

Chapter 4

Environmental Consequences and Mitigation

4.1 Introduction

Chapter 4, *Environmental Consequences and Mitigation*, outlines the analysis and evaluation of potential environmental impacts associated with Alternative 2 (referred to as the Preferred Alternative), Alternative 4, and Alternative 5 in comparison with the No Action Alternative. Information on the regulatory setting and special purpose laws, if applicable, is also provided.

FAA Order 1050.1G, *National Environmental Policy Act Implementing Procedures* and the 1050.1 Desk Reference (Version 3, February 2020) establish significance thresholds for several environmental categories.

The subsequent sections present the regulatory context, applicable significance thresholds, and the environmental consequences associated with each resource affected by the Preferred Alternative, Alternatives 4 and 5, and the No Action Alternative. If applicable, any alternative that has significant environmental impacts include corresponding mitigation measures.

As described in **Chapter 3**, *Affected Environment*, certain resource categories are not relevant to the Proposed Action. As a result, the following categories do not require further analysis and are therefore omitted from this chapter:

- Coastal Resources
- Department of Transportation, Section 4(f) and Section 6(f)
- Farmlands
- Land Use
- Natural Resources and Energy Supply
- Visual Effects

*The following figures and supporting documents for Chapter 4 can be found in **Appendix D**.*

- Appendix D1 – Air Quality and Noise Report
- Appendix D2 – USFWS IPaC Report
- Appendix D2.2 – ADCNR Correspondence Letter
- Appendix D2.3 – Aquatic Resource Survey
- Appendix D2.4 – Biological Assessment
- Appendix D2.5 – USFWS Correspondence Letter
- Appendix D3 – Asbestos Report
- Appendix D3.2 – Phase I ESA
- Appendix D3.3 – Phase II ESA
- Appendix D3.4 – ADEM Official Response Letter
- Appendix D4 – Architecture/History Report
- Appendix D4.2 – AL Historic Commission Concurrence Letter

- Appendix D4.3 – Tribal Notification Letters
- Appendix D5 – Aquatic Resource Delineation Report

4.2 Aviation Emissions and Air Quality

As defined by the 1050.1 Desk Reference, air quality is defined as “the measure of the condition of the air expressed in terms of ambient pollutant concentrations and their temporal and spatial distribution.” Air quality regulations in the United States strive to mitigate the adverse impacts of high air pollutant concentrations and protect human health, particularly those of vulnerable populations such as children, the elderly, and individuals with pre-existing health conditions.

4.2.1 Regulatory Setting

Under the Clean Air Act (CAA), the U.S. Environmental Protection Agency (EPA) developed the National Ambient Air Quality Standards (NAAQS) which includes six (6) criteria air pollutants. The criteria air pollutants are carbon monoxide (CO), nitrogen dioxide (NO₂), Ozone (O₃), particulate matter (PM), sulfur dioxide (SO₂), and lead (Pb). Two different sizes of PM are included in the NAAQS, PM₁₀ and PM_{2.5}⁴. The EPA has identified these six criteria air pollutants to be harmful to human health, the environment, and have the potential to cause property damage. The following statute relates to the protection of air quality, as established by the NAAQS and regulated by the EPA.

4.2.1.1 Clean Air Act

The Clean Air Act (CAA) is governed by the EPA and regulates air pollutants from stationary and mobile sources. The CAA authorizes the EPA to develop, maintain, and regulate the NAAQS and Hazardous Air Pollutants (HAP). The NAAQS apply to all geographies within the United States and establish designations for areas with various concentrations of pollutant levels. These classifications include *nonattainment* areas, which are regions where ambient air quality exceeds the NAAQS; *maintenance* areas, which are former nonattainment regions that have achieved and currently maintain pollutant levels below NAAQS thresholds; and *attainment* areas, where ambient concentrations of criteria air pollutants consistently remain below established NAAQS thresholds. Federal actions anticipated to occur in either *nonattainment* or *maintenance* areas must comply with the conditions listed under General Conformity⁵.

Under Section 176(c) of the CAA, federal agencies are prohibited from participating in, funding, or otherwise authorizing any project, through the licensing, permitting, or other approvals, that could cause or increase the severity and/or number of violations of the NAAQS, or delay efforts to promptly meet these standards (US EPA 1993).

⁴ PM₁₀ is coarse particles which have a diameter smaller than 10 micrometers and PM_{2.5} are fine particles which have a diameter smaller than 2.5 micrometers.

⁵ General Conformity analysis procedures contain detailed technical requirements for demonstrating how an action would conform to the applicable implementation plan (see 40 CFR § 93.159).

4.2.2 Significant Impact Threshold

The 1050.1 Desk Reference describes the threshold of significance for Aviation Emissions and Air Quality. A significant impact to air quality would occur if the action “would cause pollutant concentrations to exceed one or more of the NAAQS, as established by the EPA under the CAA, for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations.”

4.2.3 Analysis of Air Quality

An *Aviation Emissions and Air Quality and Noise Technical Report* was conducted in July 2025. The Report evaluated the potential emissions and noise impacts from aircraft, stationary sources, and “general access vehicles” under Alternatives 2 and 4. Using the analysis from Alternatives 2 and 4, impacts from Alternative 5 have been inferred.

The Airport is located in Jefferson County, Alabama. Jefferson County is designated by the EPA as *in attainment* for all criteria air pollutants except for 2006 PM_{2.5}, which is designated as *in maintenance*⁶. An area of Jefferson County was previously considered as *nonattainment* for lead pollution but is now considered *in attainment*⁷. As a result, a General Conformity analysis is required for the construction emission pollutants for PM_{2.5} for the Proposed Action. General Conformity demonstrates that a project will align with the State Implementation Plan (SIP) purpose and help eliminate/reduce NAAQS violations. *De minimis* thresholds, determined by the EPA, are used to assess the significant impacts for the *in attainment* criteria pollutants under NEPA.

Construction-related emissions, including volatile organic compounds (VOCs) from on-road vehicles (e.g., supply deliveries, labor commute, etc.), nonroad equipment (e.g., demolition, grading, and milling and paving, etc.), and fugitive dust emissions (e.g., land clearing, asphalt paving, etc.) are estimated for each phase of Alternative 2 and Alternative 4. Emission analysis is based on type of construction activity, number and types of equipment, activity levels, construction start and end dates, and project footprints. As described in the *Aviation Emissions and Air Quality and Noise Technical Report*, the Airport Construction Emission Inventory Tool (ACEIT) was used to generate an annual construction schedule for each activity. Additionally, the Motor Vehicle Emissions Simulator Version 5 (MOVES5) was used to generate off-road and on-road emission factors for Jefferson County. Emission estimates from construction activities were assessed using standard industry methods, including the *FAA Aviation Emissions and Air Quality Handbook Version 4* (FAA Handbook Version 4; FAA 2024) and associated US EPA Guidance.

