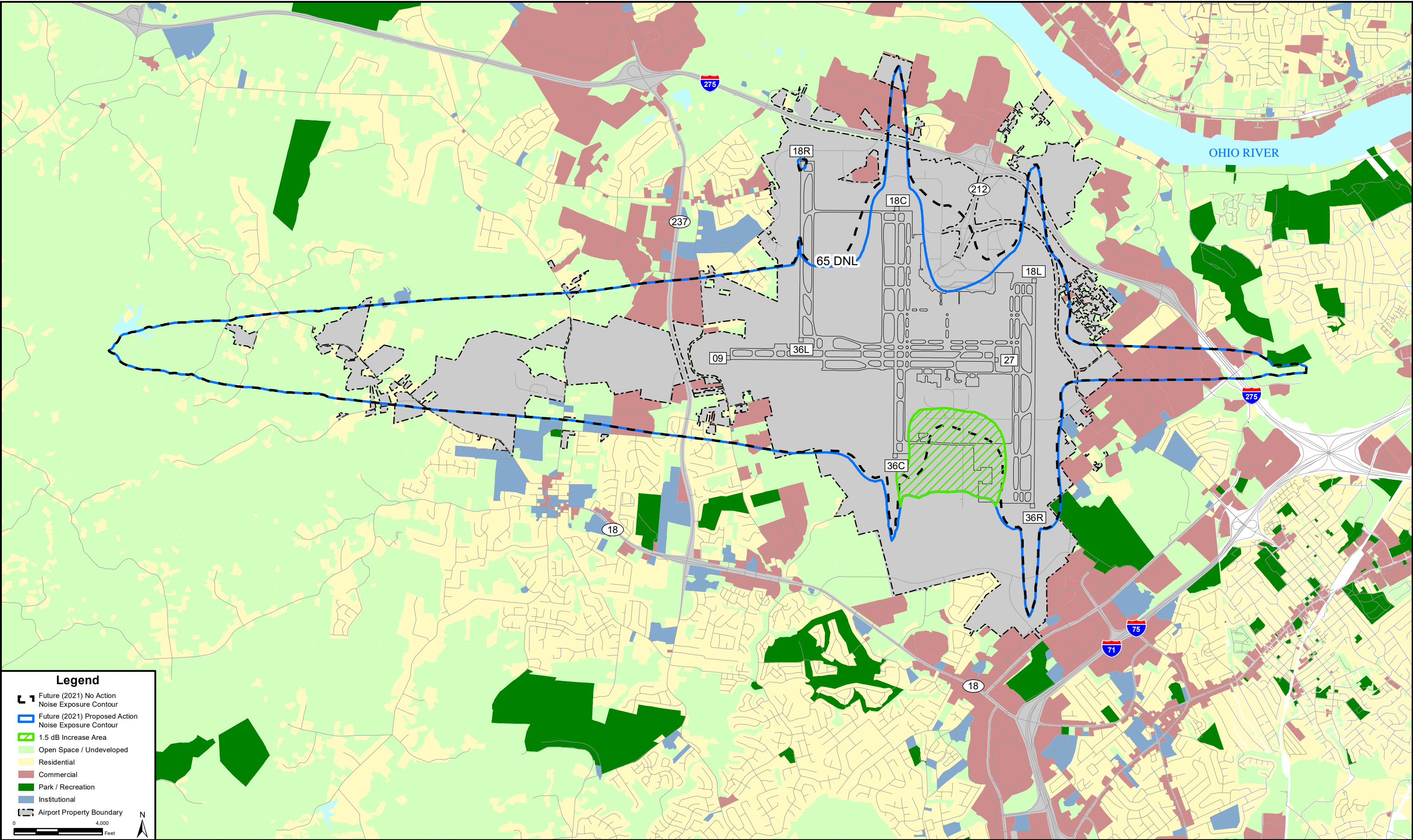
<sup>27</sup> FAA Order 1050.1F, Environmental Impacts: Policies and Procedures, Section 4.3-3 Significance Thresholds.





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### 5.12.2.2 Future (2026) Proposed Action

The Future (2026) Proposed Action Noise Exposure Contour, showing 65, 70, and 75 DNL levels, is presented on Exhibit 5-5, *Future (2026) Proposed Action Noise Exposure Contours*. The 65+ DNL of the Future (2026) Proposed Action Noise Exposure Contour encompasses approximately 13.9 square miles. Summaries of the residential population and housing units affected by noise levels exceeding 65 DNL for the Future (2026) Proposed Action Noise Exposure Contours are provided in Table 5-15.

Table 5-15

#### FUTURE (2026) PROPOSED ACTION INCOMPATIBILITIES

FUTURE (2026) PROPOSED ACTION	65-70 DNL	70-75 DNL	75+DNL	TOTAL
<b>RESIDENCES</b>				
Mitigated <sup>1</sup>	245	6	0	251
Unmitigated	209	5	0	214
Previously Offered but Refused	44	3	0	47
Never Offered Mitigation <sup>2</sup>	165	2	0	167
Total	454	11	0	465
<b>ESTIMATED POPULATION</b>				
Mitigated <sup>1</sup>	650	17	0	667
Unmitigated	477	14	0	491
Previously Offered but Refused	118	9	0	126
Never Offered Mitigation <sup>2</sup>	359	6	0	365
Total	1,127	31	0	1,158
<b>NOISE-SENSITIVE FACILITIES (NSF)</b>				
Schools	0	0	0	0
Churches	0	0	0	0
Nursing Homes	0	0	0	0
Hospitals	0	0	0	0
Libraries	0	0	0	0

1. Residences were mitigated through previous Part 150 Studies conducted by KCAB

2. Residence was either built after Part 150 mitigation program, never in the 65 DNL of an official Noise Exposure Map, or an ineligible property.

Notes: Population numbers are estimates based on the 2010 U.S. Census average household size per number of housing units.

Source: Landrum & Brown, 2018.

The Future (2026) Proposed Action Noise Exposure Contour retains a similar shape as the Future (2026) No Action Noise Exposure Contour, but is larger due to the increase in aircraft operations that would occur as a result of the implementation of the Proposed Action. Similar to 2021, the primary difference in the shape of the Future (2026) Proposed Action noise contour compared to the Future (2026) No Action noise contour is due to the location of the aircraft run-ups associated with the cargo facility.

Exhibit 5-6, *Future (2026) No Action Noise Exposure Contours Compared to Future (2026) Proposed Action Noise Exposure Contours* shows the Future (2026) Proposed Action compared to the Future (2026) No Action and the area of 1.5 dB increase within the 65 DNL. The 1.5 DNL increase area remains over compatible Airport-owned land. Therefore, no significant noise impacts would occur with the Proposed Action. However as shown in Table 5-16, there are 52 new residences exposed to 65 DNL. Of the 52 residences, 14 were mitigated through a previous Part 150 Study, two were offered mitigation but refused, and 36 were never offered mitigation. Of the 36 residences never offered mitigation five were either built after the previous mitigation program or were considered ineligible due to the type of construction and 31 are newly in the 65 DNL.

Table 5-16

NEW RESIDENCES AND NOISE-SENSITIVE FACILITIES EXPOSED TO 65 DNL IN THE FUTURE (2026) PROPOSED ACTION NOISE EXPOSURE CONTOUR

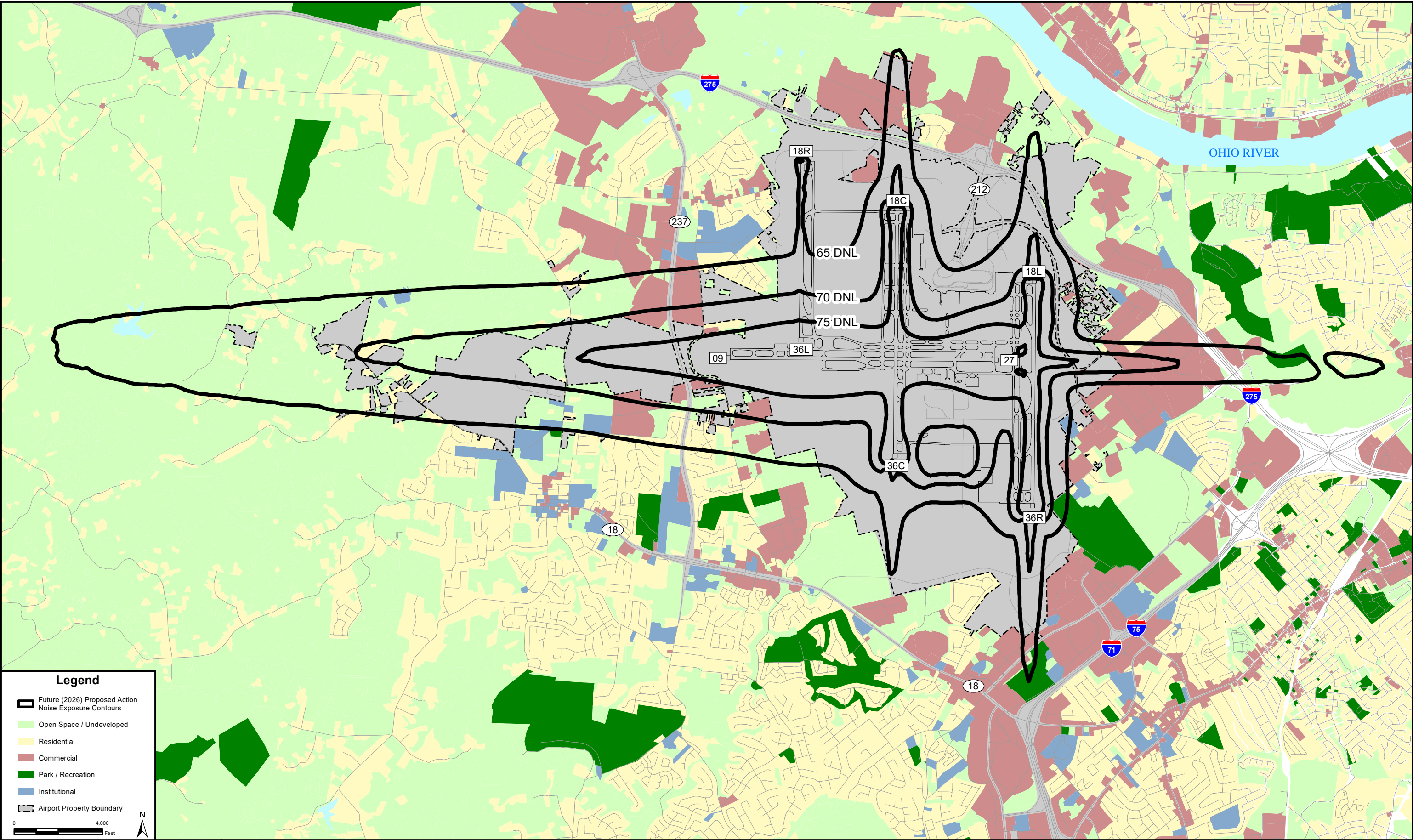
NEWLY IN FUTURE (2026) PROPOSED ACTION	65-70 DNL	70-75 DNL	75+DNL	TOTAL
<b>RESIDENCES</b>				
Mitigated <sup>1</sup>	14	0	0	14
Unmitigated	38	0	0	38
Previously Offered but Refused	2	0	0	2
Never Offered Mitigation <sup>2</sup>	36	0	0	36
Total	52	0	0	52
<b>ESTIMATED POPULATION</b>				
Mitigated <sup>1</sup>	35	35	0	69
Unmitigated	68	68	0	136
Previously Offered but Refused	5	5	0	9
Never Offered Mitigation <sup>2</sup>	63	63	0	127
Total	102	102	0	205
<b>NOISE-SENSITIVE FACILITIES (NSF)</b>				
Schools	0	0	0	0
Churches	0	0	0	0
Nursing Homes	0	0	0	0
Hospitals	0	0	0	0
Libraries	0	0	0	0

1. Residences were mitigated through previous Part 150 Studies conducted by KCAB

2. Residence was either built after Part 150 mitigation program, never in the 65 DNL of an official Noise Exposure Map, or an ineligible property.

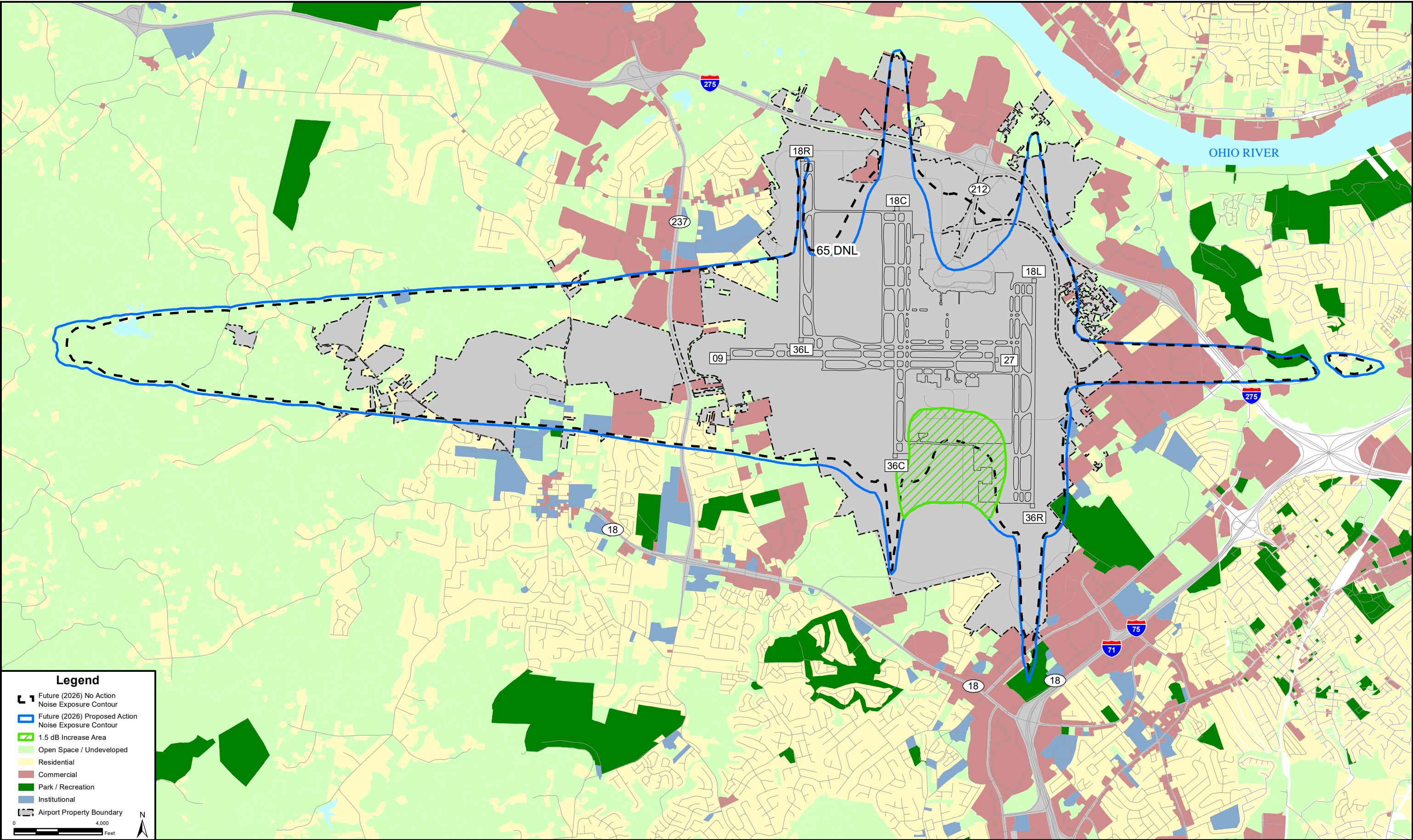
Notes: Population numbers are estimates based on the 2010 U.S. Census average household size per number of housing units.

Source: Landrum & Brown, 2018.



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## Construction

Table 5-17 depicts an estimate of the typical maximum sound level energy from various types of construction equipment that is likely to be used during construction of the Proposed Action. The total sound energy would be a product of a machine's sound level, the number of such machines in service, and the average time they operate.

Construction activities associated with the Proposed Action would result in temporary noise impacts to the residential areas surrounding the DSA. However, major construction activities would be limited to daylight hours. Additionally, noise from construction equipment would likely not be discernible from other background noise sources such as aircraft and roadway noise in most locations.

Table 5-17  
CONSTRUCTION EQUIPMENT NOISE

Construction Equipment	Typical Maximum Sound Level (Lmax) in dB(A) at 50 feet
Dump Truck	76
Concrete Mixer Truck	79
Chain Saw	84
Crane	81
Jackhammer	89
Scraper	84
Man Lift	75
Dozer	82
Tractor	84
Paver	77
Roller	80
Generator	81
Impact Pile Driver	101
Rock Drill	81
Pump	81
Pneumatic Tools	85
Backhoe	78

Source: Federal Highway Administration, *Construction Noise Handbook, 9.0 Construction Equipment Noise Levels and Ranges*. Available online at [https://www.fhwa.dot.gov/Environment/noise/construction\\_noise/handbook/handbook09.cfm](https://www.fhwa.dot.gov/Environment/noise/construction_noise/handbook/handbook09.cfm) Accessed May 2018.

### 5.12.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

No significant noise impacts would occur due to the Proposed Action in 2021 or 2026; therefore, no mitigation measures are required. However, in 2026 it is acknowledged that 43 residences may be newly exposed to 65 DNL. Given that the certainty of these impacts is unclear, it is not prudent to offer mitigation at this time. In order to address these potential impacts, KCAB commits to updating the 2006 Part 150 Study Update a full calendar year after opening of the air cargo facility to analyze noise impacts and to determine if updates to the current noise abatement program, including offering mitigation, would minimize impacts to residences in the 65+ DNL contour.

### 5.13 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, AND CHILDREN'S HEALTH AND SAFETY RISKS

This section presents the analysis of potential impacts to socioeconomic impacts, **environmental justice impacts, and children's environmental health and safety risks** that would occur as a result of the No Action and the Proposed Action.

#### 5.13.1 NO ACTION

##### Socioeconomic Impacts

Socioeconomic impacts are assessed to determine the effect that the proposed airport development would have on human environment such as population, employment, housing, and public services. The types of socioeconomic impacts that typically arise from airport development are:

- Inducing substantial economic growth in an area, either directly or indirectly (e.g., through establishing projects in an undeveloped area);
- Disrupting or dividing the physical arrangement of an established community;
- Causing extensive relocation when sufficient replacement housing is unavailable;
- Causing extensive relocation of community businesses that would cause severe economic hardship for affected communities;
- Disrupting local traffic patterns and substantially reducing the levels of service of roads serving an airport and its surrounding communities; or
- Producing a substantial change in the community tax base.

Inducing Growth: With or without the development of the new air cargo facility, it is assumed the air cargo service provider would continue to operate at existing facilities and grow at CVG, as described in Chapter 3. As a result, it is anticipated the air cargo service provider would directly employ approximately 2,720 people by 2021 and 4,550 people by 2026 from the surrounding local communities. It is also expected, that indirect economic growth in the surrounding communities would occur to support the operation and the employees.

Disrupting Communities: The No Action would not disrupt or divide an established community. Therefore, no impacts to socioeconomic resources would occur as a result of disruption to an established community.

Relocation of Residences: The No Action would not result in the acquisition or relocation of residential properties. Therefore, no impacts to socioeconomic resources would occur as a result of relocation of residences.

Relocation of Businesses: The No Action would not result in relocation of community businesses located on or off-Airport. Therefore, no impacts to socioeconomic resources would occur as a result of relocation of businesses.



Disruptions of Local Traffic Patterns: The No Action would not result in modifications to off-Airport roadways. However, a reduction in the level of service on roads serving the Airport is expected from the increased traffic from employees and delivery trucks.

Substantial Loss in Community Tax Base: The No Action would not result in a substantial loss in community tax base. Therefore, no impacts to socioeconomic resources would occur as a result.

## Environmental Justice

As previously described in the regulatory setting in Chapter Four, Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, requires all federal agencies to address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. The EO also directs federal agencies to incorporate environmental justice as part of their overall mission by conducting their programs and activities in a manner that provides minority and low-income populations an opportunity to participate in agency programs and activities.

The USDOT Order 5610.2(a) provides definitions for minority and low income populations:

- a. Low-Income means a person whose median household income is at or below the Department of Health and Human Services poverty guidelines.
- b. Minority means a person who is:
  - (1) Black: a person having origins in any of the black racial groups of Africa;
  - (2) Hispanic or Latino: a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race;
  - (3) Asian American: a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent;
  - (4) American Indian and Alaskan Native: a person having origins in any of the original people of North America, South America (including Central America), and who maintains cultural identification through tribal affiliation or community recognition; or
  - (5) Native Hawaiian and Other Pacific Islander: people having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
- c. Low-Income Population means any readily identifiable group of low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed USDOT program, policy or activity.

- d. Minority Population means any readily identifiable groups of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed USDOT program, policy or activity.

The EO relates to requirements in Title VI of the *Civil Rights Act of 1964* (Title VI), the NEPA, the *Uniform Relocation Assistance and Real Property Acquisition Policies Act* (Title 49 C.F.R. § 24), and other applicable statutes and regulations. Title VI provides that no person will, on the grounds of race, color, religion, sex, national origin, marital status, disability, or family composition, be excluded from participation in, be denied the benefits of, or be otherwise subject to discrimination under any program of the federal, state, or local government. Title VIII of the *1968 Civil Rights Act* guarantees each person equal opportunity in housing.

FAA Order 1050.1F provides guidance for the preparation of environmental justice analysis in support of an EA. The action would have the potential to lead to a disproportionately high and adverse impact to an environmental justice population, i.e., a low-income or minority population, due to:

- Significant impacts in other environmental impact categories; or
- Impacts on the physical or natural environment that affect an environmental justice population in a way that the FAA determines are unique to the environmental justice population and significant to that population.

Disproportionately high and adverse effect on minority and low-income populations means an adverse effect that:

1. Is predominately borne by a minority population and/or a low-income population; or
2. Will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the nonminority population and/or non-low-income population.

Based on a review of the direct and indirect effects and the population characteristics of the area around the Airport, no impact category would have significant impacts. Therefore, no impacts to minority or low-income populations would occur under the No Action.

### **Children's Environmental Health and Safety Risks**

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, requires all federal agencies to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. No physical development would occur for the No Action. Therefore, **no impacts to children's environmental health and safety risks would occur.**

### 5.13.2 PROPOSED ACTION

#### Socioeconomic Impacts

Inducing Growth: With the development of the new air cargo facility, it is anticipated the air cargo service provider would directly employ approximately 2,720 people by 2021 and 5,120 people by 2026 from the surrounding local communities. The Future (2021) Proposed Action and the Future (2021) No Action have the same number of employees because it is assumed all of the forecasted activity would be accommodated at existing facilities at CVG. The Future (2026) Proposed Action, results in an increase of approximately 285 employees over the Future (2026) No Action. This increase is due to the air cargo facility accommodating all of the forecasted activity, where it was assumed the Future (2026) No Action would not accommodate all of the activity. It is also expected that indirect economic growth in the surrounding communities would occur to support the operation and the employees.

Disrupting Communities: The Proposed Action would not disrupt or divide an established community. Therefore, no impacts to socioeconomic resources would occur as a result of disruption to an established community.

Relocation of Residences: The Proposed Action would not result in the acquisition or relocation of residential properties. Therefore, no impacts to socioeconomic resources would occur as a result of relocation of residences.

Relocation of Businesses: The Proposed Action would not result in relocation of community businesses located on or off-Airport. Therefore, no impacts to socioeconomic resources would occur as a result of relocation of businesses.

Disruptions of Local Traffic Patterns: The Proposed Action, along with other planned development along Aero Parkway, would cause an increase in surface traffic. A Draft Traffic Impact Study (TIS) is being prepared to describe and measure the impact of traffic generated by the proposed development on the existing roadway system. The TIS is being coordinated with the Kentucky Transportation Council (KYTC), KCAB, Boone County, and the City of Florence. The TIS will recommend roadway improvements, if needed, for potential impacts related to the proposed air cargo facility. In addition, the State Kentucky and the Ohio Kentucky Indiana Regional Council on Governments (OKI) will be conducting a planning study for the region. Therefore, no impacts to socioeconomic resources would occur as a result of disruptions of local traffic patterns.

The Proposed Action has the potential to change surface vehicle traffic patterns during construction. Standard traffic engineering techniques would be utilized to maintain traffic during construction. However, temporary construction impacts could include increased commercial traffic on neighborhood roads, increased traffic congestion, increased travel distances, and increased travel times for drivers. Normal neighborhood vehicular traffic patterns could also be disrupted if drivers chose to cut-through neighborhoods to avoid congestion induced by construction activities.

A construction management plan would be prepared which, based on the selected contractor(s) haul plan, would specify hours of operation, haul routes, and similar controls. It is expected that such a plan would be consistent with normal contracting practices. It is likely that a contractor would avoid scheduling haul activities during extreme congestion periods or weather conditions because it could increase costs to the contractor and affect the schedule.

During construction, traffic to and from the site would also increase and could potentially result in a reduction in the level of service of the local roadways. The majority of soil hauling would occur within the DSA to achieve the proper grade. A small amount of construction debris and trash removal would occur during construction and Wendell Ford Boulevard and Aero Parkway would be used for the hauling. To mitigate this potential impact, traffic on local roadways would be maintained during construction activities through the use of flaggers, arrow boards, and traffic control devices in order to reduce any potential congestion on the roads.

Substantial Loss in Community Tax Base: The Proposed Action would not result in a substantial loss in community tax base. The Proposed Action has the potential to increase the community tax base. Therefore, no adverse impacts to socioeconomic resources would occur as a result.

## Environmental Justice

Under the Proposed Action, no significant or disproportionate impacts would be expected to occur to minority or low-income populations. As stated in Chapter Four, the AEDT did not identify census block groups composed of minority populations and/or 50 percent or more low income populations within the GSA. Therefore, potential indirect impacts from the Proposed Action would not disproportionately affect any one area and no significant environmental justice impacts would occur.

## Children's Health and Safety Risks

Implementation of the Proposed Action would not be expected to create environmental health risks or safety risks for any persons, regardless of age. Therefore, there would be no potential significant impact to **children's environmental health and safety** under the Proposed Action.

### 5.13.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

The TIS being prepared for the Proposed Action will recommend roadway improvements for potential impacts to the local roadways as appropriate.

## 5.14 VISUAL EFFECTS

This section presents the analysis of potential visual effects, including impacts related to light emissions and visual resources and visual character, as a result of the No Action and the Proposed Action. Visual effects include the extent to which a proposed action would produce light emissions that create annoyance or interfere with activities, or contrast with, or detract from, the visual resources and/or the visual character of the existing environment.

Per FAA Order 1050.1F, light emission impacts are typically related to; the extent to which any lighting or glare associated with the proposed action or alternative(s) would create an annoyance for people in the vicinity; would interfere with their normal activities including work and recreation; or would contrast with or detract from the visual resources and/or the visual character of the existing environment. Visual resources include buildings, sites, traditional cultural properties, and other natural or manmade landscape features that are visually important or have unique characteristics. Visual character refers to the overall aesthetics of the existing landscape.

There are no federal special purpose laws or requirements specific to light emissions and visual effects although other special purpose laws, such as the NHPA or Section 4(f) of the USDOT Act have specific provisions for visual impacts to protected resources. In order to determine the potential visual effects, the Proposed Action conditions are compared to the No Action conditions to determine if there is a potential for annoyance and adverse impacts.

#### 5.14.1 NO ACTION

##### Light Emissions

There would be no change to light emissions for the No Action.

##### Visual Resources and Visual Character

There would be no change to the existing visual resources or visual character for the No Action.

#### 5.14.2 PROPOSED ACTION

##### Light Emissions

The Proposed Action would include development that would increase light emissions from the illumination of the proposed new buildings and parking areas. The potential lighting sources that could impact the closest residential area would be located in the parking lots and security lighting on the buildings. The parking lot lights would be directed at a downward angle and therefore would not impact the residences. The security lighting would illuminate the immediate area surrounding the building and would also be shielded or directed at angles that would not cause lighting impacts to the residences. Light emissions during the construction of the Proposed Action are not anticipated to cause any impact to the surrounding areas as most of the construction would occur during daytime hours. No significant increase in light intensity is expected to occur within residential areas due to: Aero Parkway and tree lines separating the proposed air cargo facility from residences (located approximately 550 feet to the south of the DSA) and the existing light emissions in the vicinity of the Proposed Action sites. Therefore, no significant impacts from light emissions would occur.

## Visual Resources and Visual Character

As previously discussed, the DSA is located on the southern edge of the Airport in a predominantly commercial area. The Proposed Action would not affect the nature of the visual character of the area have the potential to contrast with the visual character, or to block/obstruct views of visual resources. In addition, Aero Parkway and a tree line separate the residences from the development. Therefore, the visual character would not change from the No Action and would not result in a significant impact.

### 5.14.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

The Proposed Action does not exceed the applicable thresholds of significance for light emissions, visual resources, or visual character. Therefore, no mitigation measures are required. However, angular adjustments would be made to lighting to direct light at appropriate angles to minimize potential light impacts to the closest residences.

## 5.15 WATER RESOURCES

This section presents the analysis of potential impacts to water resources as a result of the No Action and the Proposed Action.

### 5.15.1 NO ACTION

#### Wetlands/Streams

No physical development would occur for the No Action. Therefore, no impacts to wetlands would occur.

#### Floodplains

No physical development would occur for the No Action. Therefore, no impacts to floodplains would occur.

#### Surface Waters

No physical development would occur for the No Action. Therefore, no impacts to the Gunpowder Creek watershed would occur.

#### Groundwater

No physical development would occur for the No Action. Therefore, no impacts to groundwater would occur.

### 5.15.2 PROPOSED ACTION

#### Wetlands/Streams

As discussion in Chapter Four, field surveys were conducted in the DSA. The Proposed Action would result in wetland and streams within the DSA being impacted through filling or culverting. Table 5-18 details the impacts on wetlands and streams from the Proposed Action for the full build out of the air cargo facility at CVG and to disclose the maximum impact. It should be noted, the final design and phasing of the air cargo facility is currently underway and could result in less impacts to streams and wetland.

Table 5-18  
WETLAND AND STREAM IMPACTS

Stream		
	Linear Feet	Acreage
Ephemeral	12,698	0.68
Intermittent	44,249	4.82
Perennial	7,296	2.53
Total	64,243	8.03
Wetland		
	Linear Feet	Acreage
Palustrine Emergent Wetland (PEM)	NA	11.24 <sup>1</sup>
Palustrine Scrub-Shrub Wetland (PSS)	NA	0.08
Palustrine Forested Wetland (PFO)	NA	0.51
Palustrine Unconsolidated Bottom Wetland (PUB)	NA	0.27
Pond	NA	1.48 <sup>2</sup>
Total	NA	13.58

1. This number represents the total acreage of impact to PEM. However, 0.57 acres are not waters of the U.S. The remaining 10.67 acres are considered waters of the U.S.
2. This number represents the total acreage of impact to Ponds. However, 0.59 acres are not waters of the U.S. The remaining 0.89 acres are considered waters of the U.S.

Source: Environment and Archaeology, 2018

Implementation of the Proposed Action would not result in significant impacts to wetlands and streams because compensatory mitigation will be provided. A detailed compensatory mitigation plan would be required to obtain the necessary authorizations to construct the Proposed Action. With implementation of a mitigation plan to compensate for the losses of wetland and streams resulting from the construction of the Proposed Action, the environmental impact of the Proposed Action would not be significant. The Proposed Action would impact approximately 12,698 linear feet of ephemeral streams, 44,249 linear feet of intermittent streams and 7,296 linear feet of perennial streams. In addition, 13.58 acres of wetland would be impacted. Coordination with the U.S. Army Corps of Engineers (USACE) and Kentucky Division of Water (DOW) is underway to obtain the appropriate permits per the U.S. Clean Water Act and identify mitigation requirements. All permit and mitigation conditions would be met; therefore, no significant impacts would occur to wetlands and streams. Section 5.15.3 outlines detailed mitigation measures for the impacts to the streams and wetlands.

## Floodplains

The Proposed Action would include development within the 100-year floodplain. As discussed in Chapter Two, *Purpose and Need*, and Chapter Three, *Alternatives* no other alternative sites meet the project purpose. Therefore, it is not practicable to implement the Proposed Action without constructing in an area currently in the 100-year floodplain. Although avoidance and minimization was incorporated into the project design, complete avoidance of floodplain impacts is not practical due to the air cargo facility design and layout that is dictated by **the air cargo service provider's** business model.

The Proposed Action would impact approximately 13 acres of a 100-year floodplain designated Zone AE<sup>28</sup>. However, these impacts would not be significant and would not result in: 1) a considerable probability of the loss of human life; 2) likely future damage associated with the encroachment that could be substantial in cost or extent, including interruption of service or loss of vital transportation facility; or 3) a notable adverse impact on natural and beneficial floodplain values. Design measures considered to minimize floodplain encroachments may include special flood related design criteria, elevating facilities above base flood levels, locating nonconforming structures and facilities out of the floodplain, or minimizing fill placed in floodplains. The air cargo facility would include a storm sewer to collect runoff from upstream areas and bypass it around the development to the existing outfall under Aero Parkway. However, if floodplain modeling conducted during final design indicates the proposed development has the potential to impact downstream elevations, the storm sewer would be tied into one of the detention facilities to provide further peak flow attenuation upstream of the outfall. As a result, this encroachment would not be significant.

Floodplain Management coordination would be required for the construction of the Proposed Action. The DOW requires permitting and documentation for a determination of compliance with state laws and regulations and of the effects of the project on the floodway and the flooding of the stream.

## Surface Waters

The construction and implementation of the Proposed Action would result in impacts to surface waters. New detention facilities and outfalls are proposed for the development to provide post-construction stormwater quantity and quality control for stormwater runoff, in accordance with Northern Kentucky Sanitation District No. 1 (SD1) stormwater regulatory requirements for new and redevelopment. Although a majority of the DSA currently drains to the CVG Southwest Detention Facility, the existing detention facility does not have sufficient capacity to manage flows from the Proposed Action.

Separate stormwater management facilities are proposed for the western majority of the DSA and the southeastern portion of the DSA, based on the proposed drainage divide. The proposed detention basins would reduce post-construction stormwater discharge rates in accordance with SD1 stormwater quantity control requirements.

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<sup>28</sup> Zone AE is an area inundated by the 1 percent annual chance flooding event.



These include restricting post-development discharge rates to less than pre-development runoff rates for the 2, 10, 25, 50, and 100-year design storms. Additionally, the 2-year storm post-development discharge rate would be controlled **to meet SD1's " $Q_{critical}$ " criteria, which is intended to protect the downstream receiving water from potentially erosive flows.**

The proposed detention basins would also reflect the following additional design features and characteristics to comply with SD1 requirements for stormwater quantity control and quality control basins (dry extended detention basins), as well as FAA requirements for managing hazardous wildlife attractants:

- Maximum 48-hour drawdown time with no standing water, steep side slopes, and vegetation that minimizes attraction of wildlife, to comply with FAA criteria.
- Steep side slopes that are coordinated between SD1 and FAA requirements.
- Incorporation of an internal berm if needed to satisfy SD1 requirements for a 3:1 length to width ratio and FAA requirements for a narrow, linearly shaped basin.
- Access road and ramp into basin, with paved low flow channel to facilitate sediment removal and maintenance.

**West Detention Basin:** The West Detention Basin is proposed to meet SD1 requirements for stormwater runoff from the western majority of the air cargo facility that would drain to Gunpowder Creek. It would serve approximately 500 acres of development, including the sortation building, the aircraft apron, ground support equipment (GSE) landside and airside facilities, and adjacent development. The basin would discharge stormwater to a new outfall at Gunpowder Creek.

The West Detention Basin is proposed to be an unlined, open surface detention basin with a footprint of approximately 11 acres and a detention capacity of 44 million gallons. The basin capacity is subject to change based on final modeling in the design process and regulatory review by SD1. The West Detention Basin would discharge to a new outfall that drains into Gunpowder Creek. The outfall would include the following design features:

- Emergency overflow spillway on top of basin berm;
- Piped outlets from basin multi-stage outlet structure;
- Paved apron with baffles or other energy dissipation features to reduce velocities and potential for stream erosion;
- Paved or riprap spillway channel routing flows from all basin outlets to stream; and
- Riprap or other erosion control and channel protection within stream at channel outlet.

The outfall channel would be constructed along the existing slope north of the proposed detention basin. The channel would be oriented in a northwesterly direction to align flows with existing stream flows in Gunpowder Creek to the extent possible and reduce the potential for erosion along the opposite stream bank. As previously noted, erosion control features may need to be installed within Gunpowder Creek at

the outfall tie-in point, potentially both above and below the high-water mark, and on both sides of the stream. The precise placement and extent of these features would be determined based on the results of stream erosion control modeling (associated with the  $Q_{critical}$  criteria) and SD1 coordination.

Deicer would be collected from the aircraft apron and conveyed to West Detention Basin. The aircraft apron would be divided into four areas, each segregated individually based on deicer concentration. Low concentration deicer would be treated using an aerated gravel bed (AGB). High concentration deicer would be treated using an anaerobic fluidized bed reactor (AFBR). Effluent from the treatment systems would discharge to the stormwater detention basin.

**Southeast Detention Basins:** The Southeast Detention Basins are proposed to meet SD1 requirements for stormwater runoff from the southeastern portion of the DSA. These basins would discharge to the south through existing culverts under Aero Parkway, which drain to Powder Creek, a tributary of Gunpowder Creek. It would serve approximately 100 acres of development, including the area south of the sortation building and east of the apron, and a portion of the relocated Wendell Ford Boulevard. The basin would discharge stormwater to one of the two existing outfalls north of Aero Parkway to remain consistent with pre-development conditions to the extent possible, supporting regulatory requirements.

Several basins would be required to manage the post-construction stormwater flows. The Southeast Detention Basins are proposed to be unlined, open surface detention basin with a detention capacity of approximately 10 million gallons. The basin capacity is subject to change based on final modeling in the design process and regulatory review by SD1. The proposed basins would discharge to one of the two existing outfalls along Aero Parkway.

### Permitting

SD1 requires a Land Disturbance Permit to demonstrate compliance with post-construction stormwater management requirements (for quantity and quality control) in SD1's *Storm Water Rules and Regulations* document and *Storm Water Best Management Practices Manual*. A Grading Permit can be acquired to allow grading activities to proceed in advance of the Land Disturbance Permit.

The new outfalls would require permit coverage under Kentucky Department of **Environmental Protection's** (KYDEP) National Pollutant Discharge Elimination System (NPDES) <sup>29</sup> permitting program for stormwater discharges associated with industrial activity. The permit may establish water quality based effluent limits for select parameters based on the results of a reasonable potential analysis that examines the potential for exceedance of state water quality standards. Limits may include parameters associated with deicing activities (e.g., chemical oxygen demand) to protect in-stream levels of dissolved oxygen.

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<sup>29</sup> Clean Water Act, Section 402, National Pollutant Discharge Elimination System permit.

Depending on the final height of the basin berm, the West Basin may trigger classification as a dam by the DOW (berm height of at least 25 feet above existing grade, or storage capacity of at least 50 acre-feet above existing grade). Coordination will occur with DOW during the design to confirm if a permit will be required.

## Groundwater

The DSA is in a well-developed area with public water available. As noted in Chapter Four, Affected Environment, there are no drinking water wells or agricultural wells within a one-mile radius of the DSA. Construction and operation of the proposed development would abide by all applicable regulations related to spill prevention and control regulations to prevent spills from causing significant adverse impacts to groundwater. Therefore, no significant impacts to groundwater are anticipated.

### 5.15.3 MITIGATION, AVOIDANCE, AND MINIMIZATION MEASURES

KCAB has initiated securing the anticipated compensatory mitigation requirement through the purchase of credits from the Northern Kentucky University (NKU) In-Lieu Fee (ILF) Payment Program and the Kentucky Department of Fish and Wildlife Resources (KDFWR). Jurisdictional waterbody impacts would require a 2:1 mitigation ratio. Perennial stream impacts for poor quality streams would require a 1.5:1 ratio; intermittent stream impacts would require a 1:1 ratio, and ephemeral streams would require a 0.5:1 ratio since the intermittent and ephemeral streams scored as poor quality stream features. Stream Rapid Bioassessment Protocols scores ranged from 45 to 166. The ILF Payment Program requires an increase of 20 percent for temporal loss. Therefore, the mitigation units will require a 20 percent increase. Wetland impacts are rounded to the nearest tenth of an acre. The mitigation requirements for the full build out of the Proposed Action are shown in Table 5-19. Although as previously discussed, the mitigation requirements may be reduced depending on final design and phasing of the air cargo facility.

Table 5-19

#### MITIGATION REQUIREMENTS FOR WETLAND AND STREAM IMPACTS

Waterbody	Amount (acre/linear ft.)	Quality	Ratio	In- Lieu Fee	Adjusted Mitigation Units (AMU)
Wetlands (all types) <sup>1</sup>	12.4 acres		2:1	1.2	29.8 acres
Wetlands (all types) <sup>2</sup>	1.2 acres		1:1	1.2	1.4 acres
Perennial Stream	3,946 linear ft.	Poor	1.5:1	1.2	7,103 linear ft.
Perennial Stream	1,569 linear ft.	Fair	1.5:1	1.2	2,824 linear ft.
Perennial Stream	1,781 linear ft.	Good	1.5:1	1.2	3,206 linear ft.
Intermittent Stream	44,249 linear ft.	Poor	1:1	1.2	53,099 linear ft.
Ephemeral Stream	12,698 linear ft.	Poor	0.5	1.2	7,619 linear ft.
Total Wetland	13.6 acres				31.2 acres
Total Stream	64,243 linear ft.				73,851 linear ft.

1. Jurisdictional waters of the U.S.

2. Non-jurisdictional waters of the U.S. per FAA requirements may be mitigated at a 1:1 ratio.

AMUs are included in mitigation requirements to determine the maximum mitigation required.

Source: Environment & Archaeology, LLC

Based on the initial conversations with NKU and KDFWR, credits are available for purchase. Formal, final USACE decision regarding compensatory mitigation amount

has not yet been issued. Upon USACE/KYDEP approval of the proposed mitigation, KCAB will finalize negotiations with NKU and KDFWR.

Stormwater facilities would meet all applicable state and local regulations and stormwater discharges would comply with the terms of the Kentucky Pollution Discharge Elimination System (KPDES). A KPDES permit would be obtained. Best Management Practices (BMPs) would be incorporated into the construction. Contractors would be required to comply with all applicable federal, state, and local laws and regulations, including FAA guidance contained in AC 150/5370-10G, *Standards for Specifying Construction of Airports*, including Item P-156 Temporary Air and Water Pollution, Soil Erosion and Siltation Control; AC 150/5320-15A *Management of Airport Industrial Waste*; and AC 150/5320-5D, *Subsurface Drainage Design*.

## 5.16 CUMULATIVE IMPACTS

This section describes the past, present, and reasonably foreseeable future actions relevant to cumulative impacts. The analysis of cumulative impacts recognizes that while the impacts of individual actions may be small, when combined with the impacts of past, present, and reasonably foreseeable future actions on populations or resources in and around CVG, the impacts could be potentially significant.

Cumulative impacts are defined by the CEQ in 40 C.F.R. § 1058.7 as: "The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions." Additionally, the CEQ further explained in *Considering Cumulative Effects under the National Environmental Policy Act* that "each resource, ecosystem, and human community must be analyzed in terms of its ability to accommodate effects, based on its own time and space parameters." Therefore, a cumulative effects analysis normally will encompass geographic boundaries beyond the immediate area of the Proposed Action, and a time-frame, including past actions and foreseeable future actions, in order to capture these additional effects.

The evaluation of cumulative impacts in this EA considers the past, present, and reasonably foreseeable future projects or actions undertaken by KCAB and other parties such as Boone County.

### 5.16.1 DEFINING THE CUMULATIVE IMPACT STUDY AREA AND TIMEFRAMES

For the purposes of this EA, other projects at the Airport or projects within the GSA as shown in Exhibit 4-1 will be considered to be within the overall Cumulative Impact Study Area. The FAA 1050.1F Desk Reference Section 15.2 states "*The study area for cumulative impacts analysis is the same area defined for a project's direct and indirect impact analysis. Thus, the study area will be different for each impact category.*" The Cumulative Impact Study Area(s) is consistent with the FAA 1050.1F Desk Reference using the DSA and the GSA and the specific study areas identified in Chapter Four, *Affected Environment* for each resource category.

The projects to be included in the Cumulative Impact analysis were identified through coordination with the KCAB, Boone County, Kenton County, City of Florence, City of Burlington, and the City of Hebron. The past actions are defined as those that were completed within the last five years from 2013 to 2018. Present actions are any other actions that are occurring in the same general timeframe as the proposal. Present actions for this EA are defined as those completed in 2018 or where construction is ongoing. Reasonably foreseeable future actions are actions that may affect projected impacts of a proposal and are not remote or speculative. Reasonably foreseeable future actions are defined as those planned to be completed between 2019 and 2024. This window of time represents a timeframe that is long enough to identify potential follow on impacts, yet near enough that realistic predictions of projects and impacts can be made. Potential projects beyond 2024 would be considered speculative. This section identifies those past, present, and reasonably foreseeable future projects.

### 5.16.2 PAST ACTIONS

Past actions that have occurred within the past five years in the Cumulative Impact Study Area are identified in Table 5-20.

Table 5-20  
PAST ACTIONS

PROJECT NAME	LOCATION	DESCRIPTION	CURRENT STATUS
Interchange modification of Mall Road and I-75	Florence, KY	Add a southbound on-ramp to I-75	Completed
Single point urban interchange	Burlington, KY	Intersection of KY18 & KY237. Modified to improve capacity	Completed
Demolition of Terminal 1 & 2	Airport property	Demolition of Terminals 1 & 2	Completed
Development of non-aeronautical land	Airport property	Commercial development	Completed

Source: KCAB;

<https://transportation.ky.gov/Planning/Planning%20Studies%20and%20Reports/IMR%20Mall%20Road%20-%20Executive%20Summary.pdf>

### 5.16.3 PRESENT ACTIONS

Present actions that are ongoing in the Cumulative Impact Study Area are identified in Table 5-21.

Table 5-21  
PRESENT ACTIONS

PROJECT NAME	LOCATION	DESCRIPTION	CURRENT STATUS
KY237	Hebron, KY	Add lanes	Under construction
Veterans Way	Burlington, KY	Two lane extension between KY 18 and KY 237	Under construction
Intersection of Idlewild Road and Jefferson Street	Burlington, KY	Sidewalk and Realign Intersection	Under construction
Burlington Sanitary Sewer Project	Burlington, KY	Replacing an existing sanitary sewer along Allen Fork Creek between Rogers Ln and SD1 pump station off Orient St.	Completed March 2018
Lynx Hangar Development	Airport property	Aircraft maintenance hangar	Under construction
CVG CONRAC	Airport property	Construction of a consolidated rental car facility	Under construction

Source: KCAB;

[https://www.boonecountky.org/document\\_center/PlanningCommission/FutureRoadProjects.pdf](https://www.boonecountky.org/document_center/PlanningCommission/FutureRoadProjects.pdf);

<http://www.sd1.org/Projects/SD1ProjectsInBooneCounty.aspx>

## 5.16.4 REASONABLY FORESEEABLE FUTURE ACTIONS

Reasonably foreseeable future actions that may occur within the next five years in the Cumulative Impact Study Area are identified in Table 5-22.

Table 5-22

## REASONABLY FORESEEABLE FUTURE ACTIONS

PROJECT NAME	LOCATION	DESCRIPTION	CURRENT STATUS
Pleasant Valley Road	Florence, KY	Extension from Valley View Drive to Rogers Ln	Anticipated in the next five years
Add Auxiliary Lanes on I-75	Mt Zion Road to U.S. 42	Design and right-of-way are underway.	Anticipated in the next five years
Improve Safety on KY 717 (Turfway Road)	Florence, KY	Change 90-degree turn.	Anticipated in the next five years
Extend Multi-Use Path from Stephens Elementary	Burlington, KY	Along KY 237 to KY 20 and Cougar Path, County Project, SNK Funds, 2019 Bid Date	Anticipated in the next five years
Extend Center Turn Lane on Ted Bushelman Boulevard	Florence, KY	From Doering Drive to Aero Parkway, Airport Project, SNK Funds, Hiring Engineer	Anticipated in the next five years
Construct Sidewalk & Multi-Use Path on Dolwich Drive	Erlanger, KY	From Mineola Pike to I-275, Erlanger Project, SNK Funds, 2019 Bid date	Anticipated in the next five years
CVG Common Use Cargo Facilities	Airport property	Construction of cargo hangars	Anticipated in the next five years
DHL South Airfield Development	CVG	Development of a new cargo distribution building, apron expansion, employee parking lot, at the DHL facility on the southeast side of CVG property	Anticipated in the next five years
Development of non-aeronautical land	CVG	Commercial development	Anticipated in the next five years
NEPA Document to Change the ATCT Tower Order	CVG	NEPA document to analyze the potential impacts due to changes in the Tower Order runway use directives. This NEPA document would incorporate measures OP-17 and OP-19 from the 2006 Part 150 Study.	Anticipated in the next five years

Source: KCAB;

[https://www.boonecountky.org/document\\_center/PlanningCommission/FutureRoadProjects.pdf](https://www.boonecountky.org/document_center/PlanningCommission/FutureRoadProjects.pdf)

### 5.16.5 CUMULATIVE IMPACT COMPARISON

Cumulative impacts must be evaluated relative to the direct and indirect effects of the Proposed Action for each environmental category. Significant cumulative impacts are determined according to the same thresholds of significance used in the evaluation of each environmental category in the environmental consequences discussion.

For environmental resources where construction and implementation of the Proposed Action would have no environmental impact, there is no potential for an adverse cumulative environmental impact to occur. Therefore, the following discussion of cumulative impacts discusses only those environmental categories where environmental impacts could result from implementation of the Proposed Action. Those categories are: air quality; biological resources; historic architectural, archeological, and cultural resources; noise and noise-compatible land use; traffic impacts; and water resources.

#### 5.16.5.1 Air Quality

As discussed in Section 5.4, *Air Quality*, the increase in emissions due to construction and implementation of the Proposed Action would not exceed the applicable thresholds and are therefore not significant. Construction activities associated with the Proposed Action would result in temporary emissions from construction equipment, trucks, and fugitive dust emissions from site demolition and earthwork. The impacts would occur within the immediate vicinity of the construction site and would be mitigated through best management practices to reduce emissions, particularly fugitive particle emissions, during construction.

While the Proposed Action would contribute to the cumulative emissions of air pollutants in Boone County, the cumulative effect of the net air emissions would not cause or contribute to any new violation of the NAAQS, would not increase the frequency or severity of an existing violation, and would not delay timely attainment of any standard. Therefore, the cumulative impact on air quality is not significant.

#### 5.16.5.2 Biological Resources

As discussed in Section 5.5, *Biological Resources*, the Proposed Action would result in impacts to the Indiana bat and the northern long-eared bat due to the removal of 244 acres of habitat for the full build out of the air cargo facility. Through formal ESA Section 7 consultation with the USFWS suitable mitigation options, including mitigation through payment into the IBCF were determined.

Implementation of the Proposed Action combined with the implementation of one or more of the past, present, and reasonably foreseeable future actions would not result in a cumulative impact to biological resources because each of these projects is required to have their own protective measures to avoid, minimize, and provide habitat compensation during implementation of their project. Therefore, implementation of the Proposed Action, when combined with other past, present, or reasonably foreseeable projects would not result in significant adverse impacts to biological resources.



#### 5.16.5.3 Historical, Architectural, Archeological, and Cultural Resources

As discussed in Section 5.9, *Historical, Architectural, Archeological, and Cultural Resources*, the Proposed Action would result in adverse impacts to three historical resources. Through formal Section 106 consultation and development of an MOA with the KHC, suitable mitigation options were agreed upon.

Implementation of the Proposed Action combined with the implementation of one or more of the past, present, and reasonably foreseeable future actions would not result in a cumulative impact to historical, architectural, archeological, and cultural resources because each projects would be required to adhere to measures to avoid, minimize, and provide mitigation during implementation of their project. Therefore, implementation of the Proposed Action, when combined with other past, present, or reasonably foreseeable projects would not result in significant adverse impacts to historical, architectural, archeological, and cultural resources.

#### 5.16.5.4 Noise and Noise-Compatible Land Use

As discussed in Section 5.12, *Noise and Noise-Compatible Land Use*, the Proposed Action would not result in significant noise increases, defined as an increase of 1.5 dB or more within the DNL 65 dB contour over noise sensitive land uses. However, additional residences would be located within the +65 DNL contour. However, this is not considered a significant impact. A noise impact would be considered to be significant if there were an increase of 1.5 decibel (dB) or more over noise-sensitive facilities within the 65 DNL contour when comparing the No Action and Proposed Action of the same corresponding year.

Implementation of the Proposed Action combined with the implementation of one or more of the past, present, and reasonably foreseeable future actions would not result in a cumulative impact to noise and noise-compatible land uses because each project with a significant impact due to noise is required to have their own mitigation measures to minimize impacts during implementation of their project. Therefore, implementation of the Proposed Action, when combined with other past, present, or reasonably foreseeable future projects would not result in significant adverse impacts to noise and noise-compatible land uses.

#### 5.16.5.5 **Socioeconomics, Environmental Justice, and Children's Health and Safety Risks**

As discussed in Section 5.13, **Socioeconomics, Environmental Justice, and Children's Health and Safety Risks**, the Proposed Action would result in disruptions to local traffic patterns. Through consultation with the local jurisdictions and traffic agencies, mitigation measures will be recommended to reduce impacts when the Proposed Action is implemented.

Implementation of the Proposed Action combined with the implementation of one or more of the past, present, and reasonably foreseeable future actions would not result in a cumulative traffic impact, because the TIS prepared for this EA included the other roadway projects into the traffic analysis. Therefore, implementation of the Proposed

Action, when combined with other past, present, or reasonably foreseeable future projects would not result in significant adverse traffic impacts.

#### 5.16.5.6 Water Resources

As discussed in Section 5.15, *Water Resources*, the Proposed Action would result in impacts to streams and wetlands located in the DSA. Coordination with the USACE has determined that a permit under Section 404 of the CWA would be required for construction of the Proposed Action. Permitting under Section 401 of the CWA would also be required for the Proposed Action. Furthermore, a NPDES permit would need to be obtained.

The storage volume necessary to attenuate the 100-year onsite surface water flows due to the Proposed Action would be met through the construction of on-site detention basins. As a result, the proposed detention basins would provide a cumulatively beneficial impact.

Implementation of the Proposed Action combined with the implementation of one or more of the past, present, and reasonably foreseeable future actions would not result in a cumulative impact to water resources because each of these projects is required to have their own protective measures and permits to avoid and minimize impacts during implementation of their project.

The other past, present, or reasonably foreseeable future projects would be required to comply with all existing and future water quality regulatory criteria and permit requirements. In addition, these past, present, or reasonably foreseeable future projects would also be required to develop BMPs that would ensure that concentrations of pollutants of concern do not exceed regulatory criteria. Therefore, there would be no significant cumulative impacts to water resources.

#### 5.16.6 CONCLUSION

The level of cumulative impacts anticipated to occur within these environmental resource categories is not significant due to the types of past, present, and reasonably foreseeable future projects, the extent of the built environment in which they would occur, the lack of certain environmental resources in the area, and the mitigation measures identified for the Proposed Action. Therefore, implementation of the Proposed Action would not result in significant cumulative environmental impacts.

## Chapter Six

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## CHAPTER SIX

### PUBLIC INVOLVEMENT

#### 6.1 DRAFT ENVIRONMENTAL ASSESSMENT

To satisfy requirements for public involvement, an advertisement announcing the availability of the Draft Environmental Assessment (EA) was published in the *Cincinnati Enquirer*. The advertisement provided the public meeting date, time, and location, informed the public on how to obtain a copy of the Draft EIS, and initiated the public comment period. Copies of this notice are provided in Appendix A, *Agency and Public Involvement*. The Draft EA was available at the locations identified below during normal business hours.

Kenton County Airport Board Offices  
77 Comair Boulevard  
Erlanger, KY 41018

Federal Aviation Administration  
Memphis Airports District Office  
2600 Thousand Oaks Blvd, Suite 2250  
Memphis, TN 38118-2462

The Draft EA is available for review online at the following website:

<https://www.airportprojects.net/CVG-AirCargo-EA>

In addition, the following agencies listed were sent a notice of the Draft EA availability for review via email or letter.

Ms. Kimberly J. Simpson  
U.S. Army Corps of Engineers:  
Louisville District  
600 Dr. Martin Luther King, Jr. Place  
Louisville, KY 40201

Ms. Jessica Miller  
U.S. Fish and Wildlife Service  
JC Watts Federal Building – Room 265  
330 West Broadway  
Frankfort, KY 40601

Mr. Craig Potts  
Kentucky Heritage Council  
300 Washington Street  
Frankfort, KY 40601-1824

Mr. Larry Taylor  
Kentucky Department for  
Environmental Protection  
Office of the Commissioner  
300 Sower Boulevard  
Frankfort, KY 40601

Mr. Christopher Militscher  
Chief, NEPA Program Office  
U.S. Environmental Protection Agency  
Region 4  
Sam Nunn Atlanta Federal Center  
61 Forsyth Street, SW  
Atlanta, GA 30303-8960

If you have important information that has not been considered in this document or comments on the Draft EA, please send your written/email comments to the following:

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Comments are due no later than 5:00 p.m. Eastern Time on Tuesday November 6, 2018. If submitting via the U.S. Postal Service, please allow enough time for mailing. Your comment must be postmarked by that date.

*Before including your name, address and telephone number, email or other personal identifying information in your comment, be advised that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.*

## 6.2 PUBLIC MEETING

A public meeting will be held on October 25, 2018 from 5:00 p.m. to 7:00 p.m. The meeting will be held on the 1<sup>st</sup> floor of the CVG Centre located at 77 Comair Boulevard, Erlanger, Kentucky 41018.

## Chapter Seven

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## CHAPTER SEVEN

### LIST OF PREPARERS

#### 7.1 FEDERAL AVIATION ADMINISTRATION (FAA)

Kristi Ashley, Environmental Protection Specialist, provided input throughout the process and responsible for the review of the Environmental Assessment.

#### 7.2 KENTON COUNTY AIRPORT BOARD (KCAB)

Barb Schempf, A.A.E., IAP, Vice President of Planning & Development, provided input and direction on goals for the Airport facility in regards to the Environmental Assessment

Alison Chadwell, PE, PTOE, LEED AP, Senior Project Manager/Engineer, provided input and Airport information throughout the process and responsible for managing and review of the Environmental Assessment.

Debbie Conrad, Senior Project Manager, provided input and Airport information throughout the preparation of the Environmental Assessment.

#### 7.3 LANDRUM & BROWN, INCORPORATED (L&B)

Sarah Potter, Associate Vice President, responsible for project management, technical input, and principal author of the Environmental Assessment.

Rob Adams, Officer, provided input and review of the Environmental Assessment.

Chris Sandfoss, Managing Consultant, provided technical input and assisted with the preparation of the Environmental Assessment.

Charles Babb, Managing Consultant, responsible for preparing the air quality analysis.

Chuck Lang, Senior Consultant, responsible for the preparation of the graphics for the Environmental Assessment.

Gabriela Elizondo, Analyst, assisted with the preparation of the Environmental Assessment.

#### 7.4 ENVIRONMENT & ARCHAEOLOGY, LLC (E&A)

Jeff Tingle, President, assisted with the preparation of the Historic, Architectural, Archeological, and Cultural Resources; Biological Resources; and Wetlands/Streams analysis.

Courtney Stoll, MA, RPA, Principal Investigator, assisted with the preparation of the Historic, Architectural, Archeological, and Cultural Resources field surveys and analysis.

Christina Lovins, Vice President/Senior Biologist, assisted with the preparation of the Biological Resources and Wetlands/Streams Analysis.

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## Chapter Eight

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## CHAPTER EIGHT

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## Appendix A

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## APPENDIX A

### AGENCY AND PUBLIC INVOLVEMENT

The following agencies and stakeholders were coordinated with throughout the development of the Draft Environmental Assessment.

U.S. Army Corps of Engineers  
Louisville District  
600 Dr. Martin Luther King, Jr. Place  
Louisville, KY 40201

U.S. Fish and Wildlife Service  
JC Watts Federal Building – Room 265  
330 West Broadway  
Frankfort, KY 40601

Kentucky Heritage Council  
300 Washington Street  
Frankfort, KY 40601-1824

Duke Energy Ohio and Duke Energy  
Kentucky  
139 East 4<sup>th</sup> Street  
Cincinnati, OH 45244

Northern Kentucky Sanitation District  
No. 1  
1045 Eaton Drive  
Ft. Wright, KY 41017

Kentucky Transportation Cabinet  
(KYTC)  
District 6  
421 Buttermilk Pike  
Covington, KY 41017

Boone County  
Administration Building  
First Floor 2950 Washington Square  
Burlington, KY 41005

City of Florence  
8100 Ewing Blvd.  
Florence, KY 41042

Ohio Kentucky Indiana Regional  
Council of Governments (OKI)  
720 E. Pete Rose Way, Suite 420  
Cincinnati, Ohio 45202

Natural Resources Conservation  
Service  
Burlington Service Center  
6028 Camp Ernst Rd  
Burlington, KY 41005-8369

Boone County Water District  
2475 Burlington Pike  
Burlington, KY 41005

Northern Kentucky Water District  
2835 Crescent Springs Road  
Erlanger, Kentucky 41018

Spectrum  
11427 Reed Hartman Hwy  
Cincinnati, OH 45242

Cincinnati Bell  
221 E 4<sup>th</sup> Street  
Cincinnati, OH 45202

Kentucky Division of Water  
300 Sower Boulevard, 3<sup>rd</sup> Floor  
Frankfort, Kentucky 40601

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## Appendix B

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# APPENDIX B

## AIR QUALITY

This appendix contains the Technical Report presenting the Air Quality analysis prepared for the Environmental Assessment.

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# AIR QUALITY TECHNICAL REPORT

For the Proposed Air Cargo Facility Development  
at  
Cincinnati/Northern Kentucky International Airport

September 2018

Prepared for:

Kenton County Airport Board

Prepared by:



Landrum & Brown, Incorporated  
11279 Cornell Park Road  
Cincinnati, Ohio 45242

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## 1.0 INTRODUCTION

The purpose of this Air Quality Technical Report is to provide supporting documentation for the Environmental Assessment (EA) being prepared for the Proposed Air Cargo Facility Development project at the Cincinnati/Northern Kentucky International Airport (CVG or Airport). The following document discloses the affected environment and environmental consequences of air quality for the projected future conditions in 2021 and 2026 for the following alternatives: Future (2021) No Action, Future (2021) Proposed Action, Future (2026) No Action, and Future (2026) Proposed Action. The Federal Aviation Administration (FAA) uses 2021 as a basis for analysis because 2021 is the projected implementation year of the proposed air cargo facility development. In addition, specific Airport activity levels and their associated air quality impacts are evaluated for a condition five years beyond the opening year in 2026.

## 2.0 REGULATORY SETTING

This air quality assessment of the Proposed Action and its alternatives was conducted in accordance with the guidelines provided in the most recent version of the FAA's *Aviation Emissions and Air Quality Handbook*.<sup>1</sup>

### 2.1 NATIONAL AMBIENT AIR QUALITY STANDARDS

The U.S. Environmental Protection Agency (USEPA) is the primary Federal agency responsible for regulating air quality. The USEPA implements the provisions of the Federal Clean Air Act (CAA). The CAA, including the 1990 Amendments, provides for the establishment of standards and programs to evaluate, achieve, and maintain acceptable air quality in the U.S. Under the CAA, the USEPA established a set of standards, or criteria, for six pollutants determined to be potentially harmful to human health and welfare.<sup>2</sup> The USEPA considers the presence of the following six criteria pollutants to be indicators of air quality:

- Ozone (O<sub>3</sub>);
- Carbon monoxide (CO);
- Nitrogen dioxide (NO<sub>2</sub>);
- Particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>);<sup>3</sup>
- Sulfur dioxide (SO<sub>2</sub>); and,
- Lead (Pb).

The National Ambient Air Quality Standards for the criteria pollutants, known as the NAAQS, are summarized in Table 1. A detailed description of the criteria pollutants is provided in Attachment 1 – *Description of Pollutants* of this report. For each of the criteria pollutants, the USEPA established primary standards intended to protect public health, and secondary standards for the protection of other aspects of

<sup>1</sup> Federal Aviation Administration, *Aviation Emissions and Air Quality Handbook*, Version 3 Update 1, January 2015.

<sup>2</sup> USEPA, Code of Federal Regulations, Title 40, Part 50 (40 CFR Part 50) *National Primary and Secondary Ambient Air Quality Standards* (NAAQS), July 2011.

<sup>3</sup> PM<sub>10</sub> and PM<sub>2.5</sub> are airborne inhalable particles that are less than ten micrometers (coarse particles) and less than 2.5 micrometers (fine particles) in diameter, respectively.



public welfare, such as preventing materials damage, preventing crop and vegetation damage, and assuring good visibility. Areas of the country where air pollution levels consistently exceed these standards may be designated nonattainment by the USEPA.

