

PRELIMINARY DRAFT

# Environmental Assessment for the Central Ramp Expansion and Enabling Projects

Nashville International Airport  
Nashville, Tennessee

PREPARED FOR

Metropolitan Nashville Airport Authority

U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION

As lead Federal Agency pursuant to the National Environmental Policy Act of 1969

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October 2024

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Responsible FAA Official

Date

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## Acronyms

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

AC	Advisory Circular
ACEIT	Airport Construction Emissions Inventory Tool
ACS	American Community Survey
ALP	Airport Layout Plan
APE	Area of Potential Effect
ARAP	Aquatic Resource Alteration Permit
ARFF	Aircraft, Rescue, and Firefighting
BNA	Nashville International Airport
BMP	Best management practices
CAA	Clean Air Act (as amended in 1990)
CEQ	Council on Environmental Quality
CFR	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 Equivalent
EA	Environmental Assessment
EJ	Environmental Justice
EO	Executive Order
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FBO	Fixed Base Operator
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Federal Inspection Services
GAO	General Accounting Office
GHG	Greenhouse Gas
GIP	Green Infrastructure Practice
GSE	Ground Support Equipment
H <sub>2</sub> O	Water Vapor
HFCs	Hydrofluorocarbons
ICAO	International Civil Aviation Organization
LID	Low Impact Development
MNAA	Metropolitan Nashville Airport Authority
MOVES	Motor Vehicle Emission Simulator
MS4	Municipal Separate Storm Sewer System
N <sub>2</sub> O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969, as amended
NHPA	National Historic Preservation Act

NO <sub>x</sub>	Nitrogen Oxide
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRHP	National Register of Historic Places
O <sub>3</sub>	Ozone
PAL	Planning Activity Level
PFC	Perfluorocarbons
PM <sub>2.5</sub>	Particulate matter less than 2.5 microns in diameter
PM <sub>10</sub>	Particulate matter less than 10 microns in diameter
RON	Remain Overnight
SF <sub>6</sub>	Sulfur Hexafluoride
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO <sub>x</sub>	Sulfur Oxide
SPCC	Spill Prevention, Control and Countermeasure
SQT	Stream Quantification Tool
SWPPP	Storm Water Pollution Prevention Act
TAF	Terminal Area Forecast
TDEC	Tennessee Department of Environment and Conservation
USACE	U.S. Army Corps of Engineers
U.S.C.	U.S. Code
USDOT	U.S. Department of Transportation
USEPA	United States Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOC	Volatile Organic Compound

# 1. Purpose and Need

## 1.1. Introduction

This Environmental Assessment (EA) analyzes the potential environmental effects of the proposed Central Ramp Expansion and Enabling Projects at Nashville International Airport (BNA or Airport). It is required by the National Environmental Policy Act of 1969 (NEPA), as amended (40 Code of Federal Regulations [CFR] 1500-1508) because the project will require FAA to approve a change to the Airport Layout Plan (ALP). It is 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*.

The Airport is a public use airport located in Nashville, Tennessee, approximately four miles east/southeast of downtown Nashville. The Airport lies on roughly 4,500 acres of land owned and operated by the Metropolitan Nashville Airport Authority (MNAA or Sponsor). The Airport is generally bounded to the West by Briley Parkway (State Route 155), to the South by Murfreesboro Pike, to the East by Couchville Pike, and to the North by Interstate 40 (I-40).

BNA has four runways. Three parallel runways are oriented in a generally North/South configuration (2L/20R, 2C/20C, 2R/20L), and one crosswind runway is oriented in a Northwest/Southeast direction (13/31). Runway 2L/20R is 7,704 feet long by 150 feet wide, Runway 2C/20C is 8,000 feet long by 150 feet wide, and Runway 2R/20L is 8,000 feet long by 150 feet wide. Crosswind Runway 13/31 is the longest runway at BNA, with a length of 11,029 feet and a width of 150 feet.

The runway system is supported by taxiways that provide access to the passenger terminal gates, terminal ramp areas, Federal Inspection Service (FIS) facilities, airline support facilities, cargo facilities, Aircraft Rescue and Firefighting (ARFF) facilities, aircraft deicing areas and facilities, general aviation facilities, fixed base operators (FBOs), aircraft hangar storage facilities, military facilities, and FAA Airport Traffic Control Tower facilities. Additional facilities include airport administration facilities, rental car facilities, fuel storage facilities, aircraft and airport maintenance facilities, corporate/private aircraft hangars, flight training operations, aircraft food service facilities, and vehicle parking areas.

## 1.2. FAA Federal Action

The Federal Action is FAA approval of the changes to the ALP to reflect the proposed construction of the Central Ramp Expansion project. Pursuant to 49 U.S. Code (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 for projects that materially impact the safe and efficient operation of aircraft at, to, or from the airport or that would adversely affect the safety of people or property on the ground adjacent to the airport as a result of aircraft operations, or that adversely affect the value of prior Federal investments to a significant extent.

## 1.3. Proposed Action

The Proposed Action includes expansion of the Central Ramp for additional Remain Overnight (RON) aircraft parking positions and off-gate aircraft deicing positions at BNA. The Proposed Action is located in the center of BNA property and is surrounded by aviation land uses as shown in **Exhibit 1-1, Proposed Action Location**. The site was previously disturbed by past Airport construction and presently consists of mowed grass fields, several drainage channels, a holding pond known as the

South Pond,<sup>1</sup> and access roads for maintenance vehicles. **Exhibit 1-2, Existing Site Conditions**, shows the existing conditions of the site. The Proposed Action includes the following elements:

- Expansion of the Central Ramp to provide additional aircraft RON parking, deicing locations, and ground support equipment (GSE) storage;
- Reconfiguration of taxiways and taxilanes, including realigning Taxiways T2 and T4;
- Filling in approximately 74 acres within the Mill Creek watershed and encapsulating approximately 1,879 linear feet of Sims Branch (and unnamed tributaries) and approximately 1,254 linear feet of Snakey Creek (and unnamed tributaries) for a total of approximately 3,133 linear feet of stream.<sup>2</sup> to maintain existing stream flow;
- Associated stormwater capacity improvements to enable proper drainage and stormwater collection for the site; and
- Establishment of temporary haul routes, security gate, and staging areas.

See **Exhibit 1-3, Proposed Action** for a depiction of the proposed Central Ramp development. This configuration provides appropriate taxi capabilities within the terminal ramp limits. This configuration also provides dual parallel taxilanes serving the terminal ramp area and designates taxilanes for Group III and Group V aircraft, maximizing the efficiency of aircraft ground movements to and from the terminal concourses to the airfield system.

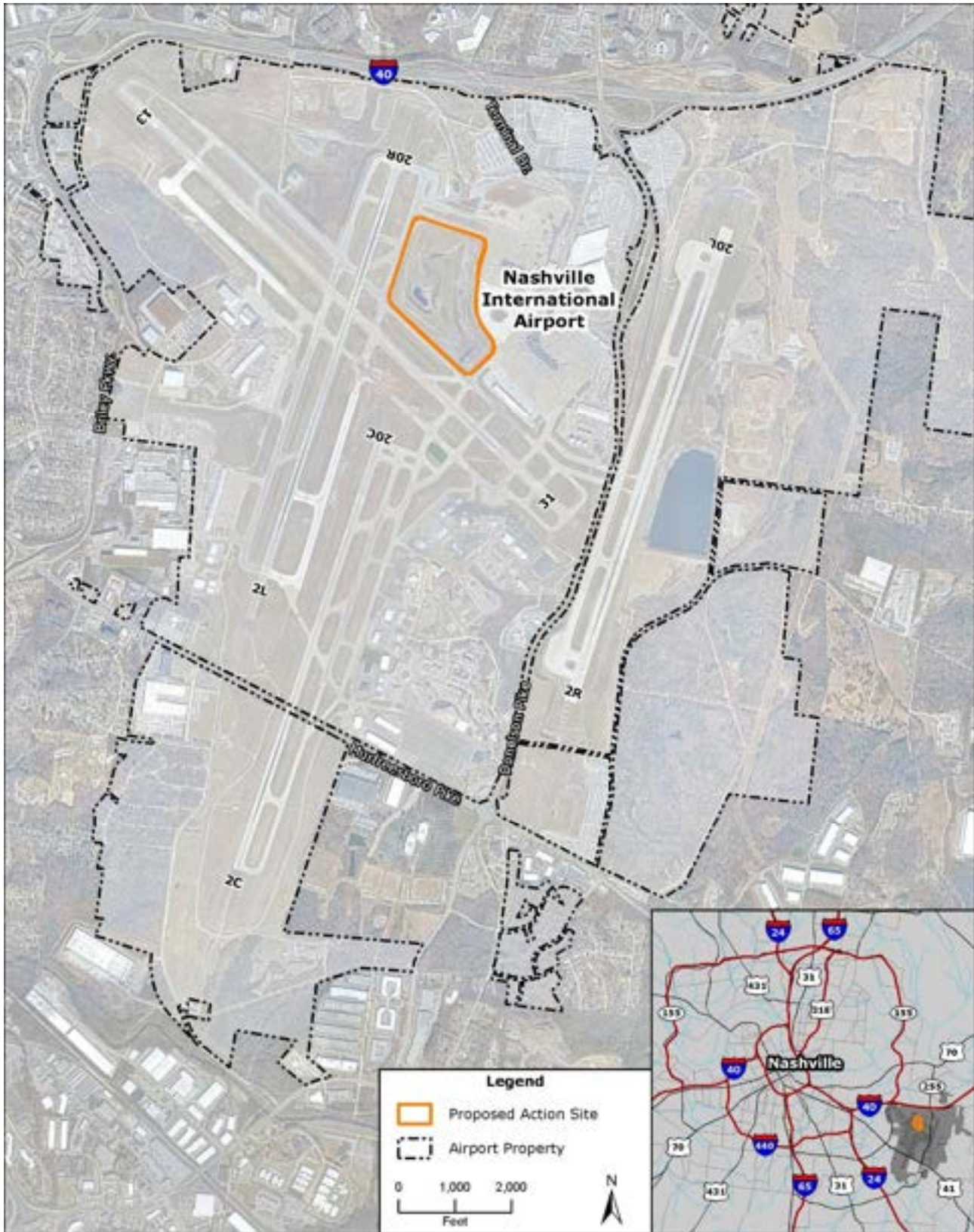
The Proposed Action would require offsite construction staging, establishment of construction haul routes, and transfer of fill material to the construction site. Haul routes would be identified in consultation with the construction contractor and would be planned in order to minimize disruption to other Airport traffic. It is expected that construction traffic can be segregated from other Airport traffic and would not directly impact a residential community. The MNA has designated construction areas that are previously disturbed and have been used for past construction staging. Fill material would include shot rock that would be obtained from an offsite local rock quarry and fill dirt from existing onsite stockpiles. **Exhibit 1-4, Construction Support Areas**, shows the location of the proposed construction staging area, onsite stockpile location, and offsite local rock quarry.

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<sup>1</sup> The South Pond is currently used as a holding pond for spent aircraft deicing fluid treatment. This pond is being decommissioned as part of a separate and independent project in the future to divert all spent deicing fluid for treatment by the Nashville Metro Water Services.

<sup>2</sup> Working Draft Tennessee Stream Quantification Tool (SQT) and Debit Tool calculations, current as of June 12, 2024, prepared for the Nashville International Airport, Garver, as part of development of Working Draft Preliminary Wetland Delineation and Hydrologic Determination, Garver, May 2024

**EXHIBIT 1-1, PROPOSED ACTION LOCATION**



Source: Landrum & Brown, 2024

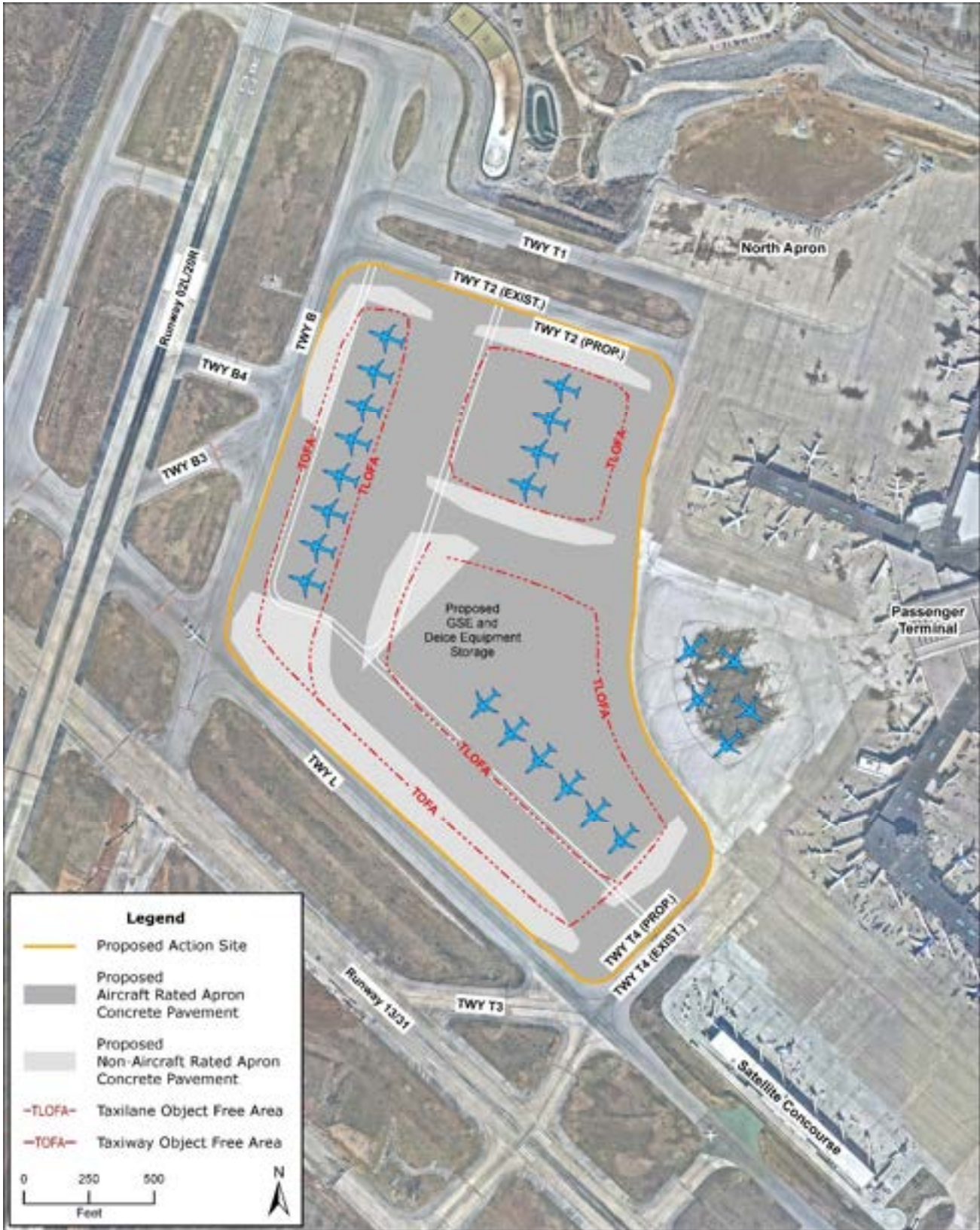


EXHIBIT 1-2, EXISTING SITE CONDITIONS



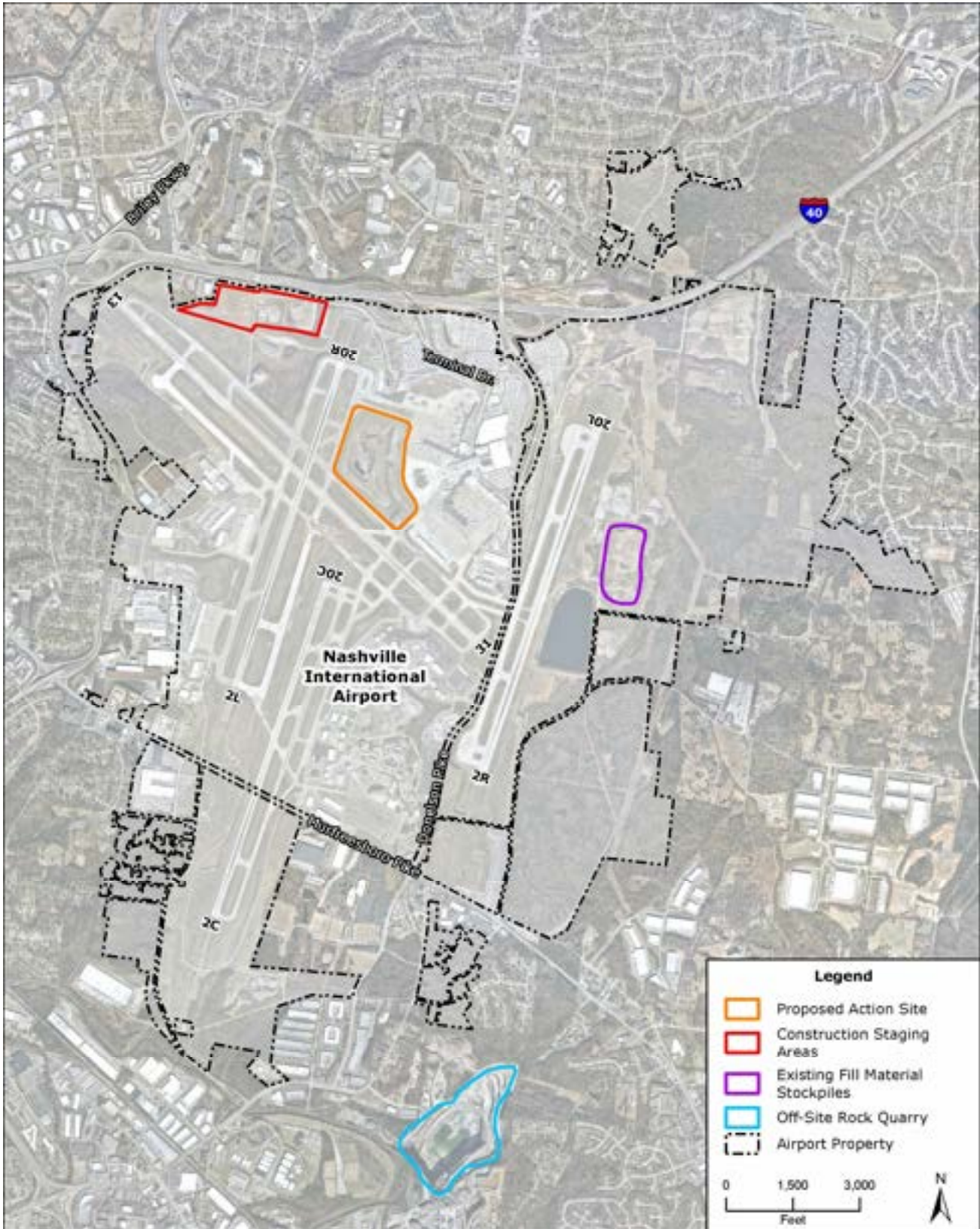
Source: 2020 Master Plan, Nearmap U.S. Vertical Imagery, Landrum & Brown, 2024.

EXHIBIT 1-3, PROPOSED ACTION



Source: Nearmap U.S. Vertical Imagery, Landrum & Brown, 2024.

EXHIBIT 1-4, CONSTRUCTION SUPPORT AREAS



Source: Nearmap U.S. Vertical Imagery, Landrum & Brown, 2024.

## 1.4. Purpose and Need for Proposed Action

### 1.4.1. Need

The MNAA prepared a Master Plan to identify airport facility requirements to meet future demand.<sup>3</sup> Airport facilities that were addressed in the BNA Master Plan included terminal ramp, aircraft de-icing, and RON parking.

BNA currently has nine dedicated deicing positions and 11 RON positions located on the Mid Area ramp (aka guitar pick) and the North Apron. With the completion of the ongoing construction for the Concourse A Reconstruction in 2028, the Airport will lose four deicing and six RON locations on the North Apron. As a result, there will only be five deicing and RON positions. Taxiways M, J, and T1 are used as overflow RON parking in the event that more than five spaces are needed once the North Apron is closed for the Concourse A Reconstruction; however, using the taxiways for RON parking creates operational challenges as it reduces the efficiency of the airfield and requires longer distances for taxi or towing of aircraft from the terminal area.

While infrastructure exists at BNA for deicing at the terminal gates, deicing at the gate causes operational and environmental concerns and is a factor in leading airports to consider locating deicing pads remote from the gate area to allow more efficient gate operations and to have a dedicated collection and treatment system. With the deicing process taking 10-15 minutes on average, deicing at the gate restricts gate availability for arriving flights. Forecasts of peak period arriving and departing flights indicate that BNA's gate areas would become congested if the gate deicing remains the primary location for these activities. Terminal ramp congestion can result in delays to departing and arriving aircraft, and lengthy taxiing distances after deicing can lead to departure delays, affecting the timing of the deice operation, especially in peak operating periods. Aircraft are limited to a "holdover" time depending on weather conditions, meaning that a deiced aircraft must depart within a certain amount of time after being deiced to maintain the required flight safety in expected in-flight icing conditions.

RON aircraft parking is a key component of an airline's operation to ensure that the right aircraft is located at the correct airport to begin daily operations. RON parking is a fluid aspect of terminal apron requirements and can vary based on the available gates to use for RON aircraft parking. Sometimes a gate used by an airline needs to remain vacant overnight and cannot be used for RON by another airline due to early morning scheduling of departures. Additionally, many airlines have preferential use agreements for gates that limit the use of the gate by other airlines. RON parking positions typically also serve as deicing positions since deicing does not typically occur at BNA overnight during the same time as RON positions are being used for aircraft parking.

The BNA 2020 Master Plan concluded additional RON parking facilities, that would also serve as deicing positions, are needed to support aircraft deicing and RON parking requirements. The facility requirements presented in the 2020 Master Plan for deicing and RON indicated that by 2037, 18 RON positions are needed to meet future demand as shown in **Table 1-1**. In 2037, it was determined 12 deicing positions are needed. However, the 12 deicing positions are not needed in addition to the 18 RON positions as the RON positions can also serve as deicing positions.

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<sup>3</sup> Nashville International Airport, Master Plan Update, December 2020

**TABLE 1-1, 2020 MASTER PLAN DEICING AND RON FACILITY NEEDS**

ALTERNATIVE	PAL 1 (2022)	PAL 2 (2027)	PAL 3 (2032)	PAL 4 (2037)
RON Parking Requirements	16	17	17	18
Deicing Positions Required	11	11	12	12

Note: PAL = Planning Activity Level  
 Source: 2020 Master Plan

However, since the preparation of the 2020 Master Plan, operations at BNA have increased substantially resulting in higher operations forecasts. **Table 1-2** shows a comparison of the forecasted total operations between the 2020 Master Plan forecast and the 2023 Terminal Area Forecast (TAF), **Attachment E**. As shown, the total operations forecast in the 2023 TAF is nine percent higher in 2027, 13 percent higher in 2032, and 17 percent higher in 2037 than the 2020 Master Plan forecast. As a result, the 2023 TAF operations were used to calculate the number of RON and deicing positions needed at BNA through 2037.<sup>4</sup>Table 1-2 shows the requirements based on the 2023 TAF.

**TABLE 1-2, COMPARISON OF 2020 MASTER PLAN AND 2023 TERMINAL AREA FORECAST (TAF) TOTAL OPERATIONS FORECAST**

	2027	2032	2037
2020 Master Plan Forecast Total Annual Operations	273,924	291,664	311,114
2023 TAF Total Annual Operations	299,488	331,332	364,413
Total RON Positions Needed Based on 2023 TAF	19	21	23
Total Deicing Positions Needed Based on 2023 TAF	12	14	14

Note: Revised forecast (2024, Landrum & Brown) for 2037 Total Annual Operations is 381,054. Demand for RON and deicing at increased operations is unknown.

Source: 2020 Master Plan, 2023 FAA TAF issued January 2024.

**1.4.2. Purpose**

The purpose of this project is to provide sufficient aircraft deicing positions and RON parking that limits airfield congestion, minimizes aircraft deicing holdover times, meets FAA Airport Design Standards, and avoids Airport Traffic Control Tower line-of-sight issues.

**1.5. Document Content and Organization**

This document is organized as follows:

- **Table of Contents** lists the chapters, exhibits, and tables presented throughout the EA. It also lists the appendices and contains the acronym list
- **Chapter 1** describes the purpose and need for the Proposed Action
- **Chapter 2** describes alternatives to the Proposed Action
- **Chapter 3** describes the affected environment and the environmental impacts of the Proposed Action and of the No Action Alternative
- **Chapter 4** includes the list of preparers of this document
- **Chapter 5** includes the references used in support of this document

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

<sup>4</sup> The Master Plan assumed approximately 0.06 RON spaces are needed per 1,000 operations and approximately 0.04 deice positions are needed per 1,000 operations. This same assumption was used using the 2023 FAA TAF to calculate the needed positions.

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 Change 1, *Environmental Impacts: Policies and Procedures* and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, and took into consideration guidance included in the FAA 1050.1F Desk Reference.

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 (EO) 11990, Protection of Wetlands
- EO 11988, Floodplain Management
- EO 11593, Protection and Enhancement of the Cultural Environment
- EO 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

## 1.6. Implementation Schedule

The Proposed Action is planned to be constructed in phases between 2025 and 2030.

## 1.7. Required Land Use / Environmental Permits

### Federal

- FAA approval of modification of the ALP
- Federal environmental approval pursuant to NEPA
- Section 404/401 Permits from the United States Army Corps of Engineers (USACE) for enclosure/alteration to Sims Branch and Snakey Creek

### State

- Updated National Pollutant Discharge Elimination System (NPDES) Permit administered by the Tennessee Department of Environment and Conservation, Division of Water Resources for Stormwater



- State of Tennessee Aquatic Resource Alteration Permit (ARAP)

**Local**

- Metropolitan Nashville Grading Permit
- Metropolitan Nashville Municipal Separate Storm Sewer System (MS4) Permit

**1.8. Public Notice**

Notice about the subject project will be published in *The Tennessean*, a newspaper of general circulation throughout Nashville and Davidson County, Tennessee, to announce the availability of the draft EA, opportunity to comment, and the date of a public hearing (if indicated by the FAA). Copies of this document will be available online at [flynashville.com](http://flynashville.com) and at the following location at the time the draft EA is published:

Metropolitan Nashville Airport Authority  
Administrative Offices  
140 BNA Park Drive, Suite 520  
Nashville, TN 37214

See **Table 3-1** and **Appendix A, Agency and Public Coordination**, for more information.

## 2. Alternatives

Specific Federal Aviation Administration (FAA) guidance was issued under FAA Orders 1050.1F and 5050.4B which require a thorough and objective assessment of the Proposed Action, the No Action Alternative, and all reasonable alternatives that would achieve the stated purpose and need for the action. Section 6-2.1(d) of FAA Order 1050.1F provides the following guidance on the content of the alternative's analysis for an Environmental Assessment (EA):

*“The alternatives discussed in an EA must include those that the approving official will consider. There is no requirement for a specific number of alternatives or a specific range of alternatives to be included in an EA. An EA may limit the range of alternatives to the proposed action and No Action when there are no unresolved conflicts concerning alternative uses of available resources. Alternatives are to be considered to the degree commensurate with the nature of the proposed action and agency experience with the environmental issues involved. Generally, the greater the degree of impacts, the wider the range of alternatives that should be considered. The preferred alternative, if one has been identified, should be indicated. For alternatives considered but eliminated from further study, the EA should briefly explain why these were eliminated.”*

### 2.1. Alternatives Screening and Evaluation

A multi-step screening process was established to identify and evaluate a range of reasonable alternatives that are capable of achieving the purpose and need statement described in Chapter 1, Purpose and Need. Those alternatives that would reasonably satisfy the purpose and need, identified in Chapter 1 of this EA, were evaluated for construction and operational feasibility. The following describes the two-step screening process.

2.1.1. Step 1 – Does the alternative meet the Purpose and Need?

2.1.2. Step 2 – In addition to Step 1, is the alternative practical and feasible to implement from a technical and economic standpoint, including constructability and operational considerations?

The alternatives that were not eliminated through this screening process were retained for a more detailed environmental evaluation in the EA process. The screening process for the alternatives is shown in Exhibit 2-1.

#### 2.1.1 Step 1: Meet the Purpose and Need

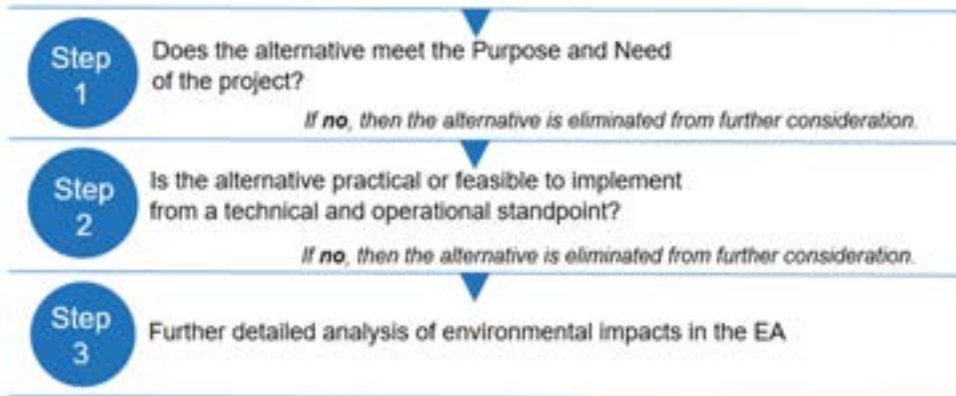
The first step addresses whether the alternatives meet the purpose and need for the Proposed Action as described in Chapter 1. This is satisfied through demonstrating the alternative provides sufficient space to accommodate the needed number of aircraft deicing positions and RON parking that limits airfield congestion, minimizes aircraft deicing holdover times, and avoids Airport Traffic Control Tower line-of-sight issues. Based on the 2023 Terminal Area Forecast (TAF), **Appendix E**, the Airport needs up to 14 deicing and 21 RON parking positions to meet 2032 demand.

#### 2.1.2 Step 2: Constructability and Operational Considerations

The second step is to determine if the alternatives would be practical and feasible from a technical and economic standpoint, including constructability and operational considerations. This is established by determining whether the alternative could accommodate the functional needs and implementation requirements of the project. The third step entails further analysis in this EA. Alternatives that did not meet the evaluation criteria established at steps one and/or two were eliminated from further consideration and were not subject to a detailed analysis of environmental impacts in this EA.



## EXHIBIT 2-1: ALTERNATIVE SCREENING PROCESS



### 2.2 Alternatives Considered for Further Environmental Evaluation

In identifying alternatives for deicing and RON locations, it is common for airports to plan for use of the same ramp area for both deicing and RON functions as the functions typically do not overlap. Areas outside of the terminal ramp area were not considered in the alternatives analysis because parking RON aircraft away from terminal areas causes operational challenges and results in airfield congestion. RON aircraft towed from areas beyond the terminal area to the terminal gates can conflict with aircraft that are taxiing under power from the terminal to the runway system, especially during the morning peak period for departures, resulting in airfield congestion. Placement of deicing and RON facilities beyond the terminal area would also require runway crossings, which is not ideal for efficient airfield operations and can lead to congestion at peak periods. Therefore, only alternatives adjacent to the terminal ramp area were considered for the deicing and RON positions. The Proposed Action Site is the only location that can provide space for deicing and RON positions in the terminal area. Therefore, only the Proposed Action and No Action Alternative are being carried forward for detailed environmental analysis in this EA.

#### Proposed Action

This alternative would expand the Central Ramp between Taxiways B and L. Combined with the Mid Area ramp (aka guitar pick), the Proposed Action would provide up to 23 RON locations to allow flexibility for future requirements. This would meet the projected need for deicing and RON parking positions with additional flexibility for storage and circulation of deicing equipment and other ground support equipment (GSE). This configuration provides appropriate taxi capabilities within the terminal ramp limits. This configuration also provides dual parallel taxilanes serving the terminal ramp area and designates taxilanes for Group III and Group V aircraft, maximizing the efficiency of aircraft ground movements to and from the terminal concourses to the airfield system.

From an operational perspective, once aircraft are deiced at the proposed Central Ramp location, they would have direct access to the taxiway and runway system, reducing the amount of ground time and reducing the possibility of ground delays due to exceedance of deicing holdover times. The Proposed Action also provides better access for General Aviation and Cargo aircraft to deice without entering the terminal ramp area.

#### No Action

With the No Action Alternative, the proposed development would not be implemented. Deicing and parking of RON aircraft would continue to occur in the Mid Area. This would result in delays to

operations. As stated in Chapter 1, Taxiways M, J, and T1 are used as overflow RON parking in the event that more than five spaces are needed. However, using the taxiways for RON parking creates operational challenges reducing the efficiency of the airfield and requires longer distances for taxi or towing of aircraft from the terminal area. As such, the No Action Alternative does not meet the stated purpose and need for this project. Although not always reasonable, feasible, prudent, nor practicable, the No Action Alternative is a required alternative under NEPA and serves as the baseline for the assessment of future conditions/impacts. To satisfy the intent of NEPA, FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*; FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*; and other special purpose environmental laws, the No Action Alternative is carried forward in the analysis of environmental consequences provided in Chapter 3.

## 3 Affected Environment, Environmental Consequences, and Mitigation

In accordance with FAA Order 1050.1F, Paragraph 6-2.1.e, this chapter presents a description of the existing environmental conditions in the potentially affected area. Per the same Paragraph of Order 1505.1F, the Affected Environment section of an EA may be combined with the Environmental Consequences Section. The potential environmental effects resulting from implementation of the alternatives are also presented in this chapter in accordance with FAA Order 1050.1F, Paragraph 6-2.1.f.

### 3.1 Study Area

The Nashville International Airport (BNA or Airport) is an international airport located on approximately 4,500 acres of land within Davidson County, Tennessee. The Proposed Action Site is located on the north side of the Airport and west of the passenger terminal. The Proposed Action would occur entirely on property currently owned by the Metropolitan Nashville Airport Authority (MNAA or the Authority).

**Exhibit 1-3, Study Areas** shows the location of the Proposed Action Site.

For the purposes of this EA, two study areas have been defined – a Direct Study Area and an Indirect Study Area. The Direct Study Area is defined as the area where direct impacts may result from the Proposed Action. As such, the Direct Study Area is the same as the Proposed Action Site and encompasses approximately 74 acres. The Indirect Study Area is defined as the area where both direct and indirect impacts may result from the development of the Proposed Action. The Indirect Study Area includes a 250-foot buffer around the Direct Study Area. Exhibit 3-1 shows the Direct and Indirect Study Areas.

Additionally, construction staging would occur on Airport property at sites previously used by the MNAA for this purpose. Fill material would be obtained from local quarries and onsite stockpiles. As such, no undisturbed areas would be impacted for these activities. Exhibit 1-4 shows the areas to be used for construction staging, the onsite stockpile location for fill material, and the offsite local rock quarry.

### 3.2 Resources Potentially Affected

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 project 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. The following provides a description of the existing environmental conditions in and around the vicinity of BNA. This section also presents the evaluation of both the No Action and Proposed Action alternatives.

The analysis of the alternatives' potential impacts on the existing conditions will include comments from agencies on their respectively managed resources. Scoping letters were sent to resource agencies and public officials on August 30 and September 3, 2024 to request information regarding study areas, potential impacts of concern and other comments on the proposed project (see **Appendix A** for agency correspondence). Table 3-1 includes the resource agencies that received scoping letters and the summarized comments received in response.

**TABLE 3-1, Agencies and Persons Consulted**

Agency/Official	Comment/Response Summary
U.S. Environmental Protection Agency	<i>No Response</i>
U.S. Army Corps of Engineers	No response to scoping letter. Agreed to act as coordinating agency. Coordination meeting 9/17/24 to discuss 404 Permitting and impact mitigation – No objections to proposed action.
U.S. Fish and Wildlife Service	Email received 9/30/24 stating USFWS will not require a biological survey provided appropriate BMPs are in place. Confirmed CRE can use 2021 concurrence that there will be “no impact” to Nashville Crayfish.
Tennessee State Historic Preservation Office	<i>No Response</i>
Tennessee Department of Environment and Conservation	No response to scoping letter. Coordination Meeting 9/17/24 to discuss Aquatic Resource Alteration Permit (404 Water Quality Certification) – No objections to proposed action.
Tennessee Wildlife Resources Agency	Email Receive 9/30 stating TWRA will defer to USFWS Cookeville
Tennessee Governor Bill Lee	<i>No Response</i>
U.S. Representative John Rose	Email, text, and voicemail received on 9/12/24. Office supports the project and has no opposition.
U.S. Senator Bill Hagerty	<i>No Response</i>

EXHIBIT 3-1, STUDY AREAS



Source: Landrum & Brown, 2024

### 3.2.1 Air Quality

#### 3.2.1.1 Affected Environment

The Airport is located within Davidson County, Tennessee. In the past, Davidson County was designated as nonattainment for the 1979 1-hour ozone standard. However, on October 30, 1996, the United States Environmental Protection Agency (USEPA) determined the area had attained the ozone standard and was redesignated to maintenance. Furthermore, the area was redesignated to attainment on April 2, 2008, after the 1979 1-hour ozone standard was revoked. As such, the area is currently in attainment for all criteria pollutants (see **Appendix B, Air Quality**, for more information).

#### 3.2.1.2 Environmental Consequences

The anticipated impacts to air quality due to the Proposed Action were determined in accordance with the guidelines provided in FAA's *Aviation Emissions and Air Quality Handbook Version 3, Update 1*,<sup>5</sup> and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, which together with the guidelines of FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, constitute compliance with all the relevant provisions of NEPA and the Clean Air Act (CAA), as amended in 1990.

##### No Action

The No Action Alternative does not involve any construction activities at the Airport; therefore, the No Action Alternative would not cause any impacts to air quality.

##### Proposed Action

Because the Proposed Action would occur in an area designated as in "attainment" for all criteria pollutants, the anticipated impacts to air quality due to the implementation of the Proposed Action are provided for informational purposes. Implementation of the Proposed Action would result in a temporary increase in emissions at the Airport during construction. **Table 3-1** shows the estimated emissions from construction of the Proposed Action. See Appendix B, *Air Quality* for additional information.

**TABLE 3-2, ANNUAL CRITERIA POLLUTANT EMISSIONS INVENTORY (SHORT TONS PER YEAR)**

YEAR	CO	VOC	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
2025	3.5	0.2	4.0	0.0	3.9	0.5
2026	5.7	0.3	5.7	0.0	7.5	0.9
2027	5.6	0.3	5.6	0.0	7.3	0.9
2028	2.2	0.1	1.8	0.0	3.7	0.4
<i>Federal de minimis Threshold</i>	100	100	100	100	100	100
<b><i>Exceeds de minimis Threshold?</i></b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>	<b>NO</b>

Note: CO = carbon monoxide, VOC = volatile organic compounds, NO<sub>x</sub> = nitrogen oxides, SO<sub>x</sub> = sulfur oxides, PM<sub>10</sub> = particulate matter less than 10 microns in diameter, PM<sub>2.5</sub> = particulate matter less than 2.5 microns in diameter.

Source: Landrum & Brown analysis using the Airport Construction Emissions Inventory Tool (ACEIT) and the USEPA's Motor Vehicle Emissions Simulator version 4 (MOVES4), 2024.

Although the Proposed Action would occur in an area in "attainment" for all criteria pollutants, the emissions are compared to *de minimis* thresholds to identify if the Proposed Action has the potential to create a new violation of the National Ambient Air Quality Standards (NAAQS) and would result in a potentially significant air quality impact. Because the estimated emissions would not exceed the *de*

<sup>5</sup> FAA, *Aviation Emissions and Air Quality Handbook Version 3, Update 1*, January 2015

*minimis* thresholds for any of the construction years, implementation of the Proposed Action is not anticipated to cause or contribute to an exceedance of any NAAQS. Therefore, the Proposed Action would not result in significant air quality impacts.

Construction of the Proposed Action would be expected to contribute to fugitive dust in and around the construction site.

### 3.2.1.3 Mitigation

The MNAA would ensure that all possible measures would be taken to reduce fugitive dust emissions by adhering to guidelines included in FAA Advisory Circular, *Standard Specifications for Construction of Airports*.<sup>6</sup> Methods of controlling dust and other airborne particles would be implemented to the maximum possible extent and may include, but not limited to, the following:

- Exposing the minimum area of erodible earth necessary.
- Applying temporary mulch with or without seeding as practicable.
- Using water sprinkler trucks

## 3.2.2 Biological Resources

### 3.2.2.1 Affected Environment

The Direct Study Area contains mowed grass fields, several drainage channels, a holding pond known as the South Pond,<sup>7</sup> and access roads for maintenance vehicles. Based on surveying done for past environmental reviews, the following species are anticipated to be present within the Direct Study Area. More information is provided in **Appendix C, Biological Resources**.

#### Federally Threatened and Endangered Species

Databases from the U.S. Fish and Wildlife Service (USFWS) and past environmental documentation was reviewed to identify Federally-listed species known to occur in Davidson County. **Table 3-3** identifies the Federally-listed species that have the potential to occur within the Direct Study Area and describes the habitat requirements for each species. The Direct Study Area does not contain any critical habitats.

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<sup>6</sup> FAA Advisory Circular, Standard Specifications for Construction of Airports, Item C-102, Temporary Air and Water Pollution, Soil Erosion, and Siltation Control, AC 150/5370-10H (December 21, 2018)

<sup>7</sup> The South Pond is currently used as a holding pond for spent aircraft deicing fluid treatment. This pond is being decommissioned as part of a separate and independent future project to divert all spent deicing fluid for treatment by the Nashville Metro Water Services.

**7TABLE 3-3, FEDERALLY-LISTED SPECIES THAT MAY OCCUR WITHIN THE DIRECT STUDY AREA**

TAXONOMIC GROUP	SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	HABITAT REQUIREMENTS	HABITAT PRESENT WITHIN THE DIRECT STUDY AREA?
Mammal	<i>Myotis grisescens</i>	Gray Bat	Endangered	Primarily use caves throughout the year, although they move from one cave to another seasonally. Males and young of the year use different caves in summer than females. Smaller colonies also occasionally roost under bridge structures.	No caves or mine portals were observed in or near the Direct Study Area.
Mammal	<i>Myotis septentrionalis</i>	Northern Long-eared Bat	Endangered	In winter, Northern Long-eared bats use caves, mine portals, abandoned tunnels, protected sites along cliff lines and similar situations that afford protection from cold. They are easily overlooked as they often wedge themselves back into wall cracks.	No caves, mine portals, or suitable trees were observed in or near the Direct Study Area.
Mammal	<i>Perimyotis subflavus</i>	Tricolored Bat	Proposed Endangered	During the winter, found in caves and abandoned mines, where caves are sparse, tricolored bats are often found roosting in road-associated culverts and forage during warm nights. During the spring, summer, and fall, tricolored bats are found in forested habitats where they roost in trees, primarily among leaves of live or recently dead deciduous hardwood trees, but may also be found in Spanish moss, pine trees, and occasionally human structures.	No caves, mine portals, or suitable trees were observed in or near the Direct Study Area.