The *Aviation Emissions and Air Quality and Noise Technical Report* concluded that the demolition and construction activities associated with the Proposed Action will be below *de*

⁶ US EPA. 2025. Green Book: Current Nonattainment Counties for All Criteria Pollutants. US EPA. <https://www.epa.gov/green-book>.

⁷ US EPA. 1995. Clean Air Act Approval and Promulgation of Redesignation of the Leeds Area of Jefferson County, Alabama, to Attainment for Lead. 40 CFR 52 and 81. <https://www.govinfo.gov/content/pkg/FR-1995-01-06/pdf/95-284.pdf#page=1>.

minimis thresholds for all air quality criteria pollutants over a five-year construction period from 2027 – 2031. The following sections discuss the potential impacts of each alternative in detail as they relate to Aviation Emissions and Air Quality.

4.2.4 Environmental Consequences

4.2.4.1 Alternative 2 (Preferred Alternative) and Alternative 4

Alternative 2 and Alternative 4 are not anticipated to result in changes to aircraft operations. Stated another way, the future aircraft operations at BHM both with and without the Proposed Action are expected to be exactly the same. Therefore, no changes to aviation emissions or air quality are expected. Runway and taxiway separation improvements associated with each Alternative (2 and 4) will not have adverse impacts on local air quality. As there are no significant impacts to air quality from the Alternatives assessed, construction emission mitigation measures will not be required. However, the Airport remains committed to best management practices (BMPs) (e.g., dust suppression, maintaining construction vehicles, limited engine idling, etc.) to alleviate impacts from construction. The projected emissions associated with construction are significantly less than the EPA *de minimis* threshold for each criteria pollutant.

4.2.4.2 Alternative 5

Alternative 5, the proposed hybrid alternative, is not anticipated to result in changes to aircraft operations; therefore, no changes to aviation emissions or air quality are expected. Runway and taxiway separation improvements associated with Alternative 5 will not have adverse impacts on local air quality. As there are no significant impacts to air quality from Alternative 5, construction emission mitigation measures will not be required. However, the Airport remains committed to best management practices (BMPs) (e.g., dust suppression, maintaining construction vehicles, limited engine idling, etc.) to alleviate impacts from construction. Construction emissions are anticipated to be comparable to those of Alternatives 2 and 4, remaining below the EPA *de minimis* thresholds.

4.2.4.3 No Action Alternative

The No Action Alternative will result in the airfield configuration remaining as is. The need to meet FAA design standards will not be addressed. The No Action Alternative will leave the project area mostly unchanged, except for minor construction to correct non-standard taxiway connectors. Construction emissions related to the No Action Alternative will be significantly less than Alternatives 2, 4, and 5 and will still be below the EPA *de minimis* thresholds, therefore resulting in no adverse impacts on air quality.

4.3 Biological Resources

The 1050.1 Desk Reference defines biological resources as “resources that are valued for their intrinsic, aesthetic, economic, and recreational qualities and include fish, wildlife, plants, and their respective habitats.” Various biological resources exist including aquatic plant and animal species, game and non-game species, special status species (state or federally listed threatened/endangered species), and environmentally sensitive or critical

habitats. The *Biological Resources Section* addresses potential impacts to any biological resource from the Proposed Action.

4.3.1 Regulatory Environment

Regulations that govern biological resources are designed to ensure the protection and conservation of ecosystems, species, and habitats. There are federal, state, and local regulations that require mitigation to adverse impacts from proposed federal actions. The subsequent sections describe the applicable regulations as they relate to biological resources for the Proposed Action.

4.3.1.1 Endangered Species Act

The primary federal regulation for biological resources is the Endangered Species Act (ESA), 16 USC § 1531-1544, administered by the U.S. Fish and Wildlife Service (USFWS). The ESA requires all federal agencies to conserve threatened and endangered species, and coordinate with the USFWS to ensure federal actions do not jeopardize the existence or destroy critical habitats of threatened or endangered species. Coordination for species and habitats of concern is administered under Section 7 of the ESA. Section 7 requires federal agencies to consult with USFWS and appropriate state fish and wildlife agencies when a federal project may adversely affect fish or wildlife resources.

On a state level, Alabama's Endangered Species Act and associated guidance impose a variety of restrictions, a permit program, and several exemptions pertaining to species designated as threatened or endangered. A person may not take, import, transport, or sell any portion of an endangered or threatened species.

4.3.1.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act, 16 USC § 703-712, administered by the USFWS, prohibits taking, selling, and other activities that harm migratory birds, bird eggs, or nests unless authorized by a special USFWS permit. In addition, the Bald and Golden Eagle Protection Act, 16 USC § 668-668d, provides protection to eagles and nests from unauthorized capture, purchase, or transport.

4.3.2 Significant Impact Threshold

According to the 1050.1 Desk Reference, a significant impact would occur if the USFWS determines that the Proposed Action would jeopardize federally listed threatened or endangered species or would result in adverse impacts to a federally designated critical habitat. The FAA has not established significance thresholds for non-listed species. The 1050.1 Desk Reference provides additional considerations for evaluating potential impacts to biological resources from federal actions including: a long-term or permanent loss of unlisted plant or wildlife species, adverse impacts to special status species, substantial losses, disturbances, degradation, or a reduction in a native species' habitat or populations; and adverse impacts to a species' ability to successfully reproduce or otherwise have non-natural mortality.

4.3.3 Analysis of Biological Resources

The analysis of biological resources identifies potential impacts from the Proposed Action to biological resources such as vegetation, threatened and endangered species, and environmentally sensitive and critical habitats.

The USFWS Information for Planning and Consultation (IPaC) tool was used to generate a list of federally protected species and critical habitats that may be within the proposed project area. An early coordination letter was submitted to USFWS requesting information on protected species that may be found within the proposed project area. **Table 4-1** summarizes the listed species that may occur within the proposed project area, which was derived from IPaC and consultation with USFWS. No critical habitats were identified within the proposed project area.

TABLE 4-1
FEDERALLY PROTECTED SPECIES LIST

Common Name	Scientific Name	Status
Gray Bat	<i>Myotis grisescens</i>	Endangered
Indiana Bat	<i>Myotis sodalist</i>	Endangered
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Endangered
Tri-colored Bat	<i>Perimyotis subflavus</i>	Proposed Endangered
Alligator Snapping Turtle	<i>Macrochelys temminckii</i>	Proposed Threatened
Flattened Musk Turtle	<i>Sternotherus depressus</i>	Threatened
Black Warrior Waterdog	<i>Necturus alabamensis</i>	Endangered
Rush Darter	<i>Etheostoma phytophilum</i>	Endangered
Watercress Darter	<i>Etheostoma nuchale</i>	Endangered
Ovate Clubshell	<i>Pleurobema perovatum</i>	Endangered
Monarch Butterfly	<i>Danaus plexippus</i>	Proposed Threatened

Source: Volkert, 2025

Common bird species that may occur at airports and are protected under the Migratory Bird Treaty Act include American crows (*Corvus branchyhyrnchos*), killdeer (*Charadrius vociferus*), mourning doves (*Zenaida macroura*), and eastern meadowlarks (*Sturnella magna*). These species use grassy areas for ground foraging. Common terrestrial animal species that may occur at airports in an urban setting include Virginia opossum (*Didelphis virginiana*), racoon (*Procyon lotor*), and armadillo (*Dasypus novemcinctus*). These species are very common throughout the area surrounding the Airport.