Table 1  
NATIONAL AMBIENT AIR QUALITY STANDARDS

POLLUTANT		PRIMARY/ SECONDARY	AVERAGING TIME	LEVEL	FORM
Carbon Monoxide		primary	8 hour	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead		primary and secondary	Rolling 3-month average	0.15 $\mu\text{g}/\text{m}^3$ (1)	Not to be exceeded
Nitrogen Dioxide		primary	1 hour	100 ppb	98 <sup>th</sup> percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb (2)	Annual Mean
Ozone		primary and secondary	8 hour	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particulate Matter	PM <sub>2.5</sub>	primary	1 year	12.0 $\mu\text{g}/\text{m}^3$	Annual mean, averaged over 3 years
		secondary	1 year	15.0 $\mu\text{g}/\text{m}^3$	Annual mean, averaged over 3 years
		primary and secondary	24 hour	35 $\mu\text{g}/\text{m}^3$	98 <sup>th</sup> percentile, averaged over 3 years
	PM <sub>10</sub>	primary and secondary	24 hour	150 $\mu\text{g}/\text{m}^3$	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide		primary	1 hour	75 ppb (4)	99 <sup>th</sup> percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hour	0.5 ppm	Not to be exceeded more than once per year

- (1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5  $\mu\text{g}/\text{m}^3$  as a calendar quarter average) also remain in effect.
- (2) The level of the annual NO<sub>2</sub> standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.
- (3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O<sub>3</sub> standards additionally remain in effect in some areas. Revocation of the previous (2008) O<sub>3</sub> standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.
- (4) The previous SO<sub>2</sub> standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO<sub>2</sub> standards or is not meeting the requirements of a SIP call under the previous SO<sub>2</sub> standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

Notes: ppm is parts per million; ppb is parts per billion, and  $\mu\text{g}/\text{m}^3$  is micrograms per cubic meter.

Source: EPA, <https://www.epa.gov/criteria-air-pollutants/naaqs-table> Accessed May 2018

A nonattainment area is a homogeneous geographical area<sup>4</sup> (usually referred to as an air quality control region) that is in violation of one or more NAAQS and has been designated as nonattainment by the USEPA as provided for under the CAA. Some regulatory provisions, for instance the CAA conformity regulations, apply only to areas designated as nonattainment or maintenance.

A maintenance area describes the air quality designation of an area previously designated nonattainment by the USEPA and subsequently redesignated attainment after emissions are reduced. Such an area remains designated as maintenance for a period up to 20 years at which time the state can apply for redesignation to attainment, provided that the NAAQS were sufficiently maintained throughout the maintenance period.

## 2.2 GENERAL CONFORMITY

The General Conformity Rule under the CAA is conducted in three phases: (1) applicability, (2) evaluation, and (3) determination. The General Conformity Rule establishes minimum values, referred to as the *de minimis* thresholds, for the criteria and precursor pollutants<sup>5</sup> for the purpose of:

- Identifying Federal actions with project-related emissions that are clearly negligible (*de minimis*);
- Avoiding unreasonable administrative burdens on the sponsoring agency, and;
- Focusing efforts on key actions that would have potential for significant air quality impacts.

The *de minimis* rates vary depending on the severity of the nonattainment area and further depend on whether the general Federal action is located inside an ozone transport region.<sup>6</sup> An evaluation relative to the General Conformity Rule (the Rule), published under 40 CFR Part 93,<sup>7</sup> is applicable to general Federal actions that would cause emissions of the criteria or precursor pollutants, and are:

- Federally-funded or Federally-approved;
- Not a highway or transit project<sup>8</sup>;
- Not identified as an exempt project<sup>9</sup> under the CAA;

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<sup>4</sup> A homogeneous geographical area, with regard to air quality, is an area, not necessarily bounded by state lines, where the air quality characteristics have been shown to be similar over the whole area. This may include several counties, encompassing more than one state, or may be a very small area within a single county.

<sup>5</sup> Precursor pollutants are pollutants that are involved in the chemical reactions that form the resultant pollutant. Ozone precursor pollutants are NO<sub>x</sub> and VOC, whereas PM<sub>2.5</sub> precursor pollutants include NO<sub>x</sub>, VOC, SO<sub>x</sub>, and ammonia (NH<sub>3</sub>).

<sup>6</sup> The ozone transport region is a single transport region for ozone (within the meaning of Section 176A(a) of the CAA), comprised of the States of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and the Consolidated Metropolitan Statistical Area that includes the District of Columbia, as given at Section 184 of the CAA.

<sup>7</sup> USEPA, 40 CFR Part 93, Subpart B, *Determining Conformity of General Federal Actions to State or Federal Implementation Plans*, July 1, 2006.

<sup>8</sup> Highway and transit projects are defined under Title 23 U.S. Code and the Federal Transit Act.

<sup>9</sup> The Proposed Action is not listed as an action exempt from a conformity determination pursuant to 40 CFR Part 93.153(c). An exempt project is one that the USEPA has determined would clearly have

- **Not a project identified on the approving Federal agency's Presumed to Conform list;**<sup>10</sup> and,
- Located within a nonattainment or maintenance area.

The Proposed Action at CVG is included in a maintenance area for ozone. Therefore, the Proposed Action meets the remaining criteria for requiring an evaluation under the General Conformity Rule. When the action requires evaluation under the General Conformity regulations, the net total direct and indirect emissions due to the Federal action may not equal or exceed the relevant *de minimis* thresholds unless:

- An analytical demonstration is provided that shows the emissions would not exceed the NAAQS; or
- Net emissions are accounted for in the State Implementation Plan (SIP) planning emissions budget; or
- Net emissions are otherwise accounted for by applying a solution prescribed under 40 CFR Part 93.158.

The Federal *de minimis* thresholds established under the CAA are given in Table 2. Conformity to the *de minimis* thresholds is relevant only with regard to those pollutants and the precursor pollutants for which the area is nonattainment or maintenance. Notably, there are no *de minimis* thresholds to which a Federal agency would compare ozone emissions. This is because ozone is not directly emitted from a source. Rather, ozone is formed through photochemical reactions involving emissions of the precursor pollutants, nitrogen oxides (NO<sub>x</sub>) and volatile organic compounds (VOC), in the presence of abundant sunlight and heat. Therefore, emissions of ozone on a project level are evaluated based on the rate of emissions of the ozone precursor pollutants, NO<sub>x</sub> and VOC. Because conformity to the *de minimis* threshold is relevant only with regard to the ozone precursor pollutants, only NO<sub>x</sub> and VOC emissions are presented and evaluated in this report.

If the General Conformity evaluation for this air quality assessment were to show that any of the applicable thresholds were equaled or exceeded due to the Proposed Action, further, more detailed analysis to demonstrate conformity would be required, which is referred to as a General Conformity Determination. Conversely, if the General Conformity evaluation were to show that none of the relevant thresholds were equaled or exceeded, the Proposed Action would be presumed to conform to the applicable Kentucky SIPs and no further analysis would be required under the CAA.

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no impact on air quality at the facility, and any net increase in emissions would be so small as to be considered negligible.

<sup>10</sup> The provisions of the CAA allow a Federal agency to submit a list of actions demonstrated to have low emissions that would have no potential to cause an exceedance of the NAAQS and are presumed to conform to the CAA conformity regulations. This list would be referred to as the "Presumed to Conform" list. The FAA Presumed to Conform list was published in the Federal Register on February 12, 2007 (72 FR 6641-6656) and includes airport projects that would not require evaluation under the General Conformity regulations.

Table 2  
DE MINIMIS THRESHOLDS

CRITERIA AND PRECURSOR POLLUTANTS	TYPE AND SEVERITY OF NONATTAINMENT AREA	TONS PER YEAR THRESHOLD
Ozone (VOC or NO <sub>x</sub> ) <sup>1</sup>	Serious nonattainment	50
	Severe nonattainment	25
	Extreme nonattainment	10
	Other areas outside an ozone transport region	100
Ozone (NO <sub>x</sub> ) <sup>1</sup>	Marginal and moderate nonattainment inside an ozone transport regions <sup>2</sup>	100
	Maintenance	100
Ozone (VOC) <sup>1</sup>	Marginal and moderate nonattainment inside an ozone transport region <sup>2</sup>	50
	Maintenance within an ozone transport region <sup>2</sup>	50
	Maintenance outside an ozone transport region <sup>2</sup>	100
Carbon monoxide (CO)	All nonattainment & maintenance	100
Sulfur dioxide (SO <sub>2</sub> )	All nonattainment & maintenance	100
Nitrogen dioxide (NO <sub>2</sub> )	All nonattainment & maintenance	100
Coarse particulate matter (PM <sub>10</sub> )	Serious nonattainment	70
	Moderate nonattainment and maintenance	100
Fine particulate matter (PM <sub>2.5</sub> ) (VOC, NO <sub>x</sub> , NH <sub>3</sub> , and SO <sub>x</sub> ) <sup>3</sup>	All nonattainment and maintenance	100
Lead (Pb)	All nonattainment and maintenance	25

<sup>1</sup> The rate of increase of ozone emissions is not evaluated for a project-level environmental review because the formation of ozone occurs on a regional level and is the result of the photochemical reaction of NO<sub>x</sub> and VOC in the presence of abundant sunlight and heat. Therefore, USEPA considers the increasing rates of NO<sub>x</sub> and VOC emissions to reflect the likelihood of ozone formation on a project level.

<sup>2</sup> An OTR is a single transport region for ozone, comprised of the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and the Consolidated Metropolitan Statistical Area that includes the District of Columbia.

<sup>3</sup> For the purposes of General Conformity applicability, VOCs and NH<sub>3</sub> emissions are only considered PM<sub>2.5</sub> precursors in nonattainment areas where either a State or USEPA has made a finding that the pollutants significantly contribute to the PM<sub>2.5</sub> problem in the area. In addition, NO<sub>x</sub> emissions are always considered a PM<sub>2.5</sub> precursor unless the State and USEPA make a finding that NO<sub>x</sub> emissions from sources in the State do not significantly contribute to PM<sub>2.5</sub> in the area. Refer to 74 FR 17003, April 5, 2006.

Notes: Federal thresholds that are shaded are applicable to this project.

Code of Federal Regulations (CFR), Title 40, *Protection of the Environment*.

USEPA defines *de minimis* as emissions that are so low as to be considered insignificant and negligible.

Volatile organic compounds (VOC); Nitrogen oxides (NO<sub>x</sub>); Ammonia (NH<sub>3</sub>); Sulfur oxides (SO<sub>x</sub>).

Sources: USEPA, 40 CFR Part 93.153(b)(1) & (2).

## 2.3 TRANSPORTATION CONFORMITY RULE APPLICABILITY

Although airport improvement projects are usually considered under the General Conformity regulations, there can be elements of a Federal action or its alternatives that may require an analysis to demonstrate Transportation Conformity, such as actions relating to transportation plans, programs, projects developed, funded, or approved under Title 23 United States Code (U.S.C.) or the Federal Transit Act (FTA),<sup>11</sup> or involve Federal highways. In such cases, the sponsoring Federal agency would be required to coordinate with the Federal Highway Administration (FHWA), the state Department of Transportation (DOT), and the local metropolitan planning organization (MPO) to assist in completing a Transportation Conformity evaluation.

As with General Conformity, Transportation Conformity regulations apply only to Federal actions located within a nonattainment or maintenance area. The Proposed Action under consideration at CVG would not be developed, funded, or approved by the FHWA or FTA. Therefore, the Transportation Conformity regulations would not apply.

## 2.4 INDIRECT SOURCE REVIEW

Some states require an air quality review when a Federal action has the potential to cause an increase in net emissions from indirect sources. Indirect sources cause emissions that occur later in time or are farther removed from the Federal action. Depending on the state, indirect sources may be identified as motor vehicles on highways, parking at sports and entertainment facilities, or an increase in aircraft operations. The state requirement may be referred to as the indirect source review (ISR) and each state requiring an ISR sets thresholds for increased operation of the indirect sources. When a Federal action has the potential to exceed these thresholds, an air quality review is required to assess the character and impact of the additional emissions and determine whether a permit is required, which is separate from the analyses required under NEPA or the CAA. According to FAA, *Aviation Emissions and Air Quality Handbook Version 3*,<sup>12</sup> Kentucky does not require an ISR.

If the General Conformity evaluation for this air quality assessment were to show that any of these thresholds were equaled or exceeded due to the Proposed Action, further, more detailed analysis to demonstrate conformity would be required, which is referred to as a General Conformity Determination. Conversely, if the General Conformity evaluation were to show that none of the relevant thresholds were equaled or exceeded, the Proposed Action at CVG would be presumed to conform to the Kentucky SIP and no further analysis would be required under the CAA.

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<sup>11</sup> USEPA, 40 CFR Part 93.153, *Applicability*, July 1, 2006.

<sup>12</sup> *Aviation Emissions and Air Quality Handbook, Version 3*, January 2015.

## 2.5 AIR QUALITY MONITORING IN REGION

The Kentucky Division for Air Quality established an air monitoring network around the state that measures air pollution.<sup>13</sup> The two air quality monitoring stations closest to the Airport are in East Bend, Kentucky and at Northern Kentucky University (NKU) in Newport, Kentucky. The monitoring station at East Bend is pictured in Figure 1. The location of the monitoring stations relative to the Airport is provided in Figure 2. The East Bend station primarily monitors for the pollutant ozone while the NKU station monitors for the pollutants NO<sub>2</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, and ozone. Data from these monitors indicate if the air quality exceeds the pollutant standard. There were no exceedances of any of the NO<sub>2</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, and ozone standards at either of the air quality monitoring stations in 2016.

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Figure 1  
AIR QUALITY MONITORING STATION IN EAST BEND, KENTUCKY



Source: Kentucky Division for Air Quality, 2018.

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<sup>13</sup> 2017 Annual Report, Kentucky Division for Air Quality, September 2017. Available on-line:  
<http://air.ky.gov/Division%20Reports/2017%20ANNUAL%20REPORT.pdf> Accessed May 2018

A map of the Cincinnati, Ohio area. The Ohio River is shown flowing through the city. Major highways like I-75, I-275, and I-71 are visible. Locations marked include Cincinnati, CVG (Cincinnati/Northern Kentucky International Airport), NKU (Northern Kentucky University), and East Bend. The map also shows various suburbs like Addyston, Covendale, and Erlanger.

Source: Kentucky Division for Air Quality, 2018.

The primary sources of air emissions accounted for in the inventory data presented in this report are derived from construction and operational activities. The following software were used to develop the emissions inventory attributed to the No Action and Proposed Action alternatives.

The Airport Construction Emissions Inventory Tool (ACEIT) was developed by the Transportation Research Board (TRB) to assist airports and other stakeholders in developing airport construction emissions inventories.<sup>14</sup> The ACEIT was used to estimate emissions resulting from construction activities attributed to the Proposed Action.

Landrum & Brown  
September 2018

## Airport Environmental Design Tool Version 2d

The Airport Environmental Design Tool (AEDT) Version **2d is now the FAA's preferred** software system that models aircraft performance in space and time to estimate fuel consumption, emissions, noise, and air quality consequences at airports.<sup>15</sup> The AEDT was used to estimate operational activity emissions resulting from aircraft, auxiliary power units (APUs), ground support equipment (GSE), and stationary sources.

## Motor Vehicle Emissions Simulator

**The USEPA's Motor Vehicle Emissions Simulator (MOVES)** is an emission modeling system that estimates emissions for mobile sources at the national, county, and project level for criteria air pollutants, greenhouse gases, and air toxics. MOVES was used to estimate operational activity emissions resulting from ground access vehicles (GAVs).

## 3.0 CONSTRUCTION ACTIVITIES

Temporary impacts would result from construction activities associated with the Proposed Action. Air pollutants would be emitted by construction equipment and fugitive dust generated during demolition and construction of the proposed development as well as during clearing and grading of the site. The air cargo facility would have initial operational capability in 2021. The construction of the sortation building would be completed under a continuous development and construction program dependent on economic and operational requirements. **The facility's final** design, development phasing, and construction schedule have not been finalized at the time of the preparation of this EA. Therefore, this document assumes a full build out in three years to disclose maximum environmental impacts due to this project.

### 3.1 CONSTRUCTION PHASING

Construction estimates (including phase durations and estimated quantities) for the Proposed Action were based on the preliminary engineering data available at the time the modeling was completed for this EA. The estimates were provided by the air cargo service provider. The construction phasing plans identify three main phases proposed to occur over three years, beginning in 2019. The Proposed Action construction phases, elements, and estimated footprints are detailed in Table 3 and shown in Exhibit 1-3 and 1-4 in Chapter 1 of the EA.

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<sup>15</sup> Because this study began in April 2018, the use of AEDT 2d is in accordance with FAA policies. **Specifically, "all FAA actions requiring noise, fuel burn or emissions modeling and for which the environmental analysis process has begun on or after September 27, 2017 are required to use AEDT 2d."** Available on-line: [https://aedt.faa.gov/2d\\_information.aspx](https://aedt.faa.gov/2d_information.aspx) Accessed May 2018.



Table 3  
PROPOSED ACTION CONSTRUCTION PHASING AND ELEMENTS

PHASE	ACTIVITY	DURATION (MONTHS)	FOOTPRINT	UNIT
1	Clearing & Site Grading	18	733	acres
1	Building Demo	3	20,875	sq ft
1	Sortation Building	15	26.8	acres
1	Load Wing Building	21	11.6	acres
1	Load Wing Parking Pavement	9	21.8	acres
1	South Parking Garage/Lot	9	1,187	parking spaces
1	West Parking Lot	18	21	acres
1	GSE Services/Maintenance Area Buildings	12	4.2	acres
1	GSE Services/Maintenance Area Pavement	9	15,5508	sq ft
1	North Parking Garage/Lot	9	990	parking spaces
1	East Parking Garage/Lot	9	50	parking spaces
1	Ramp Construction	21	243.3	acres
1	Aero Parkway Improvements	18	32,946	Linear feet
1	Detention Basin	6	15	acres
2	Sortation Building	24	26.8	acres
3	Sortation Building	24	16.3	acres

Source: Air cargo service provider, 2018; Landrum &amp; Brown analysis, 2018.

### 3.2 CONSTRUCTION EMISSIONS

A construction emissions inventory was prepared to reflect the use of construction equipment and vehicles attributed to the Proposed Action. ACEIT defaults were used for construction equipment and trip generation data. The ACEIT output files are available in Attachment 2 – *Computer Modeling Files*. The annual construction emissions inventory is provided in Table 4.

Table 4  
CONSTRUCTION EMISSIONS – PROPOSED ACTION

ACTIVITY / YEAR	ANNUAL EMISSIONS (SHORT TONS)					
	CO	VOC	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Construction - 2019	94.5	23.7	28.8	0.2	9.7	1.4
Construction - 2020	173.5	57.7	62.0	0.4	18.7	2.9
Construction - 2021	40.7	9.7	13.3	0.1	1.8	0.6

Source: ACEIT, Landrum &amp; Brown analysis, 2018.

Construction of the Proposed Action would result in the highest NO<sub>x</sub> and VOC emissions during the second construction year in 2020 when a majority of the building, pavement construction, and rough grading would take place.

## 4.0 OPERATIONAL ACTIVITIES

This section presents the analysis of operational air quality emissions from the implementation of the Proposed Action in 2021 and 2026 compared to the No Action for each year.

### 4.1 FUTURE (2021) NO ACTION

In the Future (2021) No Action alternative, it is assumed the air cargo service **provider's** operational activities would be accommodated with existing facilities as described in Chapter 3, Section 3.2 of the EA. Therefore, only the emission sources resulting from the accommodation of the air cargo service provider were modeled. This section discusses the methodology and the emissions inventory for the Future (2021) No Action alternative, accordingly.

#### 4.1.1 AIRCRAFT AND ASSOCIATED ACTIVITIES

##### Takeoffs, Landings, and APUs

The number and type of aircraft operations directly affects emissions. Therefore, the air cargo service provider would operate 23,360 annual operations; 11,680 annual daytime operations **at DHL's existing facility and 11,680** annual nighttime operations on the northwest side of the terminal area.

Some cargo aircraft use APUs while parked to operate the heating, air conditioning, and electric systems. The APU can also be **used to 'start up' or restart the aircraft** engines before departing. APU usage causes emissions and is under the control of the pilot; therefore, APU use and emissions can vary greatly from one aircraft to another. AEDT defaults for aircraft APU usage were used to model APU usage by the air cargo service provider at the Airport.

##### Taxiing

In the Future (2021) No Action alternative, the **air cargo service provider's daytime** operations would experience an average taxi-in time of 4 minutes and 19 seconds and would experience an average taxi-out time of 15 minutes and 3 seconds due to **their operation out of DHL's existing facility**. Furthermore, the air cargo service **provider's nighttime operations** would experience an average taxi-in time of 5 minutes and 32 seconds and an average taxi-out time of 15 minutes and 36 seconds due to their operation out of the northwest side of the terminal area. The taxi times were calculated based on the average taxi times to the primary runways and the location on the airfield from which the provider would operate.

## Ground Support Equipment

Typical GSE includes air conditioning, air start, baggage tractors, belt loaders, and emergency vehicles that support airport operations. The GSE annual usage under the Future (2021) No Action alternative was estimated based on the aircraft activity level, the inefficient use of multiple sortation facilities, and the suboptimal location on the airfield from which the provider would operate. GSE were modeled in AEDT by population, fuel type, and annual usage. The air cargo **service provider's** operations in the Future (2021) No Action alternative would require the GSE provided in Table 5.

Table 5  
GROUND SUPPORT EQUIPMENT – FUTURE (2021) NO ACTION

GSE TYPE	FUEL TYPE	ANNUAL USAGE (HOURS PER YEAR)
Air Conditioner	Diesel	21,900
Aircraft Tractor	Diesel	3,650
Belt Loader	Electric*	7,300
Cargo Loader	Electric*	43,800
Cargo Tractor	Electric*	21,900
Deicer	Diesel	1,825
Service Truck	Diesel	4,867
Water Service	Diesel	4,867

\* Electric vehicles produce zero direct emissions

Source: Air cargo service provider, 2018; Landrum & Brown analysis, 2018

### 4.1.2 STATIONARY SOURCES

Stationary sources of air pollution include generators and boilers located on airport property. These stationary sources are a small percentage of the overall emissions inventory and are unlikely to change significantly from year-to-year. New or replacement Airport facilities may result in a change in stationary source emissions.

Under the Future (2021) No Action alternative, the air cargo service provider would be accommodated through existing facilities. Although no new facilities would be constructed, an increase in stationary sources would be required to support the energy demands of the air cargo service provider through the existing facilities. The estimated stationary source use for the Future (2021) No Action alternative is provided in Table 6.

Table 6  
STATIONARY SOURCES: BOILER – FUTURE (2021) NO ACTION

SOURCE	DESCRIPTION	FUEL TYPE	1,000s OF CUBIC METERS USED PER YEAR
Wall Fired Boiler	100 Million BTU/hour, Uncontrolled	Natural gas	4,000

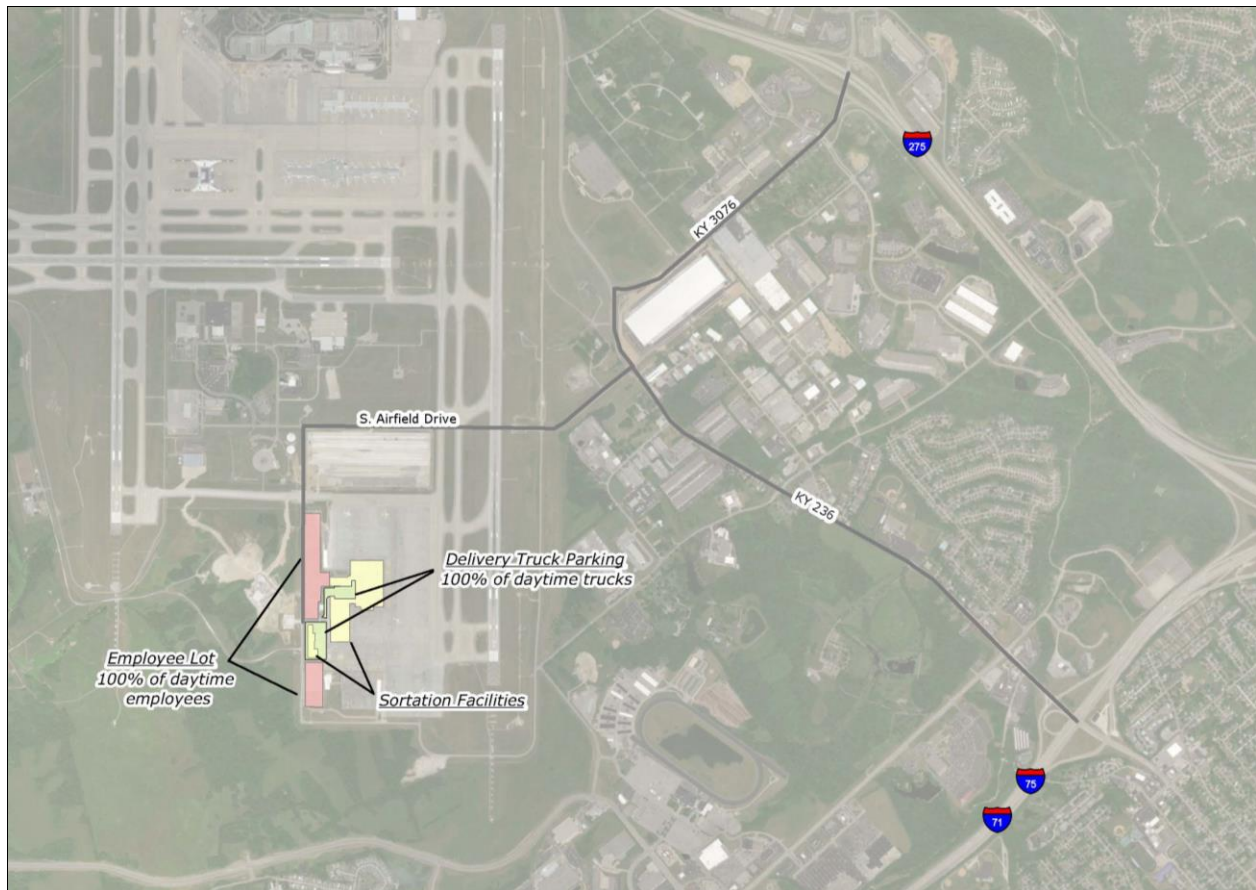
Source: Landrum & Brown analysis, 2018

#### 4.1.3 GROUND ACCESS VEHICLES

Mobile sources of air pollution include motor vehicles and other engines and equipment that can be moved from one location to another. Road sources, or GAVs, include vehicles used to transport people and goods.

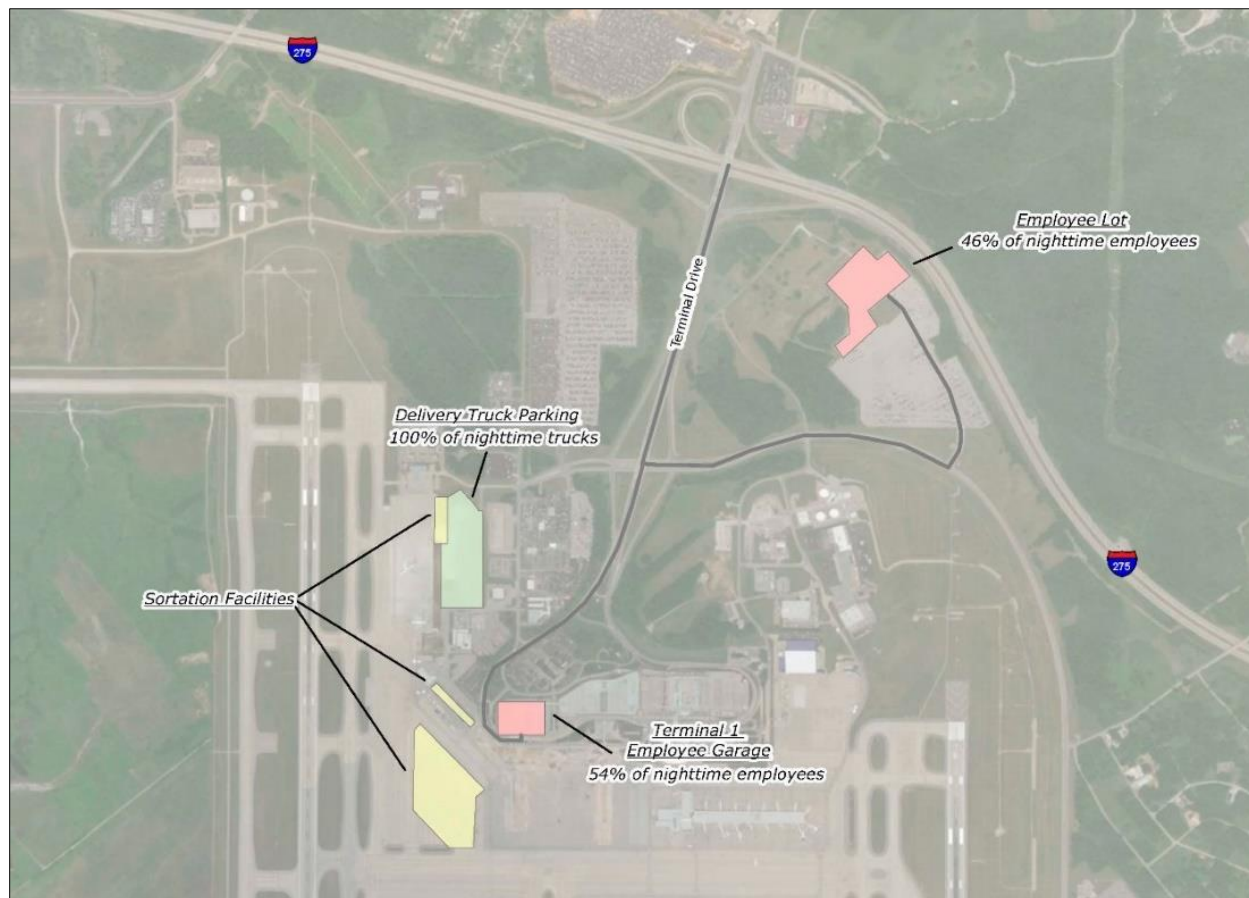
The Future (2021) No Action alternative would require GAV activity, including employee vehicles, delivery trucks, and shuttle buses to transfer employees from parking areas to the facilities. Under the Future (2021) No Action alternative, it is assumed the air cargo service provider would be accommodated **at DHL's existing** facility during the daytime and at existing facilities on the northwest side of the terminal area during the nighttime. See Figure 4 and Figure 5 for the daytime and nighttime operational facilities, respectively. The daily GAV activity for the Future (2021) No Action alternative is provided in Table 7.

Figure 3  
DAYTIME GAV OPERATIONAL FACILITIES - FUTURE (2021) NO ACTION



Source: Air cargo service provider, 2018; Landrum & Brown analysis, 2018.

Figure 4  
NIGHTTIME GAV OPERATIONAL FACILITIES - FUTURE (2021) NO ACTION



Source: Air cargo service provider, 2018; Landrum & Brown analysis, 2018.

Table 7  
GAV ACTIVITY – FUTURE (2021) NO ACTION

GAV CATEGORY	VEHICLE TRIPS PER DAY
Employee vehicles	5,432
Delivery trucks	258
Shuttles	32

Source: Air cargo service provider, 2018.

MOVES was used to model the annual emissions for GAVs. The methodology used is consistent with guidance provided by the FAA for developing an emissions inventory for general conformity analysis.<sup>16</sup> Default MOVES inputs specific to Boone County were used in this model when available. For the purpose of this study, GAV activity includes any vehicle activity occurring on Airport property and off Airport property between an Airport entry point to a major roadway. It was assumed that daytime GAVs would travel on Interstate-275 via KY 3076 and Interstate-71/75 via KY 236 to access **DHL's existing facility** on South Airfield Drive. It was also assumed that nighttime GAVs would use Interstate-275 via Terminal Drive to access the existing facilities in the northwest side of the terminal area.

<sup>16</sup> FAA, Using MOVES with AEDT, September 27, 2017.

## Employee Vehicles

Employee vehicles were modeled as passenger cars and passenger trucks. Approximately 75% of the vehicle population was assigned to gasoline passenger cars and 25% of the vehicle population was assigned to gasoline passenger trucks. It was assumed that half of all employee vehicle trips would depart from (or "start" their engines in) the parking lot once a day.

## Delivery Trucks

All delivery trucks were modeled as diesel long-haul combination trucks. It was assumed that half of all delivery truck vehicle trips would depart from (or "start" their engines in) the parking lot once a day and that each delivery truck would idle for approximately 45 minutes after arriving to the existing facility. The idle time was based on the assumption that the existing facilities would not provide immediate access to loading docks for arriving delivery trucks.

## Shuttles

Shuttles would be used during the nighttime to transfer employees from parking areas to the facilities as existing parking facilities are not located adjacent to the sortation facilities. The shuttles were modeled as diesel intercity buses. It was assumed that half of all shuttle trips would depart from (or "start" their engines in) the parking lot once a day.

### 4.1.4 EMISSIONS INVENTORY

The operational emissions inventory for the Future (2021) No Action alternative is shown in Table 8.

Table 8  
OPERATIONAL EMISSIONS INVENTORY – FUTURE (2021) NO ACTION

SOURCE	ANNUAL EMISSIONS (SHORT TONS PER YEAR)					
	CO	VOC	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Aircraft Takeoffs and Landings	17.6	8.2	200.7	11.1	0.7	0.7
APUs	1.3	0.2	5.3	0.6	0.3	0.3
Aircraft Taxiing	86.7	17.2	13.5	3.6	0.3	0.3
GSE	287.0	30.1	100.1	2.4	5.5	5.3
Stationary Sources	5.7	0.4	7.1	0.0	0.5	0.5
GAVs	32.0	3.3	10.3	0.0	0.4	0.4
<i>Future (2021) No Action - Operational Total</i>	<i>430.4</i>	<i>59.4</i>	<i>337.0</i>	<i>17.7</i>	<i>7.7</i>	<i>7.5</i>

Note: Operational activities were modeled under the assumption that the development was operational during 365 days in 2021 to account for the maximum annual operational emissions.

Source: Landrum & Brown analysis, 2018

## 4.2 FUTURE (2021) PROPOSED ACTION

**In the Future (2021) Proposed Action, it is assumed the air cargo service provider's** operational activities could be accommodated with the proposed development as described in Chapter 3, Section 3.2 of the EA. Therefore, the emission sources resulting from the operation of the air cargo service provider in the proposed development were modeled. This section discusses the methodology and the emissions inventory for the Future (2021) Proposed Action alternative, accordingly.

### 4.2.1 AIRCRAFT AND ASSOCIATED ACTIVITIES

#### Takeoffs, Landings, and APUs

Under the Future (2021) Proposed Action, **the air cargo service provider's annual** aircraft operations would be accommodated by the Proposed Action on the south side of the Airport. The Future (2021) Proposed Action alternative would accommodate the same annual aircraft operations as the Future (2021) No Action alternative; 23,360 annual aircraft operations (11,680 in the daytime and 11,680 in the nighttime). AEDT defaults for aircraft APU usage were used to model APU usage by the air cargo service provider at the Airport.

#### Taxiing

In the Future (2021) Proposed Action **alternative, the air cargo service provider's** daytime and nighttime operations would experience an average taxi-in time of 4 minutes and 19 seconds and taxi-out time of 15 minutes and 3 seconds due to their operation out of the proposed development. The taxi times were calculated based on the average taxi times of to the primary runways and the location on the airfield from where the provider would operate under the Proposed Action.

#### Ground Support Equipment

The GSE annual usage under the Future (2021) Proposed Action alternative was estimated based on the aircraft activity level, the continuous use of a single sortation facility, and the optimal location of the airfield from which the provider would operate. For this reason, it is anticipated that the GSE usage for the Future (2021) Proposed Action alternative is more efficient than that of the Future (2021) No Action alternative. The air cargo service **provider's operations** in the Future (2021) Proposed Action alternative would require the GSE provided in Table 9.

Table 9  
GROUND SUPPORT EQUIPMENT – FUTURE (2021) PROPOSED ACTION

GSE TYPE	FUEL TYPE	ANNUAL USAGE (HOURS PER YEAR)
Air Conditioner	Diesel	17,520
Aircraft Tractor	Diesel	2,920
Belt Loader	Electric*	5,840
Cargo Loader	Electric*	35,040
Cargo Tractor	Electric*	17,520
Deicer	Diesel	1,460
Service Truck	Diesel	3,894
Water Service	Diesel	3,894

\* Electric vehicles produce zero direct emissions

Source: Air cargo service provider, 2018; Landrum &amp; Brown analysis, 2018

## 4.2.2 STATIONARY SOURCES

The Future (2021) Proposed Action alternative would result in an increase in stationary sources to support the energy demands of the air cargo service provider with the proposed development. The estimated stationary source use for the Future (2021) Proposed Action alternative is provided in Table 10 and Table 11.

Table 10  
STATIONARY SOURCES: BOILER – FUTURE (2021) PROPOSED ACTION

SOURCE	DESCRIPTION	FUEL TYPE	1,000s OF CUBIC METERS USED PER YEAR
Wall Fired Boiler	100 Million BTU/hour, Uncontrolled	Natural gas	18,000

Note: Annual boiler usage was estimated based on the square footage of the Sortation Building and Load Wing.

Source: Landrum &amp; Brown analysis, 2018

Table 11  
STATIONARY SOURCES: EMERGENCY GENERATOR – FUTURE (2021)  
PROPOSED ACTION

SOURCE	DESCRIPTION	FUEL TYPE	POPULATION	ANNUAL OPERATING HOURS PER UNIT
Emergency Generator	1500 kW Generator	Diesel	4	6

Note: Each generator is assumed to be used for a maximum of 30-minute tests conducted on a monthly basis for all of 2021. The population of emergency generators is based on the assumption that the entire site will be constructed and in operation by 2021.

Source: Air cargo service provider, 2018; Landrum &amp; Brown analysis, 2018

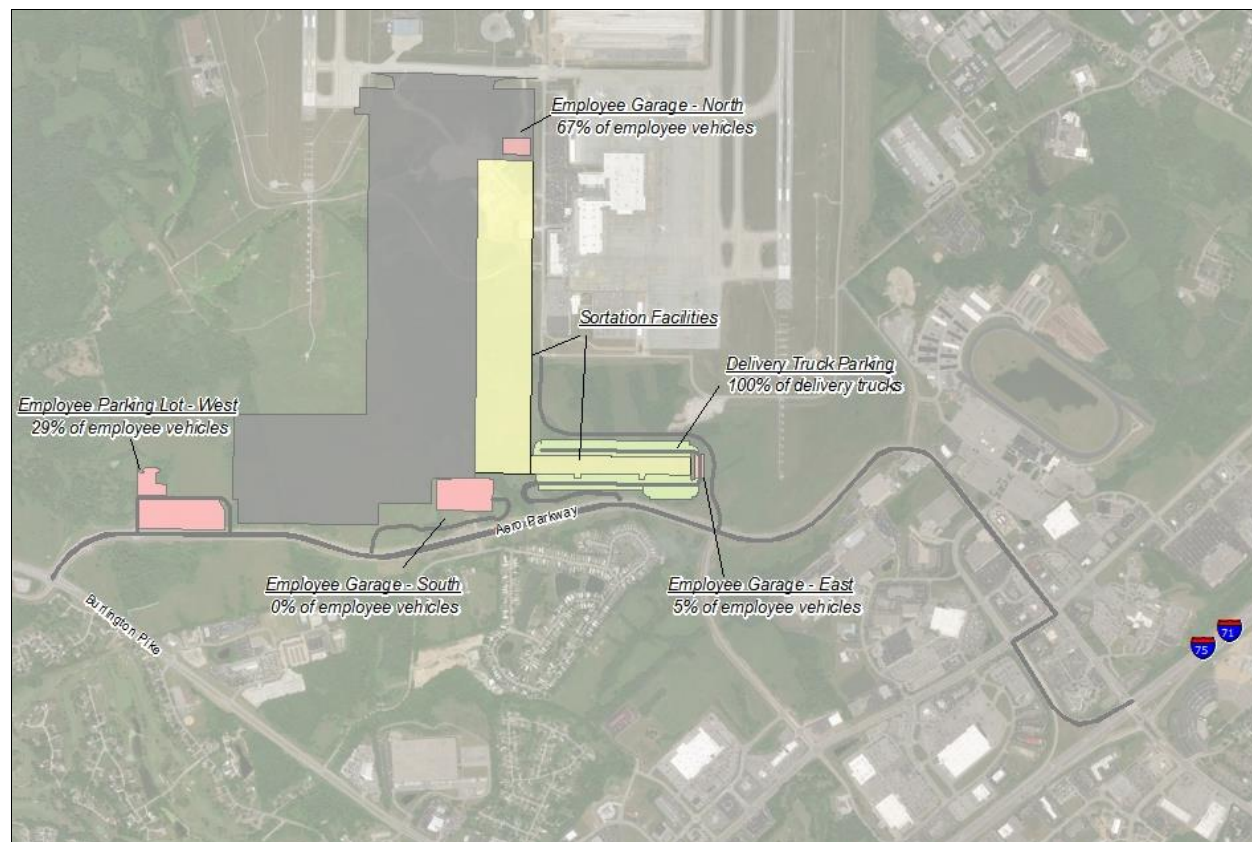
## 4.2.3 GROUND ACCESS VEHICLES

Under the Future (2021) Proposed Action alternative, GAVs would be accommodated by the proposed development. See Figure 6 for the operational facilities. It is important to note that the same volume of employee vehicles and delivery trucks would occur in the Future (2021) Proposed Action as the Future (2021) No Action. However, no shuttles are required with the proposed development as employee



parking would be located on-site. The daily GAV activity for the Future (2021) Proposed Action alternative is provided in Table 12. It was assumed that GAVs would use Burlington Pike and Interstate-71/75 via Aero Parkway and other roadways to access the proposed development.

Figure 5  
GAV OPERATIONAL FACILITIES - FUTURE (2021) PROPOSED ACTION



Source: Air cargo service provider, 2018; Landrum & Brown analysis, 2018.

Table 12  
GAV ACTIVITY – FUTURE (2021) PROPOSED ACTION

GAV CATEGORY	VEHICLE TRIPS PER DAY
Employee vehicles	5,432
Delivery trucks	258

Source: Air cargo service provider, 2018.

## Employee Vehicles

Employee vehicles were modeled as passenger cars and passenger trucks. Approximately 75% of the vehicle population was assigned to gasoline passenger cars and 25% of the vehicle population was assigned to gasoline passenger trucks. It was assumed that half of all employee vehicle trips would depart from (or “start” their engines in) the parking lot once a day.

## Delivery Trucks

All delivery trucks were modeled as diesel long-haul combination trucks. It was assumed that half of all delivery truck vehicle trips would depart **from (or "start" their engines in)** the parking lot once a day and that each delivery truck would idle for approximately 30 minutes after arriving to the proposed development. The estimated idle time was based on the assumption that the proposed development would provide immediate access to loading docks for arriving delivery trucks.

### 4.2.4 EMISSIONS INVENTORY

The operational emissions inventory for the Future (2021) Proposed Action alternative is shown in Table 13.

Table 13  
OPERATIONAL EMISSIONS INVENTORY – FUTURE (2021) PROPOSED ACTION

SOURCE	ANNUAL EMISSIONS (SHORT TONS PER YEAR)					
	CO	VOC	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Aircraft Takeoffs and Landings	17.6	8.2	200.7	11.1	0.7	0.7
APUs	1.3	0.2	5.3	0.6	0.3	0.3
Aircraft Taxiing	77.2	15.2	12.2	3.5	0.2	0.2
GSE	229.6	24.1	80.1	1.9	4.4	4.2
Stationary Sources	26.0	1.8	32.5	0.2	2.4	2.4
GAVs	29.1	3.7	8.8	0.0	0.3	0.3
<i>Future (2021) Proposed Action - Operational Total</i>	<i>380.7</i>	<i>53.2</i>	<i>339.6</i>	<i>17.3</i>	<i>8.4</i>	<i>8.2</i>

Note: Operational activities were modeled under the assumption that the development was operational during 365 days in 2021 to account for the maximum annual operational emissions.

Source: Landrum & Brown analysis, 2018

### 4.3 FUTURE (2026) NO ACTION

In the Future (2026) No Action alternative, it is assumed the air cargo service **provider's aircraft** operational activities would be accommodated with existing facilities as described in Chapter 3, Section 3.2 of the EA. However, unlike the 2021 operating levels, all of the anticipated growth in activity could not be accommodated at the Airport due to a lack of ramp and cargo processing facilities. Therefore, only the emission sources resulting from the accommodation of the air cargo service provider were modeled. This section discusses the methodology and the emissions inventory for the Future (2026) No Action alternative, accordingly.

#### 4.3.1 AIRCRAFT AND ASSOCIATED ACTIVITIES

##### Takeoffs, Landings, and APUs

Under the Future (2026) No Action alternative, the air cargo service **provider's aircraft** operations would be accommodated through existing facilities. The air cargo service provider would operate 46,720 annual operations; 26,280 annual daytime operations **at DHL's existing facility and** 20,440 annual nighttime operations on the northwest side of the terminal area. AEDT defaults for aircraft APU usage were used to model APU usage by the air cargo service provider at the Airport.

##### Taxiing

The daytime and nighttime aircraft average taxi times for the Future (2026) No Action alternative are expected to remain the same as those of the Future (2021) No Action alternative.

##### Ground Support Equipment

The GSE annual usage under the Future (2026) No Action was estimated based on the aircraft activity level, the inefficient use of multiple sortation facilities, and the suboptimal location on the airfield from which the provider would operate. The air cargo service **provider's operations** accommodated in the Future (2026) No Action alternative would require the GSE provided in Table 14.

Table 14  
GROUND SUPPORT EQUIPMENT – FUTURE (2026) NO ACTION

GSE TYPE	FUEL TYPE	ANNUAL USAGE (HOURS PER YEAR)
Air Conditioner	Diesel	43,800
Aircraft Tractor	Diesel	7,300
Belt Loader	Electric*	14,600
Cargo Loader	Electric*	87,600
Cargo Tractor	Electric*	43,800
Deicer	Diesel	3,650
Service Truck	Diesel	9,734
Water Service	Diesel	9,734

\* Electric vehicles produce zero direct emissions

Source: Air cargo service provider, 2018; Landrum & Brown analysis, 2018

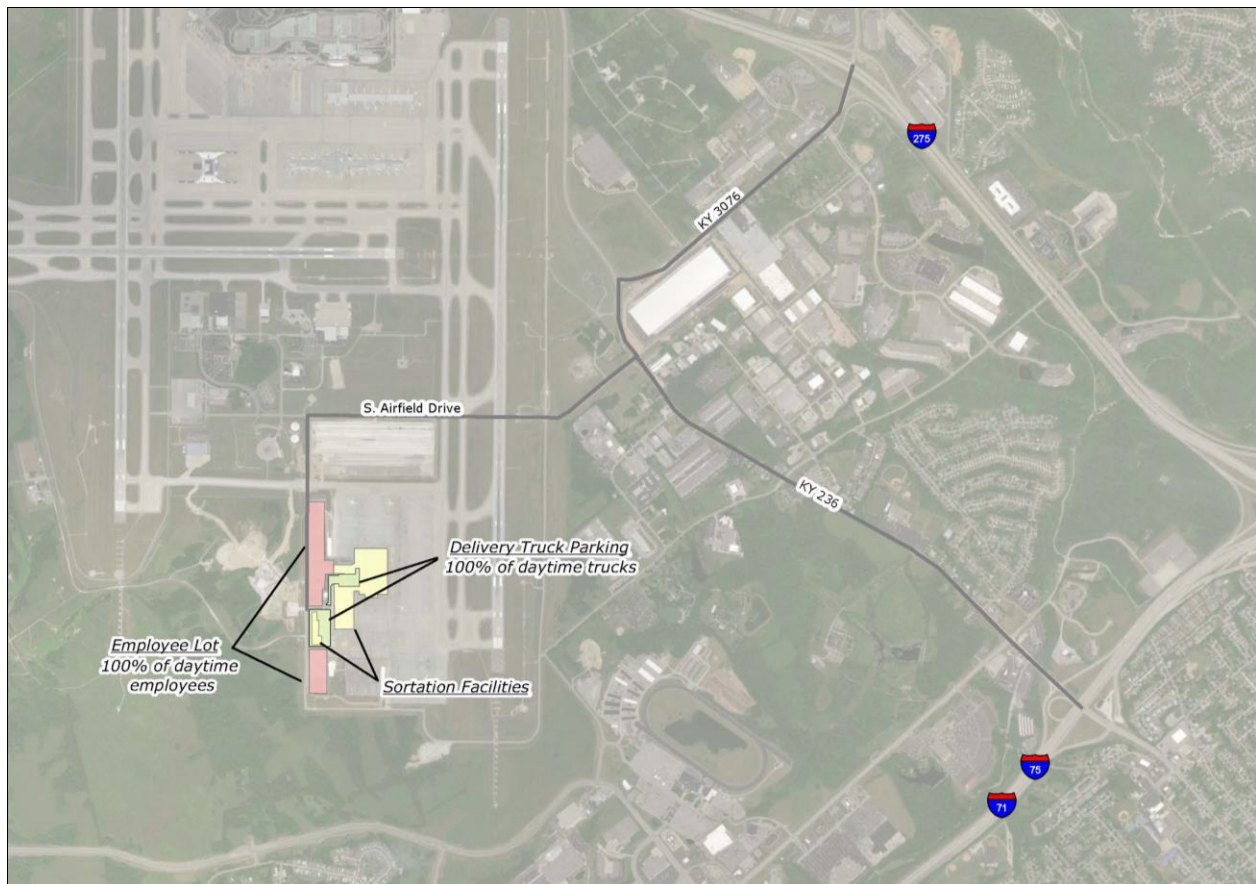
#### 4.3.2 STATIONARY SOURCES

Stationary sources are unlikely to change significantly from year-to-year. Therefore, the energy demands of the air cargo service provider for the Future (2026) No Action alternative were assumed to be the same as those of the Future (2021) No Action alternative.

### 4.3.3 GROUND ACCESS VEHICLES

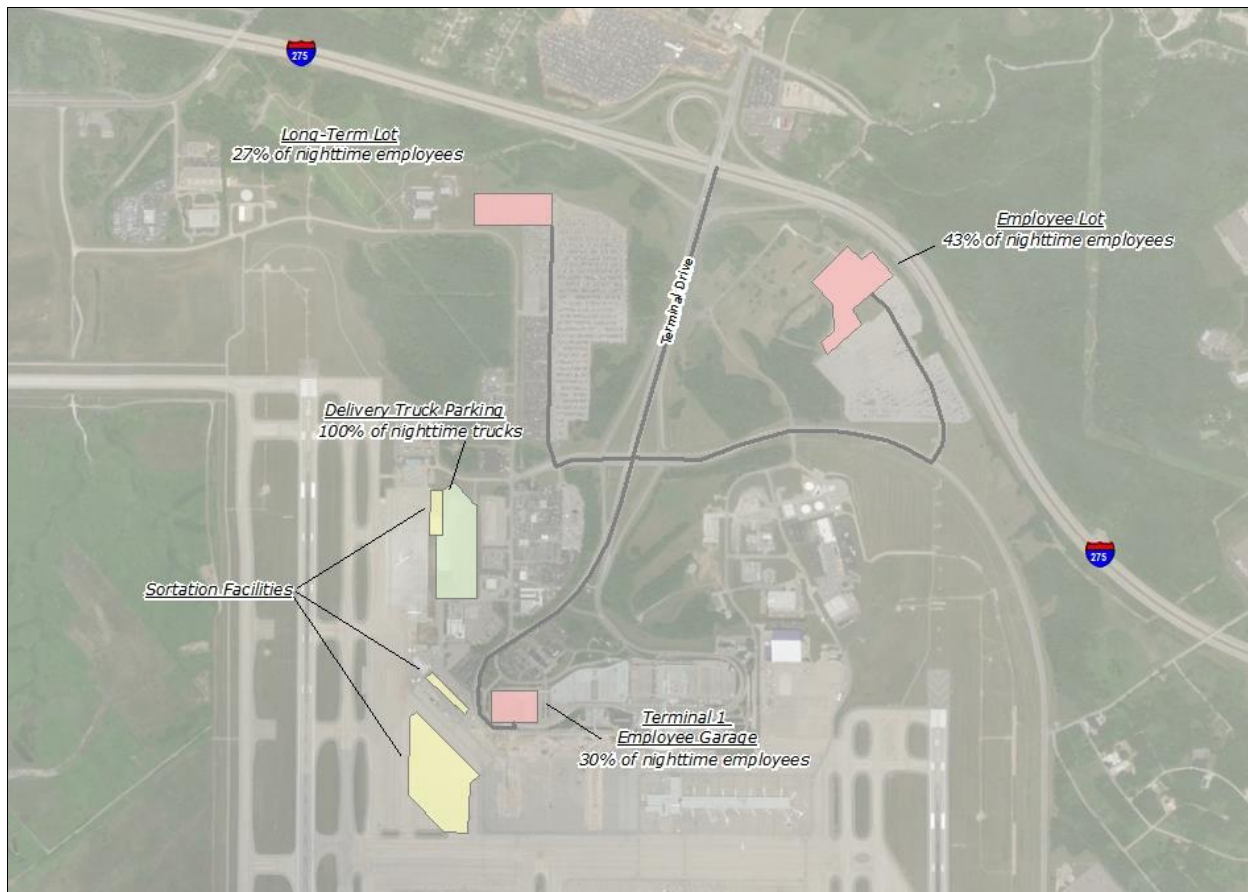
The Future (2026) No Action alternative would increase GAV activity, including employee vehicles, delivery trucks, and shuttle buses to transfer employees from parking areas to the facilities. Under the Future (2026) No Action alternative, it is assumed the air cargo service provider would be accommodated at **DHL's existing** facility during the daytime and in existing facilities in the northwest side of the terminal area during the nighttime. See Figure 7 and Figure 8 for the daytime and nighttime operational facilities, respectively. The daily GAV activity for the Future (2026) No Action alternative is provided in Table 15.

Figure 6  
DAYTIME GAV OPERATIONAL FACILITIES - FUTURE (2026) NO ACTION



Source: Air cargo service provider, 2018; Landrum & Brown analysis, 2018.

Figure 7  
NIGHTTIME GAV OPERATIONAL FACILITIES - FUTURE (2026) NO ACTION



Source: Air cargo service provider, 2018; Landrum & Brown analysis, 2018.

Table 15  
GAV ACTIVITY – FUTURE (2026) NO ACTION

GAV CATEGORY	VEHICLE TRIPS PER DAY
Employee vehicles	11,058
Delivery trucks	578
Shuttles	90

Source: Air cargo service provider, 2018.

MOVES was used to model the annual emissions from GAVs. The same methodology used to model the Future (2021) No Action alternative GAV activity was employed to model that of the Future (2026) No Action alternative.



#### 4.3.4 EMISSIONS INVENTORY

The operational emissions inventory for the Future (2026) No Action alternative is shown in Table 16.

Table 16  
OPERATIONAL EMISSIONS INVENTORY – FUTURE (2026) NO ACTION

SOURCE	ANNUAL EMISSIONS (SHORT TONS PER YEAR)					
	CO	VOC	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Aircraft Takeoffs and Landings	29.5	14.8	354.3	18.2	1.1	1.1
APUs	3.4	0.3	10.0	1.1	0.7	0.7
Taxiing	117.6	21.6	22.3	5.6	0.4	0.4
GSE	430.5	54.3	122.4	4.7	5.7	5.4
Stationary Sources	5.7	0.4	7.1	0.0	0.5	0.5
GAVs	48.4	4.9	15.1	0.0	0.8	0.7
<i>Future(2026) No Action - Operational Total</i>	<i>635.0</i>	<i>96.3</i>	<i>531.1</i>	<i>29.7</i>	<i>9.2</i>	<i>8.9</i>

Note: Operational activities were modeled under the assumption that the development was operational during 365 days in 2026 to account for the maximum annual operational emissions

Source: Landrum & Brown analysis, 2018

#### 4.4 FUTURE (2026) PROPOSED ACTION

In the Future (2026) Proposed Action alternative, it is assumed the air cargo service **provider's** operational activities could be accommodated with the proposed development as described in Chapter 3, Section 3.2 of the EA. Therefore, the emission sources resulting from the operation of the air cargo service provider in the proposed development were modeled. This section discusses the methodology and the emissions inventory for the Future (2026) Proposed Action alternative, accordingly.

##### 4.4.1 AIRCRAFT AND ASSOCIATED ACTIVITIES

###### Takeoffs, Landings, and APUs

Under the Future (2026) Proposed Action alternative, **the air cargo service provider's** annual aircraft operations would fully be accommodated by the Proposed Action on the south side of the Airport. The Future (2026) Proposed Action alternative would accommodate 52,560 annual aircraft operations (26,280 in the daytime and 26,280 in the nighttime). AEDT defaults for aircraft APU usage were used to model APU usage by the air cargo service provider at the Airport.

###### Taxiing

The aircraft average taxi time for the Future (2026) Proposed Action is expected to remain the same as the Future (2021) Proposed Action.

## Ground Support Equipment

The GSE annual usage under the Future (2026) Proposed Action alternative was estimated based on the aircraft activity level, the continuous use of a single sortation facility, and the optimal location on the airfield from which the provider would operate. For this reason, it is anticipated that the GSE usage for the Future (2026) Proposed Action alternative is more efficient than that of the Future (2026) No Action alternative. The air cargo service **provider's operations in the Future (2026) Proposed Action** alternative would require the GSE provided in Table 17.

Table 17  
GROUND SUPPORT EQUIPMENT – FUTURE (2026) PROPOSED ACTION

GSE TYPE	FUEL TYPE	ANNUAL USAGE (HOURS PER YEAR)
Air Conditioner	Diesel	39,420
Aircraft Tractor	Diesel	6,570
Belt Loader	Electric*	13,140
Cargo Loader	Electric*	78,840
Cargo Tractor	Electric*	39,420
Deicer	Diesel	3,285
Service Truck	Diesel	8,760
Water Service	Diesel	8,760

\* Electric vehicles produce zero direct emissions

Source: Air cargo service provider, 2018; Landrum & Brown analysis, 2018

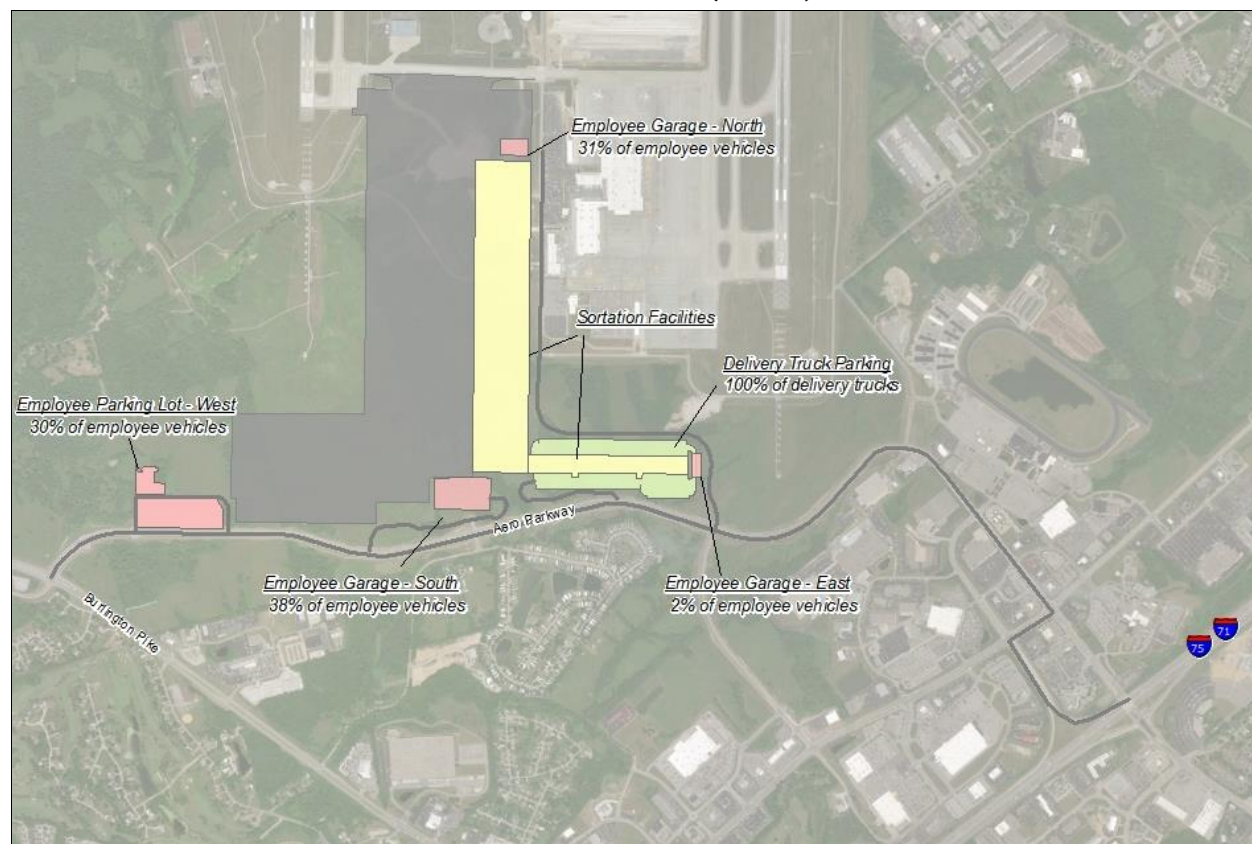
### 4.4.2 STATIONARY SOURCES

Stationary sources are unlikely to change significantly from year-to-year. Therefore, the energy demands of the air cargo service provider for the Future (2026) Proposed Action alternative were assumed to be the same as those of the Future (2026) Proposed Action alternative.

### 4.4.3 GROUND ACCESS VEHICLES

The Future (2026) Proposed Action alternative would increase GAV activity (including employee vehicles and delivery trucks) from the Future (2021) Proposed Action alternative. Under the Future (2026) Proposed Action alternative, GAVs would be accommodated by the proposed development. Additional parking facilities would be required to accommodate the increase in GAV activity. See Figure 9 for the operational facilities. No shuttles are required in the proposed development as employee parking would be located on-site. The daily GAV activity for the Future (2026) Proposed Action alternative is provided in Table 18.

Figure 8  
GAV OPERATIONAL FACILITIES - FUTURE (2026) PROPOSED ACTION



Source: Air cargo service provider, 2018; Landrum & Brown analysis, 2018.

Table 18  
GAV ACTIVITY – FUTURE (2026) PROPOSED ACTION

GAV CATEGORY	VEHICLE TRIPS PER DAY
Employee vehicles	12,440
Delivery trucks	650

Source: Air cargo service provider, 2018.

MOVES was used to model the annual emissions from GAVs. The same methodology used to model the Future (2021) Proposed Action alternative GAV activity was employed to model that of the Future (2026) Proposed Action alternative.

#### 4.4.4 EMISSIONS INVENTORY

The operational emissions inventory for the Future (2026) Proposed Action alternative is shown in Table 19.



Table 19  
OPERATIONAL EMISSIONS INVENTORY – FUTURE (2026) PROPOSED ACTION

SOURCE	ANNUAL EMISSIONS (SHORT TONS PER YEAR)					
	CO	VOC	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Aircraft Takeoffs and Landings	33.4	16.7	404.2	20.7	1.3	1.3
APUs	3.8	0.4	11.3	1.3	0.8	0.8
Taxiing	135.5	24.7	26.0	6.9	0.4	0.4
GSE	387.4	48.9	110.1	4.2	5.1	4.9
Stationary Sources	26.0	1.8	32.5	0.2	2.4	2.4
GAVs	47.5	6.0	13.2	0.0	0.6	0.5
<i>Future (2026) Proposed Action - Operational Total</i>	<i>633.5</i>	<i>98.5</i>	<i>597.2</i>	<i>33.3</i>	<i>10.7</i>	<i>10.4</i>

Note: Operational activities were modeled under the assumption that the development was operational during 365 days in 2021 to account for the maximum annual operational emissions.

Source: Landrum & Brown analysis, 2018

## 5.0 TOTAL EMISSIONS

The emissions inventories prepared for the Proposed Action were compared to the emissions inventories prepared for the No Action alternative of the same future year to disclose the potential increase in emissions caused by the Proposed Action. The comparison of the emission inventories, which included an inventory of construction and operational emissions, were used for the evaluation of General Conformity as required under the CAA (including the 1990 Amendments). Because conformity to the *de minimis* threshold is relevant only with regard to the ozone precursor pollutants, only NO<sub>x</sub> and VOC emissions are presented and evaluated in this report. Table 20 shows that neither of the relevant Federal thresholds were equaled or exceeded for the Future (2021) Proposed Action or the Future (2026) Proposed Action.

In 2019 and 2020, there is an increase in net emissions due to construction activities associated with the Proposed Action. In 2021, there is an increase in net emissions of NO<sub>x</sub> and VOCs due to construction activities and usage of stationary sources associated with the Proposed Action. However, there is also decrease in in net emissions of CO due to the inefficient usage of GSE and increased aircraft taxiing associated with the No Action. In 2026, there is an increase in net emissions of NO<sub>x</sub> and VOCs due to increased aircraft activity and taxiing levels associated with the Proposed Action. Additionally, there is decrease in in net emissions of CO due to the inefficient usage of GSE and increased aircraft taxiing associated with the No Action.

The air quality assessment demonstrates that the Proposed Action would not cause an increase in air emissions above the applicable *de minimis* thresholds. Therefore, the Proposed Action conforms to the SIP and the CAA and would not create any new violation of the NAAQS, delay the attainment of any NAAQS, nor increase the frequency or severity of any existing violations of the NAAQS. As such, no adverse impact on local or regional air quality is expected by construction of the Proposed Action. No further analysis or reporting is required under the CAA or NEPA.