**TABLE 3-3, FEDERALLY-LISTED SPECIES THAT MAY OCCUR WITHIN THE DIRECT STUDY AREA (CONTINUED)**

TAXONOMIC GROUP	SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	HABITAT REQUIREMENTS	HABITAT PRESENT WITHIN THE DIRECT STUDY AREA?
Bird	<i>Grus americana</i>	Whooping Crane	Threatened	Primarily breeds, migrates, winters, and forages in a variety of wetland and other habitats, including coastal marshes and estuaries, inland marshes, lakes, ponds, wet meadows and rivers, and agricultural fields.	Sims Branch and Snakey Creek within the study area are located in the Mill Creek Watershed.
Crustacean	<i>Orconectes shoupi</i>	Nashville Crayfish	Endangered	Inhabits well oxygenated flowing streams with clean bedrock or rocky bottoms. Large rocks are preferred for reproduction and molting. It is endemic to the Mill Creek Watershed.	Sims Branch exhibits bedrock and rocky habitat with moderate flow. Biological assessments in July 2017 and September 2019 did not discover any specimens.
Insect	<i>Danaus plexippus</i>	Monarch Butterfly	Candidate	Feeds on milkweed and lives mainly in prairies, meadows, and grasslands	No milkweed was observed in or near the Direct Study Area.
Plant	<i>Arabis perstellata</i>	Braun's Rock-cress	Endangered	Mesic forests with steep north-facing slopes with soils derived from limestone often with limestone outcrops. Prefers areas with little competition of scour, erosion, or animal disturbance.	No mesic forests or limestone outcrops were observed in or near the Direct Study Area.
Plant	<i>Astragalus bibullatus</i>	Guthrie's (pyne's) Ground-plum	Endangered	Inhabits cedar glade ecosystems where it prefers the margins with deeper soils.	There are no cedar glade ecosystems located in the Direct Study Area.
Plant	<i>Dalea foliosa</i>	Leafy Prairie-clover	Endangered	Inhabits limestone glades with thin soil near stream, seeps, or other sources of seasonal moisture.	There are no limestone glades located in the Direct Study Area.
Plant	<i>Apios priceana</i>	Price's Potato-bean	Threatened	Inhabits open, mixed-oak forests, forest edges and clearings on river bottoms and ravines.	Forest edges along Sims Branch, which could support Price's Potato-Bean.

**TABLE 3-3, FEDERALLY-LISTED SPECIES THAT MAY OCCUR WITHIN THE DIRECT STUDY AREA (CONTINUED)**

TAXONOMIC GROUP	SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	HABITAT REQUIREMENTS	HABITAT PRESENT WITHIN THE DIRECT STUDY AREA?
Plant	<i>Physaria globosa</i>	Short's Bladderpod	Endangered	Prefers dry cedar glades, limestone cliffs, talus areas, or steep rocky slopes.	There are no dry limestone or cedar glades, talus areas, or steep rocky slopes located in the Direct Study Area.

Source: Environmental Assessment, Concourse and Gate Expansion, 2021; U.S. Fish and Wildlife Service, June 12, 2024, IPaC Resource List, ECOS Database, 2024

**State-Listed Threatened and Endangered Species**

Coordination with Tennessee Department of Environment and Conservation (TDEC) is still ongoing. Based on previous environmental review, the species listed in **Table 3-4** have the potential to be present within the Direct Study Area.

**TABLE 3-4, STATE-LISTED SPECIES THAT MAY OCCUR WITHIN THE DIRECT STUDY AREA**

TAXONOMIC GROUP	SCIENTIFIC NAME	COMMON NAME	HABITAT REQUIREMENTS	HABITAT PRESENT WITHIN THE DIRECT STUDY AREA?
Bird	<i>Ardea herodias</i>	Blue Heron - Rookery	Nesting colonies are often located on islands or in wooded swamps in large trees; often in cypress trees.	There are no large bodies of water or swamps with large trees in the Direct Study Area.
Planarian	<i>Sphalloplana buchanani</i>	A Cave Obligate Planarian	Inhabits aquatic environments within caves.	No caves are located in the Direct Study Area.
Crustaceans	<i>Orconectes shoupi</i>	Nashville Crayfish	Inhabits well oxygenated flowing streams with clean bedrock or rocky bottoms. Large rocks are preferred for reproduction and molting. It is endemic to the Mill Creek Watershed.	Sims Branch exhibits bedrock and rocky habitat with moderate flow. Biological assessments in July 2017 and September 2019 did not discover any specimens.
Plants	<i>Talinum calcaricum</i>	Limestone Fameflower	In habits limestone glades typically on outcrops or edges of outcrops.	There are no limestone glades located in the Direct Study Area

**TABLE 3-4, STATE-LISTED SPECIES THAT MAY OCCUR WITHIN THE DIRECT STUDY AREA**

TAXONOMIC GROUP	SCIENTIFIC NAME	COMMON NAME	HABITAT REQUIREMENTS	HABITAT PRESENT WITHIN THE DIRECT STUDY AREA?
Plants	<i>Stellaria fontinalis</i>	Water Stitchwort	Found in wet limestone glades along streams or seeps.	There are no cedar glade ecosystems located in the Direct Study Area.
Plants	<i>Panax quinquefolius</i>	American Ginseng	Inhabits hardwood or mixed forests with moderate moisture and rich soil preferable over limestone parent material.	Mixed forest with moderate moisture is located along the unnamed tributary of Sims Branch at the north end of the Direct Study Area.

Source: Environmental Assessment, Concourse and Gate Expansion, 2021.

**Bald and Golden Eagle Protection Act**

The bald eagle is afforded protection under the Bald and Golden Eagle Protection Act of 1940 and the Migratory Bird Treaty Act of 1918, as amended. Databases from the USFWS were reviewed to identify bald and golden eagles known to occur in Davidson County.

Bald Eagle (*Haliaeetus leucocephalus*) - Bald eagles are large raptors that average 14 pounds with a wingspan of approximately eight feet as adults. They are brown with white head and tail feathers and range across North America utilizing a variety of habitats including coastal areas, rivers, lakes, and other territories in proximity to their preferred food, fish. Bald eagles are known to occur in Tennessee but are not a Bird of Conservation Concern in this area. Nests are often constructed in large, open, and accessible trees. Restrictions regarding work around their nests are in place and vary based on the time of year and distance from the nest. Generally, if work is proposed within 660 feet of the nest, restrictions may be applicable. No documented eagle nests occur within 660 feet of the Direct Study Area and no habitat for nests is located in or around the Direct Study Area.

**3.2.2.2 Environmental Consequences**

FAA Order 1050.1F states that a significant impact to biological resources (including fish, wildlife, and plants) would occur when the USFWS or the National Marine Fisheries Service determines that the action would be likely to jeopardize the continued existence of a Federally-listed threatened or endangered species, or would result in the destruction or adverse modification of Federally-designated critical habitat. The FAA has not established a threshold of significance for species of concern or non-listed species; however, the following factors should be considered, as noted in Order 1050.1F:

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

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

### No Action

The No Action Alternative does not involve any development; therefore, there would be no impacts to biological resources.

### Proposed Action

As previously discussed, there is no critical habitat for the listed species present in or around the Direct Study Area. Past endangered species surveys in 2017 and 2019 did not find any protected species within the Direct Study Area or on Airport property adjacent to the Direct Study Area. During consultation, the USFWS confirmed that the Biological Assessment for the BNA Concourse and Gate Expansion EA, and USFWS Concurrence, was sufficient for the USFWS to support a finding of "not likely to adversely affect" the Nashville Crayfish (*Orconectes shoupi*) (see **Table 3-3, Appendix A, Agency and Public Coordination**, and **Appendix C, Biological Resources**). The USFWS confirmed that they would not recommend another survey for the Nashville Crayfish, "[p]rovided appropriate BMPs are in place throughout the project that would prevent sediment/contaminant migration downstream..." As such, it is anticipated the Proposed Action would not have a significant impact on listed species or their critical habitat. See **Appendix A, Agency and Public Coordination** and **Appendix C, Biological Resources** for more information.

The Proposed Action has the potential to introduce additional wildlife attractants to the Direct Study Area. Per Advisory Circular 150/5200-33C, *Hazardous Wildlife Attractants on or near Airports*, there are substantial risks to safe air and ground operations in airport environments posed by certain wildlife species. These species can be attracted to enter the aircraft operations areas (such as the Direct Study Area) based on certain land-use practices and can increase the hazards. Some such constructed or natural areas are poorly drained locations, detention/retention ponds, and vegetation which attracts roosting, feeding, etc. The Proposed Action will include aspects to prevent additional wildlife attractants to the existing water and vegetation within the Project limits. The grass will be regularly mowed as is necessary to prevent growth to a level of concern. Stormwater management permit requirements and best management practices (BMPs) will limit the potential for water to remain pooled in one location to the extent practicable and feasible, thereby limiting wildlife attractants beyond existing conditions.

## **3.2.3 Climate**

### **3.2.3.1 Affected Environment**

Greenhouse gases (GHG) 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 are the primary sources that would generate GHGs.

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 USEPA data," compared with other industrial sources, including the remainder of the transportation sector (20 percent) and power generation (41 percent).<sup>8</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>9</sup> Climate change due to GHG emissions is a global phenomenon, so the affected

<sup>8</sup> Aviation and Climate Change, GAO Report to Congressional Committees, (2009)

<sup>9</sup> Alan Melrose, "European ATM and Climate Adaptation: A Scoping Study," in ICAO Environmental Report. (2010)

environment is the global climate.<sup>10</sup>

### 3.2.3.2 Environmental Consequences

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.

#### No Action

Under the No Action Alternative, there would be no increase in project-specific GHG emissions.

#### Proposed Action

Construction of the Proposed Action would result in a temporary increase in GHG emissions. **Table 3-5** provides an estimate of the annual GHG emissions inventory from construction activities. These estimates are provided for information only as no Federal NEPA standard for the significance of GHG emissions from individual projects on the environment has been established. See Appendix B, *Air Quality*, for a discussion on the methodology and software used to develop the estimated GHG emissions.

**TABLE 3-5, ANNUAL GHG EMISSIONS INVENTORY (METRIC TONS PER YEAR)**

YEAR	CO <sub>2</sub> E
2025	3,431.09
2026	5,747.94
2027	5,623.28
2028	2,385.55

Note: CO<sub>2</sub>E = Carbon Dioxide equivalent.

Source: Landrum & Brown analysis using the ACEIT and the USEPA's MOVES4, 2024

### 3.2.4 Coastal Resources

#### 3.2.4.1 Affected Environment

No coastal resources are present within or adjacent to the Direct Study Area.

#### 3.2.4.2 Environmental Consequences

##### No Action

The No Action Alternative does not involve any development; therefore, there would be no impacts to coastal resources.

##### Proposed Action

Because no coastal resources were identified within the Direct Study Area, no impacts to coastal resources would result from the Proposed Action.

### 3.2.5 Department of Transportation Act, Section 4(f)

#### 3.2.5.1 Affected Environment

Resources protected under Section 4(f) of the Department of Transportation Act [49 U.S.C. 303(c)] include parks, recreation areas, wildlife/waterfowl refuges, and historic sites of national, state, or local

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



significance. No Section 4(f) resources are located within the Direct Study Area. See Section 3.2.8 for more information on historic resources.

### **3.2.5.2 Environmental Consequences**

#### No Action

The No Action Alternative does not involve any development; therefore, there would be no impacts to Section 4(f) resources.

#### Proposed Action

Because no Section 4(f) resources were identified within the Direct and Indirect Study Areas, no impacts to Section 4(f) resources would result from the Proposed Action.

### 3.2.6 Farmlands

#### 3.2.6.1 Affected Environment

The Direct Study Area is located on land committed to urban development as it is located within the “urbanized area” on the Census Bureau Map.<sup>12</sup> Therefore, the Direct Study Area does not contain prime or unique farmlands.

#### 3.2.6.2 Environmental Consequences

##### No Action

The No Action Alternative does not involve any development; therefore, there would be no impacts to farmlands.

##### Proposed Action

Because no prime or unique farmlands occur within the Direct Study Area, no impacts to farmlands would result from the Proposed Action.

### 3.2.7 Hazardous Materials, Solid Waste, and Pollution Prevention

#### 3.2.7.1 Hazardous Materials

##### 3.2.7.1.1 Affected Environment

The EA completed for the BNA Vision 1.0 documented 21 remediation sites within a one-mile radius of the Airport property.<sup>13</sup> One closed remediation site (SRS190517) is located adjacent to the Direct Study Area, at Taxiway T2.<sup>14</sup> The USEPA’s online database shows no active or archived Superfund National Priorities List (NPL) sites within the Direct Study Area.<sup>15</sup> The Direct Study Area contains the South Pond that is currently used as a holding pond for spent aircraft deicing fluid treatment.

##### 3.2.7.1.2 Environmental Consequences

##### No Action

The No Action Alternative does not involve any development; therefore, there would be no impacts related to hazardous materials.

##### Proposed Action

The Direct Study Area is vacant and does not contain any known hazardous materials. The South Pond will be closed and decommissioned as a part of a separate project. The decommissioning of the pond will be performed by the contractor in accordance with applicable Federal and state regulatory requirements. The storage, use, transportation, and disposal of hazardous materials and other regulated substances would continue to be governed by Federal, state, and local regulations. Once the South Pond is closed, all spent deicing fluid will be diverted for treatment by the Nashville Metro Water Services.

##### 3.2.7.1.3 Mitigation

While there are no records or evidence of any ground contaminating events at the Direct Study Area, there is a potential for encountering hazardous substances during construction activities. The

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<sup>12</sup> United State Census Bureau, TIGERweb, Urban Areas, Available online:

[https://tigerweb.geo.census.gov/tigerwebmain/TIGERweb\\_restmapservice.html](https://tigerweb.geo.census.gov/tigerwebmain/TIGERweb_restmapservice.html), Accessed June 12, 2024

<sup>13</sup> Environmental Assessment, Vision 1.0, Corgan Architecture and Interior Design and Amex Foster Wheeler, Environmental & Infrastructure, Inc., February 2018

<sup>14</sup> TDEC, Division of Remediation (DOR) Sites, Accessed June 13, 2024, Available online: <https://tdeconline.tn.gov/dor/>

<sup>15</sup> USEPA, Superfund National Priorities List (NPL) Sites with Status Information, Available online:

<https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=33cebcdffd1b4c3a8b51d416956c41f1>, Accessed January 2, 2023

contractors would be required to implement site-specific spill prevention, control, and countermeasure (SPCC) plans 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. Therefore, the Proposed Action is not likely to result in significant impacts related to hazardous materials.

### **3.2.7.2 Solid Waste**

#### **3.2.7.2.1 Affected Environment**

Solid waste at airports is generally related to operational and construction activities. The Airport’s industrial, construction, and municipal solid wastes are disposed of by private waste management companies contracted by MNAA. Two active landfills are located within Davidson County, including Central Pike Class IV Landfill and Southern Services Landfill. For disposal of recyclable paper, cardboard, plastic, and metal, MNAA contracts the Metropolitan Nashville Department of Public Works Curby program.

#### **3.2.7.2.2 Environmental Consequences**

##### No Action

The No Action Alternative does not involve any development; therefore, there would be no impacts to solid waste generation or disposal practices at the Airport.

##### Proposed Action

The Proposed Action would create a temporary increase in solid waste generated during construction. The volume of solid waste is expected to be accommodated by surrounding landfills.

Foreign Object Debris (FOD) is defined in FAA Advisory Circular 150/5210-24A – Airport Foreign Object Debris (FOD) management, as “any object, live or not, located in an inappropriate location in the airport environment that has the capacity to injure airport or air carrier personnel and damage aircraft.” Most of the solid waste that will be generated from the Proposed Action is not at risk of becoming FOD due to the weight and/or management of the waste (see Section 3.2.7.2.2). As with all construction projects, there is an increased potential for FOD to be introduced by way of wrappers, bags, or other objects necessary for construction. This potential FOD must be adequately managed.

#### **3.2.7.2.3 Mitigation**

The developer would divert, recycle, or re-use construction waste to the extent feasible. Construction waste not diverted, recycled, or re-used would be transported to and disposed of in local permitted construction/demolition debris facilities or in accordance with applicable state and local requirements. Additionally, the operation of the Proposed Action would not increase the amount of solid waste generated annually. Therefore, the Proposed Action is not likely to result in significant impacts related to solid waste.

Pollution prevention is accomplished through the implementation of site-specific SPCC Plans and Stormwater Pollution Prevention Plans (SWPPP). The SPCC is designed to prevent the discharge of petroleum-based pollutants into the environment and the SWPPP is designed to minimize stormwater pollution through source control.

The developer 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. As previously stated, the contractor(s) would be required to implement SPCC plans that reduce the potential for substantial impacts associated with regulated materials. Therefore, the Proposed Action is not likely to result in significant impacts from environmental contamination.



FOD would be managed in various ways including, but not limited to training, prevention, evaluation, and detection. All craft and staff will be trained on what FOD is, how it is introduced, and the importance and methods for FOD management. All craft and staff would be trained on the expectations for FOD prevention and procedures for reporting and/or immediately correcting issues. Evaluation of FOD management will be included in the contractor's continuous and regularly scheduled safety walks. Any issues would be immediately corrected and/or documented for correction as soon as possible.

### **3.2.8 Historical, Architectural, Archaeological, and Cultural Resources**

#### **3.2.8.1 Affected Environment**

The National Historic Preservation Act (NHPA) is the primary Federal law governing the preservation of historic and prehistoric resources, encompassing art, architecture, archaeological, and other cultural resources. Section 106 of the NHPA requires that, prior to approval of a Federal or Federally-assisted project, or before the issuance of a license, permit, or other similar approval, Federal agencies take into account the effect of the project on properties that are on or eligible for listing on the National Register of Historic Places (NRHP).

For the purpose of this EA, the Area of Potential Effects (APE) corresponds to the Indirect Study Area. As previously stated, the Proposed Action is in the center of BNA property and is surrounded by aviation land uses. As such, the APE is located entirely within the Airport property. A review of the NRHP indicates that there are no registered properties or properties listed as being eligible for inclusion on the NRHP in the APE for this project. The closest NRHP-listed source is the James Buchanan House located 1.45 miles to the northeast of the Airport.

Furthermore, the APE is completely surrounded by Airport development and has been previously disturbed by past construction activity. Therefore, it is unlikely that any intact archaeological resources exist within the APE.

#### **3.2.8.2 Environmental Consequences**

##### No Action

The No Action Alternative does not involve any development; therefore, there would be no impacts to historic, architectural, archaeological, and cultural resources.

##### Proposed Action

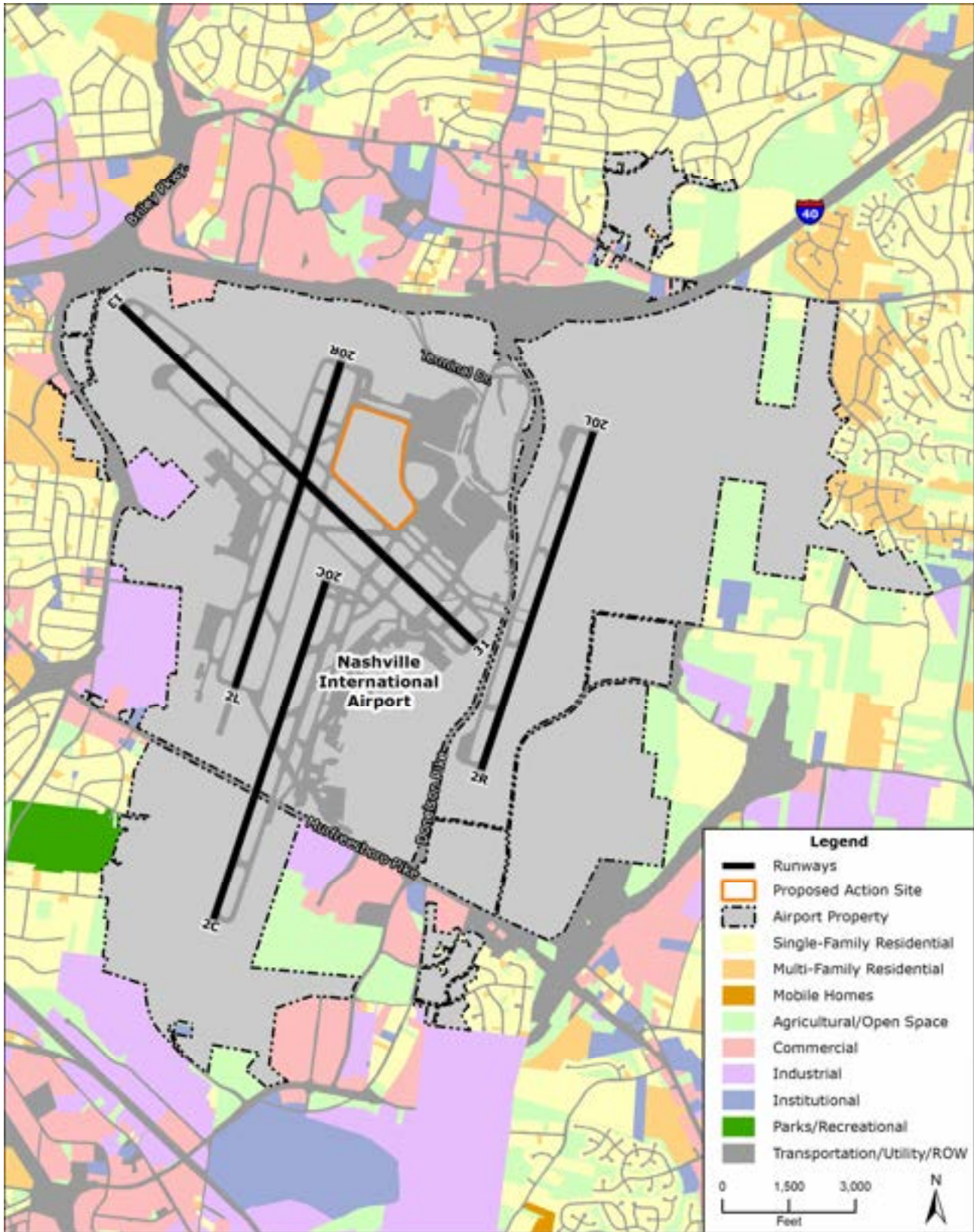
There are no properties on or eligible for listing on the NRHP in the APE. FAA anticipates SHPO concurrence on a finding of no historic properties affected, pursuant to 36 CFR 800.4(d)1. If construction activities uncover archaeological materials, work would be halted in the area of discovery and the State Historic Preservation Officer (SHPO) and FAA would be immediately notified.

### **3.2.9 Land Use**

#### **3.2.9.1 Affected Environment**

The Proposed Action would take place in the center of BNA property and is surrounded by aviation land uses. The land uses surrounding the Airport include industrial, commercial, residential, compatible public land, hotels, and areas under transition. The residences nearest to the Direct Study Area are located over 2,800 feet to the north of the Airport, north of Interstate 40. **Exhibit 3-2, Land Use**, shows the land use patterns around BNA.

**EXHIBIT 3-2, LAND USE**



Source: City of Nashville Mapping Services and GIS; Landrum & Brown, 2024

### **3.2.9.2 Environmental Consequences**

The FAA has not established a significance threshold for land use impacts, other than those related to noise impacts. However, CEQ Regulations require that NEPA documents discuss any inconsistency with approved state and/or local plan(s) and law(s). Furthermore, the NEPA document should discuss potential hazards to aviation such as landfills, wildlife refuges, or wetland mitigation that may attract wildlife species that could be hazardous to aviation and could result in potential structure-height impacts.

#### No Action

The No Action Alternative would not involve any development or cause any changes to existing land use; therefore, no adverse land use compatibility impacts would occur.

#### Proposed Action

The Proposed Action is consistent with plans related to the development of the Airport. Therefore, no adverse impacts related to land use would occur with implementation of the Proposed Action.

### **3.2.10 Natural Resources and Energy Supply**

#### **3.2.10.1 Affected Environment**

Buildings and parking lots at the Airport require electricity and natural gas for lighting, cooling, and heating. Electricity is used for cooling and lighting for buildings, lighting for aircraft and vehicle parking areas, airfield lighting systems, roadway lighting, and other facilities. The Airport receives its electric supply from Nashville Electric Service and natural gas supply from Piedmont Natural Gas. The Airport is located within a highly urbanized area with adequate access to natural resources for construction projects and operation of facilities.

#### **3.2.10.2 Environmental Consequences**

Sections 1502.16(e) and (f) of the CEQ Regulations require that Federal agencies consider energy requirements, natural resource requirements, and potential conservation measures for a proposed project and its alternatives.

#### No Action

The No Action Alternative does not involve any development; therefore, there would be no impacts to natural resources or the supply of energy.

#### Proposed Action

Construction of the Proposed Action would require natural resources such as fill material, shot rock, gravel, sand, aggregate, concrete, asphalt, water, and other construction materials. These materials are not in short supply in the Nashville metropolitan area and consumption of these materials is not expected to deplete existing supplies. Operation of the Proposed Action may increase the use of electricity to light the expanded ramp area. While the Proposed Action would increase the amount of energy and natural resources consumed in the short and long-term, the Proposed Action is in an urban area with a sufficient supply of electricity and natural gas. Therefore, the Proposed Action is not expected to result in adverse impacts to the local supply of energy or natural resources.

### **3.2.11 Noise and Noise Compatible Land Use**

#### **3.2.11.1 Affected Environment**

The Proposed Action is in the center of BNA property. As a result, the Direct Study Area experiences noise from aircraft operating at the Airport.

### 3.2.11.2 Environmental Consequences

The following section addresses potential noise impacts related to the operation and construction of the Proposed Action.

#### No Action

The No Action Alternative does not involve any development; therefore, there would be no impacts related to noise.

#### Proposed Action

The Proposed Action would not result in changes to the number of operations, fleet mix, runway use, or time of day of operations at the Airport. Therefore, no significant operational noise impacts would result from the Proposed Action.

Noise from construction equipment and trucks may be audible within and adjacent to the Direct Study Area. **Table 3-6** 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.

**TABLE 3-6, CONSTRUCTION EQUIPMENT NOISE**

CONSTRUCTION EQUIPMENT	TYPICAL MAXIMUM SOUND LEVEL (LMAX) IN DB(A) AT 50 FEET
Dump Truck	76
Concrete Mixer Truck	79
Jackhammer	89
Scraper	84
Dozer	82
Paver	77
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.

Construction activities associated with the Proposed Action are not expected to result in increases of noise levels to residential or other public land uses due to the limited amount of time the construction activity would occur and distance to the nearest residential land uses.

### 3.2.11.3 Mitigation

The nearest residential land area is located over 2,800 feet to the north of the Direct Study Area. Noise from construction equipment would likely not be discernible from other background noise sources such as aircraft and major roadway noise in most locations.

### 3.2.12 Socioeconomics, Environmental Justice, and Children’s Environmental Health and Safety Risks

#### 3.2.12.1 Socioeconomics

##### 3.2.12.1.1 Affected Environment

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.

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 project 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 project and alternative(s).

#### Population

The Indirect Study Area is located in Davidson County, Tennessee. Demographic data of the population within Davidson County and the State of Tennessee is shown in **Table 3-7**.

**TABLE 3-7, DEMOGRAPHIC DATA**

	DAVIDSON COUNTY, TENNESSEE	STATE OF TENNESSEE
<b>Population</b>	<b>715,884</b>	<b>6,910,840</b>
Not Hispanic	617,765	6,431,653
White	386,835	4,900,246
Black / African American	171,489	1,083,772
American Indian / Alaskan Native	1,309	15,539
Asian	27,660	134,302
Native Hawaiian or Pacific Islander	303	3,594
Other	30,169	294,200
Hispanic	98,119	479,187
<b>Percent Minority</b>	<b>46.0%</b>	<b>29.1%</b>
<b>Percent Low-Income*</b>	<b>14.3%</b>	<b>14.0%</b>

\*The Department of Health and Human Services poverty guideline level in 2022 for a family/household of one was \$13,590 and for a household/family of four was \$27,750.

Note: At the time of this writing, the U.S. Census Bureau, 2020 Census Demographic and Housing Characteristics File (DHC) contained population data by race and ethnicity for census block groups and counties but did not contain the data needed to estimate percent below the poverty level for census block groups or counties. As such, the U.S. Census Bureau, 2020 Census DHC was used to identify population by ethnic and race and estimate percent minority while the U.S. Census Bureau, 2018-2022 American Community Survey (ACS) 5-Year Estimates was used to estimate percent population below the poverty level.

Source: U.S. Census Bureau, 2020 Census DHC; U.S. Census Bureau, 2018-2022 ACS 5-Year Estimates; Landrum & Brown analysis, 2024.

## Public Services and Social Conditions

Public services in Davidson County include such facilities as educational institutions, medical services, and emergency response services.

- Educational Institutions: Davidson County is encompassed by the Metro Nashville Public Schools (MNPS) school district. Glengarry Elementary School is the closest MNPS school, located over two miles southeast of the Indirect Study Area.
- Medical Services: Davidson County is supported by multiple hospital networks. The closest medical center, TriStar Southern Hills Medical Center, is located over four miles southeast of the Indirect Study Area.
- Emergency Response Services: The Airport's Department of Public Safety Aircraft, Rescue, and Firefighting (ARFF) unit provide safety and security for BNA.

### **3.2.12.1.2 Environmental Consequences**

The FAA has not established a significance threshold for socioeconomic; however, in general, the significance of socioeconomic impacts is determined by the magnitude and duration of the impacts, whether beneficial or adverse. According to FAA Order 1050.1F, potential impacts to consider include:

- inducing substantial economic growth,
- dividing or disrupting an established community,
- extensive relocation of housing when sufficient replacement housing is unavailable,
- extensive relocation of businesses that would cause economic hardship,
- disruption of local traffic patterns, or
- substantial loss of the community tax base.

### No Action

The No Action Alternative does not involve any development or changes to the physical characteristics of the Airport; therefore, there would be no impacts related to socioeconomic.

### Proposed Action

The Proposed Action would not cause the relocation of housing, relocation of businesses, disruption of an established community, or the loss of the community tax base. The implementation of the Proposed Action is anticipated to induce economic growth through temporary employment during construction.

Temporary construction impacts could include increased commercial and construction traffic, increased traffic congestion, increased travel distances, and increased travel times for drivers.

### **3.2.12.1.3 Mitigation**

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 because it is not likely that a contractor would schedule haul activities during extreme congestion periods or weather conditions because it could increase costs to the contractor and affect the schedule.

### **3.2.12.2 Environmental Justice**

#### **3.2.12.2.1 Affected Environment**

Environmental justice (EJ) 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. Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, requires all Federal agencies to identify and address disproportionate and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The EO also directs Federal agencies to incorporate EJ into their overall missions 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.

U.S. Department of Transportation (USDOT) Order 5610.2, *Environmental Justice in Minority Populations and Low-Income Populations*, was issued to implement EO 12898 and updated in USDOT Order 5610.2(a).<sup>16</sup> USDOT Order 5610.2(a) defines minorities as people who are Black, Hispanic or Latino, Asian American, American Indian, Alaskan Native, Native Hawaiian, or other Pacific Islander. Minority populations are defined as “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.”<sup>17</sup> The USDOT Order defines a low-income population as “any readily identifiable group” of persons whose median household income is at or below the poverty guidelines of the

U.S. Department of Health and Human Services, “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.”<sup>18</sup>

The identification of minority and low-income communities in the surrounding area of the northern segment of the Airport was conducted through an assessment of U.S. Census Bureau data.<sup>19</sup> One census block group which contains residential land uses located north of Interstate 40 located within one mile of the Indirect Study Area was identified for the purpose of this analysis. Davidson County was used as the reference area because the Indirect Study Area is located in Davidson County and its community is relevant to the demographic of the surrounding census block groups. As previously stated, the reference area, Davidson County, contains 14.3 percent low-income and 46.0 percent minority populations. In order to identify if a census block group contained EJ populations, the percentage of low-income and minority populations for Davidson County was used as a threshold. If a census block group’s percentage of low-income and minority populations exceeds those of Davidson County, the census block group was identified as potentially containing an EJ population. As shown in **Table 3-8**, the census block group does not potentially contain an EJ population.

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<sup>16</sup> U.S. Department of Transportation (USDOT) Order 5610.2, *Environmental Justice in Minority Populations and Low-Income Populations*, was issued on April 15, 1997. Order 5610.2(a), Department of Transportation Updated Environmental Justice Order, was issued on May 2, 2012.

<sup>17</sup> Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, February 11, 1994.

<sup>18</sup> *Ibid.*

<sup>19</sup> At the time of this writing, the U.S. Census Bureau, 2020 Census Demographic and Housing Characteristics File (DHC) contained population data by race and ethnicity for census block groups and counties but did not contain the data needed to estimate percent below the poverty level for census block groups or counties. As such, the 2020 Census Demographic and Housing Characteristics File (DHC) was used to identify population by ethnic and race and estimate percent minority while the U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates was used to estimate percent population below the poverty level.

**TABLE 3-8, DEMOGRAPHIC DATA BY CENSUS BLOCK GROUP**

DAVIDSON COUNTY CENSUS TRACT BLOCK GROUP	PERCENT MINORITY POPULATION <sup>1</sup>	PERCENT LOW-INCOME POPULATION <sup>2</sup>	POTENTIAL EJ POPULATION?
Block Group 2; Census Tract 151; Davidson County; Tennessee	41.0%	2.9%	NO

<sup>1</sup> U.S. Census Bureau, 2020 Census DHC

<sup>2</sup> U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates

Source: U.S. Census Bureau, 2020 Census DHC; U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates Detailed Tables; Landrum & Brown analysis, 2024.

**3.2.12.2.2 Environmental Consequences**

A significance threshold for EJ has not been defined by the FAA. However, potential impacts would occur if disproportionately high and adverse environmental impacts in one or more environmental categories were to occur to environmental populations. In addition, unique impacts to an EJ population should also be considered even if there is no significant impact from other environmental categories.

No Action

The No Action Alternative does not involve any development or changes to the Airport; therefore, there would be no impacts related to EJ populations.

Proposed Action

Implementation of the Proposed Action would result in an increase in traffic on surrounding roadways due to construction activities which may result in a temporary impact to the local residents. However, there is no potential EJ population within one mile of the Direct Study Area and the anticipated impact would be temporary. Therefore, the Proposed Action would not result in a disproportionate and adverse impact on potential EJ populations.

**3.2.12.3 CHILDREN’S ENVIRONMENTAL HEALTH AND SAFETY RISKS**

**3.2.12.3.1 Affected Environment**

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.

There are no schools, day care centers, or parks within or adjacent to the Indirect Study Area. Glengarry Elementary School is the closest school, located over two miles southeast of the Indirect Study Area. The closest park is the Metro Soccer Complex located adjacent to the southeast portion of the Airport located approximately two miles southeast of the Indirect Study Area.

**3.2.12.3.2 Environmental Consequences**

EO 13045 directs Federal agencies to analyze their policies, programs, activities, and standards for any environmental health or safety risks that may disproportionately affect children. The FAA has not established a significance threshold for Children’s Environmental Health and Safety Risks. However, per FAA Order 1050.1F, potential impacts from other environmental categories should be assessed to determine if they have the potential to lead to a disproportionate health or safety risk to children.



No Action

The No Action Alternative does not involve any development or changes to the Airport; therefore, there would be no impact related to health or safety risk to children.

Proposed Action

Implementation of the Proposed Action would not create environmental health risks or safety risks for any persons, regardless of age. Therefore, no potential or significant adverse impacts to children’s health and safety would occur with implementation of the Proposed Action.

**3.2.13 Visual Effects (Light Emissions and Visual Character)**

**3.2.13.1 Affected Environment**

The Indirect Study Area consists of primarily mowed grass with wetlands and surface waters and airfield pavement/taxiways. The Proposed Action is in the center of BNA property and is surrounded by aviation land uses which all have lighting illuminating the existing airfield, buildings, and parking areas. These features are not visible from the nearest residential areas located over 2,800 feet to the north.

**3.2.13.2 Environmental Consequences**

No Action

The No Action Alternative does not involve any development or changes to the Airport; therefore, there would be no impact related to light emissions or visual resources/visual character.

Proposed Action

*Light Emissions:* The closest residential area is located over 2,800 feet to the north of the Airport, north of Interstate 40. Any lighting that would be implemented to illuminate the Proposed Action would be directed at angles that would not cause lighting impacts outside of the Airport property. Therefore, no significant impacts from light emissions would occur.

*Visual Resources/Visual Character:* The Direct Study Area is not visible from the nearest residential areas located over 2,800 feet to the north. Therefore, the Proposed Action would not significantly alter the views from these areas and no significant visual impacts are expected to occur.

**3.2.14 Water Resources**

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.

**3.2.14.1 Affected Environment**

Wetlands and Streams, Surface Waters

The Airport lies within the lower Mill Creek watershed and includes the headwaters of Sims Branch. A wetland and stream delineation was conducted in May 2024 to identify aquatic features within the Direct Study Area and the associated report is currently being finalized.<sup>20</sup> Based on information current as of June 12, 2024, the Direct Study Area includes of 3,133 linear feet of streams, 0.27 acres of pond, and 0.04 acres of wetlands, as shown in **Table 3-9**. These features are shown on **Exhibit 3-3, Wetlands and Streams**.

The City of Nashville is part of a Municipal Separate Storm Sewer System (MS4) that is managed by the Metro Water Services Stormwater Division and is regulated by the TDEC under the USEPA’s

<sup>20</sup> Working Draft Preliminary Wetland Delineation and Hydrologic Determination, Garver, Prepared for the Nashville International Airport, May 2024

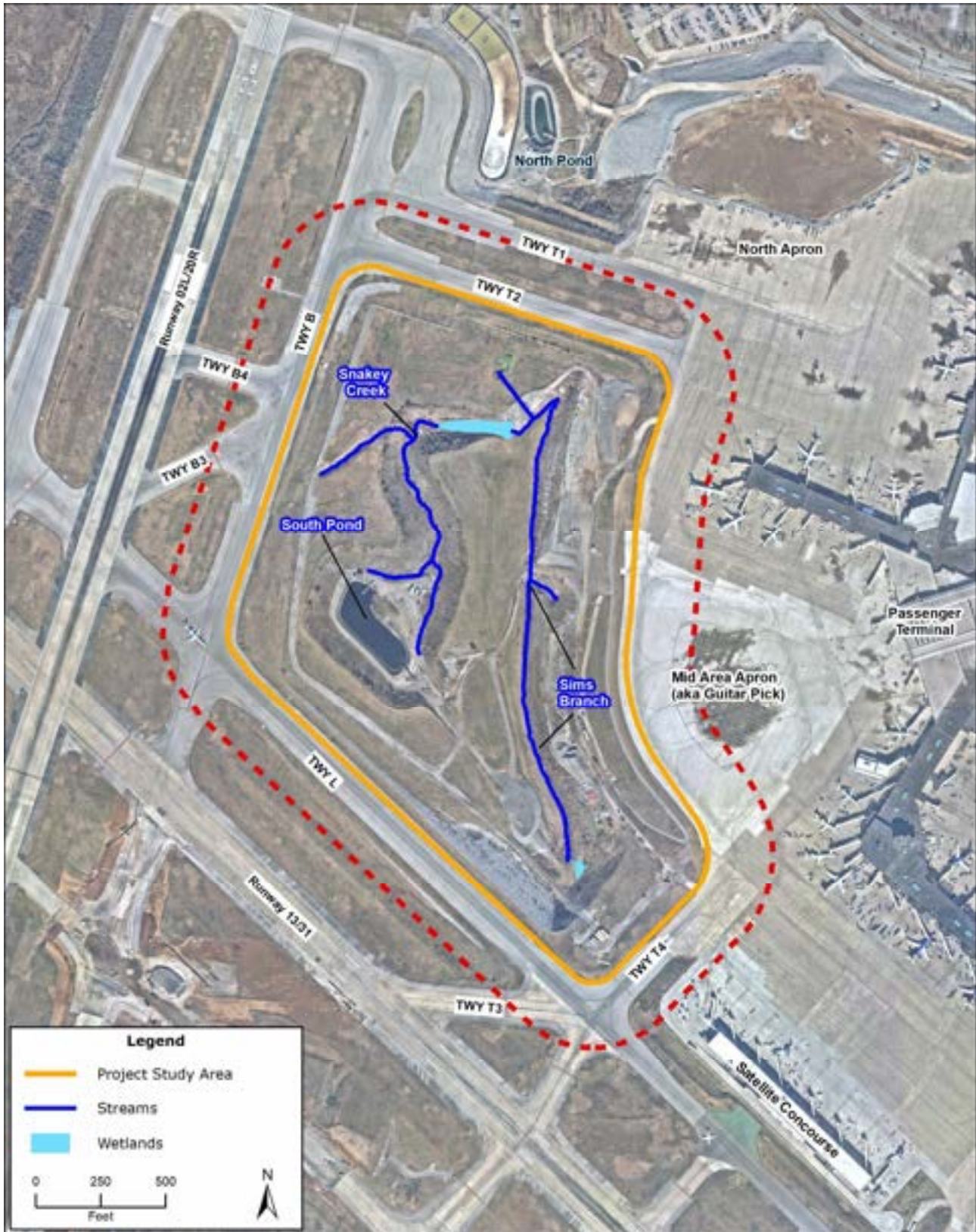
National Pollutant Discharge Elimination System (NPDES) program. Metro Water Services has developed appropriate plans and guidelines to meet the requirements of the MS4 Permit, including the Low Impact Development (LID) program.

**TABLE 3-9, WETLANDS AND STREAMS WITHIN THE DIRECT STUDY AREA**

	LINEAR FEET	ACREAGE
<b>Streams</b>		
Sims Branch-R1 (OW 1a)	1,115	N/A
Sims Branch-R3 (OW 1b)	636	N/A
Sims Branch Trib-R1 (OW 2)	128	N/A
Snakey Cr. Trib 1-R1 (OW 4)	101	N/A
Snakey Cr. Trib 1-R2 (OW 4)	62	N/A
Snakey Cr.-R1 (OW 3b)	714	N/A
Snakey Cr.-R2 (OW 3c)	224	N/A
Snakey Cr. Trib 2 (OW 5b)	153	N/A
<b>Total</b>	<b>3,133</b>	<b>N/A</b>
<b>Wetlands</b>	<b>N/A</b>	<b>0.04</b>
<b>Pond</b>	<b>N/A</b>	<b>0.27</b>

Source: Working Draft Tennessee Stream Quantification Tool (SQT) and Debit Tool calculations, current as of June 12, 2024, prepared for the Nashville International Airport, Garver, as part of development of Working Draft Preliminary Wetland Delineation and Hydrologic Determination, Garver, May 2024.

EXHIBIT 3-3, WETLANDS AND STREAMS



Source: Garver; Landrum & Brown, 2024

### Floodplains

Floodplains are defined as the lowland and relatively flat areas adjoining inland and coastal waters including flood prone areas of offshore islands, including at a minimum, that area subject to a one-percent or greater chance of flooding in any given year (i.e., 100-year floodplain). The Direct Study Area does not contain any portions of the 100-year and 500-year floodplains. The extent of the nearest floodplain to the Direct Study Area is shown on **Exhibit 3-4, Floodplains**.

### Groundwater

Nashville's public drinking water comes primarily from the Cumberland River.<sup>21</sup> Furthermore, based upon a review of USEPA's interactive map of sole source aquifers,<sup>22</sup> no USEPA-designated sole source aquifers are located within the Direct Study Area, or the State of Tennessee. Additionally, no wells are located within the Direct Study Area.

### **3.2.14.2 Environmental Consequences**

#### No Action

The No Action Alternative does not involve any development or changes to the Airport; therefore, there would be no impact related to water resources.