The Alabama Department of Conservation and Natural Resources (ADCNR) was solicited for comments and recommendations on the Proposed Action. The ADCNR's records indicate that the tri-colored bat (*Perimyotis subflavus*), the state and federally protected watercress darter, and the state protected Brazilian free-tailed bat (*Tadarida brasiliensis*) are known to occur within three miles of the proposed project area, primarily in nearby springs and karst habitats. The ADCNR also stated that state and federally protected aquatic species in Jefferson County are highly sensitive to runoff, erosion, and sedimentation from disturbed soils.

4.3.3.1 Vegetation

The Airport is in a highly urban area. The entire study area has been historically developed and/or disturbed. The study area can be characterized by permanent or semi-permanent structures, pavement or hardscape, and maintained landscaped areas.

Existing vegetation in the study area is dominated by mowed and maintained grasses such as Bermuda grass (*Cynodon dactylon*) and Bahia grass (*Paspalum notatum*). Small sections of forested upland areas are characterized by successional hardwood forests and consist of hackberry (*Celtis occidentalis*), pignut hickory (*Carya glabra*), and hop-hornbeam (*Ostrya virginiana*). Emergent wetland areas are mostly composed of various sedge species (*Carex* sp.) and wetland tolerant dallis grass (*Paspalum dilatatum*). Pockets of forested wetland areas contain obligate and facultative wetland species such as cattails (*Typha latifolia*), black willow (*Salix nigra*), and water hickory (*Carya aquatica*). Various invasive species scattered throughout the site include Chinese privet (*Ligustrum sinense*), mimosa tree (*Albizia julibrissin*), and kudzu (*Pueraria montana*).

No state or federal listed plant species were identified in the proposed project area by the USFWS or ADCNR.

4.3.3.2 Wildlife / Threatened and Endangered Species

Field evaluations were conducted by qualified biologists in May and July 2025 to identify potentially suitable habitat or ESA protected species. A Biological Assessment (BA) was prepared for and coordinated with the USFWS via email on August 18, 2025. The BA found, and the FAA determined, that the proposed project will have “No Effect” on the gray bat, Indiana bat, northern long-eared bat, flattened musk turtle, Black Warrior waterdog, rush darter, ovate clubshell, and monarch butterfly. However, the proposed project “May Affect but is Not Likely to Adversely Affect” the tri-colored bat, alligator snapping turtle and watercress darter. The USFWS concurred with the BA findings on September 23, 2025.

4.3.3.3 Environmentally Sensitive and Critical Habitats

There are no federal or state listed critical habitats within the proposed project area. However, according to the ADCNR, aquatic habitats in Jefferson County are highly sensitive to runoff, erosion, and sedimentation from ground disturbance.

4.3.4 Environmental Consequences

4.3.4.1 Alternative 2 (Preferred Alternative), Alternative 4, and Alternative 5

Because Village Creek is proposed to be relocated in the same location for Alternatives 2, 4, and 5, the impacts to biological resources will be the same. The primary difference between alternatives is the separation distance of Taxiway A: 400’ separation for Alternative 2, 500’ separation for Alternative 4, and a hybrid 400/500’ separation for Alternative 5. Even though the disturbance footprint is slightly different (approximately 100’) between alternatives, this will occur on previously disturbed areas and there will be no significant differences to impacts. Therefore, analysis for Alternatives 2, 4, and 5 are combined.

Vegetation

There are no rare or unique plant communities present in the proposed project area. No federal or state protected plant species occur within the proposed project area.

The Proposed Action will disturb approximately 47.4 acres of upland grasses, 2.2 acres of upland forests, and 0.9 acres of emergent wetlands. Once construction is complete, all bare disturbed areas will be permanently stabilized with native grass suitable for use at an airport.

Significant impacts to vegetation are not anticipated from the proposed action.

Wildlife/Threatened and Endangered Species

The USFWS reported that the watercress darter can be found in the segment of Village Creek within the study area during the colder months. The FAA determined, and the USFWS agreed, that the Proposed Action “May Affect but is Not Likely to Adversely Affect” the watercress darter if a conservation measure limiting in-stream work is implemented. The FAA also determined that if conservation measures for tree clearing are implemented the Proposed Action “May Affect but is Not Likely to Adversely Affect” the tri-colored bat. The USFWS concurred with this determination on September 23, 2025 (see **Appendix D**).

Significant impacts to wildlife/threatened and endangered species are not anticipated from the Proposed Action. This determination was made based on coordination with USFWS and the planned implementation of conservation measures during project construction.

Environmentally Sensitive and Critical Habitats

The Proposed Action will disturb approximately 122 acres of land during construction. There are no federal or state designated critical habitats within the proposed project area; however, according to ADCNR, state and federally protected aquatic species in Jefferson County are highly sensitive to runoff, erosion and sedimentation from ground disturbance. A site-specific Construction Best Management Practices Plan (CBMPP) will be developed and implemented prior to, during, and post construction to minimize impacts on protected aquatic species.

Significant impacts to environmentally sensitive and critical habitats are not anticipated from the Proposed Action.

4.3.4.2 No Action Alternative

The No Action Alternative will result in the airfield configuration remaining as it is today, and the need to meet FAA design standards will not be addressed. There will be no impacts to biological resources including vegetation, wildlife/threatened and endangered species, or environmentally sensitive and critical habitat. No further analysis will be necessary and mitigation efforts will not be required.

4.3.5 Mitigation of Biological Resources Impacts

4.3.5.1 Vegetation

There are no protected or sensitive plant species located within the proposed project area; therefore, mitigation will not be required.

4.3.5.2 Wildlife / Threatened and Endangered Species

To minimize adverse impacts to the watercress darter, no in-stream construction activities will occur between November 1st and March 31st (throughout the project duration). If this conservation measure cannot be implemented, coordination with the USFWS will be conducted.

No tree clearing will occur during the pup season (May 15th to July 31st) for the tri-colored bat. If this conservation measure cannot be implemented, coordination with the USFWS will be conducted.

4.3.5.3 Environmentally Sensitive and Critical Habitat

BMPs will be implemented before, during, and after construction to minimize runoff, erosion, and sedimentation into aquatic habitats.

4.4 Hazardous Materials, Solid Waste, and Pollution Prevention

The 1050.1 Desk Reference defines hazardous materials as "any substance or material that has been determined to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce." Solid waste is defined as "any discarded material that meets specific regulatory requirements, including items such as refuse, scrap metal, spent materials, chemical by-products, and sludge." Section 4.4.3 examines the hazardous material(s) that may be used during the construction or operational phases of the Proposed Action. The analysis in this section addresses solid waste and pollution prevention, describing anticipated waste materials to be discarded at the project site and the measures taken to avoid, prevent, and minimize pollutant discharges or emissions.