Table 20  
TOTAL ANNUAL EMISSIONS

SOURCE	ANNUAL EMISSIONS(SHORT TONS PER YEAR)					
	CO	VOC	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
<i>Federal de minimis Threshold</i>	<i>N/A</i>	<i>100</i>	<i>100</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
<b>2019</b>						
Construction - Proposed Action	94.5	23.7	28.8	0.2	9.7	1.4
<i>2019 Proposed Action Subtotal</i>	<i>94.5</i>	<i>23.7</i>	<i>28.8</i>	<i>0.2</i>	<i>9.7</i>	<i>1.4</i>
<i>2019 Proposed Action Net Emissions</i>	<i>94.5</i>	<i>23.7</i>	<i>28.8</i>	<i>0.2</i>	<i>9.7</i>	<i>1.4</i>
<b>2020</b>						
Construction - Proposed Action	173.5	57.7	62.0	0.4	18.7	2.9
<i>2020 Proposed Action Subtotal</i>	<i>173.5</i>	<i>57.7</i>	<i>62.0</i>	<i>0.4</i>	<i>18.7</i>	<i>2.9</i>
<i>2020 Proposed Action Net Emissions</i>	<i>173.5</i>	<i>57.7</i>	<i>62.0</i>	<i>0.4</i>	<i>18.7</i>	<i>2.9</i>
<b>2021</b>						
Aircraft Takeoffs and Landings - No Action	17.6	8.2	200.7	11.1	0.7	0.7
APUs – No Action	1.3	0.2	5.3	0.6	0.3	0.3
Aircraft Taxiing - No Action	86.7	17.2	13.5	3.6	0.3	0.3
GSE – No Action	287.0	30.1	100.1	2.4	5.5	5.3
Stationary Sources – No Action	5.7	0.4	7.1	0.0	0.5	0.5
GAVs - No Action	32.0	3.3	10.3	0.0	0.4	0.4
<i>2021 No Action Subtotal</i>	<i>430.4</i>	<i>59.4</i>	<i>337.0</i>	<i>17.7</i>	<i>7.7</i>	<i>7.5</i>
Aircraft Takeoffs and Landings - Proposed Action	17.6	8.2	200.7	11.1	0.7	0.7
APUs – Proposed Action	1.3	0.2	5.3	0.6	0.3	0.3
Aircraft Taxiing - Proposed Action	77.2	15.2	12.2	3.5	0.2	0.2
GSE – Proposed Action	229.6	24.1	80.1	1.9	4.4	4.2
Stationary Sources - Proposed Action	26.0	1.8	32.5	0.2	2.4	2.4
GAVs - Proposed Action	29.1	3.7	8.8	0.0	0.3	0.3
Construction - Proposed Action	40.7	9.7	13.3	0.1	1.8	0.6
<i>2021 Proposed Action Subtotal</i>	<i>421.4</i>	<i>62.9</i>	<i>352.9</i>	<i>17.4</i>	<i>10.2</i>	<i>8.8</i>
<i>2021 Proposed Action Net Emissions</i>	<i>- 8.9</i>	<i>3.4</i>	<i>15.8</i>	<i>-0.3</i>	<i>2.5</i>	<i>1.3</i>
<b>2026</b>						
Aircraft Takeoffs and Landings - No Action	29.5	14.8	354.3	18.2	1.1	1.1
APUs – No Action	3.4	0.3	10.0	1.1	0.7	0.7
Aircraft Taxiing - No Action	117.6	21.6	22.3	5.6	0.4	0.4
GSE - No Action	430.5	54.3	122.4	4.7	5.7	5.4
Stationary Sources – No Action	5.7	0.4	7.1	0.0	0.5	0.5
GAVs - No Action	48.4	4.9	15.1	0.0	0.8	0.7
<i>2026 No Action Subtotal</i>	<i>635.0</i>	<i>96.3</i>	<i>531.1</i>	<i>29.7</i>	<i>9.2</i>	<i>8.9</i>
Aircraft Takeoffs and Landings - Proposed Action	33.4	16.7	404.2	20.7	1.3	1.3
APU - Proposed Action	3.8	0.4	11.3	1.3	0.8	0.8
Aircraft Taxiing - Proposed Action	135.5	24.7	26.0	6.9	0.4	0.4
GSE - Proposed Action	387.4	48.9	110.1	4.2	5.1	4.9
Stationary Sources - Proposed Action	26.0	1.8	32.5	0.2	2.4	2.4
GAVs - Proposed Action	47.5	6.0	13.2	0.0	0.6	0.5
<i>2026 Proposed Action Subtotal</i>	<i>633.5</i>	<i>98.5</i>	<i>597.2</i>	<i>33.3</i>	<i>10.7</i>	<i>10.4</i>
<i>2026 Proposed Action Net Emissions</i>	<i>-1.5</i>	<i>2.1</i>	<i>66.1</i>	<i>3.6</i>	<i>1.5</i>	<i>1.5</i>

Note: Numbers may not sum due to rounding.

Source: Landrum &amp; Brown analysis, 2018

## 6.0 CLIMATE

### 6.1 AFFECTED ENVIRONMENT

GHGs are gases that trap heat in the earth's atmosphere. Both naturally occurring and man-made GHGs primarily include water vapor (H<sub>2</sub>O), carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>). Sources that require fuel or power at an airport are the primary sources that would generate GHGs. Aircraft are probably the most often cited air pollutant source, but they produce the same types of emissions as ground access vehicles.

Research has shown there is a direct correlation between fuel combustion and GHG emissions. In terms of U.S. contributions, the General Accounting Office (GAO) reports that "domestic aviation contributes about three percent of total carbon dioxide emissions, according to EPA data," compared with other industrial sources including the remainder of the transportation sector (20 percent) and power generation (41 percent).<sup>17</sup> The International Civil Aviation Organization (ICAO) estimates that GHG emissions from aircraft account for roughly three percent of all anthropogenic GHG emissions globally.<sup>18</sup> Climate change due to GHG emissions is a global phenomenon, so the affected environment is the global climate.<sup>19</sup>

The scientific community is continuing efforts to better understand the impact of aviation emissions on the global atmosphere. The FAA is leading and participating in a number of initiatives intended to clarify the role that commercial aviation plays in GHG emissions and climate. The FAA, with support from the U.S. Global Change Research Program and its participating federal agencies (e.g., National Aeronautics and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), USEPA, and Department of Energy (DOE)), has developed the Aviation Climate Change Research Initiative (ACCRI) in an effort to advance scientific understanding of regional and global climate impacts of aircraft emissions. FAA also funds the Partnership for Air Transportation Noise & Emissions Reduction (PARTNER) Center of Excellence research initiative to quantify the effects of aircraft exhaust and contrails on global and U.S. climate and atmospheric composition. Similar research topics are being examined at the international level by the International Civil Aviation Organization.<sup>20</sup>

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<sup>17</sup> *Aviation and Climate Change*. GAO Report to Congressional Committees, (2009).

<sup>18</sup> Alan Melrose, "European ATM and Climate Adaptation: A Scoping Study," in *ICAO Environmental Report*. (2010).

<sup>19</sup> As explained by the U.S. Environmental Protection Agency, "greenhouse gases, once emitted, become well mixed in the atmosphere, meaning U.S. emissions can affect not only the U.S. population and environment but other regions of the world as well; likewise, emissions in other countries can affect the United States." Climate Change Division, Office of Atmospheric Programs, U.S. Environmental Protection Agency, *Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act 2-3* (2009).

<sup>20</sup> Lourdes Q. Maurice and David S. Lee. *Chapter 5: Aviation Impacts on Climate*. Final Report of the International Civil Aviation Organization (ICAO) Committee on Aviation and Environmental Protection (CAEP) Workshop. October 29<sup>th</sup> November 2<sup>nd</sup> 2007, Montreal.

## 6.2 CLIMATE ENVIRONMENTAL CONSEQUENCES

Although there are no federal standards for aviation-related GHG emissions, it is well-established that GHG emissions can affect climate.<sup>21</sup> The Council on Environmental Quality (CEQ) has indicated that climate should be considered in NEPA analyses. The following provides an estimate of GHG emissions. This report used the carbon dioxide equivalent (CO<sub>2</sub>E) method to show relative impacts on climate change of different chemical species. The resulting CO<sub>2</sub>E is provided for information only as no federal NEPA standard for the significance of GHG emissions from individual projects on the environment has been established. Table 21 provides the CO<sub>2</sub>E emissions inventory for the construction and operational activities previously discussed in Section 3.0 and 4.0 of this document.

Table 21  
TOTAL ANNUAL GHG EMISSIONS

SOURCE	ANNUAL EMISSIONS (METRIC TONS)
	CO <sub>2</sub> E
2019	
Construction - Proposed Action	17,921.5
<i>2019 Proposed Action Net Emissions</i>	<i>17,921.5</i>
2020	
Construction - Proposed Action	40,988.5
<i>2020 Proposed Action Net Emissions</i>	<i>40,988.5</i>
2021	
Aircraft Takeoffs and Landings - No Action	27,144.4
Aircraft Taxiing - No Action	8,796.2
GAVs - No Action	2,493.0
<i>2021 No Action Subtotal</i>	<i>38,433.7</i>
Aircraft Takeoffs and Landings - No Action	27,144.4
Aircraft Taxiing - Proposed Action	8,526.6
GAVs - Proposed Action	2,238.4
Construction - Proposed Action	9,356.9
<i>2021 Proposed Action Subtotal</i>	<i>47,266.3</i>
<i>2021 Proposed Action Net Emissions</i>	<i>8,832.6</i>
2026	
Aircraft Takeoffs and Landings - No Action	44,423.4
Aircraft Taxiing - No Action	13,746.8
GAVs - No Action	5,062.9
<i>2026 No Action Subtotal</i>	<i>63,233.0</i>
Aircraft Takeoffs and Landings - Proposed Action	50,508.1
Aircraft Taxiing - Proposed Action	16,817.6
GAVs - Proposed Action	4,882.2
<i>2026 Proposed Action Subtotal</i>	<i>72,207.9</i>
<i>2026 Proposed Action Net Emissions</i>	<i>8,974.8</i>

CO<sub>2</sub>E: Carbon Dioxide equivalent

Note: GHG emissions for stationary sources, GSE, and APUs are not reported because AEDT does not have the capability of calculating GHG emissions for these emission sources.  
Numbers may not sum due to rounding.

Source: Landrum & Brown analysis, 2018

<sup>21</sup> See *Massachusetts v. E.P.A.*, 549 U.S. 497, 508-10, 521-23 (2007).

### 6.3 CLIMATE CUMULATIVE IMPACTS

The cumulative impact of this Proposed Action on the global climate when added to other past, present, and reasonably foreseeable future actions is not currently scientifically predictable. Aviation has been calculated to contribute approximately 3 percent of global carbon dioxide (CO<sub>2</sub>) emissions; this contribution may grow to 5 percent by 2050. Actions are underway within the U.S. and by other nations to reduce aviation's contribution through such measures as new aircraft technologies to reduce emissions and improve fuel efficiency, renewable alternative fuels with lower carbon footprints, more efficient air traffic management, market-based measures and environmental regulations including an aircraft CO<sub>2</sub> standard. The U.S. has ambitious goals to achieve carbon-neutral growth for aviation by 2020 compared to a 2005 baseline, and to gain absolute reductions in GHG emissions by 2050. At present there are no calculations of the extent to which measures individually or cumulatively may affect aviation's CO<sub>2</sub> emissions. Moreover, there are large uncertainties regarding aviation's impact on climate. The FAA, with support from the U.S. Global Change Research Program and its participating federal agencies (e. g., NASA, NOAA, EPA, and DOE), has developed the Aviation Climate Change Research Initiative (ACCRI) in an effort to advance scientific understanding of regional and global climate impacts of aircraft emissions, with quantified uncertainties for current and projected aviation scenarios under changing atmospheric conditions.<sup>22</sup>

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<sup>22</sup> Nathan Brown, et. al. *The U.S. Strategy for Tackling Aviation Climate Impacts*, (2010). 27th International Congress of the Aeronautical Sciences.

## ATTACHMENT 1 DESCRIPTION OF POLLUTANTS

*Ozone (O<sub>3</sub>)* - Ozone is a pollutant which is not directly emitted, rather, ozone is formed in the atmosphere through photochemical reaction with nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOC), sunlight, and heat. It is the primary constituent of smog and problems can occur many miles away from the pollutant sources.

People with lung disease, children, older adults, and people who are active can be affected when ozone levels are unhealthy. Numerous scientific studies have linked ground-level ozone exposure to a variety of problems, including:

- lung irritation that can cause inflammation much like a sunburn;
- wheezing, coughing, pain when taking a deep breath, and breathing difficulties during exercise or outdoor activities;
- permanent lung damage to those with repeated exposure to ozone pollution; and
- aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses like pneumonia and bronchitis.

*Carbon Monoxide (CO)* - Carbon monoxide is a colorless, odorless gas primarily associated with the incomplete combustion of fossil fuels in motor vehicles. Carbon monoxide combines with hemoglobin in the bloodstream and reduces the amount of oxygen that can be circulated through the body. High carbon monoxide concentrations can lead to headaches, aggravation of cardiovascular disease, and impairment of central nervous system functions. Carbon monoxide concentrations can vary greatly over comparatively short distances. Relatively high concentrations are typically found near crowded intersections, along heavily used roadways carrying slow-moving traffic, and at or near ground level. Even under the most severe meteorological and traffic conditions, high concentrations of carbon monoxide are limited to locations within a relatively short distance of heavily traveled roadways. Overall carbon monoxide emissions are decreasing as a result of the Federal Motor Vehicle Control Program, which has mandated increasingly lower emission levels for vehicles manufactured since 1973.

*Volatile Organic Compound (VOC)* - Volatile Organic Compounds are gases that are emitted from solids or liquids, such as stored fuel, paint, and cleaning fluids. VOCs include a variety of chemicals, some which can have short and long-term adverse health effects. As previously stated, VOCs are precursor pollutants that react with heat, sunlight and nitrogen oxides (NO<sub>x</sub>) to form ozone (O<sub>3</sub>). VOC can also mix with other gases to form particulate matter PM<sub>2.5</sub> as referenced below.

*Nitrogen Dioxide (NO<sub>2</sub>)* - Nitrogen gas, normally relatively inert (unreactive), comprises about 80% of the air. At high temperatures (i.e., in the combustion process) and under certain other conditions it can combine with oxygen, forming several different gaseous compounds collectively called nitrogen oxides (NO<sub>x</sub>). Nitric oxide (NO) and nitrogen dioxide (NO<sub>2</sub>) are the two most important compounds. Nitric

oxide is converted to nitrogen dioxide in the atmosphere. Nitrogen dioxide (NO<sub>2</sub>) is a red-brown pungent gas. Motor vehicle emissions are the main source of NO<sub>x</sub> in urban areas.

Nitrogen dioxide is toxic to various animals as well as to humans. Its toxicity relates to its ability to form nitric acid with water in the eye, lung, mucus membrane and skin. In animals, long-term exposure to nitrogen oxides increases susceptibility to respiratory infections lowering their resistance to such diseases as pneumonia and influenza. Laboratory studies show susceptible humans, such as asthmatics, exposed to high concentrations of NO<sub>2</sub> can suffer lung irritation and potentially, lung damage. Epidemiological studies have also shown associations between NO<sub>2</sub> concentrations and daily mortality from respiratory and cardiovascular causes and with hospital admissions for respiratory conditions.

While the NAAQS only addresses NO<sub>2</sub>, NO and the total group of nitrogen oxides is of concern. NO and NO<sub>2</sub> are both precursors in the formation of ozone and secondary particulate matter. Because of this and that NO emissions largely convert to NO<sub>2</sub>, NO<sub>x</sub> emissions are typically examined when assessing potential air quality impacts.

*Sulfur Dioxide (SO<sub>2</sub>)* - Sulfur oxides (SO<sub>x</sub>) constitute a class of compounds of which sulfur dioxide (SO<sub>2</sub>) and sulfur trioxide (SO<sub>3</sub>) are of greatest importance. SO<sub>2</sub> is commonly expressed as SO<sub>x</sub> since it is a larger subset of sulfur dioxides (SO<sub>2</sub>). SO<sub>2</sub> is a colorless gas that is typically identified as having a strong odor and is formed when fuel containing sulfur, like coal, oil and jet fuel, is burned. SO<sub>2</sub> combines easily with water vapor, forming aerosols of sulfurous acid (H<sub>2</sub>SO<sub>3</sub>), a colorless, mildly corrosive liquid. This liquid may then combine with oxygen in the air, forming the even more irritating and corrosive sulfuric acid (H<sub>2</sub>SO<sub>4</sub>). Peak levels of SO<sub>2</sub> in the air can cause temporary breathing difficulty for people with asthma who are active outdoors. Longer-term exposures to high levels of SO<sub>2</sub> gas and particles cause respiratory illness and aggravate existing heart disease.

*Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>)* - Particulate matter includes both aerosols and solid particles of a wide range of size and composition. PM<sub>10</sub> is considered coarse particles with a diameter of 10 micrometers or less, and PM<sub>2.5</sub>, fine particles with a diameter of 2.5 micrometers or less. Emissions of PM<sub>2.5</sub> are a subset of emissions of PM<sub>10</sub>. Particulate matter can be any particle of these sizes, including dust, dirt, and soot. Smaller particulates are of greater concern because they can penetrate deeper into the lungs than large particles.

PM<sub>2.5</sub> is directly emitted in combustion exhaust and formed from atmospheric reactions between various gaseous pollutants including nitrogen oxides (NO<sub>x</sub>) sulfur oxides (SO<sub>x</sub>) and volatile organic compounds (VOC). PM<sub>10</sub> is generally emitted directly as a result of mechanical processes that crush or grind larger particles or the resuspension of dusts, most typically through construction activities and vehicular movements. PM<sub>2.5</sub> can remain suspended in the atmosphere for days and weeks and can be transported over long distances. PM<sub>10</sub> generally settles out of the atmosphere rapidly and is not readily transported over large distances.

The principal health effect of airborne particulate matter is on the respiratory system. Short-term exposures to high PM<sub>2.5</sub> levels are associated with premature mortality, increased hospital admissions, and emergency room visits. Long-term exposures to

high PM<sub>2.5</sub> levels are associated with premature mortality and development of chronic respiratory disease.

*Carbon Dioxide (CO<sub>2</sub>)* - Carbon dioxide is a colorless, odorless gas produced through the incomplete combustion of fossil fuels. Carbon dioxide is considered to be the most significant GHG that traps heat in the earth's atmosphere.

*Carbon Dioxide Equivalent (CO<sub>2</sub>E)* - The CO<sub>2</sub>E method is a way to show relative impacts on climate change of different chemical species, including both naturally occurring and man-made greenhouse gases such as CO<sub>2</sub>, water vapor (H<sub>2</sub>O), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O). These different chemical species that are emitted have a different effect on climate known as Global Warming Potential (GWP). Specifically, it is a measure of how much energy the emission of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of CO<sub>2</sub>. The **CO<sub>2</sub>E method accounts for each GHG's GWP in order to** represent the relative impacts on climate change by different chemical species.

*Lead (Pb)* - Lead is a stable compound, which persists and accumulates both in the environment and in animals. In humans, it affects the blood-forming or hematopoietic, the nervous, and the renal systems. In addition, lead has been shown to affect the normal functions of the reproductive, endocrine, hepatic, cardiovascular, immunological, and gastrointestinal systems, although there is significant individual variability in response to lead exposure. Since 1975, lead emissions have been in decline due in part to the introduction of catalyst-equipped vehicles, and decline in production of leaded gasoline. In general, an analysis of lead is limited to projects that emit significant quantities of the pollutant (i.e. lead smelters) and are generally not applied to transportation projects.



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## Appendix C

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# APPENDIX C

## SECTION 7 CONSULTATION

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U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 17, 2018

Jessica Blackwood Miller  
Fish & Wildlife Biologist  
Kentucky Field Office  
U.S. Fish & Wildlife Service  
330 W. Broadway, Room 265  
Frankfort, KY 40601

**RE: Section 7 Consultation for the Development of a Proposed Air Cargo Hub  
Cincinnati/Northern Kentucky International Airport, Covington, KY**

Dear Ms. Miller:

The Federal Aviation Administration (FAA), as lead federal agency, is preparing an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) of 1969, as amended, for the proposed air cargo hub development project at the Cincinnati Northern Kentucky International Airport (CVG) Covington, KY. CVG is a publicly owned passenger and air cargo airport operated by the Kenton County Airport Board (KCAB). CVG is located in the northeast section of Boone County, Kentucky, approximately one mile south of the Ohio River and eight miles southwest of downtown Cincinnati.

The purpose of this letter is to initiate formal consultation with U.S. Fish and Wildlife (Service) under Section 7 of the Endangered Species Act (ESA) for the proposed project. We are enclosing a Biological Assessment (BA), prepared by KCAB's consultant, Environment & Archaeology. This BA provides information in support of FAA's determinations of effect on federally listed threatened and endangered species and designated critical habitat.

**Project Background:**

KCAB intends to enter into a long-term lease with an air cargo services provider for the development and operation of an air cargo facility at CVG. The *purpose* of this project is to provide suitable air cargo facilities for a large-scale air cargo operation on land presently owned by the KCAB. This proposal would be consistent with the Airport's current and long-term plans.

FAA has a statutory mission to ensure the safe and efficient use of navigable airspace in the U.S. as set forth under Title 49, United States Code (U.S.C.) § 47101 (a) (1). The FAA must ensure that the Proposed Action does not derogate the safety of aircraft and airport operations at CVG. Moreover, it is the policy of the United States to support growth and development of air cargo hub airports and intermodal connections on airport property under 49 USC § 47101 (a)(4) and (5).

The federal action requiring compliance with NEPA is approval of the CVG's Airport Layout Plan depicting the Proposed Action.

**Project Description:**

The Proposed Action includes the following major elements:

- Construct a primary package sortation building and support buildings (i.e., ground package sort building, equipment storage, equipment maintenance, and pilot services). The total building footprint would be approximately 3.8 million square feet.
- Construct approximately 255-acre concrete aircraft parking apron and apron taxilanes.
- Construct paved employee and visitor vehicle parking garage/lots (approximately 781,000 square feet/96,000 square yards).

The following are supporting or enabling elements to the Proposed Action major elements:

- Prepare (clear, grub, excavate, embank, and grade) approximately 800 acres of land.
- Extend (approximately 4,200 feet in length by 60 feet wide) Wendell H. Ford Boulevard.
- Construct new on-airport access roads that provide vehicle and truck access to the new air cargo facility.
- Improve sections of Aero Parkway, an existing four-lane divided highway, to install new entrances, turn lanes, traffic lights, and lighting.
- Transfer all or a portion of off-airport property (totaling approximately 200 acres) to KCAB.
- Extend utilities to the project site, including electric service, natural gas, water, sanitary sewer, data/communications, and other related infrastructure.
- Modify and/or install new taxiway edge lights and airfield directional signs.
- Install exterior pole-mounted and building-mounted lighting at package sorting buildings, access roads, vehicle parking lots, truck courts, and portions of the aircraft parking aprons.
- Construct new drainage conveyances and detention ponds and/or modify the existing airfield stormwater management system.

- Install security fence and controlled-access vehicle gates and pedestrian gates.
- Expand Airport existing fueling facilities.

**Effects on Federally Listed Species and Designated Critical Habitat:**

The Proposed Action has been reviewed for its effects on federally- listed threatened and endangered species, and designated critical habitat. Based on the analysis contained in the attached Biological Assessment, the FAA has designated that two federally-listed species have a reasonable potential to occur in the Action Area as defined in Title 50, Code of Federal Regulations (CFR) § 402.02<sup>1</sup> and are evaluated in the BA: Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*). There is no proposed or designated critical habitat for either of these species in the Detailed Study Area, which covers the entire area where physical disturbance may occur.

As discussed in the BA, the primary threats to both the northern long-eared bat are white –nose syndrome, destruction/degradation of hibernacula, and loss/degradation of forested habitat. A total of 244 acres of potential habitat suitable for Indiana and northern-long eared bat roosting, commuting, and foraging would be removed as part of the Action. As compensation for these effects, the project proponent will commit to the required payment into the Imperiled Bat Conservation Fund (IBCF). FAA will make sure that payment is made by the KCAB before tree removal.

After reviewing the status of the Indiana bat and northern-long eared bat, the FAA has determined the proposed action is likely to adversely affect this threatened and endangered species. Tree clearing in the amount of 244 acres will occur for the proposed Action. Mitigation will occur in the form of a contribution to the IBCF to offset potential negative impacts to ESA-listed bat.

In addition, to the Indiana bat and northern-long eared bat, surveys were conducted for the running buffalo clover (*Trifolium stoloniferu*), the gray bat (*Myotis grisescens*), and the seven listed mussels species which include clubshell (*Pleurobema clava*), fanshell (*Cyprogenia stegaria*), orangefoot pimpleback (*Plethobasus cooperianus*), pink mucket (*Lampsilis abrupta*), ring pink (*Obovaria retusa*), rough pigtoe (*Pleurobema plenum*), and sheepnose (*Plethobasus cyphus*). No running buffalo clover was identified on the project site during May 5, 2018 and May 22-25, 2018 species-specific surveys. In addition, habitat is lacking within the project site for the seven mussel species and the gray bat. Therefore, FAA is making a no effect determination on these nine species.

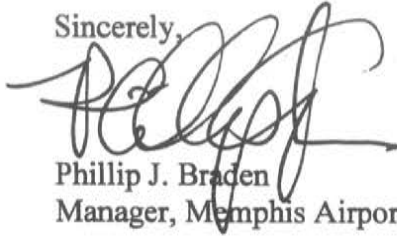
FAA seeks the Service's concurrence with our determinations made pursuant to 50 CFR Part 402, for the proposed air cargo hub development. FAA also requests the Service provide a Draft Biological Opinion to this office for review as soon as it is available.

---

<sup>1</sup> 50 CFR 402.02 defines Action Area as: "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action."

Please contact Kristi Ashley of my staff at (901) 322-8197 or by email at Kristi.ashley@faa.gov if you have any questions or need additional information concerning this matter.

Sincerely,

A handwritten signature in black ink, appearing to read 'P. Braden', with a long horizontal flourish extending to the right.

Phillip J. Braden  
Manager, Memphis Airports District Office

ENCLOSURES

cc: Debbie Conrad, KCAB, Sarah Potter, L&B



# **BIOLOGICAL ASSESSMENT**

## **CINCINNATI / NORTHERN KENTUCKY INTERNATIONAL AIRPORT AIR CARGO HUB DEVELOPMENT PROJECT**

**Boone County, Kentucky**

### **PREPARED FOR:**

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### **PREPARED BY:**

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July 2018

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## 1.0 INTRODUCTION

This biological assessment (BA), prepared by *Environment & Archaeology*, LLC on behalf of the Kenton County Airport Board (KCAB), addresses the proposed action associated with new development activities at properties within and adjacent the Cincinnati/Northern Kentucky International Airport (CVG). The new development is referred to as the CVG Air Cargo Hub Development Project. The National Environmental Policy Act of 1969 (NEPA) requires federal authorization from the Federal Aviation Administration (FAA) for potential environmental effects of the proposed Action associated with this project in compliance with Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended. Section 7 assures that, through consultation (or conferencing for proposed species) with the Service, federal actions do not jeopardize the continued existence of any threatened, endangered, or proposed species, or result in the destruction or adverse modification of critical habitat. The purpose of this BA is to address the effect of the CVG Air Cargo Hub Development Project on species listed as endangered or threatened under the ESA and under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS). This BA document addresses potential effects to the Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*). Per discussion with the USFWS, listed mussel species, grey bat, and running buffalo clover will be addressed in a follow-up consultation.

### 1.1 Project Purpose and Need

The purpose of the proposed Action is to provide sufficient air cargo facilities on land presently owned by KCAB in a way that would help the Airport meet the air cargo carrier's existing and future demands. The need for the Project is that the existing apron area and facilities at CVG are inadequate to meet the air cargo service provider's requirements for a delivery and sortation support complex, while still meeting the safety and design requirements of the FAA.

### 1.2 Consultation History

Early coordination and pre-consultation with the USFWS was conducted during a series of meetings and phone conversation including:

- June 6, 2017 – New project notification submitted to Lee Andrews (Field Supervisor, USFWS Kentucky Field Office) with preliminary project plans.
- October 31, 2017 – Phone conversation with Jessica Miller (Fish & Wildlife Biologist, USFWS Kentucky Field Office) regarding the Imperiled Bat Conservation Fund (IBCF) policy change. The Information for Planning and Consultation (IPaC) for this Project was completed prior to policy change and the IBCF could be utilized for this project.
- February 9, 2018 – In-person meeting with USFWS for a project introduction overview. A BA would be required for the project if greater than 100 acres of bat habitat removal (tree clearing).
- February 12, 2018 – Phone conversation with Jessica Miller clarifying BA trigger and requirements for the Indiana bat and northern long-eared bat
- February 28, 2018 – Phone conversation with Jessica Miller confirming no restrictions on time of year clearing and options to pay different ratios for portions of the clearing. Ratio would vary based on when clearing is set to occur if the schedule is known.

- May 14, 2018 – Phone conversation with Santiago Martin (Fish & Wildlife Biologist, USFWS Kentucky Field Office). Ms. Miller was out on vacation. Discussed the payment process layout within the BA when the schedule is variable. Also, confirmed the no tree clearing timing restrictions since the project will be issued a Biological Opinion.
- May 21, 2018 – Phone conversation with Jessica Miller discussing the likely to adversely affect determination and separate Biological Opinion.
- May 22, 2018 – Phone conversation with Jessica Miller clarifying the how to address an unknown clearing timeframe within the BA.
- June 15, 2018 – Phone conversation with Jessica Miller that clarified several BA items. To assist with the review process, the Draft BA could be submitted to Ms. Miller in advance of FAA initiating formal Section 7 consultation. The USFWS stated that a tree-clearing phasing plan will be needed in the formal BA submittal. The USFWS was provided an addendum letter regarding other project-related listed species. Ms. Miller informally responded and indicated that FAA should make a No Effect determination in the Formal Section 7 transmittal of the BA.
- June 18, 2018 - Draft BA was submitted via email to USFWS/Jessica Miller for review.
- July 2, 2018 – USFWS provided review comments to the draft BA.
- July 5, 2018 – USFWS confirmed IBCF fees for project tree clearing.

## **2.0 DESCRIPTION OF THE ACTION & ACTION AREA**

### **2.1 Proposed Action Area**

For purposes of consultation under ESA §7, the Action Area is defined as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action” (50 CFR §402.02). The proposed Action Area is located on the underdeveloped land north of Aero Parkway within the existing CVG facilities. The CVG Airport is situated in the northeast section of Boone County, Kentucky, approximately one (1) mile south of the Ohio River and eight (8) miles southwest of downtown Cincinnati, Ohio. The proposed Action Area for the CVG Air Cargo Hub Development Project consists of a total of 900 acres, which will be used to construct package sortation and support buildings, an aircraft parking apron and apron taxi lane, and a paved vehicle parking garage and lots. Approximately 1,512 acres were surveyed for the proposed Action. Appendix A, Figures 1-7, depict the Action Area, survey area and surrounding landscape.

According to data maintained by the USFWS Kentucky Field Office (KFO), the proposed Action Area does not intercept any known Summer or Swarming habitat for Indiana or northern long-eared bats. Based on maps dated from January 2018 of known Indiana and northern long-eared bat habitat in Kentucky, the Action Area for this project is located entirely within "Potential" habitat for both species (Appendix B). Two hundred and forty four (244) acres of forested Potential Indiana and northern long-eared bat habitat is present within the Action Area's disturbance limits and would be permanently removed as a result of the Action (Figure 4).

#### **2.1.1 Conservation Measures**

Conservation measures are those proposed actions taken to reduce potential impacts and offset unavoidable potential adverse effects of the proposed Action in order to promote the recovery of

the species. KCAB intends to implement the following conservation measures in the proposed Action for the development and operation of the project.

- Best management practices and sediment and erosion control measures will be utilized to control water runoff and minimize non-point source pollution and sediment damage. The reduction of water quality degradation would minimize direct and indirect effects on water sources used by bats for drinking and as habitat for aquatic insect prey items. Erosion and sedimentation controls will be installed in conjunction with the grubbing to prevent adverse impacts to the adjacent lands outside of the project area. Best management practices will include temporary and permanent measures. Temporary measures include silt fence, hay bales, berms, dikes, silt/sediment traps, brush barriers, mulching, sweeping, and dust control. Permanent measures include seeding and/or sodding, and sedimentation basins. A KPDES permit will be obtained for the project. A grading plan and site-specific Erosion Control Plan is required as a part of the KPDES permit. The site-specific plan will be submitted to Sanitation District #1 prior to the start of construction.

A contribution will be made to the Imperiled Bat Conservation fund (IBCF) to compensate for adverse effects on the species and the permanent loss and modification of potential Indiana and northern long-eared bat foraging and roosting habitat. A total of 244 acres of tree clearing is anticipated. The timeframe for tree clearing in the amount of 122 acres is to occur February-March, 2019 and the remaining 122 acres of tree clearing will occur April-May, 2019. A contribution amount of \$608,007.60 to the IBCF will be made prior to tree clearing using the mitigation multipliers and timeframes in the *Revised Conservation Strategy for Forest-Dwelling Bats* and per coordination with USFWS. All effort will be made to not remove trees in June and July.

## 2.2 Proposed Action

The proposed Action consists of both the development and operation of an air cargo facility located within and adjacent the existing CVG Airport facilities. Development associated with the Action will take place between 2019 and 2021. Once constructed, the proposed air cargo facility would continue to operate indefinitely.

### 2.2.1 Development Activities

Development activities associated with the Action area have the ability to potentially impact roosting, foraging or swarming Indiana and northern long-eared bat habitat by acting as a stressor to the species through impacts to baseline habitat conditions. Potential stressors associated with the development component of the proposed Action include noise and vibration, night lighting, collision, water quality degradation, and loss of forested habitat. A one (1) kilometer buffer around the Action area (Figure 8) has been established to also evaluate potential stressors extending beyond the Action area. Primary development activities associated with the proposed Action include the following components.

- **Construction of a primary package sortation building, ground package sortation building, and support buildings, with a total building footprint of approximately 70.95**

**acres.** The primary sorting building would be located on the south side of the airfield with access from Aero Parkway. The support buildings will include space for equipment storage and maintenance, as well as pilot services.

- **Construction of an approximate 255-acre concrete aircraft parking apron and apron taxi lanes.** These features will provide circulation and parking for up to seventy-seven (77) cargo aircrafts. Ground support equipment, unit load devices, staging areas, and fuel and de-icing pads will also be implemented.
- **Construction of a paved employee and visitor vehicle parking garage and parking lots totaling approximately 17.93 acres in size.** This portion of the proposed Action will include space for employee vehicle parking, truck courts, and vehicle circulation areas for additional trucks and cars moving throughout the cargo facility. These areas would additionally include space for employee parking service areas, unit load devices, and trailer staging.

The following are supporting or enabling elements to the proposed Action major elements:

- Preparation (clearing, grubbing, excavation, embankment, and grading) of approximately 900 acres of land.
- Improvement and widening of a section of Wendell H. Ford Boulevard, as well as construction of new on-airport access roads that provide vehicle and truck access between Wendell H. Ford Boulevard and the new air cargo facility.
- Improvement of sections of Aero Parkway, an existing four-lane divided highway located south of the Proposed Site, to install new entrances, turn lanes, traffic lights, and lighting.
- Extension of utilities to the project site, including electric service, natural gas, water, sanitary sewer, data/communications, and other related infrastructure.
- Modification and/or installation of new taxiway edge lights and airfield directional signs.
- Installation of exterior pole-mounted and building-mounted lighting at package sorting buildings, access roads, vehicle parking lots, truck courts, and portions of the aircraft parking aprons.
- Construction of new drainage conveyances and detention ponds and/or modification the existing airfield stormwater management system.
- Installation of security fence and controlled-access vehicle gates and pedestrian gates.
- Expansion of existing Airport fueling facilities.

### **2.2.2 Operation**

Upon completion of the development of the air cargo facility, it will continue to operate indefinitely. Operation will include constant air traffic, vehicle traffic, and illumination of roadways and buildings. Potential stressors associated with the operation component of the proposed Action include noise and vibration, night lighting, collision, and water quality degradation. Stressors and their effects on Indiana and northern long-eared bats are addressed in Section 5.0 Effects of the Action.

## 2.3 Alternatives Considered

Various development alternative sites for the air cargo facility were considered for further environmental review. The following summarizes the development options that were thoroughly considered as alternatives to the Proposed Action at CVG.

A multi-step evaluation process took place for this EA to evaluate the various development alternative site locations. The alternatives were evaluated against the following pass or fail criteria:

- Does the alternative site provide minimum of 500 acres of contiguous land?

In order to efficiently accommodate the operational needs of the air cargo facility, a site of at least 500 acres is needed. Air cargo facilities typically consist at a minimum of warehouse, aircraft apron, and ground support equipment (GSE) areas. A cargo warehouse is typically comprised of truck docks and doors on the landside portion of the building. On the airside of the building, vehicles have direct access to the apron and aircraft. The aircraft apron provides area for aircraft parking adjacent to the air cargo warehouse building and provides sufficient space for the vehicle, GSE, and unit load device operation and storage. This space must be large enough to accommodate freighter aircraft, aircraft tugs, cargo containers and trailers, cargo vehicles, and fueling vehicles. In addition, apron space is needed for cargo sortation, large tractor trailers, and potentially space for aircraft tail-to-tail cargo transfer and bypass containers. GSE is the support equipment at airports located on the apron. The equipment is located on the apron to support the operations of the aircraft, including ground power operations, tugs, dollies, and loading devices. GSE storage areas are also needed to park and stage GSE when not in use. These areas are often located on the apron in close proximity to aircraft parking area.

The space required for each of these areas (warehouse, apron, and GSE areas) depends on the existing and forecasted air cargo volume of the air cargo service provider. The air cargo service provider has determined, through extensive planning efforts, a minimum of 500 acres of contiguous land is needed to operate an efficient air cargo facility at CVG.

- Does the alternative site provide direct access to the DHL cargo facility?

It is preferred that the air cargo facility be located in proximity to the existing DHL cargo facility. The air cargo service provider has various business arrangements with DHL. It is expected the two entities would continue to maintain such arrangements in the future. A successful air cargo operation is predicated upon the efficient interaction of a number of businesses with different operating requirements and facility needs. These businesses have different levels of involvement based on the nature of the cargo and the geographies through which the cargo moves. In an ideal environment, most of these operations would be co-located on the airport, creating an efficient, integrated, air cargo community. Operating costs are lower, economies of scale can be achieved, and international goods can be cleared faster and with fewer problems.

- Does the alternative site provide direct airfield access?

To minimize aircraft taxi distances and delays, the site should have direct access to taxiway(s) that allow aircraft to move efficiently between the cargo facility site and the arrival/departure runways. The airfield access should have minimal taxi times and minimal



runway crossings. Flight delays have a substantial impact on delivering packages on time. Based on analysis conducted by the Institute of Transportation Studies (ITS), University of California, Berkley, the cost of flight delay per package is approximately \$0.77 for a 15-minute flight delay and approximately \$3.92 for a 60-minute flight delay. Because the air cargo service provider's business is time sensitive, it is imperative the site have direct airfield access to minimize taxi distances and potential delays to aircraft operations.

- Does the alternative site provide access to major surface transportation corridors (i.e. Interstates 71/75 and Interstate 275)?

Sites were evaluated based on their proximity and access to the surrounding interstate roadway system. The air cargo service provider plans to conduct a sort operation at CVG. As a result, delivery trucks would enter and exit the site numerous times a day. Again, because the air cargo service provider's business is driven by time definite delivery, the site needs easy access to Interstates 71/75 and Interstate 275 to eliminate potential delays from traffic on the local roadways.

- Does the alternative site allow for expansion on adjacent land?

The cargo carrier has identified the need to have additional land in the future as operational needs require expansion of the facility. Sites were evaluated based on the availability of available adjacent land to accommodate future growth.

- Does the alternative site allow for construction and operation of the facility in 2021?

The cargo service provider's business model requires the ability to construct and become operational in 2021. Sites that would not allow that would be eliminated from consideration.

The following discussion documents the various development sites that were analyzed in the alternatives analysis. The three alternative sites evaluated are shown on Figure 7.

### **2.3.1 Alternative A: West Site**

Alternative A would locate the proposed complex west of Runway 9/27. This site is approximately 320 acres and is located to the west of North Bend Road and outside of the Runway 9/27 Runway Protection Zone (RPZ).

- Does the alternative site provide minimum of 500 acres of contiguous land?
  - No, this site only has 320 acres.
- Does the alternative site provide direct access to the DHL cargo facility?
  - No, this site is the farthest site from DHL of all the alternative sites.
- Does the alternative site provide direct airfield access?
  - No, this site currently has no airfield access and to do so would require tunneling North Bend Road under a new taxiway. While feasible, even if a new taxiway was constructed, aircraft would access the airfield at the westernmost location, which is not efficient from a taxi time perspective.
- Does the alternative site provide access to major surface transportation corridors (i.e., Interstates 71/75 and Interstate 275)?

- Yes, North Bend Road has access to Interstate 275.
- Does the alternative site allow for expansion on adjacent land?
  - Yes, but through purchase of private land.
- Does the alternative site allow for operation of the facility in 2021?
  - No, the need to construct a tunnel for a section of North Bend Road (a public roadway) to allow the construction of an access taxiway would add substantial complexity to the design, approval, and construction process, which would be an impediment to completion and operation of the cargo facility by 2021.

Conclusion: Alternative A could provide access to Interstate 275, a major surface transportation corridor. Additionally, the land area is prime for development as it is located on Airport-owned property and is adjacent to land that could be acquired for expansion. Conversely, the site lacks access to the DHL cargo facility and does not provide 500 acres of contiguous land. The site also provides limited airfield access as tunneling North Bend Road under a new taxiway would be required and would add complexity and time to construction. In conclusion, this alternative site would not meet criteria representing the purpose and need. Therefore, this alternative site was eliminated from further review.

### **2.3.2 Alternative B: Midfield Site**

Alternative B would locate the proposed complex north of Runway 9/27, between Runway 18R/36L and Runway 18C/36C. This site is approximately 460 acres and divided on the north by Taxiway A.

- Does the alternative site provide minimum of 500 acres of contiguous land?
  - No, this site only has 460 acres.
- Does the alternative site provide direct access to the DHL cargo facility?
  - No, this site would require crossing two runways (18C/36C and 9/27) to access DHL.
- Does the alternative site provide direct airfield access?
  - Yes, this site offers access to Runways 18R/36L, 18C/36C, and 9/27.
- Does the alternative site provide access to major surface transportation corridors (i.e., Interstates 71/75 and Interstate 275)?
  - Yes, Interstate 275 is located directly north of the site and could be accessed via Loomis Road, which is currently two lanes or potentially a new Interstate 275 interchange.
- Does the alternative site allow for expansion on adjacent land?
  - No, the location has no adjacent land for expansion. There is a small parcel north of Taxiway A, but grade changes and the need to expand an existing tunnel make it difficult to access.
- Does the alternative site allow for operation of the facility in 2021?
  - Yes. However, if it is determined that roadway improvements and construction of a new interchange at Interstate 275 is necessary, this would add substantial

complexity to the design, approval, and construction process, which would be an impediment to completion and operation of the cargo facility by 2021.

Conclusion: Alternative B would not provide adequate access to Interstate 275, a major surface transportation corridor, without widening roads and the potential need to construct a new interchange. Additionally, the land area is prime for development as it is located on Airport-owned property and provides direct airfield access. However, the site is not large enough to accommodate existing and potential expansion, it lacks direct access to the DHL cargo facility, and would require aircraft to cross two runways to access the DHL facility. Further, the potential need for a new interchange at Interstate 275 would add substantial complexity to the project, which would affect the ability to begin operating the facility in 2021. In conclusion, this alternative site would not meet the criteria representing the purpose and need. Therefore, this alternative site was eliminated from further review.

### **2.3.3 Alternative C: Proposed Action**

Alternative C (Proposed Action) is approximately 500 acres and is located north of Aero Parkway between Runway 18C/36C and Runway 18L/36R. The Proposed Action is described in Section 1.2 and shown in Exhibit 1-2.

- Does the alternative site provide minimum of 500 acres of contiguous land?
  - Yes, this site is approximately 500 acres.
- Does the alternative site provide direct access to the DHL cargo facility?
  - Yes, this site is located immediately adjacent to DHL.
- Does the alternative site provide direct airfield access?
  - Yes, this site has direct access to Runway 18C/36C and short taxi times to Runways 18L/36R and 9/27.
- Does the alternative site provide access to major surface transportation corridors (i.e., Interstates 71/75 and Interstate 275)?
  - Yes, the site can access Interstate 71/75 via Aero Parkway.
- Does the alternative site allow for expansion on adjacent land?
  - Yes, but through purchase of private land.
- Does the alternative site allow for operation of the facility in 2021?
  - Yes, there are no known impediments to completion by 2021.

Conclusion: Alternative C would provide access to Interstate 71/75 and 275, major surface transportation corridors. The site also provides approximately 500 acres of contiguous land, with the potential for expansion on adjacent land. The site also has direct access to the DHL cargo facility and direct airfield access. In conclusion, this alternative site would meet the purpose and need. Therefore, this alternative site was selected for further review.

Alternative C provides numerous non-environmental benefits. Economically, Alternative C provides the most cost-effective alternative. Fuel and travel expenditures are decreased when expanding to immediately adjacent facilities versus the incurrence of added distance, fuel, and

time requirements if expansion activities would occur at a disconnected location or off-site location. Aesthetically, Alternative C allows for a continuation of existing airfield operations.

Table 1 provides a summary of the alternatives analysis conducted. The elements of each alternative are described in the table.

**Table 1. Development Alternatives Analysis Summary**

Alternative	Meet the Screening Criteria?					
	<i>500 acres of contiguous land</i>	<i>Direct access to DHL facility</i>	<i>Direct airfield access</i>	<i>Access to major surface transportation corridors</i>	<i>Expansion on adjacent land</i>	<i>Operation of facility in 2021</i>
<b>A</b> (West Site)	No	No	No	Yes	Yes	No
<b>B</b> (Midfield Site)	No	No	Yes	Yes	No	Yes
<b>C</b> (Proposed Action)	Yes	Yes	Yes	Yes	Yes	Yes

### 3.0 LISTED SPECIES IN THE ACTION AREA

A list of Federally-protected species within the proposed Project area was obtained from the USFWS Information for Planning and Conservation (IPaC) website (IPaC Consultation Code 04EK1000-2017-E-01568). ESA-listed species which occur within the Action area or may be affected by the proposed Action are identified in Table 2. No USFWS-designated critical habitat for ESA-listed species was identified within the proposed Project area.

**Table 2. ESA Listed Species in the Action Area**

Common Name	Scientific Name	Status
<b>Mammals</b>		
Gray bat <sup>1, 2</sup>	<i>Myotis grisescens</i>	Endangered
Indiana bat	<i>Myotis sodalis</i>	Endangered
Northern long-eared bat	<i>Myotis septentrionalis</i>	Threatened
<b>Mussels</b>		
Clubshell <sup>2</sup>	<i>Pleurobema clava</i>	Endangered
Pink mucket <sup>2</sup>	<i>Lampsilis abrupta</i>	Endangered
Orangefoot pimpleback <sup>2</sup>	<i>Plethobasus cooperianus</i>	Endangered
Sheepnose <sup>2</sup>	<i>Plethobasus cyphus</i>	Endangered
Rough pigtoe <sup>2</sup>	<i>Pleurobema plenum</i>	Endangered
Fanshell <sup>2</sup>	<i>Cyprogenia stegaria</i>	Endangered
Ring pink <sup>2</sup>	<i>Obovaria retusa</i>	Endangered
<b>Plants</b>		
Running buffalo clover <sup>2</sup>	<i>Trifolium stoloniferum</i>	Endangered

<sup>1</sup> No caves or mines providing suitable gray bat habitat are present within or adjacent to the Action area.

<sup>2</sup> Effects to these species will be addressed in a separate correspondence to USFWS.

### **3.1 Indiana bat (*Myotis sodalis*)**

#### **3.1.1 Status of the Species**

The Indiana bat was listed as endangered by the Service on March 11, 1967 (Federal Register 32[48]:4001) under the Endangered Species Preservation Act of October 15, 1966 (80 Stat. 926; 16 U.S.C. 668aa[c]). The ESA of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) subsequently extended full legal protection from unauthorized take to the species. Critical habitat was designated for the species on September 24, 1976 (41 FR 14914) and includes eleven (11) caves and two (2) mines located in six (6) states. The Recovery Priority of the Indiana bat is 8, which indicates the species has a moderate degree of threat and high recovery potential. The USFWS defines Recovery Priority as “a number, ranging from a high of 1C to a low of 18, whereby priorities to listed species and recovery tasks are assigned. The criteria on which the Recovery Priority number is based on degree of threat, recovery potential, taxonomic distinctiveness, and presence of an actual or imminent conflict between the species and development activities.”

The Recovery Plan for the Indiana Bat (USFWS 1983) was published to outline recovery actions for the species, which generally include: protection of hibernacula; maintenance, protection, and restoration of summer maternity habitat; and monitoring population trends through winter censuses. A revised draft recovery plan was noticed in the Federal Register for public review and comment on April 16, 2007 (USFWS 2007). A five (5)-year review of the Indiana bat was completed by the Bloomington, Indiana Field Office in 2009 (USFWS 2009) and found that required recovery criteria for the Indiana bat had not been achieved, and the species should remain at its current endangered status.

#### **3.1.2 Species Description**

The Indiana bat is a temperate, insectivorous, migratory bat that hibernates in mines and caves in winter and summers in wooded areas. The species is a medium-sized bat for the genus *Myotis*, with a forearm length ranging from 35 to 41mm and a head and body length from 41-49mm. Indiana bats have dark-brown fur with lighter facial areas and closely resembles the little brown bat (*Myotis lucifugus*) and northern long-eared bat (*M. septentrionalis*) (USFWS 2007). The Indiana bat can be distinguished from the little brown bat by differences in foot structure, fur color, and skull morphology (Barbour and Davis 1969, Hall 1981). Northern long-eared bats can be separated easily from the other two (2) species by its long, pointed, symmetrical tragus.

#### **3.1.3 Life History**

The average life span of the Indiana bat is five (5) to ten (10) years; however, individuals have been noted to live much longer, with the oldest known Indiana bat captured 20 years after it was first banded (LaVal and LaVal 1980).

Male Indiana bats typically do not sexually mature until the summer after their birth, whereas many young females will mate during their first autumn and have offspring in the following year

(Gustafson 1975, Schowalter et al. 1979, Racey and Entwistle 2000). Females give birth to a single pup in June or July once a maternity roost colony has been established (Easterla and Watkins 1969, Humphrey et al. 1977, Kurta and Rice 2002).

Maternity colonies are crucial to the success of raising Indiana bat pups, as they reduce thermoregulatory costs for the adults, which increases the energy available for raising young (Barclay and Harder 2003). There are no documented cases in which a female Indiana bat has successfully given birth and raised a pup alone without the communal benefits of a maternity colony. Maternity colonies are established after the bats have arrived at their summer range, and bats typically utilize ten (10) to twenty (20) trees each year, although only one (1) to three (3) trees are used as primary roosts by the majority of the bats (Callahan 1993, Callahan et al. 1997). On average, Indiana bats switch roosts every two (2) to three (3) days, although frequency is dependent on reproductive condition of the female, roost type, and time of year (Kurta et al. 2002, Kurta 2005).

Indiana bats will leave their summer roost area and migrate to their hibernacula in preparation for mating as early as July. This number continues to increase through August and peaks in September and early October (Cope and Humphrey 1977, Hawkins and Brack 2004, Rodrigue 2004, Hawkins et al. 2005). It is generally accepted that Indiana bats, especially females, return annually to the same hibernacula. However, some Indiana bats move from traditional hibernacula to occupy manmade structures, such as abandoned mines. (LaVal and LaVal 1980). Once arriving at a hibernaculum, bats will swarm for several weeks. During this time, bats will fly in and out of cave entrances at night, but few actually roost in the caves (Cope and Humphrey 1977). During swarming, the bats forage in the vicinity of the hibernaculum to replenish fat supplies in preparation for winter hibernation (Hall 1962). Swarming continues for several weeks, during which time mating occurs. After mating, females store the sperm over the winter and fertilization is delayed until the after the spring emergence the following year (Guthrie 1933). Limited mating activity can occur throughout winter and in spring as bats leave hibernation (Hall 1962).

Following fall swarming activity, Indiana bats will go into hibernation, typically at the same cave or mine at which swarming occurred. The initiation of hibernation may vary by latitude and annual weather conditions; however, most bats are hibernating by the end of November (USFWS 2007). The bats usually hibernate in large, dense clusters of several hundred bats per square foot. Clusters may protect individuals from temperature changes and reduce sensitivity to disturbance. Like other cave bats, the Indiana bat naturally arouses during hibernation. Arousals are more frequent and longer at the beginning and end of the hibernation period (Sealander & Heidt 1990).

Spring emergence occurs when outside temperatures have increased and prey insects are more abundant (Richter et al. 1993), however, the timing of emergence may vary across the range, depending on latitude and weather (Hall 1962). Based on trapping conducted at the entrances of caves in Indiana and Kentucky, Cope and Humphrey (1977) observed that peak spring emergence of female Indiana bats was in mid-April, while most males were still hibernating. Peak emergence of males occurred in early May, and few were left hibernating by mid-May. Shortly after emerging from hibernation, the females become pregnant via delayed fertilization from the sperm that has been stored in their reproductive tracts through the winter (USFWS 2007).

Following Indiana bat spring emergence is the “staging” period, in which the bats forage for several days or weeks near their hibernaculum to renew energy stores before migration to their traditional summer roosting area. Most populations will leave their hibernacula by late April and can migrate hundreds of miles to their summer roosting location. Adult mortality for Indiana bats is the highest in late March and April due to the stress of migration, particularly when their fat reserves have been depleted over the winter and food supplies are still low (USFWS 2007).

### **3.1.4 Habitat Characteristics and Use**

During the summer months, Indiana bats use forested habitat for roosting, foraging, and commuting. Indiana bats are often associated with floodplain or riparian forests with large trees, scattered canopy gaps, and open understories (USFWS 2007). Indiana bats roost in both dead and live trees which exhibit loose bark, appropriate solar exposure, and optimal spatial relationship between other trees, water sources, and foraging areas.

A typical primary roost is located under exfoliating bark of dead ash, elm, hickory, maple, oak, or poplar tree, although any tree that retains large, thick slabs of peeling bark probably is suitable. The average diameter of maternity roost trees is eighteen (18) inches, while males typically roost in smaller trees averaging approximately thirteen (13) inches in diameter. The height of the roost tree relative to the surrounding canopy is crucial for ensuring the optimum amount of solar exposure. Primary roost trees are typically found within canopy gaps in the forest or along a fenceline or wooded edge and receive direct sunlight for more than half the day. Primary roosts are usually trees in early-to-mid stages of decay, with access unimpeded by vines or small branches (USFWS 2007).

Indiana bats tend to exhibit site fidelity to their summer maternity areas, and studies have documented female Indiana bats annually returning to the same home range to establish maternity colonies (Humphrey et al. 1977, Gardner et al. 1991, Callahan et al. 1997). Roost trees may be occupied by the same colony for a number of consecutive years until they are no longer accessible or suitable. Maternity colonies of Indiana bats also appear to be faithful to their foraging areas within and between years (Humphrey et al. 1977, Gardner et al. 1991, Murray and Kurta 2004, Sparks et al. 2005).

While foraging, Indiana bats feed on aquatic and terrestrial insects. Diet varies seasonally and among different ages, sexes, and reproductive status (USFWS 1999). Studies have found that Indiana bats forage in closed to semi-open forested habitats and forest edges located in floodplains, riparian areas, lowlands, and uplands; old fields and agricultural fields are also used (USFWS 2007). At a study site near the Indianapolis International Airport, Sparks et al. (2005) found Indiana bats spending nearly 51% of their time foraging over agricultural fields with movements focused on a riparian corridor. Indiana bats frequently forage along riparian corridors and obtain water from streams, ponds, and water-filled road ruts in upland forests. Light-tagging and radiotracking have revealed that Indiana bats prefer to forage in closed to semi-open forested habitats and forest edges, primarily around, but not within, the canopy.

During winter, Indiana bats are restricted to suitable underground hibernacula. Most Indiana bats hibernate in caves or mines where the ambient temperature remains below 50.0°F but infrequently

drops below freezing (Hall 1962, Humphrey 1978), and the temperature is relatively stable (USFWS 2007). Stable, low temperatures allow bats to maintain low metabolic rates and conserve fat reserves to survive the winter (USFWS 2007). The majority of these sites are caves located in karst areas of the east-central United States; however, Indiana bats also hibernate in other cave-like locations, including abandoned mines. It has been documented that Indiana bats find and occupy newly available hibernating sites very quickly (Hall 1962). Other bat species found in Indiana bat hibernacula include little brown bats, tri-colored bats (*Perimyotis subflavus*), northern long-eared bats, gray bats (*Myotis grisescens*), big brown bats (*Eptesicus fuscus*), and silver-haired bats (*Lasionycteris noctivagans*) (Brack et al. 2003).

Staging and swarming habitat is typically located within several miles of the hibernaculum and consists of forested habitat similar to that which is chosen in the summer where bats will roost, forage, and travel (USFWS 2007). The Action Area is identified on the “Known Indiana bat habitat in Kentucky and within 20 miles (January 2018)” appendix map to the *Revised Conservation Strategy for Forest-Dwelling Bats* in Appendix B.

### **3.2 Northern long-eared bat (*Myotis septentrionalis*)**

#### **3.2.1 Status of the Species**

On October 2, 2013, USFWS determined that listing the northern long-eared bat was warranted, primarily due to the threat of white-nose syndrome (WNS), and a proposed rule was published to list the northern long-eared bat as an endangered species under the ESA (78 FR 61046). On April 2, 2015, a final rule was published listing the northern long-eared bat as a threatened species under the ESA (80 FR 17974). On January 14, 2016, a final 4(d) rule was established, which provides measures that are tailored to current understanding of the conservation needs of the northern long-eared bat. The 4(d) rule is used to target the take prohibitions to those that provide conservation benefits for the species. This targeted approach can reduce ESA conflicts by allowing some activities that do not harm the species to continue, while focusing efforts on the threats that make a difference to the species’ recovery. The 4 (d) rule is discussed further in Section 6.0 Proposed Mitigation.

#### **3.2.2 Species Description**

The northern long-eared bat is a medium-sized bat species typically weighing five (5) to eight (8) grams, a forearm length between 34 and 38 mm, and 77 to 95 mm body length (USFWS 2018). Fur color is typically medium to dark brown on its back, and tawny to pale brown on the ventral side, with dark brown ears and wing membranes (Whitaker and Mumford 2009). As its common name implies, northern long-eared bats can be distinguished from other *Myotis* species by its relatively long ears. Average ear length is seventeen (17) mm, with a pointed and symmetrical tragus averaging nine (9) mm in length (Whitaker and Mumford 2009). The species’ range includes all or portions of 37 States and all Canadian provinces west to the southern Yukon Territory and eastern British Columbia (USFWS 2015).



### 3.2.3 Life History

Adult female northern long-eared bats also utilize delayed fertilization and give birth to a single pup each year (Barbour and Davis 1969), typically around May or early June, but potentially as late as July (Whitaker and Mumford 2009, p.213). Juvenile volancy (flight) typically occurs around 21 days after birth (Krochmal and Sparks, 2007, Kunz 1971). Like the Indiana bat, female northern long-eared bats take advantage of the energy-saving benefits of utilizing a maternity colony to raise their young, while males typically roost alone (USFWS 2015). The maximum documented lifespan for northern long-eared bats is estimated to be up to 18.5 years (Hall *et al.* 1957). The majority of mortality for northern long-eared bats occurs during the juvenile stage when they are the most vulnerable (Caceres and Pybus 1997).

Northern long-eared bats are nocturnal foragers that use both hawking (catching insects in flight) and gleaning (picking insects from surfaces) techniques to capture prey. The most common insects found in the diets of these bats are lepidopterans (moths) and coleopterans (beetles) (Brack and Whitaker, 2001), with arachnids (spiders) also being a common prey item (Feldhamer *et al.*, 2009). Foraging typically occurs above the understory and under the canopy, approximately three (3) to ten (10) feet above the ground (Nagorsen and Brigham 1993) on forested hillsides and ridges, rather than along riparian areas.

The swarming period for northern long-eared bats generally occurs between July and early October, depending on the latitude within the species range (Fenton 1969, Kurta *et al.* 1997). During this time, both males and females are present at the swarming sites (often with other species of bats), and mating occurs. Swarming also introduces juveniles to potential hibernacula, as northern long-eared bats may investigate several cave or mine openings during the transient portion of the swarming period (Kurta *et al.* 1997).

Following the fall swarming period, northern long-eared bats will enter hibernation to overwinter in hibernacula that typically consists of a cave or abandoned mine. Hibernation allows for the bats to conserve energy from increased thermoregulatory demands and reduced food sources (USFWS 2015). Northern long-eared bats hibernate in smaller clusters than Indiana bats, rarely in concentrations greater than 100 in a single hibernaculum (Barbour and Davis 1969). Hibernacula is typically shared with other species, including little brown bats, big brown bats, eastern small-footed bats (*Myotis leibii*), tri-colored bats, and Indiana bats (USFWS 2015).

Spring staging is the period of time between winter hibernation and spring migration to summer habitat. During this time, bats gradually emerge from hibernation, exit the hibernaculum to feed, and re-enter the same or different hibernaculum to resume daily bouts of torpor. Staging generally occurs from mid-March through early May (Whitaker and Hamilton 1998).

### 3.2.4 Habitat Characteristics and Use

Northern long-eared bat summer habitat closely resembles Indiana bat habitat; however, the northern long-eared bat appears to be more flexible in roost tree selection. Northern long-eared bats likely do not rely on certain species of trees for roosts, but rather that suitable cavities or bark retention to be present and used by the bats opportunistically (Foster and Kurta 1999). Northern

long-eared bats utilize both live trees and snags and have also been documented roosting in human-made structures such as buildings, barns, on utility poles, behind window shutters, and in bat houses (USFWS 2015). Maternity colonies are typically found in more open areas than those the males roost in. This is likely due to increased solar radiation, which aids in pup development, and that having fewer trees surrounding the maternity roost may help the juvenile bats that are learning to fly (Perry and Thill 2007). Roosts are also largely selected below the canopy, which could be due to the species' ability to exploit cluttered environments. This skill is demonstrated by their gleaning behavior, which suggests a high degree of maneuverability around obstacles (Foster and Kurta 1999). Northern long-eared bats also tend to roost in smaller trees than Indiana bats, with around 80 percent of over 400 documented maternity roost trees ranging from four (4) to ten (10) inches in dbh (Lacki *et al.* 2009). Northern long-eared bats typically switch roost trees every few days, however, the trees are often in fairly close proximity to each other within the species' summer home range (USFWS 2015).

Northern long-eared bats typically utilize caves or abandoned mines as their winter hibernacula. Hibernacula exhibit relatively constant, cooler temperatures, approximately thirty-two (32) to forty-eight (48) degrees Fahrenheit, with high humidity and no air currents (USFWS 2015). Sites favored by northern long-eared bats often have such a high degree of humidity that droplets of water are observed on the fur of hibernating bats (Barbour and Davis 1969). The Action Area is identified on the "Known northern long-eared bat in Kentucky and within 20 miles (January 2018)" appendix map to the *Revised Conservation Strategy for Forest-Dwelling Bats* in Appendix B.

### **3.3 Conservation Threats**

Conservation threats to Indiana and northern long-eared bats generally overlap, since both species occupy similar habitat and have comparable life histories.

#### **3.3.1 White-nose Syndrome (WNS)**

WNS is an infectious disease caused by the fungus *Psuedogymnoascus destructans* (Pd), which originated in Europe and is the most severe and immediate threat to Indiana bats, northern long-eared bats, and other hibernating North American bat species. WNS was first documented in New York in the winter of 2006-2007 and since then has spread rapidly across the eastern United States and Canada (USFWS 2016). WNS is responsible for unprecedented mortality of insectivorous bats in eastern North America (Blehert *et al.* 2009; Turner *et al.* 2011).

The exact processes by which the fungal skin infection leads to death are not known, but depleted fat reserves leading to starvation contribute to mortality (Reeder *et al.* 2012, Warnecke *et al.* 2012) and dehydration may also have a role (Willis *et al.* 2011, Cryan *et al.* 2013, Ehlman *et al.* 2013). It is also suspected that some of the affected bats that survive hibernation emerge in such poor condition that they die soon after emergence or during the summer.

As of 2017, WNS or the Pd fungus was confirmed in all the states within the species' range. Further decline in Indiana and northern long-eared bat populations due to this disease is expected in the future. Research on WNS is constantly evolving.

### **3.3.2 Destruction/Degradation of Hibernacula**

Due to the delicate balance of temperature and humidity necessary for a cave to serve as a successful hibernaculum for Indiana bats, changes made by humans to the thermal regime of a cave can affect their ability to support hibernating bats (USFWS 2007). Other human activity resulting in the commercialization of caves, such as cave tours, recreational caving, vandalism, and research activities, can also disturb hibernating bats. Since the species were listed, increased awareness on the importance of maintaining the integrity of a cave's microclimate has led to a reduction of purposeful cave modifications that could disrupt hibernation. However, natural events such as flooding, freezing, and cave collapse still pose a threat to hibernating bats. It has been noted that the northern long-eared bat has likely benefited from the protections given to the winter habitat of the endangered Indiana bat and gray bat where species' ranges overlap (USFWS 2015).

### **3.3.3 Loss/Degradation of Forested Habitat**

Urbanization and development is currently the greatest contributor to loss of forested habitat used by the Indiana bat for roosting, foraging, swarming and staging loss within the species' range (U.S. Forest Service (USFS) 2005). Conversion to agricultural fields has been the largest single cause of forest loss, resulting in the permanent destruction or fragmentation of existing forest cover. The destruction of floodplain and bottomland forests, recognized as high-quality habitats for Indiana bats, has been a particular cause of concern (Humphrey 1978).