#### Proposed Action

*Wetlands and Streams:* Implementation of the Proposed Action would require the encapsulation of Sim's Branch and Snakey Creek to maintain existing stream flow and filling the pond and wetlands located within the Direct Study Area. As such, the wetlands and streams identified in Table 3-9 would be permanently impacted by the Proposed Action.

Implementation of the Proposed Action would not result in significant impacts to wetlands and streams because compensatory mitigation would be provided.

*Surface Waters:* The Proposed Action would result in impacts to surface waters. In addition to the impacts to streams and wetlands previously described, the proposed development would result in an increase of approximately 74 acres of impervious surfaces. The increase in impervious surfaces and resulting increase in stormwater runoff would be wholly accommodated by the Airport's existing stormwater systems. The MNAA would ensure compliance with all NPDES permit requirements. The Proposed Action would require a Metropolitan Nashville Grading Permit, a TDEC NPDES Stormwater Construction Permit, an Aquatic Resources Alteration Permit (ARAP). Furthermore, best management practices (BMPs) would be incorporated into the construction of the Proposed Action. As such, no significant impacts would occur to surface waters as a result of the implementation of the Proposed Action.

### **3.2.14.3 Mitigation**

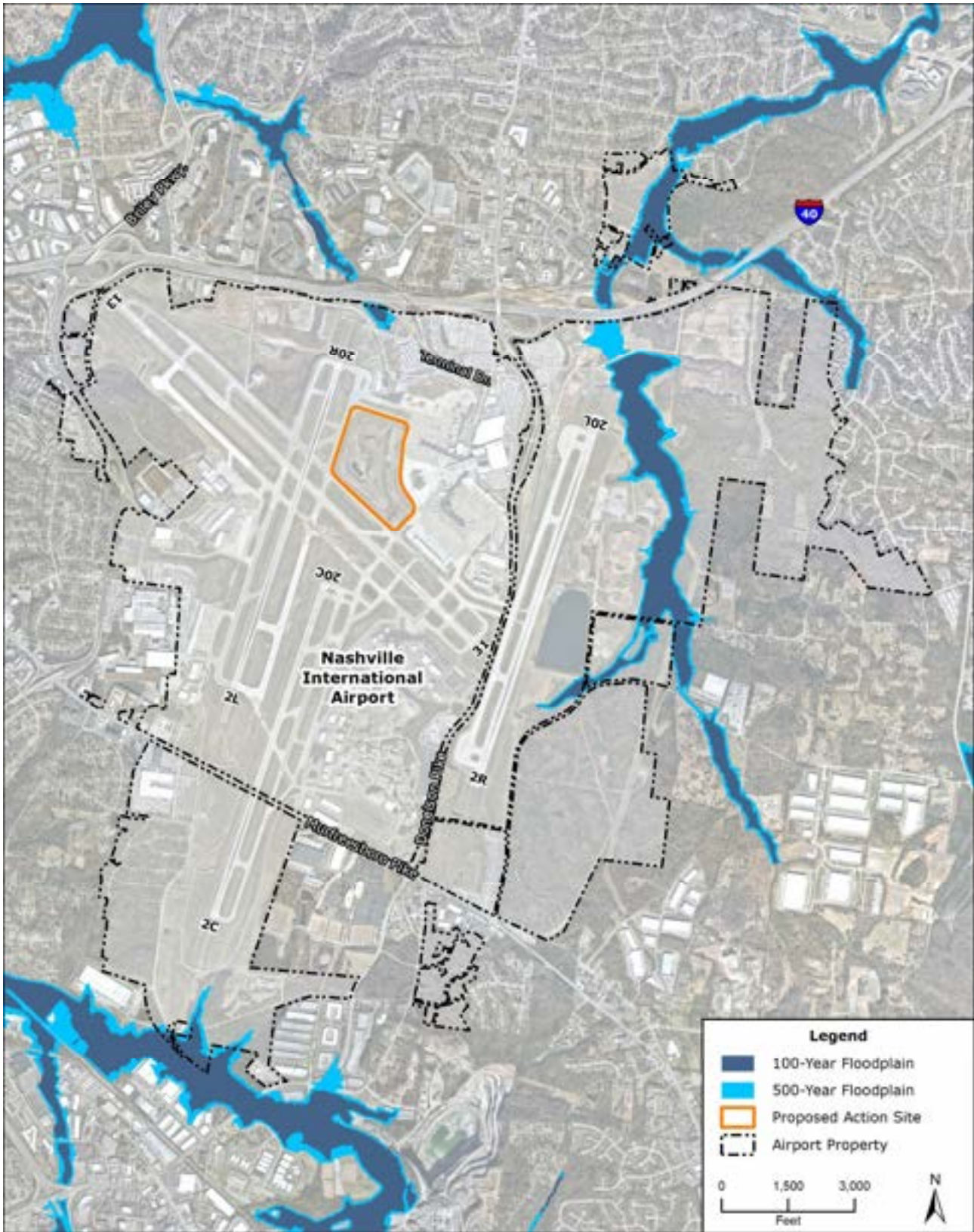
A detailed compensatory mitigation plan would be required to obtain the necessary authorizations to construct the Proposed Action. Mitigation is anticipated to be accomplished by acquiring credits from the Headwaters Reserve Cedar Forest Mitigation Bank, subject to mitigation credit releases.

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<sup>21</sup> 2023 Consumer Confidence Report, Metro Water Services, Available on-line: [https://www.nashville.gov/sites/default/files/2024-05/2023\\_Consumer\\_Confidence\\_Report-FINAL.pdf?ct=1714765800](https://www.nashville.gov/sites/default/files/2024-05/2023_Consumer_Confidence_Report-FINAL.pdf?ct=1714765800), Accessed June 17, 2024

<sup>22</sup> USEPA, Interactive Map of Sole Source Aquifers. Available on-line: <https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=9ebb047ba3ec41ada1877155fe31356b>, Accessed June 17, 2024

EXHIBIT 3-4, FLOODPLAINS



Source: Federal Emergency Management Agency; Landrum & Brown, 2024

The MNAA would also ensure compliance with the requirements of the MS4 Permit, including the LID program. The MNAA requests a waiver to the LID Stormwater Requirements for Airport development projects, with aircraft safety as the primary justification for this request, as LID Green Infrastructure Practices (GIPs) may increase hazardous wildlife activity in the BNA air operations area. Birds are of particular concern when it comes to the safe operation of aircraft due to the potential for catastrophic damage to the engines and control surfaces, as stated in FAA guidance that BNA cites in support of the waiver request, as per FAA Advisory Circular 150/5300-33C, *Hazardous Wildlife Attractants on or Near Airports*.

### **3.2.15 Cumulative Impacts**

The CEQ NEPA regulations (40 CFR 1508.7) define a cumulative impact 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. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time." This cumulative impact analysis was conducted to comply with the intent of FAA Order 1050.1F, USDOT Order 5610.1C, and the April 2022 CEQ guidance.

The construction of the Proposed Action is planned to occur from 2025 to 2030, which would overlap with several other projects at BNA. With the exception of temporary construction related impacts, the cumulative environmental impact of the Proposed Action is expected to be minimal. Extensive preventive procedures would be put into place to avoid and minimize any potential adverse impacts during construction. As described in the following sections, the Proposed Action is consistent with the overall planning mission of the Airport and the City of Nashville and would not result in adverse cumulative impacts.

#### **3.2.15.1 Past Actions**

Past projects are actions that occurred in the past five years and may warrant consideration in determining the environmental impacts of an action. Past projects at the Airport include airfield improvements, terminal expansions, roadway improvements, parking garage construction and expansion, and hotel construction. These projects are included in the existing conditions.

#### **3.2.15.2 Present Actions**

Present actions are any other projects that are occurring in the same general time frame as the Proposed Action. The following projects are currently under construction or construction is planned to begin during construction of the Proposed Action.

- Concourse A Reconstruction – This project includes the expansion and reconstruction of Concourse A into a 16-gate concourse. Construction for this project started in 2023 and is anticipated to be completed by 2028.
- Deicing Treatment Reconfiguration – This project includes the reconfiguration of the existing Spent Aircraft Deicing Fluid onsite treatment operations at the Airport.
- Terminal Access Roadway Improvements – This project will realign Donelson Pike between the access point at Interstate 40 and the terminal and landside facilities to improve efficiency of traffic flow into and out of the Airport terminal and parking garages.

Potential impacts from the aforementioned projects include an increase in stormwater runoff due to an increase in impervious surfaces, an increase in solid waste, and temporary construction impacts.

### 3.2.15.3 Reasonably Foreseeable Future Actions

Reasonably foreseeable future projects are actions that may affect projected impacts of a Proposed Action and are not remote or speculative. The potential runway extension project will undergo its own NEPA process and assess potential cumulative impacts. Therefore, it is not included in this EA.

### 3.2.15.4 Cumulative Impact Comparison

Even when impacts are determined to be individually insignificant, the impacts can be collectively significant when taking place over a period of time. Therefore, the cumulative effects of environmental impacts were considered only for those categories determined to have impacts due to the Proposed Action.

#### Air Quality

The Proposed Action would cause a temporary change in the net emissions due to the operation of construction equipment (see Appendix B). However, the emissions were shown to be *de minimis* under the CAA General Conformity Rule. Furthermore, the *de minimis* emissions are assumed to comply with the SIP and are not expected to cause an exceedance of any of the NAAQS, delay the attainment of any NAAQS, or worsen an existing violation of any NAAQS.

Overall, the Proposed Action and other development projects are expected to improve air quality as a result of improved aircraft circulation on the ramps and increased operating efficiency. The other projects recently completed, under construction, or planned in the foreseeable future at the Airport, also would be anticipated to have *de minimis* emissions and/or meet all applicable regulations under the CAA. Therefore, no cumulative adverse air quality impacts are anticipated from the Proposed Action.

#### Climate

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 three percent of global carbon dioxide (CO<sub>2</sub>) emissions; this contribution may grow to five percent by 2050.<sup>23</sup> 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.

#### Hazardous Materials, Pollution Prevention, and Solid Waste

The Proposed Action would not increase the quantity of hazardous materials present in the environment or exacerbate existing contamination. The South Pond is being decommissioned independently of this project and no longer will be used for storage of spent deicing fluid. No other hazardous materials are known to be present within the Direct Study Area. Based on the list of recent, ongoing, and future projects, there does not appear to be other projects that, when combined with the Proposed Action, would result in significant adverse cumulative impacts from hazardous materials.

Therefore, the Proposed Action would not contribute to any cumulative impacts from future actions with respect to hazardous materials.

Solid waste would be generated from the Proposed Action in the form of general construction debris. No building demolition or significant levels of pavement demolition would occur. Therefore, the Proposed Action would not contribute to any cumulative impacts from future actions with respect to solid waste.

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<sup>23</sup> U.S. Government Accountability Office, *Aviation and Climate Change*, Aircraft Emissions Expected to Grow, but Technological and Operational Improvements and Government Policies Can Help Control Emissions. June 2009.

## Water Resources

As discussed in Section 3.2.14, the Proposed Action would result in impacts to wetlands and streams located in the Direct Study Area and would result in an increase in the amount of impervious surfaces at the Airport by approximately 74 acres. Compensatory mitigation will be accomplished by acquiring the necessary credits. Additionally, coordination with the USACE and TDEC will be conducted to ensure all required permits, including but not limited to the following permits are obtained: Metropolitan Nashville Grading Permit; TDEC NPDES Stormwater Construction Permit; ARAP; permit under Section 401 and Section 404 of the CWA.

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

### **3.2.15.5 Summary of Cumulative Impacts**

No potentially significant cumulative impacts are expected to result from implementation of the Proposed Action. It is unlikely that the incremental impact of the Proposed Action would cause or contribute to a significant impact on the environment when added to past, ongoing, or reasonably foreseeable future projects or actions regardless of which agency or person undertakes those actions. The Proposed Action is not expected to cause or contribute to a significant impact on the environment when considered with other past, present, or future actions regardless of what agency or person undertakes such other actions.



## 4. List of Preparers

The following identifies the individuals that contributed to the preparation of this Environmental Assessment (EA). The list is organized by the organization for which the individuals work and provides brief synopses of the responsibilities of those individuals from the Federal Aviation Administration (FAA), Metropolitan Nashville Airport Authority, and the consultant teams responsible for preparation of this document, respectively. The preliminary draft of the document was prepared by Landrum & Brown. All subsequent iterations of the document were prepared by Kiewit under the oversight of Metropolitan Nashville Airport Authority.

### 4.1. Federal Aviation Administration

Peggy Kelley, Environmental Protection Specialist, was responsible for detailed review of this EA, development of the public process for the EA, and coordination with various Federal and state agencies.

### 4.2. Metropolitan Nashville Airport Authority

Caitlin Dillon, PE, CM, Project Manager, Engineering, provided input and Airport oversight throughout the EA process.

Syed Mehdi, A.A.E., Vice President, Airport Planning, provided input and review throughout the EA process.

Hayley Henderson, CM, ACE, provided input and review throughout the EA process.

### 4.3. Landrum & Brown

Sarah Potter, Executive Vice President, was responsible for project management and preparation of the document.

Sara Christen, Associate Vice President, was responsible for project management, preparation of the document, and provided technical input.

Chris Sandfoss, AICP, Managing Consultant, was responsible for the purpose and need statement, alternatives analyses, and provided technical input.

Gaby Elizondo, AICP, Senior Consultant, assisted with historical resources, land use, natural resources, noise, socioeconomic, and cumulative impact analyses, and preparation of the document.

Kirsten Hammons, Analyst, assisted with air quality and climate, biological resources, and hazardous materials analyses and preparation of the document.

Erich Neuman, Senior Consultant, assisted with GIS and mapping.

### 4.4. Kiewit

Marcie Aydelotte, Senior Design Manager, was responsible for design management and oversaw the preparation of the document.

Jason Bright, Environmental Director, was responsible for document oversight, provided technical input, and assisted with preparation of the document.



Carissa Agnese, Senior Environmental Manager, was responsible for agency involvement and provided technical input and oversight of the document preparation.

Caroline Santopadre, Environmental Specialist, was responsible for review of the preliminary draft and preparation of the document.

#### **4.5. Athena Engineering & Environmental, LLC**

Dave Cour, Director of Ecological Services, assisted with agency coordination and document review and editing.

## 5. References

- 33 Code of Federal Regulations (CFR) Parts 320-330, *Regulatory Programs of the Corps of Engineers*
- 36 CFR Part 800, *Advisory Council on Historic Preservation*
- 40 CFR 1500-1508, *Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of National Environmental Policy Act (NEPA)*
- 49 United States Code (U.S.C.) § 47107(a)(16)
- 49 U.S.C. § 40114
- 49 U.S.C. §§ 47101, et seq.
- 2023 Consumer Confidence Report, Metro Water Services, Available online at: [https://www.nashville.gov/sites/default/files/2024-05/2023\\_Consumer\\_Confidence\\_Report-FINAL.pdf?ct=1714765800](https://www.nashville.gov/sites/default/files/2024-05/2023_Consumer_Confidence_Report-FINAL.pdf?ct=1714765800), Accessed June 17, 2024
- 2023 Federal Aviation Administration (FAA) Terminal Area Forecast, issued January 2024
- Alan Melrose, "European ATM and Climate Adaptation: A Scoping Study," in International Civil Aviation Organization Environmental Report, 2010
- Archaeological and Historic Preservation Act, 16 U.S.C. § 469 (a)
- Archaeological Resource Protection Act, 16 U.S.C. § 470 (aa)
- Bald and Golden Eagle Protection Act of 1940
- City of Nashville Mapping Services
- 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 Parts 325 and 336
- Council on Environmental Quality § 1502.16 (e) and (f)
- Council on Environmental Quality § 1508.14
- Endangered Species Act, 16 U.S.C. § 661, et seq., as amended
- Environmental Assessment, Concourse and Gate Expansion, Nashville International Airport, Garver, July 2021
- Environmental Assessment, Vision 1.0, Corgan Architecture and Interior Design and Amex Foster Wheeler, Environmental & Infrastructure, Inc., February 2018
- 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*
- Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*

FAA Advisory Circular, *Standard Specifications for Construction of Airports, Item C-102, Temporary Air and Water Pollution, Soil Erosion, and Siltation Control*, AC 150/5370-10H (December 21, 2018).

FAA Advisory Circular 150/5300-33C, *Hazardous Wildlife Attractants on or Near Airports*

FAA Aviation Emissions and Air Quality Handbook Version 3, Update 1

FAA Order 1050.1F Change 1, *Environmental Impacts: Policies and Procedures*

FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*

Farmland Protection Policy Act, 7 U.S.C. § 73, and implementing regulations at 7 CFR § 658

Federal Aviation Act of 1958 recodified as 49 U.S.C. §§ 40101, et seq.

Federal Emergency Management Agency, National Flood Hazard Layer

Federal Highway Administration, Construction Noise Handbook, 9.0 Construction Equipment Noise Levels and Ranges

GAO Report to Congressional Committees, Aviation and Climate Change, 2009

IPaC Resource List, Environmental Conservation Online System Database, 2024

Massachusetts v. E.P.A., 549 U.S. 497, 508-10, 521-23 (2007)

Migratory Bird Treaty Act of 1918

Nashville International Airport, Master Plan Update, December 2020

National Environmental Policy Act of 1969, as amended

National Historic Preservation Act, 16 U.S.C. § 470(f), as amended

Preliminary Wetland Delineation and Hydrologic Determination, Garver, Prepared for Nashville International Airport, May 2024

Supplemental Environmental Assessment for Concourse and Gate Expansion Project, Nashville International Airport, Ricondo & Associates, February 2023

Tennessee Department of Environment and Conservation, Division of Remediation Sites, Accessed June 13, 2024, Available online: <https://tdeconline.tn.gov/dor/>.

The Airport and Airway Improvement Act of 1982, 49 U.S.C. § 47108, as amended

The Department of Transportation Act, 49 U.S.C. § 303, formerly Section 4(f)

U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates

U.S. Census Bureau, 2020 Census Demographic and Housing Characteristics File

U.S. Department of Transportation Order 5610.1C, *Procedures for Considering Environmental Impacts*

U.S. Department of Transportation Order 5610.2, *Environmental Justice in Minority Populations and Low-Income Populations*

United State Census Bureau, TIGERweb, Urban Areas, Accessed June 12, 2024, Available online: [https://tigerweb.geo.census.gov/tigerwebmain/TIGERweb\\_restmapservice.html](https://tigerweb.geo.census.gov/tigerwebmain/TIGERweb_restmapservice.html)



United States Environmental Protection Agency (USEPA), Superfund National Priorities List Sites with Status Information, Accessed January 2, 2023, Available online: <https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=33cebcdfdd1b4c3a8b51d416956c41f1>.

USEPA, Interactive Map of Sole Source Aquifers. Available online: <https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=9ebb047ba3ec41ada1877155fe31356b>, Accessed June 17, 2024

# Appendix A

## Agency and Public Involvement

# U.S. Environmental Protection Agency



September 3, 2024

Environmental Protection Agency  
Jeaneanne Gettle -Acting Regional Administrator  
EPA Region IV  
61 Forsyth St NW  
Atlanta, GA 30303

Re: Agency Scoping for an Environmental Assessment (EA) for the Central Ramp Expansion at Nashville International Airport

Dear Ms. Gettle,

This letter is sent to inform you that the Metropolitan Nashville Airport Authority (MNA) is preparing an Environmental Assessment (EA) for the proposed Central Ramp Expansion and enabling projects (the Proposed Action) at Nashville International Airport (BNA). The EA will investigate, analyze, and disclose any potential environmental impacts associated with the Proposed Action. The Proposed Action includes expansion of the Central Ramp for additional needed Remain Overnight (RON) aircraft parking positions and off-gate aircraft deicing positions at BNA. The Proposed Action includes the following elements:

- Expansion of the Central Ramp/development of a new West Ramp
- Filling in approximately 74 acres within the Mill Creek watershed and encapsulating Sims Branch to maintain existing stream flow
- Associated stormwater capacity improvements within the site

The Project Site is located in the center of BNA property and is surrounded by commercial and aviation land uses as shown in the attached **Exhibit 1, Project Location**. The site has been previously disturbed by past airport construction and presently consists of mowed grass fields, several drainage channels, a holding pond for the spent aircraft deicing fluid treatment system, and access roads for maintenance vehicles.

The following survey and determinations are being conducted as part of this project:

- A Wetland and Waters of the US Delineation/Jurisdiction Determination has been conducted in accordance with the US Army Corp of Engineers (USACE) guidelines, and a Hydrologic Determination is being completed under TDEC guidelines.

The Federal Aviation Administration (FAA) is the lead Federal agency that will review the EA. The EA document will be prepared in accordance with FAA Order 1050.1F, Environmental Impacts: Policies and Procedures and FAA Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions. As part of the coordination process for this EA, the MNA and the FAA are respectfully seeking your comments and identification of any specific areas of concern related to this Proposed Action. We would appreciate your assistance and request that your comments are





returned within 30 days or at your earliest convenience. If you would like additional information on this project, or would like to speak directly, please do not hesitate to contact Carissa Agnese, Senior Environmental Manager, at (757) 409-5013 or by email at [carissa.agnese@kiewit.com](mailto:carissa.agnese@kiewit.com)

Please send any written comments to the following address:

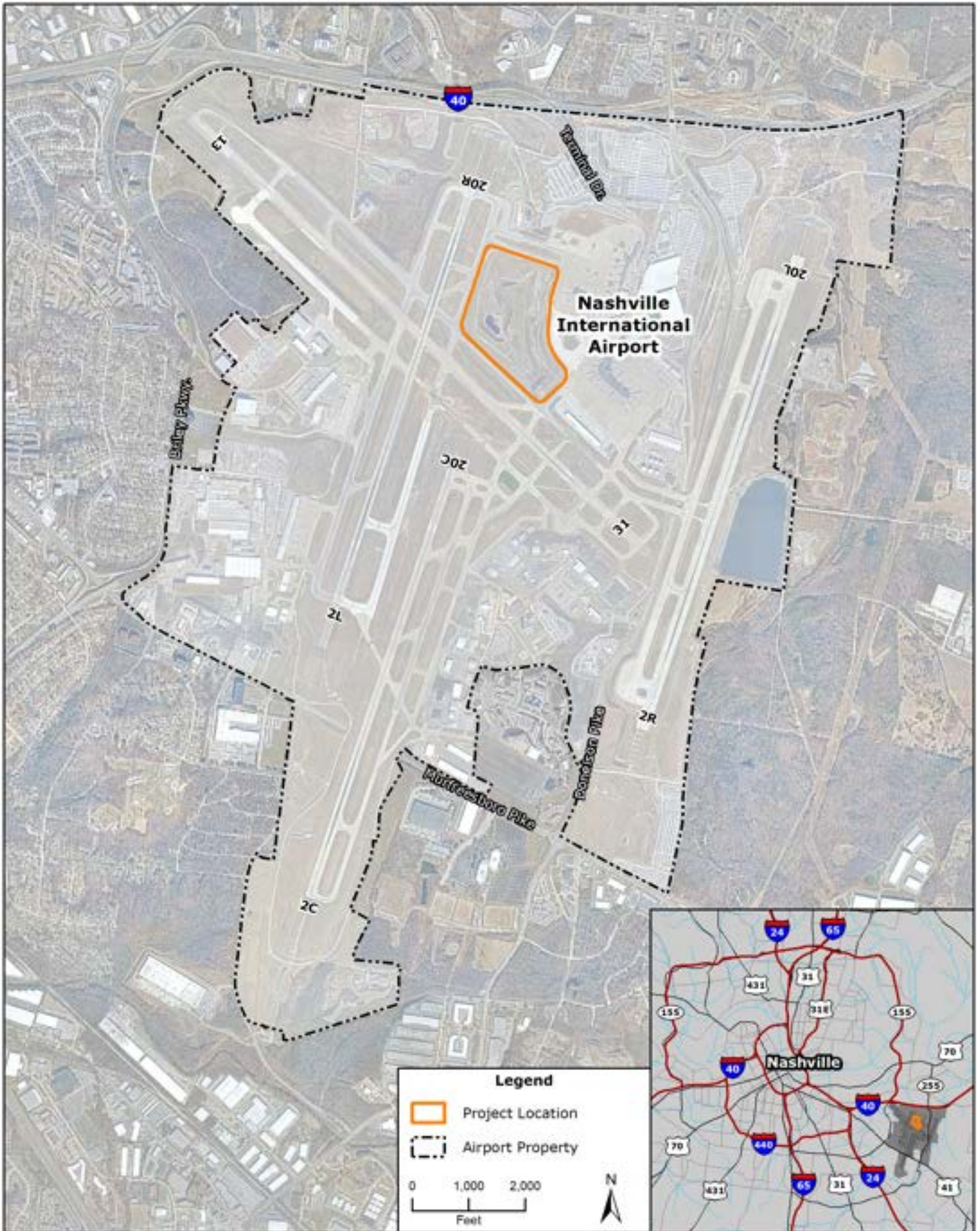
Kiewit Engineering Group  
Attn: Carissa Agnese  
105 Continental Place, Suite 150  
Brentwood, TN 37027 8755

Your prompt response is appreciated so that the project may proceed as scheduled. Thank you for your consideration of this request.

Sincerely,

Marcie Aydelotte  
Design Manager, MNAA Central Ramp Expansion

cc: Caitlin Dillon, Metropolitan Nashville Airport Authority, Traci Holton, Metropolitan Nashville Airport Authority, Peggy Kelley, Federal Aviation Administration



---

**From:** MacIntyre, Benjamin Wayne CIV USARMY CELRN (USA) <Benjamin.W.MacIntyre@usace.army.mil>  
**Sent:** Monday, September 30, 2024 2:10 PM  
**To:** Carissa.Agnese <Carissa.Agnese@kiewit.com>  
**Subject:** RE: [External]LRN-2017-00701, Cooperating Agency Request Letter, BNA

Thank you! I'll get the letter to you as soon as my boss signs it. Let me know if you need anything in the mean-time.

Ben MacIntyre  
Biologist, West Branch  
Regulatory Division  
U.S. Army Corps of Engineers  
Nashville District  
3701 Bell Road  
Nashville, Tennessee 37214  
615-369-7522 (office)  
615-308-5034 (cell)

Internet: <http://www.lrn.usace.army.mil/Missions/Regulatory.aspx>

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**From:** Carissa.Agnese <[Carissa.Agnese@kiewit.com](mailto:Carissa.Agnese@kiewit.com)>  
**Sent:** Monday, September 30, 2024 12:58 PM  
**To:** MacIntyre, Benjamin Wayne CIV USARMY CELRN (USA) <Benjamin.W.MacIntyre@usace.army.mil>  
**Subject:** [Non-DoD Source] RE: [External]LRN-2017-00701, Cooperating Agency Request Letter, BNA

Thank you very much. Please below for Peggy's e-mail

[Peggy.Kelly@faa.gov](mailto:Peggy.Kelly@faa.gov)



**CARISSA R AGNESE**

Senior Environmental Manager

[Carissa.agnese@kiewit.com](mailto:Carissa.agnese@kiewit.com)

**KIEWIT INFRASTRUCTURE ENGINEERS**

10055 Trainstation Circle, Lone Tree, CO 80124

(757) 409-5013 cell

kiewit.com

---

**From:** MacIntyre, Benjamin Wayne CIV USARMY CELRN (USA) <[Benjamin.W.MacIntyre@usace.army.mil](mailto:Benjamin.W.MacIntyre@usace.army.mil)>

**Sent:** Monday, September 30, 2024 1:42 PM

**To:** Carissa.Agnese <[Carissa.Agnese@kiewit.com](mailto:Carissa.Agnese@kiewit.com)>

**Subject:** [External]LRN-2017-00701, Cooperating Agency Request Letter, BNA

Carissa,

Please send me Peggy Kelley's email address. I'm working on our response letter today, but will need to copy her in our letter.

Thank you,

Ben MacIntyre  
Biologist, West Branch  
Regulatory Division  
U.S. Army Corps of Engineers  
Nashville District  
3701 Bell Road  
Nashville, Tennessee 37214  
615-369-7522 (office)  
615-308-5034 (cell)

Internet: <http://www.lrn.usace.army.mil/Missions/Regulatory.aspx>

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<https://regulatory.ops.usace.army.mil/customer-service-survey/>

# U.S. Army Corps of Engineers



September 3, 2024

US Army Corps of Engineers  
Timothy C. Wilder  
Chief, West Branch Regulatory Division – USACE  
3701 Bell Road  
Nashville, TN 37214

Re: Agency Scoping for an Environmental Assessment (EA) for the Central Ramp Expansion at Nashville International Airport

Dear Mr. Wilder,

This letter is sent to inform you that the Metropolitan Nashville Airport Authority (MNA) is preparing an Environmental Assessment (EA) for the proposed Central Ramp Expansion and enabling projects (the Proposed Action) at Nashville International Airport (BNA). The EA will investigate, analyze, and disclose any potential environmental impacts associated with the Proposed Action. The Proposed Action includes expansion of the Central Ramp for additional needed Remain Overnight (RON) aircraft parking positions and off-gate aircraft deicing positions at BNA. The Proposed Action includes the following elements:

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- Filling in approximately 74 acres within the Mill Creek watershed and encapsulating Sims Branch to maintain existing stream flow
- Associated stormwater capacity improvements within the site

The Project Site is located in the center of BNA property and is surrounded by commercial and aviation land uses as shown in the attached **Exhibit 1, Project Location**. The site has been previously disturbed by past airport construction and presently consists of mowed grass fields, several drainage channels, a holding pond for the spent aircraft deicing fluid treatment system, and access roads for maintenance vehicles.

The following survey and determinations are being conducted as part of this project:

- A Wetland and Waters of the US Delineation/Jurisdiction Determination has been conducted in accordance with the US Army Corp of Engineers (USACE) guidelines, and a Hydrologic Determination is being completed under TDEC guidelines.

The Federal Aviation Administration (FAA) is the lead Federal agency that will review the EA. The EA document will be prepared in accordance with FAA Order 1050.1F, Environmental Impacts: Policies and Procedures and FAA Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions. As part of the coordination process for this EA, the MNA and the FAA are respectfully seeking your comments and identification of any specific areas of concern related to this Proposed Action. We would appreciate your assistance and request that your comments are



returned within 30 days or at your earliest convenience. If you would like additional information on this project, or would like to speak directly, please do not hesitate to contact Carissa Agnese, Senior Environmental Manager, at (757) 409-5013 or by email at [carissa.agnese@kiewit.com](mailto:carissa.agnese@kiewit.com)

Please send any written comments to the following address:

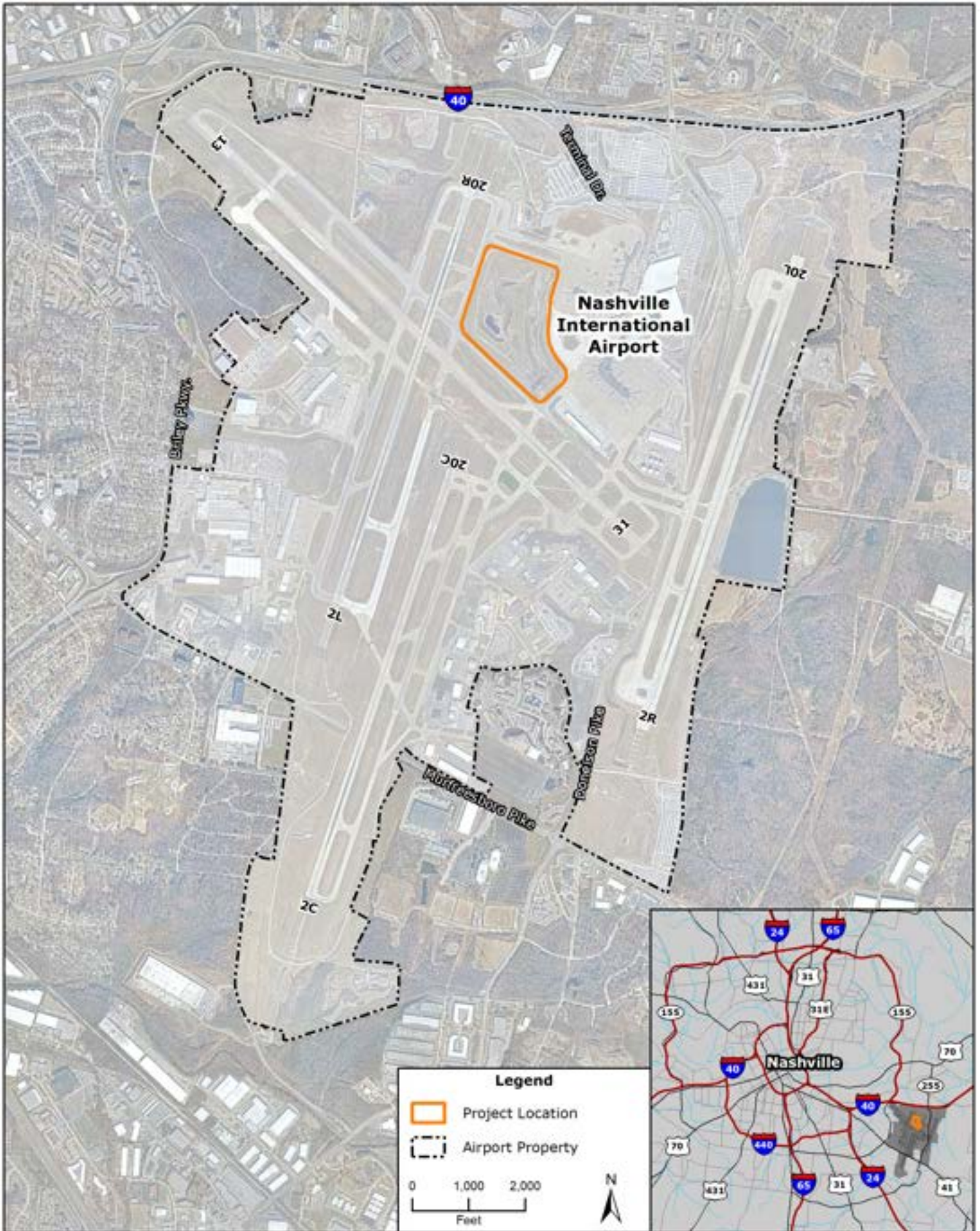
Kiewit Engineering Group  
Attn: Carissa Agnese  
105 Continental PI Suite 150  
Brentwood, TN 37027 8755

Your prompt response is appreciated so that the project may proceed as scheduled. Thank you for your consideration of this request.

Sincerely,

Marcie Aydelotte  
Design Manager, MNAA Central Ramp Expansion

cc: Caitlin Dillon, Metropolitan Nashville Airport Authority, Traci Holton, Metropolitan Nashville Airport Authority, Peggy Kelley, Federal Aviation Administration







**DEPARTMENT OF THE ARMY**  
NASHVILLE DISTRICT, CORPS OF ENGINEERS  
REGULATORY DIVISION  
3701 BELL ROAD  
NASHVILLE, TENNESSEE 37214

October 2, 2024

SUBJECT: File No. LRN-2017-00701, Request for Cooperating Agency Participation, Nashville International Airport Central Ramp Expansion, Nashville, Davidson County, Tennessee

Ms. Carissa Agnese  
Kiewit Engineering Group  
105 Continental Place, Suite 150  
Brentwood, Tennessee 37027

Dear Ms. Agnese,

Thank you for your letter of September 11, 2024, in which you requested our participation as a cooperating agency in the Federal Aviation Administration's Environmental Assessment for the "Central Ramp Expansion" project at the Nashville International Airport (BNA). Please consider this letter as our consent and agreement to be a cooperating agency.

Please contact project manager Ben MacIntyre by telephone at (615) 308-5034 or via e-mail at [Benjamin.W.MacIntyre@usace.army.mil](mailto:Benjamin.W.MacIntyre@usace.army.mil) with any questions.

Sincerely,

Timothy C. Wilder  
Chief, West Branch  
Regulatory Division

CC:

Hayley Henderson  
Environmental Compliance, MNAA

Caitlin Dillon  
Project Manager, MNAA

Peggy Kelley  
[Peggy.Kelley@faa.gov](mailto:Peggy.Kelley@faa.gov)

# U.S. Fish and Wildlife Service



September 3, 2024

US Fish and Wildlife Service  
Bryan Watkins  
USFWS Ecological Services  
446 Neal Street  
Cookeville, TN 38501

Re: Agency Scoping for an Environmental Assessment (EA) for the Central Ramp Expansion at Nashville International Airport

Dear Mr. Watkins,

This letter is sent to inform you that the Metropolitan Nashville Airport Authority (MNA) is preparing an Environmental Assessment (EA) for the proposed Central Ramp Expansion and enabling projects (the Proposed Action) at Nashville International Airport (BNA). The EA will investigate, analyze, and disclose any potential environmental impacts associated with the Proposed Action. The Proposed Action includes expansion of the Central Ramp for additional needed Remain Overnight (RON) aircraft parking positions and off-gate aircraft deicing positions at BNA. The Proposed Action includes the following elements:

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returned within 30 days or at your earliest convenience. If you would like additional information on this project, or would like to speak directly, please do not hesitate to contact Carissa Agnese, Senior Environmental Manager, at (757) 409-5013 or by email at [carissa.agnese@kiewit.com](mailto:carissa.agnese@kiewit.com)

Please send any written comments to the following address:

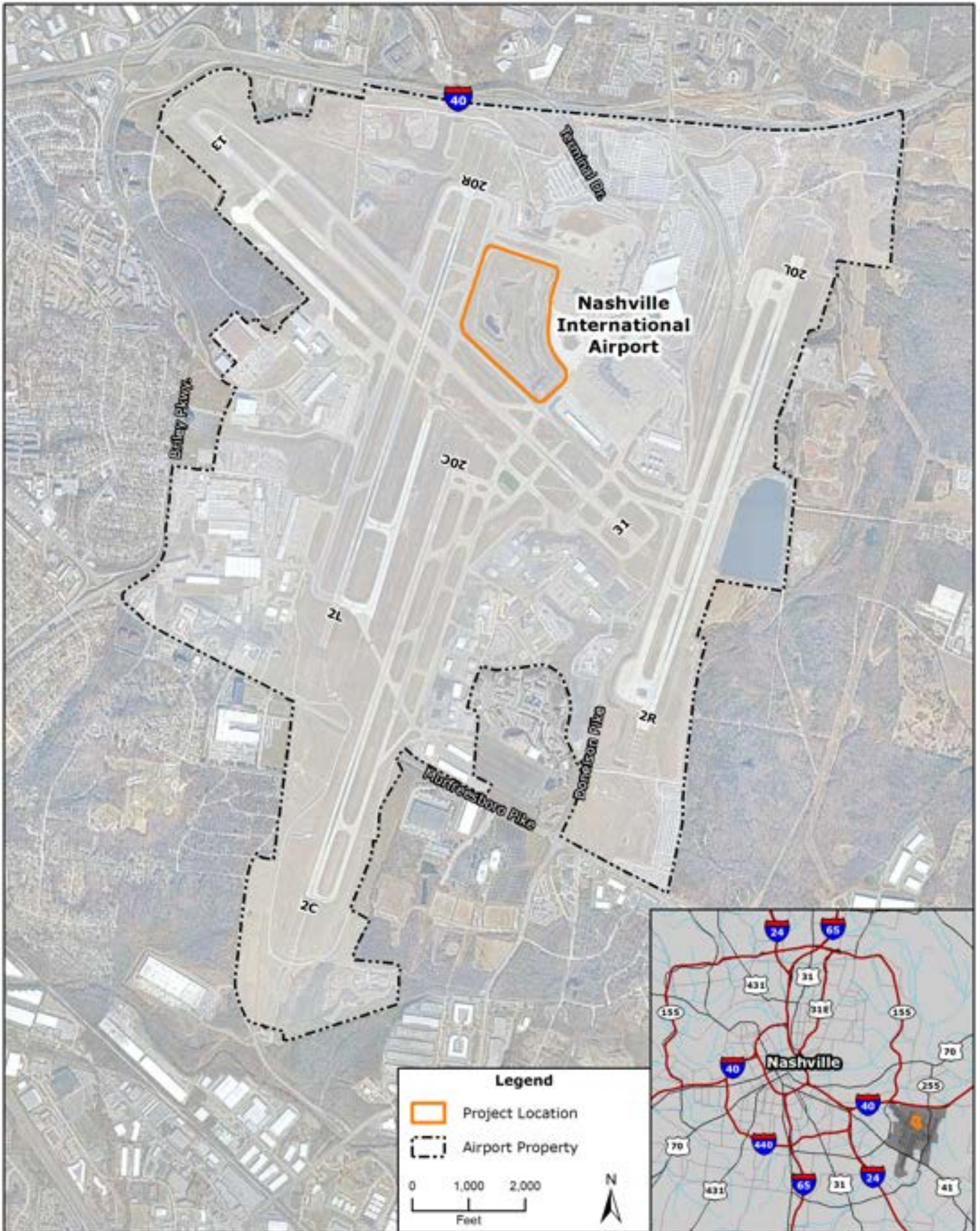
Kiewit Engineering Group  
Attn: Carissa Agnese  
105 Continental Place, Suite 150  
Brentwood, TN 37027 8755

Your prompt response is appreciated so that the project may proceed as scheduled. Thank you for your consideration of this request.

Sincerely,

Marcie Aydelotte  
Design Manager, MNAA Central Ramp Expansion

cc: Caitlin Dillon, Metropolitan Nashville Airport Authority, Traci Holton, Metropolitan Nashville Airport Authority, Peggy Kelley, Federal Aviation Administration



## Caroline.Santopadre

---

**From:** Carissa.Agnese  
**Sent:** Monday, October 7, 2024 1:54 PM  
**To:** Caroline.Santopadre  
**Subject:** FW: [External]RE: Shipping Request



**CARISSA R AGNESE**  
Senior Environmental Manager  
[Carissa.agnese@kiewit.com](mailto:Carissa.agnese@kiewit.com)

**KIEWIT INFRASTRUCTURE ENGINEERS**  
10055 Trainstation Circle, Lone Tree, CO 80124  
(757) 409-5013 cell  
kiewit.com

---

**From:** Dillon, Caitlin <[Caitlin.Dillon@flynashville.com](mailto:Caitlin.Dillon@flynashville.com)>  
**Sent:** Monday, September 23, 2024 9:04 AM  
**To:** Marcie.Aydelotte <[Marcie.Aydelotte@kiewit.com](mailto:Marcie.Aydelotte@kiewit.com)>  
**Cc:** Jordan.Gregg <[Jordan.Gregg@kiewit.com](mailto:Jordan.Gregg@kiewit.com)>; Brian.Watkinson <[Brian.Watkinson@kiewit.com](mailto:Brian.Watkinson@kiewit.com)>; Dave.Cour-PTR <[dcour@athenae.com](mailto:dcour@athenae.com)>; Carissa.Agnese <[Carissa.Agnese@kiewit.com](mailto:Carissa.Agnese@kiewit.com)>; BNA-NashvilleAirport <[BNA-NashvilleAirport@kiewit.com](mailto:BNA-NashvilleAirport@kiewit.com)>  
**Subject:** [External]RE: Shipping Request

Nice! Thank you for sending.