4.4.1 Regulatory Environment

The 1050.1 Desk Reference states that the EPA is the federal authority tasked with ensuring the compliance and enforcement of hazardous substance regulations. The following federal and state statutes described below address hazardous materials, solid waste, and pollution prevention as part of NEPA requirements.

4.4.1.1 Comprehensive Environmental Response, Compensation and Liability Act

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), administered by the EPA, holds responsible parties liable for hazardous substance releases and mandates that they pay cleanup and remediation costs. CERCLA has established a fund for cleanup when no responsible party can be identified. Additionally, CERCLA has established the National Priority List (NPL) to guide the EPA in determining which contaminated sites with known or potential hazardous releases require further investigation.

4.4.1.2 Pollution Prevention Act

The Pollution Prevention Act (PPA) is governed by the EPA. The PPA is designed to prevent pollution and reduce criteria pollutants, resulting in minimal to no adverse environmental impacts from hazardous and non-hazardous waste.

4.4.1.3 Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) regulates the creation, storage, treatment, and disposal of hazardous and non-hazardous solid waste in the U.S. The RCRA is designed to protect human health and the environment, conserve energy and natural resources, reduce the volume of waste generated, and ensure sustainable management of waste products.

4.4.1.4 Executive Order 12088, Federal Compliance with Pollution Control Standards

Executive Order (EO) 12088 requires federal agencies (e.g., the FAA) to comply with applicable pollution control standards and to coordinate with the EPA and relevant state and local agencies to determine the BMPs available in order to control, prevent, and abate pollution that is harmful to the environment. NEPA documents should disclose how federal agencies are complying with the applicable pollution control standards in order to meet the directions of this EO.

4.4.1.5 State Regulations

Within the State of Alabama, the Alabama Department of Environmental Management (ADEM) retains primary authority for the regulation, compliance, and enforcement of hazardous waste, solid waste, and pollution prevention policies. Coordination with the appropriate ADEM offices should occur to ensure compliance with relevant state regulations.

4.4.2 Significant Impact Threshold

The FAA has not defined a significant impact threshold for hazardous materials, solid waste, or pollution prevention. Key considerations include whether the Proposed Action may violate relevant federal, state, local, or tribal laws; create adverse impacts on human health or the environment; produce variable amounts or types of hazardous waste; or generate substantial quantities of hazardous materials or solid waste that would exceed local capacity thresholds. It is necessary to investigate the proposed project site for existing records of contamination, such as those listed on the EPA NPL, or sites undergoing remediation under the established federal programs. The Proposed Action must comply with applicable FAA orders or Advisory Circulars (AC) related to hazardous materials, solid waste, and pollution prevention.

4.4.3 Analysis of Hazardous Materials, Solid Waste, and Pollution Prevention

The Study Area for this environmental resource category matches the overall Study Area of the Proposed Action (see Figure C3 in Appendix C). The Study Area, along with the mappable listed hazardous materials sites, are depicted on Figure D3.3 found in Appendix D.

To maintain compliance with NEPA and the applicable state and federal guidance listed above, a limited asbestos survey and Phase I and II Environmental Site Assessments (ESA) were conducted with respect to hazardous and non-hazardous solid waste and pollution prevention as it relates to the Proposed Action.

The limited asbestos sampling survey was conducted by Slade Land Use, Environmental, and Transportation Planning in February 2025 to identify suspect asbestos materials that may be present in a structure within the proposed project area that will be demolished as part of the Proposed Action. Visual inspections and laboratory analysis were conducted using EPA's Bulk Analysis methodology to determine the presence of asbestos in the selected samples from the subject building. The asbestos sampling survey identified greater than one percent of asbestos being present in the various bulk-collected samples.

A Phase I ESA was conducted by BECC in December 2024 in an effort to identify the indication or likelihood of Recognized Environmental Conditions (RECs), Historical Recognized Environmental Conditions (HRECs) and/or Controlled Recognized Environmental Conditions (CRECs) as they relate to the proposed project area of the Proposed Action. The Phase I ESA consisted of the evaluation of an approximately 20-acre section along Village Creek on land adjacent to Taxiway A at the Airport. The findings from the Phase I ESA concluded that the historical use of the property and surrounding area for aircraft maintenance and service operations constitutes a REC. Historical uses included the generation and use of hazardous waste streams (i.e., solvents and paints). Previous tenants in this proposed project area have documented releases of regulated compounds and the existing tenant is a current and historical generator of hazardous waste in the form of solvents and paints, and petroleum products in the form of fuel and spent oil. In addition, land use controls placed on adjacent property to the south constitutes a CREC. The Phase I ESA did not identify any HRECs in connection with the area evaluated or in connection with the property in which the Proposed Action will occur. As a result of the identified RECs, the Phase I ESA recommended further investigation to establish and identify the impacts of historical operations. Additionally, the Phase I ESA noted that for any future property improvements involving excavation and removal of soil from these known contaminated areas, an investigation of the contaminants should occur to better understand the character of the material relative to its management and disposal in accounting for potential health and safety risk during its removal.

Due to the findings of the Phase I ESA, a Phase II ESA was conducted on July 24th, and July 25th, 2025. The Phase II ESA included the installation of 20 soil borings in various locations within the proposed project area. Personnel collected soil samples from each installation to assess the potential for Volatile Organic Compounds (VOCs) and Polycyclic Aromatic Hydrocarbons (PAHs), which are the potential contaminants most commonly found with historical use of the site. The Phase II ESA investigation was conducted in accordance with the American Society for Testing Materials (ASTM) Standard Practice E1902-19 and the ADEM Alabama Environmental Investigation & Remediation Guidance (AEIRG)⁸. Two (2) soil samples, E8 (1-5ft) and E14 (5-10ft) identified detectable concentrations of VOCs; however, none of the detectable concentrations were above the respective Regional Screening Levels (RSLs) for industrial soil. Five (5) soil samples, E1 (1-4ft), E5 (1-5ft), E11 (1-5ft), E15 (5-9ft),

⁸ Revised February 2017

and E19 (5-10ft) identified detectable concentrations of PAHs; however, none of the detectable concentrations were above their respective RSLs for industrial soil. Because the Phase II ESA concluded that the detectable concentrations of VOCs and PAHs were within the limits of their RSLs, impacts associated with Hazardous Materials are not anticipated as a result of the Proposed Action. The recommendations from the Phase II ESA identified that no further assessments of onsite soil are necessary during this phase.

During early agency coordination, ADEM provided a letter stating that a Site Inspection for per- and polyfluoroalkyl substances (PFAS) was conducted in 2019 for the Air National Guard (ANG) 117th Air Refueling Wing. The ANG is located on the north side of Airport property, outside of the proposed project area. The PFAS Site Inspection identified five potential release locations across the ANG base property, along with several off-base (on-airport) areas. One of the off-base, on-airport locations, the Fire Training Area, is located within the proposed project area. Given the information provided in the Site Inspection, ADEM stated that there is a potential for PFAS contamination to be present at the Airport; however, the nature and extent of PFAS contamination at the ANG has not been defined. Therefore, off-base migration of PFAS from the ANG base toward other Airport locations is possible.