Forest cover is not a completely reliable predictor of where Indiana bat maternity colonies will be found on the landscape (Farmer et al. 2002). Indiana bat maternity colonies occupy habitats ranging from completely forested to areas of highly fragmented forest. However, research has demonstrated that densities of tree-roosting bats are generally greater in old growth forests of temperate regions, where structural diversity provides more roosting options and important foraging areas for some species (USFWS 2007). Within the range of the Indiana bat, particularly within the core maternity range in the Midwest, old growth forest has been virtually eliminated, which in turn eliminates the opportunity to evaluate habitat value of old growth versus second-growth forests.

Northern long-eared bats are more flexible in which tree species they select as roosts, and as such, the species can likely tolerate some loss of roosts, provided suitable alternative roosts are available. However, longer flights to find alternative suitable habitat as a result of the removal of roosting/foraging habitat add additional stress to bats emerging from hibernation with their lowest annual fat reserves. This particularly impacts females, who are often pregnant at this time (USFWS 2015).

Throughout the range of the Indiana bat and northern long-eared bat, forest conversion is expected to increase due to commercial and urban development, energy production and transmission, and natural changes. Forest conversion causes loss of potential habitat, fragmentation of remaining habitat, and if occupied at the time of the conversion, direct injury or mortality to individuals.

### **3.3.4 Environmental Contaminants**

With the restrictions on the use of organochlorine pesticides in the 1970s, this significant threat to Indiana and northern long-eared bats was reduced. However, organophosphates (Ops), and carbamates (CA) have now become the most widely used insecticides (Grue et al. 1997), and the full impact of these chemicals on bats is not known.

### **3.3.5 Climate Change**

Climate change is expected to significantly impact both species, due to specific temperature requirements in hibernacula and summer roost trees. Cave temperatures are related to surface temperatures, and as surface temperatures rise, the suitability of a hibernaculum could be degraded. Warmer winters could also result in a shorter hibernation period, increased winter activity, and reduced reliance on stable underground temperatures. An earlier spring could mean a shorter hibernation period, which may have no detrimental effect on populations as long as sufficient food is available (Jones *et al.* 2009). Climate change is also likely to affect the timing of reproductive cycles, as female bats store spermatozoa over winter. If bats experience warmer conditions, they may arouse prematurely and become pregnant earlier in the year (Jones *et al.* 2009), posing a threat if a sufficient supply of insects has not yet available. The effects of climate change on the availability and timing of emergence of insect prey could lead to inadequate fat reserve maintenance and ultimately starvation. In a study by Loeb and Winters (2013), area suitable for Indiana bat summer maternity colonies was modeled to significantly decline in the future.

### **3.3.6 Collisions**

Indiana and northern long-eared bat fatalities have been reported as the result of collisions with aircrafts, vehicles, communication towers, and wind turbines. It was reported in 2005 that since 1997, remains from more than 126 bats that collided with military aircrafts have been processed. This figure probably largely underestimates total strikes as most of these incidents do not result in serious, if any, damage to the aircraft, and therefore are not consistently reported. Indiana bat collisions with human-made objects most often occurs during the fall migration (USFWS 2007).

## **4.0 ENVIRONMENTAL BASELINE CONDITIONS**

### **4.1 Action Area Species Habitat Distribution**

The USFWS Kentucky Field Office (KFO) has delineated specific Recovery and Mitigation Focus Areas (RMFAs) for forest-dwelling bats within the Commonwealth of Kentucky. RMFAs were identified to support conservation priorities and are known to support populations of forest-dwelling bats in areas that support recovery and conservation efforts. A total of eight (8) RMFAs have been identified in the state of Kentucky and represent areas with known summer, winter, and/or swarming habitat for Indiana and northern long-eared bats. No RMFAs for either species are located within Boone County (USFWS 2016).

#### **4.1.1 Summer Roosting (April 1 – August 15)**

The project survey area contains approximately 417 acres of forested area (Figures 3a-3b). The Action area currently contains approximately 244 acres of forested habitat suitable for Indiana and northern long-eared bat roosting, commuting, and foraging. There are no existing capture records of Indiana or northern long-eared bats within the Action area, which is currently listed as “Potential” habitat for both species by the USFWS KFO. Known “Summer 1” habitat (maternity habitat) for Indiana bats is present in Boone County to the north and west of the proposed Action area. No known summer habitat for northern long-eared bats is located within the county. In the absence of recent summer surveys, it is unknown if Indiana and northern long-eared bats are present in the Action area during the summer. Due to the presence of forested areas representing potential summer habitat, it is assumed that Indiana bats and northern long-eared bats occur in the project area.

#### **4.1.2 Winter Hibernation (November 15 – March 31)**

The expansive karst within much of Kentucky’s limestone geology results in numerous caves that historically and currently provide winter habitat for Indiana and/or northern long-eared bats. Over 100 caves in Kentucky, including five (5) Priority 1 and 16 Priority 2 hibernacula, have historic Indiana bat records, and 96 of these caves have extant winter populations. Currently, there are over 100 caves and cave-like structures that serve as known hibernacula for the northern long-eared bat. There is a total of 23 Indiana Bat Priority 1 hibernacula identified in the Recovery Plan. The five (5) Priority 1 hibernacula that lie within Kentucky’s borders are located at the Mammoth Cave System and in Kentucky’s Eastern Coalfields (USFWS 2016). There are no Priority 1 or Priority 2 Indiana bat hibernacula located within Boone or its surrounding counties.

No priority hibernacula have been identified for northern long-eared bats. Since these bats do not typically hibernate in large groups, and often move between hibernacula throughout the winter, population size is difficult to estimate based on hibernacula counts. Northern long-eared bats are also more flexible than Indiana bats in their selection of hibernacula, which often includes human-made structures such as mines and railroad tunnels in addition to caves. To date, no known northern long-eared bat hibernacula have been discovered in Boone County.

No caves, mines, or railroad tunnels that could provide suitable hibernacula habitat for either species are present within the Action area.

#### **4.1.3 Fall Swarming (August 16 – October 14)**

“Swarming habitat” refers to suitable roosting, foraging and travel habitat for Indiana bats or northern long-eared bats that is within a determined distance of a known hibernaculum. For Indiana bats this distance is 10 miles from a Priority 1 or Priority 2 hibernaculum and five (5) miles from a Priority 3 or Priority 4 hibernaculum. For northern long-eared bats, this distance is five (5) miles from a known hibernaculum (USFWS 2016). No known Indiana or northern long-eared bat hibernacula are present in relation to the Action area within identified buffers outlined by the

USFWS. Based on mapping provided by the USFWS KFO, no known Indiana or northern long-eared bat swarming habitat is currently present within Boone or any of the surrounding counties (USFWS 2018) and therefore does not occur within the Action area.

#### **4.1.4 Spring Staging (April 1 – May 14)**

The USFWS uses a one (1) mile buffer around Priority 1 and Priority 2 hibernacula to identify spring staging areas. No known hibernacula for Indiana or northern long-eared bats has been identified within Boone County, therefore suitable spring staging habitat is not present within the Action area.

### **4.2 Action Area Conservation Threats**

#### **4.2.1 Forest Loss and Fragmentation**

Indiana and northern long-eared bat forested summer habitat is susceptible to frequent changes in its quality and quantity due to changes in land use, management, and forest structure, both by natural or anthropogenic influences. Degradation of summer habitat can result in the loss of foraging and roosting habitat and can be particularly detrimental to bat maternity colonies when non-volant pups are present. The increase in conversion of forested land to developed land can be expected to further fragment and eliminate forested blocks of habitat that could be used by the species in the Action area.

#### **4.2.2 White-Nose Syndrome**

In Kentucky, WNS was first documented during the spring of 2011 in Trigg County. As of April 2016, WNS has been confirmed or is likely to be present within 94 hibernacula in 24 Kentucky counties. WNS is considered to occur throughout Kentucky and, over time, is expected to expand to and be documented in additional sites (USFWS 2016). Due to lack of suitable hibernacula, WNS has not yet been detected in Boone County.

Because Indiana and northern long-eared bats can migrate hundreds of miles from their hibernacula and WNS has been documented in Kentucky and all of the adjacent states, we assume that all bats presumed to occupy habitat within the Action area have been exposed to WNS. Therefore, Indiana and northern long-eared bats in the Action area are expected to potentially be experiencing stress and reduced body weights from their exposure to WNS.

### **5.0 EFFECTS OF THE ACTION**

This section analyzes the direct and indirect effects of the Action on Indiana and northern long-eared bats, which includes the direct and indirect effects of interrelated and interdependent actions. Direct effects are caused by the Action and occur at the same time and place. Indirect effects are caused by the Action but are later in time and reasonably certain to occur.

**Table 3. Action Components and Associated Stressors of the CVG Air Cargo Hub Development Project**

Action Component	Noise and Vibration	Night Lighting	Collision	Water Quality	Removal / Loss of Forested Habitat
Construction	X	X	X	X	X
Operation	X	X	X	X	

## 5.1 Noise and Vibration

Noise and vibration are stressors that may disrupt bats causing individuals to flush from roost trees during the day and/or night timeframe, and/or alter travel corridors and foraging behaviors. Bats may be exposed to this stressor during both the construction and operation components of the Action, within the Action Area and extending into the 1-km Buffer Area. Significant changes in noise levels in the area may result in temporary to permanent alteration of bat behaviors.

Bats have evolved highly specialized auditory sensory systems to maximize their ability to detect, locate, track, and capture aerial prey. The behavioral, morphological, and physiological mechanisms that have evolved to achieve this dramatically increase their hearing sensitivity to all sounds, particularly the low amplitude echoes of their echolocation calls (West 2016). Echolocation calls are generally in the ultrasonic frequency range (>20kHz). Foraging bats must be able to detect, classify, and localize their prey while discriminating between the background “clutter” echoes. Bats will use different call types in different habitats depending on where and how they forage and the cluttered conditions of their use areas. “Signal masking” occurs when the bat’s ability to evaluate the target echoes is hampered by clutter echoes. Bats also produce sound for communication in addition to echolocation, typically at a lower frequency range.

Anthropogenic noise not only has an effect on the echolocation and communication calls of bats, but also on the passive listening used by bats that hunt using gleaning techniques, such as northern long-eared bats. While Indiana bats generally prefer aerial hawking, which primarily relies on echolocation calls to locate prey, gleaning requires bats to listen for prey-produced sounds (passive listening). This strategy is utilized by bat species that glean arthropods from vegetation or the ground where prey echoes are masked by overlapping, strong background echoes. Data collected by Schaub et al. (2008) on the greater mouse-eared bat (*Myotis myotis*) suggests that foraging areas very close to highways, and presumably also other sources of intense broadband noise, are degraded in their suitability of foraging areas. The Schaub et al. study also points out that the reluctance of bats to forage in very noisy environments potentially also brings about conservation benefits. If bats allocate little foraging time surrounding noisy highways, the number of collision casualties could be reduced.

It is reasonable to assume that the noise and vibration disturbance as a result of the construction and operation components of the Action is expected to result in some changes to bat behaviors. However, with the close proximity of the Action area to existing CVG facilities, bats in the area are already likely exposed to the constant noise and vibration stressors caused by vehicle and aircraft traffic and may have become habituated to the disturbance. The Buffer area also contains

existing CVG facilities, interstate and major highways, and existing urban residential and commercial land use, therefore, bats within the majority of the Buffer area are also already likely exposed to noise and vibration stressors – approximately 57 percent (2,326 acres) of the buffer area is comprised of developed areas of commercial or residential use (Figure 9), with only approximately 20 percent (1,100 acres) forest cover (Figure 10). Additionally, the reluctance of gleaning bat species such as the northern long-eared bat to utilize foraging areas with a high level of anthropogenic noise disturbance could result in fewer casualties from other threats in the area.

## **5.2 Night Lighting**

An increase in night lighting is expected during both the construction and operation components of the Action. Construction activities will typically occur during daylight hours, however artificial lighting will be necessary for any activities occurring during the early morning and late evening hours, and rarely at night. No lighting of forested areas within the Action area will occur, as tree removal will occur during daytime hours, and clearing, grubbing, and grading will occur prior to construction of facilities. Once construction is complete, the safe operation of the air cargo hub facilities will require artificial lighting to be used to illuminate all roadways and parking areas, in addition to the newly constructed aircraft apron and its Appendix to existing CVG runways.

The natural light dark cycle (LDC) is a critical factor in the biological “circadian” rhythms of organisms exposed to daily fluctuations in sunlight. Daily patterns in the activity and behavior of bats are strongly influenced by the LDC. The timing of the sunset determines nightly emergence times from roosts (Erkert 1982), and moonlight affects foraging activity (Morrison 1978). Artificial lighting can damage bat foraging habitat directly by making an area unsuitable for foraging, or indirectly by disrupting commuting routes through light spillage onto hedgerows and watercourses (Rasey 2006). Studies have shown that Myotis bat species avoid commuting routes illuminated with LEDs (Stone et al. 2015) and forced to use alternative routes to reach foraging grounds. Depending on the quality and quantity of alternative routes, it may become necessary for bats to utilize suboptimal routes causing them to fly further to reach foraging grounds. This can result in an increase in energetic costs and potential exposure to predation if alternate routes do not provide sufficient forest cover. Where alternate routes are not available, bat colonies may be isolated from their foraging areas, potentially forcing them to abandon their roost (Stone et al. 2015). Illumination of the foraging areas themselves, i.e. within the Buffer area, can potentially prevent or reduce foraging activity, since artificial lighting can disrupt the composition and abundance of insect prey (Davis et al. 2012).

An increase in artificial lighting can also disrupt the timing of nightly bat emergence from roost trees since it can cause the appearance of daylight. Delayed emergence results in reduced foraging time and increases the risk that bats will miss the peak abundance of insects that occurs at dusk (Stone et al. 2015). It is possible the continuous delays in nightly emergence could negatively affect the fitness of individuals and the roost as a whole.

The Action area is located directly adjacent to existing well-illuminated runways and aircraft aprons which will attach directly to the new facilities. It is likely that the majority of the Action Area is already exposed to a high degree of night lighting as a result of its close proximity to CVG. Likewise, the majority of the Buffer area contains existing artificial illumination within the CVG



facilities, adjacent major roadways, and commercial and residential areas. However, it can be expected that the increase in night lighting as a result of the Action could cause bats utilizing the forested habitat of the Buffer area to alter their behavior.

### **5.3 Collision**

The U.S. Department of Agriculture, through an interagency agreement with the FAA, compiles a database of all reported wildlife strikes to U.S. civil aircraft and to foreign carriers experiencing strikes in the USA. They have compiled 82,057 strike reports from 1,418 USA airports and 207 foreign airports from 1990 through 2007. It is estimated that this total represents only about 20 percent of the strikes that have occurred during that timeframe.

Bat strikes represented 0.3 percent of total strikes, with 253 individuals from eight (8) identified species reported, although many bats were not identified to species. Seven (7) bat collisions were reported in Ohio and four (4) in Kentucky. The majority of strikes with bats (53 percent) occurred during the July to September timeframe in which the majority of North American bat species are most active. Bat strikes were most often occurred during the night, with few occurring during dawn, dusk, and daylight hours (Dolbeer and Wright 2008).

Collisions with vehicle traffic is also a potential threat to Indiana and northern long-eared bats in the Action area, however, the Indiana bat recovery plan indicates that bats do not seem particularly susceptible to vehicle collisions (USFWS 2007).

Potential for collisions will pose a threat to Indiana and northern long-eared bats during both the construction and operation phases of the Action. However, the construction component of the Action will take place primarily during daylight hours, reducing the risk of potential bat collisions with construction equipment. Construction activities that may occur during the night, such as pouring concrete, are generally stationary and localized and will not pose a threat of collision.

Due to the close proximity to existing CVG facilities, it is likely that Indiana and northern long-eared bats present in the Action area are already exposed to the threat of collision with vehicles and aircrafts. Since no suitable hibernacula or swarming habitat for either species is located in the vicinity of the Action area, the threat of collision is highest during the summer months when forest-dwelling bats may be commuting, migrating and/or foraging in the area after dark. Once the construction of the air cargo hub is complete, the Action will not contain any forested areas that would provide habitat for Indiana and northern long-eared bats, potentially reducing the species' presence in the area and decreasing overall risk of collision.

### **5.4 Water Quality**

The Action area is located within the Middle Ohio-Laughery watershed (HUC 8: 05090203) and the immediate receiving watershed of Gunpowder Creek. Gunpowder Creek is defined as a warm-water aquatic habitat by the Kentucky Division of Water (KDOW) and is not identified as a Special Resource Water. Wetland and stream delineations were completed for all waterbodies present within the Action area, including Rapid Bioassessment Protocol (RBP) Habitat Scores for each stream. All of the ephemeral and intermittent stream channels, and approximately 62 percent of

the perennial stream linear footage within the Action area scored within the “poor” rating, indicating that the biological integrity of the streams is low. Streams with low ratings provide poor habitat for aquatic organisms and exhibit degraded riparian habitat. Indiana and northern long-eared bats both utilize forested stream corridors for traveling and foraging, often preferring streams with canopy cover along both banks and a high biodiversity of potential insect prey. Approximately 1,569 linear feet of perennial stream scored within the “fair” rating, and approximately 1,781 linear feet of perennial stream scored within the lower end of the “good” rating, indicating a higher biological integrity of these stream segments for aquatic organisms and riparian habitat. Indiana and northern long-eared bats also often forage above and around wetlands and ponds, both of which are currently present within the Action area.

Construction activities associated with the Action will result in permanent impacts to all wetlands and streams present within the Action area. Activities that reduce the quantity or that alter the quality of water sources and foraging habitat may impact bats, even if conducted while individuals are not present. All water quality degradation has the potential to negatively affect foraging bats by reducing aquatic insect populations.

Based upon Section 404/401 permitting conditions, compensatory mitigation will be required for the proposed project’s wetland and stream impacts. KCAB has initiated securing the anticipated compensatory mitigation requirement through the purchase of credits from the Northern Kentucky Mitigation Bank (NKMB), the Northern Kentucky University (NKU) In-Lieu Fee Payment Program, and/or the Kentucky Department of Fish and Wildlife Resources (KDFWR). Formal, final USACE decision regarding compensatory mitigation amount has not yet been issued. Upon USACE/KYDEP approval of the proposed mitigation, KCAB will finalize negotiations with NKMB, NKU, and KDFWR.

The introduction of environmental contaminants to waterways also has the potential to negatively affect foraging bats by exposing them to toxic substances. Aquatic insects make up part of the diet of Indiana and northern long-eared bats and, thus, impacts to water quality may result in temporary or short-term indirect effects on foraging bats during the occupied time frames. The primary hazardous materials used in conjunction with construction activities include: diesel fuel, gasoline, hydraulic fluids, oils, lubricants, solvents, adhesives, and battery chemicals. Spills and/or leakage of these materials into the environment could affect water quality resulting in reduced densities of aquatic insects that bats consume.

Operation activities associated with snow and ice control include the application of chemicals directly to paved surfaces. Deicing agents used for snow and ice control would eventually be carried from the roadways, parking lots, aircraft apron, and runways by surface water and may enter adjacent waterways. It is likely that some of these agents would be filtered by vegetated shoulders, swales, and storm water treatment areas. Only the required amount of deicing agents would be used, and these agents have been documented as having short-term effects on aquatic macroinvertebrates depending on the concentration at which the macroinvertebrates are exposed.

Once construction is completed, there will be no suitable streams or wetlands present in the Action area which would provide commuting and foraging habitat for Indiana and northern long-eared

bats. Although the loss of habitat may have a negative impact on bat species, it could also deter bats from utilizing the Action area and reduce the risk of potential collisions.

## **5.5 Removal of Forested Habitat**

There is currently 417 acres of forest within the project's survey area. Approximately 244 acres of forested habitat is present within the Action area, all of which will be removed prior to the construction of the air cargo hub. The forested areas contain multiple stream channels, which could provide flight corridors for bats, and are surrounded by open fields which could be suitable for foraging. However, the fragmentation of surrounding forested habitat in Boone County, along with the close proximity to existing and functional airport facilities degrades the existing quality of the forested habitat present in the Action area. The forested areas are also comprised of a very dense shrub layer of invasive honeysuckle which also inhibits flyway potential for the bats.

A tri-county study of Boone and the adjacent Kenton and Campbell Counties was conducted by the Northern Kentucky Urban and Community Forest Council (NKUCFC) to determine the total canopy cover of the area. For this study, tree canopy was defined as "the layer of leaves, branches, and stems of trees that cover the ground when viewed from above." It was determined that Boone County is comprised of 156,565 total acres of land, of which 73,357 acres (47% canopy cover) is currently forested (NKUCFC 2014). The study included a breakdown of the ownership of tree canopy specifically within the Gunpowder watershed, which determined that majority of canopy cover is owned by agricultural (54%) and residential (22%) areas. The CVG Airport currently owns 4% of the canopy cover in the Gunpowder watershed (NKUCFC 2014) (Figure 6).

The Action area is located within "Potential" habitat for both species. The timeframe in which Potential habitat is considered to be "occupied" by Indiana and northern long-eared bats is from April 1 – October 14. The removal of forested habitat in the Action area will likely have a negative impact on Indiana and northern long-eared bats commuting, roosting, and foraging habitat which will be mitigated via a contribution to the Imperiled Bat Conservation Fund (IBCF) (Section 6.1).

## **6.0 PROPOSED MITIGATION**

### **6.1 Imperiled Bat Conservation Fund (IBCF)**

The Project Area is located outside of known forest-dwelling bat habitat; however, the area is designated as Potential Habitat by the USFWS KFO. Impacts to potential habitat requires mitigation per guidelines of the KFO *Revised Conservation Strategy for Forest-Dwelling Bats*.

Project plans will require tree removal from February to March, 2019 (122 acres) and from April to May, 2019 (remaining 122 acres). The project proponent will commit to contributing to the IBCF in the amount \$608,007.60 to meet the mitigation recommendations in the *Revised Conservation Strategy for Forest-Dwelling Bats* and per coordination with USFWS. The current rate for mitigation for the February to March timeframe is \$1,710/acre, and the current mitigation rate for April to May is \$3,420.00/acre. The IBCF mitigation rate/acre is updated in August of each year. Total tree removal will be 244 acres (Appendix A, Figures 5a-5b). Payment of \$16,965.00 was previously contributed for 5.22 acres within the Action area for KFO Project

Number 2016-B-0293 (Appendix C). Tree clearing has not yet occurred for the 5.22 acres under KFO Project Number 2016-B-0293, and the 5.22 acres has been included in the proposed 244-acre tree clearing schedule. Payment into the IBCF will be made prior to tree clearing per the mitigation multipliers by habitat type and season in the *Revised Conservation Strategy for Forest-Dwelling Bats*, as summarized below for the Action area.

- \$208,620.00 – February to March clearing of 122 acres
- \$399,387.60 – April to May clearing of 122 acres minus 5.22 acres previously mitigated
- Total mitigation costs: **\$608,007.60**

The clearing, grading, and site preparation for the project is set to last approximately 18 months. All effort will be made to not remove trees in June and July.

This contribution to the IBCF is expected to promote the survival and recovery of Indiana and northern long-eared bats through the protection and management of existing forested habitat to support potential maternity populations, particularly those that would expand existing conservation ownerships.

## **6.2 4(d) Rule for Northern Long-Eared Bats**

Section 4(d) of the Endangered Species Act directs the USFWS to issue regulations deemed “necessary and advisable to provide for the conservation of threatened species.” It allows promulgation of special rules for species listed as threatened (not endangered) that provide flexibility in implementing the ESA. The 4(d) rule is used to target the take prohibitions to those that provide conservation benefits for the species. This targeted approach can reduce ESA conflicts by allowing some activities that do not harm the species to continue, while focusing our efforts on the threats that make a difference to the species’ recovery.

For the northern long-eared bat, the 4(d) rule tailors protections to areas affected by white-nose syndrome during the bat’s most sensitive life stages. The rule is designed to protect the bat while minimizing regulatory requirements for landowners, land managers, government agencies and others within the species’ range. The final 4(d) rule for northern long-eared bats prohibits purposeful take throughout the species’ range, except in instances of removal of northern long-eared bats from human structures, defense of human life (including public health monitoring), removal of hazardous trees for protection of human life and property, and authorized capture and handling of northern long-eared bats by individuals permitted under section 10(a)(1)(A) of the ESA.

“Take” is defined by the ESA as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect” any endangered species. “Purposeful take” occurs when the reason for the activity or action is conduct some form of take. This includes conducting research projects and presence/absence surveys in addition to intentionally killing or harming a bat. “Incidental take” is defined by the ESA as take that is “incidental to, and not the purpose of, they carrying out of an otherwise lawful activity.” For example, harvesting trees can kill roosting bats, but the purpose of

the activity is not to kill bats. Incidental take resulting from otherwise lawful activities will not be prohibited in areas not yet affected by white-nose syndrome (WNS) under the 4(d) rule.

Take of northern long-eared bats in their hibernacula (see Section 3.2.4) is prohibited in areas affected by WNS, unless permitted under section 10(a)(1)(A) of the ESA. Take of northern long-eared bats inside of hibernacula may include disturbing or disrupting hibernating individuals when they are present as well as the physical or other alteration of the hibernaculum's entrance or environment when bats are not present if the result of the activity will impair essential behavioral patterns, including sheltering northern long-eared bats. Incidental take resulting from tree removal is prohibited if it: Occurs within a 0.25-mile radius of known northern long-eared bat hibernacula; or cuts or destroys known occupied maternity roost trees, or any other trees within a 150-foot radius from the known maternity tree during the pup season (June 1 through July 31). Incidental take of northern long-eared bats as a result of the removal of hazardous trees for the protection of human life and property is not prohibited.

There are no known northern long-eared bat hibernacula within the 0.25-mile radius outlined in the 4(d) rule that would be impacted as a result of the proposed Action.

## **7.0 CUMULATIVE EFFECTS**

For purposes of consultation under ESA §7, cumulative effects are the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the Action Area. Future federal actions that are unrelated to the proposed action are not considered, because they require separate consultation under §7 of the ESA.

The Proposed Action involves removing all existing trees within the Action Area (244 acres). There will be no remaining "Potential" habitat upon development of the Proposed Action, therefore, there are no cumulative effects to the Indiana bat and northern long-eared bat that will occur.

## **8.0 CONCLUSIONS**

The CVG Air Cargo Hub Development Project consists of a 900-acre Action area located in Boone County, Kentucky. Once construction of the new facilities is complete, the new air cargo hub will continue to operate indefinitely. National Environmental Policy Act of 1969 (NEPA) requires federal authorization from the Federal Aviation Administration (FAA) for potential environmental effects of the proposed Action in compliance with Section 7(c) of the Endangered Species Act (ESA) of 1973. The Action area contains "Potential" habitat for the endangered Indiana bat and threatened northern long-eared bat. No known hibernacula, swarming, or summer habitat is present in Boone County for either species.

Tree clearing in the amount of 244 acres will occur for the proposed Action. Mitigation will occur in the form of a contribution to the IBCF to offset potential negative impacts to ESA-listed bat

habitat. The payment will be made prior to tree clearing in the amount of \$608,007.60. The payment will follow the seasonal timelines and mitigation multipliers outlined in the *Revised Conservation Strategy for Forest-Dwelling Bats*. Payment adjustments will occur if the USFWS make adjustments to the current calculated per/acre calculation. All effort will be made to not remove trees in June and July. This contribution is expected to promote the survival and recovery of both bat species through protecting and managing existing forested habitat to support potential maternity populations, particularly those that would expand existing conservation ownerships. In conclusion, the proposed action appears to result in a likely to adversely affect Indiana bats and likely to adversely affect northern long-eared bats determination for the proposed CVG Air Cargo Hub Development Project. The Action will not affect any known hibernacula, known swarming, or known summer habitat in Boone County. Adherence to USFWS-approved clearing time frames and contribution to the IBCF will off-set impacts to these federally listed bat species.

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## **Appendix A**

### **Figures**



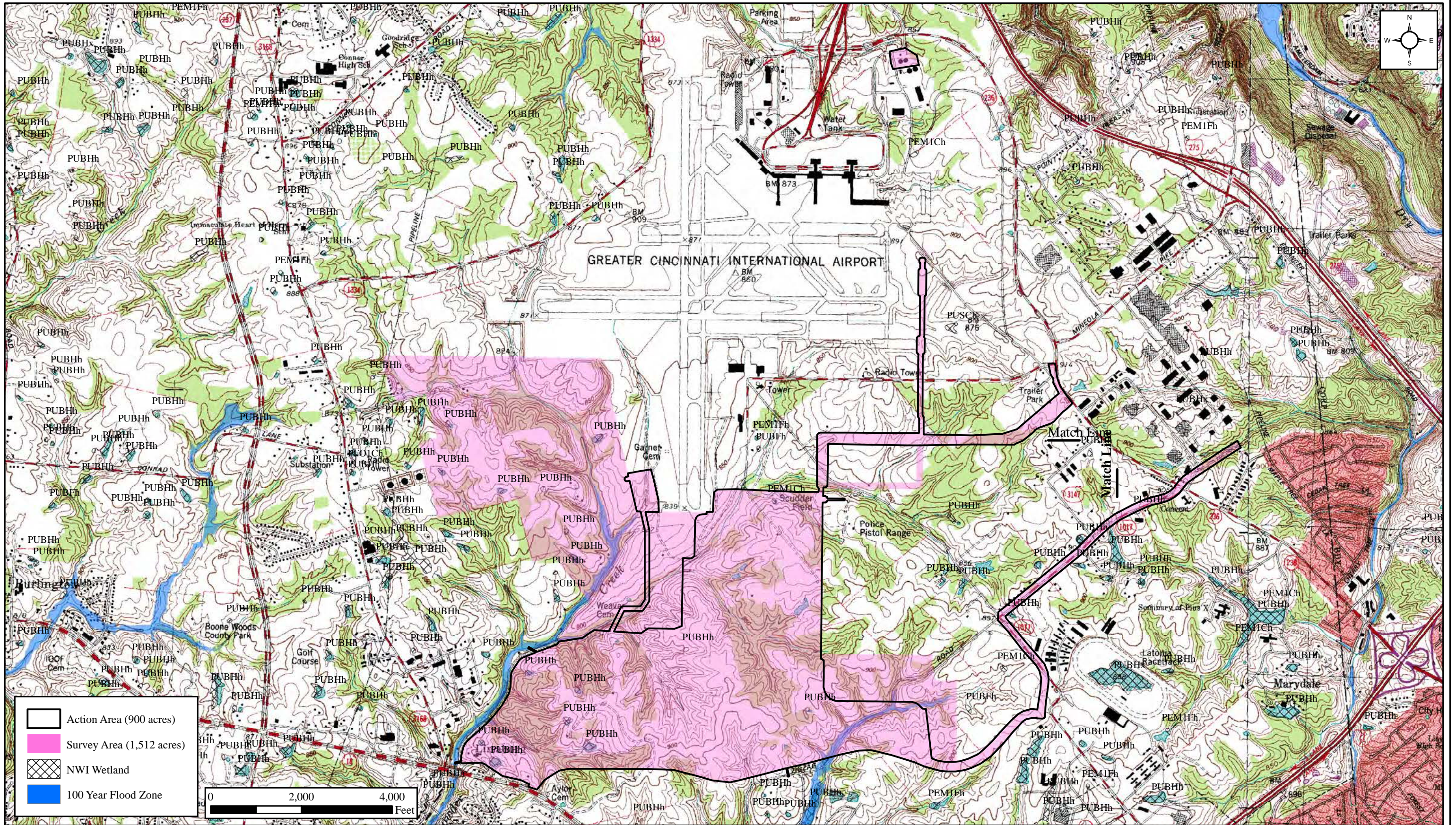


Figure 1

Kenton County Airport Board  
Cincinnati/Northern Kentucky International Airport  
Air Cargo Hub Development  
Boone County, Kentucky

USGS 7.5' Topographic Map with NWI  
and FEMA Overlay  
Burlington, KY Quadrangle  
*Environment & Archaeology*  
LLC



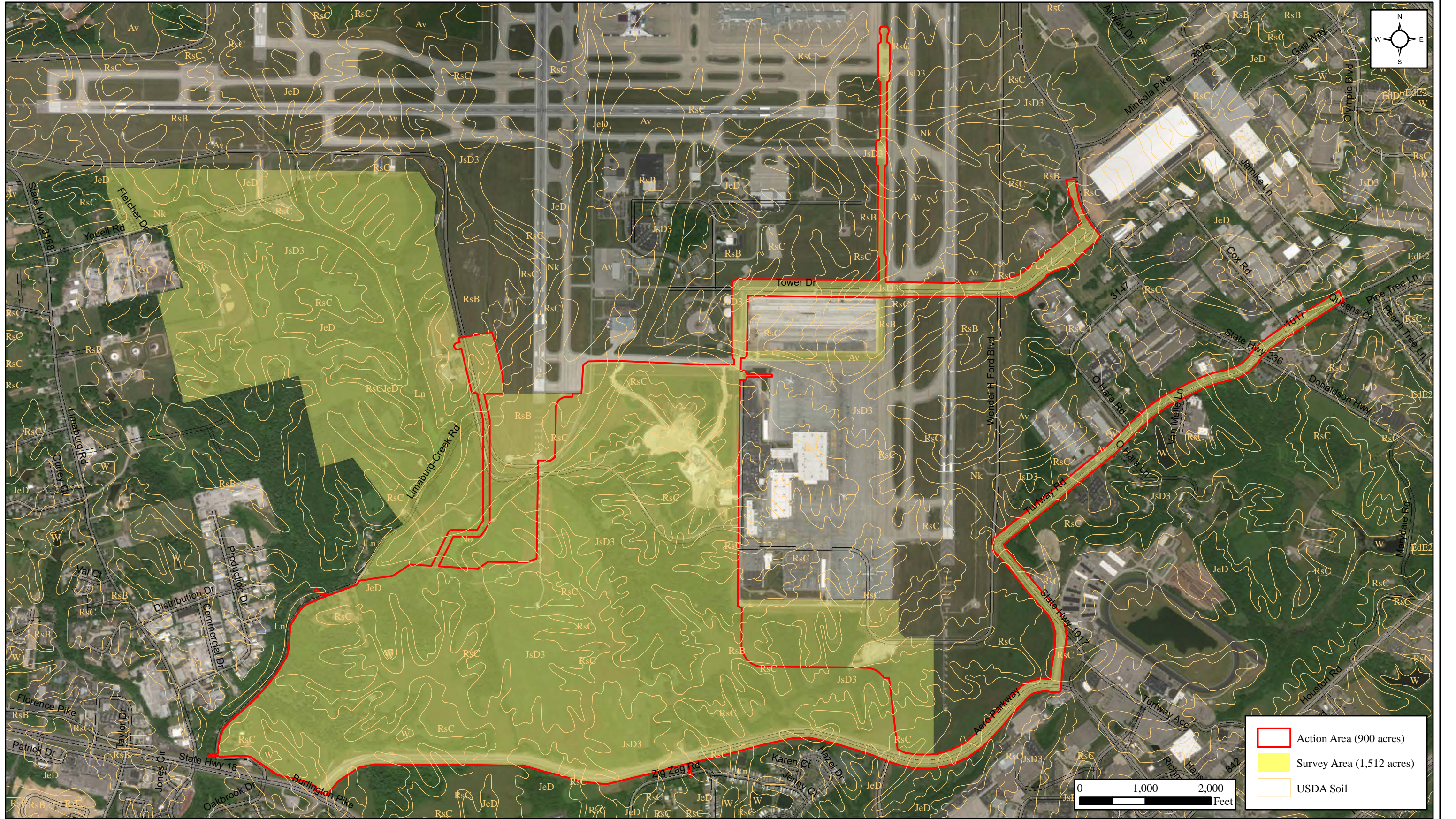


Figure 2a

Kenton County Airport Board  
Cincinnati/Northern Kentucky International Airport  
Air Cargo Hub Development  
Boone County, Kentucky

Aerial Map with USDA Soil Overlay  
Aerial Provided by ESRI Map Services  
*Environment & Archaeology*  
LLC





Figure 2b

Kenton County Airport Board  
Cincinnati/Northern Kentucky International Airport  
Air Cargo Hub Development  
Boone County, Kentucky

Aerial Map with USDA Soil Overlay  
Aerial Provided by ESRI Map Services  
*Environment & Archaeology* LLC





Figure 3a

Kenton County Airport Board  
Cincinnati/Northern Kentucky International Airport  
Air Cargo Hub Development  
Boone County, Kentucky

Aerial Map  
Aerial Provided by ESRI Map Services  
*Environment & Archaeology*  
LLC



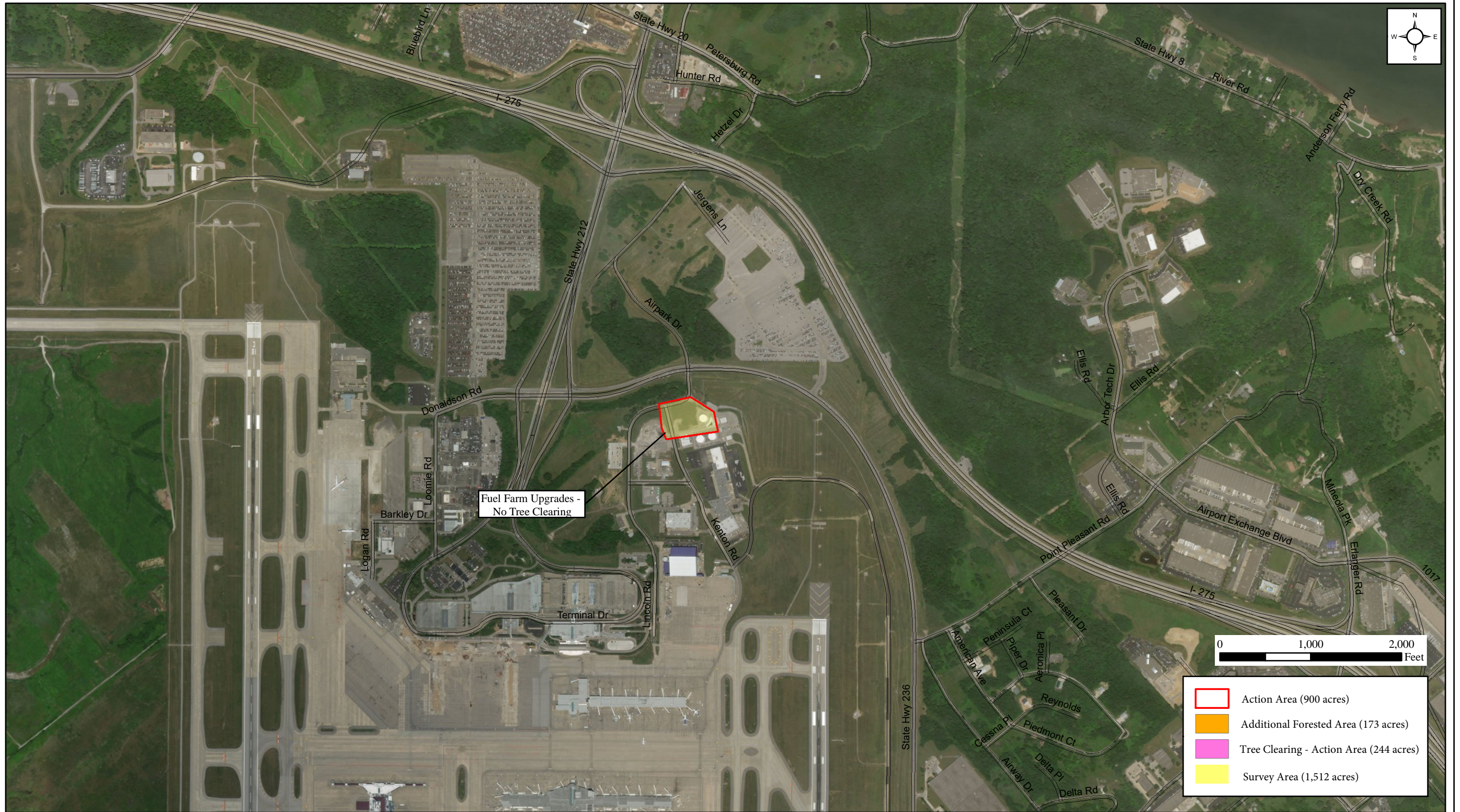


Figure 3b

Kenton County Airport Board  
Cincinnati/Northern Kentucky International Airport  
Air Cargo Hub Development  
Boone County, Kentucky

Aerial Map  
Aerial Provided by ESRI Map Services  
*Environment & Archaeology*  
LLC





Figure 4a

Kenton County Airport Board  
Cincinnati/Northern Kentucky International Airport  
Air Cargo Hub Development  
Boone County, Kentucky

Aerial Map  
Aerial Provided by ESRI Map Services  
*Environment & Archaeology* LLC



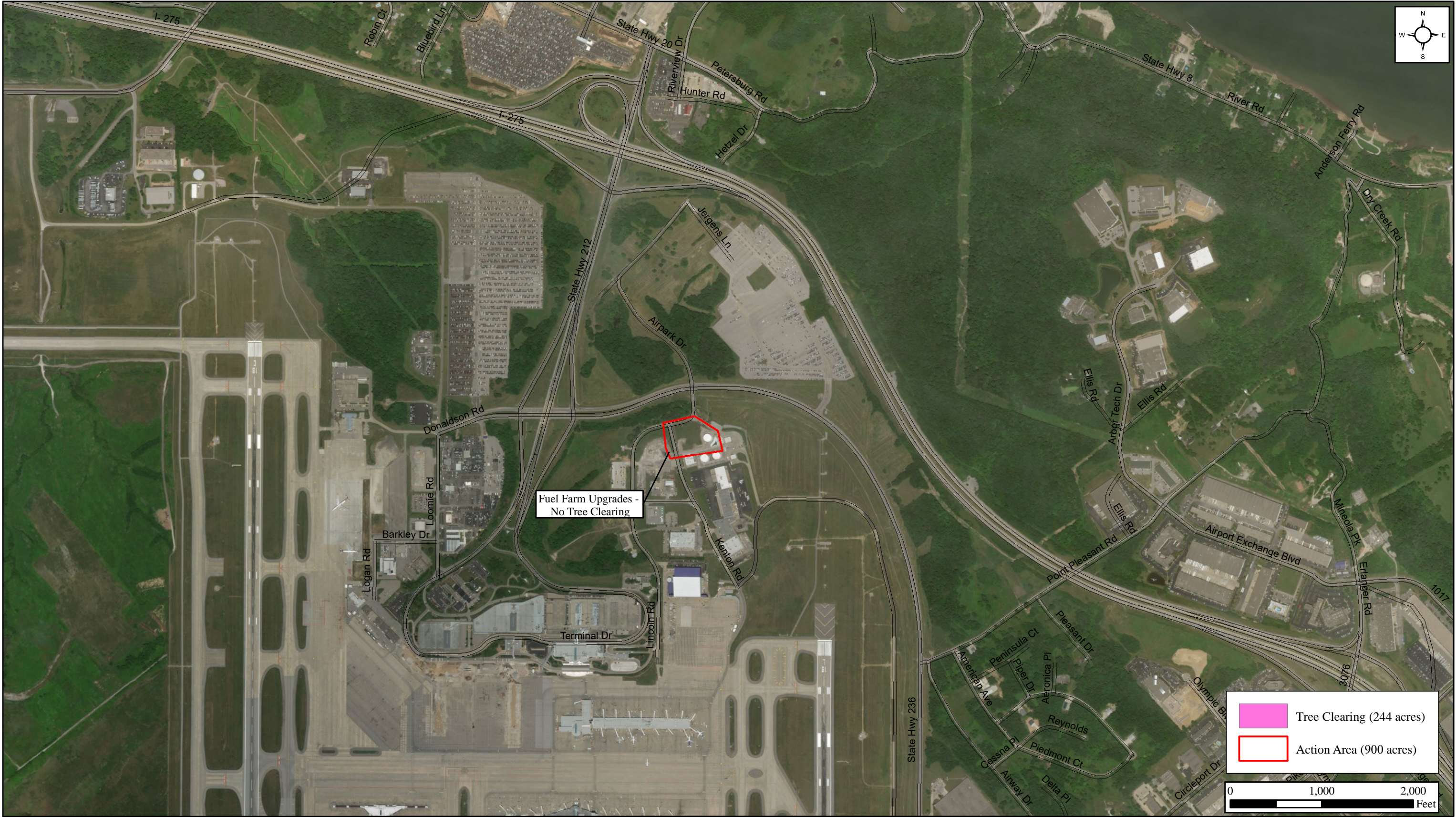


Figure 4b	Kenton County Airport Board Cincinnati/Northern Kentucky International Airport Air Cargo Hub Development Boone County, Kentucky	Aerial Map Aerial Provided by ESRI Map Services <i>Environment &amp; Archaeology</i> LLC
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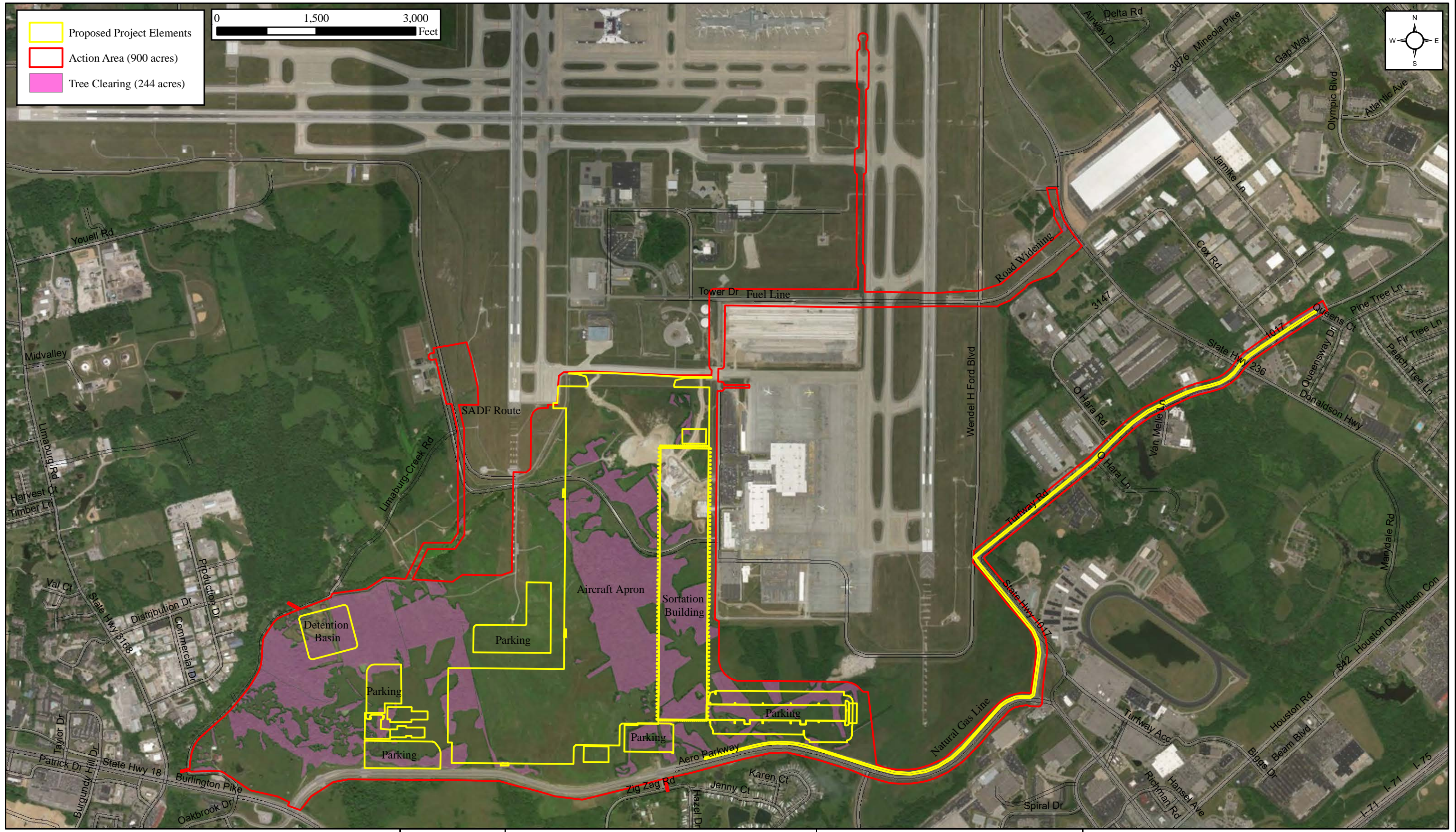


Figure 5a

Kenton County Airport Board  
Cincinnati/Northern Kentucky International Airport  
Air Cargo Hub Development  
Boone County, Kentucky

Aerial Map  
Aerial Provided by ESRI Map Services  
*Environment & Archaeology*  
LLC



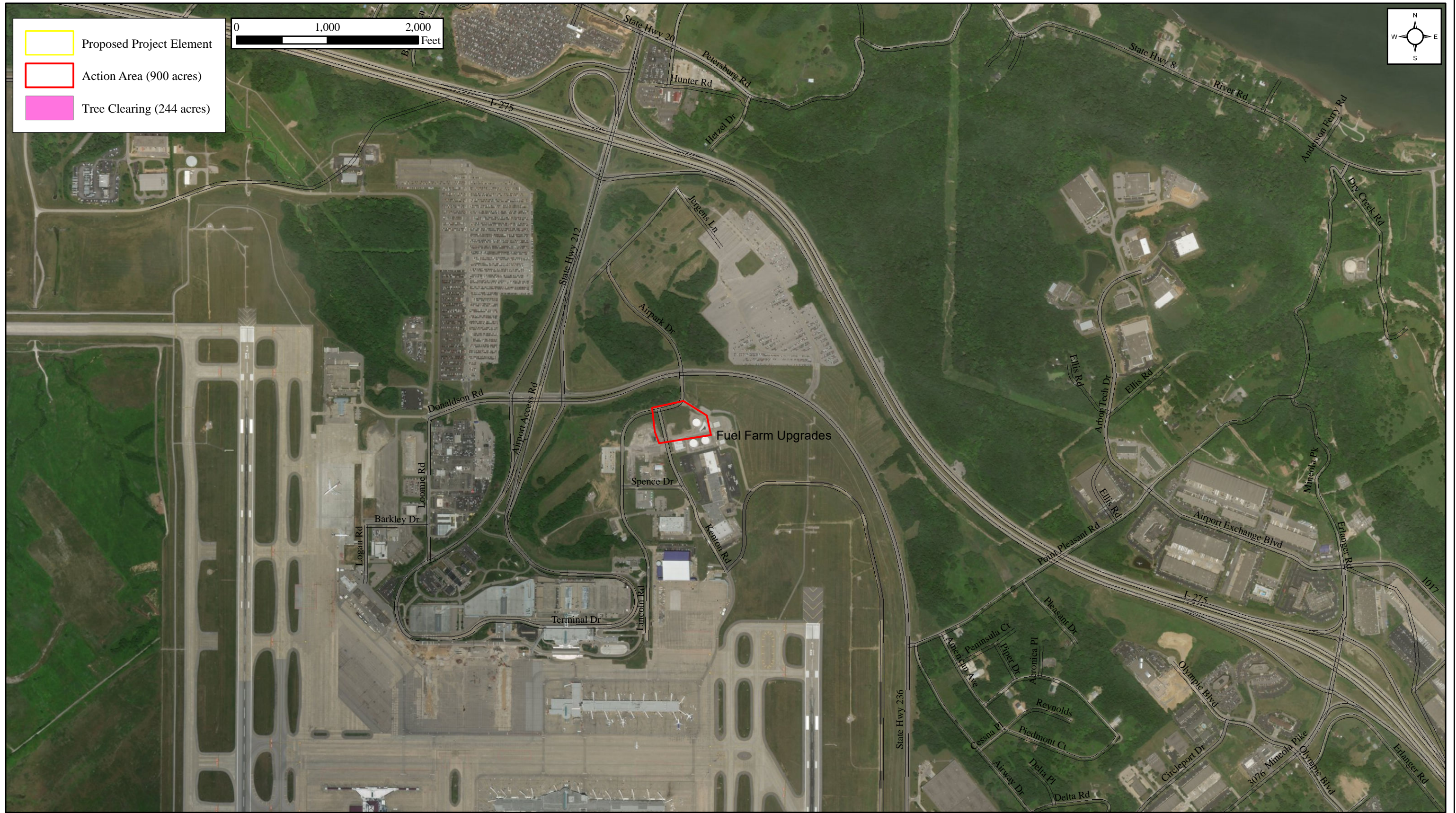


Figure 5b

Kenton County Airport Board  
Cincinnati/Northern Kentucky International Airport  
Air Cargo Hub Development  
Boone County, Kentucky

Aerial Map  
Aerial Provided by ESRI Map Services  
*Environment & Archaeology* LLC



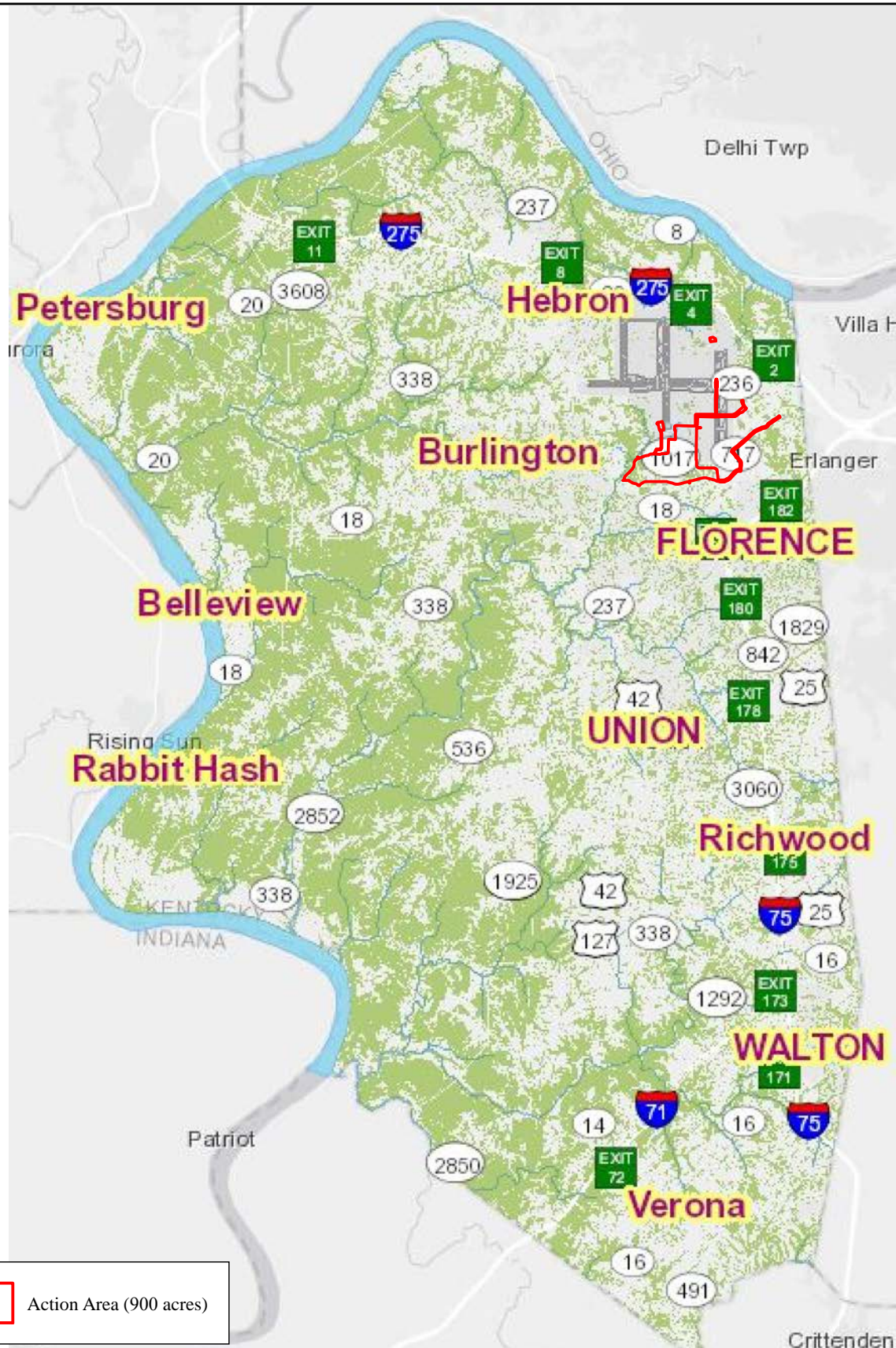


Figure 6

Kenton County Airport Board  
Cincinnati/Northern Kentucky International Airport  
Air Cargo Hub Development  
Boone County, Kentucky

Boone County Tree Canopy Cover  
Source: GIS Services Division,  
Boone County Planning Commission  
*Environment & Archaeology*  
LLC





Figure 7. Proposed Alternatives





Figure 8

Kenton County Airport Board  
Cincinnati/Northern Kentucky International Airport  
Air Cargo Hub Development  
Boone County, Kentucky  
Action Area 1-km Buffer

Aerial Map  
Aerial Provided by ESRI Map Services  
*Environment & Archaeology* LLC





Figure 9

Kenton County Airport Board  
Cincinnati/Northern Kentucky International Airport  
Air Cargo Hub Development  
Boone County, Kentucky  
Action Area 1-km Buffer

Aerial Map  
Aerial Provided by ESRI Map Services  
*Environment & Archaeology* LLC





Figure 10

Kenton County Airport Board  
Cincinnati/Northern Kentucky International Airport  
Air Cargo Hub Development  
Boone County, Kentucky  
Action Area 1-km Buffer

Aerial Map  
Aerial Provided by ESRI Map Services  
*Environment & Archaeology* LLC

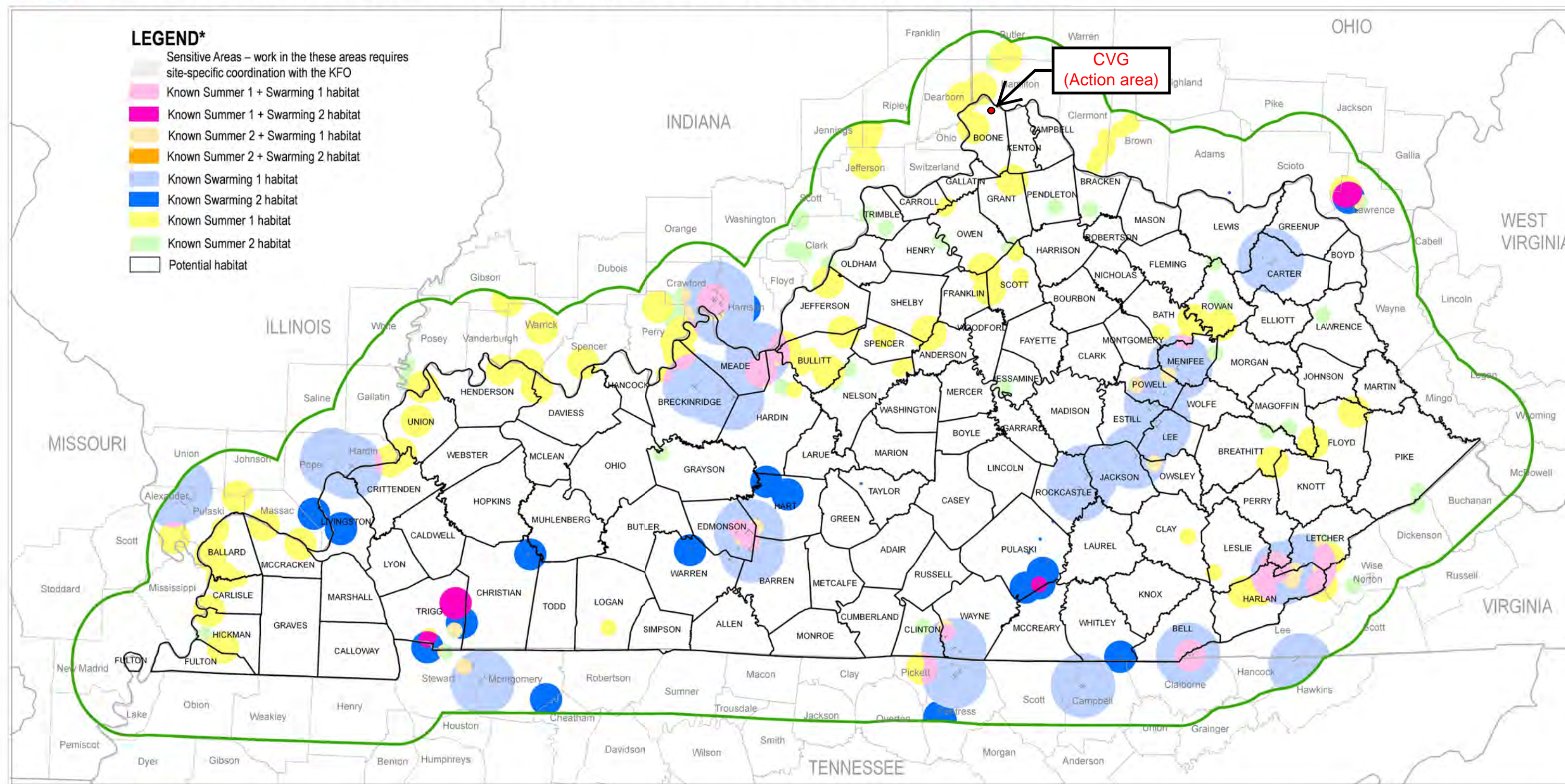


**Attachment B**  
**Known Indiana and Northern Long-eared Bat Habitat Maps**





## Known Indiana bat habitat in Kentucky and within 20 miles (January 2018)



NOTE: This map is based on species occurrence information and is subject to change as new data become available. Please contact our office at 502/695-0468 to ensure you are working with the most current version.

\*For an explanation of terms, please see the Conservation Strategy for Forest-Dwelling Bats in the Commonwealth of Kentucky.

0 10 20 40 60 80 100 Miles

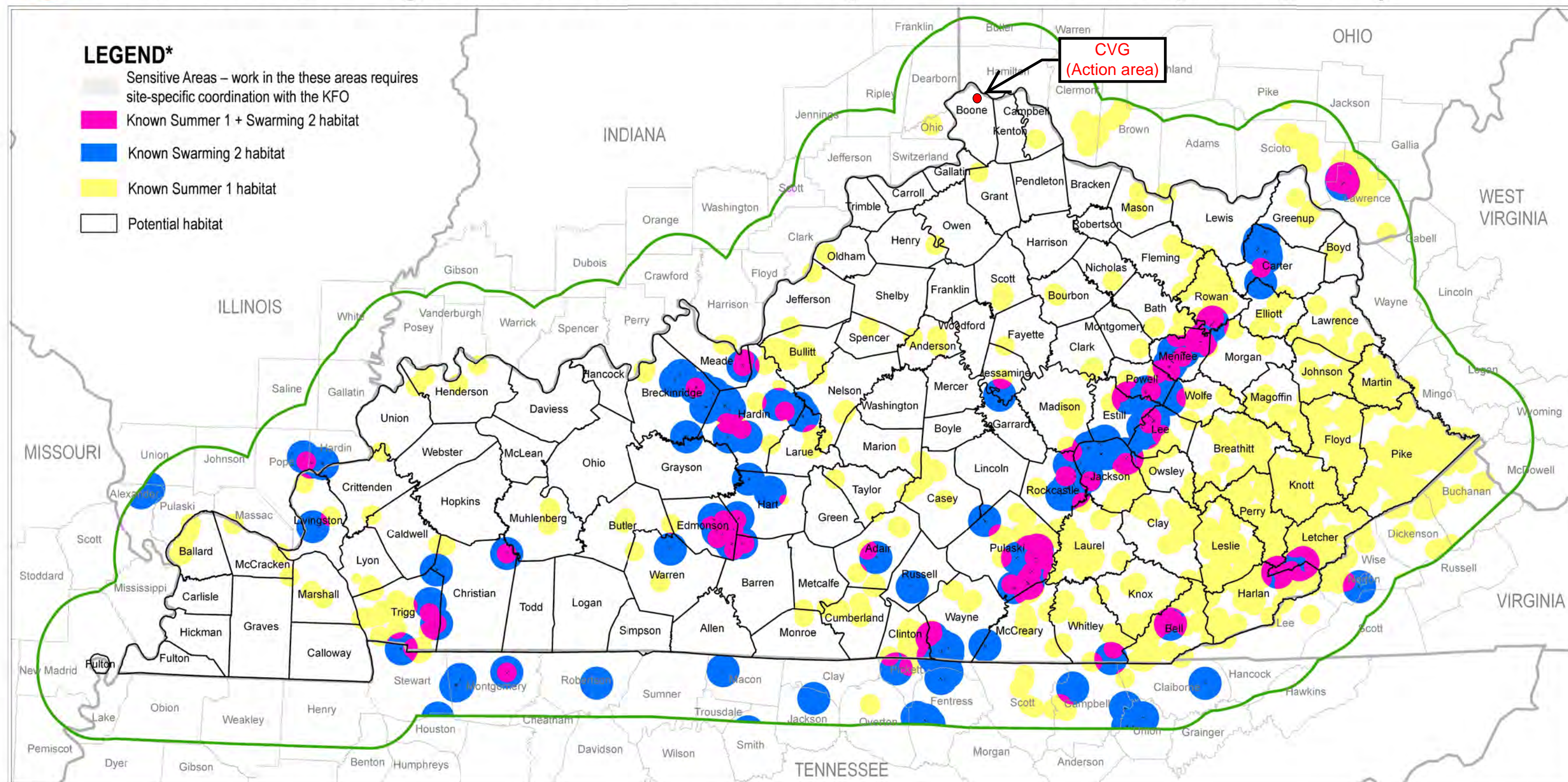
The USFWS makes no warranty for use of this map and cannot be held liable for actions or decisions based on map content. This map was produced as an appendix to the Conservation Strategy for Forest-Dwelling Bats in the Commonwealth of Kentucky and should only be used in the context of this Strategy.