---

**From:** Marcie.Aydelotte <[Marcie.Aydelotte@kiewit.com](mailto:Marcie.Aydelotte@kiewit.com)>  
**Sent:** Monday, September 23, 2024 8:03 AM  
**To:** Dillon, Caitlin <[Caitlin.Dillon@flynashville.com](mailto:Caitlin.Dillon@flynashville.com)>  
**Cc:** Jordan.Gregg <[Jordan.Gregg@kiewit.com](mailto:Jordan.Gregg@kiewit.com)>; Brian.Watkinson <[Brian.Watkinson@kiewit.com](mailto:Brian.Watkinson@kiewit.com)>; Dave.Cour-PTR <[dcour@athenae.com](mailto:dcour@athenae.com)>; Carissa.Agnese <[Carissa.Agnese@kiewit.com](mailto:Carissa.Agnese@kiewit.com)>; BNA-NashvilleAirport <[BNA-NashvilleAirport@kiewit.com](mailto:BNA-NashvilleAirport@kiewit.com)>  
**Subject:** FW: Shipping Request

**CAUTION:** This email originated from outside the Airport Authority's network. Exercise caution when opening attachments or clicking links, especially from unknown senders as it could be a phishing attack or contain malware.

Caitlin,

As part of the conversation at the Task Force meeting last week, we talked about how to address the biological assessment. As you can see below, we have feedback from USFWS that they would not recommend another biological assessment. We have yet to receive the response to the letter, but this is the information (and writing) we were seeking in order to proceed without additional field investigations at this point.

Thanks,

Marcie

---

**From:** Dave Cour <[dcour@athenae.com](mailto:dcour@athenae.com)>  
**Sent:** Wednesday, September 18, 2024 3:54 PM  
**To:** Marcie.Aydelotte <[Marcie.Aydelotte@kiewit.com](mailto:Marcie.Aydelotte@kiewit.com)>  
**Cc:** Carissa.Agnese <[Carissa.Agnese@kiewit.com](mailto:Carissa.Agnese@kiewit.com)>; Caroline.Santopadre <[Caroline.Santopadre@kiewit.com](mailto:Caroline.Santopadre@kiewit.com)>  
**Subject:** FW: [EXTERNAL] FW: Shipping Request

See below – re-confirmed no crayfish survey needed. Formal response to come shortly.

Please let me know if you have any questions or need any additional information.

**Dave Cour**

Director of Ecological Services

Athena Engineering and Environmental, LLC

C: 615.258.3600

[dcour@athenae.com](mailto:dcour@athenae.com)

[www.AthenaEE.com](http://www.AthenaEE.com)



---

**From:** Sykes, Robbie <[robbie\\_sykes@fws.gov](mailto:robbie_sykes@fws.gov)>  
**Sent:** Wednesday, September 18, 2024 2:21 PM  
**To:** Dave Cour <[dcour@athenaee.com](mailto:dcour@athenaee.com)>  
**Subject:** RE: [EXTERNAL] FW: Shipping Request

Dave,

Steve and I looked over the proposal, and we wouldn't recommend another survey. Provided appropriate BMPs are in place throughout the project that would prevent sediment/contaminant migration downstream, we wouldn't have any concerns.

I'll send a more formal response to Marcie hopefully tomorrow. I'm on Teams calls the rest of today.

Thanks,

Robbie Sykes

Fish and Wildlife Biologist

U.S. Fish and Wildlife Service

446 Neal Street

Cookeville, TN 38501

(tele. 931/214-3215)

---

**From:** Dave Cour <[dcour@athenaee.com](mailto:dcour@athenaee.com)>  
**Sent:** Wednesday, September 18, 2024 10:37 AM  
**To:** Sykes, Robbie <[robbie\\_sykes@fws.gov](mailto:robbie_sykes@fws.gov)>  
**Cc:** Alexander, Steven <[steven\\_alexander@fws.gov](mailto:steven_alexander@fws.gov)>  
**Subject:** [EXTERNAL] FW: Shipping Request

**This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.**



Robbie,

Please see below – the letter was delivered and signed for 8/30/24 at 1:31PM.

Please let me know if you have any questions or need anything else from us.

Thanks,

**Dave Cour**

Director of Ecological Services

Athena Engineering and Environmental, LLC

C: 615.258.3600

[dcour@athenaee.com](mailto:dcour@athenaee.com)

[www.AthenaEE.com](http://www.AthenaEE.com)

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**From:** EDTO365.SVC <[EDTO365.SVC@kiewit.com](mailto:EDTO365.SVC@kiewit.com)>  
**Sent:** Thursday, August 29, 2024 4:54 PM  
**To:** Marcie.Aydelotte <[marcie.aydelotte@kiewit.com](mailto:marcie.aydelotte@kiewit.com)>  
**Subject:** Shipping Request

Marcie.Aydelotte,

You have submitted a shipping request. Below is the information for the request. Please, write the **Internal Shipping Form Number** on top in the upper right-hand corner of the package, so that it can be referenced, when creating the shipping label.

Internal Shipping Form #SF-3411

Recipient Name: Bryan Watkins  
Recipient Company: US Fish and Wildlife Service

Requested Ship Date: 08/29/2024

Business Related/Personal: Business Related

The tracking number will be emailed directly to you, once it has been entered.

If this is a personal shipment, you will be emailed with the total cost for the shipment, at which time you will need to make payment to the receptionist.

Regards,

Ricoh Printing Services

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**BIOLOGICAL ASSESSMENT**

**THE NASHVILLE CRAYFISH (*Orconectes shoupi*)**

**Concourse and Gate Expansion (CAGE)**

**Metro Nashville Airport Authority  
Nashville International Airport  
Davidson County, Tennessee**

---

*Prepared for:*

**Metro Nashville Airport Authority  
Nashville, TN**

**Garver, LLC  
Franklin, TN**

*Prepared by:*

**wood.**

**Wood Environment & Infrastructure Solutions, Inc.  
3800 Ezell Road, Suite 100  
Nashville, TN 37211**

**Wood Project Number: 7650-19-1222**

**February 2020**

*This document was prepared by Wood Environment & Infrastructure Solutions, Inc. in support of the Concourse and Gate Expansion Environmental Assessment at the Nashville International Airport being conducted by Garver, LLC for the Metro Nashville Airport Authority.*



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## FEDERALLY LISTED SPECIES

Wood Environment & Infrastructure Solutions, Inc. (Wood) has prepared this Biological Assessment to address the potential impact to the federally listed endangered Nashville Crayfish (*Orconectes shoupi*) from the Concourse and Gate Expansion (CAGE) project at Nashville International Airport. The Nashville Crayfish is known to occur in Mill Creek and its tributaries. Sims Branch is a direct tributary to Mill Creek (Figure 1). Even though the Nashville Crayfish was not found during the site visit on September 30, 2019 (and other previous surveys conducted within the airport property), it has been documented to occur further downstream in Sims Branch and Mill Creek and could be affected by construction activities.

## PROJECT DESCRIPTION

Sims Branch originates on the airport property and empties directly into Mill Creek. The construction associated with CAGE will include impacts to Sims Branch and the surrounding upland areas. The project area includes previously developed and undeveloped areas of the airport property. In-stream construction is anticipated.

## SITE DESCRIPTION

The project site was visited on September 30, 2019. The area adjacent to the stream ranges from existing paved surfaces, mowed and maintained undeveloped property, and wooded areas with a mix of herbaceous vegetation (see Photographs 1 through 7). The herbaceous vegetation generally includes mowed grasses. The wooded species bordering the stream were primarily box elder (*Acer negundo*), sycamore (*Platanus occidentalis*), black willow (*Salix nigra*), and cottonwood (*Populus deltoides*). Shrub species included Chinese privet (*Ligustrum sinense*) and bush honeysuckle (*Lonicera maackii*).

Sims Branch and one unnamed tributary to Sims Branch originates near the north central portion of the airport. Sims Branch generally flows north for approximately 1 mile before exiting the airport property at a culvert located at I-40. From that point, Sims Branch flows approximately 1.85 miles northwest to its confluence with Mill Creek. The unnamed tributary originates near Terminal Drive, east of Sims Branch, and flows approximately 0.25 miles to its confluence with Sims Branch.

When visited on September 30, 2019 there was water present throughout the entire length of Sims Branch (Photographs 1-3, 5-7). The perennial stream was approximately 2 feet wide and had a flow depth of approximately 3-8 inches at the upper most sample location. The stream widens to approximately 20 feet and a depth of 6-16 inches near the northern most sample location. The stream consisted of a soil and gravel substrate in the upper reaches to bedrock, gravel, and cobble sized substrate mixed with sand and silt in the lower reaches. Various fish were present during our assessment. The unnamed tributary was approximately 1 foot wide and generally dry channel at the upper most reach near Terminal Drive. The stream widens to approximately 10 feet and with intermittent pools until its confluence with Sims Branch. The intermittent stream consisted of a soil and gravel substrate in the upper reaches to bedrock, gravel, and cobble sized substrate mixed with sand and silt in the lower reaches.

## NASHVILLE CRAYFISH (*Orconectes shoupi*)

### STATUS

Endangered throughout its range: U.S.A. (TN) (51 FR 34412, September 26, 1986). Recovery Plan completed in 1988 (Nashville Crayfish Recovery Plan). This species was recently proposed for delisting on November 26, 2019, pending public comment and further review after publishing in the Federal Register.

### Species Description

This pigmented crayfish with well-developed eyes ranges from 1/4 to 7 inches in total length. Like many crayfish, this species probably feeds on a variety of organic material, both vegetation fragments and animal matter (USFWS 1988).



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The crayfish is a good benthic walker and a good swimmer. The Nashville crayfish is most active in the summer. The crayfish's activity level is low in the winter, but it does move about under ice (Nature Serve Explorer 2002).

### **Reproduction and Development**

Reproductive activity begins in spring and egg-laying probably occurs in late winter and early spring (Nature Serve Explorer 2002 and USFWS 1988). Females with eggs and young are found in the spring when they are secluded under large objects (rocks, pieces of metal, and other debris) along the stream banks (USFWS 1988). Females brood eggs below the abdomen. Young are released early in the summer (Nature Serve Explorer 2002).

### **Range and Population Level**

The Nashville crayfish is currently known only from Mill Creek and six of its tributaries in Davidson and Williamson Counties, Tennessee (O'Bara et al. 1985, Bouchard 1984). The crayfish continues to exist in six Mill Creek tributaries: Sevenmile Creek, Sims Branch, Whittemore Branch, Indian Creek, Owl Creek, and Edmonson Branch. All tributary populations except Sevenmile Creek are concentrated near the creek mouths (O'Bara et al. 1985, Bouchard 1984).

### **Habitat**

The Nashville crayfish has been observed to inhabit pools and riffle areas with moderate current (USFWS 1986). The substrate of the animal's main habitat, Mill Creek, is mainly bedrock which is covered in some areas with gravel and scattered limestone slabs. The pools, backwater areas, and stream margins are covered with silt and sand. Riverweed (*Podostemum sp.*) occurs on rocks in some swift water areas, and water willow (*Justicia sp.*) occurs along some shallow gravel shoals. Much of the stream bank is vegetated with trees and shrubs (Bouchard 1976).

The Nashville crayfish has been found in a wide range of environments including gravel and cobble runs, pools with up to 10 centimeters (cm) of settled sediment, and under slabrocks and other cover (the largest crayfish are usually under cover) (USFWS 1988). The species is highly photosensitive and is usually found under cover during the day (Bouchard 1976). Canopy cover appears important, as O'Bara et al. (1985) reported that all sites they sampled had canopy cover of 60 to 90 percent. The species has been found in small pools where the flow was intermittent (Stark 1986, Miller and Hartfield 1985). Gravel-cobble substrate provides good cover for juveniles (Stark 1986, Miller and Hartfield 1985). Females seek out large slabrocks when they are carrying eggs and young. These secluded places are also needed for molting (USFWS 1988).

The animal's need for clean, high quality water is strongly indicated, despite the fact that it can exist (no data on how long) in polluted-by-silt situations (Nature Serve Explorer 2002). The Nashville crayfish requires non-turbid, well-oxygenated water and clean substrate. However, the species does appear to be more tolerant of short-term, less favorable conditions than originally believed.

### **Past Threats**

The species is threatened by siltation, stream alterations, urban runoff, and general water quality deterioration resulting from development pressures in the urbanized areas surrounding Nashville, Tennessee. The species is endangered by water quality and other habitat deterioration from development within the watershed. The U.S. Department of the Army, Corps of Engineers (COE) concluded in 1981 that the uppermost segment of Mill Creek was degraded by organic enrichment and had very poor water quality (USFWS 1986).

The Nashville crayfish's restricted range makes it vulnerable to a single catastrophic event, such as a chemical spill. COE (1984) reported that occasional spills and discharges have occurred along Mill Creek in the past (USFWS 1986).

Nashville International Airport experienced a de-icer spill in 2010 that impacted much of Sims Branch. Biological monitoring has been conducted by MNAA since 2010. Nashville crayfish have not previously been documented during these monitoring events or other subsequent crayfish sampling conducted by Wood.



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## Current Threats

The Nashville crayfish is endangered by water quality deterioration from development within the watershed. The Nashville crayfish's restricted range continues to make it vulnerable to spill that could affect a large portion of its range.

Much of the Mill Creek system is within the Nashville City limits and water quality degradation in this area does not appear to have reduced the range of the Nashville crayfish. Continued growth and development in northeast Williamson County, and the potential impacts to the upper portion of the Mill Creek watershed also provide a potential source of impacts to this species.

Threats to the species could also come from other activities in the watershed such as road and bridge construction, stream channel modifications, impoundments, land use changes and other projects, if such activities are not planned and implemented with the survival of this geographically restricted species in mind (USFWS 1986).

Crayfish are frequently taken in the southeastern United States for food or bait. Over-utilization for these purposes could become a problem if the species' specific habitat were identified to the extent required for designation of critical habitat (USFWS 1986).

## METHODS

The Nashville Crayfish was not collected during the field survey conducted on September 30, 2019; however, due to the proposed construction location being located directly on Sims Branch, impacts to areas downstream and within Mill Creek could occur and may be affected by construction activities. Protection of the site should include protection of the riparian zone, sediment control and bank stabilization in the construction area. Again, even though not found on September 30, 2019, the permitting agencies may require that crayfish be collected and relocated just before and during construction. Seven locations were sampled during this assessment (Figure 2). Crayfish sampling data sheets are located in Appendix A. The Nashville Crayfish was not collected at any of the seven sampling locations.

## IMPACT MINIMIZATION

The proposed construction activity is to be completed in conjunction with approved BMP's to protect the stream channel. Detailed construction plans are not available at this time; however, specific notes will be placed on the project plans to give attention to erosion and sediment control measures. Stream buffer requirement may also apply. In addition to sediment and erosion control measures, if stipulated by the permitting agencies, biologists will collect all crayfish in the vicinity of the proposed stream impacts just prior to and during construction activities. All crayfish will be documented and transported a minimum of 150 feet upstream of construction activities. All activities will be coordinated and approved by the USFWS.

## SUMMARY

The Nashville Crayfish do not appear to occur in the project area in the Sims Branch or the unnamed tributary to Sims Branch. Nevertheless, the construction activities may affect the populations of Nashville crayfish present in the lower reaches of Sims Branch and in Mill Creek. If required by the permitting agency all crayfish will be relocated prior to construction. Approved sediment and erosion control methods will be used in the construction zone to minimize impacts. A biologist familiar with the Nashville Crayfish, and holding valid state and federal permits, will coordinate the relocation activities. All activities will be coordinated with the U. S. Fish and Wildlife Service.



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## REFERENCES

- Bouchard, R.W. 1976. Investigations on the status of fourteen species of freshwater decapod crustaceans in the United States, Part I. Troglotic shrimp and western North American crayfishes. Report to Office of Endangered Species, Department of the Interior. 26 pp.
- Bouchard, R.W. 1984. Distribution and status of the endangered crayfish *Orconectes shoupi* (Decapoda: Cambaridae). U.S. Fish and Wildlife Service, Tennessee Cooperative Fishery Research Unit, Tennessee Tech University, Cookeville, Tennessee. 27 pp.
- Miller, A. C. and P. D. Hartfield. 1985. A study of *Orconectes shoupi*, Mill Creek Basin, Tennessee, 1985. U.S. Army Corps of Engineers, Nashville, TN. 25 pp.
- Nature Serve Explorer. An online encyclopedia of life [web application]. 2001. Version 1.6. Arlington, Virginia, USA: Nature Serve. Available: <http://www.natureserve.org/explorer> (Accessed: March 13, 2002).
- O'Bara, C. J., A. J. Korgi, and G. J. Stark. 1985. Final report, status survey of the Nashville crayfish (*Orconectes shoupi*). Report to U.S. Fish and Wildlife Service, Asheville, NC. 17 pp.
- Stark, G. J. 1986. Microhabitat use by the crayfish community of the Mill Creek Basin. Thesis, Tennessee Technological University, Cookeville, TN. 44 pp.
- U.S. Army Corps of Engineers, Nashville District. 1981. Water quality along Mill Creek. Nashville, Tennessee. 35 pp.
- U.S. Army Corps of Engineers, Nashville District. 1984. Mill Creek, Wimpole Drive area, Nashville, Davidson County, Tennessee. Final detailed project report and environmental assessment. 331 pp.
- U.S. Fish and Wildlife Service. 1986. Endangered and threatened wildlife and plants; determination of endangered status for the Nashville crayfish. 51 Federal Register 34412.
- U.S. Fish and Wildlife Service. 1988. Nashville crayfish Recovery Plan (1st revision). U.S. Fish and Wildlife Service, Atlanta, Georgia. 16 pp.





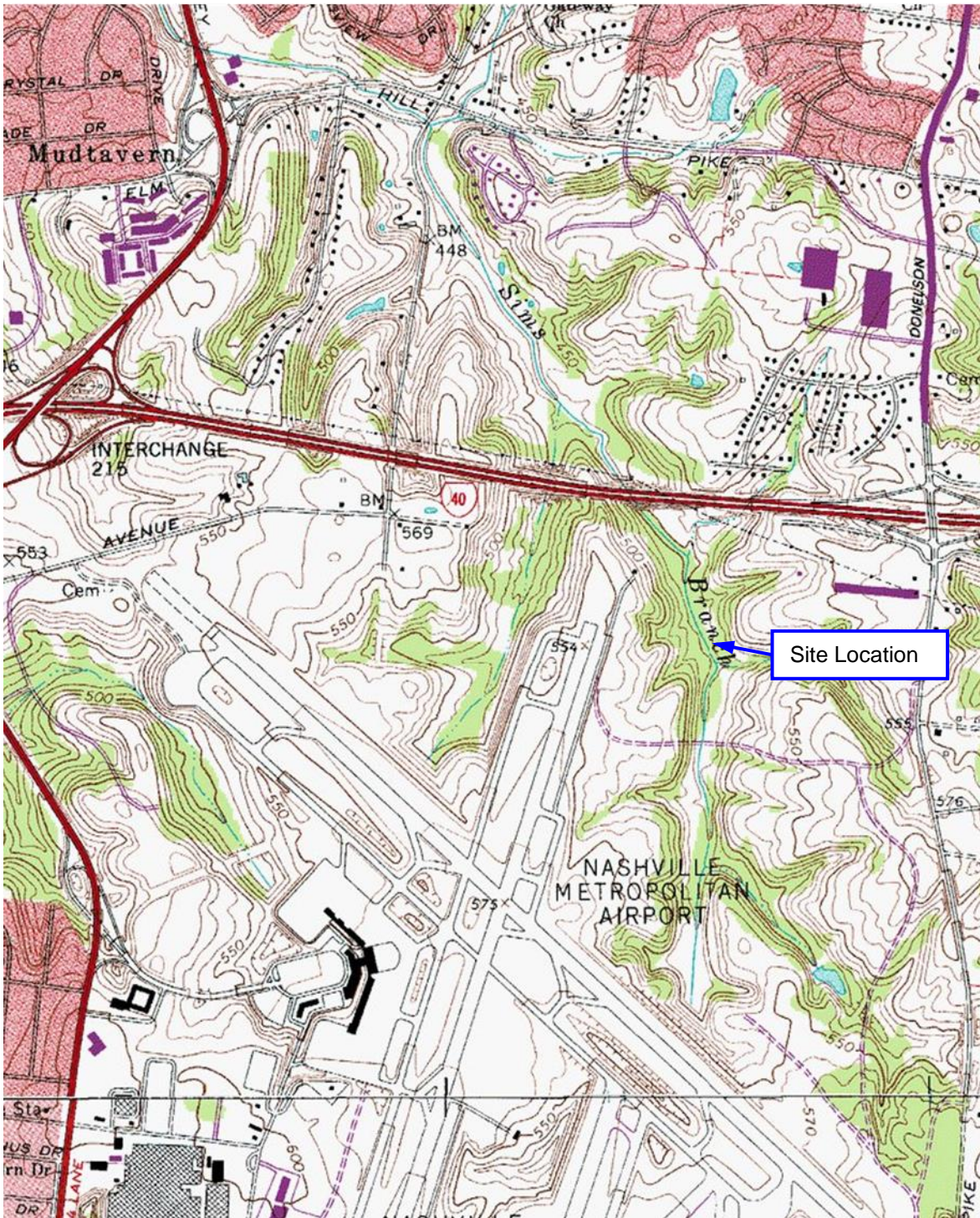


Figure 1. Approximate Site Location Project No. 7650-19-1222, Nashville International Airport, Davidson County, Tennessee





Figure 2. Approximate Crayfish Sampling Locations Project No. 7650-19-1222, Nashville International Airport, Davidson County, Tennessee





Photo 1. Sims Branch, Location 1, facing upstream (south).



Photo 2. Sims Branch, Location 2, facing upstream (south).





Photo 3. Sims Branch, Location 3, facing downstream (north).



Photo 4. Sims Branch, Location 4, facing downstream (northeast).





Photo 5. Unnamed tributary to Sims Branch, Location 5, facing upstream (east).



Photo 6. Sims Branch, Location 6, facing upstream (south).





Photo 7. Sims Branch, Location 7, facing downstream (northwest).



**APPENDIX A**  
**Crayfish Field Data Sheets**

**CRAYFISH FIELD DATA SHEET**

**wood.**

DATE: 9/30/19  
 SITE NAME: BNA - Additional Gates  
 PROJECT NUMBER: 7650-19-1222  
 SAMPLING CREW: Rudzinski, Glover  
 PURPOSE FOR SITE VISIT (Circle One):  SURVEY  RELOCATION

CONSTRUCTION ACTIVITIES PLANNED (i.e., Road Crossing):  
Airport Expansion

SITE DESCRIPTION (i.e., Land Use):  
Airport property

STREAM DESCRIPTION:  
Sims Branch Location 1  
  
36.130986, -86.675212

SPECIES	QUANTITY	TOTAL PER SPECIES
1.) <i>Orconectes duelli</i>	1	1
2.) <i>Cambanus striatus</i>	1	1
3.)		
4.)		
5.)		
6.)		

Form Completed By <u>SBR</u>	Form Checked By <u>FSG</u>	TOTAL COLLECTED	2
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**CRAYFISH FIELD DATA SHEET**

**wood.**

DATE: 9/30/19  
 SITE NAME: BNA - Additional Gates  
 PROJECT NUMBER: 7650-19-1222  
 SAMPLING CREW: Rudzinski, Glover

PURPOSE FOR SITE VISIT (Circle One):  SURVEY  RELOCATION

CONSTRUCTION ACTIVITIES PLANNED (i.e., Road Crossing):  
Airport Expansion

SITE DESCRIPTION (i.e., Land Use):  
Airport Property

STREAM DESCRIPTION:  
Sims Branch near T2 Location 2

36.133375, - 86.674953

SPECIES	QUANTITY	TOTAL PER SPECIES
1.) <i>Cambarus striatus</i>	11	11
2.) <i>Orcoectes duelli</i>	10	10
3.)		
4.)		
5.)		
6.)		

Form Completed By <u>SBR</u>	Form Checked By <u>FSG</u>	TOTAL COLLECTED <u>21</u>
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**CRAYFISH FIELD DATA SHEET**

**wood.**

DATE: 9/30/19  
 SITE NAME: BNA - Additional Gates  
 PROJECT NUMBER: 7650-19-1222  
 SAMPLING CREW: Rudzinski, Alver

PURPOSE FOR SITE VISIT (Circle One): SURVEY RELOCATION

CONSTRUCTION ACTIVITIES PLANNED (i.e., Road Crossing):

Airport Expansion

SITE DESCRIPTION (i.e., Land Use):

Airport Property

STREAM DESCRIPTION:

Sims Branch

Location 3

36.136414, -86.674377

SPECIES	QUANTITY	TOTAL PER SPECIES
1.) <u>Orconectes duelli</u>	<u>10</u>	<u>10</u>
2.) <u>Cambarus striatus</u>	<u>4</u>	<u>4</u>
3.)		
4.)		
5.)		
6.)		
Form Completed By <u>SBR</u>	Form Checked By <u>FSG</u>	TOTAL COLLECTED <u>14</u>

**CRAYFISH FIELD DATA SHEET**

**wood.**

DATE: 9/30/19  
 SITE NAME: BNA - Additional Gates  
 PROJECT NUMBER: 7650-19-1222  
 SAMPLING CREW: Radeinski, Glover

PURPOSE FOR SITE VISIT (Circle One):  SURVEY  RELOCATION

CONSTRUCTION ACTIVITIES PLANNED (i.e., Road Crossing):  
Airport Expansion

SITE DESCRIPTION (i.e., Land Use):  
Airport Property

STREAM DESCRIPTION:  
Sine Branch Location 4

36.137262, -86.674045

SPECIES	QUANTITY	TOTAL PER SPECIES
1.) <u>Orconectes dumalli</u>	<u>13</u>	<u>13</u>
2.)		
3.)		
4.)		
5.)		
6.)		

Form Completed By <u>SBR</u>	Form Checked By <u>FSG</u>	TOTAL COLLECTED <u>13</u>
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**CRAYFISH FIELD DATA SHEET**

**wood.**

DATE: 9/30/19  
 SITE NAME: BNA - Additional Gates  
 PROJECT NUMBER: 7650-19-1222  
 SAMPLING CREW: Rudzinski, Glover

PURPOSE FOR SITE VISIT (Circle One):  SURVEY  RELOCATION

CONSTRUCTION ACTIVITIES PLANNED (i.e., Road Crossing):

Airport Expansion

SITE DESCRIPTION (i.e., Land Use):

Airport Property

STREAM DESCRIPTION:

Unnamed Tributary to Sims Branch

Location 5

36.137116, -86.673360

SPECIES	QUANTITY	TOTAL PER SPECIES
1.) <u>Cambarus striatus</u>	<u>3</u>	<u>3</u>
2.) <u>Orconectes dorelli</u>	<u>1</u>	<u>1</u>
3.)		
4.)		
5.)		
6.)		

Form Completed By <u>SBR</u>	Form Checked By <u>FSG</u>	TOTAL COLLECTED	<u>4</u>
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**CRAYFISH FIELD DATA SHEET**

**wood.**

DATE: 9/30/19  
 SITE NAME: BNR - Addition of Gates  
 PROJECT NUMBER: 7650-19-1222  
 SAMPLING CREW: Rudzinski, Glover  
 PURPOSE FOR SITE VISIT (Circle One):  SURVEY  RELOCATION

CONSTRUCTION ACTIVITIES PLANNED (i.e., Road Crossing):  
Airport Property - Airport Expansion

SITE DESCRIPTION (i.e., Land Use):  
Airport Property

STREAM DESCRIPTION:  
Sims Branch Location 6  
  
36.139059, -86.674779

SPECIES	QUANTITY	TOTAL PER SPECIES
1.) <i>Oreconectes dorsalis</i>	8	8
2.) <i>Cambarus striatus</i>	4	4
3.)		
4.)		
5.)		
6.)		

Form Completed By	<u>SBR</u>	Form Checked By	<u>FSG</u>	TOTAL COLLECTED	<u>12</u>
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**CRAYFISH FIELD DATA SHEET**

**wood.**

DATE: 9/30/19  
 SITE NAME: BNA - Additional Gates  
 PROJECT NUMBER: 7650-19-1222  
 SAMPLING CREW: Rudewski, Alver  
 PURPOSE FOR SITE VISIT (Circle One):  SURVEY  RELOCATION

CONSTRUCTION ACTIVITIES PLANNED (i.e., Road Crossing):  
Airport Expansion

SITE DESCRIPTION (i.e., Land Use):  
Airport Property

STREAM DESCRIPTION:  
Sims Branch just south of I-40      Location 7  
  
36.140395, -86.675300

SPECIES	QUANTITY	TOTAL PER SPECIES
1.) <u>Orconectes dwelli</u>	<u>25</u>	<u>25</u>
2.)		
3.)		
4.)		
5.)		
6.)		

Form Completed By <u>SBR</u>	Form Checked By <u>FSG</u>	TOTAL COLLECTED	<u>25</u>
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Tennessee  
Wildlife Resource  
Agency



September 3, 2024

Tennessee Wildlife Resources Agency  
Ellington Agricultural Center  
5107 Edmonson Pike  
Nashville, TN 37211TN

Re: Agency Scoping for an Environmental Assessment (EA) for the Central Ramp Expansion at Nashville International Airport

Dear Tennessee Wildlife Resources Agency,

This letter is sent to inform you that the Metropolitan Nashville Airport Authority (MNA) is preparing an Environmental Assessment (EA) for the proposed Central Ramp Expansion and enabling projects (the Proposed Action) at Nashville International Airport (BNA). The EA will investigate, analyze, and disclose any potential environmental impacts associated with the Proposed Action. The Proposed Action includes expansion of the Central Ramp for additional needed Remain Overnight (RON) aircraft parking positions and off-gate aircraft deicing positions at BNA. The Proposed Action includes the following elements:

- Expansion of the Central Ramp/development of a new West Ramp
- Filling in approximately 74 acres within the Mill Creek watershed and encapsulating Sims Branch to maintain existing stream flow
- Associated stormwater capacity improvements within the site

The Project Site is located in the center of BNA property and is surrounded by commercial and aviation land uses as shown in the attached **Exhibit 1, Project Location**. The site has been previously disturbed by past airport construction and presently consists of mowed grass fields, several drainage channels, a holding pond for the spent aircraft deicing fluid treatment system, and access roads for maintenance vehicles.

The following survey and determinations are being conducted as part of this project:

- A Wetland and Waters of the US Delineation/Jurisdiction Determination has been conducted in accordance with the US Army Corp of Engineers (USACE) guidelines, and a Hydrologic Determination is being completed under TDEC guidelines.

The Federal Aviation Administration (FAA) is the lead Federal agency that will review the EA. The EA document will be prepared in accordance with FAA Order 1050.1F, Environmental Impacts: Policies and Procedures and FAA Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions. As part of the coordination process for this EA, the MNA and the FAA are respectfully seeking your comments and identification of any specific areas of concern related to this Proposed Action. We would appreciate your assistance and request that your comments are returned within 30 days or at your earliest convenience. If you would like additional information on this





project, or would like to speak directly, please do not hesitate to contact Carissa Agnese, Senior Environmental Manager, at (757) 409-5013 or by email at [carissa.agnese@kiewit.com](mailto:carissa.agnese@kiewit.com)

Please send any written comments to the following address:

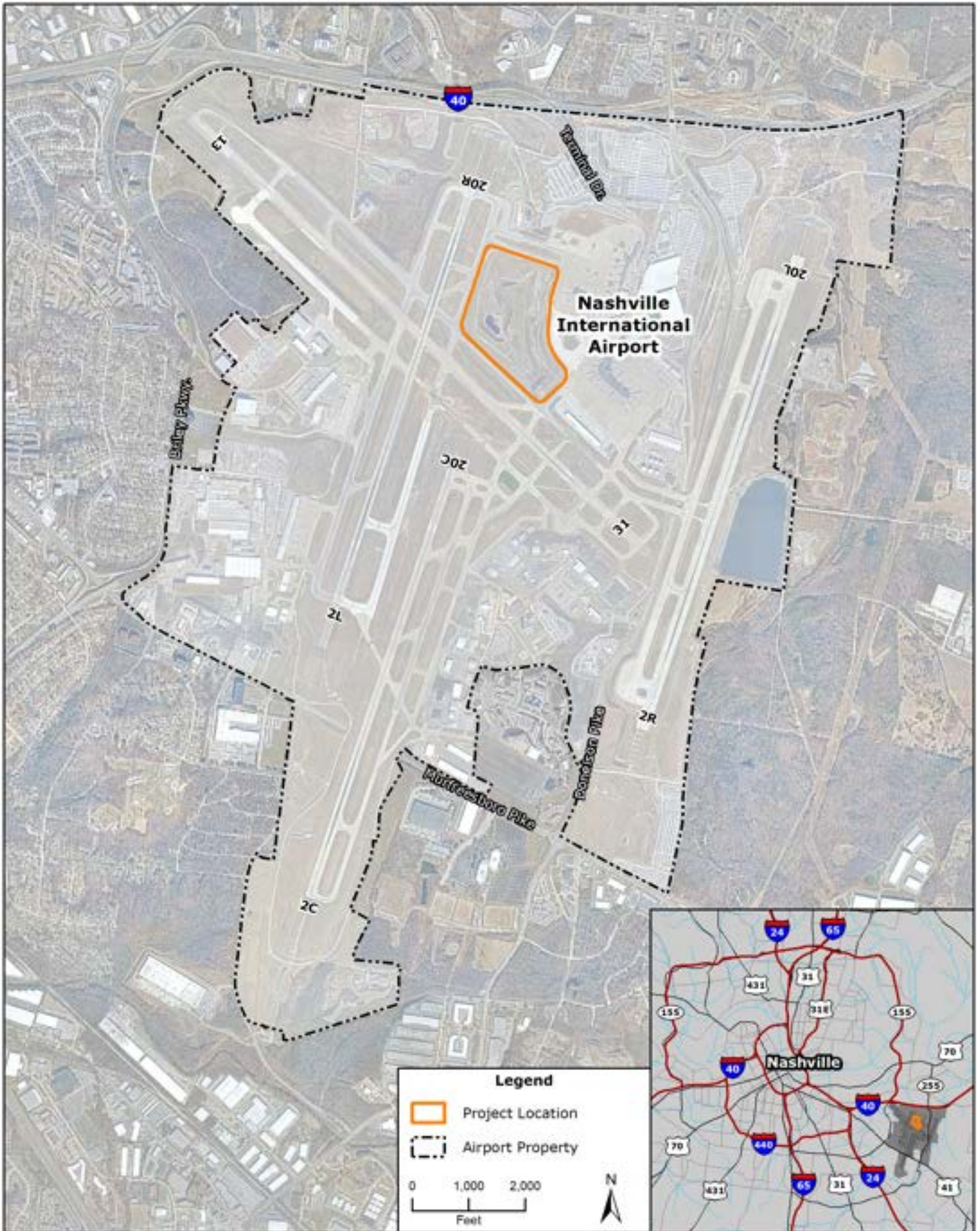
Kiewit Engineering Group  
Attn: Carissa Agnese  
105 Continental Place, Suite 150  
Brentwood, TN 37027 8755

Your prompt response is appreciated so that the project may proceed as scheduled. Thank you for your consideration of this request.

Sincerely,

Marcie Aydelotte  
Design Manager, MNAA Central Ramp Expansion

cc: Caitlin Dillon, Metropolitan Nashville Airport Authority, Traci Holton, Metropolitan Nashville Airport Authority, Peggy Kelley, Federal Aviation Administration





## TENNESSEE WILDLIFE RESOURCES AGENCY

ELLINGTON AGRICULTURAL CENTER  
5105 EDMONDSON PIKE  
NASHVILLE, TENNESSEE 37211

9/30/2024

TWRA Environmental Review:  
MNA Central Ramp Expansion, Davidson County, TN

The Tennessee Wildlife Resources Agency has reviewed the information that you provided. Kiewit have requested an endangered species review on the proposed expansion of the Central Ramp at the Nashville Airport in Nashville, Davidson County, TN. It is my understanding that a section of Sims Branch will be encapsulated for the construction of the ramp.

Since we share authority with the U.S. Fish and Wildlife Service (USFWS) on the Nashville Crayfish (*Orconectes shoupi*), we request that you consult with the USFWS Cookeville, Tennessee Field Office regarding potential impacts to these listed species; and will defer to the opinion of the U.S. Fish and Wildlife Service's Cookeville Field Office regarding potential impacts to the state and federally endangered species due to the proposed project.

Otherwise, we do not anticipate adverse impacts to state listed species under our authority due to the proposed construction; provided that best management practices to address erosion and sediment are implemented and maintained during construction activities. Thank you for the opportunity to review and comment on this proposed project. If I may be of further assistance, please contact me at [katie.m.murphy@tn.gov](mailto:katie.m.murphy@tn.gov).

Sincerely,

A handwritten signature in black ink that reads "Katie M. Murphy".

Katie Murphy  
Region 2 Aquatic Habitat Biologist

The State of Tennessee

AN EQUAL OPPORTUNITY, EQUAL ACCESS, AFFIRMATIVE ACTION EMPLOYER

Tennessee  
Department of  
Environment and  
Conservation



September 3, 2024

TN Department of Environment and Conservation  
Tara Pedraza, Deputy Director  
Nashville Environmental Field Office  
711 R.S. Gass Blvd  
Nashville, TN 37216 Mark Gudlin

Re: Agency Scoping for an Environmental Assessment (EA) for the Central Ramp Expansion at Nashville International Airport

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returned within 30 days or at your earliest convenience. If you would like additional information on this project, or would like to speak directly, please do not hesitate to contact Carissa Agnese, Senior Environmental Manager, at (757) 409-5013 or by email at [carissa.agnese@kiewit.com](mailto:carissa.agnese@kiewit.com)

Please send any written comments to the following address:

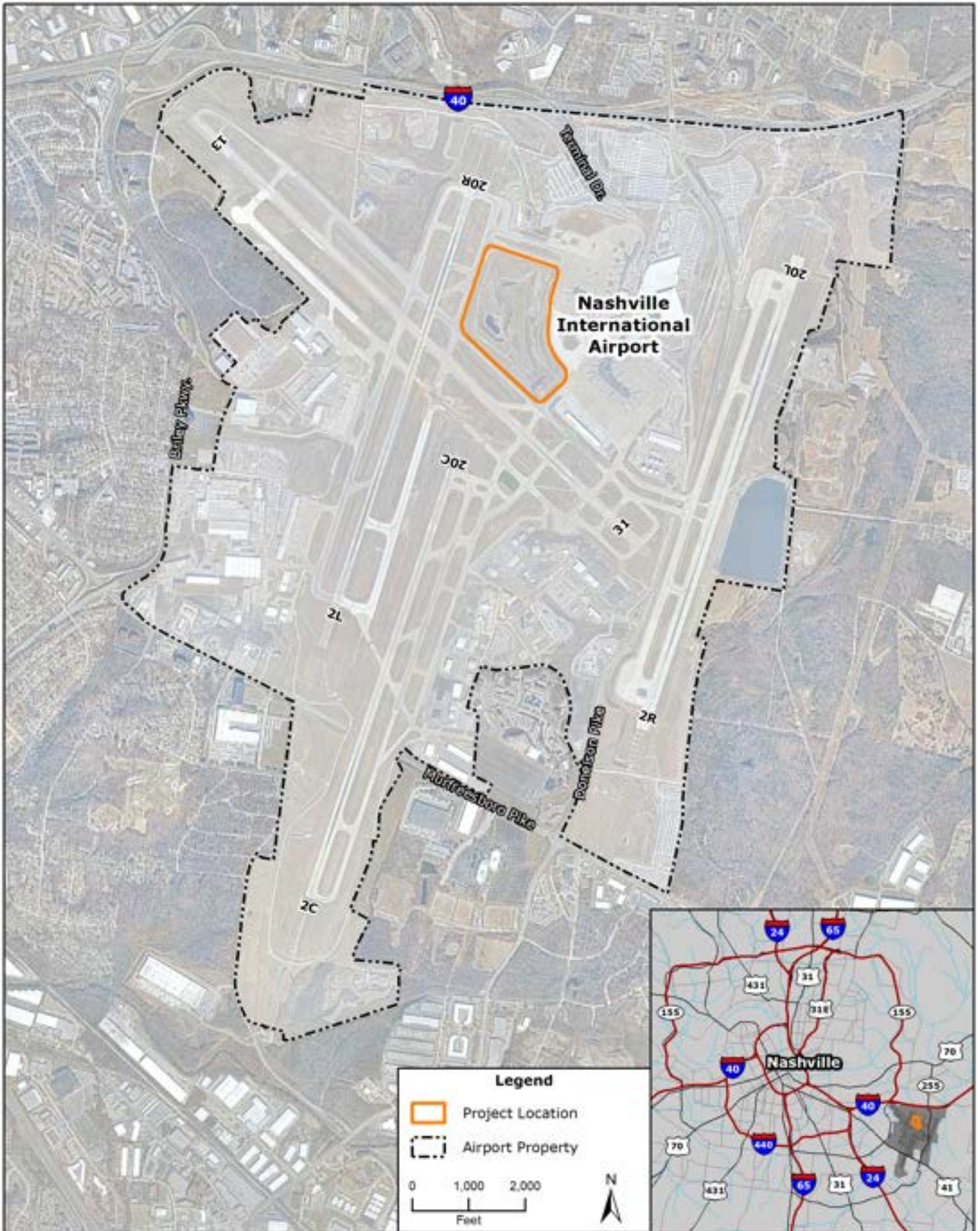
Kiewit Engineering Group  
Attn: Carissa Agnese  
105 Continental Place, Suite 150  
Brentwood, TN 37027 8755

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Sincerely,

Marcie Aydelotte  
Design Manager, MNAA Central Ramp Expansion

cc: Caitlin Dillon, Metropolitan Nashville Airport Authority, Traci Holton, Metropolitan Nashville Airport Authority, Peggy Kelley, Federal Aviation Administration



# State Historic Preservation Office





September 3, 2024

State Historic Preservation Office  
Patrick McIntyre - Executive Director  
2941 Lebanon Pike  
Nashville, TN 37214

Re: Agency Scoping for an Environmental Assessment (EA) for the Central Ramp Expansion at Nashville International Airport

Dear Mr. McIntyre,

This letter is sent to inform you that the Metropolitan Nashville Airport Authority (MNA) is preparing an Environmental Assessment (EA) for the proposed Central Ramp Expansion and enabling projects (the Proposed Action) at Nashville International Airport (BNA). The EA will investigate, analyze, and disclose any potential environmental impacts associated with the Proposed Action. The Proposed Action includes expansion of the Central Ramp for additional needed Remain Overnight (RON) aircraft parking positions and off-gate aircraft deicing positions at BNA. The Proposed Action includes the following elements:

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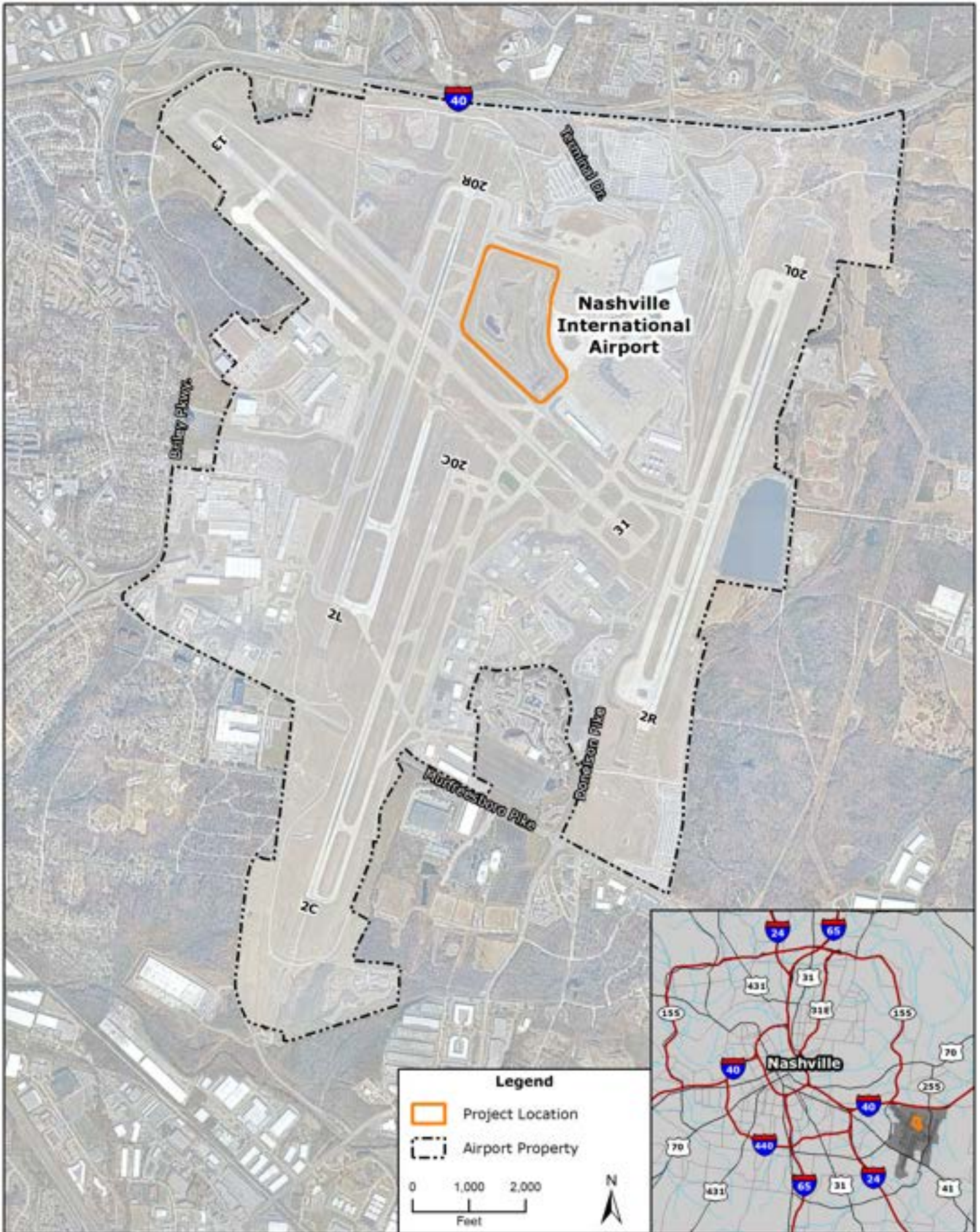
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Marcie Aydelotte  
Design Manager, MNA Central Ramp Expansion

cc: Caitlin Dillon, Metropolitan Nashville Airport Authority, Traci Holton, Metropolitan Nashville Airport Authority, Peggy Kelley, Federal Aviation Administration



**Legend**

- Project Location
- Airport Property

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Filename: Y:\BNA\Central Ramp EAE\IS Work\GIS\Map\GIS\Map\Project\_Location.mxd

# Public Officials



September 3, 2024

Governor Bill Lee  
State Capitol, 1st Floor  
600 Dr. Martin L. King, Jr. Blvd.  
Nashville, TN

Re: Agency Scoping for an Environmental Assessment (EA) for the Central Ramp Expansion at Nashville International Airport

Dear Governor Lee,

This letter is sent to inform you that the Metropolitan Nashville Airport Authority (MNA) is preparing an Environmental Assessment (EA) for the proposed Central Ramp Expansion and enabling projects (the Proposed Action) at Nashville International Airport (BNA). The EA will investigate, analyze, and disclose any potential environmental impacts associated with the Proposed Action. The Proposed Action includes expansion of the Central Ramp for additional needed Remain Overnight (RON) aircraft parking positions and off-gate aircraft deicing positions at BNA. The Proposed Action includes the following elements:

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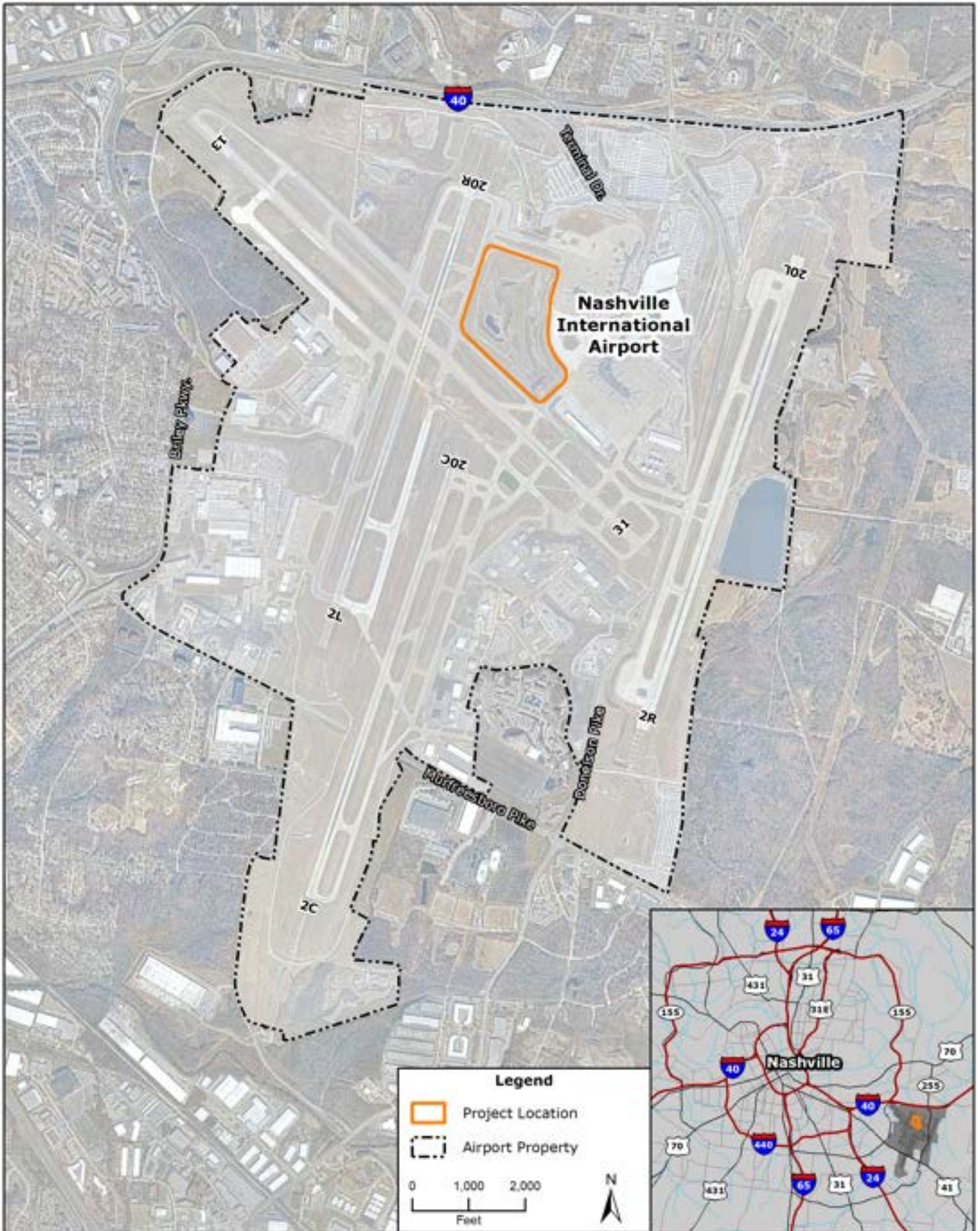
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Marcie Aydelotte  
Design Manager, MNAA Central Ramp Expansion

cc: Caitlin Dillon, Metropolitan Nashville Airport Authority, Traci Holton, Metropolitan Nashville Airport Authority, Peggy Kelley, Federal Aviation Administration





September 3, 2024

Representative John Rose  
Gallatin District Office  
355 North Belvedere Drive  
Suite 308  
Gallatin, TN

Re: Agency Scoping for an Environmental Assessment (EA) for the Central Ramp Expansion at Nashville International Airport

Dear Representative Rose,

This letter is sent to inform you that the Metropolitan Nashville Airport Authority (MNA) is preparing an Environmental Assessment (EA) for the proposed Central Ramp Expansion and enabling projects (the Proposed Action) at Nashville International Airport (BNA). The EA will investigate, analyze, and disclose any potential environmental impacts associated with the Proposed Action. The Proposed Action includes expansion of the Central Ramp for additional needed Remain Overnight (RON) aircraft parking positions and off-gate aircraft deicing positions at BNA. The Proposed Action includes the following elements:

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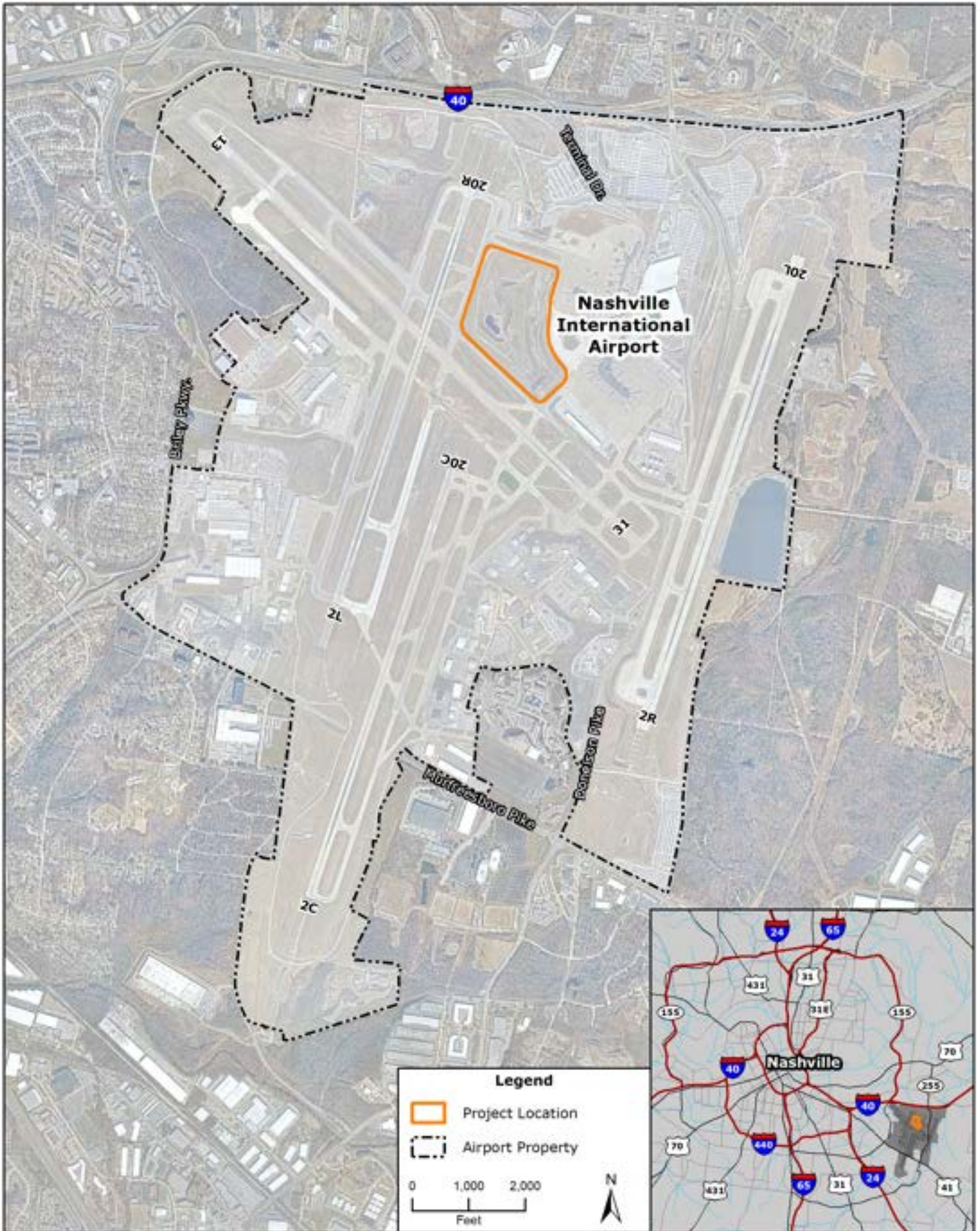
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cc: Caitlin Dillon, Metropolitan Nashville Airport Authority, Traci Holton, Metropolitan Nashville Airport Authority, Peggy Kelley, Federal Aviation Administration



Kiewit  
Paula Adams  
10055 Trainstation Circle,  
Lone Tree, CO 80124

PLACES STICKER AT TOP OF ENVELOPE TO THE  
OF THE RETURN ADDRESS, FOLD AT CORNERS  
**CERTIFIED MAIL**

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**RECEIVED**  
SEP 11 2024

BY: *Paula Adams*

Representative John Rose  
Gallatin District Office  
355 North Belvedere Drive, Suite 308  
Gallatin, TN 37066

37066-541083





RECEIVED  
SEP 11 2024

September 3, 2024

BY: .....

Representative John Rose  
Gallatin District Office  
355 North Belvedere Drive  
Suite 308  
Gallatin, TN 37066

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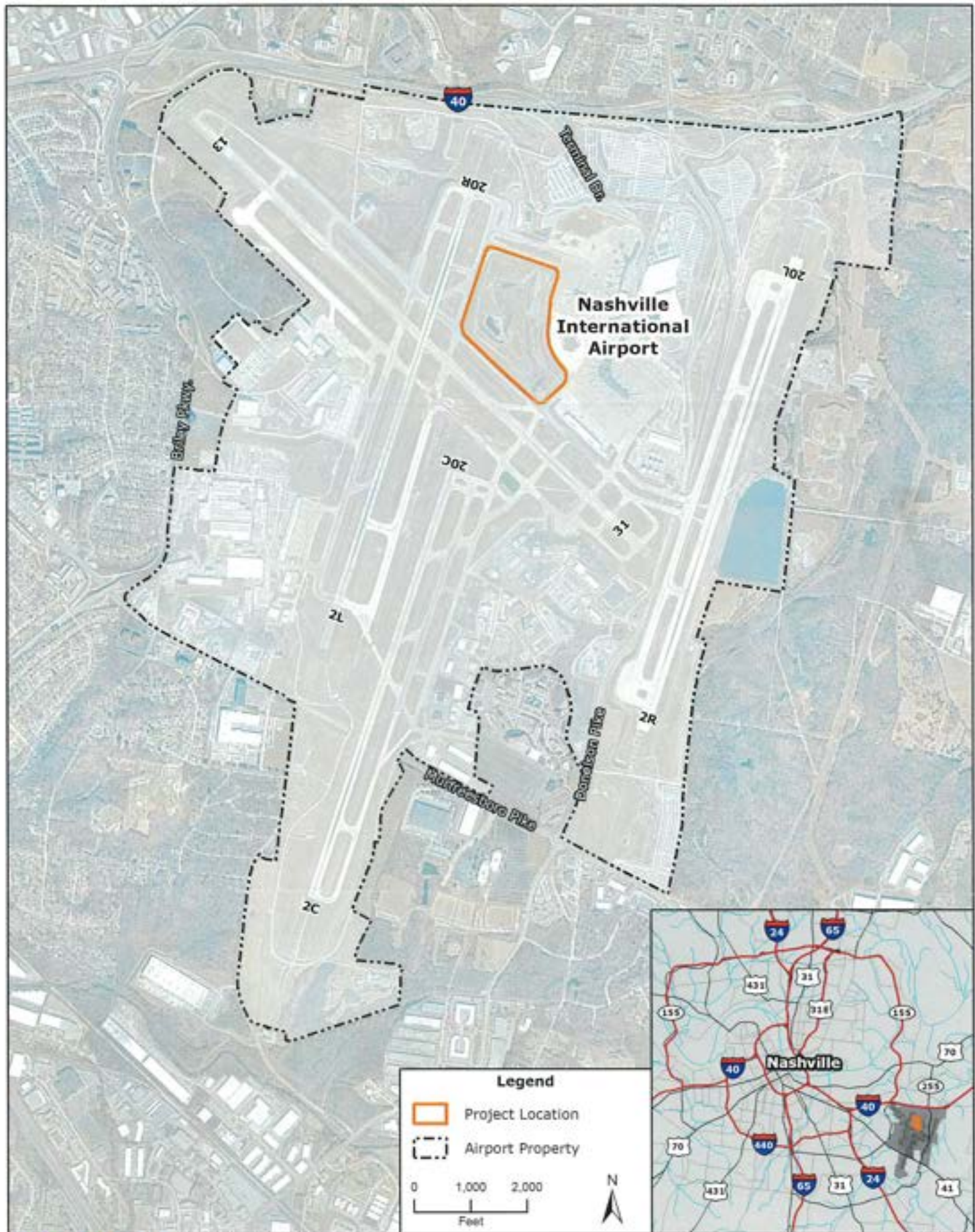
Kiewit Engineering Group  
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Brentwood, TN 37027 8755

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Sincerely,

Marcie Aydelotte  
Design Manager, MNA Central Ramp Expansion

cc: Caitlin Dillon, Metropolitan Nashville Airport Authority, Traci Holton, Metropolitan Nashville Airport Authority, Peggy Kelley, Federal Aviation Administration





September 3, 2024

Senator Bill Hagerty  
United States Senator  
719 Church Street  
Suite 2150  
Nashville, TN

Re: Agency Scoping for an Environmental Assessment (EA) for the Central Ramp Expansion at Nashville International Airport

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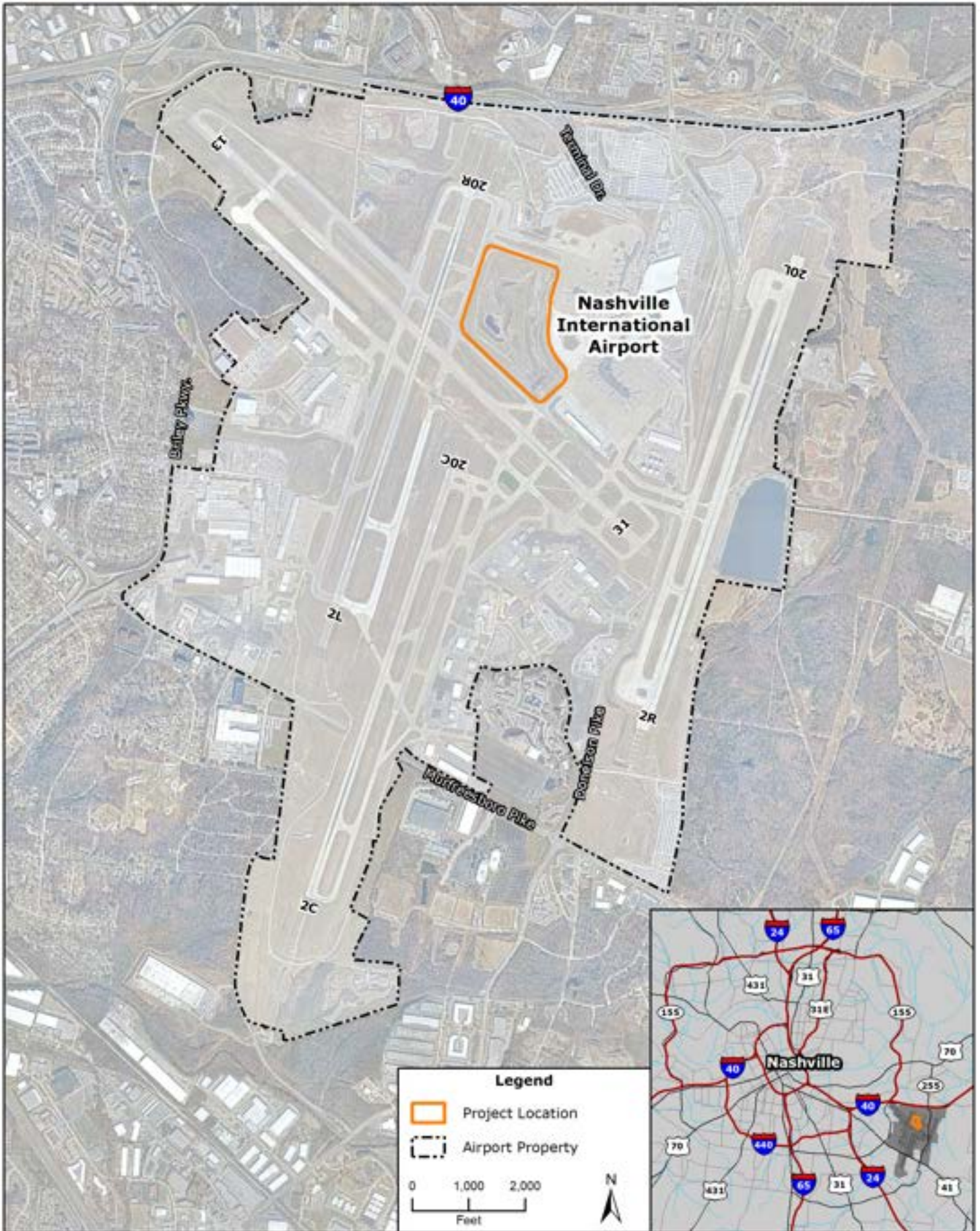
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Design Manager, MNAA Central Ramp Expansion

cc: Caitlin Dillon, Metropolitan Nashville Airport Authority, Traci Holton, Metropolitan Nashville Airport Authority, Peggy Kelley, Federal Aviation Administration





# Appendix B, Air Quality

# 1 AIR QUALITY

The Clean Air Act (CAA) establishes standards and programs to evaluate, achieve, and maintain acceptable air quality in the United States (U.S.). In accordance with CAA requirements, the U.S. Environmental Protection Agency (USEPA) 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 USEPA 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>);<sup>2</sup> sulfur dioxide (SO<sub>2</sub>); particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>);<sup>3</sup> and, lead (Pb).<sup>4</sup> **Table 1** provides the NAAQS for each of the criteria pollutants.

A nonattainment area is a homogeneous geographical area (usually referred to as an air quality control region or airshed) that is in violation of one or more NAAQS and has been designated as nonattainment by the USEPA as provided for under the CAA. Each nonattainment area is required to have a State Implementation Plan (SIP), developed by the state that quantifies current conditions, projects future conditions through the date of prescribed attainment, and identifies mitigation measures that are to be used to bring the area back into attainment. A maintenance area describes the air quality designation of an area previously designated nonattainment by the USEPA that subsequently meets 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 remained in attainment throughout the maintenance period.

The CAA conformity regulations (40 Code of Federal Regulations [CFR] Part 93) apply only to areas designated as nonattainment or maintenance. Under these rules, a federal agency shall not support, permit, or approve any action, which does not conform to an approved SIP. **Table 2** provides the *de minimis* thresholds for each of the criteria pollutants and the types of nonattainment.

---

<sup>1</sup> USEPA, Title 40 Code of Federal Regulations (CFR) Part 50, National Primary and Secondary Ambient Air Quality Standards (NAAQS).

<sup>2</sup> 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.

<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.

<sup>4</sup> Airborne lead in urban areas is primarily emitted by vehicles using leaded fuels. 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 USEPA for a Nonattainment New Source Review permitting program would emit over 100 tons per year. Therefore, an emissions inventory of lead was not conducted for this EA.

**TABLE 1, NATIONAL AMBIENT AIR QUALITY STANDARDS**

POLLUTANT		PRIMARY/ SECONDARY	AVERAGING TIME	LEVEL	FORM OF MEASUREMENT
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 µg/m <sup>3</sup> (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 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particulate Matter	PM <sub>2.5</sub>	Primary	1 year	9.0 µg/m <sup>3</sup>	Annual mean, averaged over 3 years
		Secondary	1 year	15.0 µg/m <sup>3</sup>	Annual mean, averaged over 3 years
		Primary and Secondary	24 hours	35 µg/m <sup>3</sup>	98 <sup>th</sup> percentile, averaged over 3 years
	PM <sub>10</sub>	Primary and Secondary	24 hours	150 µg/m <sup>3</sup>	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 hours	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 µg/m<sup>3</sup> 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 are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O<sub>3</sub> 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 µg/m<sup>3</sup> is micrograms per cubic meter.

Source: EPA, <https://www.epa.gov/criteria-air-pollutants/naaqs-table>, Accessed June 2024.

**TABLE 2, FEDERAL 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

1 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.

2 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.

3 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: CFR Title 40, Protection of the Environment Part 93.153. 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 C.F.R. Part 93.153(b)(1) & (2).

Nashville International Airport (BNA) is in Davidson County, Tennessee. In the past, Davidson County was designated as nonattainment for the 1979 1-hour ozone standard. However, on October 30, 1996, the USEPA determined the area had attained the ozone standard and was redesignated to maintenance. Furthermore, the area was redesignated to attainment on April 2, 2008, after the 1979 1-hour ozone standard was revoked.<sup>5</sup> Davidson County is in attainment for all other pollutants. Although the Proposed Action would occur in an area in “attainment” for all criteria pollutants, the emissions are compared to *de minimis* thresholds to identify if the Proposed Action has the potential to create a new violation of the NAAQS and would result in a potentially significant air quality impact.

The Proposed Action includes expansion of the Central Ramp for additional Remain Overnight (RON) aircraft parking positions and off-gate aircraft deicing positions at BNA. The expansion requires filling in approximately 74 acres within the Mill Creek watershed and encapsulating approximately 3,133 linear feet of streams to maintain existing stream flow. The Proposed Action is located in the center of BNA property and is surrounded by aviation land uses.

The Proposed Action would not result in changes to the number of operations, fleet mix, runway use, or time of day of operations at the Airport. Therefore, no operational impacts would occur, and an operational air quality analysis was not required for this project. However, construction of the Proposed Action would result in a temporary increase in emissions. A construction emissions inventory was calculated for the Proposed Action using emissions factors from the USEPA’s Motor Vehicle Emission Simulator (MOVES) to calculate emissions from construction equipment usage developed with the Airport Construction Emissions Inventory Tool (ACEIT). The annual construction emissions are provided in **Table 3**.

---

<sup>5</sup> US EPA, Green Book Early Action Compact (EAC) Areas, Accessed June 25, 2024, Available on-line: <https://www.epa.gov/green-book/green-book-early-action-compact-eac-areas>

**TABLE 3, ANNUAL CONSTRUCTION EMISSIONS INVENTORY (SHORT TONS)**

YEAR	CO	VOC	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
2025	3.5	0.2	4.0	0.0	3.9	0.5
2026	5.7	0.3	5.7	0.0	7.5	0.9
2027	5.6	0.3	5.6	0.0	7.3	0.9
2028	2.2	0.1	1.8	0.0	3.7	0.4
<i>Federal de minimis Threshold:</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>
<b><i>Exceeds de minimis Threshold?</i></b>	<b><i>NO</i></b>	<b><i>NO</i></b>	<b><i>NO</i></b>	<b><i>NO</i></b>	<b><i>NO</i></b>	<b><i>NO</i></b>

Note: CO = carbon monoxide, VOC = volatile organic compounds, NO<sub>x</sub> = nitrogen oxides, SO<sub>x</sub> = sulfur oxides, PM<sub>10</sub> = particulate matter less than 10 microns in diameter, PM<sub>2.5</sub> = particulate matter less than 2.5 microns in diameter.

Source: Landrum & Brown analysis, 2024.

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 a result, no adverse impact on local or regional air quality is anticipated due to construction of the Proposed Action.

## 2 CLIMATE

Although there are no Federal standards for aviation-related greenhouse gas (GHG) emissions, it is well established that GHG emissions can affect climate. **Table 4** provides an estimate of the total GHG construction emissions inventory. These estimates are 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 4, TOTAL GHG CONSTRUCTION EMISSIONS INVENTORY (METRIC TONS)**

YEAR	CO <sub>2</sub> E
2025	3,431.09
2026	5,747.94
2027	5,623.28
2028	2,385.55

Notes: CO<sub>2</sub>E = Carbon Dioxide Equivalent, GWP = Global Warming Potential.

Carbon Dioxide (CO<sub>2</sub>) GWP = 1, Methane (CH<sub>4</sub>) GWP = 28, Nitrous Oxides (N<sub>2</sub>O) GWP = 298

Source: Landrum & Brown Analysis, 2024.

# Appendix C, Biological Resources



# **APPENDIX D**

## **Federal and State Listed Species and Reports**



# United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Tennessee Ecological Services Field Office  
446 Neal Street  
Cookeville, TN 38501-4027  
Phone: (931) 528-6481 Fax: (931) 528-7075

In Reply Refer To:

November 23, 2020

Consultation Code: 04ET1000-2021-SLI-0191

Event Code: 04ET1000-2021-E-00356

Project Name: Nashville International Airport Concourse and Gate Expansion Environmental Assessment

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

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

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

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

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

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

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

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

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
  - Migratory Birds
  - Wetlands
-

## Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Tennessee Ecological Services Field Office**

446 Neal Street

Cookeville, TN 38501-4027

(931) 528-6481

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## Project Summary

Consultation Code: 04ET1000-2021-SLI-0191

Event Code: 04ET1000-2021-E-00356

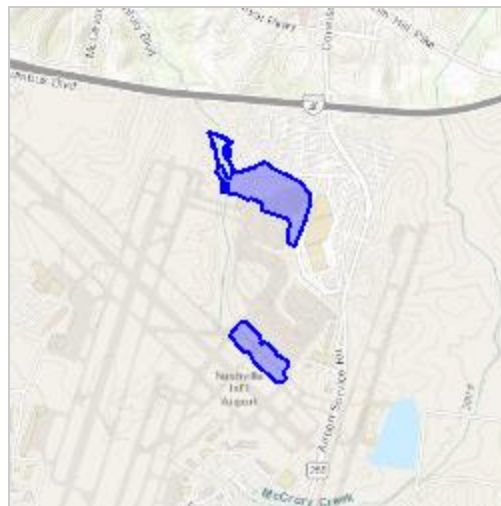
Project Name: Nashville International Airport Concourse and Gate Expansion Environmental Assessment

Project Type: TRANSPORTATION

Project Description: The purpose of the Proposed Action is to address current and forecasted passenger, air carrier and stakeholder needs by providing Nashville International Airport with 17 additional gates within the 20-year planning period. To accomplish this, Concourse A will be redeveloped, the north and south aprons will be expanded and a satellite concourse will be added to the south apron. Stormwater improvements, stream encapsulation, utility infrastructure improvements and security fence relocations would result from the Proposed Action, which is currently in the Environmental Assessment phase.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/36.136190731830276N86.67128773343453W>



Counties: Davidson, TN

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## Endangered Species Act Species

There is a total of 9 threatened, endangered, or candidate species on this species list.

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

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

- 
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

### Mammals

NAME	STATUS
Gray Bat <i>Myotis grisescens</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/6329">https://ecos.fws.gov/ecp/species/6329</a>	Endangered
Indiana Bat <i>Myotis sodalis</i> There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/5949">https://ecos.fws.gov/ecp/species/5949</a>	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a>	Threatened

### Crustaceans

NAME	STATUS
Nashville Crayfish <i>Orconectes shoupi</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/7181">https://ecos.fws.gov/ecp/species/7181</a>	Endangered

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## Flowering Plants

NAME	STATUS
<p>Braun's Rock-cress <i>Arabis perstellata</i></p> <p>There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat.            Species profile: <a href="https://ecos.fws.gov/ecp/species/4704">https://ecos.fws.gov/ecp/species/4704</a></p>	Endangered
<p>Guthrie's (=pyne's) Ground-plum <i>Astragalus bibullatus</i></p> <p>No critical habitat has been designated for this species.            Species profile: <a href="https://ecos.fws.gov/ecp/species/1739">https://ecos.fws.gov/ecp/species/1739</a></p>	Endangered
<p>Leafy Prairie-clover <i>Dalea foliosa</i></p> <p>No critical habitat has been designated for this species.            Species profile: <a href="https://ecos.fws.gov/ecp/species/5498">https://ecos.fws.gov/ecp/species/5498</a></p>	Endangered
<p>Prices Potato-bean <i>Apios priceana</i></p> <p>No critical habitat has been designated for this species.            Species profile: <a href="https://ecos.fws.gov/ecp/species/7422">https://ecos.fws.gov/ecp/species/7422</a></p>	Threatened
<p>Short's Bladderpod <i>Physaria globosa</i></p> <p>There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat.            Species profile: <a href="https://ecos.fws.gov/ecp/species/7206">https://ecos.fws.gov/ecp/species/7206</a></p>	Endangered

## Critical habitats

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

# Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

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

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
<b>Bald Eagle <i>Haliaeetus leucocephalus</i></b> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. <a href="https://ecos.fws.gov/ecp/species/1626">https://ecos.fws.gov/ecp/species/1626</a>	Breeds Sep 1 to Jul 31
<b>Blue-winged Warbler <i>Vermivora pinus</i></b> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds May 1 to Jun 30

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NAME	BREEDING SEASON
<b>Kentucky Warbler <i>Oporornis formosus</i></b> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
<b>Lesser Yellowlegs <i>Tringa flavipes</i></b> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9679">https://ecos.fws.gov/ecp/species/9679</a>	Breeds elsewhere
<b>Rusty Blackbird <i>Euphagus carolinus</i></b> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
<b>Wood Thrush <i>Hylocichla mustelina</i></b> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

## Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ “Proper Interpretation and Use of Your Migratory Bird Report” before using or attempting to interpret this report.

### Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12

(0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is  $0.25/0.25 = 1$ ; at week 20 it is  $0.05/0.25 = 0.2$ .

- The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

**Breeding Season (■)**

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

**Survey Effort (|)**

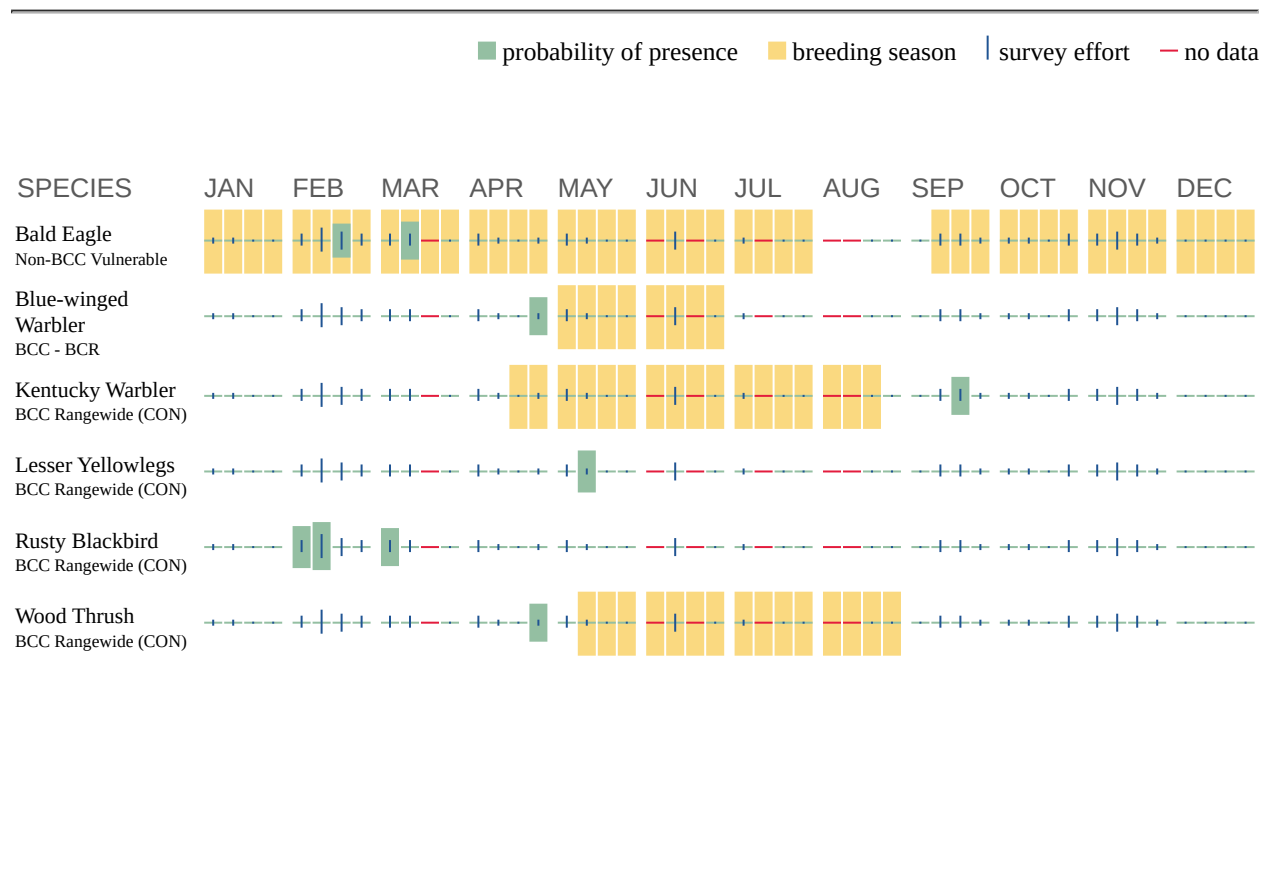
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

**No Data (-)**

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

**Survey Timeframe**

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

## Migratory Birds FAQ

**Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.**

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) and/or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

**What does IPaC use to generate the migratory birds potentially occurring in my specified location?**

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

**What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?**

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The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

### **How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?**

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

### **What are the levels of concern for migratory birds?**

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

### **Details about birds that are potentially affected by offshore projects**

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical](#)

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[Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

### **What if I have eagles on my list?**

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

### **Proper Interpretation and Use of Your Migratory Bird Report**

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

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# Wetlands

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

## FRESHWATER FORESTED/SHRUB WETLAND

- [PFO1A](#)

## FRESHWATER POND

- [PUBHx](#)

## RIVERINE

- [R4SBC](#)
-

**Department of State  
Division of Publications**

312 Rosa L. Parks Avenue, 8th Floor Snodgrass/TN Tower  
Nashville, TN 37243  
Phone: 615-741-2650  
Email: [publications.information@tn.gov](mailto:publications.information@tn.gov)

**For Department of State Use Only**

Sequence Number: \_\_\_\_\_  
Rule ID(s): \_\_\_\_\_  
File Date: \_\_\_\_\_  
Effective Date: \_\_\_\_\_

**Rulemaking Hearing Rule(s) Filing Form**

*Rulemaking Hearing Rules are rules filed after and as a result of a rulemaking hearing (Tenn. Code Ann. § 4-5-205).*

*Pursuant to Tenn. Code Ann. § 4-5-229, any new fee or fee increase promulgated by state agency rule shall take effect on July 1, following the expiration of the ninety (90) day period as provided in § 4-5-207. This section shall not apply to rules that implement new fees or fee increases that are promulgated as emergency rules pursuant to § 4-5-208(a) and to subsequent rules that make permanent such emergency rules, as amended during the rulemaking process. In addition, this section shall not apply to state agencies that did not, during the preceding two (2) fiscal years, collect fees in an amount sufficient to pay the cost of operating the board, commission or entity in accordance with § 4-29-121(b).*

<b>Agency/Board/Commission:</b>	Tennessee Wildlife Resources Agency
<b>Division:</b>	Biodiversity
<b>Contact Person:</b>	Lisa Crawford
<b>Address:</b>	PO Box 40747, Nashville, TN
<b>Zip:</b>	37204
<b>Phone:</b>	615-781-6606
<b>Email:</b>	Lisa.Crawford@tn.gov

**Revision Type (check all that apply):**

- Amendment  
 New  
 Repeal

**Rule(s)** (ALL chapters and rules contained in filing must be listed here. If needed, copy and paste additional tables to accommodate multiple chapters. Please make sure that **ALL** new rule and repealed rule numbers are listed in the chart below. Please enter only **ONE** Rule Number/Rule Title per row)

Chapter Number	Chapter Title
1660-01-32	Rules and Regulation for In Need of Management, Threatened, and Endangered Species
Rule Number	Rule Title
1660-01-32-.01	Adoption of Federal Endangered Species Act
1660-01-32-.02	Threatened and Endangered Species Lists and Rules
1660-01-32-.03	Wildlife In Need of Management List and Rules

New Rules

1660-01-32-.01, Adoption of Federal Endangered Species Act, is added as a new rule to read as follows:

- (1) The Tennessee Wildlife Resources Agency hereby adopts by reference the species and subspecies protected by the Federal Endangered Species Act of 1973, as amended, 16 USCA, Ch. 35. A list of Tennessee's Federally threatened and endangered species under the Endangered Species Act may be found at 50 C.F.R. §17.11.

**Authority:** T.C.A. §§70-1-206, 70-8-104, 70-8-106 and 70-8-107. **Administrative History:**  
Original rule filed \_\_\_\_\_; effective \_\_\_\_\_.

1660-01-32-.02, Threatened and Endangered Species Lists and Rules, is added as a new rule to read as follows:

- (1) The following species or subspecies are listed as state endangered.
  - (a) Crayfish

Common Name	Scientific Name
Big South Fork Crayfish	<i>Cambarus bouchardi</i>
Mountain Crayfish	<i>Cambarus conasaugaensis</i>
Conasauga Blue Burrower	<i>Cambarus cymatilis</i>
Valley Flame Crayfish	<i>Cambarus deweesae</i>
Chickamauga Crayfish	<i>Cambarus extraneus</i>
Obey Crayfish	<i>Cambarus obeyensis</i>
Pristine Crayfish	<i>Cambarus pristinus</i>
Speckled Crayfish	<i>Cambarus lentiginosus</i>
Hatchie Burrowing Crayfish	<i>Creaserinus hortonii</i>
Blood River Crayfish	<i>Faxonius burri</i>
Flint River Crayfish	<i>Faxonius cooperi</i>
Tennessee Cave Crayfish	<i>Orconectes incomptus</i>
Hardin Crayfish	<i>Faxonius wrighti</i>

- (b) Fish

Common Name	Scientific Name
Lake Sturgeon	<i>Acipenser fulvescens</i>
Ashy Darter	<i>Etheostoma cinereum</i>
Crown Darter	<i>Etheostoma corona</i>
Barrens Darter	<i>Etheostoma forbesi</i>
Tuckasegee Darter	<i>Etheostoma gutselli</i>
Egg-mimic Darter	<i>Etheostoma pseudovulatum</i>
Barrens Topminnow	<i>Fundulus julisia</i>
Coosa Chub	<i>Macrhybopsis sp. 1</i>
Silverjaw minnow	<i>Notropis buccatus</i>



(c) Amphibians

Common Name	Scientific Name
Streamside Salamander	<i>Ambystoma barbouri</i>
Hellbender	<i>Cryptobranchus alleganiensis</i>

(d) Birds

Common Name	Scientific Name
Bachman's Sparrow	<i>Peucaea aestivalis</i>

(2) The following species or subspecies are listed as state threatened.