4.4.4 Environmental Consequences

4.4.4.1 Alternative 2 (Preferred Alternative), Alternative 4, and Alternative 5

Because Village Creek is proposed to be relocated in the same location for Alternatives 2, 4, and 5, the primary impacts to hazardous materials, solid waste, and pollution prevention will be the same. The primary difference between alternatives is the separation distance of Taxiway A: 400' separation for Alternative 2, 500' separation for Alternative 4, and a hybrid 400/500' separation for Alternative 5. Even though the disturbance footprint is slightly different (approximately 100') between alternatives, this will occur on previously disturbed areas, the alternatives will require the demolition of the same buildings, and the amount of soil excavation will be similar; therefore, there will be no significant differences to impacts. Thus, analysis for Alternatives 2, 4, and 5 are combined.

The Preferred Alternative, Alternative 4, and Alternative 5 will require the demolition of two structures within the proposed project area and will require the excavation of soil to relocate Village Creek. The Phase I and II ESAs determined that VOCs and PAHs are below RSLs (i.e. below significance thresholds). The limited asbestos sampling survey found that one structure to be demolished contains greater than one percent of asbestos materials, which can be mitigated by following appropriate regulations. Asbestos testing on the secondary structure was not conducted because there is no reason to believe that asbestos or insulation materials are present within the structure. If a need for asbestos testing occurs, the recommendation is to test for asbestos during the beginning of the construction/demolition phase. Additionally, the Preferred Alternative, Alternative 4, and Alternative 5 have the possibility of encountering PFAS, which can be mitigated by following ADEM and other industry recommendations. Given these findings and following the appropriate mitigation measures as described in Section 4.4.5, impacts to hazardous

materials, solid waste, and pollution prevention will be below significance thresholds for the Preferred Alternative, Alternative 4, and Alternative 5.

4.4.4.2 No Action Alternative

The No Action Alternative will result in the airfield configuration remaining as is, and the need to meet FAA design standards will not be addressed. The No Action Alternative will not have the potential to generate hazardous waste, solid waste, or produce pollution. No further analysis is necessary, and mitigation efforts will not be required under this alternative.

4.4.5 Mitigation of Hazardous Materials, Solid Waste, and Pollution Prevention

More than one percent of asbestos material was identified in one of the structures within the proposed project area. This requires adherence to the Occupational Health and Safety Administration (OSHA) and the National Emission Standards for Hazardous Air Pollutants (NESHAPS) regulations (40 CFR Part 61, Subpart M) during demolition. Following these mitigation measures will protect the health and safety of construction workers and protect the environment from any asbestos impacts.

While the findings of the Phase II ESA do not require mitigation of VOCs or PAHs within excavated soil, it was recommended by ADEM to test for PFAS contamination in soils during the design phase. Testing for PFAS contamination before construction will allow for appropriate planning of mitigation measures that will be needed during construction. If PFAS is found within soils, ADEM recommends that any excavated soil stockpiled onsite be placed on impermeable materials and protected from wind and rainwater runoff to prevent migration of contamination. Further coordination with ADEM would be required to determine appropriate reuse and/or disposal methods of excavated soils.

4.5 Historical, Architectural, Archaeological, and Cultural Resources

The Historical, Architectural, Archaeological, and Cultural Resources category includes a variety of resources and sites, including properties and physical resources related to human activities, societies, and cultural institutions. According to the 1050.1 Desk Reference, “such resources include past and present expressions of human culture and history in the physical environment, such as prehistoric and historic archeological sites, structures, objects, and districts, which are considered important to a culture or community.” This resource category may also include traditional practices that are associated with certain community values and institutions.

4.5.1 Regulatory Environment

Numerous regulations exist relating to historical, architectural, archeological, and cultural resources. An exhaustive list of federal policies is listed in Appendix B.7 of the 1050.1 Desk Reference. The subsequent list of federal and state acts were considered in the analysis of this environmental category, if applicable:

4.5.1.1 Archeological and Historic Preservation Act

Under 54 U.S.C § 312501-312508, the National Park Service (NPS) Departmental Consulting Archeologist and Archeological Assistance Program (DCAAAP) provides oversight for the

preservation of historical and archeological data which may be lost or destroyed due to federal actions.

4.5.1.2 Historic Sites Act

The Historic Sites Act mandates the preservation of historic sites, objects, properties of national importance, and other related resources for public use. It forms the foundation for the National Historic Landmarks Program, granting the federal government power to conduct historical surveys, safeguard and maintain historic data, and acquire and protect archaeological and historic sites.

4.5.1.3 National Historic Preservation Act

According to Section 106 of the National Historic Preservation Act (NHPA), the FAA must assess impacts to properties listed on the National Register of Historic Places (NRHP) and collaborate with the relevant State Historic Preservation Office (SHPO) for any projects that have the potential to affect historic properties. It's important to note that NEPA and NHPA are separate and distinct acts, each with its own set of review processes. However, both require similar efforts regarding scoping and agency consultation.

4.5.1.4 State Regulations

The Alabama Historical Commission (AHC) functions as the SHPO for the state of Alabama. The AHC has specific duties throughout the Section 106 review process, including consulting on the Area of Potential Effect (APE) for a Proposed Action. According to the AHC, the agency achieves its mission by “preservation and promotion of state-owned historic sites as public attraction; and statewide programs to assist people, groups, and cities with local preservation activities.” Significant sites within Alabama that have been placed on the NRHP can be found by using the online AHC interactive map.⁹ This tool is useful in identifying sites listed on the NRHP, although it is not an exhaustive list of all known or unknown historical, architectural, archeological, and cultural resources.

The Alabama Burial Act (Code of Alabama 1975, §13A-7-23.1) and the Alabama Historical Commission Administrative Code Chapter 460-X-10 Burials define the lawful excavation, relocation, and/or restoration of cemeteries and human remains. The crime of desecration or defacement of a memorial occurs if “a person willfully or maliciously injures, defaces, removes or destroys any tomb, monument, gravestone, burial mound, earthen or shell monument containing human skeletal remains or associated burial artifacts.”

4.5.2 Significant Impact Threshold

Per the 1050.1 Desk Reference, there are no established significance thresholds for this impact category. However, the guidance specifies a consideration factor when assessing the context and intensity of potential environmental impacts on historical, architectural, archeological, and cultural resources. This factor involves, but is not restricted to, scenarios where the Proposed Action may lead to findings of Adverse Effect during the Section 106

⁹ <https://ahc.alabama.gov/nationalregister.aspx>

review process. Importantly, this factor is not intended to be a threshold, and NHPA regulations at 36 CFR § 800.8(a) state that “an adverse effect finding does not necessarily require an EIS under NEPA.”