# Known northern long-eared bat habitat in Kentucky and within 20 miles (January 2018)



NOTE: This map is based on species occurrence information and is subject to change as new data become available. Please contact our office at 502/695-0468 to ensure you are working with the most current version.

\*For an explanation of terms, please see the Conservation Strategy for Forest-Dwelling Bats in the Commonwealth of Kentucky.

0 10 20 40 60 80 100 Miles

The USFWS makes no warranty for use of this map and cannot be held liable for actions or decisions based on map content. This map was produced as an appendix to the Conservation Strategy for Forest-Dwelling Bats in the Commonwealth of Kentucky and should only be used in the context of this Strategy.





**Attachment C**  
**Previous IBCF Contribution Documentation**



P.O. Box 752000  
Cincinnati, OH 45275-2000  
Phone: 859-767-3151  
Fax: 859-767-3080  
cvgairport.com

May 20, 2016

Kentucky Natural Lands Trust  
c/o Hugh Archer, Executive Director  
433 Chestnut Street  
Berea, KY 40403

Re: IBCF Contribution  
KFO Project Number 2016-B-0293

Dear Mr. Archer:

Enclosed is a check made payable to the Kentucky Natural Lands Trust in the amount of \$16,965.00 as a contribution to the Imperiled Bat Conservation Fund (IBCF) for the removal of 5.22 acres of "potential" Indiana bat and northern long-eared bat habitat for the Wendell Ford Boulevard Extension Project. The Kentucky Field Office (KFO) Project Number is 2016-B-0293.

Please issue a letter of receipt for this payment to the following address. Also, please notify the KFO that this contribution has been received at your earliest convenience.

Kenton County Airport Board  
Attn: Debbie Conrad  
P.O. Box 752000  
Cincinnati, OH 45275-2000

If you have any questions or concerns, please feel free to contact me at 859-767-7021.

Sincerely,

A handwritten signature in blue ink, appearing to read "Debbie Conrad". The signature is fluid and cursive, with the first name "Debbie" and last name "Conrad" clearly distinguishable.

Debbie Conrad  
Senior Project Manager

Cc: Phil DeGarmo, USFWS



## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

Kentucky Ecological Services Field Office  
330 West Broadway, Suite 265  
Frankfort, Kentucky 40601  
(502) 695-0468

June 29, 2016

Ms. Debbie Conrad  
Senior Project Manager  
Kenton County Airport Board  
Cincinnati/Northern Kentucky International Airport  
P.O. Box 752000  
Cincinnati, Ohio 45275

Re: FWS 2016-B-0293; Kenton County Airport Board; located in Kenton County, Kentucky

Dear Ms. Conrad:

The U.S. Fish and Wildlife Service (Service) has reviewed recent correspondence regarding this proposed project and offers the following comments in accordance with the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*).

**Indiana Bat** (*Myotis sodalis*)

**Northern Long-eared Bat** (*Myotis septentrionalis*)

The correspondence from AECOM states that the project area does not contain caves, caverns, mine adits, or other underground voids that could potentially provide winter habitat for these species. The project area does contain suitable summer roosting habitat. We have received a copy of a May 23, 2016 receipt acknowledging the \$16,443.00 contribution Kenton County Airport Board made to Kentucky Natural Lands Trust for the Imperiled Bat Conservation Fund. Your project adheres to the conservation measures associated with the Kentucky Field Office's 2015 *Conservation Strategy for Forest-Dwelling Bats* (Conservation Strategy) and the 2015 Biological Opinion: *Kentucky Field Office's Participation in Conservation Memoranda of Agreement for the Indiana Bat and/or Northern Long-eared Bat* (BO). The contribution made is the appropriate amount, following the process in the Conservation Strategy, to mitigate for the removal of the "potential" Indiana bat habitat and "potential" northern long-eared bat habitat for this project as described in the original correspondence and attachments from AECOM. Specifically, 5.22 acres of forested habitat removal will occur anytime of the year, except June and July. Through the adherence to the Conservation Strategy, the Service has already analyzed the effects of your action under the BO and has concluded that the project is not likely to jeopardize the continued existence of the Indiana bat or the northern long-eared bat or result in the destruction or adverse modification of designated critical habitat for this species. Any incidental take of Indiana bats and/or northern long-eared bats that will or could result from the

forest habitat removal associated with your project is authorized under the KFO BO. If additional forested areas not previously considered are to be removed, then Kenton County Airport Board should coordinate with the Service to determine if additional compensation is necessary to be in ESA compliance.

In view of these findings we believe that the requirements of section 7 of the Endangered Species Act have been fulfilled for this project. Your obligations under section 7 must be reconsidered, however, if: (1) new information reveals that the proposed action may affect listed species in a manner or to an extent not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered during this consultation, or (3) new species are listed or critical habitat designated.

Thank you again for your request. Your concern for the protection of endangered and threatened species is greatly appreciated. If you have any questions regarding the information that we have provided, please contact Phil DeGarmo at (502) 695-0468 extension 110 or [phil\\_degarmo@fws.gov](mailto:phil_degarmo@fws.gov).

Sincerely,

A handwritten signature in blue ink, appearing to read "Virgil Lee Andrews, Jr.", written in a cursive style.

for Virgil Lee Andrews, Jr.  
Field Supervisor



June 4, 2018

United States Fish and Wildlife Service  
Attn: Lee Andrews, Field Supervisor  
330 West Broadway, Suite 265  
Frankfort, Kentucky 40601

**Re: Section 7 Threatened and Endangered Species Consultation**  
Consultation Code: 04EK1000-2017-SLI-0481  
CVG Air Cargo Hub Development Project  
Cincinnati/Northern Kentucky International Airport in Boone County, Kentucky

Dear Mr. Andrews:

The Kenton County Airport Board (KCAB) is proposing new development activities at property within and adjacent the Cincinnati/Northern Kentucky International Airport (CVG). The new development is referred to as the CVG Air Cargo Hub Development Project (Action). The Action will require federal authorization from the Federal Aviation Administration (FAA). As such, Section 7 consultation is required. *Environment & Archaeology, LLC* submits this consultation on behalf of KCAB and we provide to you the project information below and attached so that you can provide a determination of effect/no effect. A Biological Assessment has been prepared regarding the Indiana bat and northern long-eared bat for submittal to your office by the FAA. The two bat species will not be addressed in this letter.

## **1.0 PROJECT DESCRIPTION**

The proposed Action Area is located on undeveloped land north of Aero Parkway within the existing CVG facilities. The CVG Airport is situated in the northeast section of Boone County, Kentucky, approximately one (1) mile south of the Ohio River and eight (8) miles southwest of downtown Cincinnati, Ohio. The proposed Action Area for the CVG Air Cargo Hub Development Project consists of a total of 889 acres, which will be used to construct package sortation and support buildings, an aircraft parking apron and apron taxilane, and a paved vehicle parking garage and lots. Approximately 1,512 acres were surveyed for the proposed Action (Enclosure 1).

Primary development activities associated with the proposed Action include the following components.

- **Construction of a primary package sortation building, ground package sortation building, and support buildings, with a total building footprint of approximately 70.95 acres.** The primary sorting building would be located on the south side of the airfield with access from Aero Parkway and Wendell Ford Boulevard. The support buildings will include space for equipment storage and maintenance, as well as pilot services.
- **Construction of an approximate 255-acre concrete aircraft parking apron and apron taxilanes.** These features will provide circulation and parking for up to seventy-seven (77)

cargo aircrafts. Ground support equipment, unit load devices, staging areas, and fuel and de-icing pads will also be implemented.

- **Construction of a paved employee and visitor vehicle parking garage and parking lots totaling approximately 17.93 acres in size.** This portion of the proposed Action will include space for employee vehicle parking, truck courts, and vehicle circulation areas for additional trucks and cars moving throughout the cargo facility. These areas would additionally include space for employee parking service areas, and trailer staging.

The following are supporting or enabling elements to the proposed Action major elements:

- Preparation (clearing, grubbing, excavation, embankment, and grading) of approximately 889 acres of land.
- Improvement and widening of a section of Wendell H. Ford Boulevard, as well as construction of new on-airport access roads that provide vehicle and truck access between Wendell H. Ford Boulevard and the new air cargo facility.
- Improvement of sections of Aero Parkway, an existing four-lane divided highway located south of the Proposed Site, to install new entrances, turn lanes, traffic lights, and lighting.
- Extension of utilities to the project site, including electric service, natural gas, water, sanitary sewer, data/communications, and other related infrastructure.
- Modification and/or installation of new taxiway edge lights and airfield directional signs.
- Installation of exterior pole-mounted and building-mounted lighting at package sorting buildings, access roads, vehicle parking lots, truck courts, and portions of the aircraft parking aprons.
- Construction of new drainage conveyances and detention ponds and/or modification the existing airfield stormwater management system.
- Installation of security fence and controlled-access vehicle gates and pedestrian gates.
- Expansion of existing Airport fueling facilities.

Land disturbance for the Action measures approximately 889-acres and includes area for access and soil stockpiling. The site is shown on the Burlington USGS 7.5-minute topographic quadrangle map (Figure 1). The surrounding land consists of urban/industrial turf and upland deciduous forest, and the Action Area is currently undeveloped airport property. The Action Area occurs within the watershed of Upper Gunpowder Creek (HUC 12: 050902030806) of the Ohio River basin within Boone County, Kentucky.

*Environment & Archaeology, LLC* conducted a formal wetland and stream delineation and threatened and endangered species habitat survey on August 21, October 29 and 30, 2015, September 21, 22, and 23, 2016, March 14 and 15, 2017, September 5, 6, 7, 8, 11, and 12, 2017, and May 22, 23, 24, and 25, 2018.

This letter includes the results of the gray bat and mussel species habitat assessment, and running buffalo clover (RBC) habitat and flowering period surveys (Section 3). A photolog providing representative photographs of the Survey Area is provided with this letter.



## 2.0 THREATENED AND ENDANGERED SPECIES IN BOONE COUNTY, KENTUCKY

A review of the U.S. Fish and Wildlife Service's Information, Planning, and Conservation System (IPAC) and Boone county list determined that eleven (11) threatened, endangered or proposed endangered species have ranges within the Survey Area. The species have been identified below in Table 1. The IPAC Consultation was dated May 17, 2017 and the code is 04EK1000-2017-SLI-0481.

**Table 1. Threatened/Endangered Species Known to Have Ranges in the Survey Area.**

Common Name	Scientific Name	Status
<b>Mammals</b>		
Gray bat	<i>Myotis grisescens</i>	Endangered
Indiana bat	<i>Myotis sodalis</i>	Endangered
Northern long-eared bat	<i>Myotis septentrionalis</i>	Threatened
<b>Mussels</b>		
Clubshell	<i>Pleurobema clava</i>	Endangered
Fanshell	<i>Cyprogenia stegaria</i>	Endangered
Orangefoot pimpleback	<i>Plethobasus cooperianus</i>	Endangered
Pink mucket	<i>Lampsilis abrupta</i>	Endangered
Ring pink	<i>Obovaria retusa</i>	Endangered
Rough pigtoe	<i>Pleurobema plenum</i>	Endangered
Sheepnose	<i>Plethobasus cyphus</i>	Endangered
<b>Plants</b>		
Running buffalo clover	<i>Trifolium stoloniferum</i>	Endangered

Indiana Bat and Northern long-eared bat are not discussed in this letter, as they have been included in the project's Biological Assessment. The following sections summarize the gray bat, mussel species, and running buffalo clover.

## 3.0 POTENTIAL THREATENED/ENDANGERED SPECIES HABITAT IN THE SURVEY AREA

### 3.1 Gray Bat

Gray bats inhabit caves year-round. In the winter, the gray bat hibernates in deep vertical caves. In the summer, they roost in caves scattered along rivers. No karst topography occurs within the Survey Area and no caves were identified within or adjacent to the Survey Area during the habitat surveys on February 16, 2017, September 5 through 8, 2017, and May 22 through 25, 2018. The Action Area does not contain the required habitat for the gray bat.

### 3.2 Mussels

According to the USFWS IPaC and county list, there are seven mussel species with the potential to be located within the proposed Survey Area. A review of the required habitat for each of the mussel species and threat status via NatureServe was performed (<http://explorer.natureserve.org/servlet/NatureServe?init=Species>). The habitat requirements for the seven (7) mussel species are outlined in Table 3. One of the threats to all of the seven (7) listed mussel species are impoundments.

The Survey Area contains four (4) perennial streams. The remaining streams are intermittent and ephemeral. Each of the four (4) perennial streams, Gunpowder Creek, and three unnamed tributaries to Gunpowder Creek, contained impoundments. High accumulations of silt were present immediately upstream of the impoundments, creating unsuitable mussel habitat. In addition, the northern reach of one unnamed tributary to Gunpowder Creek has also been channelized by concrete and is likewise not suitable mussel habitat. Per correspondence with the USFWS in February 2018, the mussel species are listed on the IPaC due to the close proximity of the Ohio River to the Action Area. With the use of best management practices, it is the opinion of *Environment & Archaeology, LLC* that the Action will have no effect on the listed mussel species.

Photographs of the substrates within these reaches are included in Enclosure 2. The remaining intermittent and ephemeral streams lack the morphology and flow regime necessary to support the listed mussel species. Datasheets and additional photographs for identified streams and wetlands within the Survey Area are available upon request.

**Table 3. Federally Listed Endangered Mussel Species to Have Ranges in Survey Area.**

Common Name	Scientific Name	Habitat Requirements	Potential for Action to Impact Species
Clubshell	<i>Pleurobema clava</i>	Clean, loose sand and gravel in medium to small rivers and streams	No effect
Fanshell	<i>Cyprogenia stegaria</i>	Medium to large rivers; requires sand or gravel substrate in a moderate current	
Orangefoot pimpleback	<i>Plethobasus cooperianus</i>	Clean, fast-flowing water in silt-free rubble, gravel or sand of medium to large rivers	
Pink Mucket	<i>Lampsilis orbiculata</i>	Requires silt-free shallow riffles and shoals in a mud and sand substrate	
Ring pink	<i>Obovaria retusa</i>	Shallow water over silt-free sand and gravel bottoms of large rivers	
Rough pigtoe	<i>Pleurobema plenum</i>	Wide variety of streams from large to small with firmly packed sand or gravel	
Sheepnose	<i>Plethobasus cyphyus</i>	Shallow areas of large rivers and streams of moderate to swift current; variable substrates ranging from coarse sand to gravel to mud, cobble, boulders	

### 3.3 Running Buffalo Clover

Surveys for running buffalo clover (RBC) included habitat assessments followed by flowering-period presence-absence surveys. Suitable habitat for RBC is typified by mesic woodlands in partial to filtered sunlight, where there is a pattern of moderate periodic disturbance for a prolonged period, such as mowing, trampling, or grazing. It is most often found in regions underlain with limestone or other calcareous bedrock, but not exclusively. It has been reported from a variety of disturbed woodland habitats, including blue-ash savannahs, floodplains, streambanks, shoals (especially where old trails cross or parallel intermittent streams), grazed woodlots, mowed paths (e.g. cemeteries and lawns), old logging roads, jeep trails, skidder trails, mowed wildlife openings within mature forests, and steep, weedy ravines.

#### 3.3.3 Habitat Survey Summary

Habitat assessments were performed on the following dates by the following USFWS-Qualified Running Buffalo Clover Surveyors. A summary of RBC-surveyor qualifications is provided in Enclosure 3.

- Parcel 1 – February 16, 2017 –approximately 37 acres (Doug Whitlatch and Audrey Hanner)
  - The 14-acre portion of the Survey Area is not likely to result in significant adverse impacts to RBC, according to an April 25, 2017 FWS clearance letter (FWS 2017-B-0288).
- Parcel 2 – March 14 and 15, 2017 – approximately 500 acres (Laura Heikkinen)
- Parcel 3 – September 5 to 8, 2017 – approximately 663 acres (Laura Heikkinen)
- Parcel 4 – January 22, 2018 (OBG) and May 22, 23 and 24, 2018 (Jack Stenger) – approximately 335 acres

#### **Parcels 1, 2, and 3:**

Parcel 1-3 was dominated by open land cover of old field growth subjected to full sun and upland mixed deciduous forest occupied by a dense understory of honeysuckle. A description of the dominant forest species and shade regime is provided below. Portions of Parcel 1-3 have been previously disturbed by roadway construction and graveled staging areas. As a result, the majority of Parcel 1-3 does not appear suitable for RBC habitat.

Parcel 1-3 contained occasional areas of low quality potential RBC habitat characterized by filtered sunlight with moderate disturbance from mowing, vehicle travel, and scouring. These potential habitat areas consisted of ATV trails, two-track roads, floodplains, forest openings, and mown corridors through mixed deciduous forest. Several ATV trails crossed intermittent streams. However, the amount of filtered sunlight that reached the ground was limited along both ATV trails and floodplains due to the overreaching canopy. Suitable floodplain habitat was also extremely limited due to the dense honeysuckle growth that was typical along the majority of stream channels within Parcel 1-3. The locations ATV trails and few areas of moderately open floodplain habitat are illustrated on Figure 3.

**Species Summary:** The species present within the areas identified as potential RBC habitat is summarized below, which was dominated by non-native species and indicative of disturbed areas. The vegetative cover along the ATV trails, mown corridors, and forest openings was dominated by tall fescue (*Schedonorus arundinaceus*), Japanese stiltgrass (*Microstegium vimineum*), white clover (*Trifolium repens*), field garlic (*Allium vineale*), chickweed (*Stellaria media*), jewelweed (*Impatiens capensis*), Indian tobacco (*Lobelia inflata*), clearweed (*Pilea pumila*) sweet woodruff (*Galium odoratum*), Indian strawberry (*Duchesnea indica*), spotted ladythumb (*Polygonum persicaria*), white snakeroot (*Ageratina altissima*), and purple deadnettle (*Lamium purpureum*). Typical species within floodplains included wingstem (*Verbesina alternifolia*), Japanese stiltgrass, white clover, hog peanut (*Amphicarpaea bracteata*), deertongue grass (*Dichanthelium clandestinum*), mistflower (*Conoclinium coelestinum*), great lobelia (*Lobelia siphilitica*), aster (*Symphyotrichum* spp.), spotted ladythumb, violet (*Viola* spp.), creeping jenny (*Lysimachia nummularia*), bugleweed (*Lycopus* spp.), white snakeroot, and harvestlice (*Agrimonia parviflora*). Representative photographs of potential habitat are provided in Enclosure 2.

Upland mixed deciduous forest was identified primarily along stream and drainage corridors, although several larger sections of contiguous forest were identified. It is the professional opinion of *Environment & Archaeology, LLC* that the mixed deciduous forest, with the exceptions of the forest openings/trails discussed above, does not support RBC habitat due to the density of the non-native forest understory. Although periodic areas of lesser-density understory was identified, these areas had limited sunlight due to density of the canopy and lacked a disturbance regime. Dominant canopy vegetation included: sugar maple (*Acer saccharum*), red maple (*Acer rubrum*), black cherry (*Prunus serotina*), black walnut (*Juglans nigra*), green ash (*Fraxinus pennsylvanica*), hackberry (*Celtis occidentalis*), black locust (*Robina pseudoacacia*), honey locust (*Gleditsia triacanthos*), red oak (*Quercus rubra*), chinquapin oak (*Quercus muehlenbergii*), American elm (*Ulmus americana*), box elder (*Acer negundo*), American sycamore (*Platanus occidentalis*), and yellow buckeye (*Aesculus flava*). The understory vegetation was relatively dense across much of the forested areas, however, periodic areas of lesser shrub growth and a moderately open understory were identified. The understory was dominated by Amur honeysuckle (*Lonicera maackii*), multiflora rose (*Rosa multiflora*), brambles (*Rubus* spp.), spicebush (*Lindera benzoin*), pawpaw (*Asimina triloba*), and saplings of the canopy species. The herbaceous layer was dominated by white snakeroot, wild rye (*Elymus* spp.), jumpseed (*Polygonum virginianum*), garlic mustard (*Alliaria petiolata*), aster, Japanese honeysuckle (*Lonicera japonica*), clearweed, white avens (*Geum canadense*), and hog peanut. Poison ivy (*Toxicodendron radicans*), Virginia creeper (*Parthenocissus quinquefolia*), and summer grape (*Vitis aestivalis*) were identified within both the understory and vine strata.

#### **Parcel 4:**

Much of Parcel 4 Area does not exhibit suitable habitat for running buffalo clover due to past disturbance of the land. For example, the hayfield (H) areas contain no potential habitat since this habitat is open and this species cannot tolerate full sun exposure. Moreover, these areas have either been plowed in the past or heavily grazed. Although the Hickory Woodland (HW) area presently contains potential habitat where RBC could grow and survive, an examination of the historic aerials from the 1950s shows that this area was comprised of mostly open hayfield at that time – since then, the hickory trees have volunteered and occupied this area within the past 50 to 60 years. Consequently, the HW is not considered suitable RBC habitat.

Potential RBC habitat is present in the Mixed Deciduous Forest (MDF) and Beech Forest (BF) areas. Based on the habitat characteristics observed, both areas represent relatively mature forest and undisturbed soils. The two habitat areas comprise approximately 11.9 acres of the overall Site. The forest was predominately closed-canopied with a heavy sugar maple subcanopy and Amur honeysuckle shrub layer, causing a light regime unfit for RBC. However, there was a light and disturbance regime suitable for RBC along some stream corridors and old roadbeds. The woodland between Stream 1 and Stream 23 appeared to have been selectively logged both recently and historically, so there were old logging roadbeds with filtered light and periodic disturbance. These areas were dominated by Japanese honeysuckle, ground ivy (*Glechoma hederacea*), orchard grass (*Dactylis glomerata*), Japanese stiltgrass, multiflora rose, brambles, white clover, hairy vetch (*Vicia villosa*), poison ivy, and Amur honeysuckle. The dominance of non-native species, especially the abundant Japanese honeysuckle, diminishes the probability that RBC is present. There is also marginal floodplain habitat along the unnamed tributary to Gunpowder Creek. The vegetational community and disturbance regime were similar to the mixed deciduous forest described in Parcel 3.

The Post-agricultural Disturbed Forest held some potential RBC habitat. Based on the old barbed-wire fencing and the presence of sporadic large trees (>2' DBH) the area had a history as an open canopy cattle pasture. Currently, the canopy is dominated by black walnut, black locust, hackberry, American elm, and sassafras (*Sassafras albidum*). Most of the herbaceous layer is shaded out by Amur honeysuckle, but there were walnut glades where honeysuckle was absent and a thick herbaceous layer grew. The herbaceous layer is dominated by chickweed, striped violet (*Viola striata*), Japanese honeysuckle, and vegetative grass and sedge. The area was intersected by a high density of deer trails providing corridors of regular soil disturbance.

Due to the suitable forested areas present, there is moderate probability that RBC could occur within Parcel 4.

#### 3.3.4 RBC Flowering-Period Survey

Flowering-period RBC surveys were performed on the following dates by the following USFWS-Qualified Running Buffalo Clover Surveyors:

- Parcel 2 – May 5, 2017 –approximately 500 acres (Laura Heikkinen)
  - On April 28, 2017, Jennifer Finfera of the USFWS Columbus Field office confirmed that running buffalo clover was in bloom in the region (southern Ohio).
- Parcels 3 and 4 – May 22, 23, 24, and 25, 2018 – approximately 998 acres (Jack Stenger)
- A flowering period survey was not conducted within Parcel 1, as clearance has already been received by USFWS for the parcel, as noted in section 3.3.3.

**Survey Methodology:** The flowering period surveys were conducted within each area identified as potential habitat during the habitat assessments. A pedestrian meander survey was conducted within each potential habitat area. Since the majority of potential suitable habitat within the Survey Area area was linear, a single transect along narrow ATV trails or mown corridors was conducted. Within wider corridors, open woods, or suitable floodplains, meandering was done so the entire suitable area could be investigated.



### 3.3.5 RBC Survey Results

No running buffalo clover was identified. Based on the results of the species-specific survey conducted during the flowering period for approximately 1,512-acres of the Survey Area, the project is not anticipated to affect running buffalo clover. The survey result is supported by the limited, low quality habitat within the Survey Area.

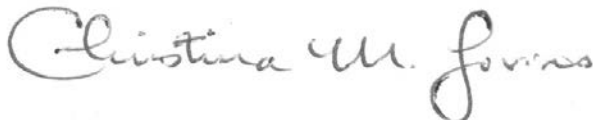
## 4.0 SUMMARY

The Survey Area for the proposed CVG Air Cargo Hub Development Project encompassed approximately 1,095-acres area of open, old field growth and urban/industrial turf; the remaining 417 acres consisted of woodland. It is the professional opinion of *Environment & Archaeology, LLC*, that the Action will have no effect to the listed species due to the following:

- Habitat for the listed mussel may occur within the perennial stream reaches located within the Survey Area, however, low potential is likely along the perennial reach due to impoundments located along the channels and areas of stream channelization. Per the USFWS in February 2018, the mussel species are listed due to the close proximity to the Ohio River;
- Cave habitat is lacking for the gray bat; and
- No running buffalo clover was identified on site during May 5, 2017 and May 22-25, 2018 species-specific surveys.

We appreciate your assistance with the Project and look forward to the USFWS determination of no effect to federally-protected species. Please contact me at (865) 560-1601 for any additional information.

Sincerely,



Christina Lovins  
Vice President

Enclosures (3):

- 1- Location Maps – USGS Topographic Map, Aerial Imagery Maps
- 2- Habitat Photographs
- 3- RBC-Surveyor Qualifications

**Enclosure 1**  
**Location Maps –**

**USGS Topographic Map, Aerial Imagery Map**



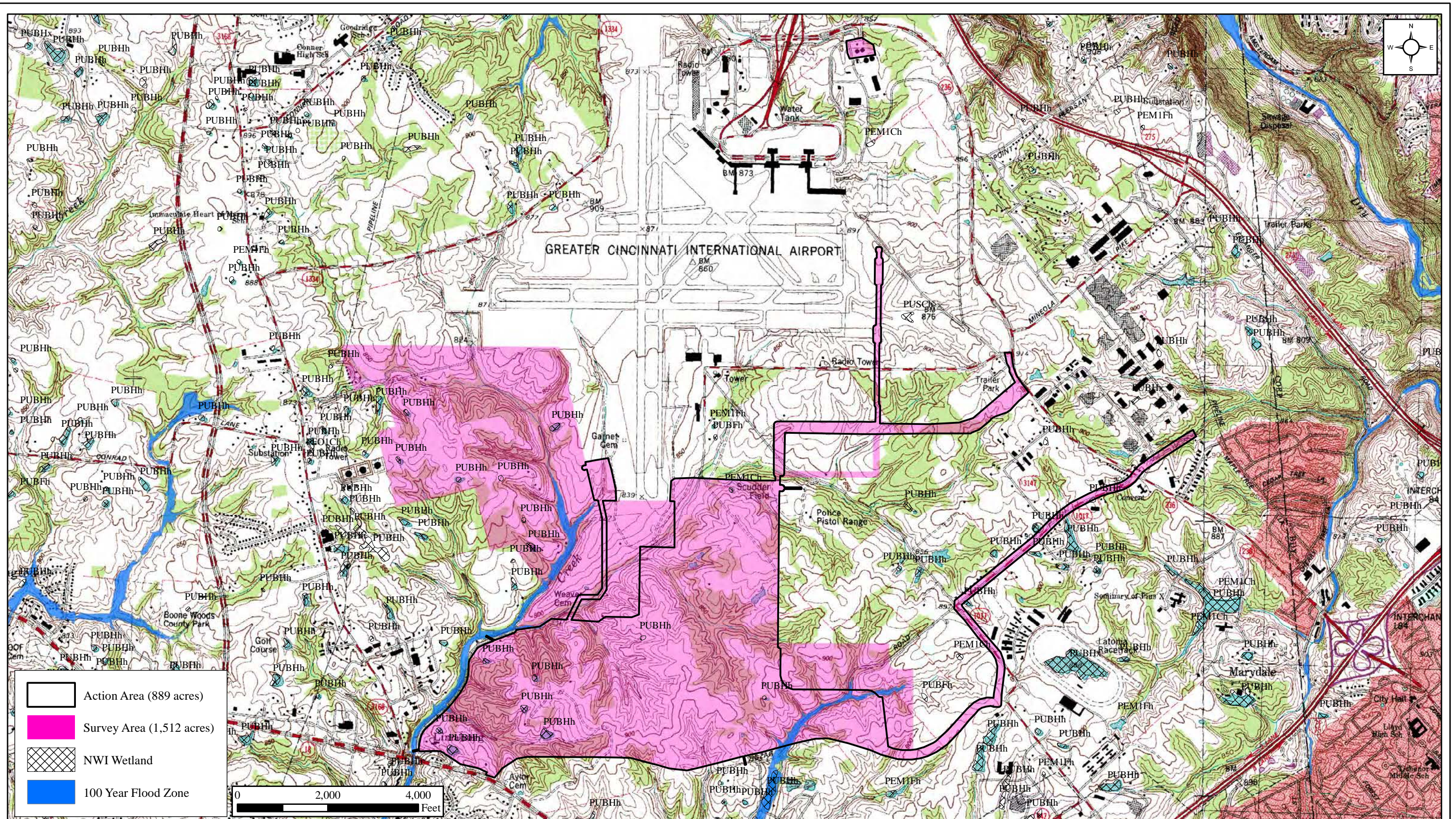


Figure 1

Kenton County Airport Board  
Cincinnati/Northern Kentucky International Airport  
Air Cargo Hub Development  
Boone County, Kentucky

USGS 7.5' Topographic Map with NWI  
and FEMA Overlay  
Burlington, KY Quadrangle  
*Environment & Archaeology*  
LLC



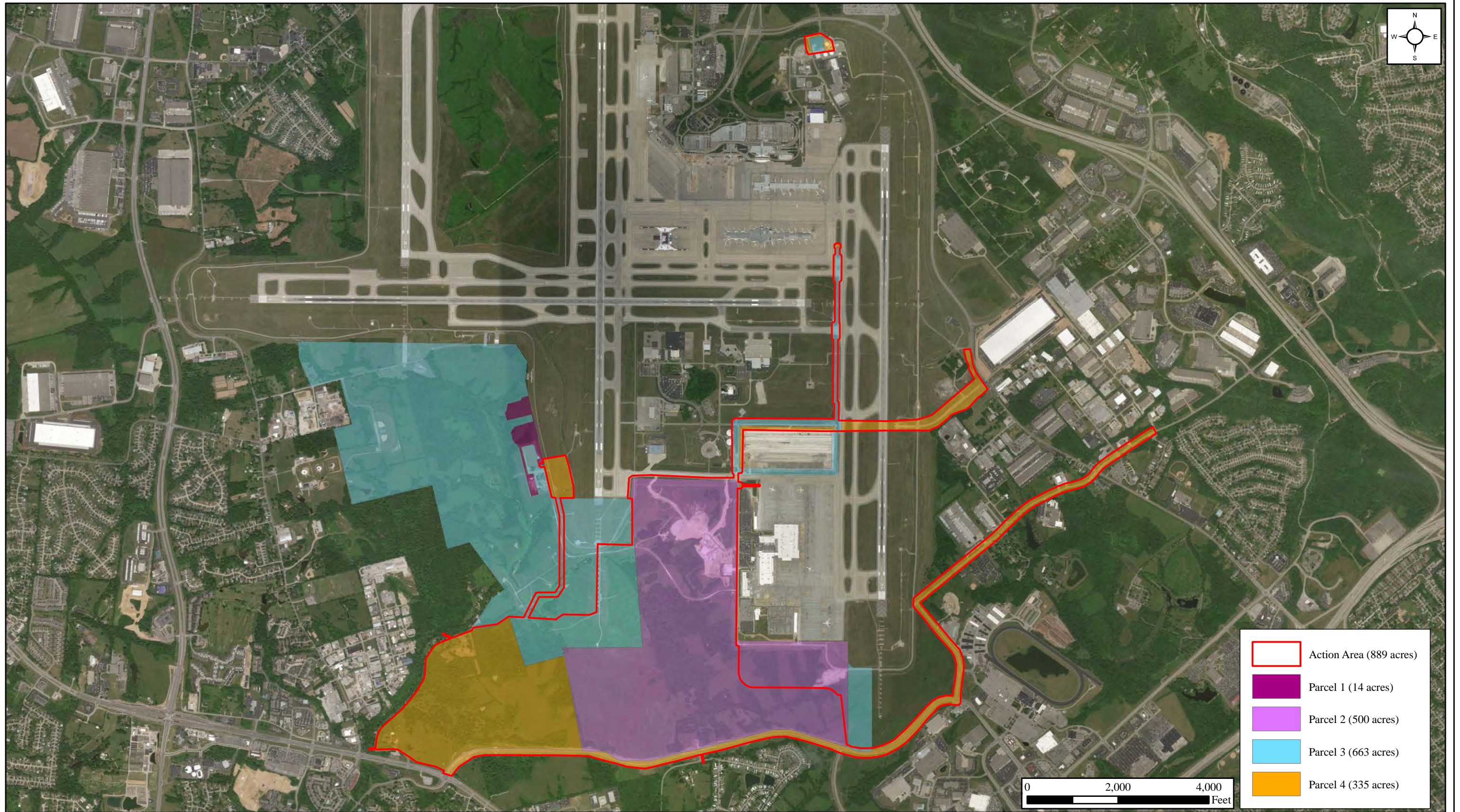


Figure 2

Kenton County Airport Board  
Cincinnati/Northern Kentucky International Airport  
Air Cargo Hub Development  
Boone County, Kentucky

Aerial Map  
Aerial Provided by ESRI Map Services  
*Environment & Archaeology* LLC



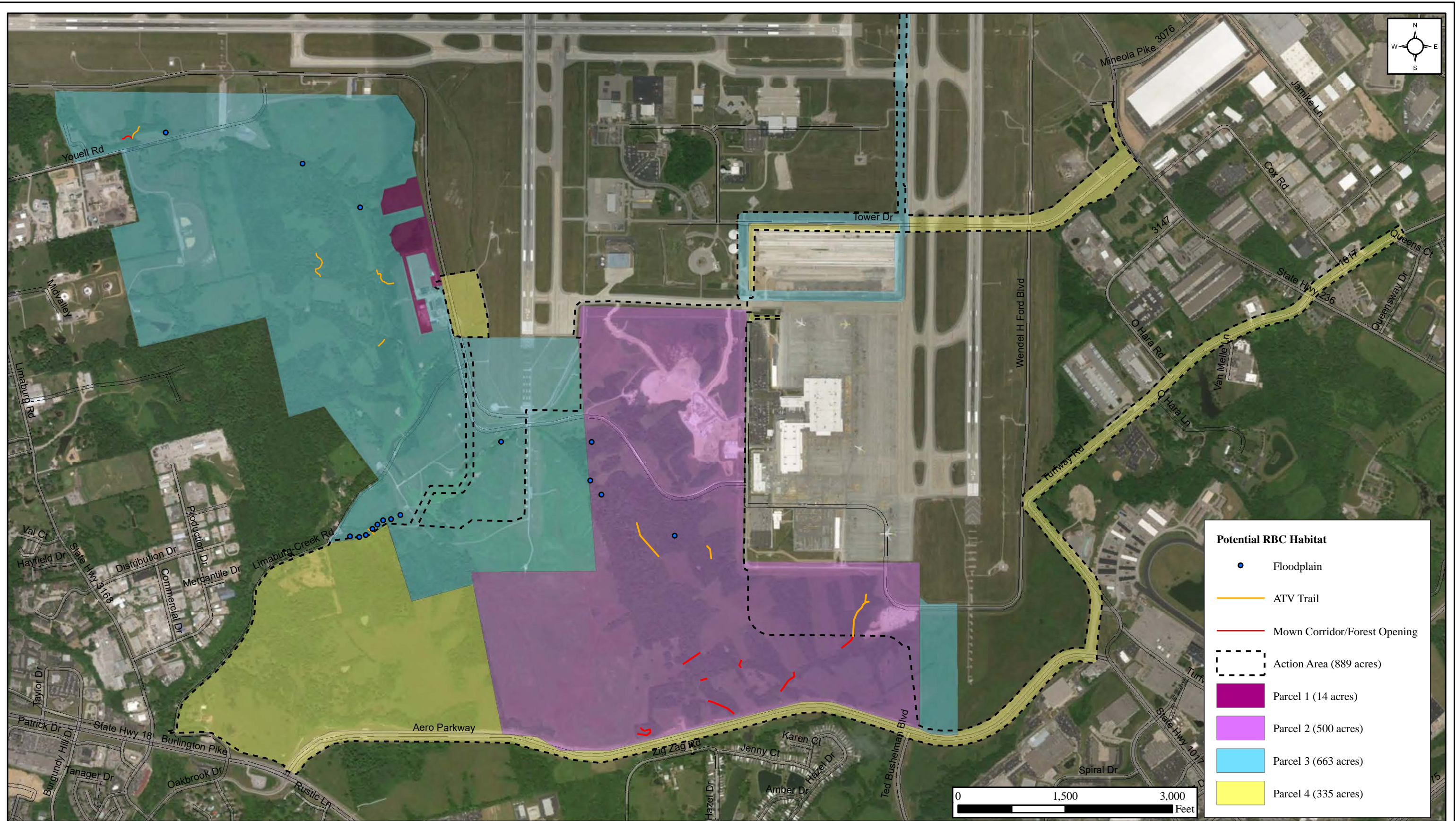


Figure 3

Kenton County Airport Board  
Cincinnati/Northern Kentucky International Airport  
Air Cargo Hub Development  
Boone County, Kentucky





Aerial Map  
Aerial Provided by ESRI Map Services  
*Environment & Archaeology* LLC



## **Enclosure 2**


### **Habitat Photographs**

*Environment & Archaeology, LLC*  
CVG Air Cargo Hub Development Project – Parcel 1

											
Photo:	1	Direction:	SSE	Date:	2/16/2017	Photo:	2	Direction:	SW	Date:	2/16/2017
Comments: Overview of the existing Stormwater Treatment Plant, as seen from its NE corner and facing southward along its easterly fencing.						Comments: Overview of the existing Stormwater Treatment Plant, as seen from its NE corner and facing towards its interior to the southwest.					
											
Photo:	3	Direction:	WSW	Date:	2/16/2017	Photo:	4	Direction:	SSE	Date:	2/16/2017
Comments: Overview of the northern portion of the existing Stormwater Treatment Plant, as seen from its NE corner and along its northern fencing.						Comments: Overview of the open land to the immediate west side of the existing Stormwater Treatment Plant facility.					



*Environment & Archaeology, LLC*  
CVG Air Cargo Hub Development Project – Parcel 1

											
Photo:	5	Direction:	S	Date:	2/16/2017	Photo:	6	Direction:	SW	Date:	2/16/2017
Comments: Overview of the proposed SADF and Stormwater Treatment Plant expansion area, as seen from its NE corner.						Comments: Overview of the proposed SADF and Stormwater Treatment Plant expansion area, as seen from its NE corner.					
											
Photo:	7	Direction:	NNW	Date:	2/16/2017	Photo:	8	Direction:	SSE	Date:	2/16/2017
Comments: General dense scrub-shrub vegetation.						Comments: Typical upland forested vegetation within Parcel .					







*Environment & Archaeology, LLC*  
 CVG Air Cargo Hub Development Project – Parcel 2

											
Photo:	1	Direction:	S	Date:	3/14/2017	Photo:	2	Direction:	E	Date:	3/14/2017
Comments: Representative view of old field vegetation, typical to the non-forested portions of the survey area.						Comments: Representative view of typical mixed deciduous forest conditions with a dense shrub layer.					
											
Photo:	3	Direction:	S	Date:	3/14/2017	Photo:	4	Direction:	NW	Date:	3/14/2017
Comments: Representative view of mixed deciduous forest with a relatively open understory. Forest with open understory was present only in a minor component of the survey area.						Comments: Representative overview of ATV trail within mixed deciduous forest. Filtered light to the ground layer is limited due to adjacent forest.					







*Environment & Archaeology, LLC*  
CVG Air Cargo Hub Development Project – Parcel 2

											
Photo:	5	Direction:	NE	Date:	3/14/2017	Photo:	6	Direction:	W	Date:	3/14/2017
Comments: Representative overview of vegetated two-track road with filtered sunlight though adjacent mixed deciduous forest.						Comments: Representative overview of periodically-mown old field opening within mixed deciduous forest.					
											
Photo:	7	Direction:	S	Date:	3/14/2017	Photo:	8	Direction:	S	Date:	3/15/2017
Comments: Representative overview of periodically-mown old field corridor through mixed deciduous forest.						Comments: Overview of floodplain habitat along Stream 17. Filtered light to the ground layer is limited due to moderately dense forest canopy.					



*Environment & Archaeology, LLC*  
 CVG Air Cargo Hub Development Project – Parcel 3

											
Photo:	1	Direction:	NE	Date:	9/6/2017	Photo:	2	Direction:	N	Date:	9/6/2017
Comments: Overview of 2-acre parcel, comprised of urban/industrial turf.						Comments: Overview of northern portion of 36-acre parcel, comprised primarily of urban/industrial turf.					
											
Photo:	3	Direction:	E	Date:	9/6/2017	Photo:	4	Direction:	S	Date:	9/8/2017
Comments: Overview of southern portion of 36-acre parcel, comprised primarily of urban/industrial turf.						Comments: Overview of 22-acre parcel, comprised of urban/industrial turf, old field, PEM wetland and limited forest cover.					







*Environment & Archaeology, LLC*  
CVG Air Cargo Hub Development Project – Parcel 3

											
Photo:	5	Direction:	W	Date:	9/5/2017	Photo:	6	Direction:	SSW	Date:	9/5/2017
Comments: Representative overview of urban/industrial turf within the 618-acre parcel.						Comments: Representative overview of old field within the 618-acre parcel.					
											
Photo:	7	Direction:	W	Date:	9/6/2017	Photo:	8	Direction:	E	Date:	9/6/2017
Comments: Representative overview of relatively dense mixed deciduous forest within the 618-acre parcel.						Comments: Representative overview of moderately open mixed deciduous forest within the 618-acre parcel.					







*Environment & Archaeology, LLC*  
CVG Air Cargo Hub Development Project – Parcel 3

											
Photo:	9	Direction:	E	Date:	9/6/2017	Photo:	10	Direction:	SE	Date:	9/6/2017
Comments: Representative overview of floodplain habitat, as seen along unnamed tributary to Gunpowder Creek.						Comments: Representative overview of ATV trail within mixed deciduous forest, as seen looking toward/crossing Gunpowder Creek.					
											
Photo:	11	Direction:	NW	Date:	9/6/2017	Photo:	12	Direction:	NW	Date:	9/6/2017
Comments: Representative overview of ATV trail within mixed deciduous forest.						Comments: Representative overview of periodically-mown old field corridor through mixed deciduous forest.					







*Environment & Archaeology, LLC*  
 CVG Air Cargo Hub Development Project – Parcel 3

											
Photo:	13	Direction:	NW	Date:	9/5/2017	Photo:	14	Direction:	NE	Date:	9/5/2017
Comments: Upstream overview of Gunpowder Creek.						Comments: Representative overview of substrate within Gunpowder Creek.					
											
Photo:	15	Direction:	N	Date:	9/5/2017	Photo:	16	Direction:	N	Date:	9/5/2017
Comments: Representative overview of substrate within Gunpowder Creek.						Comments: Representative overview of substrate within Gunpowder Creek.					







*Environment & Archaeology, LLC*  
 CVG Air Cargo Hub Development Project – Parcel 3

											
Photo:	17	Direction:	SW	Date:	9/5/2017	Photo:	18	Direction:	NE	Date:	9/5/2017
Comments: Downstream overview of unnamed tributary to Gunpowder Creek.						Comments: Representative overview of substrate within unnamed tributary to Gunpowder Creek.					
											
Photo:	19	Direction:	NE	Date:	9/5/2017	Photo:	20	Direction:	NE	Date:	9/5/2017
Comments: Representative overview of substrate within unnamed tributary to Gunpowder Creek.						Comments: Representative overview of substrate within unnamed tributary to Gunpowder Creek.					







*Environment & Archaeology, LLC*  
CVG Air Cargo Hub Development Project – Parcel 4


											
Photo:	1	Direction:	W	Date:	5/24/2018	Photo:	2	Direction:	N	Date:	5/24/2018
Comments: Representative overview of potential RBC floodplain habitat. Note filtered light and disturbance from stream scouring.						Comments: Representative overview of potential RBC habitat in Black Walnut glade within post-agricultural disturbed forest.					
											
Photo:	3	Direction:	N	Date:	5/24/2018	Photo:	4	Direction:	N	Date:	5/24/2018
Comments: Representative overview of open Black Walnut canopy and Sugar Maple subcanopy in post-agricultural disturbed forest, taken from same location as Photo 2.						Comments: One of the numerous deer-trails through the post-agricultural disturbed forest.					



*Environment & Archaeology, LLC*  
CVG Air Cargo Hub Development Project – Parcel 4

											
Photo:	5	Direction:	NW	Date:	5/24/2018	Photo:	6	Direction:	S	Date:	5/24/2018
Comments: Representative overview of periodically mown corridor within relatively dense mixed deciduous forest.						Comments: Representative overview of ATV trail crossing perennial stream within mixed deciduous forest.					
											
Photo:	7	Direction:	n/a	Date:	5/24/2018	Photo:	8	Direction:	n/a	Date:	5/24/2018
Comments: Representative photo of red clover ( <i>Trifolium pratense</i> ).						Comments: Representative photo of white clover ( <i>Trifolium repens</i> ).					

*Environment & Archaeology, LLC*  
CVG Air Cargo Hub Development Project – Parcel 4

					
Photo:	9	Direction:	n/a	Date:	5/24/2018
Comments: Representative photo of alsike clover ( <i>Trifolium hybridum</i> ).					

**Enclosure 3**

**RBC Surveyor Qualifications**



### **RBC Surveyor Qualifications**

Laura (Kangas) Heikkinen has eight (8) years of professional botany experience and has been a USFWS-qualified RBC surveyor since May 17, 2016. Ms. Heikkinen successfully identified three (3) populations of RBC in Hamilton County, Ohio within a 488-acre survey area in May, 2016. The USFWS Ohio Field Office, represented by Ms. Jennifer Finfera, visited the one (1) of the locations on May 17, 2016 and verified the population. Ms. Heikkinen has also conducted five (5) rare, threatened, and endangered species surveys in Pennsylvania since 2014, in which the target species was identified in four (4) of the five (5) surveys.

Jack Stenger has five (5) years of professional botany experience and has been a USFWS-qualified RBC surveyor since May 10, 2018. Mr. Stenger has a background in plant identification and taught field botany labs at University of Cincinnati for two (2) years. Mr. Stenger has seen and studied four (4) representative populations of RBC in Hamilton County, Ohio and Boone County, Kentucky.



# Species Information

## State Threatened, Endangered, and Special Concern Species observations for selected counties

Linked life history provided courtesy of NatureServe Explorer .

**Records may include both recent and historical observations.**

[US Status Definitions](#)   [Kentucky Status Definitions](#)

List State Threatened, Endangered, and Special Concern Species observations in 1 selected county.

Selected county is: Boone.

Scientific Name and Life History	Common Name and Pictures	Class	County	US Status	KY Status	WAP	Reference
<i>Accipiter striatus</i>	Sharp-shinned Hawk	Aves	Boone	N	S	Yes	Reference
<i>Actitis macularius</i>	Spotted Sandpiper	Aves	Boone	N	E	Yes	Reference
<i>Ammodramus henslowii</i>	Henslow's Sparrow	Aves	Boone	N	S	Yes	Reference
<i>Anas clypeata</i>	Northern Shoveler	Aves	Boone	N	E		Reference
<i>Anas discors</i>	Blue-winged Teal	Aves	Boone	N	T		Reference
<i>Ardea alba</i>	Great Egret	Aves	Boone	N	T	Yes	Reference
<i>Asio flammeus</i>	Short-eared Owl	Aves	Boone	N	E	Yes	Reference
<i>Atractosteus spatula</i>	Alligator Gar	Actinopterygii	Boone	N	E	Yes	Reference
<i>Bartramia longicauda</i>	Upland Sandpiper	Aves	Boone	N	H	Yes	Reference
<i>Bubulcus ibis</i>	Cattle Egret	Aves	Boone	N	S		Reference
<i>Calephelis borealis</i>	Northern Metalmark	Insecta	Boone	N	T		Reference
<i>Cardellina canadensis</i>	Canada Warbler	Aves	Boone	N	S	Yes	Reference
<i>Certhia americana</i>	Brown Creeper	Aves	Boone	N	E	Yes	Reference
<i>Circus cyaneus</i>	Northern Harrier	Aves	Boone	N	T	Yes	Reference

<i>Cistothorus platensis</i>	Sedge Wren	Aves	Boone	N	S	Yes	Reference
<i>Corvus ossifragus</i>	Fish Crow	Aves	Boone	N	S		Reference
<i>Cryptobranchus alleganiensis alleganiensis</i>	Eastern Hellbender	Amphibia	Boone	N	E	Yes	Reference
<i>Cumberlandia monodonta</i>	Spectaclecase	Bivalvia	Boone	E	E	Yes	Reference
<i>Dolichonyx oryzivorus</i>	Bobolink	Aves	Boone	N	S	Yes	Reference
<i>Egretta caerulea</i>	Little Blue Heron	Aves	Boone	N	E	Yes	Reference
<i>Esox niger</i>	Chain Pickerel	Actinopterygii	Boone	N	S		Reference
<i>Falco peregrinus</i>	Peregrine Falcon	Aves	Boone	N	E	Yes	Reference
<i>Fulica americana</i>	American Coot	Aves	Boone	N	E		Reference
<i>Gallinula galeata</i>	Common Gallinule	Aves	Boone	N	T	Yes	Reference
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Aves	Boone	N	T	Yes	Reference
<i>Ictiobus niger</i>	Black Buffalo	Actinopterygii	Boone	N	S	Yes	Reference
<i>Junco hyemalis</i>	Dark-eyed Junco	Aves	Boone	N	S		Reference
<i>Lampsilis abrupta</i>	Pink Mucket	Bivalvia	Boone	E	E	Yes	Reference
<i>Lampsilis ovata</i>	Pocketbook	Bivalvia	Boone	N	E	Yes	Reference
<i>Leptoxis praerosa</i>	Onyx Rocksnail	Gastropoda	Boone	N	S		Reference
<i>Lioplax sulculosa</i>	Furrowed Lioplax	Gastropoda	Boone	N	S		Reference
<i>Lithasia verrucosa</i>	Varicose Rocksnail	Gastropoda	Boone	N	S		Reference
<i>Lophodytes cucullatus</i>	Hooded Merganser	Aves	Boone	N	T	Yes	Reference
<i>Lota lota</i>	Burbot	Actinopterygii	Boone	N	S	Yes	Reference
<i>Myotis sodalis</i>	Indiana Bat	Mammalia	Boone	E	E	Yes	Reference
<i>Notropis hudsonius</i>	Spottail Shiner	Actinopterygii	Boone	N	S		Reference
<i>Nycticorax nycticorax</i>	Black-crowned Night-heron	Aves	Boone	N	T	Yes	Reference

<i>Obovaria retusa</i>	Ring Pink	Bivalvia	Boone	E	E	Yes	Reference
<i>Passerculus sandwichensis</i>	Savannah Sparrow	Aves	Boone	N	S	Yes	Reference
<i>Phalacrocorax auritus</i>	Double-crested Cormorant	Aves	Boone	N	T		Reference
<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	Aves	Boone	N	S	Yes	Reference
<i>Plethobasus cyphus</i>	Sheepnose	Bivalvia	Boone	E	E	Yes	Reference
<i>Plethodon cinereus</i>	Redback Salamander	Amphibia	Boone	N	S	Yes	Reference
<i>Pleurobema rubrum</i>	Pyramid Pigtoe	Bivalvia	Boone	N	E	Yes	Reference
<i>Podilymbus podiceps</i>	Pied-billed Grebe	Aves	Boone	N	E	Yes	Reference
<i>Poocetes gramineus</i>	Vesper Sparrow	Aves	Boone	N	E	Yes	Reference
<i>Rana pipiens</i>	Northern Leopard Frog	Amphibia	Boone	N	S	Yes	Reference
<i>Riparia riparia</i>	Bank Swallow	Aves	Boone	N	S	Yes	Reference
<i>Sitta canadensis</i>	Red-breasted Nuthatch	Aves	Boone	N	E	Yes	Reference
<i>Tyto alba</i>	Barn Owl	Aves	Boone	N	S	Yes	Reference
<i>Vermivora chrysoptera</i>	Golden-winged Warbler	Aves	Boone	N	T	Yes	Reference
<i>Vireo bellii</i>	Bell's Vireo	Aves	Boone	N	S	Yes	Reference

52 species are listed



## Appendix D

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# APPENDIX D

## HAZARDOUS MATERIALS

This appendix contains the Executive Summaries for the Phase I Environmental Site Assessments for the Detailed Study Area. The full document was not included due to its large size. However, upon request the full document can be provided.

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# PHASE I ENVIRONMENTAL SITE ASSESSMENT

**Project Janus – Southern Portion**

**Aero Parkway**

**Florence, Kentucky 41042**

**Submitted To:** Mark C. Griffin

Transactions, NA Operations Real Estate

399 Fairview Ave North

Seattle, WA 98109

**Submitted By:** Golder Associates Inc.

1335 Dublin Road, Suite 126-D

Columbus, Ohio 43215 USA

**Distribution:** Amazon

**October 20, 2017**

**Project No. 1671158**

**A world of  
capabilities  
delivered locally**







October 20, 2017

Project No. 1671158

Mark C. Griffin  
Transactions, NA Operations Real Estate  
399 Fairview Ave North  
Seattle, WA 98109

**RE: REPORT ON THE PHASE I ENVIRONMENTAL SITE ASSESSMENT  
PROJECT JANUS – SOUTHERN PORTION (SUBJECT PROPERTY)  
FLORENCE, KENTUCKY**

Dear Mr. Ludtka

Golder Associates (Golder) is pleased to present to Amazon this Phase I Environmental Site Assessment Report for the Subject Property. Information presented in this Report is subject to the general limitations presented in the Report and Golder's Proposal dated February 22, 2017.

Golder appreciates this opportunity to assist you with your environmental needs. If you have any questions or comments regarding the information presented in this report, please call our office.

Sincerely,

**GOLDER ASSOCIATES INC.**

A handwritten signature in blue ink that reads 'Jamie E. Bailey'.

Jamie E. Bailey  
Project Geologist

A handwritten signature in blue ink that reads 'David P. Regalbuto'.

David P. Regalbuto  
Associate & Hydrogeologist

JEB/DPR

cc:





## Summary

DLR Group, on behalf of Amazon (the User), retained Golder Associates Inc. (Golder) to perform a Phase I Environmental Site Assessment (ESA) of the property located on Aero Parkway in Florence, Kentucky (the Subject Property). The purpose of this Phase I ESA is to identify recognized environmental conditions (RECs) in connection with the Subject Property, to the extent feasible, pursuant to the processes prescribed in the ASTM Practice E 1527-13 entitled “Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process” (ASTM Standard), and the EPA Rule entitled, “Standards and Practices for All Appropriate Inquiries; Final Rule” (AAI Rule), 40 CFR Part 312, the Golder Proposal dated February 22, 2017 (the Proposal), and Golder’s professional judgment.

This Summary is to be used only in conjunction with the attached Project Janus – Southern Portion, dated June 30, 2017 (the Report). All definitions used in this Summary have the same meanings as in the Report, and the use of this Summary is subject to the limitations and conditions contained in the Report. The Report shall govern in the event of any inconsistency between this Summary and the Report.

The Subject Property is a portion of the Cincinnati/Northern Kentucky International Airport (CVG) and is situated in a mixed-use setting including agricultural, wooded, vacant, light industrial, commercial and residential properties approximately 3.15 miles due west of the intersection of I-275 and I-75 in the greater Cincinnati area.

The Subject Property is currently undeveloped and consists of grass fields and dense woods. Ms. Alison Chadwell, Senior Project Manager/Engineer for the CVG indicated that the Subject Property is utilized for recreational purposes by CVG personnel.

The Subject Property has one gated access road that enters into the north-central portion from the east off of Wendell H. Ford Boulevard. Also located on the northern portion is a ‘mobile’ cement plant that is utilized by DHL and the CVG for improvement and maintenance purposes. It also appears that a small ‘shed’ type building that houses a back-up generator for lights associated with the runway protection zone (RPZ) south of runway 18C-36C is also located in the western portion of the Subject Property.

Golder did not identify recognized environmental conditions (RECs) at the Subject Property.

Golder did not identify Conditional RECs (CRECs) at the Subject Property.

Golder identified the following Historical RECs (HRECs) at the Subject Property:



- A stationary firing range and a skeet range were historically located on the Subject Property where tractor trailers are currently staged along Wendell H. Ford Boulevard in the northeastern portion. The associated closure report states that soils were removed prior to redevelopment by removal, treatment, and disposal of soil containing lead shot and slugs, and by burial under as much as two feet of fill soil. These soils now partially underlay the adjacent DHL Facility. At the Kentucky Department for Environmental Protection (KDEP) request, soil from range areas that were excavated but not subsequently covered with fill or pavement were sampled; results for lead content ranged in concentration from 18.8 to 32.1 mg/kg, which is less than residential preliminary remediation goals (PRGs) for lead and therefore received a no further action (NFA) status. It is Golder's opinion that the Former Firing Ranges are considered a HREC and therefore do not require additional investigation at this time.
- A former fire training pit was historically located adjacent to the west of the current fire training pit near Gunpowder Creek prior to 1988. Information received from the KDEP via FOIA request indicated that the Kenton County Airport Board (KCAB) was required to submit a closure plan for the solid waste management units (SWMU) identified as the burn pit, adjacent drum storage area and associated UST, and the former surface impoundment areas historically located at the fire pit by December 31, 1988.

A case status summary by KDEP personnel, dated December 1, 2004 references the SWMUs and discusses remedial actions that are occurring at the Subject Property but is not clear as to which SWMUs are being addressed.

A report provided by the CVG titled *Closure Report, Former Fire Training Area*, written by Dames & Moore and dated June 17, 1999, details the work performed to obtain clean closure for the Former Burn Pit and North Drum Storage Area. The conclusions state that the Former Burn Pit and North Drum Storage Area were excavated and contaminated soil was removed prior to commencement of the compliance monitoring period. The chemicals-of-concern (COC) that were detected in the site groundwater were either well below the approved site-specific standards or are equivalent to background (upgradient) conditions for both shallow and deep wells. The authors provided evidence for interpreting that benzene detected in groundwater at MW-4R comes not from site contamination but from natural conditions in the deep bedrock.

Post-closure care of the site was also implemented in addition to a paved roadway (Tower Drive) being installed over the site. Post-closure care includes the following:

- Maintenance of signage delimiting the site and stipulation usage restrictions;
- Recording of deed notification restricting usage of the site; and,
- Decommissioning of the monitoring well system used to establish closure.

It is Golder's opinion that the Former Burn Pit and North Drum Storage Area are considered a HREC and therefore do not require additional investigation at this time.

Golder identified the following de minimis conditions at the Subject Property:

- Aircraft de-icing fluids, consisting primarily of ethylene and propylene glycols and other additives, are utilized for aircraft de-icing operations. The glycols are CERCLA hazardous substances. Golder has reviewed several historical site assessments and plans prepared by the KCAB and reviewed by KDEP. KCAB currently maintains a comprehensive glycol spill containment and control plan, however, it is possible that surface waters on the Subject Property may have been historically impacted by releases of glycol.



Because KDEP has reviewed prior investigations conducted by the KCAB and has not required further assessment of surface water on the Subject Property, impacts on the Subject Property that exceed human health and environmental criteria are not expected. The possible releases of glycol are considered de-minimis conditions.

- Golder also observed cloudy surface water conditions on surface water flowing through a drainage ditch just west of Wendell H. Ford Boulevard. Golder notified CVG personnel, who are investigating and will provide additional information. This impact may be caused by a variety of conditions, and at present is considered a de-minimis condition.



## EXECUTIVE SUMMARY

In accordance with an agreement with The Kleingers Group (Kleingers), dated January 25, 2017, O'Brien & Gere Engineers, Inc. (OBG) was retained by Kleingers to conduct a Phase I Environmental Site Assessment (ESA) for the property located along Limaburg Creek Road and Aero Parkway, Florence, Boone County, Kentucky (subject property). The subject property consists of one full parcel and three partial parcels totaling approximately 200 acres. One of the parcels is fully within the subject property limits and two of the partial parcels, both of which consist of their northern portions north of Aero Parkway, are owned by KY18 Acres LLC, a limited liability corporation represented by Paul Vesper. The fourth parcel, which consists of approximately 20 acres in the northern portion of the subject property south of Limaburg Creek Road, is owned by Lisa Vittitoe. A small approximately 1-acre portion of this parcel is located to the north of Limaburg Creek Road and is not considered part of the subject property. OBG understands that the anticipated future use of the property will be for light industrial and/or warehousing development.

The Phase I ESA was performed to identify recognized environmental conditions (RECs) associated with the subject property as a result of past and/or present site activities and current site conditions. As such, OBG's work in performing this Phase I ESA has been conducted in accordance with the American Society for Testing and Materials (ASTM) "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, designation E1527-13" (ASTM E1527-13). Any exceptions to, or deletions from, this practice are described in this report.

There were no historical RECs (HRECs) or controlled RECs (CRECs) identified in connection with the subject property.

This Phase I ESA is valid for 180 days from the date of the earliest interview, search for recorded environmental lien, review of federal, tribal, state, and local environmental records, site reconnaissance, or environmental professional declaration, whichever is first. An update to the Phase I ESA performed within 180 days of the above-referenced tasks will extend the validity of the report for one year from the date of the earliest interview, search for recorded environmental lien, review of federal, tribal, state, and local environmental records, site reconnaissance, or environmental professional declaration, whichever occurs first.

## Appendix E

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# APPENDIX E

## SECTION 106 CONSULTATION

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U.S. Department  
of Transportation

**Federal Aviation  
Administration**

Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

Principal Chief Richard Sneed  
Cherokee Agency  
88 Council House Loop Road  
Cherokee, NC 28719

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport - Request for Participation**

Dear Principal Chief Sneed:

This letter is notification that the Kenton County Airport Board (KCAB) is proposing to construct an air cargo hub at the Cincinnati/Northern Kentucky International Airport (CVG). This project has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA). The Federal Aviation Administration (FAA) has initiated preparation of an Environmental Assessment to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.

The Area of Potential Effects (APE), as shown in **Exhibit 1, Area of Potential Effects**, is the area in which the proposed project may cause alterations in the character or use of historic resources. At this time, cultural resource investigations are underway for both aboveground and archaeological resources.

FAA is identifying organizations with an interest in this project and its potential to affect historic properties. This letter is intended to initiate Section 106 consultation, solicit any initial comments you may have on the proposed undertaking, and to find out whether you wish to become a consulting party for this project. Consulting parties have certain rights and obligations under the NHPA and its implementing regulations at 36 CFR Part 800. By becoming a consulting party, you will be informed of steps in the Section 106 process. Section 106 compliance is a requirement of the NEPA for which an Environmental Assessment is being prepared.

As part of the process, the FAA identified your organization as a potential local interested party that may wish to participate as a consulting party in the Section 106 process. The purpose of this letter is to determine if you wish to participate in that regard. In order to become a consulting party, you must respond by August 15, 2018 to request consulting party status. If you are requesting consulting party status, we request that your organization nominate one representative and an alternate to participate on behalf of the group. Individuals may also participate in the Section 106 process as members of the public.

If you would like to request consulting party status on this project or have any questions, please contact Kristi Ashley of my staff by email at [kristi.ashley@faa.gov](mailto:kristi.ashley@faa.gov).

Sincerely,



Tommy L. Dupree  
Acting Manager, Memphis Airports District Office

Enclosures

cc: Debbie Conrad, Kenton County Airport Board, Jennifer Ryall, Kentucky Heritage Council, Chris Gunn, Kentucky Heritage Council



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

Principal Chief Bill John Baker  
Cherokee Nation  
P.O. Box 948  
Tahlequah, OK 74465

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport - Request for Participation**

Dear Principal Chief Baker:

This letter is notification that the Kenton County Airport Board (KCAB) is proposing to construct an air cargo hub at the Cincinnati/Northern Kentucky International Airport (CVG). This project has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA). The Federal Aviation Administration (FAA) has initiated preparation of an Environmental Assessment to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.

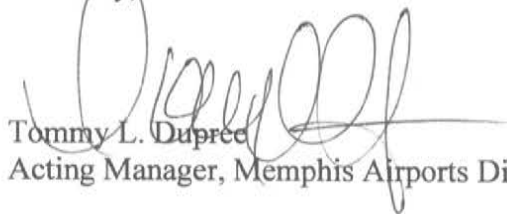
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Sincerely,



Tommy L. Dupree  
Acting Manager, Memphis Airports District Office

Enclosures

cc: Debbie Conrad, Kenton County Airport Board, Jennifer Ryall, Kentucky Heritage Council, Chris Gunn, Kentucky Heritage Council



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

Governor Bill Anoatubby  
Chickasaw Nation  
520 E. Arlington  
Ada, OK 74820

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport - Request for Participation**

Dear Governor Anoatubby:

This letter is notification that the Kenton County Airport Board (KCAB) is proposing to construct an air cargo hub at the Cincinnati/Northern Kentucky International Airport (CVG). This project has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA). The Federal Aviation Administration (FAA) has initiated preparation of an Environmental Assessment to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.