(a) Crayfish

Common Name	Scientific Name
Tennessee Bottlebrush Crayfish	<i>Barbicambarus simmonsii</i>
Hiwassee Crayfish	<i>Cambarus hiwasseeensis</i>
Greensaddle Crayfish	<i>Cambarus manningi</i>
Cocoa Crayfish	<i>Cambarus stockeri</i>
Brawleys Fork Crayfish	<i>Cambarus williamsi</i>
Crescent Crayfish	<i>Faxonius taylori</i>

(b) Fish

Common Name	Scientific Name
Western Sand Darter	<i>Ammocrypta clara</i>
Blue sucker	<i>Cycleptus elongatus</i>
Coppercheek Darter	<i>Etheostoma aquali</i>
Holiday Darter	<i>Etheostoma brevirostrum</i>
Coldwater Darter	<i>Etheostoma ditrema</i>
Redlips Darter	<i>Etheostoma maydeni</i>
Striated Darter	<i>Etheostoma striatulum</i>
Trispot Darter	<i>Etheostoma trisella</i>
Saddled Madtom	<i>Noturus fasciatus</i>
Frecklebelly Madtom	<i>Noturus munitus</i>
Longhead Darter	<i>Percina macrocephala</i>
Sickle Darter	<i>Percina williamsi</i>

(c) Amphibians

Common Name	Scientific Name
Berry Cave Salamander	<i>Gyrinophilus gulolineatus</i>
Tennessee Cave Salamander	<i>Gyrinophilus palleucus</i>
Pale Salamander	<i>Gyrinophilus palleucus palleucus</i>
Big Mouth Cave Salamander	<i>Gyrinophilus palleucus necturoides</i>

(d) Reptiles

Common Name	Scientific Name
Alligator Snapping Turtle	<i>Macrolemys temminckii</i>
Northern Pine Snake	<i>Pituophis melanoleucus</i>
Western Pigmy Rattlesnake	<i>Sistrurus miliarius streckeri</i>

(e) Birds

Common Name	Scientific Name
Henslow's Sparrow	<i>Ammodramus henslowii</i>
Golden-winged Warbler	<i>Vermivora chrysoptera</i>

(f) Mammals

Common Name	Scientific Name
Little Brown Bat	<i>Myotis lucifugus</i>
Tri-colored Bat	<i>Perimyotis subflavus</i>

**Authority:** T.C.A. §§70-1-206, 70-8-104, 70-8-106 and 70-8-107. **Administrative History:**  
Original rule filed \_\_\_\_\_; effective \_\_\_\_\_.

New Rule

1660-01-32-.03, Wildlife In Need of Management List and Rules, is added as a new rule to read as follows:

(1) The following species or subspecies are listed as state wildlife in need of management

(a) Crayfish

Common Name	Scientific Name
Bottlebrush Crayfish	<i>Barbicambarus cornutus</i>
Short Mountain Crayfish	<i>Cambarus clivosus</i>
Prickly Cave Crayfish	<i>Cambarus hamulatus</i>

Spiny Scale Crayfish	<i>Cambarus jezerinaci</i>
Florence Crayfish	<i>Cambarus andersoni</i>
Alabama Crayfish	<i>Faxonius alabamensis</i>
Barren River Crayfish	<i>Faxonius barrenensis</i>
Cumberland Plateau Cave	<i>Orconectes barri</i>
Mammoth Cave Crayfish	<i>Orconectes pellucidus</i>

(b) Fish

<b>Common Name</b>	<b>Scientific Name</b>
Naked Sand Darter	<i>Ammocrypta beanii</i>
Scaly Sand Darter	<i>Ammocrypta vivax</i>
American Eel	<i>Anguilla rostrata</i>
Alligator Gar	<i>Atractosteus spatula</i>
Highfin Carpsucker	<i>Carpiodes velifer</i>
Tennessee Dace	<i>Chrosomus tennesseensis</i>
Rugby Dace	<i>Chrosomus sp 1</i>
Smoky Dace	<i>Clinostomus funduloides ssp. 1</i>
Emerald Darter	<i>Etheostoma baileyi</i>
Teardrop Darter	<i>Etheostoma barbouri</i>
Splendid Darter	<i>Etheostoma barrenense</i>
Orangefin Darter	<i>Etheostoma bellum</i>
Chickasaw Darter	<i>Etheostoma cervus</i>
Golden Darter	<i>Etheostoma denoncourti</i>
Redband Darter	<i>Etheostoma luteovinctum</i>
Smallscale Darter	<i>Etheostoma microlepidum</i>
Lollypop Darter	<i>Etheostoma neopterum</i>
Sooty Darter	<i>Etheostoma olivaceum</i>
Firebelly Darter	<i>Etheostoma pyrrhogaster</i>
Arrow Darter	<i>Etheostoma sagitta</i>
Tippecanoe Darter	<i>Etheostoma tippecanoe</i>
Tuscumbia Darter	<i>Etheostoma tuscumbia</i>
Wounded Darter	<i>Etheostoma vulneratum</i>
Golden Topminnow	<i>Fundulus chrysotus</i>
Flame Chub	<i>Hemitremia flammea</i>
Plains Minnow	<i>Hybognathus placitus</i>
Lined Chub	<i>Hybopsis lineapunctata</i>
Southern Brook Lamprey	<i>Ichthyomyzon gagei</i>
Silver Lamprey	<i>Ichthyomyzon unicuspis</i>
Sturgeon Chub	<i>Macrhybopsis gelida</i>
Sicklefin Chub	<i>Macrhybopsis meeki</i>
Rainbow Shiner	<i>Notropis chrosomus</i>
Bigmouth Shiner	<i>Notropis dorsalis</i>
Bedrock Shiner	<i>Notropis rupestris</i>
Piebald Madtom	<i>Noturus gladiator</i>
Tangerine Darter	<i>Percina aurantiaca</i>

Blotchside Logperch	<i>Percina burtoni</i>
Slenderhead Darter	<i>Percina phoxocephala</i>
Olive Darter	<i>Percina squamata</i>
Frecklebelly Darter	<i>Percina stictogaster</i>
Riffle Minnow	<i>Phenacobius catostomus</i>
Blackfin Sucker	<i>Thoburnia atripinnis</i>
Southern Cavefish	<i>Typhlichthys subterraneus</i>

(c) Amphibians

Common Name	Scientific Name
Cumberland Dusky Salamander	<i>Desmognathus abditus</i>
Seepage Salamander	<i>Desmognathus aeneus</i>
Black Mountain Salamander	<i>Desmognathus welteri</i>
Pygmy Salamander	<i>Desmognathus wrighti</i>
Junaluska Salamander	<i>Eurycea junaluska</i>
Four-toed Salamander	<i>Hemidactylium scutatum</i>
Wehrle's Salamander	<i>Plethodon wehrlei</i>
Weller's Salamander	<i>Plethodon welleri</i>

(d) Reptiles

Common Name	Scientific Name
Mississippi Green Water Snake	<i>Nerodia cyclopion</i>
Eastern Slender Glass Lizard	<i>Ophisaurus attenuatus longicaudus</i>
Coal Skink	<i>Plestiodon anthracinus</i>

(e) Birds

Common Name	Scientific Name
Golden Eagle	<i>Aquila chrysaetos</i>
Little Blue Heron	<i>Egretta caerulea</i>
Wood Thrush	<i>Hylocichla mustelina</i>
Least Bittern	<i>Ixobrychus exilis</i>
Loggerhead Shrike	<i>Lanius ludovicianus</i>
Swainson's Warbler	<i>Limnothlypis swainsonii</i>
Black-crowned Night-heron	<i>Nycticorax nycticorax</i>
King Rail	<i>Rallus elegans</i>
Cerulean Warbler	<i>Setophaga cerulea</i>
Bewick's Wren	<i>Thryomanes bewickii</i>

(f) Mammals

Common Name	Scientific Name
Star-nosed Mole	<i>Condylura cristata</i>
Rafinesque's Big-eared Bat	<i>Corynorhinus rafinesquii</i>
Southern Rock Vole	<i>Microtus chrotorrhinus carolinensis</i>

Eastern Small-footed Bat	<i>Myotis leibii</i>
Southern Appalachian Woodrat	<i>Neotoma floridana haematoreia</i>
Eastern Woodrat	<i>Neotoma floridana illinoensis</i>
Allegheny Woodrat	<i>Neotoma magister</i>
Hairy-tailed Mole	<i>Parascalops breweri</i>
Long-tailed Shrew	<i>Sorex dispar</i>
American Water Shrew	<i>Sorex palustris</i>
Southern Bog Lemming	<i>Synaptomys cooperi</i>

**Authority:** T.C.A. §§70-1-206, 70-8-104, 70-8-106 and 70-8-107. **Administrative History:** Original rule filed \_\_\_\_\_; effective \_\_\_\_\_.

\* If a roll-call vote was necessary, the vote by the Agency on these rulemaking hearing rules was as follows:

Board Member	Aye	No	Abstain	Absent	Signature (if required)
Chad Baker					
Angie Box					
Jeff Cook					
Bill Cox					
Dennis Gardner					
Kurt Holbert					
Connie King					
Brian McLerrin					
Tony Sanders					
James Stroud					
Bill Swan					
Kent Woods					
Jamie Woodson					

I certify that this is an accurate and complete copy of rulemaking hearing rules, lawfully promulgated and adopted by the Tennessee Fish & Wildlife Commission on 12/08/2017 (mm/dd/yyyy), and is in compliance with the provisions of T.C.A. § 4-5-222.

I further certify the following:

Notice of Rulemaking Hearing filed with the Department of State on: 10/06/2017

Rulemaking Hearing(s) Conducted on: (add more dates). 12/08/2017

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

Name of Officer: Ed Carter

Title of Officer: Executive Director

Subscribed and sworn to before me on: \_\_\_\_\_

Notary Public Signature: \_\_\_\_\_

My commission expires on: 03-10-2019

All rulemaking hearing rules provided for herein (Rule 1660-01-32, Rules and Regulation for In Need of Management, Threatened, and Endangered Species) have been examined by the Attorney General and Reporter of the State of Tennessee and are approved as to legality pursuant to the provisions of the Administrative Procedures Act, Tennessee Code Annotated, Title 4, Chapter 5.

\_\_\_\_\_  
Herbert H. Slatery III  
Attorney General and Reporter

\_\_\_\_\_  
Date

**Department of State Use Only**

Filed with the Department of State on: \_\_\_\_\_

Effective on: \_\_\_\_\_

\_\_\_\_\_  
Tre Hargett  
Secretary of State

## **Public Hearing Comments**

One copy of a document containing responses to comments made at the public hearing must accompany the filing pursuant to T.C.A § 4-5-222. Agencies shall include only their responses to public hearing comments, which can be summarized. No letters of inquiry from parties questioning the rule will be accepted. When no comments are received at the public hearing, the agency need only draft a memorandum stating such and include it with the Rulemaking Hearing Rule filing. Minutes of the meeting will not be accepted. Transcripts are not acceptable.

## **PUBLIC COMMENTS AND RESPONSES**

Comment: No written or verbal comments were received by the Commission.

Response: N/A



## Regulatory Flexibility Addendum

Pursuant to T.C.A. §§ 4-5-401 through 4-5-404, prior to initiating the rule making process, all agencies shall conduct a review of whether a proposed rule or rule affects small business.

(1) The type or types of small business and an identification and estimate of the number of small businesses subject to the proposed rule that would bear the cost of, and/or directly benefit from the proposed rule;

This rule would have minimal impact on small business. The impact to small business would in most instances occur during construction projects when any of the following permits are required Aquatic Resources Alteration Permit, General Construction Permit, National Pollution Discharge Elimination System Permit, or Injection Well Permit; a 404 Dredge and Fill Permit from the U.S. Army Corps of Engineers; or they are required to develop an Environmental Impact Statement or Environmental Assessment where impacts could occur to listed species. Any entity obtaining federal funds is also required to consult with state and federal wildlife agencies per the National Environmental Policy Act on species that could be impacted within the project area. Small business that would potentially be impacted would include construction, real estate, manufacturing, utilities, and mining. We estimate that less than 50 small businesses a year potentially could be impacted by this rule.

Small businesses that would directly benefit from this rule are consulting firms which are contracted by other business, local governments, or the state to complete surveys for In Need of Management, Threatened, or Endangered species that may occur within the boundaries of a project that could be impacted by that projects activities. We estimated that at least 15 small businesses annually could benefit from this rule.

(2) The projected reporting, recordkeeping and other administrative costs required for compliance with the proposed rule, including the type of professional skills necessary for preparation of the report or record;

This rule requires a skill set found in most wildlife consulting firms and carried out by a wildlife biologist. The skills include knowledge of species and subspecies habitats, surveying techniques for listed species, proper handling techniques of species in order to minimize stress, and the use of geographic information systems to map habitat. Also skills are needed to write necessary reports.

(3) A statement of the probable effect on impacted small businesses and consumers;

There will be minimal impact to small businesses and consumers. The cost of surveys and mitigations will typically be less than \$5,000 and will likely only impact business during construction or other activities that could impact threatened, endangered, and in need of management species habitat or directly impact individuals; and when any of the following permits are required Aquatic Resources Alteration Permit, General Construction Permit, National Pollution Discharge Elimination System Permit, or Injection Well Permit; a 404 Dredge and Fill Permit from the U.S. Army Corps of Engineers; or they are required to develop an Environmental Impact Statement or Environmental Assessment where impacts could occur to listed species. Any entity obtaining federal funds is also required to consult with state and federal wildlife agencies per the National Environmental Policy Act on species that could be impacted with in the project area

We expect minimal impact to consumers.

(4) A description of any less burdensome, less intrusive or less costly alternative methods of achieving the purpose and/or objectives of the proposed rule that may exist, and to what extent, such alternative means might be less burdensome to small business;

Due to the minimal cost associated with this rule we do not see any alternative methods that would reduce the burden on small businesses while still reducing impacts to those species listed in the rule.

(5) A comparison of the proposed rule with any federal or state counterparts; and

The Federal Endangered Species Act of 1973 makes it unlawful for a person to take a listed animal without a permit. Take defined in the federal endangered species act is defined as to harass, harm, pursue, hunt, shoot wound, kill trap, capture, or collect or attempt to engage in any such activity. The act makes it unlawful to significantly modify habitat or degrade habitat where it actually kills or injures listed wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. The federal law allows

landowners, citizens, corporations, and states take through section 10 permits. Current Tennessee T.C.A. makes it unlawful for take of state listed species. This rule like the federal section 10 permits will allow small business, corporations, local government to continue projects while working to minimize impacts to species listed in the rule.

(6) Analysis of the effect of the possible exemption of small businesses from all or any part of the requirements contained in the proposed rule.

Due to the number of different small businesses that may have impact on state listed in need of management, threatened, and endangered species it would be very difficult to exempt small business from all or part of the rule. Exempting small businesses would still mean that they would be required to meet federal endangered species act requirements in many parts of Tennessee. It would also be difficult to exempt some business due to both state and federal law requirements for taking into consideration listed species during the permitting process.

### **Impact on Local Governments**

Pursuant to T.C.A. §§ 4-5-220 and 4-5-228 “any rule proposed to be promulgated shall state in a simple declarative sentence, without additional comments on the merits of the policy of the rules or regulation, whether the rule or regulation may have a projected impact on local governments.” (See Public Chapter Number 1070 (<http://state.tn.us/sos/acts/106/pub/pc1070.pdf>) of the 2010 Session of the General Assembly)

Will passage of this rule have a projected financial impact on local governments?

The Commission is aware that the passage of this rule could have a small financial impact on local government.

Please describe the increase in expenditures or decrease in revenues:

The increase in expenditures is in relations to performing surveys and mitigation of listed species in relation to those that may occur within a proposed construction projects footprint. It is not expected that there will be a decrease in revenues as this rule mainly effects projects during construction. Once a project is completed and efforts are made to reduce or mitigate impacts on listed species it is not expected that the entity will be further impacted by this rule.

### **Additional Information Required by Joint Government Operations Committee**

All agencies, upon filing a rule, must also submit the following pursuant to T.C.A. § 4-5-226(i)(1).

- (A)** A brief summary of the rule and a description of all relevant changes in previous regulations effectuated by such rule;

The rule lists threatened, endangered, and in need of management species or subspecies indigenous to Tennessee. The only changes to previous regulations which were set out in Tennessee Wildlife Resources Agency proclamations 00-14 and 00-15 were changes in the species or subspecies listed.

- (B)** A citation to and brief description of any federal law or regulation or any state law or regulation mandating promulgation of such rule or establishing guidelines relevant thereto;

T.C.A. §70-8-104 Nongame species Promulgation of regulations prohibited acts (a) states that the executive director shall conduct investigation on nongame wildlife in order to determine management measures necessary for their continued ability to sustain themselves successfully. On the basis of this information the fish and wildlife commission shall issue regulations and development management programs to ensure the continued ability of nongame, endangered, or threatened wildlife. Such regulations shall set forth species or subspecies of nongame wildlife that the executive director deems in need of management. T.C.A. 70-8-105 Endangered or threatened species list on the basis of investigation on nongame wildlife in 70-8-104, and other scientific data and after consultation with other agencies and organizations the fish and wildlife commission shall by regulation propose a list of species or subspecies indigenous to the state that are determined to be endangered or threatened. The commission shall conduct a review of the state list no more than two years form effective date and every two years after. In the event the United States' List of Endangered Native fish and Wildlife is modified subsequent to 1974 the commission may accept such modification for the state. T.C.A. 70-8-107 Rule making authority, The fish and wildlife commission shall issue regulations as necessary to carry out the purposed of 70-8.

- (C) Identification of persons, organizations, corporations or governmental entities most directly affected by this rule, and whether those persons, organizations, corporations or governmental entities urge adoption or rejection of this rule;

This rule will have a direct impact on any entity required to obtain Aquatic Resources Alteration Permit, General Construction Permit, National Pollution Discharge Elimination System Permit, or Injection Well Permit from TDEC, obtain a 404 Dredge and Fill Permit from the U.S. Army Corps of Engineers, or required to develop an Environmental Impact Statement or Environmental Assessment where impacts could occur to listed species. Any entity obtaining federal funds is also required to consult with state and federal wildlife agencies per the National Environmental Policy Act on species that could be impacted with in the project area. Due to both State and Federal law requiring consultation on listed species this rule would be supported by those entities affected as it clarifies protected species and dealing with impacts to those species and allows permitting to meet state and federal law. Tennessee Wildlife Resources Agency will be directly impacted by this rule as it is required by law to working with entities to mitigate impacts to listed species. TWRA urges the adoption of the rule as it defines listed species and allows for mitigation.

- (D) Identification of any opinions of the attorney general and reporter or any judicial ruling that directly relates to the rule or the necessity to promulgate the rule;

We are not aware of any opinions of the attorney general or any judicial ruling that directly relate to this rule.

- (E) An estimate of the probable increase or decrease in state and local government revenues and expenditures, if any, resulting from the promulgation of this rule, and assumptions and reasoning upon which the estimate is based. An agency shall not state that the fiscal impact is minimal if the fiscal impact is more than two percent (2%) of the agency's annual budget or five hundred thousand dollars (\$500,000), whichever is less;

The impact to state government revenues and expenditures is minimal as cost to contract surveys and to mitigate impacts is typically <\$5,000 as related to state listed species. There will be no increase in revenue from this rule.

- (F) Identification of the appropriate agency representative or representatives, possessing substantial knowledge and understanding of the rule;

Andrea English, Assistant Chief of Biodiversity ([Pandy.English@tn.gov](mailto:Pandy.English@tn.gov)); Brian Flock, Wildlife Diversity Coordinator, ([brian.flock@tn.gov](mailto:brian.flock@tn.gov))

- (G) Identification of the appropriate agency representative or representatives who will explain the rule at a scheduled meeting of the committees;

Chris Richardson, TWRA Special Assistant to the Director/Policy and Legislation, will explain the rule at the scheduled meeting of the Government Operations Committee.

- (H) Office address, telephone number, and email address of the agency representative or representatives who will explain the rule at a scheduled meeting of the committees; and

Chris Richardson, Tennessee Wildlife Resources Agency, P.O. Box 40747, Nashville, TN 37204, (615) 837-6016, [Chris.Richardson@tn.gov](mailto:Chris.Richardson@tn.gov)

- (I) Any additional information relevant to the rule proposed for continuation that the committee requests.

n/a

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**BIOLOGICAL ASSESSMENT**

**THE NASHVILLE CRAYFISH (*Orconectes shoupi*)**

**Concourse and Gate Expansion (CAGE)**

**Metro Nashville Airport Authority  
Nashville International Airport  
Davidson County, Tennessee**

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*Prepared for:*

**Metro Nashville Airport Authority  
Nashville, TN**

**Garver, LLC  
Franklin, TN**

*Prepared by:*

**wood.**

**Wood Environment & Infrastructure Solutions, Inc.  
3800 Ezell Road, Suite 100  
Nashville, TN 37211**

**Wood Project Number: 7650-19-1222**

**February 2020**

*This document was prepared by Wood Environment & Infrastructure Solutions, Inc. in support of the Concourse and Gate Expansion Environmental Assessment at the Nashville International Airport being conducted by Garver, LLC for the Metro Nashville Airport Authority.*



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## FEDERALLY LISTED SPECIES

Wood Environment & Infrastructure Solutions, Inc. (Wood) has prepared this Biological Assessment to address the potential impact to the federally listed endangered Nashville Crayfish (*Orconectes shoupi*) from the Concourse and Gate Expansion (CAGE) project at Nashville International Airport. The Nashville Crayfish is known to occur in Mill Creek and its tributaries. Sims Branch is a direct tributary to Mill Creek (Figure 1). Even though the Nashville Crayfish was not found during the site visit on September 30, 2019 (and other previous surveys conducted within the airport property), it has been documented to occur further downstream in Sims Branch and Mill Creek and could be affected by construction activities.

## PROJECT DESCRIPTION

Sims Branch originates on the airport property and empties directly into Mill Creek. The construction associated with CAGE will include impacts to Sims Branch and the surrounding upland areas. The project area includes previously developed and undeveloped areas of the airport property. In-stream construction is anticipated.

## SITE DESCRIPTION

The project site was visited on September 30, 2019. The area adjacent to the stream ranges from existing paved surfaces, mowed and maintained undeveloped property, and wooded areas with a mix of herbaceous vegetation (see Photographs 1 through 7). The herbaceous vegetation generally includes mowed grasses. The wooded species bordering the stream were primarily box elder (*Acer negundo*), sycamore (*Platanus occidentalis*), black willow (*Salix nigra*), and cottonwood (*Populus deltoides*). Shrub species included Chinese privet (*Ligustrum sinense*) and bush honeysuckle (*Lonicera maackii*).

Sims Branch and one unnamed tributary to Sims Branch originates near the north central portion of the airport. Sims Branch generally flows north for approximately 1 mile before exiting the airport property at a culvert located at I-40. From that point, Sims Branch flows approximately 1.85 miles northwest to its confluence with Mill Creek. The unnamed tributary originates near Terminal Drive, east of Sims Branch, and flows approximately 0.25 miles to its confluence with Sims Branch.

When visited on September 30, 2019 there was water present throughout the entire length of Sims Branch (Photographs 1-3, 5-7). The perennial stream was approximately 2 feet wide and had a flow depth of approximately 3-8 inches at the upper most sample location. The stream widens to approximately 20 feet and a depth of 6-16 inches near the northern most sample location. The stream consisted of a soil and gravel substrate in the upper reaches to bedrock, gravel, and cobble sized substrate mixed with sand and silt in the lower reaches. Various fish were present during our assessment. The unnamed tributary was approximately 1 foot wide and generally dry channel at the upper most reach near Terminal Drive. The stream widens to approximately 10 feet and with intermittent pools until its confluence with Sims Branch. The intermittent stream consisted of a soil and gravel substrate in the upper reaches to bedrock, gravel, and cobble sized substrate mixed with sand and silt in the lower reaches.

## NASHVILLE CRAYFISH (*Orconectes shoupi*)

### STATUS

Endangered throughout its range: U.S.A. (TN) (51 FR 34412, September 26, 1986). Recovery Plan completed in 1988 (Nashville Crayfish Recovery Plan). This species was recently proposed for delisting on November 26, 2019, pending public comment and further review after publishing in the Federal Register.

### Species Description

This pigmented crayfish with well-developed eyes ranges from 1/4 to 7 inches in total length. Like many crayfish, this species probably feeds on a variety of organic material, both vegetation fragments and animal matter (USFWS 1988).



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The crayfish is a good benthic walker and a good swimmer. The Nashville crayfish is most active in the summer. The crayfish's activity level is low in the winter, but it does move about under ice (Nature Serve Explorer 2002).

### **Reproduction and Development**

Reproductive activity begins in spring and egg-laying probably occurs in late winter and early spring (Nature Serve Explorer 2002 and USFWS 1988). Females with eggs and young are found in the spring when they are secluded under large objects (rocks, pieces of metal, and other debris) along the stream banks (USFWS 1988). Females brood eggs below the abdomen. Young are released early in the summer (Nature Serve Explorer 2002).

### **Range and Population Level**

The Nashville crayfish is currently known only from Mill Creek and six of its tributaries in Davidson and Williamson Counties, Tennessee (O'Bara et al. 1985, Bouchard 1984). The crayfish continues to exist in six Mill Creek tributaries: Sevenmile Creek, Sims Branch, Whittemore Branch, Indian Creek, Owl Creek, and Edmonson Branch. All tributary populations except Sevenmile Creek are concentrated near the creek mouths (O'Bara et al. 1985, Bouchard 1984).

### **Habitat**

The Nashville crayfish has been observed to inhabit pools and riffle areas with moderate current (USFWS 1986). The substrate of the animal's main habitat, Mill Creek, is mainly bedrock which is covered in some areas with gravel and scattered limestone slabs. The pools, backwater areas, and stream margins are covered with silt and sand. Riverweed (*Podostemum sp.*) occurs on rocks in some swift water areas, and water willow (*Justicia sp.*) occurs along some shallow gravel shoals. Much of the stream bank is vegetated with trees and shrubs (Bouchard 1976).

The Nashville crayfish has been found in a wide range of environments including gravel and cobble runs, pools with up to 10 centimeters (cm) of settled sediment, and under slabrocks and other cover (the largest crayfish are usually under cover) (USFWS 1988). The species is highly photosensitive and is usually found under cover during the day (Bouchard 1976). Canopy cover appears important, as O'Bara et al. (1985) reported that all sites they sampled had canopy cover of 60 to 90 percent. The species has been found in small pools where the flow was intermittent (Stark 1986, Miller and Hartfield 1985). Gravel-cobble substrate provides good cover for juveniles (Stark 1986, Miller and Hartfield 1985). Females seek out large slabrocks when they are carrying eggs and young. These secluded places are also needed for molting (USFWS 1988).

The animal's need for clean, high quality water is strongly indicated, despite the fact that it can exist (no data on how long) in polluted-by-silt situations (Nature Serve Explorer 2002). The Nashville crayfish requires non-turbid, well-oxygenated water and clean substrate. However, the species does appear to be more tolerant of short-term, less favorable conditions than originally believed.

### **Past Threats**

The species is threatened by siltation, stream alterations, urban runoff, and general water quality deterioration resulting from development pressures in the urbanized areas surrounding Nashville, Tennessee. The species is endangered by water quality and other habitat deterioration from development within the watershed. The U.S. Department of the Army, Corps of Engineers (COE) concluded in 1981 that the uppermost segment of Mill Creek was degraded by organic enrichment and had very poor water quality (USFWS 1986).

The Nashville crayfish's restricted range makes it vulnerable to a single catastrophic event, such as a chemical spill. COE (1984) reported that occasional spills and discharges have occurred along Mill Creek in the past (USFWS 1986).

Nashville International Airport experienced a de-icer spill in 2010 that impacted much of Sims Branch. Biological monitoring has been conducted by MNAA since 2010. Nashville crayfish have not previously been documented during these monitoring events or other subsequent crayfish sampling conducted by Wood.



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## Current Threats

The Nashville crayfish is endangered by water quality deterioration from development within the watershed. The Nashville crayfish's restricted range continues to make it vulnerable to spill that could affect a large portion of its range.

Much of the Mill Creek system is within the Nashville City limits and water quality degradation in this area does not appear to have reduced the range of the Nashville crayfish. Continued growth and development in northeast Williamson County, and the potential impacts to the upper portion of the Mill Creek watershed also provide a potential source of impacts to this species.

Threats to the species could also come from other activities in the watershed such as road and bridge construction, stream channel modifications, impoundments, land use changes and other projects, if such activities are not planned and implemented with the survival of this geographically restricted species in mind (USFWS 1986).

Crayfish are frequently taken in the southeastern United States for food or bait. Over-utilization for these purposes could become a problem if the species' specific habitat were identified to the extent required for designation of critical habitat (USFWS 1986).

## METHODS

The Nashville Crayfish was not collected during the field survey conducted on September 30, 2019; however, due to the proposed construction location being located directly on Sims Branch, impacts to areas downstream and within Mill Creek could occur and may be affected by construction activities. Protection of the site should include protection of the riparian zone, sediment control and bank stabilization in the construction area. Again, even though not found on September 30, 2019, the permitting agencies may require that crayfish be collected and relocated just before and during construction. Seven locations were sampled during this assessment (Figure 2). Crayfish sampling data sheets are located in Appendix A. The Nashville Crayfish was not collected at any of the seven sampling locations.

## IMPACT MINIMIZATION

The proposed construction activity is to be completed in conjunction with approved BMP's to protect the stream channel. Detailed construction plans are not available at this time; however, specific notes will be placed on the project plans to give attention to erosion and sediment control measures. Stream buffer requirement may also apply. In addition to sediment and erosion control measures, if stipulated by the permitting agencies, biologists will collect all crayfish in the vicinity of the proposed stream impacts just prior to and during construction activities. All crayfish will be documented and transported a minimum of 150 feet upstream of construction activities. All activities will be coordinated and approved by the USFWS.

## SUMMARY

The Nashville Crayfish do not appear to occur in the project area in the Sims Branch or the unnamed tributary to Sims Branch. Nevertheless, the construction activities may affect the populations of Nashville crayfish present in the lower reaches of Sims Branch and in Mill Creek. If required by the permitting agency all crayfish will be relocated prior to construction. Approved sediment and erosion control methods will be used in the construction zone to minimize impacts. A biologist familiar with the Nashville Crayfish, and holding valid state and federal permits, will coordinate the relocation activities. All activities will be coordinated with the U. S. Fish and Wildlife Service.





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## REFERENCES

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- Stark, G. J. 1986. Microhabitat use by the crayfish community of the Mill Creek Basin. Thesis, Tennessee Technological University, Cookeville, TN. 44 pp.
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- U.S. Fish and Wildlife Service. 1986. Endangered and threatened wildlife and plants; determination of endangered status for the Nashville crayfish. 51 Federal Register 34412.
- U.S. Fish and Wildlife Service. 1988. Nashville crayfish Recovery Plan (1st revision). U.S. Fish and Wildlife Service, Atlanta, Georgia. 16 pp.



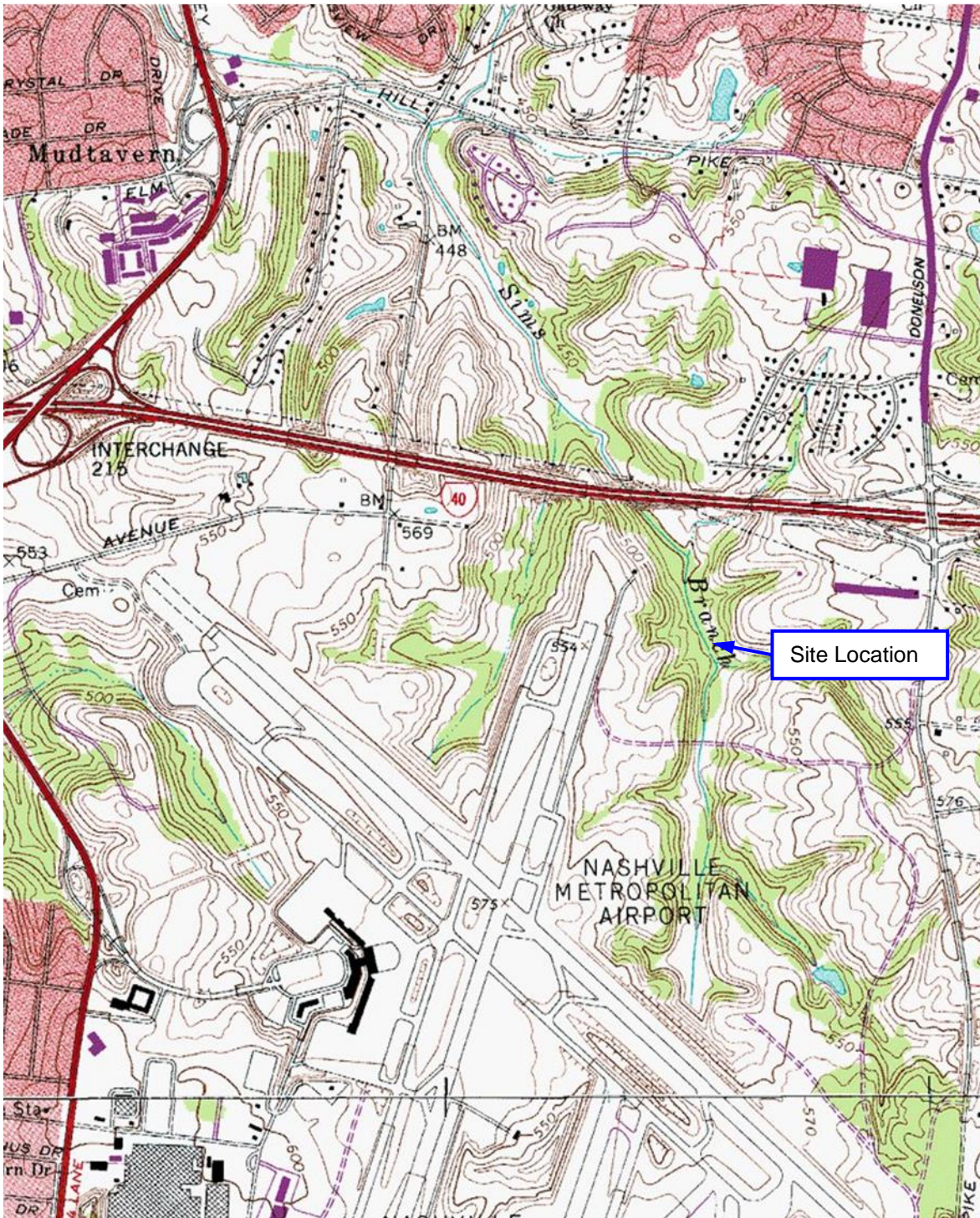


Figure 1. Approximate Site Location Project No. 7650-19-1222, Nashville International Airport, Davidson County, Tennessee





Figure 2. Approximate Crayfish Sampling Locations Project No. 7650-19-1222, Nashville International Airport, Davidson County, Tennessee





Photo 1. Sims Branch, Location 1, facing upstream (south).



Photo 2. Sims Branch, Location 2, facing upstream (south).





Photo 3. Sims Branch, Location 3, facing downstream (north).



Photo 4. Sims Branch, Location 4, facing downstream (northeast).





Photo 5. Unnamed tributary to Sims Branch, Location 5, facing upstream (east).



Photo 6. Sims Branch, Location 6, facing upstream (south).





Photo 7. Sims Branch, Location 7, facing downstream (northwest).



**APPENDIX A**  
**Crayfish Field Data Sheets**



**CRAYFISH FIELD DATA SHEET**

**wood.**

DATE: 9/30/19  
 SITE NAME: BNA - Additional Gates  
 PROJECT NUMBER: 7650-19-1222  
 SAMPLING CREW: Rudzinski, Glover  
 PURPOSE FOR SITE VISIT (Circle One):  SURVEY  RELOCATION

CONSTRUCTION ACTIVITIES PLANNED (i.e., Road Crossing):  
Airport Expansion

SITE DESCRIPTION (i.e., Land Use):  
Airport property

STREAM DESCRIPTION:  
Sims Branch Location 1  
  
36.130986, -86.675212

SPECIES	QUANTITY	TOTAL PER SPECIES
1.) <i>Orconectes duelli</i>	1	1
2.) <i>Cambanus striatus</i>	1	1
3.)		
4.)		
5.)		
6.)		

Form Completed By <u>SBR</u>	Form Checked By <u>FSG</u>	TOTAL COLLECTED	<u>2</u>
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**CRAYFISH FIELD DATA SHEET**

**wood.**

DATE: 9/30/19  
 SITE NAME: BNA - Additional Gates  
 PROJECT NUMBER: 7650-19-1222  
 SAMPLING CREW: Rudzinski, Glover

PURPOSE FOR SITE VISIT (Circle One):  SURVEY  RELOCATION

CONSTRUCTION ACTIVITIES PLANNED (i.e., Road Crossing):  
Airport Expansion

SITE DESCRIPTION (i.e., Land Use):  
Airport Property

STREAM DESCRIPTION:  
Sims Branch near T2 Location 2

36.133375, - 86.674953

SPECIES	QUANTITY	TOTAL PER SPECIES
1.) <i>Cambarus striatus</i>	11	11
2.) <i>Orcopectes duelli</i>	10	10
3.)		
4.)		
5.)		
6.)		

Form Completed By <u>SBR</u>	Form Checked By <u>FSG</u>	TOTAL COLLECTED <u>21</u>
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**CRAYFISH FIELD DATA SHEET**

**wood.**

DATE: 9/30/19  
 SITE NAME: BNA - Additional Gates  
 PROJECT NUMBER: 7650-19-1222  
 SAMPLING CREW: Rudzinski, Alver

PURPOSE FOR SITE VISIT (Circle One): SURVEY RELOCATION

CONSTRUCTION ACTIVITIES PLANNED (i.e., Road Crossing):

Airport Expansion

SITE DESCRIPTION (i.e., Land Use):

Airport Property

STREAM DESCRIPTION:

Sims Branch

Location 3

36.136414, -86.674377

SPECIES	QUANTITY	TOTAL PER SPECIES
1.) <u>Orconectes duelli</u>	<u>10</u>	<u>10</u>
2.) <u>Cambarus striatus</u>	<u>4</u>	<u>4</u>
3.)		
4.)		
5.)		
6.)		
Form Completed By <u>SBR</u>	Form Checked By <u>FSG</u>	TOTAL COLLECTED <u>14</u>

**CRAYFISH FIELD DATA SHEET**

**wood.**

DATE: 9/30/19  
 SITE NAME: BNA - Additional Gates  
 PROJECT NUMBER: 7650-19-1222  
 SAMPLING CREW: Radeinski, Glover

PURPOSE FOR SITE VISIT (Circle One):  SURVEY  RELOCATION

CONSTRUCTION ACTIVITIES PLANNED (i.e., Road Crossing):  
Airport Expansion

SITE DESCRIPTION (i.e., Land Use):  
Airport Property

STREAM DESCRIPTION:  
Sine Branch Location 4

36.137262, -86.674045

SPECIES	QUANTITY	TOTAL PER SPECIES
1.) <i>Orconectes dumalli</i>	13	13
2.)		
3.)		
4.)		
5.)		
6.)		

Form Completed By <u>SBR</u>	Form Checked By <u>FSG</u>	TOTAL COLLECTED	<u>13</u>
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**CRAYFISH FIELD DATA SHEET**

**wood.**

DATE: 9/30/19  
 SITE NAME: BNA - Additional Gates  
 PROJECT NUMBER: 7650-19-1222  
 SAMPLING CREW: Rudzinski, Glover  
 PURPOSE FOR SITE VISIT (Circle One):  SURVEY  RELOCATION

CONSTRUCTION ACTIVITIES PLANNED (i.e., Road Crossing):  
Airport Expansion

SITE DESCRIPTION (i.e., Land Use):  
Airport Property

STREAM DESCRIPTION:  
Unnamed Tributary to Sims Branch Location 5  
36.137116, -86.673360

SPECIES	QUANTITY	TOTAL PER SPECIES
1.) <i>Camborus striatus</i>	3	3
2.) <i>Orconectes dorelli</i>	1	1
3.)		
4.)		
5.)		
6.)		

Form Completed By <u>SBR</u>	Form Checked By <u>FSG</u>	TOTAL COLLECTED	<u>4</u>
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**CRAYFISH FIELD DATA SHEET**

**wood.**

DATE: 9/30/19  
 SITE NAME: BNR - Addition of Gates  
 PROJECT NUMBER: 7650-19-1222  
 SAMPLING CREW: Rudzinski, Glover  
 PURPOSE FOR SITE VISIT (Circle One):  SURVEY  RELOCATION

CONSTRUCTION ACTIVITIES PLANNED (i.e., Road Crossing):  
Airport Property - Airport Expansion

SITE DESCRIPTION (i.e., Land Use):  
Airport Property

STREAM DESCRIPTION:  
Sims Branch Location 6  
  
36.139059, -86.674779

SPECIES	QUANTITY	TOTAL PER SPECIES
1.) <i>Oreconectes dorelli</i>	8	8
2.) <i>Cambarus striatus</i>	4	4
3.)		
4.)		
5.)		
6.)		

Form Completed By <u>SBR</u>	Form Checked By <u>FSG</u>	TOTAL COLLECTED <u>12</u>
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**CRAYFISH FIELD DATA SHEET**

**wood.**

DATE: 9/30/19  
 SITE NAME: BNA - Additional Gates  
 PROJECT NUMBER: 7650-19-1222  
 SAMPLING CREW: Rudevicki, Alaver  
 PURPOSE FOR SITE VISIT (Circle One):  SURVEY  RELOCATION

CONSTRUCTION ACTIVITIES PLANNED (i.e., Road Crossing):  
Airport Expansion

SITE DESCRIPTION (i.e., Land Use):  
Airport Property

STREAM DESCRIPTION:  
Sims Branch just south of I-40      Location 7  
  
36.140395, -86.675300

SPECIES	QUANTITY	TOTAL PER SPECIES
1.) <u>Orconectes diwelli</u>	<u>25</u>	<u>25</u>
2.)		
3.)		
4.)		
5.)		
6.)		