4.5.3 Analysis of Historical, Architectural, Archeological, and Cultural Resources

The APE for Section 106 efforts is the area in which the project may directly or indirectly impact historic properties. Per 36 CFR § 800.16(d), the APE “means the geographic area(s) within which an undertaking may directly or indirectly cause alterations to the character or use of historic properties, if such properties exist.” The extent of the APE is determined by the size and type of project and varies depending on the impacts from the proposed project. The 1050.1 Desk Reference describes other considerations when determining the extent of the APE, including operational effects, increased noise, vibration, or lighting, and increased traffic with ground disturbing impacts. As described in Section 3.2, the APE is the same boundary as the Study Area (see Figure C3 in Appendix C).

In May 2025 Mead & Hunt developed an Architecture/History Survey Report (AHSR) that identified buildings, structures, and/or objects that are at least 50 years of age, or may be of exceptional significance. Several non-historic age resources are located just outside the APE, including two cargo buildings that were erected in 2000 and 2024, and a fire safety building that was erected in 2020. Two historic-age resources were identified within the APE, including a mid-century office/industrial building that was erected in 1968, and a mid-century storage shed that was erected in 1965. Both historic-age resources are proposed for demolition as part of the Proposed Action. The results of the AHSR concluded that neither historic-age resource is eligible for listing in the State nor National Register of Historic Places (NRHP); therefore, a determination of *No Historic Properties Affected* was recommended. The AHC concurred with this determination on June 23, 2025.

4.5.4 Environmental Consequences

4.5.4.1 Alternative 2 (Preferred Alternative), Alternative 4, Alternative 5

As a result of the determination of no effect to historic properties, runway and taxiway separation improvements associated with the Preferred Alternative, Alternative 4, or Alternative 5 are not anticipated to result in adverse impacts to historical, architectural, archaeological, and cultural resources. In accordance with the AHC letter of concurrence, if archaeological materials are encountered during construction of the Proposed Action, 36 CFR §800.13(b) will be adhered to. Archaeological materials consist of any items, fifty years or older, which were made or used by man, and include but are not limited to arrowheads, ceramic sherds, bricks, worked wood, bone, stone, metal, and glass objects.

4.5.4.2 No Action Alternative

The No Action Alternative will result in the airfield configuration remaining as is today, and the need to meet FAA design standards will not be addressed. The No Action Alternative will not have the potential to result in adverse impacts on historical, architectural, archaeological, and cultural resources.

4.6 Socioeconomic and Children's Environmental Health and Safety Risks

Socioeconomics refers to factors relating to social and economic elements of a project. A socioeconomic analysis examines potential impacts on components of the human environment, including population, employment, housing, and public services, which may result from the Proposed Action. Per the 1050.1 Desk Reference, children's environmental health and safety risks refers to "risks to health or to safety that are attributable to products or substances that a child is likely to come into contact with or ingest (including air, food, water, soil, and consumer products)."

4.6.1 Regulatory Setting

The main statute concerning socioeconomic impacts is the Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970. This Act establishes requirements that apply when real property is acquired, or individuals are displaced due to implementation of a chosen alternative. The regulatory setting that applies to children's health and safety risks are provided in Section 12.3.1 and Exhibit 12-5 of the 1050.1 Desk Reference. Executive Order 13045, *Protection of Children from Environmental Health and Safety Risks*, requires federal agencies to examine their policies, programs, activities, and standards for environmental health or safety risks that may disproportionately impact children. There are no requirements for federal consultation processes, permits, or approvals that relate to children's health and safety risks.

4.6.2 Significant Impact Threshold

The FAA has not established a threshold of significance that relates to socioeconomics. Factors to consider when evaluating the context and intensity of potential environmental impacts to socioeconomics include the possibility of substantial economic growth, changes in the physical structure of established communities, relocation needs when replacement housing is insufficient, community or business relocations, alterations in local traffic patterns, and changes to the community tax base.

The FAA has not established a threshold of significance that relates to children's health and safety risks. Factors to consider when evaluating the context and intensity of potential impacts include mitigation measures that have the potential to disproportionately impact children's health and safety.

4.6.3 Analysis of Socioeconomics and Children's Environmental Health and Safety Risks

The proposed project area is contained within the urban Airport setting of Jefferson County, Alabama. Surrounding land uses include industrial, commercial, and residential, which are typical of the Birmingham region. The Proposed Action will occur entirely within existing Airport property. No residences or non-Airport related businesses are located within the construction footprint. U.S. Census American Community Survey (ACS) 5-year data was used to analyze low-income and minority populations surrounding the proposed project area. **Table 4-2** provides the demographic profile of populations within the proposed project area, the county, and the state, using ACS 5-year data.

TABLE 4-2

DEMOGRAPHIC PROFILE

Location	Race Comparison	Minority (%)	Below Poverty (%)	Median HH Income (\$)	Unemployment (%)	Children <18 (%)
Project Buffer	200,733	72.8	25.2	36,002	11.5	12.5
Jefferson County	674,721	19.83 Black	15.9	35,600	3.1	25.4
		7.55 White				
Alabama	5,024,279	12.4 Black	38.4	16.8	4.5	1.4
		61.6 White				

Source: *Worldpopulationreview.com, Census.gov*

There are no socioeconomic or disproportionate environmental health and safety risks to children within the proposed project area, and no new exposure pathways will be created. Standard construction safety controls will be used, including dust and noise BMPs. As a result, no impacts to socioeconomics or children's health and safety are anticipated as a result of the proposed project.

4.6.4 Environmental Consequences

4.6.4.1 Alternative 2 (Preferred Alternative), Alternative 4, Alternative 5

Because the proposed action will be confined entirely within the existing Airport boundary, and there will be no disproportionate environmental health and safety risks to children within or near the proposed project area, there are no anticipated impacts to socioeconomics and children's environmental health and safety as a result of the Preferred Alternative, Alternative 4, or Alternative 5.

4.6.4.2 No Action Alternative

The No Action Alternative will result in the airfield configuration remaining as is today, and the need to meet FAA design standards will not be addressed. The No Action Alternative will not have the potential to result in adverse impacts to socioeconomics and children's environmental health and safety risks.

4.7 Noise and Compatible Land Use

The 1050.1 Desk Reference defines noise as "unwanted sound that can disturb routine activities, such as sleep or conversation." Certain land uses, such as residential areas, are more sensitive to airport noise than others. The FAA often requires noise analysis during environmental reviews. The FAA's primary noise metric is the Day Night Average Sound Level (DNL), which is the "cumulative noise energy exposure of individuals to noise resulting from

various aviation activities and are established.” The DNL considers the noise level of individual aircraft events, the frequency of these events over a specific period, and the time when they occur, whether day or night.

4.7.1 Regulatory Environment

The Aviation Safety and Noise Abatement Act of 1979 directed the FAA to establish a system for measuring noise, exposure to noise, and to identify land uses that are compatible with various exposure levels.