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Sincerely,



Tommy L. Dupree  
Acting Manager, Memphis Airports District Office

Enclosures

cc: Debbie Conrad, Kenton County Airport Board, Jennifer Ryall, Kentucky Heritage Council, Chris Gunn, Kentucky Heritage Council



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

Dr. David Pollack  
Manager, Kentucky Native American  
Heritage Commission  
1020A Export St.  
Lexington, KY 40504

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport - Request for Participation**

Dear Dr. Pollack:

This letter is notification that the Kenton County Airport Board (KCAB) is proposing to construct an air cargo hub at the Cincinnati/Northern Kentucky International Airport (CVG). This project has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA). The Federal Aviation Administration (FAA) has initiated preparation of an Environmental Assessment to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.


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If you would like to request consulting party status on this project or have any questions, please contact Kristi Ashley of my staff by email at [kristi.ashley@faa.gov](mailto:kristi.ashley@faa.gov).

Sincerely,



Tommy L. Dupree  
Acting Manager, Memphis Airports District Office

Enclosures

cc: Debbie Conrad, Kenton County Airport Board, Jennifer Ryall, Kentucky Heritage Council, Chris Gunn, Kentucky Heritage Council



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

Tribal Administrator Jodi Hayes  
Shawnee Tribe  
P.O. Box 189 29 S. Highway 69A  
Miami, OK 74355

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport - Request for Participation**

Dear Tribal Administrator Hayes:

This letter is notification that the Kenton County Airport Board (KCAB) is proposing to construct an air cargo hub at the Cincinnati/Northern Kentucky International Airport (CVG). This project has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA). The Federal Aviation Administration (FAA) has initiated preparation of an Environmental Assessment to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.

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Sincerely,



Tommy L. Dupree  
Acting Manager, Memphis Airports District Office

Enclosures

cc: Debbie Conrad, Kenton County Airport Board, Jennifer Ryall, Kentucky Heritage Council, Chris Gunn, Kentucky Heritage Council





U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

Everett Bandy, THPO  
Quapaw Tribe of Indians  
5681 S. 630 Road  
Quapaw, OK 74363

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport - Request for Participation**

Dear THPO Bandy:

This letter is notification that the Kenton County Airport Board (KCAB) is proposing to construct an air cargo hub at the Cincinnati/Northern Kentucky International Airport (CVG). This project has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA). The Federal Aviation Administration (FAA) has initiated preparation of an Environmental Assessment to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.

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Sincerely,



Tommy L. Dupree  
Acting Manager, Memphis Airports District Office

Enclosures

cc: Debbie Conrad, Kenton County Airport Board, Jennifer Ryall, Kentucky Heritage Council, Chris Gunn, Kentucky Heritage Council



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

Principal Chief Joe Bunch  
United Keetoowah Band  
of Cherokee Indians in Oklahoma  
P.O. Box 746  
Tahlequah, OK 74465

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport - Request for Participation**

Dear Principal Chief Bunch:

This letter is notification that the Kenton County Airport Board (KCAB) is proposing to construct an air cargo hub at the Cincinnati/Northern Kentucky International Airport (CVG). This project has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA). The Federal Aviation Administration (FAA) has initiated preparation of an Environmental Assessment to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.


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Sincerely,



Tommy L. Dupree  
Acting Manager, Memphis Airports District Office

Enclosures

cc: Debbie Conrad, Kenton County Airport Board, Jennifer Ryall, Kentucky Heritage Council, Chris Gunn, Kentucky Heritage Council



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

President William Quackenbush  
Wisconsin Inter-Tribal Repatriation Committee  
P.O. Box 67  
Lac Du Flambeau, WI 54538

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport - Request for Participation**

Dear President Quackenbush:

This letter is notification that the Kenton County Airport Board (KCAB) is proposing to construct an air cargo hub at the Cincinnati/Northern Kentucky International Airport (CVG). This project has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA). The Federal Aviation Administration (FAA) has initiated preparation of an Environmental Assessment to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.

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As part of the process, the FAA identified your organization as a potential local interested party that may wish to participate as a consulting party in the Section 106 process. The purpose of this letter is to determine if you wish to participate in that regard. In order to become a consulting party, you must respond by August 15, 2018 to request consulting party status. If you are requesting consulting party status, we request that your organization nominate one representative and an alternate to participate on behalf of the group. Individuals may also participate in the Section 106 process as members of the public.

If you would like to request consulting party status on this project or have any questions, please contact Kristi Ashley of my staff by email at [kristi.ashley@faa.gov](mailto:kristi.ashley@faa.gov).

Sincerely,



Tommy L. Dupree  
Acting Manager, Memphis Airports District Office

Enclosures

cc: Debbie Conrad, Kenton County Airport Board, Jennifer Ryall, Kentucky Heritage Council, Chris Gunn, Kentucky Heritage Council



U.S. Department  
of Transportation

**Federal Aviation  
Administration**

Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

Tribal Chairman Floyd Azure  
Fort Peck Assinoboine and Sioux Tribes  
P.O. Box 1027 501 Medicine Bear Rd.  
Poplar, MT 59255

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport - Request for Participation**

Dear Tribal Chairman Azure:

This letter is notification that the Kenton County Airport Board (KCAB) is proposing to construct an air cargo hub at the Cincinnati/Northern Kentucky International Airport (CVG). This project has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA). The Federal Aviation Administration (FAA) has initiated preparation of an Environmental Assessment to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.

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Sincerely,



Tommy L. Dupree  
Acting Manager, Memphis Airports District Office

Enclosures

cc: Debbie Conrad, Kenton County Airport Board, Jennifer Ryall, Kentucky Heritage Council, Chris Gunn, Kentucky Heritage Council



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

President Robert Webster  
Kenton County Historical Society  
P.O. Box 641  
Covington, KY 41012

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport - Request for Participation**

Dear President Webster:

This letter is notification that the Kenton County Airport Board (KCAB) is proposing to construct an air cargo hub at the Cincinnati/Northern Kentucky International Airport (CVG). This project has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA). The Federal Aviation Administration (FAA) has initiated preparation of an Environmental Assessment to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.

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Sincerely,



Tommy L. Dupree  
Acting Manager, Memphis Airports District Office

Enclosures

cc: Debbie Conrad, Kenton County Airport Board, Jennifer Ryall, Kentucky Heritage Council, Chris Gunn, Kentucky Heritage Council





U.S. Department  
of Transportation

**Federal Aviation  
Administration**

Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

President Betty Roszmann  
Erlanger Historical Society  
3319 Crescent Avenue  
Erlanger, KY 41018

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport - Request for Participation**

Dear President Roszmann:

This letter is notification that the Kenton County Airport Board (KCAB) is proposing to construct an air cargo hub at the Cincinnati/Northern Kentucky International Airport (CVG). This project has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA). The Federal Aviation Administration (FAA) has initiated preparation of an Environmental Assessment to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.

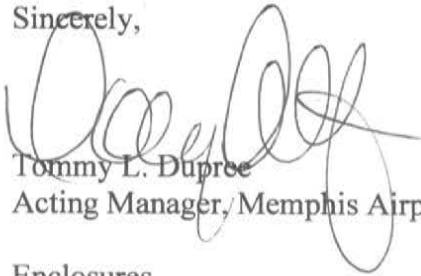
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Acting Manager, Memphis Airports District Office

Enclosures

cc: Debbie Conrad, Kenton County Airport Board, Jennifer Ryall, Kentucky Heritage Council, Chris Gunn, Kentucky Heritage Council



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

President Steve Battistone  
Campbell County Historical & Genealogical Society  
8352 E. Main Street  
Alexandria, KY 41001

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport - Request for Participation**

Dear President Battistone:

This letter is notification that the Kenton County Airport Board (KCAB) is proposing to construct an air cargo hub at the Cincinnati/Northern Kentucky International Airport (CVG). This project has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA). The Federal Aviation Administration (FAA) has initiated preparation of an Environmental Assessment to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.

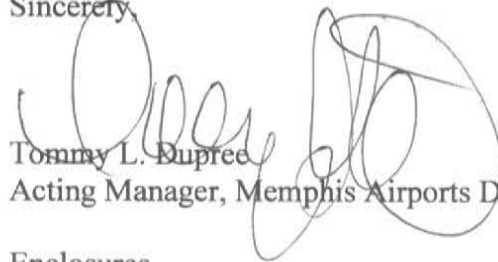
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Tommy L. Dupree  
Acting Manager, Memphis Airports District Office

Enclosures

cc: Debbie Conrad, Kenton County Airport Board, Jennifer Ryall, Kentucky Heritage Council, Chris Gunn, Kentucky Heritage Council



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

President Emeritus Ken Reis  
Campbell County Historical & Genealogical Society  
8352 E. Main Street  
Alexandria, KY 41001

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport - Request for Participation**

Dear President Emeritus Reis:

This letter is notification that the Kenton County Airport Board (KCAB) is proposing to construct an air cargo hub at the Cincinnati/Northern Kentucky International Airport (CVG). This project has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA). The Federal Aviation Administration (FAA) has initiated preparation of an Environmental Assessment to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.

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Acting Manager, Memphis Airports District Office

Enclosures

cc: Debbie Conrad, Kenton County Airport Board, Jennifer Ryall, Kentucky Heritage Council, Chris Gunn, Kentucky Heritage Council



U.S. Department  
of Transportation

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Administration**

Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

Rural/Open Space Planner Matt Becher  
Boone County Preservation Review Board  
2995 Washington Street  
Burlington, KY 41005

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport - Request for Participation**

Dear Rural/Open Space Planner Becher:

This letter is notification that the Kenton County Airport Board (KCAB) is proposing to construct an air cargo hub at the Cincinnati/Northern Kentucky International Airport (CVG). This project has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA). The Federal Aviation Administration (FAA) has initiated preparation of an Environmental Assessment to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.

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Tommy L. Dupree  
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Enclosures

cc: Debbie Conrad, Kenton County Airport Board, Jennifer Ryall, Kentucky Heritage Council, Chris Gunn, Kentucky Heritage Council



U.S. Department  
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**Federal Aviation  
Administration**

Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

President Betsy Conrad  
Boone County Historical Society  
P.O. Box 23  
Florence, KY 41022

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport - Request for Participation**

Dear President Conrad:

This letter is notification that the Kenton County Airport Board (KCAB) is proposing to construct an air cargo hub at the Cincinnati/Northern Kentucky International Airport (CVG). This project has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA). The Federal Aviation Administration (FAA) has initiated preparation of an Environmental Assessment to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.

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Tommy L. Dupree  
Acting Manager, Memphis Airports District Office

Enclosures

cc: Debbie Conrad, Kenton County Airport Board, Jennifer Ryall, Kentucky Heritage Council, Chris Gunn, Kentucky Heritage Council





U.S. Department  
of Transportation  
**Federal Aviation  
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Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

Archives and Records Commissioner Terry Manuel  
Kentucky Historical Society  
100 W. Broadway Street  
Frankfort, KY 40601

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport - Request for Participation**

Dear Archives and Records Commissioner Manuel:

This letter is notification that the Kenton County Airport Board (KCAB) is proposing to construct an air cargo hub at the Cincinnati/Northern Kentucky International Airport (CVG). This project has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA). The Federal Aviation Administration (FAA) has initiated preparation of an Environmental Assessment to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.

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Acting Manager, Memphis Airports District Office

Enclosures

cc: Debbie Conrad, Kenton County Airport Board, Jennifer Ryall, Kentucky Heritage Council, Chris Gunn, Kentucky Heritage Council



U.S. Department  
of Transportation  
**Federal Aviation  
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Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

Mildred Anderson  
3135 Petersburg Road  
Burlington, KY 41005

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport - Request for Participation**

Dear Ms. Anderson:

This letter is notification that the Kenton County Airport Board (KCAB) is proposing to construct an air cargo hub at the Cincinnati/Northern Kentucky International Airport (CVG). This project has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA). The Federal Aviation Administration (FAA) has initiated preparation of an Environmental Assessment to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.

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Enclosures

cc: Debbie Conrad, Kenton County Airport Board, Jennifer Ryall, Kentucky Heritage Council, Chris Gunn, Kentucky Heritage Council



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

Carl W. Anderson  
3121 Petersburg Road  
Burlington, KY 41005

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport - Request for Participation**

Dear Mr. Anderson:

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Enclosures

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U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

Charles H. Anderson  
7720 McVile Road  
Burlington, KY 41005

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport – Request for Participation**

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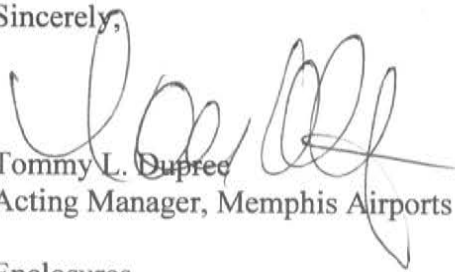
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As part of the process, the FAA identified your organization as a potential local interested party that may wish to participate as a consulting party in the Section 106 process. The

purpose of this letter is to determine if you wish to participate in that regard. In order to become a consulting party, you must respond by August 15, 2018 to request consulting party status. If you are requesting consulting party status, we request that your organization nominate one representative and an alternate to participate on behalf of the group. Individuals may also participate in the Section 106 process as members of the public.

If you would like to request consulting party status on this project or have any questions, please contact Kristi Ashley of my staff by email at [kristi.ashley@faa.gov](mailto:kristi.ashley@faa.gov).

Sincerely,



Tommy L. Dupree  
Acting Manager, Memphis Airports District Office

Enclosures

cc: Debbie Conrad, Kenton County Airport Board, Jennifer Ryall, Kentucky Heritage Council, Chris Gunn, Kentucky Heritage Council



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

Robert K. England  
2766 Coachlight Lane  
Burlington, KY 41005

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport - Request for Participation**

Dear Mr. England:

This letter is notification that the Kenton County Airport Board (KCAB) is proposing to construct an air cargo hub at the Cincinnati/Northern Kentucky International Airport (CVG). This project has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA). The Federal Aviation Administration (FAA) has initiated preparation of an Environmental Assessment to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.

The Area of Potential Effects (APE), as shown in **Exhibit 1, Area of Potential Effects**, is the area in which the proposed project may cause alterations in the character or use of historic resources. At this time, cultural resource investigations are underway for both aboveground and archaeological resources.

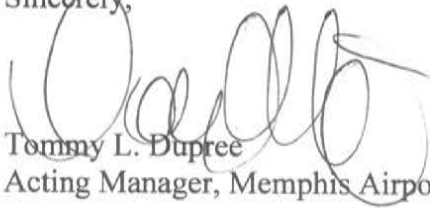
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As part of the process, the FAA identified your organization as a potential local interested party that may wish to participate as a consulting party in the Section 106 process. The

purpose of this letter is to determine if you wish to participate in that regard. In order to become a consulting party, you must respond by August 15, 2018 to request consulting party status. If you are requesting consulting party status, we request that your organization nominate one representative and an alternate to participate on behalf of the group. Individuals may also participate in the Section 106 process as members of the public.

If you would like to request consulting party status on this project or have any questions, please contact Kristi Ashley of my staff by email at [kristi.ashley@faa.gov](mailto:kristi.ashley@faa.gov).

Sincerely,

A handwritten signature in black ink, appearing to read 'Tommy L. Dupree', written over the printed name.

Tommy L. Dupree  
Acting Manager, Memphis Airports District Office

Enclosures

cc: Debbie Conrad, Kenton County Airport Board, Jennifer Ryall, Kentucky Heritage Council, Chris Gunn, Kentucky Heritage Council





U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Memphis Airports District Office  
2600 Thousand Oaks Blvd., Suite 2250  
Memphis, TN 38118

Phone (901) 322-8180

July 12, 2018

Steven J. Popham  
313 Crown Point Circle  
Crestview Hills, KY 41017

**RE: Section 106 Consultation for Cincinnati/Northern Kentucky International  
Airport - Request for Participation**

Dear Mr. Popham:

This letter is notification that the Kenton County Airport Board (KCAB) is proposing to construct an air cargo hub at the Cincinnati/Northern Kentucky International Airport (CVG). This project has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA). The Federal Aviation Administration (FAA) has initiated preparation of an Environmental Assessment to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.

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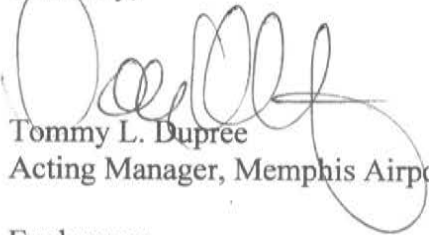
FAA is identifying organizations with an interest in this project and its potential to affect historic properties. This letter is intended to initiate Section 106 consultation, solicit any initial comments you may have on the proposed undertaking, and to find out whether you wish to become a consulting party for this project. Consulting parties have certain rights and obligations under the NHPA and its implementing regulations at 36 CFR Part 800. By becoming a consulting party, you will be informed of steps in the Section 106 process. Section 106 compliance is a requirement of the NEPA for which an Environmental Assessment is being prepared.

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If you would like to request consulting party status on this project or have any questions, please contact Kristi Ashley of my staff by email at [kristi.ashley@faa.gov](mailto:kristi.ashley@faa.gov).

Sincerely,

A handwritten signature in black ink, appearing to read 'Tommy L. Dupree', with a large, stylized loop at the end.

Tommy L. Dupree  
Acting Manager, Memphis Airports District Office

Enclosures

cc: Debbie Conrad, Kenton County Airport Board, Jennifer Ryall, Kentucky Heritage Council, Chris Gunn, Kentucky Heritage Council

## Sarah Potter

---

**To:** Sarah Potter  
**Subject:** FW: Cincinnati Northern Kentucky International Airport Amazon Development

**From:** Ryall, Jennifer (Heritage Council) <Jennifer.Ryall@ky.gov>  
**Sent:** Friday, July 20, 2018 2:27 PM  
**To:** Sarah Potter <spotter@landrum-brown.com>  
**Cc:** kristi.ashley@faa.gov  
**Subject:** RE: Cincinnati Northern Kentucky International Airport Amazon Development

Hi Sarah,

The revised aboveground APE presented in the attachment to your e-mail from yesterday (7-19-18) looks appropriate to address both indirect and direct effects for this project.

Thanks for your help,  
~Jenn

**Jennifer Ryall**  
Environmental Review Coordinator  
Kentucky Heritage Council  
410 High Street  
Frankfort, Kentucky 40601  
Phone: (502)564-7005 ext 4565

---

**From:** Sarah Potter <[spotter@landrum-brown.com](mailto:spotter@landrum-brown.com)>  
**Sent:** Thursday, July 19, 2018 4:34 PM  
**To:** Ryall, Jennifer (Heritage Council) <[Jennifer.Ryall@ky.gov](mailto:Jennifer.Ryall@ky.gov)>  
**Cc:** [kristi.ashley@faa.gov](mailto:kristi.ashley@faa.gov)  
**Subject:** RE: Cincinnati Northern Kentucky International Airport Amazon Development

Hi Jenn – See attached exhibit. I will call to follow-up.

Thanks!

Sarah

## Appendix F

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# APPENDIX F

## NOISE

This appendix contains the Technical Report presenting the Noise analysis prepared for the Environmental Assessment.



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# NOISE TECHNICAL REPORT

For the Proposed Air Cargo Facility Development  
at  
Cincinnati/Northern Kentucky International Airport

September 2018

Prepared for:

Kenton County Airport Board

Prepared by:



Landrum & Brown, Incorporated

11279 Cornell Park Road

Cincinnati, Ohio 45242

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## 1.0 INTRODUCTION

The purpose of this Noise Technical Report is to provide supporting documentation for the Environmental Assessment (EA) being prepared for the Proposed Air Cargo Facility Development project at the Cincinnati/Northern Kentucky International Airport (CVG or Airport). Noise Exposure Contours were prepared for the following conditions: Existing, Future (2021) No Action, Future (2021) Proposed Action, Future (2026) No Action, and Future (2026) Proposed Action. The Existing Noise Exposure Contour represents the current operating conditions at CVG and is based on data collected from January 2017 through December 2017, which was the most recent data available when modeling began. The Future (2021) conditions represent the opening year of the air cargo facility. Future (2026) conditions represent five years after the opening of the air cargo facility.

## 2.0 BACKGROUND ON CHARACTERISTICS OF NOISE

Sound is created by a vibrating source that induces vibrations in the air. The vibration produces alternating bands of relatively dense and sparse particles of air, spreading outward from the source like ripples on a pond. Sound waves dissipate with increasing distance from the source. Sound waves can also be reflected, diffracted, refracted, or scattered. When the source stops vibrating, the sound waves disappear almost instantly and the sound ceases.

Sound conveys information to listeners. It can be instructional, alarming, pleasant and relaxing, or annoying. Identical sounds can be characterized by different people, or even by the same person at different times, as desirable or unwanted. Unwanted sound is **commonly referred to as "noise."**

Sound can be defined in terms of three components:

1. Level (amplitude)
2. Pitch (frequency)
3. Duration (time pattern)

### 2.1 SOUND LEVEL

The level of sound is measured by the difference between atmospheric pressure (without the sound) and the total pressure (with the sound). Amplitude of sound is like the relative height of the ripples caused by the stone thrown into the water. Although physicists typically measure pressure using the linear Pascal scale, sound is measured using the logarithmic decibel (dB) scale. This is because the range of sound pressures detectable by the human ear can vary from *1 to 100 trillion units*. A logarithmic scale allows us to discuss and analyze noise using more manageable numbers. The range of audible sound ranges from approximately 1 to 140 dB, although everyday sounds rarely rise above about 120 dB. The human ear is extremely sensitive to sound pressure fluctuations. A sound of 140 dB, which is sharply painful to humans, contains *100 trillion ( $10^{14}$ ) times more* sound pressure than the least audible sound.

By definition, a 10-dB increase in sound is equal to a tenfold ( $10^1$ ) increase in the mean square sound pressure of the reference sound. A 20-dB increase is a 100-fold ( $10^2$ ) increase in the mean square sound pressure of the reference sound. A 30-dB increase is a 1,000-fold ( $10^3$ ) increase in mean square sound pressure.

A logarithmic scale requires different mathematics than used with linear scales. The sound pressures of two separate sounds, expressed in dB, are not arithmetically additive. For example, if a sound of 80 dB is added to another sound of 74 dB, the total is a 1-dB increase in the louder sound (81 dB), not the arithmetic sum of 154 dB. If two equally loud noise events occur simultaneously, the sound pressure level from the combined events is 3-dB higher than the level produced by either event alone.

Human perceptions of changes in sound pressure are less sensitive than a sound level meter. People typically perceive a tenfold increase in sound pressure, a 10-dB increase, as a doubling of loudness. Conversely, a 10-dB decrease in sound pressure is normally perceived as half as loud. In community settings, most people perceive a 3-dB increase in sound pressure (a doubling of the sound pressure or energy) as just noticeable. (In laboratory settings, people with good hearing are able to detect changes in sounds of as little as 1-dB.)

## 2.2 SOUND FREQUENCY

The pitch (or frequency) of sound can vary greatly from a low-pitched rumble to a shrill whistle. If we consider the analogy of ripples in a pond, high frequency sounds are vibrations with tightly spaced ripples, while low rumbles are vibrations with widely spaced ripples. The rate at which a source vibrates determines the frequency. The rate of vibration is measured in units called **"Hertz"** -- **the number of cycles, or waves, per second. One's** ability to hear a sound depends greatly on the frequency composition. Humans hear sounds best at frequencies between 1,000 and 6,000 Hertz. Sound at frequencies above 10,000 Hertz (high-pitched hissing) and below 100 Hertz (low rumble) are much more difficult to hear.

If we are attempting to measure sound in a way that approximates what our ears hear, we must give more weight to sounds at the frequencies we hear well and less weight to sounds at frequencies we do not hear well. Acousticians have developed several weighting scales for measuring sound. The A-weighted scale was developed to correlate with the judgments people make about the loudness of sounds. The A-weighted decibel scale (dBA) is used in studies where audible sound is the focus of inquiry. The U.S. Environmental Protection Agency (USEPA) has recommended the use of the A-weighted decibel scale in studies of environmental noise.<sup>1</sup> Its use is required by the FAA in airport noise studies.<sup>2</sup> For the purposes of this analysis, dBA was used as the noise metric and dB and dBA are used interchangeably.

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<sup>1</sup> Information on Levels of Environmental Noise Requisite to Protect Health and Welfare with an Adequate Margin of Safety. U.S. Environmental Protection Agency, Office of Noise Abatement and Control. 1974, P. A-10.

<sup>2</sup> "Airport Noise Compatibility Planning." 14 CFR Part 150, Sec. A150.3, September 24, 2004.



## 2.3 DURATION OF SOUNDS

The duration of sounds – their patterns of loudness and pitch over time – can vary greatly. Sounds can be classified as *continuous* like a waterfall, *impulsive* like a firecracker, or *intermittent* like aircraft overflights. Intermittent sounds are produced for relatively short periods, with the instantaneous sound level during the event roughly appearing as a bell-shaped curve. An aircraft event is characterized by the period during which it rises above the background sound level, reaches its peak, and then recedes below the background level.

## 3.0 STANDARD NOISE DESCRIPTORS

Given the multiple dimensions of sound, a variety of descriptors, or metrics, have been developed for describing sound and noise. Some of the most commonly used metrics are discussed in this section. They include:

1. Maximum Level (L<sub>max</sub>)
2. Time Above Level (TA)
3. Sound Exposure Level (SEL)
4. Equivalent Sound Level (L<sub>eq</sub>)
5. Day/Night Average Sound Level (DNL)

### 3.1 MAXIMUM LEVEL (L<sub>MAX</sub>)

L<sub>max</sub> is simply the highest sound level recorded during an event or over a given period of time. It provides a simple and understandable way to describe a sound event and compare it with other events. In addition to describing the peak sound level, L<sub>max</sub> can be reported on an appropriate weighted decibel scale (A-weighted, for example) so that it can disclose information about the frequency range of the sound event in addition to the loudness.

L<sub>max</sub>, however, fails to provide any information about the duration of the sound event. This can be a critical shortcoming when comparing different sounds. Even if they have identical L<sub>max</sub> values, sounds of greater duration contain more sound energy than sounds of shorter duration. Research has demonstrated that for many kinds of sound effects, the total sound energy, not just the peak sound level, is a critical consideration.

### 3.2 TIME ABOVE LEVEL (TA)

**The “time above,” or TA, metric indicates the amount of time that sound at a particular location exceeds a given sound level threshold.** TA is often expressed in terms of the total time per day that the threshold is exceeded. The TA metric explicitly provides information about the duration of sound events, although it conveys no information about the peak levels during the period of observation.

### 3.3 SOUND EXPOSURE LEVEL (SEL)

The sound exposure level, or SEL metric, provides a way of describing the total sound energy of a single event. In computing the SEL value, all sound energy occurring during the event, within 10 dB of the peak level (L<sub>max</sub>), is mathematically integrated over one second. (Very little information is lost by discarding the sound below the 10 dB cut-off,

since the highest sound levels completely dominate the integration calculation.) Consequently, the SEL is always greater than the Lmax for events with a duration greater than one second. SELs for aircraft overflights typically range from five to 10 dB higher than the Lmax for the event.

### 3.4 EQUIVALENT SOUND LEVEL (LEQ)

The equivalent sound level (Leq) metric may be used to define cumulative noise dosage, or noise exposure, over a period of time. In computing Leq, the total noise energy over a given period of time, during which numerous events may have occurred, is logarithmically averaged over the time period. The Leq represents the steady sound level that is equivalent to the varying sound levels actually occurring during the period of observation. For example, an 8-hour Leq of 67 dB indicates that the amount of sound energy in all the peaks and valleys that occurred in the 8-hour period is equivalent to the energy in a continuous sound level of 67 dB. Leq is typically computed for measurement periods of 1 hour, 8 hours, or 24 hours, although any time period can be specified.

Leq is a critical noise metric for many kinds of analysis where total noise dosage, or noise exposure, is under investigation. As already noted, noise dosage is important in understanding the effects of noise on both animals and people. Indeed, research has led **to the formulation of the "equal energy rule."** This rule states that it is the total acoustical energy to which people are exposed that explains the effects the noise will have on them. That is, a very loud noise with a short duration will have the same effect as a lesser noise with a longer duration if they have the same total sound energy.

### 3.5 DAY/NIGHT AVERAGE SOUND LEVEL (DNL)

The DNL metric is really a variation of the 24-hour Leq metric. Like Leq, the DNL metric describes the total noise exposure during a given period. Unlike Leq, however, DNL, by definition, can only be applied to a 24-hour period. In computing DNL, an extra weight of 10 dB is assigned to any sound levels occurring between the hours of 10:00 p.m. and 6:59 a.m. This is intended to account for the greater annoyance that nighttime noise is presumed to cause for most people. Recalling the logarithmic nature of the dB scale, this extra weight treats one nighttime noise event as equivalent to 10 daytime events of the same magnitude.

As with Leq, DNL values are strongly influenced by the loud events. For example, 30 seconds of sound of 100 dB, followed by 23 hours, 59 minutes, and 30 seconds of silence would compute to a DNL value of 65 dB. If the 30 seconds occurred at night, it would yield a DNL of 75 dB.

This example can be roughly equated to an airport noise environment. Recall that an SEL is the mathematical compression of a noise event into one second. Thus, 30 SELs of 100 dB during a 24-hour period would equal DNL 65 dB, or DNL 75 dB if they occurred at night. This situation could actually occur in places around a real airport. If the area experienced 30 overflights during the day, each of which produced an SEL of 100 dB, it would be exposed to DNL 65 dB. Recalling the relationship of SEL to the peak noise level (Lmax) of an aircraft overflight, the Lmax recorded for each of those overflights (the peak level a person would actually hear) would typically range from 90 to 95 dB.

## 4.0 REGULATORY SETTING

This section presents information regarding noise and land use criteria that may be useful in the evaluation of noise impacts. The FAA has a long history of publishing noise and use assessment criteria. A summary of some of the more pertinent regulations and guidelines is presented in the following paragraphs.

### 4.1 NOISE CONTROL ACT

Congress passed the Noise Control Act (42 U.S.C. §4901 et seq.) in 1972, which established a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare. The act set forth the foundation for conducting research and setting guidelines to restrict noise pollution.

### 4.2 FEDERAL AVIATION NOISE ABATEMENT POLICY

On November 18, 1976, the U.S. Department of Transportation and FAA jointly issued the Federal Aviation Noise Abatement Policy. This policy recognized aircraft noise as a major constraint on the further development of the commercial aviation established key responsibilities for addressing aircraft noise. The policy stated that the Federal Government has the authority and responsibility to regulate noise at the source by designing and managing flight procedures to limit the impact of aircraft noise on local communities; and by providing funding to airports for noise abatement planning.

### 4.3 AVIATION SAFETY AND NOISE ABATEMENT ACT OF 1979

The Aviation Safety and Noise Abatement Act of 1979 (ASNA), which is codified as 49 U.S.C. 47501-47510, set forth the foundation for the airport noise compatibility planning program outlined in 14 Code of Federal Regulations (CFR) Part 150. The act established the requirements for conducting noise compatibility planning and provided assistance to, and funding for which airport operators could apply to undertake such planning.

### 4.4 AIRPORT NOISE AND CAPACITY ACT OF 1990

The Airport Noise and Capacity Act (ANCA) of 1990 established two broad directives for the FAA: 1) to establish a method by which to review airport noise and access/use restrictions imposed by airport proprietors, and 2) to institute a program to phase out Stage 2 aircraft over 75,000 lbs. by December 31, 1999.<sup>3</sup> To implement ANCA, the FAA amended 14 CFR Part 91 and issued 14 CFR Part 161 which sets forth noise levels that are permitted for aircraft of various weights, engine number.

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<sup>3</sup> Title 14, Part 36 of the CFR sets forth noise levels that are permitted for aircraft of various weights, engine number, and date of certification. Aircraft were divided into three classes according to noise level, Stage 1, Stage 2, and Stage 3, with Stage three being the quietest. Per 14 CFR Part 36, to be designated as Stage 3, aircraft must meet noise levels defined by the FAA at takeoff, sideline, and approach measurement locations.

## 4.5 FEDERAL REQUIREMENTS TO USE DNL IN ENVIRONMENTAL NOISE STUDIES

DNL is the standard metric used for environmental noise analysis in the U.S. This practice originated with the **USEPA's** effort to comply with the Noise Control Act of 1972. The USEPA **designated a task group to "consider the characterization of the impact of airport community noise and develop a community noise exposure measure."**<sup>4</sup> The task group recommended using the DNL metric. The USEPA accepted the recommendation in 1974, based on the following considerations:

- The measure is applicable to the evaluation of pervasive, long-term noise in various defined areas and under various conditions over long periods of time.
- The measure correlates well with known effects of the noise environment on individuals and the public.
- The measure is simple, practical, and accurate.
- Measurement equipment is commercially available.
- The metric at a given location is predictable, within an acceptable tolerance, from knowledge of the physical events producing the noise.<sup>5</sup>

Soon thereafter, the Department of Housing and Urban Development (HUD), Department of Defense, and the Veterans Administration adopted the use of DNL.

At about the same time, the Acoustical Society of America developed a standard (ANSI S3.23-1980) which established DNL as the preferred metric for outdoor environments. This standard was reevaluated in 1990 and they reached the same conclusions regarding the use of DNL (ANSI S12.40-1990).

In 1980, the Federal Interagency Committee on Urban Noise (FICUN) met to consolidate Federal guidance on incorporating noise considerations in local land use planning. The committee selected DNL as the best noise metric for the purpose, thus endorsing the **USEPA's earlier work and making it applicable to all Federal agencies.**<sup>6</sup>

In response to the requirements of the ASNA Act of 1979 and the recommendations of FICUN and USEPA, the FAA established DNL in 1981 as the single metric for use in airport noise and land use compatibility planning. This decision was incorporated into the final rule implementing ASNA, 14 CFR Part 150, in 1985. Part 150 established the DNL as the noise metric for determining the exposure of individuals to aircraft noise and identified residential land uses as being normally compatible with noise levels below DNL 65 dB.

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4 Information on Levels of Environmental Noise Requisite to Protect Health and Welfare with an Adequate Margin of Safety. U.S. Environmental Protection Agency, Office of Noise Abatement and Control. 1974, P. A-10.

5 Information on Levels of Environmental Noise Requisite to Protect Health and Welfare with an Adequate Margin of Safety. U.S. Environmental Protection Agency, Office of Noise Abatement and Control. 1974, Pp. A-1-A-23.

6 *Guidelines for Considering Noise in Land Use Planning and Control.* Federal Interagency Committee on Urban Noise (FICUN). 1980.

## 5.0 MODELING METHODOLOGY

The analysis of noise exposure around CVG was prepared using the **FAA's** Aviation Environmental Design Tool (AEDT) Version 2d SP2. Inputs to the AEDT include runway definition, number of aircraft operations during the time period evaluated, the types of aircraft flown, the time of day when they are flown, how frequently each runway is used for arriving and departing aircraft, the routes of flight used when arriving to and departing from the runways, and ground run-up activity. The AEDT calculates noise exposure for the area around an airport and outputs contours of noise exposure using the Day-Night Average Sound Level (DNL) metric. Noise exposure contours for the levels of 65, 70, and 75 DNL were calculated and represent average-annual day conditions.

### 5.1 EXISTING NOISE EXPOSURE CONTOUR INPUT DATA

**Runway Definition:** The Airport currently has four runways: three parallel runways (18L/36R, 18C/36C, and 18R/36L), and a crosswind runway (09/27). The current airfield layout at CVG is shown on Exhibit 1. The runways and lengths at CVG are listed below:

<u>Runway</u>	<u>Length (feet)</u>
09/27	12,000
18L/36R	10,000
18C/36C	11,000
18R/36L	8,000

**Number of Operations and Fleet Mix:** The number of annual operations modeled for the Air Cargo Facility Development EA at CVG was based on Air Traffic Control Tower (ATCT) counts for the period from January 2017 through December 2017, which was the most recent twelve months of data available when the noise modeling began. During that twelve-month period, 150,463 operations occurred at CVG, which results in 412.2 average-annual day operations. Specific aircraft types and times of operation for commercial and non-commercial aircraft was based on representative aircraft derived from the flight information **included in the Airport's flight tracking system** data for the period from January 2017 through December 2017. Table 1 provides a summary of the average daily operations and fleet mix at CVG, organized by aircraft type, operation type, and time of day.



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Table 1  
DISTRIBUTION OF AVERAGE DAILY OPERATIONS BY AIRCRAFT CATEGORY  
EXISTING CONDITIONS

Operating Conditions						
Aircraft Type	Noise Model ID	Arrivals		Departures		Total
		Daytime	Nighttime	Daytime	Nighttime	
Heavy Jets						
Boeing 747-800 Freighter	7478	1.0	3.0	1.4	2.6	7.9
Boeing 747-400 Series Freighter	747R21	0.6	1.8	0.8	1.5	4.7
Boeing 767-300 Series	767300	3.7	11.6	5.3	10.0	30.7
Boeing 767-200 Series Freighter	767CF6	3.5	10.9	5.0	9.4	28.7
Boeing 777 Freighter	777FRE	0.4	1.3	0.6	1.1	3.5
Airbus A300F4-600 Series	A300-622R	0.3	1.0	0.5	0.9	2.7
Airbus A300-200 Series Freighter	A300B4-203	0.0	0.1	0.0	0.1	0.3
Subtotal		9.5	29.7	13.6	25.6	78.4
Large Cargo Jets						
Boeing 727-200 Series Freighter	727EM2	0.1	0.3	0.1	0.2	0.7
Boeing 737-400 Series Freighter	737400	0.2	4.1	0.8	3.5	8.6
Boeing 757-200 Series Freighter	757PW	2.3	0.4	2.5	0.3	5.5
Boeing 757-200 Series	757RR	1.3	0.2	1.4	0.1	3.1
Subtotal		3.9	5.1	4.9	4.1	17.9
Large Passenger Jets						
Boeing 717-200 Series	717200	1.6	1.6	1.6	1.6	6.4
Boeing 737-300 Series	737300	0.1	0.0	0.1	0.0	0.2
Boeing 737-700 Series	737700	3.6	0.7	3.8	0.4	8.5
Boeing 737-800 Series	737800	5.9	1.1	6.4	0.7	14.1
Boeing 737-900-ER	737900	0.6	0.1	0.7	0.1	1.5
Airbus A319-100 Series	A319-131	7.6	1.4	8.1	0.8	17.9
Airbus A320-200 Series	A320-211	8.2	1.5	8.8	0.9	19.3
Airbus A320-200 Series	A320-232	0.6	0.1	0.6	0.1	1.4
Airbus A321-100 Series	A321-232	2.4	0.4	2.5	0.3	5.6
Boeing MD-82	MD82	1.3	0.2	1.4	0.1	3.0
Boeing MD-83	MD83	6.7	1.2	7.1	0.7	15.8
Boeing MD-90	MD9025	0.2	0.0	0.2	0.0	0.5
Subtotal		38.7	8.4	41.4	5.7	94.1
Regional Jets						
Bombardier CRJ-100	CLREGJ	20.8	2.3	21.0	2.1	46.1
Bombardier CRJ-700-ER	CRJ701	17.6	3.2	18.9	1.9	41.7
Bombardier CRJ-900	CRJ9-ER	19.6	3.6	21.1	2.2	46.4
Embraer ERJ145-LR	EMB145	12.5	1.4	12.6	1.3	27.7
Embraer ERJ170	EMB170	4.0	0.7	4.2	0.4	9.3
Embraer ERJ175	EMB175	8.8	1.6	9.4	1.0	20.8
Subtotal		83.3	12.8	87.2	8.9	192.1

Table 1, (continued)

DISTRIBUTION OF AVERAGE DAILY OPERATIONS BY AIRCRAFT CATEGORY  
EXISTING CONDITIONS

Aircraft Type	Noise Model ID	Arrivals		Departures		Total
		Daytime	Nighttime	Daytime	Nighttime	
Business Jets						
Cessna 650 Citation III	CIT3	0.0	0.0	0.0	0.0	0.1
Bombardier Challenger 600	CL600	1.4	0.2	1.4	0.1	3.2
Bombardier Challenger 601	CL601	0.1	0.0	0.1	0.0	0.3
Cessna 500 Citation I	CNA500	0.6	0.4	0.7	0.4	2.1
Cessna 500 Citation I	CNA510	0.0	0.0	0.0	0.0	0.1
Cessna 525 Citation Jet	CNA525C	0.3	0.2	0.3	0.2	0.9
Cessna 550 Citation II Bravo	CNA55B	0.5	0.1	0.5	0.0	1.0
Cessna 560 Citation Ultra	CNA560U	0.1	0.0	0.1	0.0	0.2
Cessna 560 Citation Excel	CNA560XL	0.4	0.0	0.4	0.0	1.0
Cessna 680 Citation Sovereign	CNA680	0.1	0.0	0.1	0.0	0.1
Cessna 750 Citation X	CNA750	0.1	0.0	0.1	0.0	0.1
Eclipse Aerospace EA500	ECLIPSE500	0.0	0.0	0.0	0.0	0.1
Fokker 100	F10062	0.1	0.0	0.1	0.0	0.3
Gulfstream G-IIIB	GIIB	0.1	0.0	0.1	0.0	0.3
Gulfstream G450	GIV	0.1	0.0	0.1	0.0	0.3
Gulfstream V	GV	0.2	0.0	0.2	0.0	0.4
Raytheon Hawker 800	IA1125	0.1	0.0	0.1	0.0	0.2
Bombardier Learjet 60	LEAR35	0.6	0.1	0.6	0.1	1.3
Mitsubishi MU-300	MU3001	0.2	0.0	0.2	0.0	0.4
Subtotal		5.1	1.1	5.2	1.0	12.4
Propeller Aircraft						
Raytheon Beechcraft 1900	1900D	0.9	0.1	0.9	0.1	2.0
Beechcraft Baron 58P	BEC58P	0.4	0.0	0.4	0.0	0.9
Cessna 172 Skyhawk	CNA172	0.3	0.2	0.3	0.2	1.0
Cessna 182 Skyhawk	CNA182	0.1	0.0	0.1	0.0	0.2
Cessna 206 Caravan	CNA206	0.1	0.0	0.1	0.0	0.2
Cessna 208 Caravan	CNA208	0.7	0.5	0.8	0.4	2.5
Cessna 441 Conquest II	CNA441	0.8	0.1	0.8	0.1	1.8
De Havilland Canada DHC Twin Otter	DHC6	1.6	0.2	1.6	0.2	3.6
Dornier Do 228	DO228	0.1	0.0	0.1	0.0	0.1
Embraer EMB120 Brasilia	EMB120	0.4	0.3	0.4	0.2	1.3
General Aviation Single Engine Prop	GASEPV	0.7	0.1	0.7	0.1	1.6
Piper PA-28 Cherokee	PA28	0.1	0.1	0.1	0.1	0.3
Shorts 330 Series	SD330	0.5	0.3	0.6	0.3	1.7
Subtotal		6.7	1.9	6.9	1.7	17.2
Grand Total		147.3	58.9	159.1	47.0	412.2

Notes: Day = 7:00 a.m. to 9:59 p.m., Night = 10:00 p.m. to 6:59 a.m.

Totals may not equal sum due to rounding.

Source: FAA Operations Network (OPSNET) data, CVG Flight Tracking System Data, Landrum &amp; Brown, 2018.



Runway End Utilization: Average-annual day runway end utilization was derived primarily from analysis of radar data and a review of previous noise analysis at CVG. Table 2 summarizes the percentage of use by each aircraft category on each of the runways at CVG during the daytime (7:00 a.m. – 9:59 p.m.) and nighttime (10:00 p.m. – 6:59 a.m.).

Table 2  
RUNWAY END UTILIZATION - EXISTING CONDITIONS

Daytime Arrivals								
	09	27	18C	18L	18R	36C	36L	36R
Heavy Jets	0.9%	2.5%	22.8%	54.5%	0.5%	6.5%	0.0%	12.4%
Large Cargo Jets	0.8%	3.1%	36.2%	38.5%	0.0%	10.8%	0.0%	10.8%
Large Passenger Jets	0.5%	3.8%	31.3%	40.8%	0.3%	10.4%	0.0%	12.9%
Propeller Aircraft	0.5%	4.2%	33.8%	39.1%	1.0%	11.5%	0.1%	9.9%
Regional / Business Jets	0.4%	4.1%	33.1%	37.5%	0.3%	12.9%	0.0%	11.8%
Nighttime Arrivals								
	09	27	18C	18L	18R	36C	36L	36R
Heavy Jets	60.5%	32.2%	4.1%	0.0%	0.0%	2.2%	0.0%	0.9%
Large Cargo Jets	18.1%	27.7%	3.4%	7.8%	0.4%	4.6%	0.1%	38.0%
Large Passenger Jets	56.9%	34.3%	4.3%	0.1%	0.0%	2.7%	0.0%	1.8%
Propeller Aircraft	43.9%	27.3%	4.7%	3.1%	0.2%	3.1%	0.0%	17.7%
Regional / Business Jets	17.0%	18.9%	7.5%	17.6%	7.7%	3.4%	0.0%	28.0%
Daytime Departures								
	09	27	18C	18L	18R	36C	36L	36R
Heavy Jets	0.0%	84.0%	5.1%	4.3%	0.0%	2.8%	0.0%	3.8%
Large Cargo Jets	0.0%	67.6%	2.2%	17.3%	0.6%	1.9%	0.0%	10.3%
Large Passenger Jets	0.0%	68.4%	3.5%	18.5%	0.0%	2.2%	0.0%	7.3%
Propeller Aircraft	0.0%	62.6%	2.5%	24.3%	0.1%	1.7%	0.0%	8.8%
Regional / Business Jets	0.0%	69.5%	2.2%	16.7%	0.8%	2.2%	0.5%	8.1%
Nighttime Departures								
	09	27	18C	18L	18R	36C	36L	36R
Heavy Jets	0.0%	85.0%	1.2%	0.4%	0.0%	4.4%	0.0%	9.0%
Large Cargo Jets	0.1%	78.8%	1.0%	3.7%	0.3%	6.0%	0.0%	10.0%
Large Passenger Jets	0.0%	80.2%	1.6%	1.6%	0.0%	8.4%	0.0%	8.2%
Propeller Aircraft	0.0%	80.9%	1.2%	5.2%	0.1%	8.4%	0.2%	4.1%
Regional / Business Jets	0.2%	30.2%	1.0%	12.5%	0.1%	8.5%	1.3%	46.4%

Daytime = 7:00 a.m. – 9:59 p.m.

Nighttime = 10:00 p.m. – 6:59 a.m.

Source: FAA radar data, Landrum & Brown analysis, 2018.

During the daytime, the Airport operates in one of two operating configurations - south/west flow or north/west flow. When the Airport operates in the south/west flow configuration, aircraft arrive from the north to Runways 18L and 18C. Departures to the south/west occur from Runways 18L, 18C, and 27. The primary departure runway is Runway 27 followed by Runways 18L and 18C. When the Airport operates in the north/west flow, aircraft arrive from the south to Runways 36R and 36C. Departures to the north/west occur from Runways 27, 36R, and 36C.

During the nighttime, Runway 9 is the primary runway for arrivals and Runway 27 is the preferred departure runway due to the compatible land use corridor that has been created as a result of a land acquisition program to the west of CVG the Airport

Flight Tracks: Radar data was gathered for selected periods from January 2017 through December 2017<sup>7</sup> and analyzed to verify the location, density, and width of existing flight corridors. Consolidated flight tracks were developed from this radar data and used in the AEDT to model the flight corridors present around the Airport.

The AEDT arrival flight tracks modeled for the Existing Noise Exposure Contour are shown on Exhibit 2. Table 3 shows arrival flight track utilization percentages. The AEDT departure flight tracks modeled for the Existing Noise Exposure Contour are shown on Exhibit 3. Table 4 shows departure flight track utilization percentages for the Existing conditions. Each flight track is identified by a track ID that corresponds to the label in the flight track exhibits.

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<sup>7</sup> Radar flight track data was obtained from specific days in February, May, August, and November 2017 to provide a sample of data from different seasons and days of the week.



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Table 3  
ARRIVAL FLIGHT TRACK UTILIZATION PERCENTAGES –  
EXISTING CONDITIONS

Runway End	Track ID	Heavy Jets	Large Cargo Jets	Large Passenger Jets	Propeller Aircraft	Regional / Business Jets
09	AT61	46.0%	10.6%	10.6%	10.0%	2.6%
27	AT31	14.6%	8.9%	4.6%	5.5%	2.3%
	AT32	6.7%	6.6%	2.1%	2.4%	1.6%
	AT33	3.7%	1.5%	2.5%	1.3%	2.2%
18C	AT20	0.0%	0.0%	0.0%	4.4%	3.7%
	AT22	2.7%	0.0%	4.7%	0.0%	0.0%
	AT23	3.9%	15.1%	11.7%	0.0%	0.0%
	AT24	0.9%	2.5%	3.4%	0.0%	0.0%
	AT25	1.1%	0.0%	6.6%	0.0%	0.0%
	AT26	0.0%	0.0%	0.0%	2.9%	3.4%
	AT27	0.0%	0.0%	0.0%	1.1%	1.2%
	AT28	0.0%	0.0%	0.0%	1.1%	1.2%
	AT29	0.0%	0.0%	0.0%	4.3%	5.4%
	AT2B	0.0%	0.0%	0.0%	2.9%	3.4%
	AT2F	0.0%	0.0%	0.0%	1.1%	1.2%
	AT2G	0.0%	0.0%	0.0%	1.1%	1.2%
	AT2N	0.0%	0.0%	0.0%	4.3%	5.4%
	AT2V	0.0%	0.0%	0.0%	4.4%	3.7%
18L	AT11	0.8%	0.0%	4.2%	0.0%	0.0%
	AT12	5.9%	18.1%	14.8%	0.0%	0.0%
	AT13	4.2%	0.0%	6.0%	0.0%	0.0%
	AT14	1.4%	3.0%	4.4%	0.0%	0.0%
	AT15	0.8%	0.0%	4.2%	0.0%	0.0%
	AT16	0.0%	0.0%	0.0%	6.6%	8.1%
	AT17	0.0%	0.0%	0.0%	5.0%	5.4%
	AT18	0.0%	0.0%	0.0%	9.7%	12.6%
	AT19	0.0%	0.0%	0.0%	10.0%	8.7%
18R	A701	0.1%	0.2%	0.2%	0.8%	1.3%
36C	AT50	0.0%	0.0%	0.0%	1.5%	1.5%
	AT51	0.4%	0.0%	2.3%	0.0%	0.0%
	AT52	1.5%	6.2%	4.0%	0.0%	0.0%
	AT53	0.4%	1.0%	1.2%	0.0%	0.0%
	AT54	1.0%	0.0%	1.6%	0.0%	0.0%
	AT55	0.0%	0.0%	0.0%	0.5%	0.9%
	AT56	0.0%	0.0%	0.0%	1.2%	1.6%
	AT57	0.0%	0.0%	0.0%	1.3%	0.9%
	AT58	0.0%	0.0%	0.0%	0.7%	0.9%
	AT59	0.0%	0.0%	0.0%	0.7%	0.9%
	AT5B	0.0%	0.0%	0.0%	0.7%	0.9%
	AT5F	0.0%	0.0%	0.0%	0.5%	0.9%
	AT5N	0.0%	0.0%	0.0%	1.2%	1.7%
	AT5V	0.0%	0.0%	0.0%	1.5%	1.5%
36L	A601	0.0%	0.1%	0.0%	0.1%	0.0%

Table 3, (continued)  
 ARRIVAL FLIGHT TRACK UTILIZATION PERCENTAGES –  
 EXISTING CONDITIONS

Runway End	Track ID	Heavy Jets	Large Cargo Jets	Large Passenger Jets	Propeller Aircraft	Regional / Business Jets
36R	AT41	1.7%	22.4%	4.8%	0.0%	0.0%
	AT42	0.5%	0.0%	2.7%	0.0%	0.0%
	AT43	1.2%	0.0%	1.9%	0.0%	0.0%
	AT44	0.4%	3.7%	1.4%	0.0%	0.0%
	AT46	0.0%	0.0%	0.0%	7.1%	6.7%
	AT47	0.0%	0.0%	0.0%	1.2%	2.2%
	AT48	0.0%	0.0%	0.0%	3.4%	5.0%
Total		100.0%	100.0%	100.0%	100.0%	100.0%

Source: FAA radar data, Landrum & Brown analysis, 2018.

Table 4  
DEPARTURE FLIGHT TRACK UTILIZATION PERCENTAGES –  
EXISTING CONDITIONS

Runway End	Track ID	Heavy Jets	Large Cargo Jets	Large Passenger Jets	Propeller Aircraft	Regional / Business Jets
09	DT61	0.0%	0.0%	0.0%	0.0%	0.0%
	DT62	0.0%	0.0%	0.0%	0.0%	0.0%
	DT63	0.0%	0.0%	0.0%	0.0%	0.0%
27	D2G1	0.8%	0.0%	3.5%	0.0%	0.0%
	D2G2	83.0%	0.0%	55.9%	0.0%	0.0%
	D2G3	0.8%	0.0%	3.5%	0.0%	0.0%
	D2J4	0.0%	28.4%	0.0%	0.0%	0.0%
	D2J5	0.0%	34.2%	0.0%	0.0%	0.0%
	D2J6	0.0%	10.2%	0.0%	0.0%	0.0%
	DT30	0.0%	0.0%	0.0%	4.3%	5.9%
	DT36	0.0%	0.0%	0.0%	7.0%	7.9%
	DT37	0.0%	0.0%	0.0%	14.2%	11.8%
	DT38	0.0%	0.0%	0.0%	11.6%	7.2%
	DT39	0.0%	0.0%	0.0%	6.6%	5.9%
	DT3A	0.0%	0.0%	0.0%	4.6%	5.9%
	DT3R	0.0%	0.0%	0.0%	2.6%	3.9%
	DT3X	0.0%	0.0%	0.0%	8.6%	5.3%
	DT3Y	0.0%	0.0%	0.0%	3.3%	5.3%
	DT3Z	0.0%	0.0%	3.5%	1.7%	2.6%
	DTE2	0.0%	0.0%	3.5%	1.7%	3.9%
18C	D1G5	2.5%	0.0%	2.4%	0.0%	0.0%
	D1G6	0.0%	0.0%	0.1%	0.0%	0.0%
	D1J5	0.0%	1.6%	0.0%	0.0%	0.0%
	D1J6	0.0%	0.1%	0.0%	0.0%	0.9%
	DT20	0.0%	0.0%	0.0%	0.4%	0.2%
	DT28	0.0%	0.0%	0.0%	1.1%	0.4%
	DT29	0.0%	0.0%	0.0%	0.3%	0.1%
	DT2A	0.0%	0.0%	0.0%	0.3%	0.2%
	DT2Y	0.0%	0.0%	0.0%	0.2%	0.2%
	DTNW3	0.0%	0.0%	0.8%	0.0%	0.1%
18L	DTNW4	0.0%	0.0%	0.0%	0.0%	0.0%
	D1G1	0.4%	0.0%	2.6%	0.0%	0.0%
	D1G2	1.4%	0.0%	13.9%	0.0%	0.0%
	D1J1	0.0%	1.6%	0.0%	0.0%	4.6%
	D1J2	0.0%	9.5%	0.0%	0.0%	6.6%
	DT16	0.0%	0.0%	0.0%	12.9%	2.4%
	DT17	0.0%	0.0%	0.0%	7.6%	1.6%
	DTSW1	0.0%	0.0%	0.0%	0.0%	0.5%
18R	DTW1	0.0%	0.0%	0.0%	0.0%	0.5%
	D701	0.0%	0.5%	0.0%	0.1%	0.8%

Table 4, (continued)

DEPARTURE FLIGHT TRACK UTILIZATION PERCENTAGES –  
EXISTING CONDITIONS

Runway End	Track ID	Heavy Jets	Large Cargo Jets	Large Passenger Jets	Propeller Aircraft	Regional / Business Jets
36C	DT51X	0.0%	3.8%	0.0%	0.0%	0.0%
	DT54	0.0%	0.0%	0.0%	1.2%	1.3%
	DT55X	0.0%	0.0%	0.0%	0.4%	0.4%
	DT56	0.0%	0.0%	0.0%	1.4%	1.1%
	DTE1	0.0%	0.0%	0.0%	0.0%	0.0%
	DTG1X	3.8%	0.0%	3.0%	0.0%	0.0%
	DTW2	0.0%	0.0%	0.0%	0.0%	0.0%
36L	D60D	0.0%	0.0%	0.0%	0.0%	0.6%
36R	D3G1	0.5%	1.7%	0.0%	0.0%	0.0%
	D3G2	2.8%	0.2%	0.1%	0.0%	0.0%
	D3G2	0.0%	0.0%	0.0%	0.0%	0.0%
	D3G3	0.5%	3.6%	0.0%	0.0%	0.0%
	D3J1	0.0%	0.0%	0.3%	0.0%	0.0%
	D3J1	0.0%	0.0%	1.9%	0.0%	0.0%
	D3J2	0.0%	0.0%	0.0%	0.0%	0.0%
	D3J2	0.1%	0.3%	0.3%	0.0%	0.1%
	D3J3	0.0%	0.0%	4.2%	0.0%	0.0%
	DT46	0.0%	0.0%	0.0%	0.3%	1.4%
	DT46	0.0%	0.0%	0.0%	2.3%	2.3%
	DT47	0.0%	0.0%	0.0%	0.1%	0.6%
	DT47	0.0%	0.0%	0.0%	0.9%	0.9%
	DT48	0.0%	0.0%	0.0%	0.1%	0.3%
	DT48	0.0%	0.0%	0.0%	0.9%	0.5%
	DT49	0.0%	0.0%	0.0%	0.3%	1.6%
	DT49	0.0%	0.0%	0.0%	3.1%	2.6%
	DTNE1	2.9%	1.4%	0.0%	0.0%	0.3%
	DTNE1	0.0%	0.0%	0.0%	0.0%	0.5%
	DTNW1	0.1%	0.0%	0.0%	0.0%	0.0%
	DTNW1	0.3%	0.0%	0.0%	0.0%	0.0%
	DTSE1	0.2%	3.0%	0.6%	0.0%	0.0%
	DTSE2	0.0%	0.0%	0.0%	0.0%	0.3%
	DTSE2	0.0%	0.0%	0.0%	0.0%	0.5%
Total		100.0%	100.0%	100.0%	100.0%	100.0%

Source: FAA radar data, Landrum &amp; Brown analysis, 2018.

**Aircraft Weight and Trip Length:** Aircraft weight upon departure is a factor in the dispersion of noise because it impacts the rate at which an aircraft is able to climb. Generally, heavier aircraft have a slower rate of climb and a wider dispersion of noise along the flight route. Where specific aircraft weights are unknown, the AEDT uses the distance flown to the first stop as a surrogate for the weight, by assuming that the weight has a direct relationship with the fuel load necessary to reach the first destination. The AEDT groups trip lengths into nine stage categories and assigns standard aircraft weights to each stage category. These categories are:



<u>Stage Category</u>	<u>Stage Length</u>
1	0-500 nautical miles
2	501-1000 nautical miles
3	1001-1500 nautical miles
4	1501-2500 nautical miles
5	2501-3500 nautical miles
6	3501-4500 nautical miles
7	4501-5500 nautical miles
8	5501-6500 nautical miles
9	6500+ nautical miles

The trip lengths modeled for the Air Cargo Facility at CVG is based upon a review of aircraft departures primarily from analysis of OAG data and a review of previous noise analysis at CVG. Table 5 indicates the proportion of the operations that fell within each of the nine trip length categories during this time period. For the Existing conditions, the majority of departures operated to destinations with a stage length of one (0 to 500 nautical miles).

Table 5  
DEPARTURE TRIP LENGTH DISTRIBUTION  
EXISTING CONDITIONS

Stage Length Category	Heavy Jets	Large Cargo Jets	Large Passenger Jets	Propeller Aircraft	Regional / Business Jets
1	16.1%	31.9%	48.0%	100.0%	68.2%
2	29.3%	33.6%	43.0%	0.0%	26.5%
3	17.9%	11.8%	4.0%	0.0%	3.2%
4	16.0%	11.2%	4.7%	0.0%	2.2%
5	6.7%	4.2%	0.0%	0.0%	0.0%
6	6.7%	3.4%	0.3%	0.0%	0.0%
7	7.3%	3.9%	0.0%	0.0%	0.0%
8	0.0%	0.0%	0.0%	0.0%	0.0%
9	0.0%	0.0%	0.0%	0.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: FAA radar data, Landrum & Brown analysis, 2018.

## 5.2 FUTURE (2021) NO ACTION NOISE EXPOSURE CONTOUR INPUT DATA

Runway Definition: No changes to runway configuration are expected at CVG by 2021; therefore, the runway layout discussed for the existing condition was also used to model the Future (2021) No Action Noise Exposure Contour.

Number of Operations and Fleet Mix: The Future (2021) No Action Noise Exposure Contour operating levels are based **upon the FAA's Terminal Area Forecast (TAF)** issued in January 2018 plus additional air cargo activity that would occur with general growth in aviation demand and the expected increase in cargo operations that would occur with or without the Proposed Action. This growth in activity can be handled at the Airport without new facilities being constructed. The Future (2021) No Action conditions include 194,426 annual operations or 532.7 average-annual day operations, an increase of 29.2 percent from the Existing Noise Exposure Contour operating levels. Table 6 provides a summary of the average daily operations and fleet mix at CVG for the Future (2021) No Action conditions, organized by aircraft category, operation type, and time of day.

Table 6  
DISTRIBUTION OF AVERAGE DAILY OPERATIONS BY AIRCRAFT CATEGORY  
FUTURE (2021) NO ACTION CONDITIONS

Aircraft Type	Noise Model ID	Arrivals		Departures		Total
		Daytime	Nighttime	Daytime	Nighttime	
Heavy Jets						
Boeing 747-800 Freighter	7478	1.3	4.0	1.8	3.5	10.7
Boeing 747-400 Series Freighter	747R21	0.8	2.4	1.1	2.1	6.4
Boeing 767-300 Series	767300	12.1	21.8	14.2	19.6	67.7
Boeing 767-200 Series Freighter	767CF6	4.7	14.7	6.8	12.7	38.9
Boeing 777 Freighter	777FRE	0.6	1.8	0.8	1.5	4.7
Airbus A300F4-600 Series	A300-622R	0.3	1.0	0.5	0.9	2.7
Airbus A300-200 Series Freighter	A300B4-203	0.0	0.1	0.0	0.1	0.3
Airbus A300-200 Series Freighter	A330-301	6.0	6.0	6.0	6.0	24.0
Subtotal		25.8	51.9	31.3	46.4	155.3
Large Cargo Jets						
Boeing 727-200 Series Freighter	727EM2	0.1	0.3	0.1	0.2	0.7
Boeing 737-400 Series Freighter	737400	0.2	5.6	1.1	4.7	11.7
Boeing 737-800 Series	737800	2.0	2.0	2.0	2.0	8.0
Boeing 757-200 Series	757PW	3.2	0.6	3.4	0.4	7.5
Boeing 757-200 Series	757RR	1.8	0.3	1.9	0.2	4.2
Airbus A321-200 Series	A321-232c	1.0	2.0	1.0	2.0	6.0
Subtotal		8.3	10.8	9.6	9.5	38.1

Table 6, (continued)

DISTRIBUTION OF AVERAGE DAILY OPERATIONS BY AIRCRAFT CATEGORY  
FUTURE (2021) NO ACTION CONDITIONS

Aircraft Type	Noise Model ID	Arrivals		Departures		Total
		Daytime	Nighttime	Daytime	Nighttime	
Large Passenger Jets						
Boeing 717-200 Series	717200	2.2	2.2	2.2	2.2	8.7
Boeing 737-300 Series	737300	0.1	0.0	0.1	0.0	0.3
Boeing 737-700 Series	737700	4.9	0.9	5.2	0.5	11.5
Boeing 737-800 Series	737800	8.1	1.5	8.7	0.9	19.1
Boeing 737-900-ER	737900	0.8	0.2	0.9	0.1	2.0
Airbus A319-100 Series	A319-131	10.3	1.9	11.0	1.1	24.3
Airbus A320-200 Series	A320-211	11.1	2.0	11.9	1.2	26.2
Airbus A320-200 Series	A320-232	0.8	0.1	0.9	0.1	1.9
Airbus A321-100 Series	A321-232	3.2	0.6	3.4	0.4	7.6
Boeing MD-82	MD82	1.3	0.2	1.4	0.1	3.0
Boeing MD-83	MD83	6.7	1.2	7.1	0.7	15.8
Boeing MD-90	MD9025	0.3	0.1	0.3	0.0	0.7
Subtotal		38.7	8.4	41.4	5.7	121.1
Regional Jets						
Bombardier CRJ-100	CLREGJ	9.5	1.0	9.5	1.0	21.0
Bombardier CRJ-700-ER	CRJ701	23.9	4.4	25.6	2.6	56.6
Bombardier CRJ-900	CRJ9-ER	26.7	4.9	28.6	2.9	63.0
Embraer ERJ145-EP	EMB145	5.7	0.6	5.7	0.6	12.6
Embraer ERJ170	EMB170	5.4	1.0	5.8	0.6	12.7
Embraer ERJ175	EMB175	11.9	2.2	12.8	1.3	28.2
Subtotal		83.0	14.0	88.0	9.0	194.1
Business Jets						
Cessna 650 Citation III	CIT3	0.1	0.0	0.1	0.0	0.1
Bombardier Challenger 600	CL600	0.6	0.1	0.7	0.1	1.4
Bombardier Challenger 601	CL601	0.1	0.0	0.1	0.0	0.1
Cessna 500 Citation I	CNA500	0.7	0.5	0.7	0.4	2.3
Cessna Citation Mustang 510	CNA510	0.0	0.0	0.0	0.0	0.1
Cessna 525 CitationJet	CNA525C	0.3	0.2	0.3	0.2	1.0
Cessna 550 Citation II Bravo	CNA55B	0.5	0.1	0.5	0.1	1.1
Cessna 560 Citation Ultra	CNA560U	0.1	0.0	0.1	0.0	0.3
Cessna 560 Citation Excel	CNA560XL	0.5	0.1	0.5	0.0	1.1
Cessna 680 Citation Sovereign	CNA680	0.1	0.0	0.1	0.0	0.1
Cessna 750 Citation X	CNA750	0.1	0.0	0.1	0.0	0.1
Eclipse Aerospace EA500	ECLIPSE500	0.0	0.0	0.0	0.0	0.1
Fokker 100	F10062	0.1	0.0	0.1	0.0	0.1
Gulfstream G-IIIB	GIIB	0.1	0.0	0.1	0.0	0.1
Gulfstream G450	GIV	0.2	0.0	0.2	0.0	0.4
Gulfstream V	GV	0.1	0.0	0.1	0.0	0.2
Raytheon Hawker 800	IA1125	0.1	0.0	0.1	0.0	0.3
Bombardier Learjet 60	LEAR35	0.6	0.1	0.6	0.1	1.4
Mitsubishi MU-300	MU3001	0.2	0.0	0.2	0.0	0.4
Subtotal		4.4	1.0	4.4	0.9	10.8

Table 6, (continued)

DISTRIBUTION OF AVERAGE DAILY OPERATIONS BY AIRCRAFT CATEGORY  
FUTURE (2021) NO ACTION CONDITIONS

STORE (2021) NO ACTION CONDITIONS

Aircraft Type	Noise Model ID	Arrivals		Departures		Total
		Daytime	Nighttime	Daytime	Nighttime	
Propeller Aircraft						
Raytheon Beechcraft 1900	1900D	0.4	0.0	0.4	0.0	0.9
Beechcraft Baron 58P	BEC58P	0.4	0.0	0.4	0.0	0.9
Cessna 172 Skyhawk	CNA172	0.3	0.2	0.3	0.2	1.1
Cessna 182 Skyhawk	CNA182	0.1	0.0	0.1	0.0	0.2
Cessna 206 Caravan	CNA206	0.1	0.0	0.1	0.0	0.2
Cessna 208 Caravan	CNA208	0.8	0.5	0.9	0.5	2.7
Cessna 441 Conquest II	CNA441	0.9	0.1	0.9	0.1	2.0
De Havilland Canada DHC6 Twin Otter	DHC6	0.7	0.1	0.7	0.1	1.6
Dornier Do 228	DO228	0.0	0.0	0.0	0.0	0.1
Embraer EMB120 Brasilia	EMB120	0.2	0.1	0.2	0.1	0.6
General Aviation Single Engine Prop	GASEPV	0.8	0.1	0.8	0.1	1.8
Piper PA-28 Cherokee	PA28	0.1	0.1	0.1	0.1	0.3
Shorts 330 Series	SD330	0.2	0.2	0.3	0.1	0.8
Subtotal		5.2	1.5	5.3	1.4	13.3
Grand Total		165.2	87.7	180.0	72.9	532.7

Notes: Day = 7:00 a.m. to 9:59 p.m., Night = 10:00 p.m. to 6:59 a.m.