Form Completed By <u>SBR</u>	Form Checked By <u>FSG</u>	TOTAL COLLECTED	<u>25</u>
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# Tennessee Department of Environment & Conservation

## Rare Species (Listed by Watershed)

Huc 12	Huc 12 Name	Type	Category	Scientific Name	Common Name	Global Rank	State Rank	Fed Status	State Status	Habitat Description	Wet Habitat Flag
051302020102	Mill Creek Lower	Vascular Plant	Flowering Plant	<u><a href="#">Phemeranthus calcaricus</a></u>	Limestone Fame-flower	G3	S3	--	S	Glades	Upland
051302020102	Mill Creek Lower	Invertebrate Animal	Planarian	<u><a href="#">Sphalloplana buchanani</a></u>	A Cave Obligate Planarian	G1G2	S1	--	Rare, Not State Listed	Aquatic cave obligate; northern Central Basin; Davidson County; taxonomy poorly understood.	Aquatic
051302020102	Mill Creek Lower	Vascular Plant	Flowering Plant	<u><a href="#">Stellaria fontinalis</a></u>	Water Stitchwort	G3	S3	--	S	Seeps And Limestone Creek Beds	Possible
051302020102	Mill Creek Lower	Animal Assemblage	-	<u><a href="#">Rookery</a></u>	Heron Rookery	G5	SNR	--	Rare, Not State Listed	-	-
051302020102	Mill Creek Lower	Invertebrate Animal	Crustacean	<u><a href="#">Faxonius shoupi</a></u>	Nashville Crayfish	G1G2	S1S2	LE	E	1st-order & larger streams, generally with bedrock bottom, under slabrock; endemic to Mill Creek watershed; Davidson & William. cos.	Aquatic
051302020102	Mill Creek Lower	Vascular Plant	Flowering Plant	<u><a href="#">Panax quinquefolius</a></u>	American Ginseng	G3G4	S3S4	--	S-CE	Rich Woods	Possible

This list was populated using the TDEC Rare Species Dataviewer - [http://environment-online.state.tn.us:8080/pls/enf\\_reports/f?p=9014:3](http://environment-online.state.tn.us:8080/pls/enf_reports/f?p=9014:3)



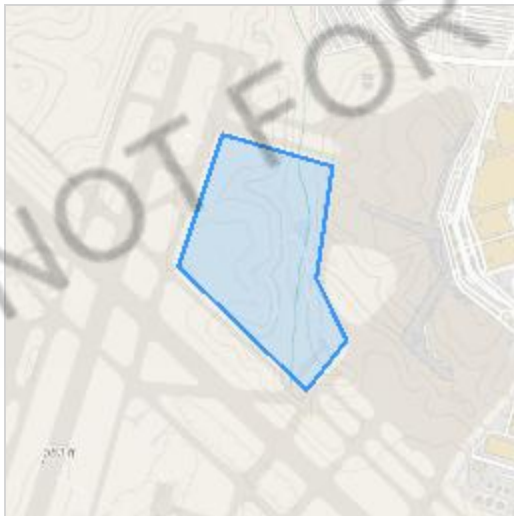
# IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

## Location

Davidson County, Tennessee



## Local office

Tennessee Ecological Services Field Office

☎ (931) 528-6481

📠 (931) 528-7075

446 Neal Street  
Cookeville, TN 38501-4027

NOT FOR CONSULTATION

# Endangered species

**This resource list is for informational purposes only and does not constitute an analysis of project level impacts.**

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species<sup>1</sup> and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries<sup>2</sup>).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

- 
1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

## Mammals

NAME	STATUS
<p><b>Gray Bat</b> <i>Myotis grisescens</i> Wherever found No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/6329">https://ecos.fws.gov/ecp/species/6329</a></p>	Endangered
<p><b>Northern Long-eared Bat</b> <i>Myotis septentrionalis</i> Wherever found This species only needs to be considered if the following condition applies:</p> <ul style="list-style-type: none"> <li>This species only needs to be considered if the project includes wind turbine operations.</li> </ul> <p>No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a></p>	Endangered
<p><b>Tricolored Bat</b> <i>Perimyotis subflavus</i> Wherever found No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/10515">https://ecos.fws.gov/ecp/species/10515</a></p>	Proposed Endangered

## Birds

NAME	STATUS
<p><b>Whooping Crane</b> <i>Grus americana</i> No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/758">https://ecos.fws.gov/ecp/species/758</a></p>	<a href="#">EXPN</a>

## Insects

NAME	STATUS
<p><b>Monarch Butterfly</b> <i>Danaus plexippus</i> Wherever found No critical habitat has been designated for this species. <a href="https://ecos.fws.gov/ecp/species/9743">https://ecos.fws.gov/ecp/species/9743</a></p>	Candidate

## Crustaceans

NAME	STATUS
<p>Nashville Crayfish <i>Orconectes shoupi</i></p> <p>Wherever found</p> <p>No critical habitat has been designated for this species.  <a href="https://ecos.fws.gov/ecp/species/7181">https://ecos.fws.gov/ecp/species/7181</a></p>	Endangered

## Flowering Plants

NAME	STATUS
<p>Braun's Rock-cress <i>Arabis perstellata</i></p> <p>Wherever found</p> <p>There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat.  <a href="https://ecos.fws.gov/ecp/species/4704">https://ecos.fws.gov/ecp/species/4704</a></p>	Endangered
<p>Guthrie's (=pyne's) Ground-plum <i>Astragalus bibullatus</i></p> <p>Wherever found</p> <p>No critical habitat has been designated for this species.  <a href="https://ecos.fws.gov/ecp/species/1739">https://ecos.fws.gov/ecp/species/1739</a></p>	Endangered
<p>Leafy Prairie-clover <i>Dalea foliosa</i></p> <p>No critical habitat has been designated for this species.  <a href="https://ecos.fws.gov/ecp/species/5498">https://ecos.fws.gov/ecp/species/5498</a></p>	Endangered
<p>Price's Potato-bean <i>Apios priceana</i></p> <p>No critical habitat has been designated for this species.  <a href="https://ecos.fws.gov/ecp/species/7422">https://ecos.fws.gov/ecp/species/7422</a></p>	Threatened
<p>Short's Bladderpod <i>Physaria globosa</i></p> <p>Wherever found</p> <p>There is <b>final</b> critical habitat for this species. Your location does not overlap the critical habitat.  <a href="https://ecos.fws.gov/ecp/species/7206">https://ecos.fws.gov/ecp/species/7206</a></p>	Endangered

## Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

## Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act<sup>1</sup> and the Migratory Bird Treaty Act<sup>2</sup>.

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats<sup>3</sup>, should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below.

Specifically, please review the ["Supplemental Information on Migratory Birds and Eagles"](#).

Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

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

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON

**Bald Eagle** *Haliaeetus leucocephalus*

Breeds Sep 1 to Jul 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

<https://ecos.fws.gov/ecp/species/1626>

## Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read ["Supplemental Information on Migratory Birds and Eagles"](#), specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

### Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is  $0.25/0.25 = 1$ ; at week 20 it is  $0.05/0.25 = 0.2$ .
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

### Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

### Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

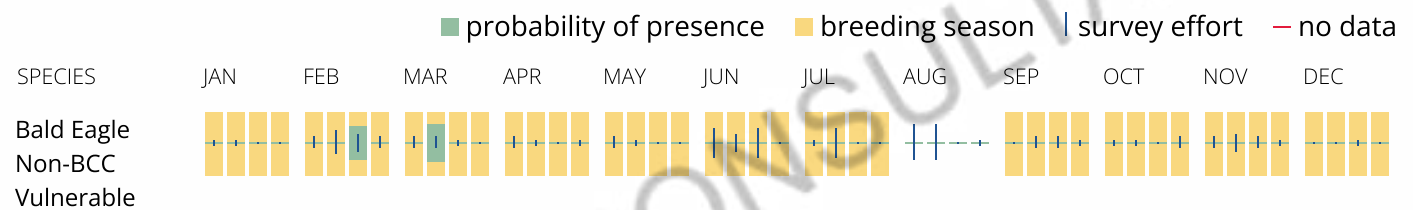
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

### No Data (—)

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

### Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



### What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply). To see a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

### What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.



Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

### What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the [Eagle Act](#) should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

## Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

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

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern \(BCC\)](#) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your

list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
<p><b>Bald Eagle</b> <i>Haliaeetus leucocephalus</i></p> <p>This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.</p> <p><a href="https://ecos.fws.gov/ecp/species/1626">https://ecos.fws.gov/ecp/species/1626</a></p>	Breeds Sep 1 to Jul 31
<p><b>Black-billed Cuckoo</b> <i>Coccyzus erythrophthalmus</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> <p><a href="https://ecos.fws.gov/ecp/species/9399">https://ecos.fws.gov/ecp/species/9399</a></p>	Breeds May 15 to Oct 10
<p><b>Bobolink</b> <i>Dolichonyx oryzivorus</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds May 20 to Jul 31
<p><b>Cerulean Warbler</b> <i>Setophaga cerulea</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> <p><a href="https://ecos.fws.gov/ecp/species/2974">https://ecos.fws.gov/ecp/species/2974</a></p>	Breeds Apr 23 to Jul 20
<p><b>Chimney Swift</b> <i>Chaetura pelagica</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds Mar 15 to Aug 25
<p><b>Field Sparrow</b> <i>Spizella pusilla</i></p> <p>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA</p>	Breeds Mar 1 to Aug 15
<p><b>Kentucky Warbler</b> <i>Geothlypis formosa</i></p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p>	Breeds Apr 20 to Aug 20

**Lesser Yellowlegs** *Tringa flavipes*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9679>

Breeds elsewhere

**Prairie Warbler** *Setophaga discolor*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 1 to Jul 31

**Prothonotary Warbler** *Protonotaria citrea*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds Apr 1 to Jul 31

**Rusty Blackbird** *Euphagus carolinus*

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Breeds elsewhere

**Wood Thrush** *Hyllocichla mustelina*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 10 to Aug 31

## Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read ["Supplemental Information on Migratory Birds and Eagles"](#), specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

### Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted

Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

- To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is  $0.25/0.25 = 1$ ; at week 20 it is  $0.05/0.25 = 0.2$ .
- The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

### Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

### Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

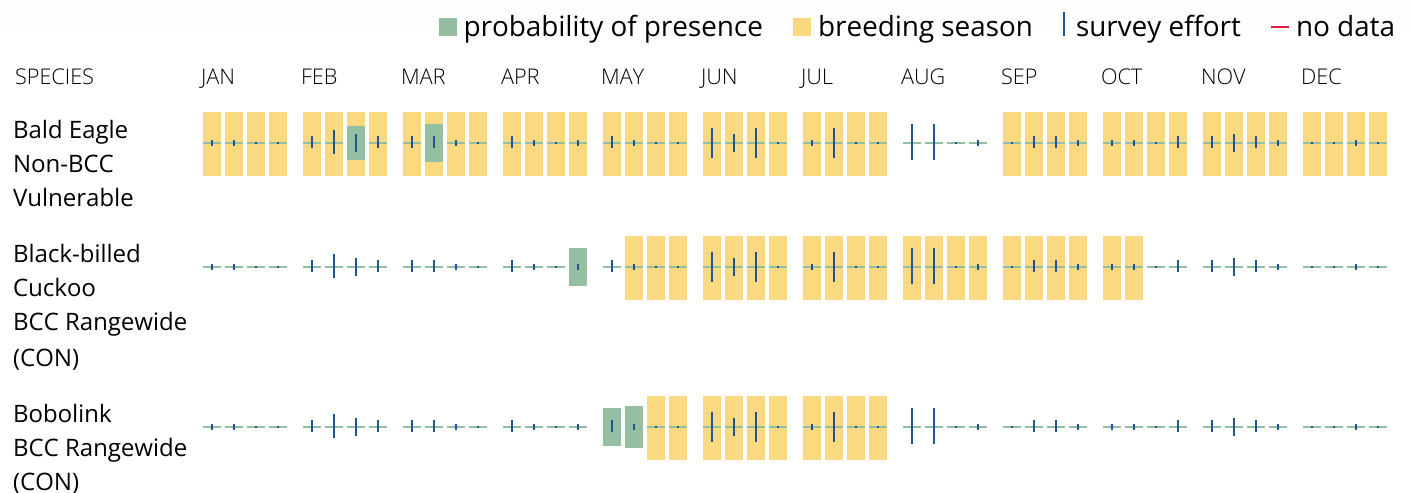
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

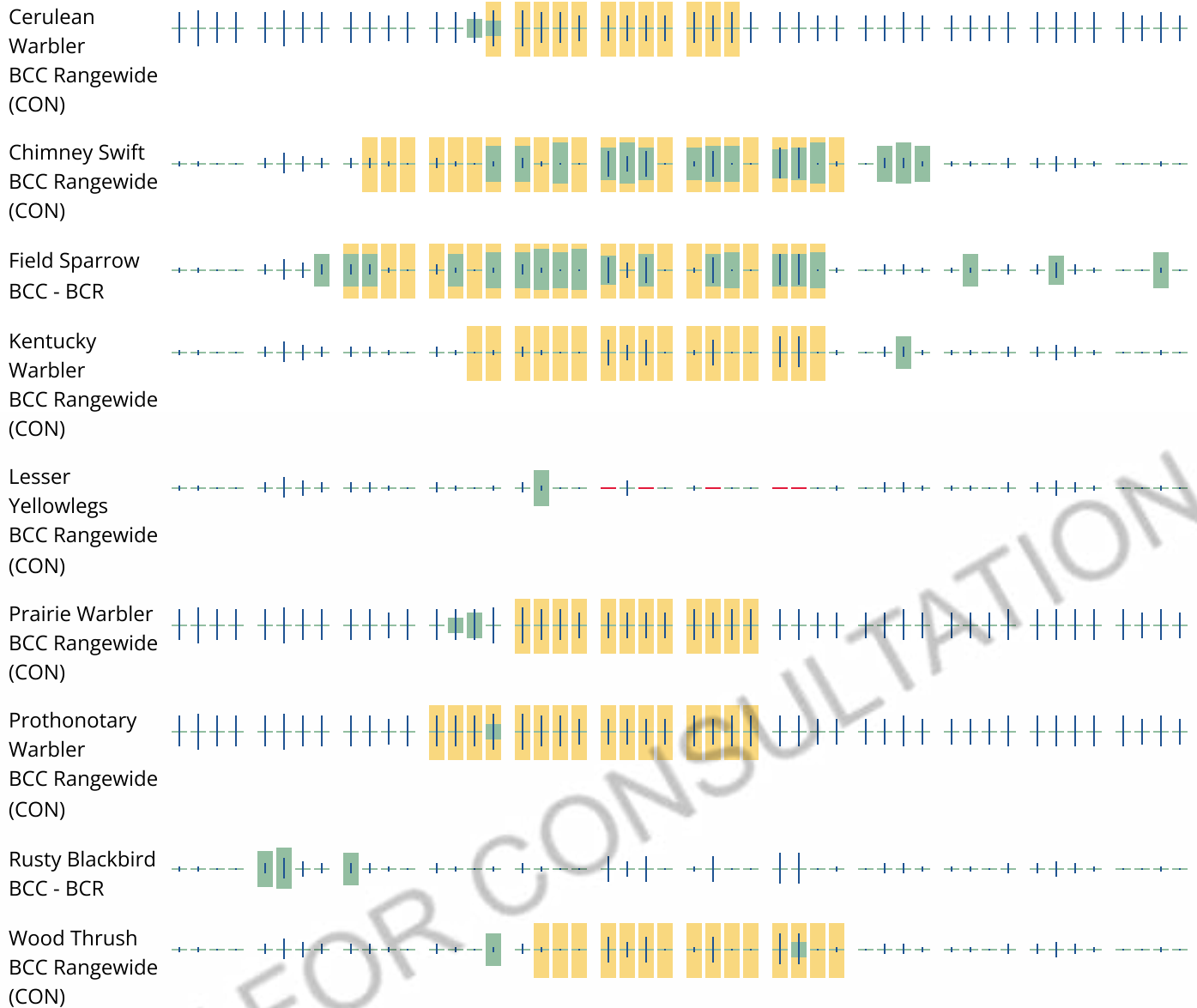
### No Data (-)

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

### Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





**Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.**

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

**What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?**

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

### **What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?**

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

### **How do I know if a bird is breeding, wintering or migrating in my area?**

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

### **What are the levels of concern for migratory birds?**

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

### **Details about birds that are potentially affected by offshore projects**

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

### What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

### Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

## Facilities

### National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

# Fish hatcheries

There are no fish hatcheries at this location.

## Wetlands in the National Wetlands Inventory (NWI)

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

### FRESHWATER EMERGENT WETLAND

[PEM1Ch](#)

[PEM1Fh](#)

### FRESHWATER FORESTED/SHRUB WETLAND

[PFO1C](#)

[PSS1F](#)

### FRESHWATER POND

[PUBHh](#)

### RIVERINE

[R4SBC](#)

[R5UBH](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

**NOTE:** This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

### Data limitations



The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

### **Data exclusions**

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

### **Data precautions**

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

# Appendix D, Water Resources



# Preliminary Wetland Delineation and Hydrologic Determination

Nashville International Airport (BNA)



Prepared For:

**Nashville International Airport**

May 2024



**Environmental Scientist's Certification**

This Preliminary Wetland Delineation and Hydrologic Determination was completed by Colby Marshall (TN-QHP-in training). I hereby certify that this report was prepared by Garver under my direct supervision for the Metropolitan Nashville Airport Authority.

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Ryan Mountain, PWS

Senior Environmental Scientist

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## **1.0 Introduction**

The Metropolitan Nashville Airport Authority (Authority) is proposing the Central Ramp Expansion at Nashville International Airport (BNA) in Nashville, Davidson County, Tennessee (**Appendix A**). The expansion will require the partial encapsulation of Sim's Branch and tributaries in the study area (**Appendix B**). The Authority has retained Garver, LLC to delineate and report on aquatic resources and submit to the Tennessee Department of Environment and Conservation (TDEC) and US Army Corps of Engineers (USACE) for concurrence.

### **1.1 Project Area**

The Study Area (SA) is in the Outer Nashville Basin ecoregion of the Interior Plateau within Davidson County, Tennessee. It is described as having rolling or hilly topography made up of limestone with higher hills and knobs capped with chert. Deciduous forest, pasture, and cropland are the dominant landcovers, and streams are low to medium gradient. The SA is located entirely on airport property east of downtown Nashville and west of the airport terminal between taxiways T2 and T4. The area is highly developed and land use at the airport is considered industrial while adjacent land use is commercial, residential, and undeveloped woodland. The SA is approximately 71 acres in size and ranges in elevation from 487 feet to 570 feet. The SA includes gravel access roads, stormwater treatment ponds, maintained herbaceous vegetation, and some shrubs, saplings, and trees along waterways. Two perennial streams and two wet weather conveyances are located in the SA.

### **1.2 Project Description**

The purpose of the proposed project is to expand the ramp and apron between taxiways T2 and T4 to the west to accommodate required remain overnight (RON) aircraft parking. The project will be completed in four phases and will require encapsulating wet weather conveyances and streams, grubbing and grading, filling, and paving of surfaces.

### 1.3 Regulatory Basis

Discharges of dredged or fill material into waters of the United States are regulated under Section 404 of the Clean Water Act. Any such action proposed in wetlands or other waters of the US are subject to review by the USACE and other federal and state agencies and require authorization by USACE. For jurisdictional purposes, USACE and the US Environmental Protection Agency (EPA) jointly define wetlands as follows: *Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (USACE 1987).* Other Waters (OW) were those delineated watercourses (streams or wet weather conveyances) that exhibited Ordinary High Water Marks (OHWMs). According to TDEC Division of Water Resources, Guidance For Making Hydrologic Determinations (April 2020), wet weather conveyances are: *Man-made or natural watercourses, including natural watercourses that have been modified by channelization: that flow only in direct response to precipitation runoff in their immediate locality; whose channels are at all times above the ground water table; that are not suitable for drinking water supplies; and in which hydrological and biological analyses indicate that, under normal weather conditions, due to naturally occurring ephemeral or low flow there is not sufficient water to support fish, or multiple populations of obligate lotic aquatic organisms whose life cycle includes an aquatic phase of at least two months [Rule 0400-40-03-.05(9)].* TDEC defines a stream as: *A surface water that is not a wet weather conveyance [Rule 1200-4-3.04(20)].*

### 2.0 Methodology

Prior to fieldwork a desktop review was completed to identify potential aquatic resources. TDEC's Division of Water Resources Hydrologic Determination Map View was used to search for previous determinations made in the SA. According to the map viewer, two hydrologic determinations were submitted (ID No. 4383 and 31328).

Garver also reviewed United States Geological Survey (USGS) topographic quadrangle maps for the presence of streams and other waterbodies. According to Natural Resources Conservation Service (NRCS) Web Soil Survey, four soil units are in the SA, of which, one is considered hydric (**Appendix B**). FEMA Floodplains are absent from the area. According to the NOAA weather station located at the airport, BNA received a total of 0.85 inch of rainfall within a week prior to the April 16, 2024 delineation. The area received 3.09 inches in the week prior to the May 15, 2024 visit with 0.75 inch occurring within 24 hours to the visit. The USACE's Antecedent Precipitation Tool was used to determine that seasonal precipitation conditions were abnormally dry during the April 16 visit and normal the May 15 visit.

The US Fish and Wildlife Service (USFWS) in cooperation with Cowardin, et al. (1979), have identified a classification system that is widely accepted by the USACE and USFWS in relation to classifying wetland and stream habitats (i.e., Classification of Wetlands and Deepwater Habitats of the United States). Aquatic resources within the SA have been identified utilizing the methodology presented in this classification system. A field investigation of the SA was performed by Colby Marshall of Garver on April 16 and May 15, 2024. The SA was inspected to locate areas of potentially-jurisdictional wetlands and waterways. Streams mapped during the field investigation were marked with an "OW" (Other Waters) identifier. Aquatic features, such as OW 1, that varied in hydrologic properties were divided into reaches according to their respective channel and flow characteristics. Stream information was documented using the TDEC Hydrologic Determination Field Data Sheet (TDEC Form CN-1612). Wetland determinations were made using observable vegetation, hydrology, and soils in accordance with the routine approach described in the USACE Wetland Delineation Manual (1987), and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont (Version 2.0). A map detailing aquatic resources with photo locations can be found as **Appendix C**. Stream data was collected at two reaches of one stream and one reach of a second stream. Hydrologic Determination forms describing the existing stream features and wetland data forms can be found in **Appendix D**.



### 3.0 Results

#### 3.1 Other Waters (OW)

- **OW 1 (Sim's Branch)** is a USGS mapped perennial stream, which flows from the south end of the SA to the north. Approximately 1,842 linear feet of OW 1 flow through the SA. Riparian vegetation included box elder (*Acer negundo*), black willow (*Salix nigra*), Amur honeysuckle (*Lonicera maackii*), dock species (*Rumex sp.*), tall fescue (*Schedonorus arundinaceus*), goldenrod species (*Solidago spp.*), aster species (*Symphotrichum spp.*), and sedge species (*Carex sp.*). Macroinvertebrates were observed in each reach and included amphipods, isopods, and crayfish. Salamander eggs were also found under rocks within OW 1. Due to significant variation in hydrologic characteristics, this feature has been divided into two reaches (OW 1a and OW 1b). The ordinary high water marks varied from 3 to 8 feet wide and 0.2 to 1 foot deep. The substrate included areas with silt, sand, gravel, and cobble. These reaches of Sims Branch are impaired for failure to meet the fish and aquatic life designated use. Refer to the attached stream data forms (**Appendix D**) and site photographs (**Appendix E**) for additional information.
  - **OW 1a** – This reach is approximately 1,115 linear feet in length and originates at a concrete pipe culvert approximately 500 feet west of taxiway T4. OW 1a appears to be perennial and flows north before reaching its confluence with OW 2 and a culvert crossing. At the time of investigation, OW 1a had moderate flow possibly over baseline resulting from recent rain. The average Ordinary High Water Mark (OHWM) within this reach was 3.6 feet wide and 0.5 feet deep. The stream substrate is predominately comprised of silt and sand. Aquatic species observed within the reach included minnows (cyprinids), scuds (amphipods), and sowbug species (Isopoda sp.).
  - **OW 1b** – This reach is approximately 727 linear feet in length and begins at the confluence of OW 1a and OW 2. OW 1b appears to be perennial and flows north to its confluence with OW 3. At the time of investigation, OW 1b had moderate flow possibly over baseline. Approximately 91 linear feet are culverted at the south end

for an access road. The average OHWM within this reach was 5.2 feet wide and 0.5 feet deep. The stream substrate is predominately comprised of sand, gravel, and cobble. Aquatic species observed within the reach included a common snapping turtle (*Chelydra serpentina*), minnows, scuds, and sowbug species.

- **OW 2** – This reach is approximately 128 linear feet in length and originates under the airport apron east of the SA and flows west northwest to Sims Branch. OW 2 is a spring fed stream which was documented as perennial in a 2018 Aquatic Resource Alteration Permit (NRS 17.191). OW 2 was flowing at the time of investigation. Riparian vegetation was similar to that of OW 1. The average OHWM within this reach was 4 feet wide and 0.5 feet deep. The stream substrate is predominately comprised of sand, gravel, and cobble. Aquatic species observed within the reach included sowbugs and snails.
- **OW 3 (Snakey Creek)** – is a USGS mapped perennial stream, which originates from a culvert near the southeast side of the deicing pond and generally flows northeast to Pond 1 and thence Sim's Branch. Approximately 9.3 linear feet of OW 1 flow through the SA. Riparian vegetation included box elder (*Acer negundo*), black willow (*Salix nigra*), Amur honeysuckle (*Lonicera maackii*), dock species (*Rumex sp.*), tall fescue (*Schedonorus arundinaceus*), goldenrod species (*Solidago spp.*), aster species (*Symphotrichum spp.*), and sedge species (*Carex sp.*). Macroinvertebrates were observed in each reach and included isopods and gastropods. Fish from the family cyprinidae and salamander eggs were also observed throughout OW 3. Due to significant variation in hydrologic characteristics, this feature has been divided into two reaches (OW 3a and OW 3b). The ordinary high water marks varied from 3 to 6 feet wide and 0.2 to 1 foot deep. The substrate included areas with gravel, and cobble. Refer to the attached stream data forms (**Appendix D**) and site photographs (**Appendix E**) for additional information.
  - **OW 3a** – This reach is approximately 685 linear feet in length and originates at the confluence of OW6 and OW7 where it flows north until reaching the retention pond further downstream. OW 3a appears to flow intermittently with extended seasonal flow influenced by both surface stormwater runoff and groundwater. OW 3a was

flowing at the time of investigation. The average OHWM within this reach was 3 feet wide and 0.5 feet deep. Aquatic species observed within the reach included sowbugs and snails.

- **OW 3b** – This reach is approximately 224 linear feet in length and originates at the downstream end of the retention pond as shown in the figures and flows northeast to Sims Branch. OW 3b is intermittent to perennial and was flowing at the time of the site investigation. The average OHWM within this reach was 3.6 feet wide and 0.5 feet deep. Aquatic species observed within the reach included sowbugs and snails.
- **OW 4 (Spring Run)** – This reach is approximately 218 linear feet in length and originates at a spring box located due south of Taxiway T2 and flows southeast into OW 3b. OW 4 is a spring fed stream and was flowing at the time of investigation. Approximately 32 linear feet are culverted for an access road. Riparian vegetation was dominated by sumac (*Rhus sp.*), Amur honeysuckle, and dodder (*Cuscuta sp.*). The average OHWM within this reach was 2.5 feet wide and 0.25 feet deep. The stream substrate is predominately comprised of sand and gravel. Aquatic species observed within the reach included snails and sowbugs.
- **OW 5** – This reach is approximately 421 linear feet in length and originates under Taxiway Bravo west of the SA and flows northeast into OW 3a. The primary source of hydrology for OW 5 appears to be groundwater which was observed to be issuing from a point just east of the toe of slope of Taxiway Bravo. OW 5 was flowing at the time of investigation from this point downstream. Riparian vegetation included Amur honeysuckle, eastern cottonwood (*Populus deltoides*), and knotweed (*Persicaria sp.*). The average OHWM within this reach was 3 feet wide and 0.3 feet deep. The stream substrate is predominately comprised of sand, gravel, and cobble. Aquatic species observed within the reach included crayfish, sowbugs, and snails.
- **OW 6 (Upper Tributary to Snakey Creek)** – This reach is approximately 275 linear feet in length and originates under the airport apron east of the SA and flows west northwest to Sims Branch. OW 2 is a spring fed stream which was documented as perennial in a 2018 Aquatic Resource Alteration Permit (NRS 17.191). OW 2 was flowing at the time of investigation.

Riparian vegetation was similar to that of OW 1. The average OHWM within this reach was 4 feet wide and 0.5 feet deep. The stream substrate is predominately comprised of sand, gravel, and cobble. Aquatic species observed within the reach included minnows.

- **OW 7 (Snakey Creek - WWC)** – This reach is approximately 394 linear feet in length and originates under the airport apron east of the SA and flows west northwest to Sims Branch. OW 2 is a spring fed stream which was documented as perennial in a 2018 Aquatic Resource Alteration Permit (NRS 17.191). OW 2 was flowing at the time of investigation. Riparian vegetation was similar to that of OW 1. The average OHWM within this reach was 4 feet wide and 0.5 feet deep. The stream substrate is predominately comprised of sand, gravel, and cobble. Aquatic species observed within the reach included minnows.

### 3.2 Wetlands (W)

**Wetland 1**, classified as a PEM1E (Palustrine, Emergent, Persistent, Seasonally Flooded / Saturated), is located at the beginning point of Sims Branch just northwest of Taxiway T4 and appears hydrologically connected to Sim's Branch (OW 1). It exists due to the influence of a shallow groundwater table and seeps from the toeslope to the southeast. Wetland 1 drains northwest into Sim's Branch by overland stormwater flow. Primary hydrology indicators within Wetland 1 included high water table and saturation. Dominant vegetation observed throughout Wetland 1 included yellow-fruit sedge. Hydric soil indicators observed in data point 1 met depleted matrix criteria. Approximately 0.04 acre occurs within the study area.

### 3.3 Ponds (P)

One pond (**Pond 1**) is located within and breaks up the continuous channel of Snakey Creek between reaches OW 3a and OW 3b. This pond was constructed as a stormwater retention pond and is approximately 0.27 acre in size. This feature is considered jurisdictional as it is hydrologically connected to Snakey Creek.

### 3.4 Summary

In summary, 3,518 linear feet of streams were identified within the SA. 669 linear feet of wet weather conveyances were also present in the SA. There are 0.04 acre of emergent wetland and 0.27 acre of pond. No other aquatic resources were identified in the SA. This report is to be presented to the USACE for concurrence of the jurisdictional status of the wetlands and streams and to TDEC for hydrologic determination of streams.

### 4.0 References

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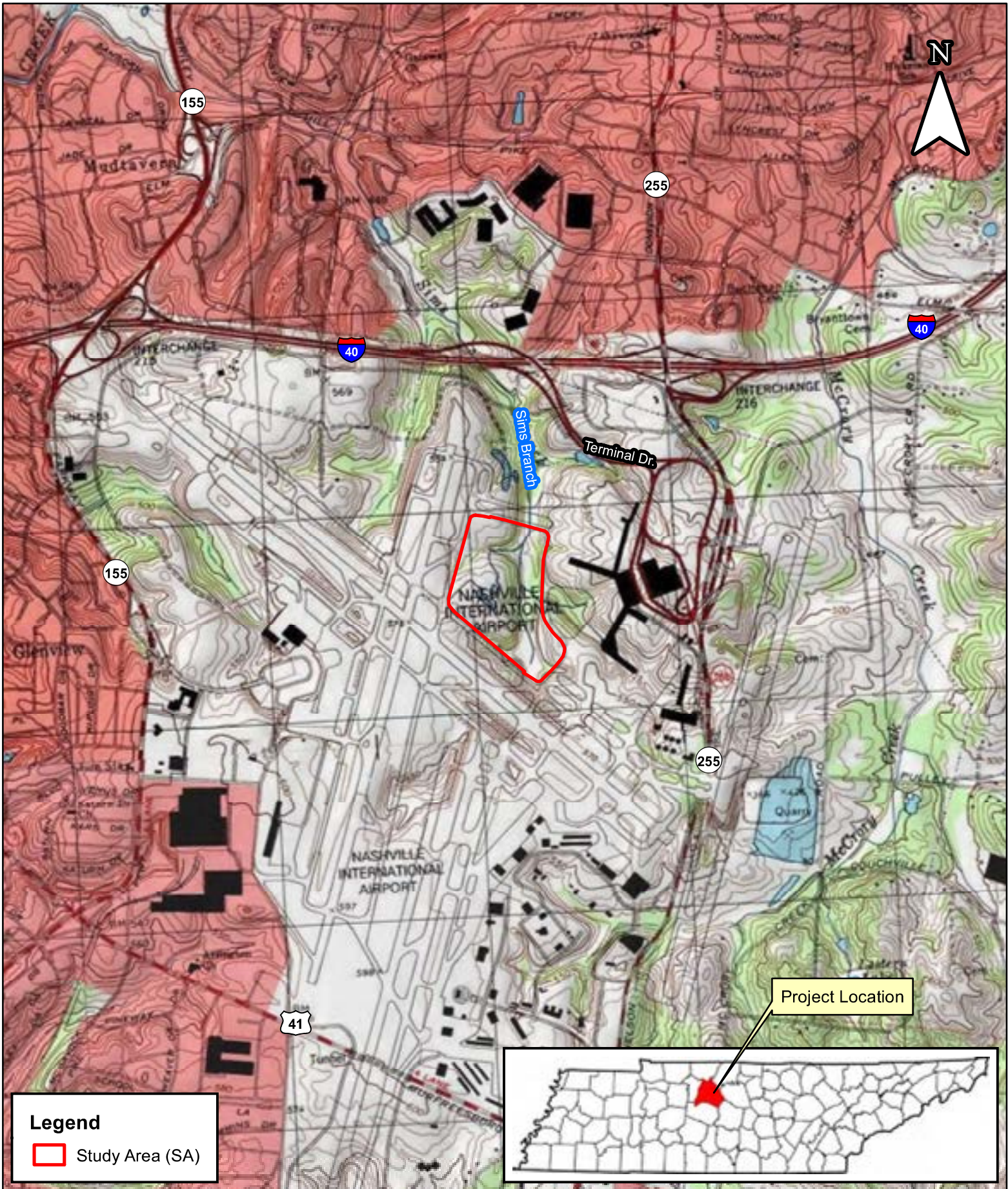
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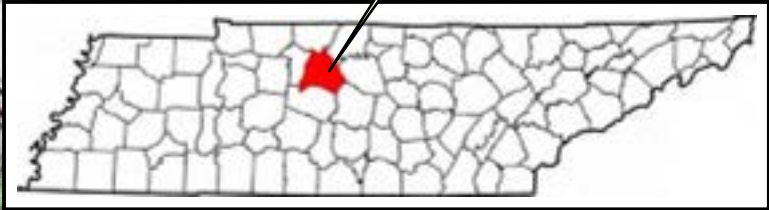
# APPENDIX A

## Site Location Map



**Legend**

Study Area (SA)



SITE LOCATION MAP

BNA Stream Determinations  
Nashville International Airport  
Nashville, Davidson County, Tennessee

Lat: 36.131775°  
Long: -86.675131°

USGS Topographic Image; ESRI GIS INFORMATION

0      0.25      0.5  
Miles

Appendix A



# APPENDIX B

## NRCS Soils Map



	Study Area (SA)
	NRCS Soil Unit
	Stream
	Snakey Crk-Lower
	Snakey Crk-Upper
	Spring Run
	Trib to Snakey Crk
	WWC
	Open Water



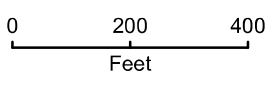
Map Unit Symbol	Map Unit Name	Hydric?
Ld	Lindell silt loam, 0 to 2 percent slopes, occasionally flooded	Yes
StC	Stiversville loam, 5 to 12 percent slopes, eroded	No
StD	Stiversville loam, 12 to 25 percent slopes, eroded	No
SvD	Stiversville-Urban land complex, 3 to 25 percent slopes	No



NRCS SOILS MAP

BNA Stream Determinations  
Nashville International Airport  
Nashville, Davidson County, Tennessee

Lat: 36.131775°  
Long: -86.675131°



# APPENDIX C

## Preliminary Wetland Delineation & Photo Location Map

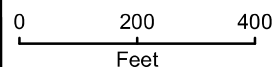


WETLAND DELINEATION & PHOTO LOCATION MAP

BNA Stream Determinations  
Nashville International Airport  
Nashville, Davidson County, Tennessee

2022 ESRI Aerial Image; ESRI GIS INFORMATION

Lat: 36.131775°  
Long: -86.675131°



# APPENDIX D

## Data Forms



**Hydrologic Determination Field Data Sheet**

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: Sims Branch		Date/Time: 4/16/24 14:00
Assessors/Affiliation: Colby Marshall/Garver LLC		Project ID : BNA HDs
Site Name/Description: OW 1a		
Site Location: BNA Airport, Nashville, TN		
HUC (12 digit): 051302020102	Latitude: 36.128819°	
Previous Rainfall (7-days) : 0.85 inch	Longitude: -86.674637°	
Precipitation this Season vs. Normal : <b>abnormally dry</b> <b>NOAA/USACE ATP</b> Source of recent & seasonal precip. data :		
Watershed Size : 372 acres	County: Davidson	
Soil Type(s) / Geology : <small>Stiversville loam, 12 to 25 percent slopes, eroded &amp; Lindell silt loam, 0 to 2 percent slopes, occasionally flooded</small>	Source: NRCS WSS	
Surrounding Land Use : Industrial/Airport		
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : <b>Moderate</b>		

**Primary Field Indicators Observed**

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	<input checked="" type="checkbox"/>	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	<input checked="" type="checkbox"/>	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	<input type="checkbox"/>	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	<input checked="" type="checkbox"/>	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	<input checked="" type="checkbox"/>	Stream
6. Presence of fish (except <i>Gambusia</i> )	<input type="checkbox"/>	<u>Stream</u>
7. Presence of naturally occurring ground water table connection	<input checked="" type="checkbox"/>	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	<input checked="" type="checkbox"/>	Stream
9. Evidence watercourse has been used as a supply of drinking water	<input checked="" type="checkbox"/>	Stream

**NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.**

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

**Overall Hydrologic Determination = STREAM**

**Secondary Indicator Score (if applicable) = 33.50**

**Justification / Notes :**

Upstream morphology and hydrology altered by fill, encapsulation, and channelization during airport development. Multiple cyprinid species present.

## Secondary Field Indicator Evaluation

<b>A. Geomorphology</b> (Subtotal = 9.00)					
	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>	
1. Continuous bed and bank	0	1	2	3	3
2. Sinuous channel	0	1	2	3	0.5
3. In-channel structure: riffle-pool sequences	0	1	2	3	1
4. Sorting of soil textures or other substrate	0	1	2	3	1.5
5. Active/relic floodplain	0	0.5	1	1.5	0.5
6. Depositional bars or benches	0	1	2	3	1
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0.5
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0
12. Natural valley or drainageway	0	0.5	1	1.5	1
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

<b>B. Hydrology</b> (Subtotal = 10.00)					
	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>	
14. Subsurface flow/discharge into channel	0	1	2	3	2
15. Water in channel and >48 hours since sig. rain	0	1	2	3	3
16. Leaf litter in channel	1.5	1	0.5	0	1.5
17. Sediment on plants or on debris	0	0.5	1	1.5	1.25
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0.75
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5

<b>C. Biology</b> (Subtotal = 14.50)					
	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>	
20. Fibrous roots in channel bed <sup>1</sup>	3	2	1	0	3
21. Rooted plants in the thalweg <sup>1</sup>	3	2	1	0	3
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	1.5
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macroinvertebrates (record type & abundance)	0	1	2	3	2
26. Filamentous algae; periphyton	0	1	2	3	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0.75
28. Wetland plants in channel bed <sup>2</sup>	0	0.5	1	1.5	1.25

<sup>1</sup> Focus is on the presence of terrestrial plants.

<sup>2</sup> Focus is on the presence of aquatic or wetland plants.

**Total Points = 33.50**

*Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points*

### Notes :

Stream low gradient. Substrate consistently silty clay throughout reach. Riffles nearly absent due to low grade. Crayfish, sow bugs (isopods), and, scuds (amphipods) observed.

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**Hydrologic Determination Field Data Sheet**

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: Sims Branch		Date/Time: 4/16/24 11:45
Assessors/Affiliation: Colby Marshall/Garver LLC		Project ID : BNA HDs
Site Name/Description: OW 1b		
Site Location: BNA Airport, Nashville, TN		
HUC (12 digit): 051302020102	Latitude: 36.132020°	
Previous Rainfall (7-days) : 0.85 inch	Longitude: -86.675134°	
Precipitation this Season vs. Normal : <b>abnormally dry</b> <b>NOAA/USACE ATP</b> Source of recent & seasonal precip. data :		
Watershed Size : 603 acres	County: Davidson	
Soil Type(s) / Geology : Stiversville loam, 12 to 25 percent slopes, eroded	Source: NRCS WSS	
Surrounding Land Use : Industrial/Airport		
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : <b>Moderate</b>		

**Primary Field Indicators Observed**

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	<input checked="" type="checkbox"/>	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	<input checked="" type="checkbox"/>	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	<input type="checkbox"/>	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	<input checked="" type="checkbox"/>	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	<input checked="" type="checkbox"/>	Stream
6. Presence of fish (except <i>Gambusia</i> )	<input type="checkbox"/>	<u>Stream</u>
7. Presence of naturally occurring ground water table connection	<input type="checkbox"/>	<u>Stream</u>
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	<input checked="" type="checkbox"/>	Stream
9. Evidence watercourse has been used as a supply of drinking water	<input checked="" type="checkbox"/>	Stream

**NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.**

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

**Overall Hydrologic Determination = STREAM**

**Secondary Indicator Score (if applicable) = 38.25**

**Justification / Notes :**

Upstream morphology and hydrology altered by fill, encapsulation, and channelization during airport development. Multiple cyprinid species present.



## Secondary Field Indicator Evaluation

<b>A. Geomorphology</b> (Subtotal = 14.00)					
	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>	
1. Continuous bed and bank	0	1	2	3	2.5
2. Sinuous channel	0	1	2	3	1
3. In-channel structure: riffle-pool sequences	0	1	2	3	3
4. Sorting of soil textures or other substrate	0	1	2	3	3
5. Active/relic floodplain	0	0.5	1	1.5	0.5
6. Depositional bars or benches	0	1	2	3	2
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	1
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0
12. Natural valley or drainageway	0	0.5	1	1.5	1
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

<b>B. Hydrology</b> (Subtotal = 10.25)					
	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>	
14. Subsurface flow/discharge into channel	0	1	2	3	2
15. Water in channel and >48 hours since sig. rain	0	1	2	3	3
16. Leaf litter in channel	1.5	1	0.5	0	1.5
17. Sediment on plants or on debris	0	0.5	1	1.5	1.25
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	1
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5

<b>C. Biology</b> (Subtotal = 14.00)					
	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>	
20. Fibrous roots in channel bed <sup>1</sup>	3	2	1	0	3
21. Rooted plants in the thalweg <sup>1</sup>	3	2	1	0	3
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	1.5
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macroinvertebrates (record type & abundance)	0	1	2	3	2
26. Filamentous algae; periphyton	0	1	2	3	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0.5
28. Wetland plants in channel bed <sup>2</sup>	0	0.5	1	1.5	1

<sup>1</sup> Focus is on the presence of terrestrial plants.

<sup>2</sup> Focus is on the presence of aquatic or wetland plants.

**Total Points = 38.25**

*Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points*

### Notes :

Stream low gradient. Substrate gravel and cobble. Riffles nearly absent due to low grade. Crayfish, sow bugs, and, scuds observed.

Common snapping turtle observed in channel.



**Hydrologic Determination Field Data Sheet**

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: Unnamed Tributary of Sims Branch		Date/Time: 4/16/24 11:45
Assessors/Affiliation: Colby Marshall/Garver LLC		Project ID : BNA HDs
Site Name/Description: OW 2		
Site Location: BNA Airport, Nashville, TN		
HUC (12 digit): 051302020102	Latitude: 36.131775°	
Previous Rainfall (7-days) : 0.85 inch	Longitude: -86.675131°	
Precipitation this Season vs. Normal : <b>abnormally dry</b> <b>NOAA/USACE ATP</b> Source of recent & seasonal precip. data :		
Watershed Size : 175 acres	County: Davidson	
Soil Type(s) / Geology : <small>Stiversville loam, 12 to 25 percent slopes, eroded &amp; Lindell silt loam, 0 to 2 percent slopes, occasionally flooded</small>	Source: NRCS WSS	
Surrounding Land Use : Industrial/Airport		
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : <b>Moderate</b>		

**Primary Field Indicators Observed**

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	<input checked="" type="checkbox"/>	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	<input checked="" type="checkbox"/>	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	<input type="checkbox"/>	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	<input checked="" type="checkbox"/>	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	<input checked="" type="checkbox"/>	Stream
6. Presence of fish (except <i>Gambusia</i> )	<input type="checkbox"/>	<u>Stream</u>
7. Presence of naturally occurring ground water table connection	<input type="checkbox"/>	<u>Stream</u>
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	<input checked="" type="checkbox"/>	Stream
9. Evidence watercourse has been used as a supply of drinking water	<input checked="" type="checkbox"/>	Stream

**NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.**

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

**Overall Hydrologic Determination = STREAM**

**Secondary Indicator Score (if applicable) = 0.00**

**Justification / Notes :**

OW 2 is a spring fed stream designated as a stream in a 2018 ARAP (NRS 17.191) Upstream morphology and hydrology altered by fill, encapsulation, and channelization during airport development.