4.7.2 Significant Impact Threshold

The 1050.1 Desk Reference provides the significance threshold for noise. The threshold includes actions that “would increase noise by DNL 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB noise level due to a DNL 1.5 dB or greater increase, when compared to the No Action Alternative for the same time frame. For example, an increase in DNL from 65.5 dB to 67 dB would be considered a significant impact. The determination of significance must be obtained through the use of noise contours and/or grid point analysis alongside local land use information.”

4.7.3 Analysis of Noise and Compatible Land Use

An *Aviation Emissions and Air Quality and Noise Technical Report* was conducted in July 2025. The report evaluated the Preferred Alternative and Alternative 4 to identify potential emissions and noise impacts from aircraft, stationary sources, and “general access vehicles”. Using the analysis for the Preferred Alternative and Alternative 4, impacts from Alternative 5 have been inferred.

The *Aviation Emissions and Air Quality and Noise Technical Report* states that according to the U.S. Department of Housing and Urban Development’s Noise Abatement and Control standards (24 CFR Part 51, Subpart B), standard construction noise does not typically impact locations or people beyond 500 feet from the source. The closest residences to the Proposed Action site are 1,500 feet away, which exceeds the 500-foot boundary. Due to the distance between the proposed project site and the residences, noise impacts from operation of the proposed project are not anticipated. Construction-related noise may be heard during the day; however, daytime construction noise is exempt from most noise ordinances. The Airport will follow the BMPs described below to reduce potential noise disruptions:

- Avoid construction within 1,000 feet of an occupied dwelling on Sundays, legal holidays, or between the hours of 10:00 pm and 6:00 am
- Refrain from blasting activities within 3,000 feet of an occupied dwelling on Sundays, legal holidays, or between the hours of 8:00 pm and 8:00 am

If a noise complaint is filed, various noise mitigation strategies will be considered and employed to an extent that is reasonably possible.

4.7.4 Environmental Consequences

4.7.4.1 Alternative 2 (Preferred Alternative), Alternative 4, Alternative 5

Because Village Creek is proposed to be relocated in the same location for Alternatives 2, 4, and 5, the primary impacts to noise and compatible land use will be the same. The primary difference between alternatives is the separation distance of Taxiway A: 400' separation for Alternative 2, 500' separation for Alternative 4, and a hybrid 400/500' separation for Alternative 5. Even though the disturbance footprint is slightly different (approximately 100') between alternatives, noise analysis is based on contours, not disturbance; therefore, there will be no significant differences to impacts. Thus, analysis for Alternatives 2, 4, and 5 are combined.

As the closest residences are 1,500 feet from the area in which the Proposed Action will occur, no significant noise or land use compatibility impacts are anticipated as a result of the Preferred Alternative, Alternative 4, and Alternative 5. Additionally, Alternative 2, Alternative 4, and Alternative 5 are not anticipated to result in changes to aircraft operations. The future aircraft operations at BHM both with and without the Proposed Action are expected to be exactly the same.

4.7.4.2 No Action Alternative

The No Action Alternative will result in the airfield configuration remaining as is today, and the need to meet FAA design standards will not be addressed. The No Action Alternative will not have the potential to result in adverse impacts to noise and compatible land use.

4.8 Water Resources

The EPA defines water resources as “lakes, streams, groundwater, coastal waters, wetlands, and other waters, their associated ecosystems, and the human uses they support (e.g., drinking water, recreation, and fish consumption).” The quality and distribution of available water resources are critical to the health of both humans and ecosystems. Water resource stewardship ensures the proper functionality and sustainability of the hydrologic cycle. According to the 1050.1 Desk Reference, this resource category should cover the following topics: wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers. These components are interconnected within a watershed and collectively support the entire local watershed system.

4.8.1 Regulatory Setting

The 1050.1 Desk Reference provides a comprehensive list of applicable laws and regulations relating to this impact category, including the Clean Water Act (CWA), Executive Order 11990 Protection of Wetlands, DOT Order 5660.1a Preservation of The Nation's Wetlands, Fish and Wildlife Coordination Act, Rivers and Harbors Act, and Safe Drinking Water Act.. Coordination with all regulatory agencies having authority over the Proposed Action is essential to ensure full compliance with all applicable regulations.

4.8.2 Non-Applicable Water Resource Impact Categories

FAA Order 1050.1G Part 1.2 (b) states “when considering whether the reasonably foreseeable effects of the Proposed Action are significant, FAA will analyze the potentially affected environment and degree of the effects of the action. FAA may use any reliable data source and will not undertake new research unless it is essential to evaluating alternatives and the cost and time of obtaining it are not unreasonable.”

Available desktop data was used to determine that the following resource categories are unlikely to be significantly affected as a result of the Proposed Action; therefore, they have not been analyzed further.

4.8.2.1 Groundwater

Section 14.4 of the 1050.1 Desk Reference defines groundwater as “subsurface water that occupies the space between sand, clay, and rock formations.” Additionally, it defines aquifers as the geologic layers that store or transmit groundwater to wells, springs, and other water sources. Under the Safe Water Drinking Act, EPA’s Source Aquifer program allows the agency to designate an aquifer as a sole source of drinking water and establish a review area. An aquifer is categorized as a sole source aquifer if it supplies 50 percent of the drinking water for its service area and there are no reasonable alternative drinking water sources should the aquifer become contaminated. The EPA’s map of sole source aquifer locations¹⁰ was reviewed to determine if there is a sole source aquifer within the geographic area of the Proposed Action. None were identified; therefore, it is anticipated that the Proposed Action will have no effect on groundwater resources.

4.8.2.2 Wild and Scenic Rivers

Section 14.5 of the 1050.1 Desk Reference defines Wild and Scenic Rivers as rivers having remarkable scenic, recreational, geologic, fish, wildlife, historic, or cultural values as defined by the Wild and Scenic Rivers Act. These rivers are listed within the National Wild and Scenic River System (National System) and are regulated by four federal agencies: the National Park Service (NPS), the USFWS, the Bureau of Land Management (BLM), and the U.S. Forestry Service (USFS). According to the National Wild and Scenic River System interactive map, the Sipsey Fork of the West Fork River is the only river shown in Alabama to be listed in the National System.

The National River Inventory (NRI) identifies rivers or river segments that appear to meet the minimum Wild and Scenic Rivers Act criteria based on free-flowing status and resource values. The NRI interactive map indicates the closest river that meets this criteria is the Cahaba River, located approximately 6 miles to the southeast of the proposed project area.

¹⁰ <https://www.epa.gov/dwssa/map-sole-source-aquifer-locations>

No Wild and Scenic Rivers or NRI listed streams were found within the proposed project area; therefore, it is anticipated that the Proposed Action will have no effect on Wild and Scenic Rivers or NRI listed resources.

4.8.3 Significant Impact Threshold

The significance thresholds for each applicable water resource subcategory are listed below.