Totals may not equal sum due to rounding.

Source: FAA Operations Network (OPSNET) data, APO Terminal Area Forecast, CVG Flight Tracking System Data, Landrum &amp; Brown, 2018.

Runway End Utilization: Average-annual day runway end utilization in 2021 is expected to be similar to what was modeled for the Existing Noise Exposure Contour as shown in Table 2.

Flight Tracks: Minimal changes to flight track locations or utilization percentages are expected to occur by 2021. Flight track percentages modeled for the Future (2021) No Action Noise Exposure Contour are shown in Table 7 and Table 8.

Table 7  
ARRIVAL FLIGHT TRACK UTILIZATION PERCENTAGES –  
FUTURE (2021) NO ACTION CONDITIONS

Runway End	Track ID	Heavy Jets	Large Cargo Jets	Large Passenger Jets	Propeller Aircraft	Regional / Business Jets
09	AT61	40.7%	10.3%	10.7%	10.2%	2.8%
27	AT31	2.5%	0.9%	4.4%	5.6%	2.4%
	AT32	1.2%	0.7%	2.1%	2.4%	1.6%
	AT33	0.6%	0.2%	2.4%	1.3%	2.3%
18C	AT20	0.0%	0.0%	0.0%	4.4%	3.7%
	AT22	4.7%	0.0%	4.5%	0.0%	0.0%
	AT23	6.7%	18.9%	11.9%	0.0%	0.0%
	AT24	1.6%	3.2%	3.4%	0.0%	0.0%
	AT25	1.9%	0.0%	6.3%	0.0%	0.0%
	AT26	0.0%	0.0%	0.0%	2.9%	3.4%
	AT27	0.0%	0.0%	0.0%	1.1%	1.1%
	AT28	0.0%	0.0%	0.0%	1.1%	1.1%
	AT29	0.0%	0.0%	0.0%	4.2%	5.3%
	AT2B	0.0%	0.0%	0.0%	2.9%	3.4%
	AT2F	0.0%	0.0%	0.0%	1.1%	1.1%
	AT2G	0.0%	0.0%	0.0%	1.1%	1.1%
	AT2N	0.0%	0.0%	0.0%	4.2%	5.3%
	AT2V	0.0%	0.0%	0.0%	4.4%	3.7%
18L	AT11	1.1%	0.0%	4.0%	0.0%	0.0%
	AT12	8.1%	18.5%	14.8%	0.0%	0.0%
	AT13	5.7%	0.0%	5.7%	0.0%	0.0%
	AT14	2.0%	3.1%	4.3%	0.0%	0.0%
	AT15	1.1%	0.0%	4.0%	0.0%	0.0%
	AT16	0.0%	0.0%	0.0%	6.5%	8.1%
	AT17	0.0%	0.0%	0.0%	5.0%	5.4%
	AT18	0.0%	0.0%	0.0%	9.6%	12.5%
	AT19	0.0%	0.0%	0.0%	9.9%	8.6%



Table 7, (continued)  
ARRIVAL FLIGHT TRACK UTILIZATION PERCENTAGES –  
FUTURE (2021) NO ACTION CONDITIONS

Runway End	Track ID	Heavy Jets	Large Cargo Jets	Large Passenger Jets	Propeller Aircraft	Regional / Business Jets
18R	A701	0.2%	0.2%	0.2%	0.8%	1.4%
36C	AT50	0.0%	0.0%	0.0%	1.5%	1.4%
	AT51	0.9%	0.0%	2.2%	0.0%	0.0%
	AT52	3.1%	8.2%	4.2%	0.0%	0.0%
	AT53	0.8%	1.4%	1.2%	0.0%	0.0%
	AT54	2.2%	0.0%	1.5%	0.0%	0.0%
	AT55	0.0%	0.0%	0.0%	0.5%	0.9%
	AT56	0.0%	0.0%	0.0%	1.2%	1.6%
	AT57	0.0%	0.0%	0.0%	1.2%	0.9%
	AT58	0.0%	0.0%	0.0%	0.7%	0.9%
	AT59	0.0%	0.0%	0.0%	0.7%	0.9%
	AT5B	0.0%	0.0%	0.0%	0.7%	0.9%
	AT5F	0.0%	0.0%	0.0%	0.5%	0.9%
	AT5N	0.0%	0.0%	0.0%	1.2%	1.6%
	AT5V	0.0%	0.0%	0.0%	1.5%	1.4%
36L	A601	0.0%	0.1%	0.0%	0.1%	0.0%
36R	AT41	6.6%	29.5%	6.2%	0.0%	0.0%
	AT42	1.9%	0.0%	2.6%	0.0%	0.0%
	AT43	4.7%	0.0%	1.8%	0.0%	0.0%
	AT44	1.6%	4.9%	1.6%	0.0%	0.0%
	AT46	0.0%	0.0%	0.0%	7.1%	6.8%
	AT47	0.0%	0.0%	0.0%	1.2%	2.2%
	AT48	0.0%	0.0%	0.0%	3.4%	5.1%
Total		100%	100%	100%	100%	100%

Source: FAA radar data, Landrum & Brown analysis, 2018.

Table 8  
DEPARTURE FLIGHT TRACK UTILIZATION PERCENTAGES –  
FUTURE (2021) NO ACTION CONDITIONS

Runway End	Track ID	Heavy Jets	Large Cargo Jets	Large Passenger Jets	Propeller Aircraft	Regional / Business Jets
09	DT61	0.0%	0.1%	0.0%	0.0%	0.0%
	DT62	0.0%	0.0%	0.0%	0.0%	0.0%
	DT63	0.0%	0.0%	0.0%	0.0%	0.0%
27	D2G1	0.8%	0.0%	3.3%	0.0%	0.0%
	D2G2	83.2%	0.0%	53.2%	0.0%	0.0%
	D2G3	0.8%	0.0%	3.3%	0.0%	0.0%
	D2J4	0.0%	27.0%	1.3%	0.0%	0.0%
	D2J5	0.0%	32.5%	1.5%	0.0%	0.0%
	D2J6	0.0%	9.7%	0.5%	0.0%	0.0%
	DT30	0.0%	0.0%	0.0%	4.3%	5.9%
	DT36	0.0%	0.0%	0.0%	7.0%	7.9%
	DT37	0.0%	0.0%	0.0%	14.3%	11.8%
	DT38	0.0%	0.0%	0.0%	11.6%	7.2%
	DT39	0.0%	0.0%	0.0%	6.6%	5.9%
	DT3A	0.0%	0.0%	0.0%	4.6%	5.9%
	DT3R	0.0%	0.0%	0.0%	2.7%	3.9%
	DT3X	0.0%	0.0%	0.0%	8.6%	5.3%
	DT3Y	0.0%	0.0%	0.0%	3.3%	5.3%
	DT3Z	0.0%	0.0%	3.3%	1.7%	2.6%
	DTE2	0.0%	0.0%	3.3%	1.7%	3.9%
18C	D1G5	2.8%	0.0%	2.3%	0.0%	0.0%
	D1G6	0.0%	0.0%	0.1%	0.0%	0.0%
	D1J5	0.0%	1.5%	0.1%	0.0%	0.0%
	D1J6	0.0%	0.1%	0.0%	0.0%	0.9%
	DT20	0.0%	0.0%	0.0%	0.4%	0.2%
	DT28	0.0%	0.0%	0.0%	1.1%	0.4%
	DT29	0.0%	0.0%	0.0%	0.3%	0.1%
	DT2A	0.0%	0.0%	0.0%	0.3%	0.2%
	DT2Y	0.0%	0.0%	0.0%	0.2%	0.2%
	DTNW3	0.0%	0.0%	0.7%	0.0%	0.1%
	DTNW4	0.0%	0.0%	0.0%	0.0%	0.0%
18L	D1G1	0.5%	0.0%	2.5%	0.0%	0.0%
	D1G2	2.0%	0.0%	13.2%	0.0%	0.0%
	D1J1	0.0%	1.7%	0.1%	0.0%	4.6%
	D1J2	0.0%	10.2%	0.4%	0.0%	6.6%
	DT16	0.0%	0.0%	0.0%	12.9%	2.4%
	DT17	0.0%	0.0%	0.0%	7.6%	1.6%
	DTSW1	0.0%	0.0%	0.0%	0.0%	0.5%
	DTW1	0.0%	0.0%	0.0%	0.0%	0.5%

Table 8, (continued)

DEPARTURE FLIGHT TRACK UTILIZATION PERCENTAGES –  
FUTURE (2021) NO ACTION CONDITIONS

Runway End	Track ID	Heavy Jets	Large Cargo Jets	Large Passenger Jets	Propeller Aircraft	Regional / Business Jets
18R	D701	0.0%	0.5%	0.0%	0.1%	0.8%
36C	DT51X	0.0%	3.4%	0.2%	0.0%	0.0%
	DT54	0.0%	0.0%	0.0%	1.2%	1.3%
	DT55X	0.0%	0.0%	0.0%	0.4%	0.4%
	DT56	0.0%	0.0%	0.0%	1.4%	1.1%
	DTE1	0.0%	0.0%	0.0%	0.0%	0.0%
	DTG1X	2.7%	0.0%	2.8%	0.0%	0.0%
	DTW2	0.0%	0.0%	0.0%	0.0%	0.0%
36L	D60D	0.0%	0.0%	0.0%	0.0%	0.6%
36R	D3G1	0.5%	1.6%	0.0%	0.0%	0.0%
	D3G2	2.0%	0.4%	0.1%	0.0%	0.0%
	D3G2	0.0%	0.0%	0.0%	0.0%	0.0%
	D3G3	0.5%	3.6%	0.1%	0.0%	0.0%
	D3J1	0.0%	0.0%	0.3%	0.0%	0.0%
	D3J1	0.0%	0.0%	1.8%	0.0%	0.0%
	D3J2	0.0%	0.0%	0.0%	0.0%	0.0%
	D3J2	0.1%	0.3%	0.3%	0.0%	0.1%
	D3J3	0.0%	0.0%	4.0%	0.0%	0.0%
	DT46	0.0%	0.0%	0.0%	0.3%	1.4%
	DT46	0.0%	0.0%	0.0%	2.3%	2.3%
	DT47	0.0%	0.0%	0.0%	0.1%	0.6%
	DT47	0.0%	0.0%	0.0%	0.8%	0.9%
	DT48	0.0%	0.0%	0.0%	0.1%	0.3%
	DT48	0.0%	0.0%	0.0%	0.8%	0.5%
	DT49	0.0%	0.0%	0.0%	0.4%	1.6%
	DT49	0.0%	0.0%	0.0%	3.0%	2.6%
	DTNE1	2.5%	2.4%	0.2%	0.0%	0.3%
	DTNE1	0.0%	0.0%	0.0%	0.0%	0.5%
	DTNW1	0.5%	0.0%	0.0%	0.0%	0.0%
	DTNW1	0.4%	0.0%	0.0%	0.0%	0.0%
	DTSE1	0.6%	5.2%	1.0%	0.0%	0.0%
	DTSE2	0.0%	0.0%	0.0%	0.0%	0.3%
	DTSE2	0.0%	0.0%	0.0%	0.0%	0.5%
Total		100.0%	100.0%	100.0%	100.0%	100.0%

Source: FAA radar data, Landrum &amp; Brown analysis, 2018.

**Aircraft Weight and Trip Length:** The trip lengths flown from CVG are based upon projected operations for the future conditions. There are no major changes in the destinations served by airlines from CVG as compared to the Existing condition. However, changes in the number of operations and fleet mix may result in small variations in the departure trip length distributions for the Future (2021) No Action conditions, as shown in Table 9.

Table 9  
DEPARTURE TRIP LENGTH DISTRIBUTION -  
FUTURE (2021) NO ACTION CONDITIONS

Stage Length Category	Heavy Passenger Jets	Cargo Jets	Large Passenger Jets	Propeller Aircraft	Regional / Business Jets
1	20.74%	36.50%	48.10%	100.00%	58.33%
2	31.80%	37.78%	43.33%	0.00%	34.42%
3	15.78%	8.81%	3.81%	0.00%	4.33%
4	15.55%	8.40%	4.44%	0.00%	2.92%
5	4.52%	3.03%	0.00%	0.00%	0.00%
6	6.64%	2.56%	0.32%	0.00%	0.00%
7	4.97%	2.92%	0.00%	0.00%	0.00%
8	0.0%	0.0%	0.0%	0.0%	0.0%
9	0.0%	0.0%	0.0%	0.0%	0.0%
Total	100%	100%	100%	100%	100%

Source: Official Airline Guide, Landrum & Brown, 2018.

Aircraft Engine Run-Ups: Engine run-ups were modeled to account for the expected increase in run-ups performed for maintenance purposes. Under the No Action, run-ups would be expected to occur on the north airfield just east of Runway 18C/36C as shown on Exhibit 4. The number of run-ups expected to be performed is based on the number of total operations and typical routine maintenance requirements. The number of run-ups modeled for the Future (2021) No Action is shown in Table 10.

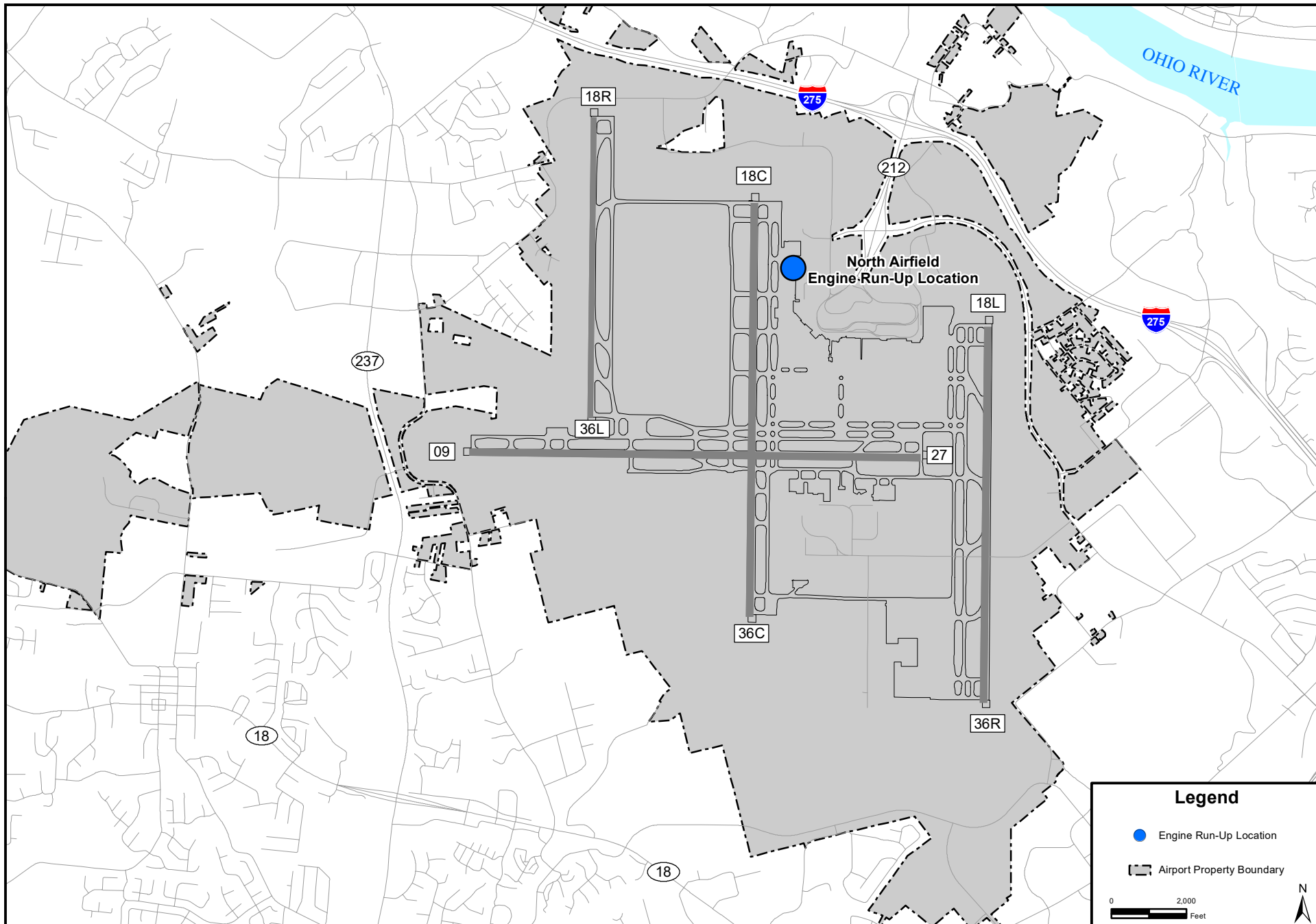
Table 10  
ENGINE RUN-UPS – FUTURE (2021) NO ACTION CONDITIONS

AEDT Aircraft ID	RUN-UP LOCATION	AIRCRAFT HEADING (DEGREES)	AVERAGE WEEKLY RUN-UPS		AVERAGE DURATION (IN MINUTES)	THRUST SETTING (LBS.)
			DAYTIME	NIGHTTIME		
737400	North Airfield	180	2.8	2.8	60	12,000
737400	North Airfield	360	4.2	4.2	60	12,000
737400	North Airfield	180	2.8	2.8	4	23,500
737400	North Airfield	360	4.2	4.2	4	23,500
767300	North Airfield	180	2.8	2.8	60	12,000
767300	North Airfield	360	4.2	4.2	60	12,000
767300	North Airfield	180	2.8	2.8	4	23,500
767300	North Airfield	360	4.2	4.2	4	23,500
TOTAL			28	28	n/a	n/a

Note: Daytime = 7:00 a.m. to 9:59 p.m., Nighttime = 10:00 p.m. to 6:59 a.m.  
n/a = total value not applicable

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### 5.3 FUTURE (2021) PROPOSED ACTION NOISE EXPOSURE CONTOUR INPUT DATA

**Runway Definition:** No changes to runway configuration are included as part of the Future (2021) Proposed Action; therefore, the runway layout discussed for the Future (2021) No Action was also used to model the Future (2021) Proposed Action Noise Exposure Contour.

**Number of Operations and Fleet Mix:** The Future (2021) Proposed Action operating levels would be the same as the Future (2021) No Action.

**Runway End Utilization:** The Future (2021) Proposed Action runway end utilization would be the same as the Future (2021) No Action.

**Flight Tracks:** The Future (2021) Proposed Action flight tracks would be the same as the Future (2021) No Action.

**Aircraft Weight and Trip Length:** The Future (2021) Proposed Action aircraft weight and trip lengths would be the same as the Future (2021) No Action.

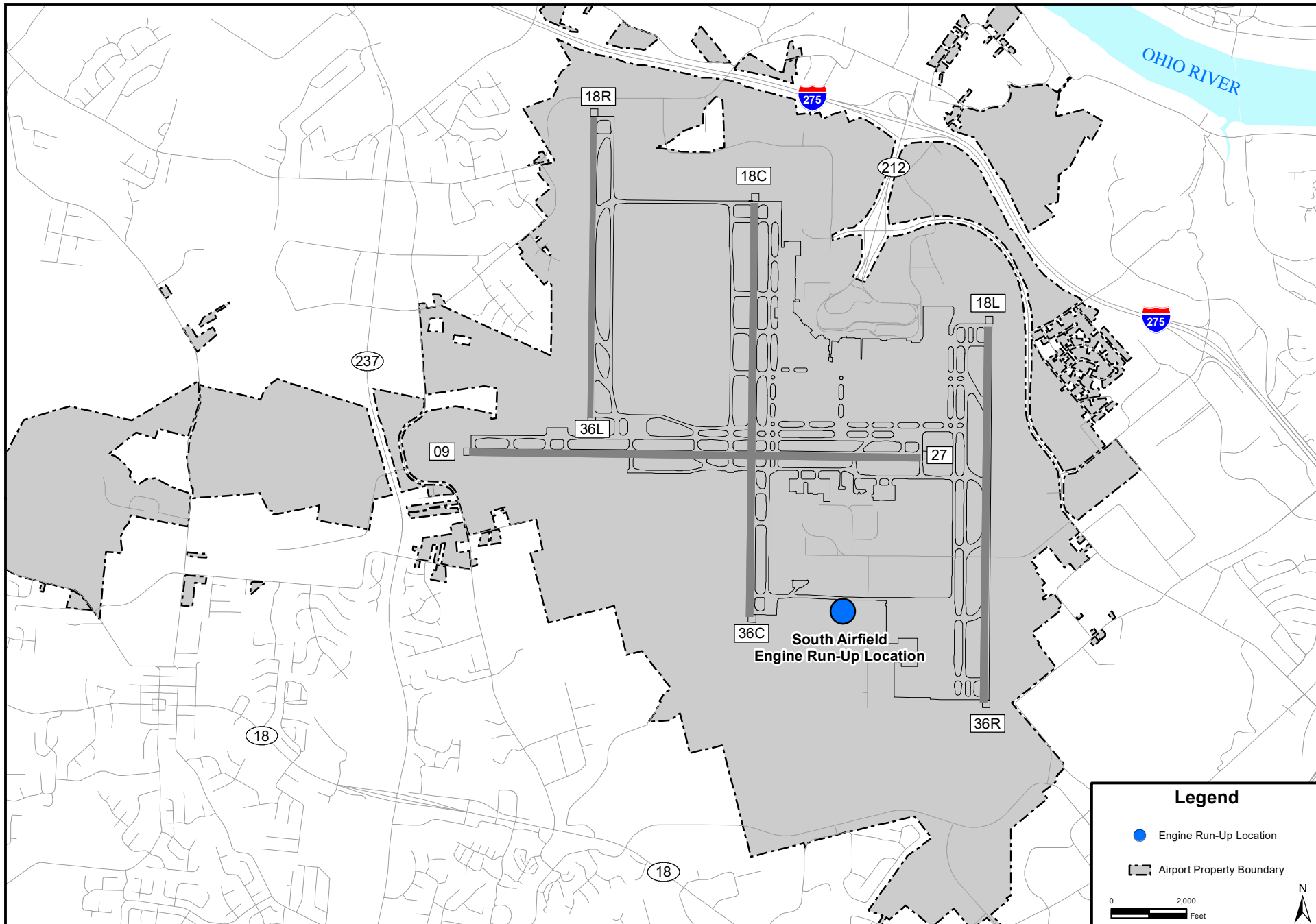
**Aircraft Engine Run-Ups:** The number of aircraft engine run-ups would remain the same for the Future (2021) Proposed Action as compared to the Future (2021) No Action. However, aircraft engine run-ups would occur at the proposed cargo facility on the south airfield. Therefore, engine run-up locations would be different under the Future (2021) Proposed Action as compared to the Future (2021) No Action as shown in Exhibit 5 and Table 11.

Table 11  
ENGINE RUN-UPS – FUTURE (2021) NO ACTION CONDITIONS

AEDT Aircraft ID	RUN-UP LOCATION	AIRCRAFT HEADING (DEGREES)	AVERAGE WEEKLY RUN-UPS		AVERAGE DURATION (IN MINUTES)	THRUST SETTING (LBS.)
			DAYTIME	NIGHTTIME		
737400	South Airfield	180	2.8	2.8	60	12,000
737400	South Airfield	360	4.2	4.2	60	12,000
737400	South Airfield	180	2.8	2.8	4	23,500
737400	South Airfield	360	4.2	4.2	4	23,500
767300	South Airfield	180	2.8	2.8	60	12,000
767300	South Airfield	360	4.2	4.2	60	12,000
767300	South Airfield	180	2.8	2.8	4	23,500
767300	South Airfield	360	4.2	4.2	4	23,500
TOTAL			28	28	n/a	n/a

Note: Daytime = 7:00 a.m. to 9:59 p.m., Nighttime = 10:00 p.m. to 6:59 a.m.  
n/a = total value not applicable

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**Legend**

- Engine Run-Up Location
- Airport Property Boundary

0 2,000 Feet

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## 5.4 FUTURE (2026) NO ACTION NOISE EXPOSURE CONTOUR INPUT DATA

Runway Definition: No changes to runway configuration are expected at CVG by 2026; therefore, the runway layout discussed for the Existing condition was also used to model the Future (2026) No Action Noise Exposure Contour.

Number of Operations and Fleet Mix: The Future (2026) No Action Noise Exposure Contour **operating levels are based upon the FAA's Terminal Area Forecast (TAF)** issued in January 2018 plus additional air cargo activity that would occur with general growth in aviation demand and the expected increase in cargo operations that would occur with or without the Proposed Action. However, unlike the 2021 operating levels, all of the anticipated growth in activity could not be accommodated at the Airport due to a lack of ramp and cargo processing facilities. The Future (2026) No Action condition includes 233,430 annual operations or 639.5 average-annual day operations, an increase of 20.1 percent from the Future (2021) No Action Noise Exposure Contour operating levels. Table 12 provides a summary of the average daily operations and fleet mix at CVG for the Future (2026) No Action conditions, organized by aircraft category, operation type, and time of day.

Table 12  
DISTRIBUTION OF AVERAGE DAILY OPERATIONS BY AIRCRAFT CATEGORY  
FUTURE (2026) NO ACTION CONDITIONS

STORE (2020) NO ACTION CONDITIONS

Aircraft Type	Noise Model ID	Arrivals		Departures		Total
		Daytime	Nighttime	Daytime	Nighttime	
Heavy Jets						
Boeing 747-800 Freighter	7478	1.5	4.7	2.1	4.0	12.4
Boeing 747-400 Series Freighter	747R21	0.9	2.8	1.3	2.4	7.4
Boeing 767-300 Series	767300	11.9	24.6	14.4	22.1	72.9
Boeing 767-200 Series Freighter	767CF6	5.5	17.1	7.8	14.8	45.3
Boeing 777 Freighter	777FRE	0.7	3.6	0.9	3.3	8.6
Airbus A300F4-600 Series	A300-622R	0.3	1.0	0.5	0.9	2.7
Airbus A300-200 Series Freighter	A300B4-203	0.0	0.1	0.0	0.1	0.3
Airbus A300-200 Series Freighter	A330-301	5.0	6.2	5.0	6.2	22.4
Subtotal		25.8	60.2	32.1	53.8	171.9
Large Cargo Jets						
Boeing 727-200 Series Freighter	727EM2	0.1	0.3	0.1	0.2	0.7
Boeing 737-400 Series Freighter	737400	0.2	6.5	1.3	5.5	13.6
Boeing 737-800 Series	737800	13.0	7.0	13.0	7.0	40.0
Boeing 757-200 Series	757PW	3.7	0.7	4.0	0.4	8.8
Boeing 757-200 Series	757RR	2.1	0.4	2.2	0.2	4.9
Airbus A321-200 Series	A321-232c	12.0	7.0	12.0	7.0	38.0
Subtotal		31.1	21.9	32.6	20.3	105.9

Table 12, (continued)

DISTRIBUTION OF AVERAGE DAILY OPERATIONS BY AIRCRAFT CATEGORY  
FUTURE (2026) NO ACTION CONDITIONS

Aircraft Type	Noise Model ID	Arrivals		Departures		Total
		Daytime	Nighttime	Daytime	Nighttime	
Large Passenger Jets						
Boeing 717-200 Series	717200	2.5	2.5	2.5	2.5	10.2
Boeing 737-300 Series	737300	0.1	0.0	0.1	0.0	0.3
Boeing 737-700 Series	737700	5.6	1.0	6.0	0.6	13.3
Boeing 737-800 Series	737800	9.4	1.7	10.1	1.0	22.2
Boeing 737-900-ER	737900	1.0	0.2	1.0	0.1	2.3
Airbus A319-100 Series	A319-131	11.9	2.2	12.8	1.3	28.2
Airbus A320-200 Series	A320-211	12.9	2.4	13.8	1.4	30.5
Airbus A320-200 Series	A320-232	0.9	0.2	1.0	0.1	2.2
Airbus A321-100 Series	A321-232	3.7	0.7	4.0	0.4	8.8
Boeing MD-82	MD82	1.3	0.2	1.4	0.1	3.0
Boeing MD-83	MD83	6.7	1.2	7.1	0.7	15.8
Boeing MD-90	MD9025	0.4	0.1	0.4	0.0	0.8
Subtotal		38.7	8.4	41.4	5.7	137.7
Regional Jets						
Bombardier CRJ-100	CLREGJ	4.6	0.5	4.7	0.5	10.3
Bombardier CRJ-700-ER	CRJ701	27.8	5.1	29.8	3.1	65.8
Bombardier CRJ-900	CRJ9-ER	31.0	5.7	33.2	3.4	73.3
Embraer ERJ145-EP	EMB145	2.8	0.3	2.8	0.3	6.2
Embraer ERJ170	EMB170	6.2	1.1	6.7	0.7	14.7
Embraer ERJ175	EMB175	13.8	2.5	14.8	1.5	32.7
Subtotal		86.3	15.2	92.0	9.5	203.0
Business Jets						
Cessna 650 Citation III	CIT3	0.1	0.0	0.1	0.0	0.1
Bombardier Challenger 600	CL600	0.3	0.0	0.3	0.0	0.7
Bombardier Challenger 601	CL601	0.0	0.0	0.0	0.0	0.1
Cessna 500 Citation I	CNA500	0.7	0.5	0.7	0.4	2.3
Cessna Citation Mustang 510	CNA510	0.0	0.0	0.0	0.0	0.1
Cessna 525 Citation Jet	CNA525C	0.3	0.2	0.3	0.2	1.0
Cessna 550 Citation II Bravo	CNA55B	0.5	0.1	0.5	0.1	1.1
Cessna 560 Citation Ultra	CNA560U	0.1	0.0	0.1	0.0	0.3
Cessna 560 Citation Excel	CNA560XL	0.5	0.1	0.5	0.0	1.1
Cessna 680 Citation Sovereign	CNA680	0.1	0.0	0.1	0.0	0.1
Cessna 750 Citation X	CNA750	0.1	0.0	0.1	0.0	0.1
Eclipse Aerospace EA500	ECLIPSE500	0.0	0.0	0.0	0.0	0.1
Fokker 100	F10062	0.0	0.0	0.0	0.0	0.1
Gulfstream G-IIIB	GIIB	0.0	0.0	0.0	0.0	0.1
Gulfstream G450	GIV	0.2	0.0	0.2	0.0	0.4
Gulfstream V	GV	0.0	0.0	0.0	0.0	0.1
Raytheon Hawker 800	IA1125	0.1	0.0	0.1	0.0	0.3
Bombardier Learjet 60	LEAR35	0.6	0.1	0.6	0.1	1.4
Mitsubishi MU-300	MU3001	0.2	0.0	0.2	0.0	0.4
Subtotal		3.9	1.0	4.0	0.9	9.7

Table 12, (continued)

DISTRIBUTION OF AVERAGE DAILY OPERATIONS BY AIRCRAFT CATEGORY  
FUTURE (2026) NO ACTION CONDITIONS

Aircraft Type	Noise Model ID	Arrivals		Departures		Total
		Daytime	Nighttime	Daytime	Nighttime	
Propeller Aircraft						
Raytheon Beechcraft 1900	1900D	0.2	0.0	0.2	0.0	0.4
Beechcraft Baron 58P	BEC58P	0.4	0.0	0.4	0.0	0.9
Cessna 172 Skyhawk	CNA172	0.3	0.2	0.3	0.2	1.1
Cessna 182 Skyhawk	CNA182	0.1	0.0	0.1	0.0	0.2
Cessna 206 Caravan	CNA206	0.1	0.0	0.1	0.0	0.2
Cessna 208 Caravan	CNA208	0.8	0.5	0.9	0.5	2.7
Cessna 441 Conquest II	CNA441	0.9	0.1	0.9	0.1	2.0
De Havilland Canada DHC6 Twin Otter	DHC6	0.4	0.0	0.4	0.0	0.8
Dornier Do 228	DO228	0.0	0.0	0.0	0.0	0.0
Embraer EMB120 Brasilia	EMB120	0.1	0.1	0.1	0.1	0.3
General Aviation Single Engine Prop	GASEPV	0.8	0.1	0.8	0.1	1.8
Piper PA-28 Cherokee	PA28	0.1	0.1	0.1	0.1	0.3
Shorts 330 Series	SD330	0.1	0.1	0.1	0.1	0.4
Subtotal		4.4	1.3	4.5	1.2	11.3
Grand Total		190.1	107.9	206.6	91.4	639.5

Notes: Day = 7:00 a.m. to 9:59 p.m., Night = 10:00 p.m. to 6:59 a.m.

Totals may not equal sum due to rounding.

Source: FAA Operations Network (OPSNET) data, APO Terminal Area Forecast, CVG Flight Tracking System Data, Landrum &amp; Brown, 2018.

Runway End Utilization: Average-annual day runway end utilization in 2026 is expected to remain the same as the Future (2021) No Action conditions.

Flight Tracks: Minimal changes to flight tracks locations or utilization percentages are expected to occur by 2026. Flight track percentages modeled for the Future (2026) No Action Noise Exposure Contour are shown in Table 13 and Table 14.

Table 13  
ARRIVAL FLIGHT TRACK UTILIZATION PERCENTAGES –  
FUTURE (2026) NO ACTION CONDITIONS

Runway End	Track ID	Heavy Jets	Large Cargo Jets	Large Passenger Jets	Propeller Aircraft	Regional / Business Jets
09	AT61	42.6%	8.4%	9.9%	10.2%	2.9%
27	AT31	2.6%	1.1%	3.9%	5.7%	2.4%
	AT32	1.2%	0.8%	1.9%	2.5%	1.6%
	AT33	0.7%	0.2%	2.0%	1.3%	2.3%
18C	AT20	0.0%	0.0%	0.0%	4.4%	3.6%
	AT22	4.6%	0.0%	3.7%	0.0%	0.0%
	AT23	6.5%	21.3%	14.1%	0.0%	0.0%
	AT24	1.6%	3.6%	3.5%	0.0%	0.0%
	AT25	1.9%	0.0%	5.2%	0.0%	0.0%
	AT26	0.0%	0.0%	0.0%	2.9%	3.4%
	AT27	0.0%	0.0%	0.0%	1.1%	1.1%
	AT28	0.0%	0.0%	0.0%	1.1%	1.1%
	AT29	0.0%	0.0%	0.0%	4.2%	5.3%
	AT2B	0.0%	0.0%	0.0%	2.9%	3.4%
	AT2F	0.0%	0.0%	0.0%	1.1%	1.1%
	AT2G	0.0%	0.0%	0.0%	1.1%	1.1%
	AT2N	0.0%	0.0%	0.0%	4.2%	5.3%
	AT2V	0.0%	0.0%	0.0%	4.4%	3.6%
18L	AT11	1.0%	0.0%	3.3%	0.0%	0.0%
	AT12	7.3%	21.4%	16.6%	0.0%	0.0%
	AT13	5.2%	0.0%	4.7%	0.0%	0.0%
	AT14	1.8%	3.6%	4.3%	0.0%	0.0%
	AT15	1.0%	0.0%	3.3%	0.0%	0.0%
	AT16	0.0%	0.0%	0.0%	6.5%	8.0%
	AT17	0.0%	0.0%	0.0%	5.0%	5.3%
	AT18	0.0%	0.0%	0.0%	9.6%	12.5%
18R	AT19	0.0%	0.0%	0.0%	9.9%	8.6%
	A701	0.1%	0.2%	0.2%	0.8%	1.4%
36C	AT50	0.0%	0.0%	0.0%	1.5%	1.4%
	AT51	0.9%	0.0%	1.8%	0.0%	0.0%
	AT52	3.1%	8.4%	5.0%	0.0%	0.0%
	AT53	0.8%	1.4%	1.2%	0.0%	0.0%
	AT54	2.2%	0.0%	1.2%	0.0%	0.0%
	AT55	0.0%	0.0%	0.0%	0.5%	0.9%
	AT56	0.0%	0.0%	0.0%	1.2%	1.6%
	AT57	0.0%	0.0%	0.0%	1.2%	0.9%
	AT58	0.0%	0.0%	0.0%	0.7%	0.9%
	AT59	0.0%	0.0%	0.0%	0.7%	0.9%
	AT5B	0.0%	0.0%	0.0%	0.7%	0.9%
	AT5F	0.0%	0.0%	0.0%	0.5%	0.9%
	AT5N	0.0%	0.0%	0.0%	1.2%	1.6%
	AT5V	0.0%	0.0%	0.0%	1.5%	1.4%



Table 13, (continued)  
ARRIVAL FLIGHT TRACK UTILIZATION PERCENTAGES –  
FUTURE (2026) NO ACTION CONDITIONS

Runway End	Track ID	Heavy Jets	Large Cargo Jets	Large Passenger Jets	Propeller Aircraft	Regional / Business Jets
36L	A601	0.0%	0.1%	0.0%	0.1%	0.0%
36R	AT41	6.6%	25.4%	8.7%	0.0%	0.0%
	AT42	1.9%	0.0%	2.1%	0.0%	0.0%
	AT43	4.7%	0.0%	1.5%	0.0%	0.0%
	AT44	1.6%	4.2%	1.9%	0.0%	0.0%
	AT46	0.0%	0.0%	0.0%	7.1%	6.9%
	AT47	0.0%	0.0%	0.0%	1.2%	2.2%
	AT48	0.0%	0.0%	0.0%	3.4%	5.1%
Total		100.0%	100.0%	100.0%	100.0%	100.0%

Source: FAA radar data, Landrum & Brown analysis, 2018.

Table 14  
DEPARTURE FLIGHT TRACK UTILIZATION PERCENTAGES –  
FUTURE (2026) NO ACTION CONDITIONS

Runway End	Track ID	Heavy Jets	Large Cargo Jets	Large Passenger Jets	Propeller Aircraft	Regional / Business Jets
09	DT61	0.0%	0.1%	0.0%	0.0%	0.0%
	DT62	0.0%	0.0%	0.0%	0.0%	0.0%
	DT63	0.0%	0.0%	0.0%	0.0%	0.0%
27	D2G1	0.8%	0.0%	2.7%	0.0%	0.0%
	D2G2	83.2%	0.0%	43.8%	0.0%	0.0%
	D2G3	0.8%	0.0%	2.7%	0.0%	0.0%
	D2J4	0.0%	26.9%	5.8%	0.0%	0.0%
	D2J5	0.0%	32.4%	7.0%	0.0%	0.0%
	D2J6	0.0%	9.6%	2.1%	0.0%	0.0%
	DT30	0.0%	0.0%	0.0%	4.3%	5.9%
	DT36	0.0%	0.0%	0.0%	7.0%	7.9%
	DT37	0.0%	0.0%	0.0%	14.3%	11.8%
	DT38	0.0%	0.0%	0.0%	11.6%	7.2%
	DT39	0.0%	0.0%	0.0%	6.6%	5.9%
	DT3A	0.0%	0.0%	0.0%	4.6%	5.9%
	DT3R	0.0%	0.0%	0.0%	2.7%	3.9%
	DT3X	0.0%	0.0%	0.0%	8.6%	5.3%
	DT3Y	0.0%	0.0%	0.0%	3.3%	5.3%
	DT3Z	0.0%	0.0%	2.7%	1.7%	2.6%
	DTE2	0.0%	0.0%	2.7%	1.7%	3.9%
18C	D1G5	2.7%	0.0%	1.9%	0.0%	0.0%
	D1G6	0.0%	0.0%	0.1%	0.0%	0.0%
	D1J5	0.0%	1.6%	0.4%	0.0%	0.0%
	D1J6	0.0%	0.1%	0.0%	0.0%	0.9%
	DT20	0.0%	0.0%	0.0%	0.4%	0.2%
	DT28	0.0%	0.0%	0.0%	1.1%	0.4%
	DT29	0.0%	0.0%	0.0%	0.3%	0.1%
	DT2A	0.0%	0.0%	0.0%	0.3%	0.2%
	DT2Y	0.0%	0.0%	0.0%	0.2%	0.2%
	DTNW3	0.0%	0.0%	0.6%	0.0%	0.1%
18L	D1G1	0.5%	0.0%	2.1%	0.0%	0.0%
	D1G2	1.9%	0.0%	10.8%	0.0%	0.0%
	D1J1	0.0%	1.8%	0.4%	0.0%	4.6%
	D1J2	0.0%	11.0%	2.4%	0.0%	6.6%
	DT16	0.0%	0.0%	0.0%	12.8%	2.4%
	DT17	0.0%	0.0%	0.0%	7.5%	1.6%
	DTSW1	0.0%	0.0%	0.0%	0.0%	0.5%
	DTW1	0.0%	0.0%	0.0%	0.0%	0.5%
18R	D701	0.0%	0.5%	0.1%	0.1%	0.8%

Table 14, (continued)

DEPARTURE FLIGHT TRACK UTILIZATION PERCENTAGES –  
FUTURE (2026) NO ACTION CONDITIONS

Runway End	Track ID	Heavy Jets	Large Cargo Jets	Large Passenger Jets	Propeller Aircraft	Regional / Business Jets
36C	DT51X	0.0%	3.1%	0.7%	0.0%	0.0%
	DT54	0.0%	0.0%	0.0%	1.2%	1.3%
	DT55X	0.0%	0.0%	0.0%	0.4%	0.4%
	DT56	0.0%	0.0%	0.0%	1.5%	1.1%
	DTE1	0.0%	0.0%	0.0%	0.0%	0.0%
	DTG1X	2.7%	0.0%	2.3%	0.0%	0.0%
	DTW2	0.0%	0.0%	0.0%	0.0%	0.0%
36L	D60D	0.0%	0.0%	0.0%	0.0%	0.6%
36R	D3G1	0.5%	1.9%	0.4%	0.0%	0.0%
	D3G2	2.1%	0.3%	0.1%	0.0%	0.0%
	D3G2	0.0%	0.0%	0.0%	0.0%	0.0%
	D3G3	0.5%	4.0%	0.9%	0.0%	0.0%
	D3J1	0.0%	0.0%	0.2%	0.0%	0.0%
	D3J1	0.0%	0.0%	1.5%	0.0%	0.0%
	D3J2	0.0%	0.0%	0.0%	0.0%	0.0%
	D3J2	0.1%	0.3%	0.3%	0.0%	0.1%
	D3J3	0.0%	0.0%	3.3%	0.0%	0.0%
	DT46	0.0%	0.0%	0.0%	0.3%	1.4%
	DT46	0.0%	0.0%	0.0%	2.3%	2.3%
	DT47	0.0%	0.0%	0.0%	0.1%	0.6%
	DT47	0.0%	0.0%	0.0%	0.8%	0.9%
	DT48	0.0%	0.0%	0.0%	0.1%	0.3%
	DT48	0.0%	0.0%	0.0%	0.8%	0.5%
	DT49	0.0%	0.0%	0.0%	0.4%	1.6%
	DT49	0.0%	0.0%	0.0%	3.0%	2.6%
	DTNE1	2.6%	2.0%	0.4%	0.0%	0.3%
	DTNE1	0.0%	0.0%	0.0%	0.0%	0.5%
	DTNW1	0.5%	0.0%	0.0%	0.0%	0.0%
	DTNW1	0.4%	0.0%	0.0%	0.0%	0.0%
	DTSE1	0.7%	4.3%	1.4%	0.0%	0.0%
	DTSE2	0.0%	0.0%	0.0%	0.0%	0.3%
	DTSE2	0.0%	0.0%	0.0%	0.0%	0.5%
Total		100.0%	100.0%	100.0%	100.0%	100.0%

**Aircraft Weight and Trip Length:** The trip lengths flown from CVG are based upon projected operations for the future conditions. There are no major changes in the destinations served by airlines at CVG from Future (2021) No Action conditions. However, changes in the number of operations and fleet mix may result in small variations in the departure trip length distributions, as shown in Table 15.

Table 15  
DEPARTURE TRIP LENGTH DISTRIBUTION  
FUTURE (2026) NO ACTION CONDITIONS

Stage Length Category	Heavy Passenger Jets	Cargo Jets	Large Passenger Jets	Propeller Aircraft	Regional / Business Jets
1	19.7%	45.3%	48.0%	100.0%	53.8%
2	30.9%	45.7%	43.0%	0.0%	38.0%
3	15.8%	3.1%	4.0%	0.0%	4.8%
4	15.3%	2.9%	4.6%	0.0%	3.3%
5	4.7%	1.0%	0.0%	0.0%	0.0%
6	6.5%	0.9%	0.3%	0.0%	0.0%
7	7.0%	1.0%	0.0%	0.0%	0.0%
8	0.0%	0.0%	0.0%	0.0%	0.0%
9	0.0%	0.0%	0.0%	0.0%	0.0%
Total	100%	100%	100%	100%	100%

Source: Official Airline Guide, Landrum & Brown, 2018.

Aircraft Engine Run-Ups: Engine run-ups were modeled to account for the expected increase in run-ups performed for maintenance purposes. Under the No Action, run-ups would be expected to occur on the north airfield just east of Runway 18C/36C as shown on Exhibit 4. The number of run-ups expected to be performed was based on the number of total operations and typical routine maintenance requirements. The number of run-ups modeled for the Future (2026) No Action is shown in Table 16.

Table 16  
ENGINE RUN-UPS – FUTURE (2026) NO ACTION CONDITIONS

AEDT Aircraft ID	RUN-UP LOCATION	AIRCRAFT HEADING (DEGREES)	AVERAGE WEEKLY RUN-UPS		AVERAGE DURATION (IN MINUTES)	THRUST SETTING (LBS.)
			DAYTIME	NIGHTTIME		
737400	North Airfield	180	2.8	5.6	60	12,000
737400	North Airfield	360	4.2	8.4	60	12,000
737400	North Airfield	180	2.8	5.6	4	23,500
737400	North Airfield	360	4.2	8.4	4	23,500
767300	North Airfield	180	2.8	5.6	60	12,000
767300	North Airfield	360	4.2	8.4	60	12,000
767300	North Airfield	180	2.8	5.6	4	23,500
767300	North Airfield	360	4.2	8.4	4	23,500
7773ER	North Airfield	180	0.0	0.6	60	12,000
7773ER	North Airfield	360	0.0	0.8	60	12,000
7773ER	North Airfield	180	0.0	0.6	4	23,500
7773ER	North Airfield	360	0.0	0.8	4	23,500
TOTAL			28	28	n/a	n/a

Note: Daytime = 7:00 a.m. to 9:59 p.m., Nighttime = 10:00 p.m. to 6:59 a.m.  
n/a = total value not applicable

## 5.5 FUTURE (2026) PROPOSED ACTION NOISE EXPOSURE CONTOUR INPUT DATA

Runway Definition: No changes to runway configuration are expected at CVG by 2026; therefore, the runway layout discussed for the Existing condition was also used to model the Future (2026) Proposed Action Noise Exposure Contour.

Number of Operations and Fleet Mix: The Future (2026) Proposed Action operating levels are higher than those in the Future (2026) No Action Noise Exposure Contour due to the additional operations that could be accommodated with the development of the cargo facility. The Future (2026) Proposed Action condition includes 239,257 annual operations or 655.5 average-annual day operations, an increase of 2.5 percent over the Future (2026) No Action operating levels. Table 17 provides a summary of the average daily operations and fleet mix at CVG for the Future (2026) Proposed Action conditions, organized by aircraft category, operation type, and time of day.

Table 17  
DISTRIBUTION OF AVERAGE DAILY OPERATIONS BY AIRCRAFT CATEGORY  
FUTURE (2026) PROPOSED ACTION CONDITIONS

Aircraft Type	Noise Model ID	Arrivals		Departures		Total
		Daytime	Nighttime	Daytime	Nighttime	
Heavy Jets						
Boeing 747-800 Freighter	7478	1.5	4.7	2.1	4.0	12.4
Boeing 747-400 Series Freighter	747R21	0.9	2.8	1.3	2.4	7.4
Boeing 767-300 Series	767300	11.9	26.4	14.4	23.8	76.5
Boeing 767-200 Series Freighter	767CF6	5.5	17.1	7.8	14.8	45.3
Boeing 777 Freighter	777FRE	0.7	4.1	0.9	3.8	9.4
Airbus A300F4-600 Series	A300-622R	0.3	1.0	0.5	0.9	2.7
Airbus A300-200 Series Freighter	A300B4-203	0.0	0.1	0.0	0.1	0.3
Airbus A300-200 Series Freighter	A330-301	5.0	8.0	5.0	8.0	26.0
Subtotal		25.8	64.2	32.1	57.8	179.9
Large Cargo Jets						
Boeing 727-200 Series Freighter	727EM2	0.1	0.3	0.1	0.2	0.7
Boeing 737-400 Series Freighter	737400	0.2	6.5	1.3	5.5	13.6
Boeing 737-800 Series	737800	13.0	9.0	13.0	9.0	44.0
Boeing 757-200 Series	757PW	3.7	0.7	4.0	0.4	8.8
Boeing 757-200 Series	757RR	2.1	0.4	2.2	0.2	4.9
Airbus A321-200 Series	A321-232c	12.0	9.0	12.0	9.0	42.0
Subtotal		31.1	25.9	32.6	24.3	113.9



Table 17, (continued)

DISTRIBUTION OF AVERAGE DAILY OPERATIONS BY AIRCRAFT CATEGORY  
FUTURE (2026) PROPOSED ACTION CONDITIONS

Aircraft Type	Noise Model ID	Arrivals		Departures		Total
		Daytime	Nighttime	Daytime	Nighttime	
Large Passenger Jets						
Boeing 717-200 Series	717200	2.5	2.5	2.5	2.5	10.2
Boeing 737-300 Series	737300	0.1	0.0	0.1	0.0	0.3
Boeing 737-700 Series	737700	5.6	1.0	6.0	0.6	13.3
Boeing 737-800 Series	737800	9.4	1.7	10.1	1.0	22.2
Boeing 737-900-ER	737900	1.0	0.2	1.0	0.1	2.3
Airbus A319-100 Series	A319-131	11.9	2.2	12.8	1.3	28.2
Airbus A320-200 Series	A320-211	12.9	2.4	13.8	1.4	30.5
Airbus A320-200 Series	A320-232	0.9	0.2	1.0	0.1	2.2
Airbus A321-100 Series	A321-232	3.7	0.7	4.0	0.4	8.8
Boeing MD-82	MD82	1.3	0.2	1.4	0.1	3.0
Boeing MD-83	MD83	6.7	1.2	7.1	0.7	15.8
Boeing MD-90	MD9025	0.4	0.1	0.4	0.0	0.8
Subtotal		38.7	8.4	41.4	5.7	137.7
Regional Jets						
Bombardier CRJ-100	CLREGJ	4.6	0.5	4.7	0.5	10.3
Bombardier CRJ-700-ER	CRJ701	27.8	5.1	29.8	3.1	65.8
Bombardier CRJ-900	CRJ9-ER	31.0	5.7	33.2	3.4	73.3
Embraer ERJ145-EP	EMB145	2.8	0.3	2.8	0.3	6.2
Embraer ERJ170	EMB170	6.2	1.1	6.7	0.7	14.7
Embraer ERJ175	EMB175	13.8	2.5	14.8	1.5	32.7
Subtotal		86.3	15.2	92.0	9.5	203.0
Business Jets						
Cessna 650 Citation III	CIT3	0.1	0.0	0.1	0.0	0.1
Bombardier Challenger 600	CL600	0.3	0.0	0.3	0.0	0.7
Bombardier Challenger 601	CL601	0.0	0.0	0.0	0.0	0.1
Cessna 500 Citation I	CNA500	0.7	0.5	0.7	0.4	2.3
Cessna Citation Mustang 510	CNA510	0.0	0.0	0.0	0.0	0.1
Cessna 525 CitationJet	CNA525C	0.3	0.2	0.3	0.2	1.0
Cessna 550 Citation II Bravo	CNA55B	0.5	0.1	0.5	0.1	1.1
Cessna 560 Citation Ultra	CNA560U	0.1	0.0	0.1	0.0	0.3
Cessna 560 Citation Excel	CNA560XL	0.5	0.1	0.5	0.0	1.1
Cessna 680 Citation Sovereign	CNA680	0.1	0.0	0.1	0.0	0.1
Cessna 750 Citation X	CNA750	0.1	0.0	0.1	0.0	0.1
Eclipse Aerospace EA500	ECLIPSE500	0.0	0.0	0.0	0.0	0.1
Fokker 100	F10062	0.0	0.0	0.0	0.0	0.1
Gulfstream G-IIIB	GIIB	0.0	0.0	0.0	0.0	0.1
Gulfstream G450	GIV	0.2	0.0	0.2	0.0	0.4
Gulfstream V	GV	0.0	0.0	0.0	0.0	0.1
Raytheon Hawker 800	IA1125	0.1	0.0	0.1	0.0	0.3
Bombardier Learjet 60	LEAR35	0.6	0.1	0.6	0.1	1.4
Mitsubishi MU-300	MU3001	0.2	0.0	0.2	0.0	0.4
Subtotal		3.9	1.0	4.0	0.9	9.7

Table 17, (continued)

DISTRIBUTION OF AVERAGE DAILY OPERATIONS BY AIRCRAFT CATEGORY  
FUTURE (2026) PROPOSED ACTION CONDITIONS

Aircraft Type	Noise Model ID	Arrivals		Departures		Total
		Daytime	Nighttime	Daytime	Nighttime	
Propeller Aircraft						
Raytheon Beechcraft 1900	1900D	0.2	0.0	0.2	0.0	0.4
Beechcraft Baron 58P	BEC58P	0.4	0.0	0.4	0.0	0.9
Cessna 172 Skyhawk	CNA172	0.3	0.2	0.3	0.2	1.1
Cessna 182 Skyhawk	CNA182	0.1	0.0	0.1	0.0	0.2
Cessna 206 Caravan	CNA206	0.1	0.0	0.1	0.0	0.2
Cessna 208 Caravan	CNA208	0.8	0.5	0.9	0.5	2.7
Cessna 441 Conquest II	CNA441	0.9	0.1	0.9	0.1	2.0
De Havilland Canada DHC6 Twin Otter	DHC6	0.4	0.0	0.4	0.0	0.8
Dornier Do 228	DO228	0.0	0.0	0.0	0.0	0.0
Embraer EMB120 Brasilia	EMB120	0.1	0.1	0.1	0.1	0.3
General Aviation Single Engine Prop	GASEPV	0.8	0.1	0.8	0.1	1.8
Piper PA-28 Cherokee	PA28	0.1	0.1	0.1	0.1	0.3
Shorts 330 Series	SD330	0.1	0.1	0.1	0.1	0.4
Subtotal		4.4	1.3	4.5	1.2	11.3
Grand Total		190.1	115.9	206.6	99.4	655.5

Notes: Day = 7:00 a.m. to 9:59 p.m., Night = 10:00 p.m. to 6:59 a.m.

Totals may not equal sum due to rounding.

Source: FAA Operations Network (OPSNET) data, CVG Flight Tracking System Data, Landrum &amp; Brown, 2018.

Runway End Utilization: Average-annual day runway end utilization in 2026 is expected to remain the same as the Future (2021) No Action and the Future (2026) No Action conditions.

Flight Tracks: Flight tracks locations would not change under the Future (2026) Proposed Action. There would be small variations in flight track utilization percentages due to the increase in the number of operations. Flight track percentages modeled for the Future (2026) Proposed Action Noise Exposure Contour are shown in Table 18 and Table 19.

Table 18  
ARRIVAL FLIGHT TRACK UTILIZATION PERCENTAGES –  
FUTURE (2026) PROPOSED ACTION CONDITIONS

Runway End	Track ID	Heavy Jets	Large Cargo Jets	Large Passenger Jets	Propeller Aircraft	Regional / Business Jets
09	AT61	43.4%	8.9%	10.1%	10.4%	2.9%
27	AT31	2.6%	1.0%	3.8%	5.7%	2.4%
	AT32	1.2%	0.8%	1.8%	2.4%	1.6%
	AT33	0.7%	0.2%	2.0%	1.3%	2.3%
18C	AT20	0.0%	0.0%	0.0%	4.3%	3.6%
	AT22	4.6%	0.0%	3.6%	0.0%	0.0%
	AT23	6.5%	20.6%	14.0%	0.0%	0.0%
	AT24	1.6%	3.4%	3.5%	0.0%	0.0%
	AT25	1.8%	0.0%	5.1%	0.0%	0.0%
	AT26	0.0%	0.0%	0.0%	2.9%	3.4%
	AT27	0.0%	0.0%	0.0%	1.1%	1.1%
	AT28	0.0%	0.0%	0.0%	1.1%	1.1%
	AT29	0.0%	0.0%	0.0%	4.2%	5.3%
	AT2B	0.0%	0.0%	0.0%	2.9%	3.4%
	AT2F	0.0%	0.0%	0.0%	1.1%	1.1%
	AT2G	0.0%	0.0%	0.0%	1.1%	1.1%
	AT2N	0.0%	0.0%	0.0%	4.2%	5.3%
	AT2V	0.0%	0.0%	0.0%	4.3%	3.6%
18L	AT11	1.0%	0.0%	3.2%	0.0%	0.0%
	AT12	7.0%	20.6%	16.4%	0.0%	0.0%
	AT13	5.0%	0.0%	4.6%	0.0%	0.0%
	AT14	1.7%	3.4%	4.2%	0.0%	0.0%
	AT15	1.0%	0.0%	3.2%	0.0%	0.0%
	AT16	0.0%	0.0%	0.0%	6.5%	8.0%
	AT17	0.0%	0.0%	0.0%	4.9%	5.3%
	AT18	0.0%	0.0%	0.0%	9.6%	12.5%
18R	AT19	0.0%	0.0%	0.0%	9.9%	8.6%
	A701	0.1%	0.2%	0.2%	0.8%	1.4%
36C	AT50	0.0%	0.0%	0.0%	1.5%	1.4%
	AT51	0.9%	0.0%	1.7%	0.0%	0.0%
	AT52	3.1%	8.4%	5.0%	0.0%	0.0%
	AT53	0.8%	1.4%	1.2%	0.0%	0.0%
	AT54	2.2%	0.0%	1.2%	0.0%	0.0%
	AT55	0.0%	0.0%	0.0%	0.5%	0.9%
	AT56	0.0%	0.0%	0.0%	1.1%	1.6%
	AT57	0.0%	0.0%	0.0%	1.2%	0.9%
	AT58	0.0%	0.0%	0.0%	0.7%	0.9%
	AT59	0.0%	0.0%	0.0%	0.7%	0.9%
	AT5B	0.0%	0.0%	0.0%	0.7%	0.9%
	AT5F	0.0%	0.0%	0.0%	0.5%	0.9%
	AT5N	0.0%	0.0%	0.0%	1.1%	1.6%
	AT5V	0.0%	0.0%	0.0%	1.5%	1.4%

Table 18, (continued)  
ARRIVAL FLIGHT TRACK UTILIZATION PERCENTAGES –  
FUTURE (2026) PROPOSED ACTION CONDITIONS

Runway End	Track ID	Heavy Jets	Large Cargo Jets	Large Passenger Jets	Propeller Aircraft	Regional / Business Jets
36L	A601	0.0%	0.1%	0.0%	0.1%	0.0%
36R	AT41	6.7%	26.6%	9.6%	0.0%	0.0%
	AT42	1.9%	0.0%	2.1%	0.0%	0.0%
	AT43	4.7%	0.0%	1.5%	0.0%	0.0%
	AT44	1.6%	4.4%	2.1%	0.0%	0.0%
	AT46	0.0%	0.0%	0.0%	7.1%	6.9%
	AT47	0.0%	0.0%	0.0%	1.2%	2.2%
	AT48	0.0%	0.0%	0.0%	3.4%	5.1%
Total		100.0%	100.0%	100.0%	100.0%	100.0%

Source: FAA radar data, Landrum & Brown analysis, 2018.

Table 19  
DEPARTURE FLIGHT TRACK UTILIZATION PERCENTAGES –  
FUTURE (2026) PROPOSED ACTION CONDITIONS

Runway End	Track ID	Heavy Jets	Large Cargo Jets	Large Passenger Jets	Propeller Aircraft	Regional / Business Jets
09	DT61	0.0%	0.1%	0.0%	0.0%	0.0%
	DT62	0.0%	0.0%	0.0%	0.0%	0.0%
	DT63	0.0%	0.0%	0.0%	0.0%	0.0%
27	D2G1	0.9%	0.0%	2.7%	0.0%	0.0%
	D2G2	83.5%	0.0%	42.8%	0.0%	0.0%
	D2G3	0.9%	0.0%	2.7%	0.0%	0.0%
	D2J4	0.0%	26.9%	6.3%	0.0%	0.0%
	D2J5	0.0%	32.4%	7.6%	0.0%	0.0%
	D2J6	0.0%	9.7%	2.3%	0.0%	0.0%
	DT30	0.0%	0.0%	0.0%	4.3%	5.9%
	DT36	0.0%	0.0%	0.0%	7.0%	7.9%
	DT37	0.0%	0.0%	0.0%	14.3%	11.8%
	DT38	0.0%	0.0%	0.0%	11.6%	7.2%
	DT39	0.0%	0.0%	0.0%	6.6%	5.9%
	DT3A	0.0%	0.0%	0.0%	4.6%	5.9%
	DT3R	0.0%	0.0%	0.0%	2.7%	3.9%
	DT3X	0.0%	0.0%	0.0%	8.6%	5.3%
	DT3Y	0.0%	0.0%	0.0%	3.3%	5.3%
	DT3Z	0.0%	0.0%	2.7%	1.7%	2.6%
	DTE2	0.0%	0.0%	2.7%	1.7%	3.9%
18C	D1G5	2.6%	0.0%	1.9%	0.0%	0.0%
	D1G6	0.0%	0.0%	0.0%	0.0%	0.0%
	D1J5	0.0%	1.6%	0.4%	0.0%	0.0%
	D1J6	0.0%	0.1%	0.0%	0.0%	0.9%
	DT20	0.0%	0.0%	0.0%	0.4%	0.2%
	DT28	0.0%	0.0%	0.0%	1.1%	0.4%
	DT29	0.0%	0.0%	0.0%	0.3%	0.1%
	DT2A	0.0%	0.0%	0.0%	0.3%	0.2%
	DT2Y	0.0%	0.0%	0.0%	0.2%	0.2%
	DTNW3	0.0%	0.0%	0.6%	0.0%	0.1%
	DTNW4	0.0%	0.0%	0.0%	0.0%	0.0%
18L	D1G1	0.5%	0.0%	2.0%	0.0%	0.0%
	D1G2	1.9%	0.0%	10.6%	0.0%	0.0%
	D1J1	0.0%	1.7%	0.4%	0.0%	4.6%
	D1J2	0.0%	10.6%	2.5%	0.0%	6.6%
	DT16	0.0%	0.0%	0.0%	12.8%	2.4%
	DT17	0.0%	0.0%	0.0%	7.5%	1.6%
	DTSW1	0.0%	0.0%	0.0%	0.0%	0.5%
	DTW1	0.0%	0.0%	0.0%	0.0%	0.5%
18R	D701	0.0%	0.5%	0.1%	0.1%	0.8%



Table 19, (continued)

DEPARTURE FLIGHT TRACK UTILIZATION PERCENTAGES –  
FUTURE (2026) PROPOSED ACTION CONDITIONS

Runway End	Track ID	Heavy Jets	Large Cargo Jets	Large Passenger Jets	Propeller Aircraft	Regional / Business Jets
36C	DT51X	0.0%	3.3%	0.8%	0.0%	0.0%
	DT54	0.0%	0.0%	0.0%	1.2%	1.3%
	DT55X	0.0%	0.0%	0.0%	0.4%	0.4%
	DT56	0.0%	0.0%	0.0%	1.5%	1.1%
	DTE1	0.0%	0.0%	0.0%	0.0%	0.0%
	DTG1X	2.7%	0.0%	2.3%	0.0%	0.0%
	DTW2	0.0%	0.0%	0.0%	0.0%	0.0%
36L	D60D	0.0%	0.0%	0.0%	0.0%	0.6%
36R	D3G1	0.5%	1.8%	0.4%	0.0%	0.0%
	D3G2	2.0%	0.4%	0.1%	0.0%	0.0%
	D3G2	0.0%	0.0%	0.0%	0.0%	0.0%
	D3G3	0.5%	3.8%	0.9%	0.0%	0.0%
	D3J1	0.0%	0.0%	0.2%	0.0%	0.0%
	D3J1	0.0%	0.0%	1.5%	0.0%	0.0%
	D3J2	0.0%	0.0%	0.0%	0.0%	0.0%
	D3J2	0.1%	0.3%	0.3%	0.0%	0.1%
	D3J3	0.0%	0.0%	3.2%	0.0%	0.0%
	DT46	0.0%	0.0%	0.0%	0.3%	1.4%
	DT46	0.0%	0.0%	0.0%	2.3%	2.3%
	DT47	0.0%	0.0%	0.0%	0.1%	0.6%
	DT47	0.0%	0.0%	0.0%	0.8%	0.9%
	DT48	0.0%	0.0%	0.0%	0.1%	0.3%
	DT48	0.0%	0.0%	0.0%	0.8%	0.5%
	DT49	0.0%	0.0%	0.0%	0.4%	1.6%
	DT49	0.0%	0.0%	0.0%	3.0%	2.6%
	DTNE1	2.6%	2.2%	0.5%	0.0%	0.3%
	DTNE1	0.0%	0.0%	0.0%	0.0%	0.5%
	DTNW1	0.5%	0.0%	0.0%	0.0%	0.0%
	DTNW1	0.3%	0.0%	0.0%	0.0%	0.0%
	DTSE1	0.7%	4.7%	1.6%	0.0%	0.0%
	DTSE2	0.0%	0.0%	0.0%	0.0%	0.3%
	DTSE2	0.0%	0.0%	0.0%	0.0%	0.5%
Total		100.0%	100.0%	100.0%	100.0%	100.0%

Source: FAA radar data, Landrum &amp; Brown analysis, 2018.