Two cyprinid species observed including a central stone roller and one possible creek chub.

## Secondary Field Indicator Evaluation

<b>A. Geomorphology</b> (Subtotal = 0.00)	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>	
1. Continuous bed and bank	0	1	2	3	0
2. Sinuous channel	0	1	2	3	0
3. In-channel structure: riffle-pool sequences	0	1	2	3	0
4. Sorting of soil textures or other substrate	0	1	2	3	0
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0
12. Natural valley or drainageway	0	0.5	1	1.5	0
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

<b>B. Hydrology</b> (Subtotal = 0.00)	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>	
14. Subsurface flow/discharge into channel	0	1	2	3	0
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0
16. Leaf litter in channel	1.5	1	0.5	0	0
17. Sediment on plants or on debris	0	0.5	1	1.5	0
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0

<b>C. Biology</b> (Subtotal = 0.00)	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>	
20. Fibrous roots in channel bed <sup>1</sup>	3	2	1	0	0
21. Rooted plants in the thalweg <sup>1</sup>	3	2	1	0	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macroinvertebrates (record type & abundance)	0	1	2	3	0
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed <sup>2</sup>	0	0.5	1	1.5	0

<sup>1</sup> Focus is on the presence of terrestrial plants.

<sup>2</sup> Focus is on the presence of aquatic or wetland plants.

**Total Points =** 0.00

*Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points*

**Notes :**

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**Hydrologic Determination Field Data Sheet**

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: Snakey Creek		Date/Time: 5/15/24
Assessors/Affiliation: Colby Marshall/Garver LLC		Project ID : BNA HDs
Site Name/Description: OW 3b - Between Pond 1 and Sim's Branch		
Site Location: BNA Airport, Nashville, TN		
HUC (12 digit): 051302020102	Latitude: 36.133362°	
Previous Rainfall (7-days) : 3.09	Longitude: -86.675401°	
Precipitation this Season vs. Normal : <b>average</b> <span style="float: right;"><b>NOAA/USACE ATP</b></span>		
Source of recent & seasonal precip. data :		
Watershed Size : 38 acres	County: Davidson	
Soil Type(s) / Geology : Stiversville loam, 12 to 25 percent slopes, eroded	Source: NRCS WSS	
Surrounding Land Use : Industrial/Airport		
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : <b>Moderate</b>		

**Primary Field Indicators Observed**

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	<input checked="" type="checkbox"/>	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	<input checked="" type="checkbox"/>	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions <span style="float: right; color: red;">N/A</span>	<input type="checkbox"/>	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	<input checked="" type="checkbox"/>	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	<input checked="" type="checkbox"/>	Stream
6. Presence of fish (except <i>Gambusia</i> )	<input type="checkbox"/>	<u>Stream</u>
7. Presence of naturally occurring ground water table connection	<input checked="" type="checkbox"/>	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	<input checked="" type="checkbox"/>	Stream
9. Evidence watercourse has been used as a supply of drinking water	<input checked="" type="checkbox"/>	Stream

**NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.**

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

**Overall Hydrologic Determination = STREAM**

**Secondary Indicator Score (if applicable) = 30.00**

**Justification / Notes :**

Cyprinids possibly from Sim's Branch.

## Secondary Field Indicator Evaluation

<b>A. Geomorphology</b> (Subtotal = 12.50)	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>	
1. Continuous bed and bank	0	1	2	3	3
2. Sinuous channel	0	1	2	3	0.5
3. In-channel structure: riffle-pool sequences	0	1	2	3	3
4. Sorting of soil textures or other substrate	0	1	2	3	2.5
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	1.5
7. Braided channel	0	1	2	3	0
8. Recent alluvial deposits	0	0.5	1	1.5	0.5
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	0
11. Grade controls	0	0.5	1	1.5	0
12. Natural valley or drainageway	0	0.5	1	1.5	1.5
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

<b>B. Hydrology</b> (Subtotal = 5.50)	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>	
14. Subsurface flow/discharge into channel	0	1	2	3	2
15. Water in channel and >48 hours since sig. rain	0	1	2	3	0
16. Leaf litter in channel	1.5	1	0.5	0	1.5
17. Sediment on plants or on debris	0	0.5	1	1.5	0.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		1.5

<b>C. Biology</b> (Subtotal = 12.00)	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>	
20. Fibrous roots in channel bed <sup>1</sup>	3	2	1	0	3
21. Rooted plants in the thalweg <sup>1</sup>	3	2	1	0	3
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	0
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	1
25. Macroinvertebrates (record type & abundance)	0	1	2	3	1.5
26. Filamentous algae; periphyton	0	1	2	3	2.5
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0
28. Wetland plants in channel bed <sup>2</sup>	0	0.5	1	1.5	1

<sup>1</sup> Focus is on the presence of terrestrial plants.

<sup>2</sup> Focus is on the presence of aquatic or wetland plants.

**Total Points =** 30.00

*Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points*

**Notes :**

Isopods, gastropods, filamentous algae, salamander eggs

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**Hydrologic Determination Field Data Sheet**

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: Unnamed Spring to Snakey Creek		Date/Time: 5/15/24 12:00
Assessors/Affiliation: Colby Marshall/Garver LLC		Project ID : BNA HDs
Site Name/Description: OW 4		
Site Location: BNA Airport, Nashville, TN		
HUC (12 digit): 051302020102	Latitude: 36.133953°	
Previous Rainfall (7-days) : 3.09	Longitude: -86.675589°	
Precipitation this Season vs. Normal : <b>average</b> <span style="float: right;"><b>NOAA/USACE ATP</b></span>		
Source of recent & seasonal precip. data :		
Watershed Size : 4 acres	County: Davidson	
Soil Type(s) / Geology : Stiversville loam, 12 to 25 percent slopes, eroded	Source: NRCS WSS	
Surrounding Land Use : Industrial/Airport		
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : <b>Absent</b>		

**Primary Field Indicators Observed**

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	<input type="checkbox"/>	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	<input type="checkbox"/>	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions <span style="float: right; color: red;">N/A</span>	<input type="checkbox"/>	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	<input type="checkbox"/>	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	<input type="checkbox"/>	Stream
6. Presence of fish (except <i>Gambusia</i> )	<input type="checkbox"/>	Stream
7. Presence of naturally occurring ground water table connection	<input type="checkbox"/>	<b>Stream</b>
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	<input type="checkbox"/>	Stream
9. Evidence watercourse has been used as a supply of drinking water	<input type="checkbox"/>	<b>Stream</b>

**NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.**

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

**Overall Hydrologic Determination = STREAM**

**Secondary Indicator Score (if applicable) = 0.00**

**Justification / Notes :**

Stream originates at a historic spring box. Marked as water source on 1952 Nashville East, TN, Quadrangle Map.





**Hydrologic Determination Field Data Sheet**

Tennessee Division of Water Resources, Version 1.5 (Fillable Form)

Named Waterbody: Unnamed Tributary to Snakey Creek		Date/Time: 5/15/24 16:45
Assessors/Affiliation: Colby Marshall/Garver LLC		Project ID : BNA HDs
Site Name/Description: OW 5		
Site Location: BNA Airport, Nashville, TN		
HUC (12 digit): 051302020102	Latitude: 36.133394°	
Previous Rainfall (7-days) : 3.09	Longitude: -86.676739°	
Precipitation this Season vs. Normal : <b>average</b> <span style="float: right;"><b>NOAA/USACE ATP</b></span>		
Source of recent & seasonal precip. data :		
Watershed Size : 18 acres	County: Davidson	
Soil Type(s) / Geology : Stiversville loam, 12 to 25 percent slopes, eroded	Source: NRCS	
Surrounding Land Use : Industrial/Airport		
Degree of historical alteration to natural channel morphology & hydrology (select one & describe fully in Notes) : <b>Moderate</b>		

**Primary Field Indicators Observed**

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	<input checked="" type="checkbox"/>	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	<input checked="" type="checkbox"/>	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions <span style="float: right; color: red;">N/A</span>	<input type="checkbox"/>	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	<input checked="" type="checkbox"/>	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	<input checked="" type="checkbox"/>	Stream
6. Presence of fish (except <i>Gambusia</i> )	<input checked="" type="checkbox"/>	Stream
7. Presence of naturally occurring ground water table connection	<input checked="" type="checkbox"/>	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	<input checked="" type="checkbox"/>	Stream
9. Evidence watercourse has been used as a supply of drinking water	<input checked="" type="checkbox"/>	Stream

**NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.**

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-DWR Guidance For Making Hydrologic Determinations, Version 1.5*

**Overall Hydrologic Determination = STREAM**

**Secondary Indicator Score (if applicable) = 23.00**

**Justification / Notes :**

Precipitation seasonally normal but 0.75 inch received in the last 24 hours and 3.09 in the previous week.



## Secondary Field Indicator Evaluation

<b>A. Geomorphology</b> (Subtotal = 12.25)					
	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>	
1. Continuous bed and bank	0	1	2	3	2
2. Sinuous channel	0	1	2	3	1
3. In-channel structure: riffle-pool sequences	0	1	2	3	2
4. Sorting of soil textures or other substrate	0	1	2	3	2.5
5. Active/relic floodplain	0	0.5	1	1.5	0
6. Depositional bars or benches	0	1	2	3	0
7. Braided channel	0	1	2	3	1
8. Recent alluvial deposits	0	0.5	1	1.5	0.5
9. Natural levees	0	1	2	3	0
10. Headcuts	0	1	2	3	1
11. Grade controls	0	0.5	1	1.5	1
12. Natural valley or drainageway	0	0.5	1	1.5	1.25
13. At least second order channel on existing USGS or NRCS map	0	1	2	3	0

<b>B. Hydrology</b> (Subtotal = 4.25)					
	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>	
14. Subsurface flow/discharge into channel	0	1	2	3	1.5
15. Water in channel and >48 hours since sig. rain	0	1	2	3	NA
16. Leaf litter in channel	1.5	1	0.5	0	1.5
17. Sediment on plants or on debris	0	0.5	1	1.5	0.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5	0
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5		0.75

<b>C. Biology</b> (Subtotal = 6.50)					
	<b>Absent</b>	<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>	
20. Fibrous roots in channel bed <sup>1</sup>	3	2	1	0	1.5
21. Rooted plants in the thalweg <sup>1</sup>	3	2	1	0	2.5
22. Crayfish in stream (exclude in floodplain)	0	1	2	3	1
23. Bivalves/mussels	0	1	2	3	0
24. Amphibians	0	0.5	1	1.5	0
25. Macroinvertebrates (record type & abundance)	0	1	2	3	1
26. Filamentous algae; periphyton	0	1	2	3	0
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5	0.5
28. Wetland plants in channel bed <sup>2</sup>	0	0.5	1	1.5	0

<sup>1</sup> Focus is on the presence of terrestrial plants.

<sup>2</sup> Focus is on the presence of aquatic or wetland plants.

**Total Points =** 23.00

*Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points*

### Notes :

1 crayfish observed swimming in bedrock pool below waterfall. Several isopod individuals observed. Grade controls included bedrock shelves, waterfall, and cobble and stone clusters. One headcut observed. Iron staining observed below headcut.

Project/Site: Central Ramp Expansion (CRE) City/County: Nashville, Davidson Co. Sampling Date: 5/15/2024  
 Applicant/Owner: MNAA State: TN Sampling Point: DP1  
 Investigator(s): Colby Marshall Section, Township, Range: NA  
 Landform (hillside, terrace, etc.): Slope Local relief (concave, convex, none): Concave Slope (%): 2  
 Subregion (LRR or MLRA): LRR N, MLRA 123 Lat: 36.128756° Long: -86.674553° Datum: NAD 83  
 Soil Map Unit Name: StD - Stiversville Loam, 12-25% Slopes, Eroded NWI classification: NA  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No      (If no, explain in Remarks.)  
 Are Vegetation     , Soil     , or Hydrology      significantly disturbed? Are "Normal Circumstances" present? Yes X No       
 Are Vegetation     , Soil     , or Hydrology      naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <u>X</u> No <u>    </u> Hydric Soil Present? Yes <u>X</u> No <u>    </u> Wetland Hydrology Present? Yes <u>X</u> No <u>    </u>	<b>Is the Sampled Area within a Wetland?</b> Yes <u>X</u> No <u>    </u>
Remarks: Meets all wetland criteria.	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b> <u>Primary Indicators</u> (minimum of one is required; check all that apply)	<u>Secondary Indicators</u> (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)

<b>Field Observations:</b> Surface Water Present? Yes <u>    </u> No <u>X</u> Depth (inches): <u>    </u> Water Table Present? Yes <u>X</u> No <u>    </u> Depth (inches): <u>1</u> Saturation Present? Yes <u>X</u> No <u>    </u> Depth (inches): <u>0</u> (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <u>X</u> No <u>    </u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:  
 Saturation and high water table present. Meets hydrology criteria.

**VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: DP1

<u>Tree Stratum</u> (Plot size: <u>NA</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
=Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
50% of total cover: _____		20% of total cover: _____		
<u>Sapling/Shrub Stratum</u> (Plot size: <u>NA</u> )				<b>Hydrophytic Vegetation Indicators:</b> ___ 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 <sup>1</sup> ___ 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
=Total Cover				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
50% of total cover: _____		20% of total cover: _____		
<u>Herb Stratum</u> (Plot size: <u>10'</u> )				<b>Definitions of Four Vegetation Strata:</b> <b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. <b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. <b>Woody Vine</b> – All woody vines greater than 3.28 ft in height.
1. <u>Carex annectens</u>	90	Yes	FACW	
2. <u>Sedum pulchellum</u>	10	No	FACU	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
100 =Total Cover				<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No _____
50% of total cover: <u>50</u>		20% of total cover: <u>20</u>		
<u>Woody Vine Stratum</u> (Plot size: _____ )				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
=Total Cover				
50% of total cover: _____		20% of total cover: _____		

Remarks: (Include photo numbers here or on a separate sheet.)  
 Meets hydrophytic vegetation criteria.

**SOIL**

Sampling Point: DP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-1	10YR 5/2	100						
1-8	10YR 5/2	96	10YR 5/6	4	C	M		Prominent redox concentrations

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) (**LRR N**)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7)

- Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- Thin Dark Surface (S9) (**MLRA 147, 148**)
- Loamy Mucky Mineral (F1) (**MLRA 136**)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) (**LRR N, MLRA 136**)
- Umbric Surface (F13) (**MLRA 122, 136**)
- Piedmont Floodplain Soils (F19) (**MLRA 148**)
- Red Parent Material (F21) (**MLRA 127, 147, 148**)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 2 cm Muck (A10) (**MLRA 147**)
- Coast Prairie Redox (A16) (**MLRA 147, 148**)
- Piedmont Floodplain Soils (F19) (**MLRA 136, 147**)
- Red Parent Material (F21) (**outside MLRA 127, 147, 148**)
- Very Shallow Dark Surface (F22)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present?    Yes     No

Remarks:  
 Meets hydric soils criteria.

Project/Site: Central Ramp Expansion (CRE) City/County: Nashville, Davidson Co. Sampling Date: 5/15/2024  
 Applicant/Owner: MNAA State: TN Sampling Point: DP2  
 Investigator(s): Colby Marshall Section, Township, Range: NA  
 Landform (hillside, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 4  
 Subregion (LRR or MLRA): LRR N, MLRA 123 Lat: 36.128749° Long: -86.674566° Datum: NAD 83  
 Soil Map Unit Name: StD - Stiversville Loam, 12-25% Slopes, Eroded NWI classification: NA

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

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

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Does not meet wetland criteria	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b> <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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<b>Field Observations:</b> Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
--	---

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

Remarks:  
Does not meet hydrology criteria.

**VEGETATION (Four Strata) – Use scientific names of plants.**

Sampling Point: DP2

Tree Stratum (Plot size: <u>NA</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
	_____ = Total Cover		
	50% of total cover: _____	20% of total cover: _____	

Sapling/Shrub Stratum (Plot size: <u>NA</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
	_____ = Total Cover		
	50% of total cover: _____	20% of total cover: _____	

Herb Stratum (Plot size: <u>10'</u> )	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Sorghum halepense</u>	45	Yes	FACU
2. <u>Lespedeza cuneata</u>	45	Yes	FACU
3. <u>Sedum pulchellum</u>	10	No	FACU
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
	100 = Total Cover		
	50% of total cover: <u>50</u>	20% of total cover: <u>20</u>	

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
	_____ = Total Cover		
	50% of total cover: _____	20% of total cover: _____	

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)  
 Total Number of Dominant Species Across All Strata: 2 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_  
 FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_  
 FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: \_\_\_\_\_ (A) \_\_\_\_\_ (B)  
 Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**  
 \_\_\_ 1 - Rapid Test for Hydrophytic Vegetation  
 \_\_\_ 2 - Dominance Test is >50%  
 \_\_\_ 3 - Prevalence Index is ≤3.0<sup>1</sup>  
 \_\_\_ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 \_\_\_ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**  
**Tree** – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  
**Sapling/Shrub** – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.  
**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  
**Woody Vine** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes \_\_\_\_\_ No X

Remarks: (Include photo numbers here or on a separate sheet.)  
 Does not meet hydrophytic vegetation criteria.

**SOIL**

Sampling Point: DP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-2	10YR 3/3	100						
2-8	10YR 4/6	100						
8-14	10YR 5/2	98	10YR 5/6	2	C	M		Prominent redox concentrations

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) (**LRR N**)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7)

- Polyvalue Below Surface (S8) (**MLRA 147, 148**)
- Thin Dark Surface (S9) (**MLRA 147, 148**)
- Loamy Mucky Mineral (F1) (**MLRA 136**)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) (**LRR N, MLRA 136**)
- Umbric Surface (F13) (**MLRA 122, 136**)
- Piedmont Floodplain Soils (F19) (**MLRA 148**)
- Red Parent Material (F21) (**MLRA 127, 147, 148**)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 2 cm Muck (A10) (**MLRA 147**)
- Coast Prairie Redox (A16) (**MLRA 147, 148**)
- Piedmont Floodplain Soils (F19) (**MLRA 136, 147**)
- Red Parent Material (F21) (**outside MLRA 127, 147, 148**)
- Very Shallow Dark Surface (F22)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present?    Yes \_\_\_\_\_    No X

Remarks:  
 Does not meet hydric soil criteria.

# APPENDIX E

## Site Photographs



**PH 1**

OW 1a



**Description** | View of OW1a facing upstream to the south.

**PH 2**

OW 1a



**Description** | View of OW 1a facing downstream to the north.

**PH 3**

OW 1a



**Description**

View of OW 1a facing downstream to the north. Filamentous green algae was common throughout OW 1.

**PH 4**

OW 1a & OW 2



**Description**

View of the confluence of OW1a (right) and OW 2 (left) to the south.

**PH 5**

OW 1b



**Description**

View of OW 1b facing downstream to the northeast near the transition from OW 1a to 1b.

**PH 6**

OW 1b



**Description**

View of OW 1b facing upstream to the south near the transition from OW 1a to 1b. Filamentous green algae was common throughout OW 1.

**PH 7**

OW 1b



**Description**

View of OW 1b facing downstream to the north.

**PH 8**

OW 1b



**Description**

View of OW 1b facing upstream to the south near the northern SA extent.

PH 9

OW 1b



**Description**

View of OW 1b facing downstream to the north near the northern SA extent.

PH 10

OW 2



**Description**

View of OW 2 facing south near where it enters the SA from a culvert. The stream flows left to right in the photo.

**PH 11**

OW 3b



**Description**

View of OW 1b facing downstream to the northeast near the confluence with Sims Branch.

**PH 12**

Pond 1



**Description**

View of P 1 facing upstream to the west.

PH 13

OW 4



**Description**

View of OW 4 where it originates from a spring box.

PH 14

OW 5



**Description**

View of OW 5 facing downstream to the east. A crayfish was observed swimming at this location.

**PH 15**

OW 5



**Description**

View of OW 5 above the groundwater connection. This reach is a WWC.

**PH 16**

OW 3a

**Description**

View of OW 3a



**PH 17**

OW 6



**Description** | View of OW 6.... This reach is a WWC.

**PH 18**

OW 7



**Description** | View of OW 7.... This reach is a WWC.

**PH 19**

W 1



**Description**

View of W 1 facing south.

**PH 20**

DP 1



**Description**

View of hydric soils (depleted matrix) from DP 1.

# APPENDIX F

## Weather Data

**Record of Climatological Observations**  
 These data are quality controlled and may not be identical to the original observations.

Current Location: Elev: 587 ft. Lat: 36.1105° N Lon: 86.6882° W

Generated on 04/29/2024

Observation Time Temperature: Unknown Observation Time Precipitation: 2400

Station: **NASHVILLE INTERNATIONAL AIRPORT, TN US USW00013897**

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		"Soil Temperature (F)"						
			"24 Hrs. Ending at Observation Time"		At Obs.	24 Hour Amounts Ending at Observation Time				At Obs. Time	24 Hour Wind Movement (mi)	Amount of Evap. (in)	4 in. Depth			8 in. Depth			
			Max.	Min.		Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag				Snow, Ice Pellets, Hail, Ice on Ground (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2024	04	01	79	69		0.00		0.0		0.0									
2024	04	02	74	53		0.98		0.0		0.0									
2024	04	03	57	45		0.02		0.0		0.0									
2024	04	04	56	42		0.00		0.0		0.0									
2024	04	05	51	36		0.00		0.0		0.0									
2024	04	06	63	37		0.00		0.0		0.0									
2024	04	07	77	40		0.00		0.0		0.0									
2024	04	08	74	58		0.05		0.0		0.0									
2024	04	09	64	58		0.40		0.0		0.0									
2024	04	10	70	61		0.10		0.0		0.0									
2024	04	11	70	55		0.35		0.0		0.0									
2024	04	12	67	48		0.00		0.0		0.0									
2024	04	13	80	42		0.00		0.0		0.0									
2024	04	14	87	56		0.00		0.0		0.0									
2024	04	15	86	60		0.00		0.0		0.0									
2024	04	16	87	65		T		0.0		0.0									
2024	04	17	80	66		0.06		0.0		0.0									
2024	04	18	87	66		0.00		0.0		0.0									
2024	04	19	73	58		0.02		0.0		0.0									
2024	04	20	67	48		0.36		0.0		0.0									
2024	04	21	61	46		0.00		0.0		0.0									
2024	04	22	67	37		0.00		0.0		0.0									
2024	04	23	76	42		0.00		0.0		0.0									
2024	04	24	77	56		0.04		0.0		0.0									
2024	04	25	74	47		T				0.0									
2024	04	26	84	54		0.25		0.0		0.0									
2024	04	27																	
2024	04	28																	
2024	04	29																	
2024	04	30																	
Summary			70	50		2.63		0.0											

Empty, or blank, cells indicate that a data observation was not reported.

\*Ground Cover: 1=Grass; 2=Fallow; 3=Bare Ground; 4=Brome grass; 5=Sod; 6=Straw mulch; 7=Grass muck; 8=Bare muck; 0=Unknown

"s" This data value failed one of NCEI's quality control tests. "At Obs." = Temperature at time of observation

"T" values in the Precipitation or Snow category above indicate a "trace" value was recorded.

"A" values in the Precipitation Flag or the Snow Flag column indicate a multiday total, accumulated since last measurement, is being used.

Data value inconsistency may be present due to rounding calculations during the conversion process from SI metric units to standard imperial units.

## Record of Climatological Observations

**These data are quality controlled and may not be identical to the original observations.**

Current Location: Elev: 587 ft. Lat: 36.1105° N Lon: 86.6882° W

Generated on 05/28/2024

Observation Time Temperature: Unknown Observation Time Precipitation: 2400

Station: **NASHVILLE INTERNATIONAL AIRPORT, TN US USW00013897**

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		"Soil Temperature (F)"						
			"24 Hrs. Ending at Observation Time"		At Obs.	24 Hour Amounts Ending at Observation Time				At Obs. Time	24 Hour Wind Movement (mi)	Amount of Evap. (in)	4 in. Depth			8 in. Depth			
			Max.	Min.		Rain, Melted Snow, Etc. (in)	F l a g	Snow, Ice Pellets, Hail (in)	F l a g				Snow, Ice Pellets, Hail, Ice on Ground (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2024	05	01	87	58		0.00		0.0		0.0									
2024	05	02	87	62		0.00		0.0		0.0									
2024	05	03	81	68		0.28		0.0		0.0									
2024	05	04	77	65		0.82		0.0		0.0									
2024	05	05	85	63		0.00		0.0		0.0									
2024	05	06	81	67		0.54		0.0		0.0									
2024	05	07	82	65		0.03		0.0		0.0									
2024	05	08	82	68		0.63		0.0		0.0									
2024	05	09	84	65		1.70		0.0		0.0									
2024	05	10	71	53		0.00		0.0		0.0									
2024	05	11	80	50		0.00		0.0		0.0									
2024	05	12	81	50		0.00		0.0		0.0									
2024	05	13	72	59		0.02		0.0		0.0									
2024	05	14	78	59		0.73		0.0		0.0									
2024	05	15	77	59		0.03		0.0		0.0									
2024	05	16	82	61		0.00		0.0		0.0									
2024	05	17	73	66		0.06		0.0		0.0									
2024	05	18	79	66		T		0.0		0.0									
2024	05	19	88	63		0.00		0.0		0.0									
2024	05	20	91	64		0.00		0.0		0.0									
2024	05	21	90	67		0.00		0.0		0.0									
2024	05	22	87	66		0.66		0.0		0.0									
2024	05	23	86	66		0.05		0.0		0.0									
2024	05	24	77	67		T		0.0		0.0									
2024	05	25																	
2024	05	26																	
2024	05	27																	
2024	05	28																	
2024	05	29																	
2024	05	30																	
2024	05	31																	
Summary			78	60		5.55		0.0											

Empty, or blank, cells indicate that a data observation was not reported.

\*Ground Cover: 1=Grass; 2=Fallow; 3=Bare Ground; 4=Brome grass; 5=Sod; 6=Straw mulch; 7=Grass muck; 8=Bare muck; 0=Unknown

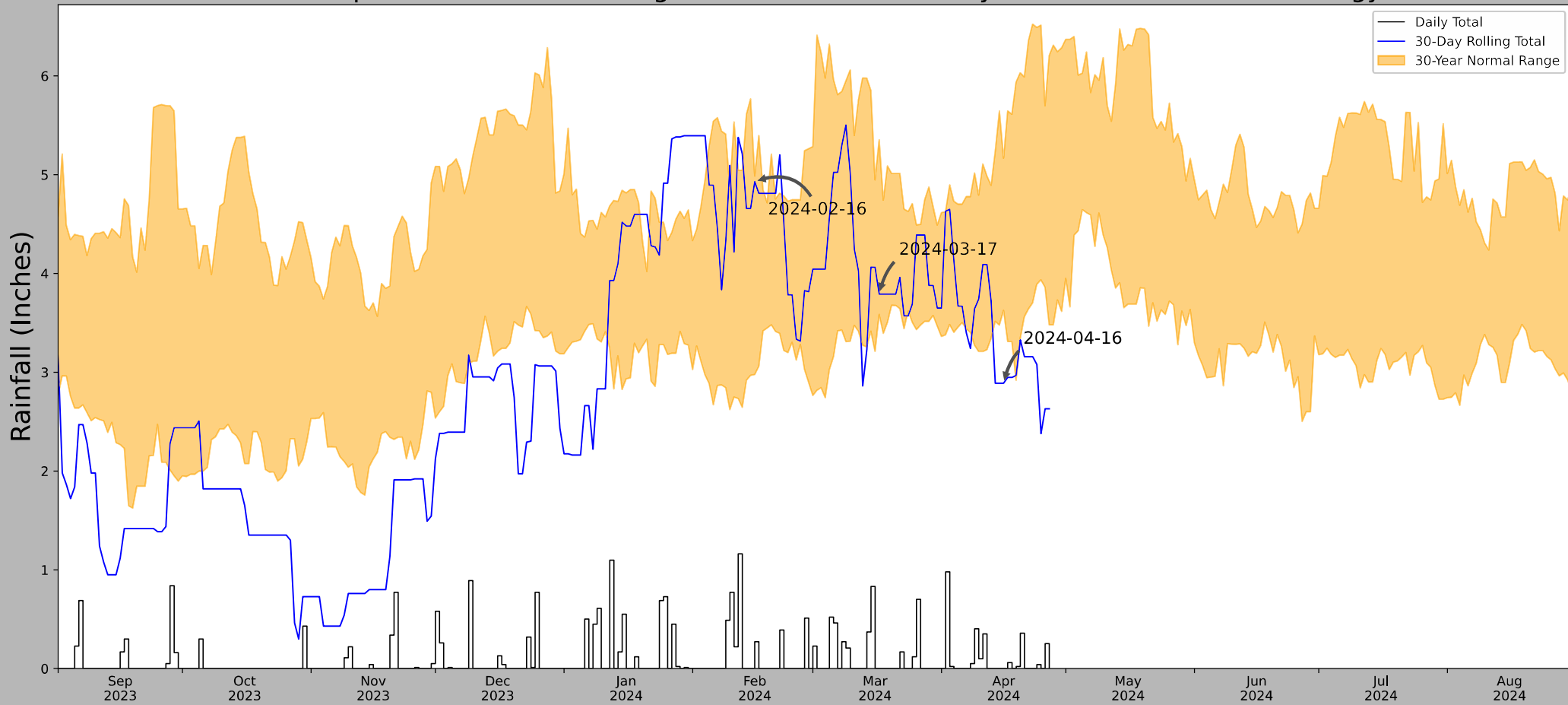
"s" This data value failed one of NCEI's quality control tests. "At Obs." = Temperature at time of observation

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"A" values in the Precipitation Flag or the Snow Flag column indicate a multiday total, accumulated since last measurement, is being used.

Data value inconsistency may be present due to rounding calculations during the conversion process from SI metric units to standard imperial units.

# Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	36.131848, -86.675195
Observation Date	2024-04-16
Elevation (ft)	494.898
Drought Index (PDSI)	Moderate drought (2024-03)
WebWIMP H <sub>2</sub> O Balance	Wet Season

30 Days Ending	30 <sup>th</sup> %ile (in)	70 <sup>th</sup> %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-04-16	3.625984	5.166536	2.889764	Dry	1	3	3
2024-03-17	3.584646	5.353543	3.791339	Normal	2	2	4
2024-02-16	2.976772	4.986614	4.929134	Normal	2	1	2
Result							Drier than Normal - 9

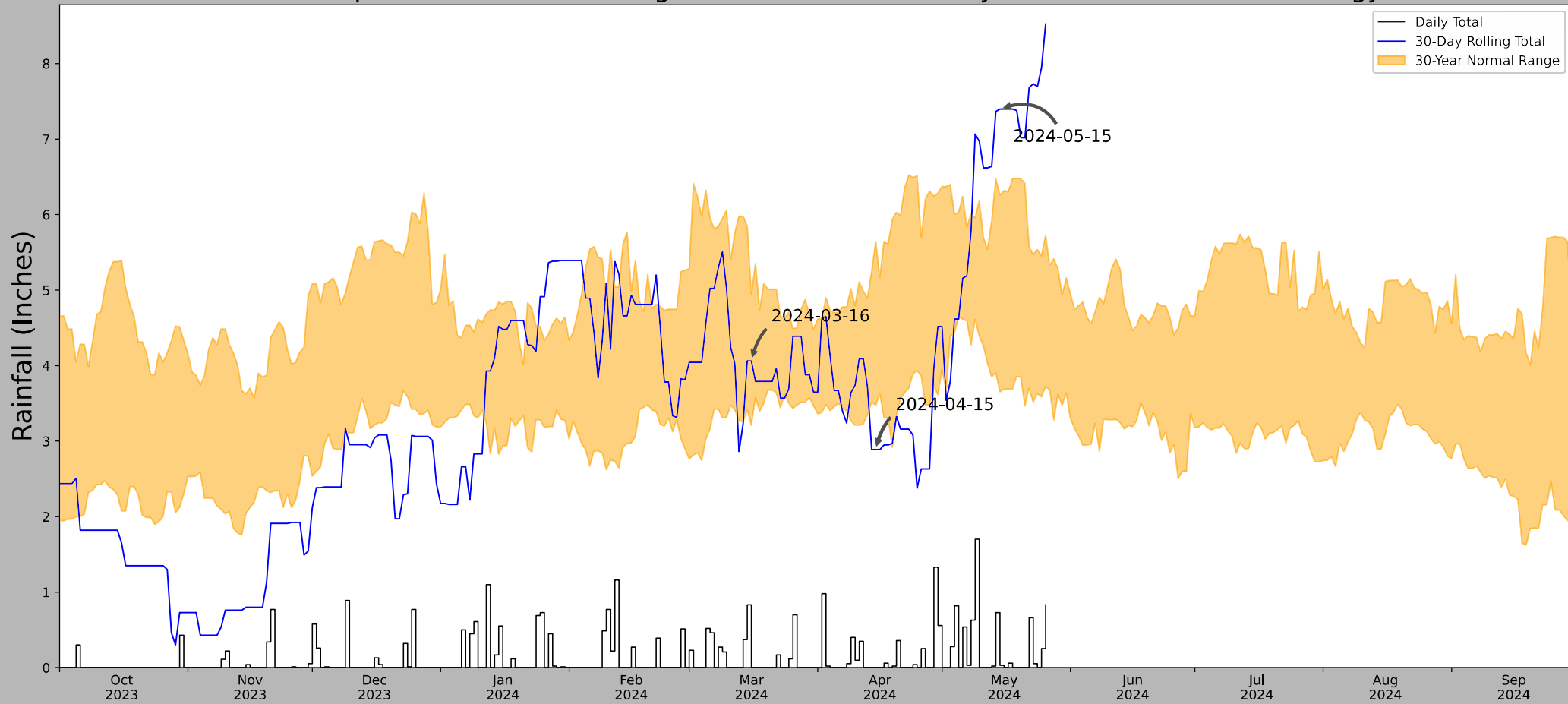


Figure and tables made by the  
**Antecedent Precipitation Tool**  
Version 1.0

Written by Jason Deters  
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
NASHVILLE INTL AP	36.1106, -86.6881	586.942	1.635	92.044	0.886	11350	90
NASHVILLE BERRY FLD	36.1136, -86.6781	560.039	0.595	26.903	0.284	2	0

# Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	36.131848, -86.675195
Observation Date	2024-05-15
Elevation (ft)	494.898
Drought Index (PDSI)	Moderate drought (2024-04)
WebWIMP H <sub>2</sub> O Balance	Wet Season

30 Days Ending	30 <sup>th</sup> %ile (in)	70 <sup>th</sup> %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-05-15	3.653543	6.261418	7.397638	Wet	3	3	9
2024-04-15	3.477165	5.644488	2.889764	Dry	1	2	2
2024-03-16	3.21063	4.948032	4.062992	Normal	2	1	2
Result							Normal Conditions - 13



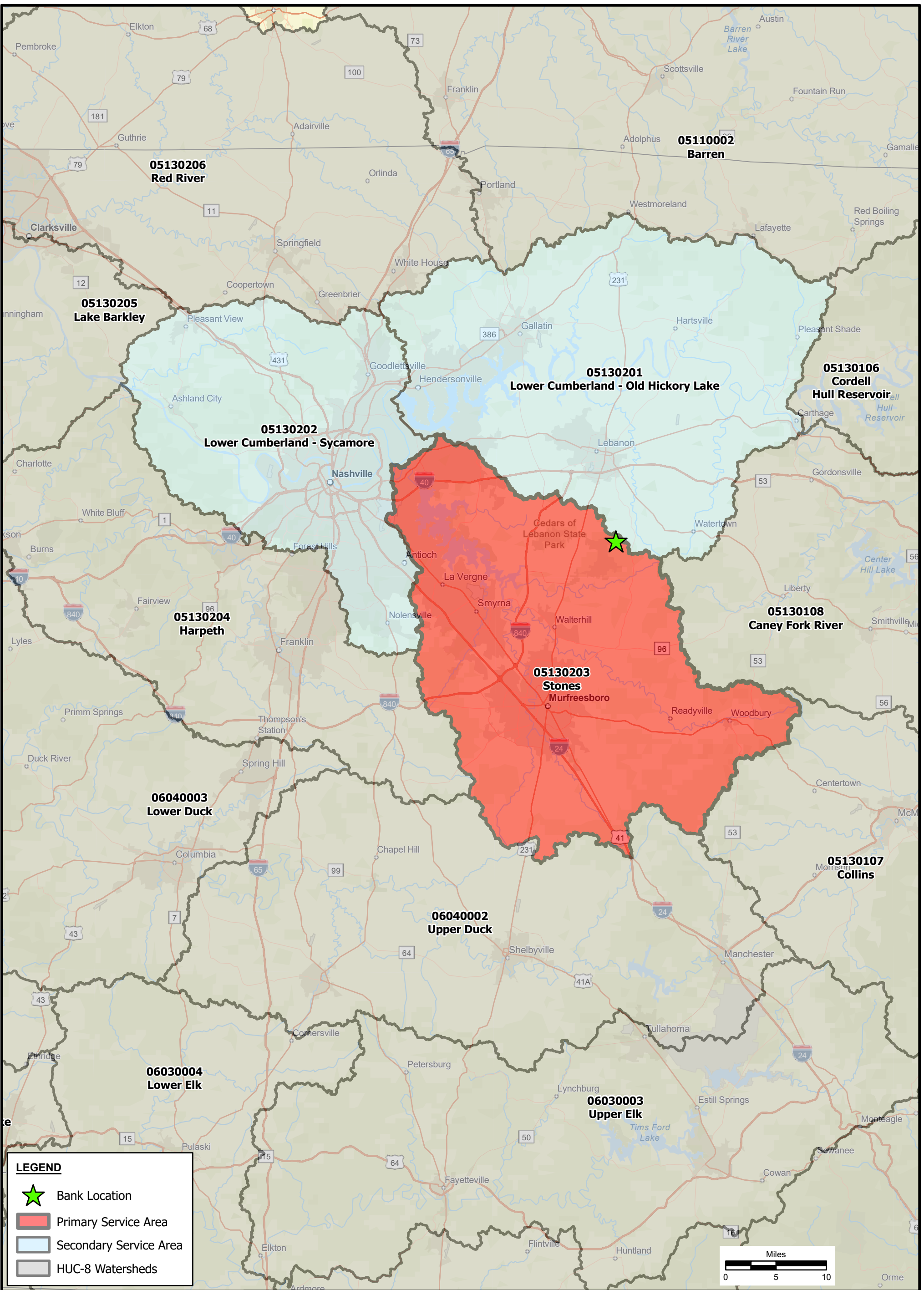
Figure and tables made by the  
Antecedent Precipitation Tool  
Version 1.0

Written by Jason Deters  
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Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
NASHVILLE INTL AP	36.1106, -86.6881	586.942	1.635	92.044	0.886	11350	90
NASHVILLE BERRY FLD	36.1136, -86.6781	560.039	0.595	26.903	0.284	2	0







# Appendix E

## BNA Terminal Area Forecast

# APO TERMINAL AREA FORECAST DETAIL REPORT

## Forecast Issued January 2024

BNA

### AIRCRAFT OPERATIONS

Fiscal Year	Enplanements			Itinerant Operations					Local Operations			Total Ops	Total Tracon Ops	Based Aircraft
	Air Carrier	Commuter	Total	Air Carrier	Air Taxi & Commuter	GA	Military	Total	Civil	Military	Total			
<b>REGION:ASO STATE:TN LOCID:BNA</b>														
<b>CITY:NASHVILLE AIRPORT:NASHVILLE INTL</b>														
2023*	10,093,827	894,060	10,987,887	197,741	31,222	34,903	2,458	266,324	0	0	0	266,324	389,328	109
2024*	11,008,750	943,280	11,952,030	210,583	31,748	37,021	2,458	281,810	0	0	0	281,810	407,299	112
2025*	11,241,534	963,591	12,205,125	214,826	31,977	37,359	2,458	286,620	0	0	0	286,620	413,921	115
2026*	11,549,287	990,797	12,540,084	220,825	32,131	37,700	2,458	293,114	0	0	0	293,114	421,739	118
2027*	11,868,044	1,019,175	12,887,219	226,580	32,406	38,044	2,458	299,488	0	0	0	299,488	429,488	121
2028*	12,204,404	1,048,933	13,253,337	232,427	32,737	38,391	2,458	306,013	0	0	0	306,013	436,817	124
2029*	12,531,508	1,077,914	13,609,422	238,077	33,071	38,742	2,458	312,348	0	0	0	312,348	443,946	127
2030*	12,857,052	1,106,712	13,963,764	243,669	33,408	39,095	2,458	318,630	0	0	0	318,630	451,019	130
2031*	13,184,075	1,135,628	14,319,703	249,269	33,748	39,452	2,458	324,927	0	0	0	324,927	458,113	133
2032*	13,517,899	1,165,094	14,682,993	254,970	34,091	39,813	2,458	331,332	0	0	0	331,332	465,321	136
2033*	13,853,199	1,194,638	15,047,837	260,673	34,438	40,176	2,458	337,745	0	0	0	337,745	472,545	139
2034*	14,188,035	1,224,088	15,412,123	266,342	34,788	40,543	2,458	344,131	0	0	0	344,131	479,745	142
2035*	14,534,114	1,254,500	15,788,614	272,196	35,142	40,913	2,458	350,709	0	0	0	350,709	487,151	145
2036*	14,892,248	1,285,916	16,178,164	278,251	35,500	41,287	2,458	357,496	0	0	0	357,496	494,776	148
2037*	15,258,646	1,317,934	16,576,580	284,430	35,861	41,664	2,458	364,413	0	0	0	364,413	502,537	151
2038*	15,624,957	1,349,948	16,974,905	290,587	36,226	42,044	2,458	371,315	0	0	0	371,315	510,288	154
2039*	16,002,972	1,382,939	17,385,911	296,935	36,595	42,428	2,458	378,416	0	0	0	378,416	518,247	157
2040*	16,395,787	1,417,176	17,812,963	303,530	36,968	42,815	2,458	385,771	0	0	0	385,771	526,470	161
2041*	16,783,405	1,450,881	18,234,286	310,007	37,344	43,206	2,458	393,015	0	0	0	393,015	534,588	165
2042*	17,191,349	1,486,330	18,677,679	316,832	37,724	43,601	2,458	400,615	0	0	0	400,615	543,076	169
2043*	17,606,368	1,522,314	19,128,682	323,760	38,108	43,999	2,458	408,325	0	0	0	408,325	551,678	173
2044*	18,023,544	1,558,469	19,582,013	330,703	38,496	44,400	2,458	416,057	0	0	0	416,057	560,306	177
2045*	18,443,894	1,594,880	20,038,774	337,681	38,888	44,806	2,458	423,833	0	0	0	423,833	568,982	181
2046*	18,867,915	1,631,596	20,499,511	344,703	39,284	45,215	2,458	431,660	0	0	0	431,660	577,716	185
2047*	19,304,599	1,669,395	20,973,994	351,933	39,684	45,628	2,458	439,703	0	0	0	439,703	586,675	189
2048*	19,750,272	1,707,871	21,458,143	359,296	40,088	46,044	2,458	447,886	0	0	0	447,886	595,780	193
2049*	20,208,360	1,747,386	21,955,746	366,860	40,496	46,465	2,458	456,279	0	0	0	456,279	605,108	197
2050*	20,680,092	1,788,060	22,468,152	374,646	40,909	46,889	2,458	464,902	0	0	0	464,902	614,680	202