Aircraft Weight and Trip Length: The trip lengths flown from CVG are based upon projected operations for the future conditions. There are expected to be no major changes in the destinations served by airlines at CVG from the Future (2026) No Action, however changes in the number of operations and fleet mix results in small variations in the departure trip length distributions for the Future (2026) Proposed Action conditions as shown in Table 20.

Table 20  
DEPARTURE TRIP LENGTH DISTRIBUTION  
FUTURE (2026) PROPOSED ACTION CONDITIONS

Stage Length Category	Heavy Jet	Cargo Jets	Large Passenger Jets	Propeller Aircraft	Regional / Business Jets
1	20.1%	45.6%	48.0%	100.0%	53.8%
2	31.0%	46.0%	43.0%	0.0%	38.0%
3	15.5%	2.9%	4.0%	0.0%	4.8%
4	15.2%	2.7%	4.7%	0.0%	3.3%
5	4.5%	1.0%	0.0%	0.0%	0.0%
6	6.5%	0.8%	0.3%	0.0%	0.0%
7	7.2%	1.0%	0.0%	0.0%	0.0%
8	0.0%	0.0%	0.0%	0.0%	0.0%
9	0.0%	0.0%	0.0%	0.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Official Airline Guide, Landrum & Brown, 2018.

## 6.0 NOISE MODELING RESULTS

### 6.1 EXISTING NOISE CONTOUR

The Existing Noise Exposure Contour, showing levels of 65, 70, and 75 DNL, is presented on Exhibit 6. The area within each five-decibel noise exposure contour is shown in Table 21. The 65+ DNL of the Existing Noise Exposure Contour encompasses approximately 7.0 square miles.

The shape of the noise contours reflect the predominant use of Runway 27, Runway 18C/36C and Runway 18L/36R. During the daytime, the Airport generally operates in a south/west configuration or in a north/west configuration. When in a south/west configuration, arrivals occur from the north to Runways 18L, 18C, and from the east on Runway 27; and departures occur to the south from Runways 18C and 18L, and to the west on Runway 27. When in north/west flow, arrivals occur to Runways 36R, 36C and 27, and departures from Runways 36R, 36C, and 27. During the nighttime, Runway 27 is the preferred departure runway due to the compatible land use corridor that has been created as a result of a land acquisition program to the west of CVG.

Due to the runway use pattern, the noise contour extends west of Runway 27 with lesser extensions to the north and south of Runway 18L/36R and Runway 18C/36C. The noise contour emanating from Runway 18R/36L is minimal due to the limited use of this runway.

Table 21  
AREA EXPOSED TO VARIOUS NOISE LEVELS (IN SQUARE MILES)  
EXISTING NOISE EXPOSURE CONTOUR

CONTOUR RANGE	EXISTING NOISE EXPOSURE CONTOUR (SQUARE MILES)
65-70 DNL	4.0
70-75 DNL	1.8
75 + DNL	1.1
65 + DNL	7.0

Source: AEDT Version 2d, Landrum & Brown, 2018.

## 6.2 FUTURE (2021) NO ACTION NOISE CONTOUR

The Future (2021) No Action Noise Exposure Contour, showing 65, 70, and 75 DNL levels, is presented on Exhibit 7. The area within each five-decibel noise exposure contour is shown in Table 22. The 65+ DNL of the Future (2021) No Action Noise Exposure Contour encompasses approximately 11.2 square miles. The Future (2021) No Action Noise Exposure Contour is larger than the Existing Noise Exposure Contour due to the forecasted increase in aircraft operations, which includes general growth in aviation demand and the expected increase in cargo operations that would occur with or without the Proposed Action.

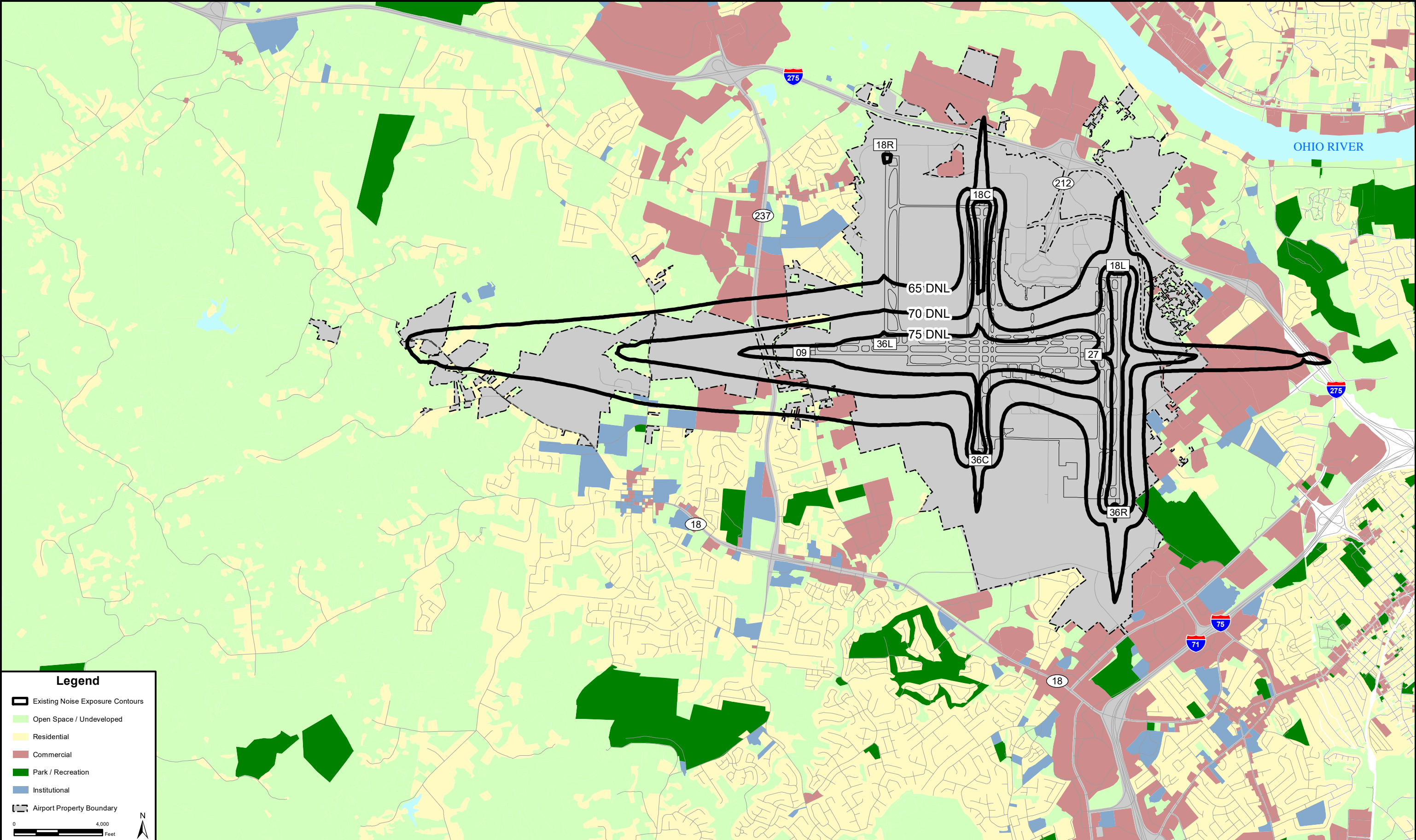
The Future (2021) No Action Noise Exposure Contour retains a similar shape as the Existing Noise Exposure contour because runway use patterns and flight tracks are expected to remain similar.

Table 22

FUTURE (2021) NO ACTION NOISE EXPOSURE CONTOUR AREAS EXPOSED TO VARIOUS NOISE LEVELS (IN SQUARE MILES)

CONTOUR RANGE	2021 NO ACTION NOISE EXPOSURE CONTOUR (SQUARE MILES)
65-70 DNL	6.6
70-75 DNL	2.7
75 + DNL	1.9
65 + DNL	11.2

Source: Landrum & Brown, 2018.



**Legend**

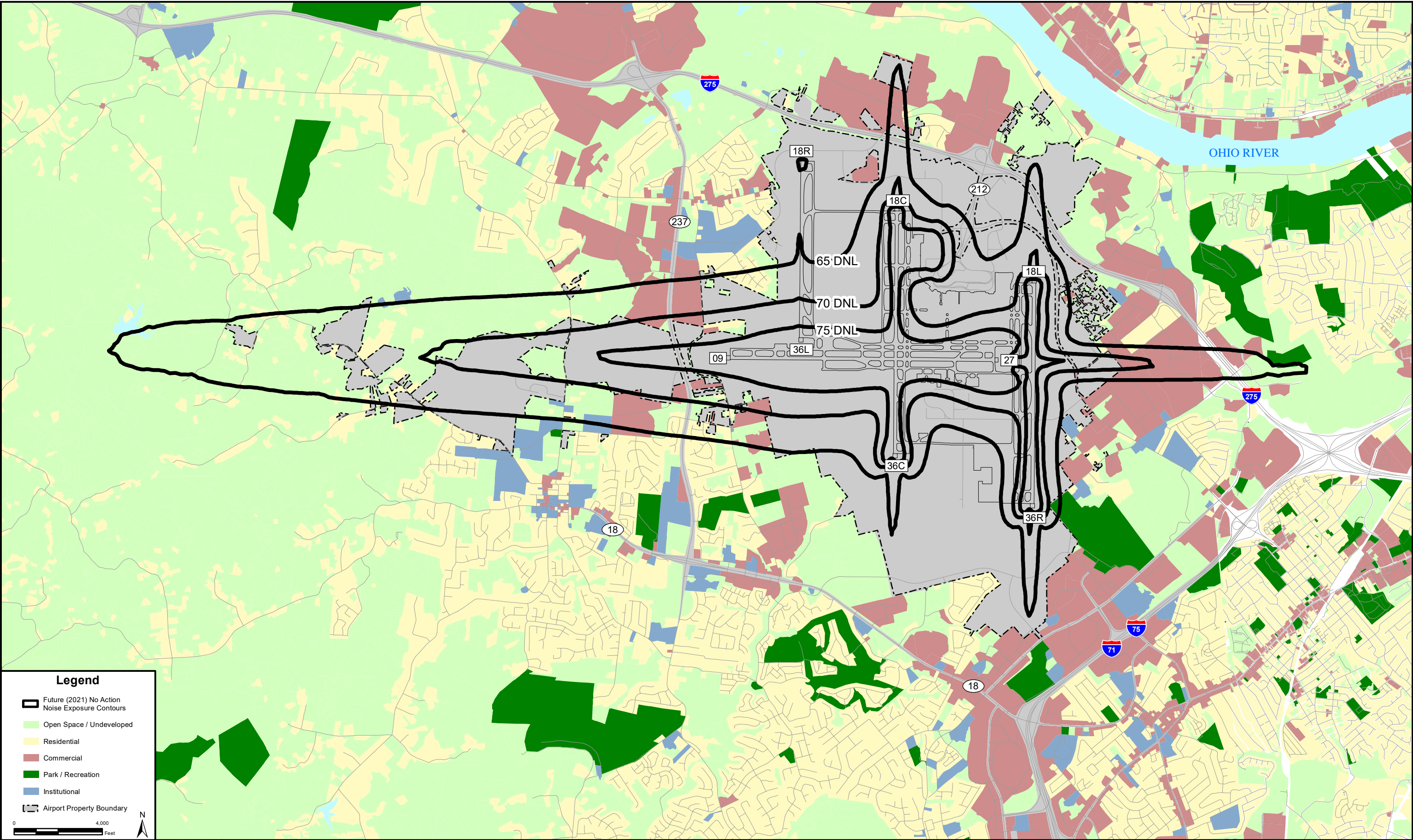
- Existing Noise Exposure Contours
- Open Space / Undeveloped
- Residential
- Commercial
- Park / Recreation
- Institutional
- Airport Property Boundary

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### 6.3 FUTURE (2021) PROPOSED ACTION NOISE CONTOUR

The Future (2021) Proposed Action Noise Exposure Contour, showing 65, 70, and 75 DNL levels, is presented on Exhibit 8. The area within each five-decibel noise exposure contour is shown in Table 23. The 65+ DNL of the Future (2021) Proposed Action Noise Exposure Contour encompasses approximately 11.2 square miles. The Future (2021) Proposed Action Noise Exposure Contour is similar in shape and size to the Future (2021) No Action Noise Contour. There would be no change to the number of arrivals and departure, nor would there be any change to runway use or flight tracks. Under the Future (2021) No Action, run-ups would occur on the north airfield to the east of Runway 18C. Under the Future (2021) Proposed Action, run-ups would occur at the proposed cargo facility on the south airfield. Therefore, the size of the Future (2021) Proposed Action noise contour increases within the south airfield between Runway 36C and Runway 36R and decreases within the north airfield east of Runway 18C. The Future (2021) Proposed Action, compared to the Future (2021) No Action, and the area of 1.5 DNL increase within the 65 DNL is shown on Exhibit 9. The 1.5 DNL increase area remains over compatible Airport-owned land.

Table 23

FUTURE (2021) NO ACTION NOISE EXPOSURE CONTOUR AREAS EXPOSED TO VARIOUS NOISE LEVELS (IN SQUARE MILES)

CONTOUR RANGE	2021 PROPOSED ACTION NOISE EXPOSURE CONTOUR (SQUARE MILES)
65-70 DNL	6.5
70-75 DNL	2.8
75 + DNL	1.9
65 + DNL	11.2

Source: Landrum & Brown, 2018.

## 6.4 FUTURE (2026) NO ACTION NOISE CONTOUR

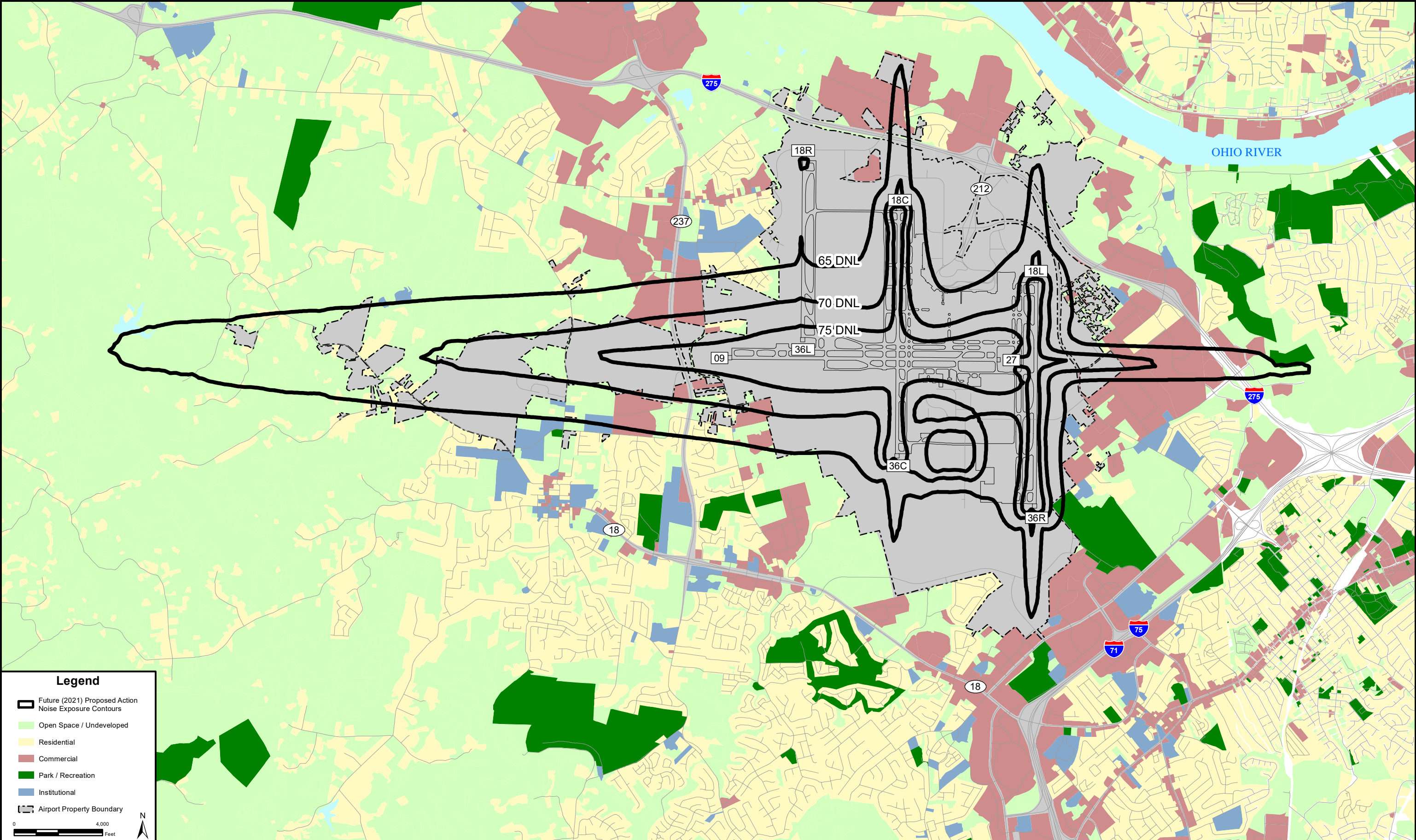
The Future (2026) No Action Noise Exposure Contour, showing 65, 70, and 75 DNL levels, is presented on Exhibit 10. The area within each five-decibel noise exposure contour is shown in Table 24. The 65+ DNL of the Future (2026) No Action Noise Exposure Contour encompasses approximately 13.3 square miles. The Future (2026) No Action Noise Exposure Contour retains a similar shape as the Future (2021) No Action Noise Exposure Contour, but is larger due to the forecasted increase in aircraft operations.

Table 24  
FUTURE (2026) NO ACTION NOISE EXPOSURE CONTOUR AREAS EXPOSED TO  
VARIOUS NOISE LEVELS (IN SQUARE MILES)

CONTOUR RANGE	2026 NO ACTION NOISE EXPOSURE CONTOUR (SQUARE MILES)
65-70 DNL	7.8
70-75 DNL	3.2
75 + DNL	2.3
65 + DNL	13.3

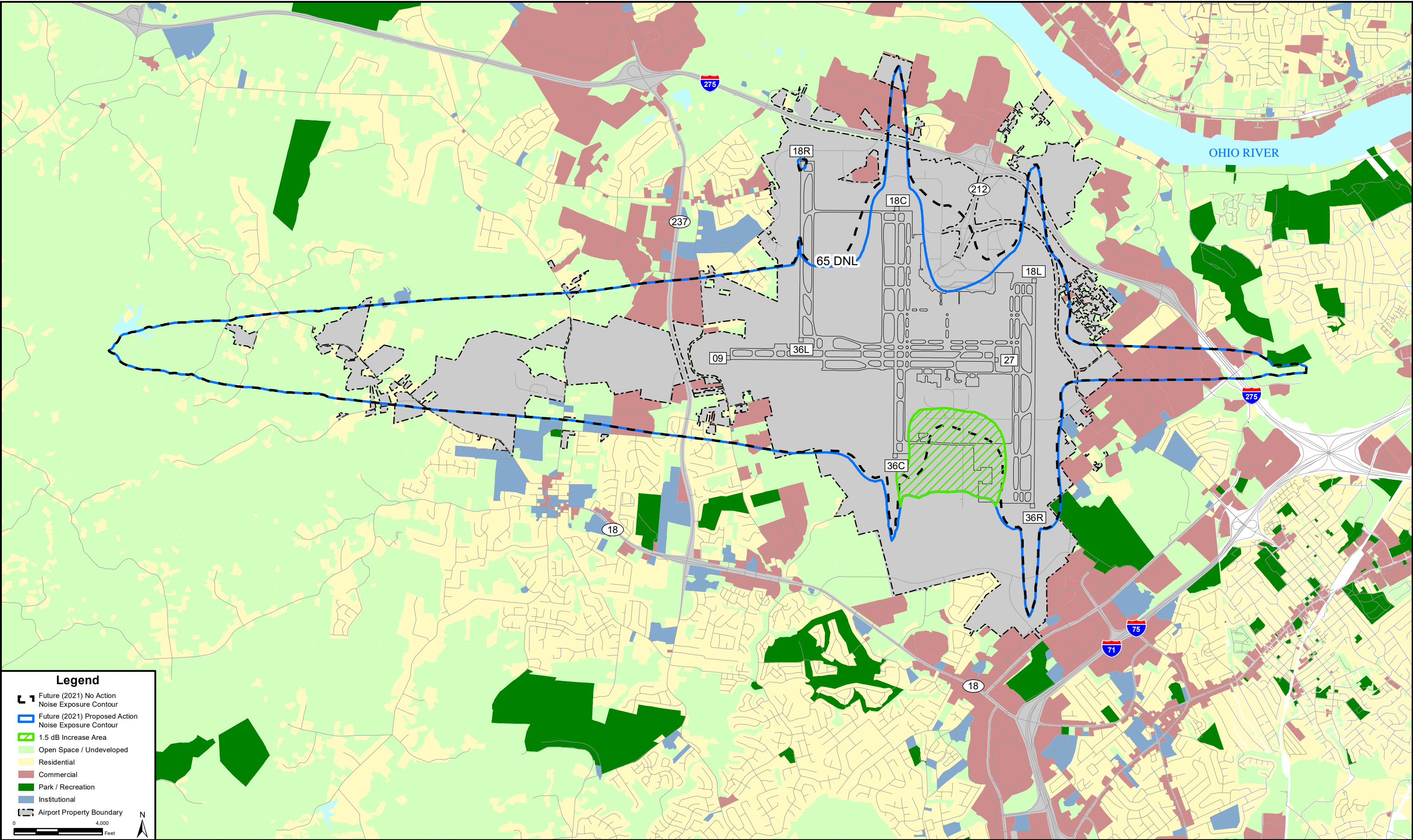
Source: Landrum & Brown, 2018.





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## 6.5 FUTURE (2026) PROPOSED ACTION NOISE CONTOUR

The Future (2026) Proposed Action Noise Exposure Contour, showing 65, 70, and 75 DNL levels, is presented on Exhibit 11. The 65+ DNL of the Future (2026) Proposed Action Noise Exposure Contour encompasses approximately 13.9 square miles.

The Future (2026) Proposed Action Noise Exposure Contour retains a similar shape as the Future (2026) No Action Noise Exposure Contour, but is larger due to the increase in aircraft operations that would occur as a result of the implementation of the Proposed Action. Similar to 2021, the primary difference in the shape of the Future (2026) Proposed Action noise contour compared to the Future (2026) No Action noise contour is due to the location of the aircraft run-ups associated with the cargo facility. Exhibit 12 shows the Future (2026) Proposed Action compared to the Future (2026) No Action and the area of 1.5 DNL increase within the 65 DNL. The 1.5 DNL increase area remains over compatible Airport-owned land.

The difference in area between the Future (2026) Proposed Action Noise Exposure Contour and the Future (2026) No Action Noise Exposure Contour is shown below, in Table 25.

Table 25

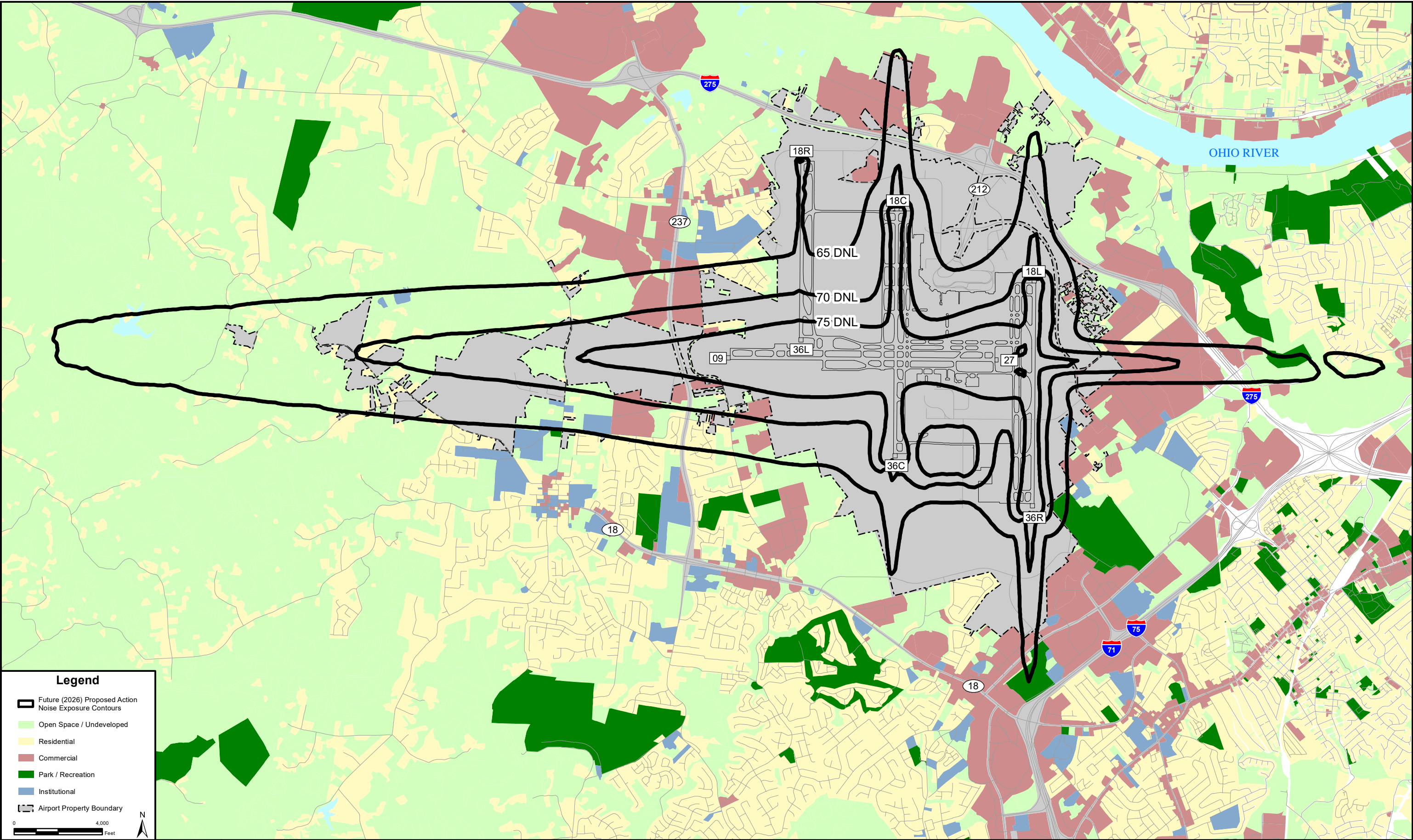
FUTURE (2026) NO ACTION vs. FUTURE (2026) PROPOSED ACTION NOISE EXPOSURE CONTOUR AREAS EXPOSED TO VARIOUS NOISE LEVELS (IN SQUARE MILES)

CONTOUR RANGE	2026 NO ACTION NOISE EXPOSURE CONTOUR (SQUARE MILES)	2026 PROPOSED ACTION NOISE EXPOSURE CONTOUR (SQUARE MILES)	DIFFERENCE
65-70 DNL	7.8	7.9	0.1
70-75 DNL	3.2	3.5	0.3
75 + DNL	2.3	2.5	0.1
65 + DNL	13.3	13.9	0.5

Source: Landrum & Brown, 2018.



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**Legend**

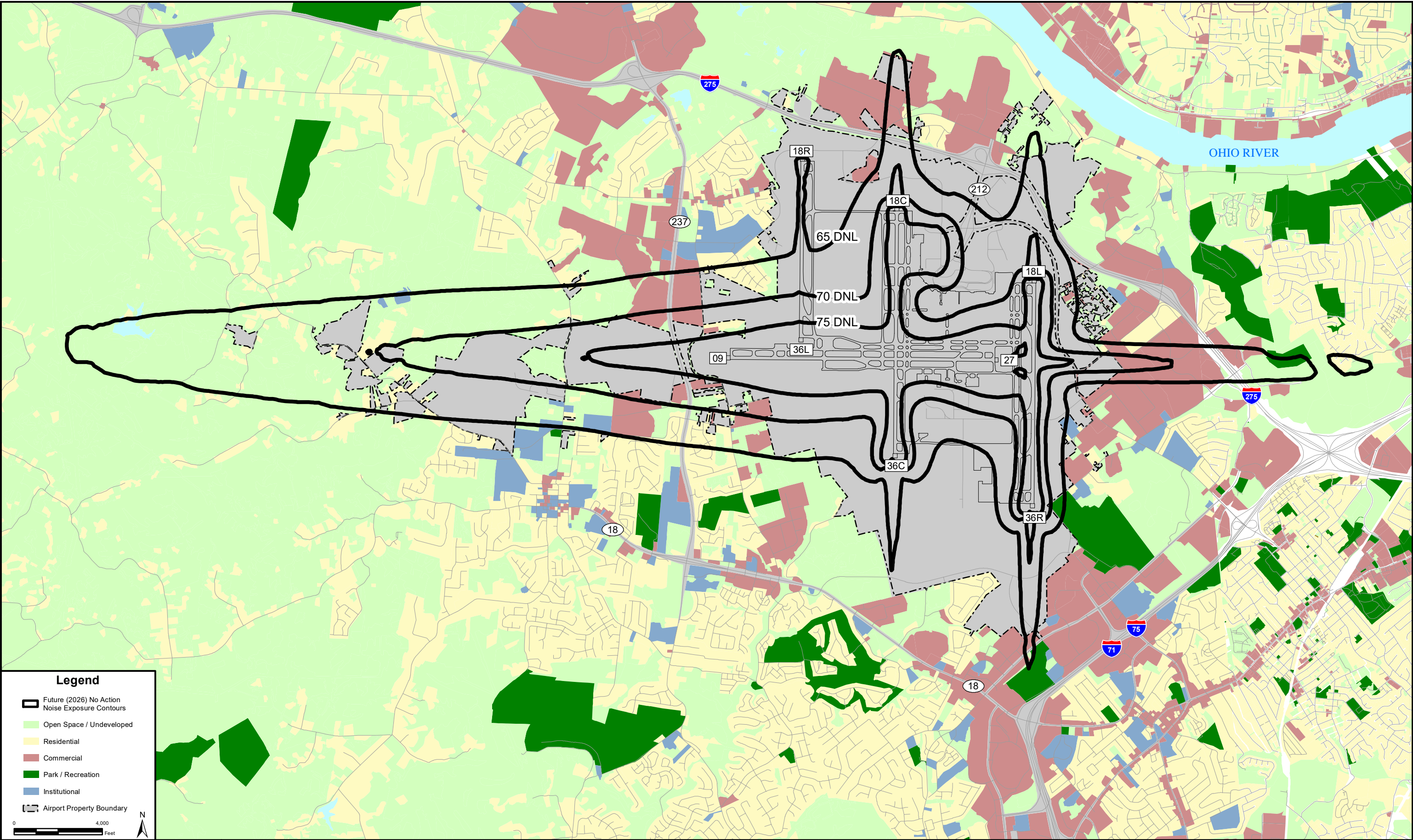
- Future (2026) Proposed Action Noise Exposure Contours
- Open Space / Undeveloped
- Residential
- Commercial
- Park / Recreation
- Institutional
- Airport Property Boundary

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**Legend**

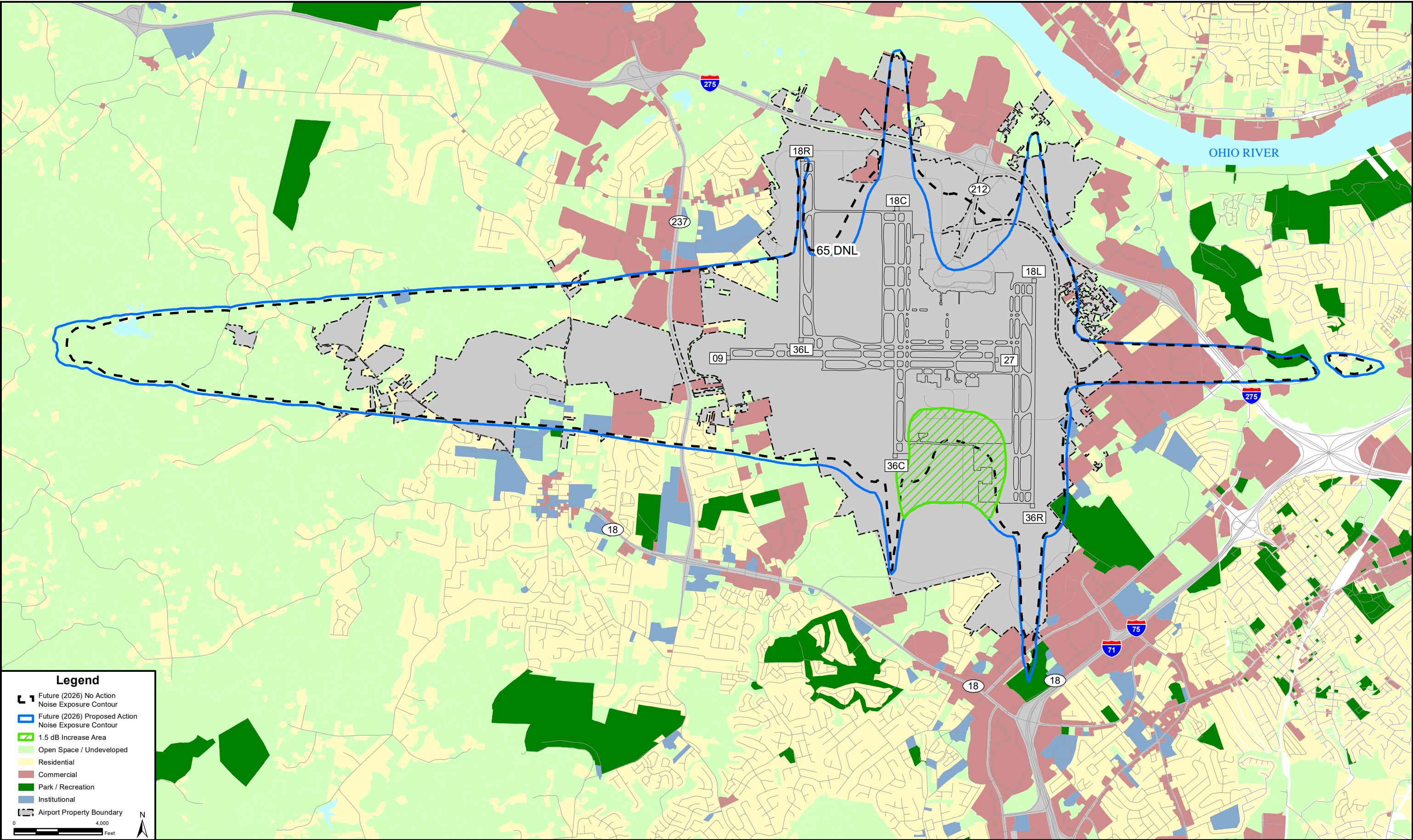
- Future (2026) No Action Noise Exposure Contours
- Open Space / Undeveloped
- Residential
- Commercial
- Park / Recreation
- Institutional
- Airport Property Boundary

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## Appendix G

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# APPENDIX G

## WATER RESOURCES

This appendix contains the Wetland Delineation Report and coordination with the U.S. Army Corp of Engineers and Kentucky Department of Water. The full document, including maps, was not included due to its large size. However, upon request the full document can be provided.

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## JURISDICTIONAL DETERMINATION COORDINATION

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**To:** [clovins@environment-archaeology.com](mailto:clovins@environment-archaeology.com)  
**Subject:** UPS Delivery Notification, Tracking Number 1ZF576540191366794  
**Date:** Monday, June 25, 2018 8:08:15 AM

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## Your package has been delivered.

**Delivery Date:** Monday, 06/25/2018

**Delivery Time:** 07:56 AM

At the request of ENVIRONMENT & ARCHAEOLOGY this notice alerts you that the status of the shipment listed below has changed.

## Shipment Detail

<b>Tracking Number:</b>	<b><u><a href="#">1ZF576540191366794</a></u></b>
<b>Ship To:</b>	Kimberly Simpson U.S. Army Corps of Engineers 600 DR MARTIN LUTHER KING PL FLOOR B ROOM 700-999 LOUISVILLE, KY 40202 US
<b>UPS Service:</b>	UPS NEXT DAY AIR
<b>Number of Packages:</b>	1
<b>Weight:</b>	17.5 LBS
<b>Delivery Location:</b>	MAIL ROOM JOHNSON
<b>Reference Number 1:</b>	E&A-2943e
<b>Reference Number 2:</b>	CVG Air Cargo WD



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June 22, 2018

Ms. Kimberly Simpson, Regulatory Branch  
Department of Army Corps of Engineers  
600 Martin Luther King Jr. Place  
Louisville, Kentucky 40202

**Re:    *Wetland and Stream Delineation Report*  
         **Kenton County Airport Board**  
         **CVG Air Cargo Hub Development Project**  
         **ACOE Louisville District ID No. LRL-2018-00268**  
         **Boone County, Kentucky****

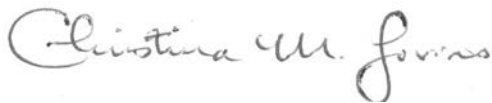
Dear Ms. Simpson,

The Kenton County Airport Board (KCAB) is continuing to pursue development of the proposed CVG Air Cargo Development Project in Boone County, Kentucky. Please find enclosed the completed Wetland and Stream Delineation of the CVG Air Cargo Hub Development Project. This report and supportive attachments provide a summary of findings and delineated surface waters within a 1,465-acre survey area. The report enables the Louisville District and KCAB to continue to complete the request for a jurisdictional determination of “waters of the United States.”

*Environment & Archaeology, LLC* has been actively compiling the required data to complete the delineation and address all items in an April 24, 2018 letter from the Louisville District. *Environment & Archaeology, LLC* confirmed in a June 18, 2018 telephone conversation with Mr. Greg McKay to proceed with submitting the proposed project’s final delineation report in order to continue the requested Jurisdictional Determination at the project site. KCAB will be submitting the complete Individual 404/401 permit application package in the coming weeks.

We respectfully request that you review the attached information and contact us at your earliest convenience to schedule a site visit. We appreciate your assistance with this matter. If you have any questions or concerns, please do not hesitate to contact me at (513) 899-9023 or Debbie Conrad at (859) 767-7021.

Sincerely,



Christina Lovins  
Vice President

**Enclosed:** Wetland and Stream Delineation Technical Letter



Ms. Kimberly Simpsont  
Page 2

**cc:** Debbie Conrad (KCAB)  
Sarah Potter (L&B)

June 22, 2018

Debbie Conrad  
Kenton County Airport Board  
Cincinnati/Northern Kentucky International Airport  
P.O. Box 752000  
Cincinnati, Ohio 45275-2000

RE: CVG Air Cargo Hub Development Project in Boone County, Kentucky  
Wetland and Stream Delineation Technical Letter  
ACOE Louisville District ID No. LRL-2018-00268

Dear Ms. Conrad:

Kenton County Airport Board (KCAB) has proposed development within properties and adjacent parcels of the Cincinnati/Northern Kentucky International Airport (CVG) in Florence, Boone County, Kentucky. KCAB requested a wetland and stream delineation containing the proposed development area and an approximate 1,465-acre survey area contains the project footprint referred to as the Proposed CVG Air Cargo Hub Development Project. The survey area and the proposed project's Action Area is located north of Burlington Pike/State Highway 18 and Aero Parkway, parallels Turfway Road, and extends northward toward existing airport infrastructure. The survey area spans land coverage west to east from Limaburg Creek Road to Turfway Road and State Highway 236.

The cumulative 1,465-acre survey area is a cumulation of delineations efforts within three (3) original separate survey areas and occurred within of the following dates: October 29 and 30, 2015; February 8 to 16, 2016 and September 5 to 12 and 23, 2016; and September 5 to 12, 2017. The three (3) original delineation areas were identified as the Vesper Property, the Air Cargo Hub Wetland Delineation, and the Air Cargo Hub- Additional Areas (Attachment 1- Location Maps). Re-delineation efforts of the entire 1,465-acre survey area occurred from April 24, 2018 through May 25, 2018. A variety of land types were identified within the survey area and consisted of the following: urban/industrial turf, old field, upland scrub/shrub vegetation, upland mixed deciduous forest, palustrine emergent wetland, palustrine scrub/shrub wetland, areas of palustrine forested wetland, open water wetland areas, and ponds.

The wetland and stream delineation identified 247 streams, 175 wetlands, and 11 ponds (Attachment 1 – Location maps). The delineated wetlands amounted to 28.41 acres of palustrine emergent wetland, 0.69 acres of scrub-shrub wetlands, 0.78 acres of palustrine forested wetland, 0.27 acre of open water/wetland areas, and 2.89 acres of ponds. Linear footage of streams within the survey area consisted of 15,359 feet of ephemeral streams, 75,059 feet of intermittent streams, and 24,929 feet of perennial streams.

This technical letter provides a summary of the available map reviews and data collected during the survey. Attachments 1 through 7 provide supportive mapping, waterbody summary tables, photographs, and wetland and stream data sheets documenting the vegetation communities and surface waters.

## **METHODOLOGY**

### **Wetlands**

*Environment & Archaeology, LLC* utilized the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Eastern Mountains and Piedmont Region Regional Supplement Version 2* (U.S. Army Corps of Engineers 2012). This methodology calls for a step-by-step approach to the delineation which identifies the presence or absence of three (3) factors: hydrophytic vegetation, hydric soils, and wetland hydrology. Each factor must be present if a location is to be considered a wetland. Prior to visiting the site, relevant resource information on the survey area was reviewed to determine the potential presence of wetlands, including: U.S. Geological Survey 7.5' topographic quadrangle maps, U.S. Department of Agriculture, Natural Resource Conservation Service (USDA, NRCS) soil surveys, Federal Emergency Management Agency (FEMA) maps, and National Wetlands Inventory (NWI) maps.

After a review of the agency resource information, a field delineation of the survey area was conducted utilizing the routine on-site method for delineation. Representative plots were taken within the survey area wherever a change in the vegetation, soils, or hydrology became apparent. During sampling, a determination was made as to whether the plot was a wetland or upland site. If an area was determined to be a wetland site, additional sampling of vegetation, soils, and hydrology was performed to determine the boundaries of the wetland area.

Each wetland area was photo-documented, then described in accordance with characteristics assigned by Cowardin, et al. (1979). Dominant vegetation was determined by estimating percent areal coverage for the most prevalent species which cumulatively totaled 50 percent of the areal coverage along with any other single species accounting for at least 20 percent coverage within a plot. Each identified dominant species was assigned its pertinent wetland indicator status according to the 2016 National Wetland Plant List (<http://rsgisias.crrel.usace.army.mil/NWPL/>), with all field data recorded on an Eastern Mountains and Piedmont Region Routine Wetland Determination Data Form (Version 2.0). Field notes were collected on any observed runoff features, as well as conveyance channels that provided justification of 'connectivity' for a surface water. The total size of each identified wetland area was determined using the GPS data collected in the field and measured utilizing ArcGIS for Desktop. Wetland acreage was rounded to the nearest one-hundredth of an acre.

### **Streams**

The project Action Area occurs within the Bluegrass Bioregion of Kentucky and the survey consisted of numerous headwater streams to Dry Creek, Gunpowder Creek and included Gunpowder Creek itself. All identified streams were assessed using the Kentucky Department of Environmental Protection Bioassessment Stream Sheets. Stream lengths were rounded to the nearest foot. All stream channels were followed in the field to their origin within the survey area to accurately classify each stream's flow regime.

The location of the streams and wetlands within the survey area were flagged and global positioning system (GPS) data was collected at each of these points with a handheld GPS unit capable of sub-meter accuracy. GPS data points were downloaded into the ArcGIS for Desktop mapping program and then overlaid atop various resource maps - USGS topographic map, FEMA map, NWI map, USDA soil survey, and aerial imagery.

All statements presented in this report concerning potentially jurisdictional or non-jurisdictional waters of the United States are considered preliminary until the U.S. Army Corps of Engineers provides written concurrence with the report's findings. An approximate 177-acre portion of the survey area has been documented to have already received USACE review and a preliminary jurisdictional determination; in addition, two (2) wetland features and two (2) open water features/ponds within the 177-acres were provided an approved jurisdictional determination.

## **AGENCY RESOURCE INFORMATION**

Prior to initiation of the field survey, available agency resource information to determine the likelihood of wetlands and streams present on the site. NWI maps have been prepared for the site by the U.S. Fish and Wildlife Service. The USDA Soil Survey of Boone County, Kentucky, has also been published. FEMA flood maps are available online at <https://msc.fema.gov/portal>. All agency resource data has been digitized for use in GIS mapping programs and has been incorporated into the project mapping.

### **U.S. Geological Survey (USGS) Map**

The parcel was located on the Burlington, Kentucky, USGS 7.5' topographic quadrangle (Attachment 1: Overview and Figures 1a-1c). Topography within the study area was gentle to steeply sloped. The survey area occurs within the HUC 8 watershed of Middle-Ohio Laughery (HUC 05090203). The northernmost parcel adjacent to Kenton Road was located within the immediate receiving watershed of Dry Creek-Ohio River (HUC 12: 050902030202). The remainder of the survey area occurred within the immediate receiving watershed of Gunpowder Creek (050902030806). Gunpowder Creek is defined as a warm-water aquatic habitat by the Kentucky Division of Water; the stream is not identified as a Special Resource Water. Mapped FEMA 100-year floodplain occurs along portions of Gunpowder Creek within the survey area.

The Burlington, Kentucky topo illustrated the presence of Gunpowder Creek (perennial and intermittent) and numerous unnamed intermittent and perennial headwater stream channels throughout the survey area. Topographic indications of the potential for additional channel flow was also prevalent throughout the excerpt of the quadrangle map containing the survey area. The field investigation utilized the topographic map to assist in flow regime determinations but site conditions and visual observations of stream channels were the basis of stream classification decisions.

## **National Wetland Inventory (NWI) Map**

The survey area was located on the Burlington, Kentucky, USGS 7.5' NWI quadrangle (Attachment 1: Location Maps). Numerous mapped NWI features were shown on NWI mapping and consisted predominantly of pond features classified as palustrine, unconsolidated bottom, permanently flooded, impounded/diked (PUBHh). Palustrine emergent, persistent, seasonally flooded, dike/impoundment (PEM1Ch) was also illustrated within the survey area. All mapped NWI features were examined to determine the presence or absence of the surface waters.

Note that the NWI data does not preclude the possible existence of additional wetlands in the area. NWI maps utilize high altitude, stereoscopic, aerial photography, and is partially dependent on the conditions at the time of the photograph. NWI mapping limitations can occur in the following situations: accurately identifying locations and extents of small wetlands, wetlands within evergreen forests, some aquatic bed wetlands, and when mapping efforts were conducted during drier seasons or a period of drought conditions.

## **Natural Resources Conservation Service (NRCS) Soil Survey**

The Soil Surveys of Boone, Campbell, and Kenton Counties, Kentucky (USDA 1973, 2015) identified nine (9) soil types within the study area (Attachment 1: Figure 2). These soil types, as well as their hydric status, are presented in Table 1. Three (3) soil types within the survey area were classified as hydric by the USDA (Table 1). Hydric soils are soils which formed under saturated conditions. The presence of hydric soils on a site indicates the historical presence of conditions which would favor the development of wetlands. The presence of hydric soil types on a site does not, however, guarantee the presence of wetlands. Due to changes in vegetation patterns and drainage, areas of hydric soils may be sufficiently modified to prevent the presence of wetland hydrology and hydrophytic vegetation.

## **RESULTS**

### **Vegetation Communities**

The survey area consisted of seven (7) vegetation communities: urban/industrial turf, old field, upland mixed deciduous forest, palustrine emergent wetland, palustrine forested wetland, palustrine scrub/shrub wetland, and upland scrub/shrub. Representative photos have been provided in Attachment 4. Datasheets provided in Attachment 5 provide additional vegetation information.

**Urban/industrial turf:** Urban/industrial turf was identified throughout portions of the survey area. These areas consisted of gravel/dirt road grades and staging areas. Maintained, monotypic grasses were also identified along paved and gravel roadways.



Table 1. Soil types located within the survey area in Boone County, Kentucky.

Symbol	Soil Type	Hydric Status	Drainage Class
Av	Avonburg silt loam (0 to 4 percent slopes)	Hydric	Somewhat poorly-drained
JeD	Jessup silt loam, 12 to 20% slopes	Non-hydric	Well-drained
JsD3	Jessup silty clay loam, 12 to 20% slopes	Non-hydric	Well-drained
Ln	Lindside silt loam (0 to 3 percent slopes, occasionally flooded)	Non-hydric	Moderately well-drained
NeD	Negley silt loam, 12 to 20 percent slopes	Non-hydric	Well-drained
Nk	Newark silt loam, 0 to 2% slopes, occasionally flooded	Hydric	Somewhat poorly-drained
No	Nolin silt loam, 0 to 2% slopes, occasionally flooded	Hydric	Well-drained
RsB	Rossmoyne silt loam, 0 to 6% slopes	Non-hydric	Moderately well-drained
RsC	Rossmoyne silt loam, 6 to 12% slopes	Non-hydric	Moderately well-drained

**Old field:** Old field vegetation was the dominant land cover within the open portions of the survey area and was identified along vegetated two-track travel lanes and maintained corridors through upland forest. Dominant vegetation included tall fescue (*Festuca arundinacea*), yellow foxtail (*Setaria pumila*), foxtail millet (*Setaria italica*), red clover (*Trifolium pratense*), Fuller's teasel (*Dipsacus fullonum*), late goldenrod (*Solidago altissima*), broomsedge (*Andropogon virginicus*), common ragweed (*Ambrosia artemisiifolia*), thistle (*Cirsium* sp.), Queen Anne's lace (*Daucus carota*), white clover (*Trifolium repens*), Japanese honeysuckle (*Lonicera japonica*), poison hemlock (*Conium maculatum*), field garlic (*Allium vineale*), lance-leaf plantain (*Plantago lanceolata*), sulfur cinquefoil (*Potentilla recta*), sweet woodruff (*Galium odoratum*), Indian strawberry (*Duchesnea indica*), purple deadnettle (*Lamium purpureum*), and aster (*Symphyotrichum* spp.).

**Upland scrub/shrub:** Upland scrub/shrub was primarily identified near roadways and along ridgetops. Vegetation included Canada goldenrod (*Solidago canadensis*), hackberry, stiff goldenrod (*Solidago rigida*), multiflora rose, poison ivy (*Toxicodendron radicans*), calico aster (*Symphyotrichum lateriflorum*), common yarrow (*Achillea millefolium*), Fuller's teasel (*Dipsacus fullonum*), black locust, Queen Anne's lace, honeysuckle, giant ironweed (*Vernonia gigantea*), and white snakeroot.

**Upland mixed deciduous forest:** Upland mixed deciduous forest was identified primarily surrounding stream and drainage corridors and occupied several large sections of contiguous forest within the southern and western portions of the survey area. Dominant canopy vegetation included: sugar maple (*Acer saccharum*), honey locust (*Gleditsia triacanthos*), hackberry (*Celtis occidentalis*), black cherry (*Prunus serotina*), black locust (*Robina pseudoacacia*), green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum*), American elm (*Ulmus americana*), black walnut (*Juglans nigra*), and box elder (*Acer negundo*). The understory vegetation was dense and

dominated by bush honeysuckle (*Lonicera maackii*), multiflora rose (*Rosa multiflora*), brambles (*Rubus* spp.), and white snakeroot (*Ageratina altissima*).

**Palustrine emergent wetland:** Palustrine emergent wetlands were the predominated wetland cover type on-site and occurred in depressional areas and seeps throughout the survey area. Dominant vegetation included Virginia wild rye (*Elymus virginicus*), soft stem bulrush (*Schoenoplectus tabernaemontani*), broadleaf cattail (*Typha angustifolia*), woolgrass (*Scirpus cyperinus*), arrowleaf tearthumb (*Polygonum sagittatum*), sensitive fern (*Onoclea sensibilis*), deertongue grass (*Dichanthelium clandestinum*), reed canary grass (*Phalaris arundinacea*), spotted touch-me-nots (*Impatiens capensis*), panic grass (*Dichanthelium acuminatum*), lurid sedge (*Carex lurida*), and occasional seedlings/saplings of black willow (*Salix nigra*), red maple, green ash and box elder.

**Palustrine scrub/shrub wetland:** Palustrine scrub/shrub wetland vegetation was located in ten (10) locations as the single wetland community type or as a component of a larger wetland complex (W-3, W-4, W-5, W-8, W-26, W-111, W-158 to W-161). Dominant vegetation included black willow, hackberry, American elm, green ash saplings, sedge (*Carex* sp.), common boneset (*Eupatorium perfoliatum*), creeping Jenny (*Lysimachia nummularia*), fowl manna grass (*Glyceria striata*), and broadleaf cattail.

**Palustrine forested wetland:** Palustrine forested wetland vegetation was located at six (6) locations within the survey area (W-1, W-9, W-61, W-68, W-145, W-156). Dominant canopy trees typically included silver maple (*Acer saccharinum*), green ash, box elder, and American elm (*Ulmus Americana*).

## **Waterbodies**

The field survey identified the following waterbodies within the survey area:

- A total of 175 wetlands areas where:
  - 164 wetland areas supported palustrine emergent wetlands or were a component of a wetland complex;
  - Ten (10) features of palustrine scrub/shrub wetlands or was a component of a wetland larger wetland complex;
  - Six (6) features of palustrine forested wetland or was a component of a wetland complex;
  - Three (3) palustrine unconsolidated bottom/wetland areas;
- A total of 247 streams channels where streams reaches were entirely one flow regime of a transition of flow regime that included in the following;
  - 77 ephemeral stream reaches;
  - 190 intermittent stream reaches;
  - Eight (8) perennial stream reaches; and
- A total of 11 ponds.

Refer to Attachment 2 for a complete inventory list of delineated wetlands and Attachment 3 for a complete inventory list for delineated streams. The original delineation efforts spanned from 2015 to 2017 and re-delineation efforts were conducted April and May 2018. Site conditions of the 2015 to 2017 delineation surveys differed from the April and May 2018 delineation site conditions. Drier, colder conditions occurred during February and March and September and October site investigations. Much higher vegetation was present in many of the open field and non-forested areas during the original delineations timeframe. Maintenance mowing and bush-hogging activities had occurred preceding the April and May 2018 re-delineation efforts. Early growing season herbaceous vegetation was present and identifiable and spring rains preceding the May re-delineation efforts allowed for a better determination of flow regime. The low vegetation height also allowed observation of numerous crayfish holes and crayfish chimneys in and near seep areas, as well as observations of fissures in ground surface that were investigated for groundwater discharge at headwater and seep locations.

The re-delineation efforts in April and May 2018 had been requested by the USACE on April 24, 2018 and resulted in additional field documentation early in the growing season. Documentation of base-flow conditions and better observation of groundwater discharge also occurred. Most of the streams in the survey area were low-order streams comprised of mostly straight to sinuous to some meandering channel sinuosity.

The survey area's landscape was comprised of underlying limestone and shale. Classification of flow regime was based on observations of hydrology, biology, and geomorphology. The underlying limestone shale in the survey area was found to support numerous seep areas. The extended delineation timeframe allowed for documentation of the presence of a high-water table and groundwater seepage resulting in the observation of a survey area that was dominated by an intermittent flow regime that ranged from shallow to well-developed channels, with a majority of stream channels originating at a seep area.

Grade controls, such as rock outcrops, accumulated woody debris, and head-cutting were additional indicators of a stream channel's flow regime. Stream channels with no observed supportive groundwater presence (ex., pooling) or discharge were classified as ephemeral channels. Stream channels with observed groundwater presence and holes in the stream bed indicating locations of groundwater discharge were considered of intermittent flow regime. Crayfish holes were a common occurrence in headwater seep areas at stream origins and in adjacent wetland areas. An intermittent to perennial flow regime designation was dependent upon observed flow, channel development, observation of any fish, the amount of leave litter accumulation, wrack/drift lines, and degree of rooted plants in the streambed.

All delineated streams required water quality habitat assessment and habitat scoring was conducted per the Kentucky Department of Environmental Protection Rapid Bioassessment Stream Sheets (Attachment 6).

Table 2a: Waterbodies summary of Wetlands and Streams in the Air Cargo Hub Development Survey Area - Streams.

Waterbody#	Waterbody Type <sup>1</sup>	RBP Score (range) <sup>2</sup>	Provisional Hydrologic Status	Linear Footage	Acreage
<b>STREAMS</b>					
S-7, S-8, S-9; S-14, S-23, S-25, S-29, S-35, S-43, S-45, S-51, S-56, S-59; S-61, S-62, S-63, S-68, S-77; S-80 to S-83, S-85, S-86, S-87, S-89; S-91, S-93, S-95; S-104, S-105, S-106, S-112, S-113, S-114, S-116; S-122, S-141, S-150, S-158, S-159; S-177, S-178, S-179; S-181, S-186 to S-189, S-191, S-194 to S-196; S-201, S-202, S-206, S-207, S-219; S-220, S-222, S-223, S-226, S-229; S-230 to S-233, S-235, S-236, S-237, S-239; and S-241 to S-243, S-245 to S-247	Ephemeral	43 (S-141) to - 118 (S-234)	Connected	15,359	0.80
S-1 to S-6, S-7, S-8, S-9; S-10 to S-13, S-14, S-15, S-16, S-17, S-18, S-19; S-20 to S-22, S-23, S-24, S-27, S-28, S-29; S-30 to S-34, S-35, S-36 to S-42, S-43, S-44, S-46 to S-49; S-50, S-52 to S-55, S-57, S-58, S-59; S-60, S-63, S-64 to S-67, S-69 to S-76, S-78, S-79; S-84, S-86, S-88, S-89, S-90, S-92, S-94, S-96 to S-99; S-100, S-102, S-103, S-104, S-105, S-106, S-107 to S-111; S-113, S-114, S-115, S-116, S-118 to S-121; S-123 to S-140; S-142 to S-149; S-151 to S-157; S-160 to S-176, S-177, S-178; S-180, S-182 to S-185, S-190, S-192, S-193, S-197 to S-199; S-200, S-201, S-202, S-203 to S-205, S-208 to S-213, S-215 to S-218; S-219, S-224, S-225, S-227, S-228, S-229; and S-234, S-236, S-238, S-239, S-240, S-244	Intermittent	34 (S-130) to 139 (S-130)	Connected	75,059	8.08
S-17, S-19, S-26; S-101 (Gunpowder Creek), S-117; and S-214, S-221, S-239	Perennial	96 (S-19) to 166 (S-26)	Connected	24,929	10.96
<b>TOTAL STREAMS</b>				<b>115,347</b>	<b>19.84</b>

- 1 PEM = Palustrine Emergent Wetland, PSS = Palustrine Scrub-Shrub Wetland, PFO = Palustrine Forested Wetland, PUB = Palustrine Unconsolidated Bottom Wetland
- 2 RBP Habitat Scores for Kentucky as provided in *Methods for Assessing Habitat in Wadeable Waters* (March 01, 2011, Revision 1.0)  
Poor = </=141, Fair = 142-155, Good = above 156

Table 2b: Waterbodies summary of Wetlands and Streams in the Air Cargo Hub Development Survey Area - Wetlands.

Waterbody#	Waterbody Type <sup>1</sup>	RBP Score (range) <sup>2</sup>	Provisional Hydrologic Status	Linear Footage	Acreage
<b>WETLANDS</b>					
W-1, W-6, W-7, W-8, W-10 to W-25, W-26; W-27 to W-60, W-61, W-62 to W-67, W-68; W-69 to W-97, W-98; W-99 to W-110; W-112 to W-144, W-146 to W-155, W-157, W-158; and W-162 to W-175	PEM	---	Connected	---	28.41
W-3, W-4, W-5, W-8; W-26, W-111, W-158; and W-159 to WW-161	PSS	---	Connected	---	0.69
W-1, W-9, W-61, W-68, W-145, W-156	PFO	---	Connected	---	0.78
W-2, W-3, W-5	PUB	---	Connected	---	0.27
P-1 to P-11	Pond	---	Connected	---	2.89
<b>TOTAL WETLANDS</b>				<b>---</b>	<b>33.04</b>

- 1 PEM = Palustrine Emergent Wetland, PSS = Palustrine Scrub-Shrub Wetland, PFO = Palustrine Forested Wetland, PUB = Palustrine Unconsolidated Bottom Wetland
- 2 RBP Habitat Scores for Kentucky as provided in *Methods for Assessing Habitat in Wadeable Waters* (March -1, 2011, Revision 1.0)  
Poor = </-141, Fair = 142-155, Good = above 156

In addition, a preliminary jurisdiction form has been completed for the delineated surface waters (Attachment 7). An approximate 177-acre portion of the survey area has already received USACE review and a preliminary jurisdictional determination; in addition, two (2) wetland features and two (2) open water features/ponds within the 177-acres were provided an approved jurisdictional determination.

The full inventory of delineated waterbodies is provided in Attached 2 – Wetland Summary Table and Attachment 3 – Stream Summary. Formal determination of jurisdiction can only be determined by the USACE through submittal of a Jurisdictional Determination request submitted by KCAB.

## SUMMARY

The CVG Air Cargo Hub Development survey area in Florence, Boone County, Kentucky comprised approximately 1,465 acres. A delineation of wetland and streams within the survey area resulted in the identification of the following surface waters:

- 15,359 feet of ephemeral streams;
- 75,059 feet of intermittent streams;
- 24,929 feet of perennial streams;
- 28.41 acres of palustrine emergent wetland;
- 0.69 acres of palustrine scrub/shrub wetland;



- 0.78 acres of palustrine forested wetland;
- 0.27 acres of palustrine unconsolidated bottom wetland; and
- 2.89 acres of ponds.

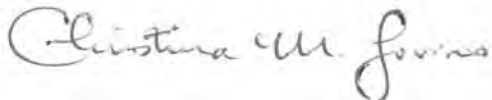
Impacts to surface waters of the U.S. are regulated by Section 401 and Section 404 of the Clean Water Act. Parcel projects involving surface water impacts can often qualify under Nationwide Permit (NWP) #39 – Commercial and Institutional Developments. Projects must meet the general and regional conditions of a Nationwide Permit. The Proposed Action Area, contained within the survey area of the CVG Air Cargo Hub Development does not appear to qualify under NWP#39 due to the potential impacts exceeding the following NWP #39 permit thresholds:

- Permanent loss of ½ acre or greater of waters of the US (wetlands and streams); and
- Permanent loss of greater than 300 linear feet of stream bed. NWP #39 does allow for waivers granted by the District Engineer for intermittent and ephemeral impacts and would be determined on a case-by-case basis.

An Individual Section 404 Permit is required if the above impact thresholds are exceeded. An Individual Section 401 Permit will also be required under the Kentucky Division of Water. Compliance with the Endangered Species Act and Section 106 of the Historic Preservation Act are required components of The Nationwide Permit program and Individual Section 404/401 Permit authorizations.

If you should require additional information or have any questions regarding this project, please contact me at (513) 899-9023.

Sincerely,



Christina Lovins  
Vice President

**Attachments:**

- Attachment 1 – Location Maps
- Attachment 2 – Waterbody Summary Table – Wetlands
- Attachment 3 – Waterbody Summary Table – Streams
- Attachment 4 – Photolog
- Attachment 5 – Wetland Datasheets
- Attachment 6 – Kentucky Rapid Bioassessment Protocol Datasheets
- Attachment 7 – Preliminary and Approved Jurisdictional Determination Forms

## REFERENCES

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