4.8.3.1 Wetlands

Section 14.1.3.1 of the 1050.1 Desk Reference outlines the threshold for determining significant impacts to wetlands from federal actions. An impact is considered significant if the action:

- Adversely affects the wetland's ability to protect the quality or quantity of municipal water supplies, including surface waters and sole source aquifers
- Substantially alters the hydrology necessary to maintain the wetland's ecological functions and values
- Significantly reduces the wetland's capacity to retain floodwater or storm runoff
- Harms the natural systems that support wildlife, fish habitats, or other critical surrounding resources
- Encourages secondary development or services that would trigger any of the above effects
- Conflicts with applicable state wetland management strategies

4.8.3.2 Floodplains

Section 14.2.1.1. of the 1050.1 Desk Reference states that all FAA actions must avoid floodplains if a practicable alternative exists; if no practicable alternative exists, actions in a floodplain must be designed to minimize adverse impacts to the floodplain's natural and beneficial values. This requirement is to comply with Executive Order 11988, *Floodplain Management*, 42 *Federal Register* 26951, (May 25, 1977) and DOT Order 5650.2, *Floodplain Management and Protection*. Significant encroachment is defined by the DOT Order 5650.2, as an encroachment in a floodplain that results in one or more of the following construction or flood-related impacts: 1) considerable probability of loss of human life, 2) likely future damage associated with the encroachment that could be substantial in cost or extent, including interruption of service on or loss of a vital transportation facility, and 3) a notable adverse impact on "natural and beneficial floodplain values".

4.8.3.3 Surface Waters

Section 14.3.3.1 of the FAA Desk Reference outlines the threshold for determining significant impacts from federal actions. An impact to surface waters is considered significant if the action would 1) exceed water quality standards established by federal, state, local, and tribal regulatory agencies; or 2) contaminate public drinking water supply in a way that public health may be adversely affected.

4.8.4 Analysis of Water Resources

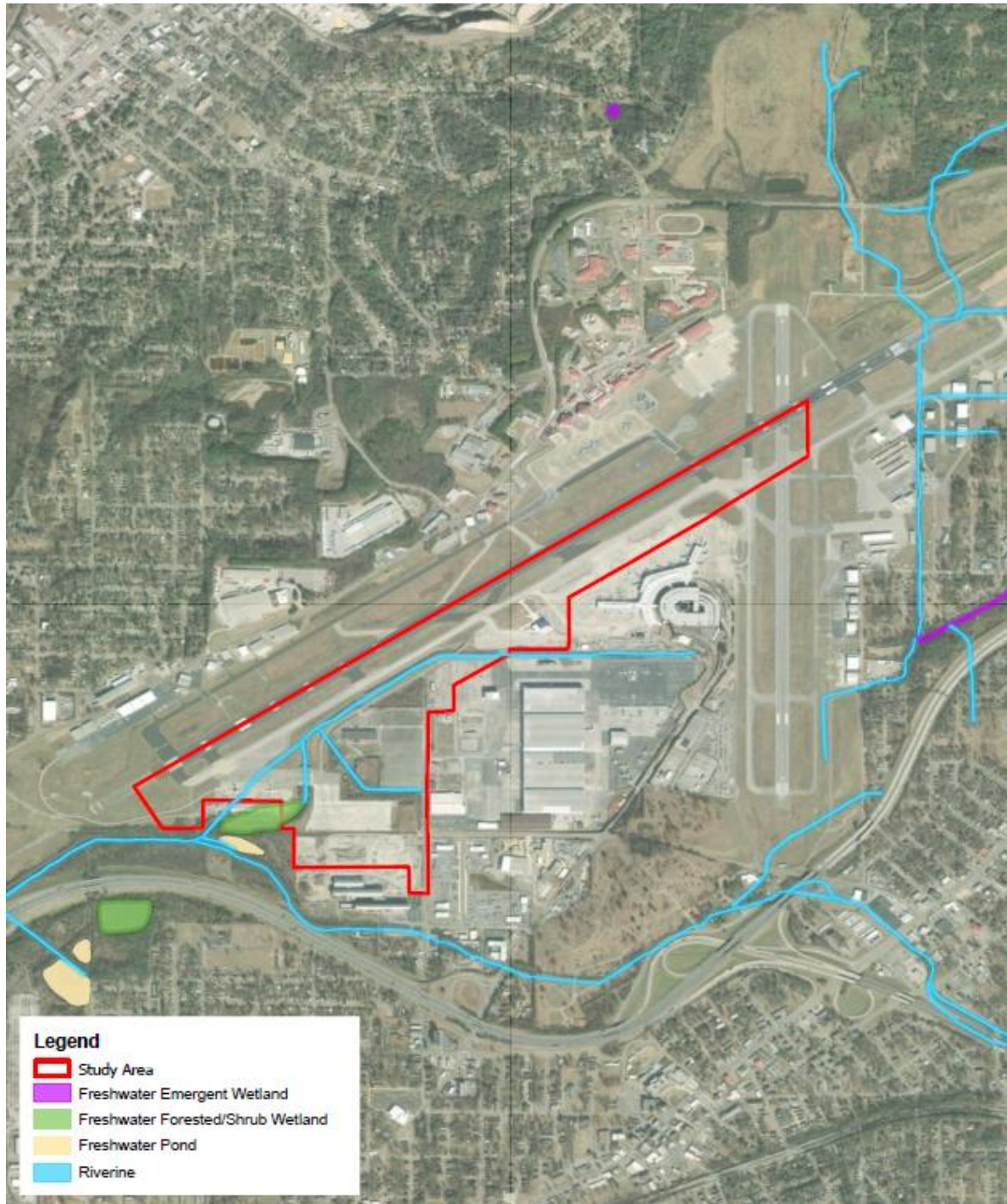
The analysis of impacts on water resources is necessary to determine if the impacts will be considered significant. Analysis performed for each water resource found within the proposed project area is described in the following sections.

4.8.4.1 Wetlands

An Aquatic Resources Delineation was performed to identify and describe the aquatic resources within the proposed project area, in accordance with Section 404 of the CWA (33. U.S.C. 1344) and/or Section 10 of the River and Harbors Act (RHA) of 1899 (33. U.S.C. 403). The delineation was conducted in two phases. Phase I included conducting a desktop review of readily available GIS database information of the proposed project area to identify potential aquatic resources (see **Figure D1**). Databases reviewed included aerial photographs, the U.S. Geological Survey (USGS) quadrangle map, the Federal Emergency Management Agency (FEMA) flood map, the U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey, and the USFWS National Wetland Inventory (NWI) map.

Phase II of the Aquatic Resource Delineation was conducted on May 15, 2025 and July 11, 2025. This phase included using the USACE Wetland Delineation Manual and the 2012 Eastern Mountains and Piedmont Regional Supplement to identify and flag wetlands in the field. Flag locations were collected using a Trimble TD6 handheld unit. A total of seven (7) wetland areas (WL1, WL2, WL3, WL4, WL5, WL6, WL7) were found within the proposed project area (see **Figure D2**).

FIGURE D1
NATIONAL WETLANDS INVENTORY



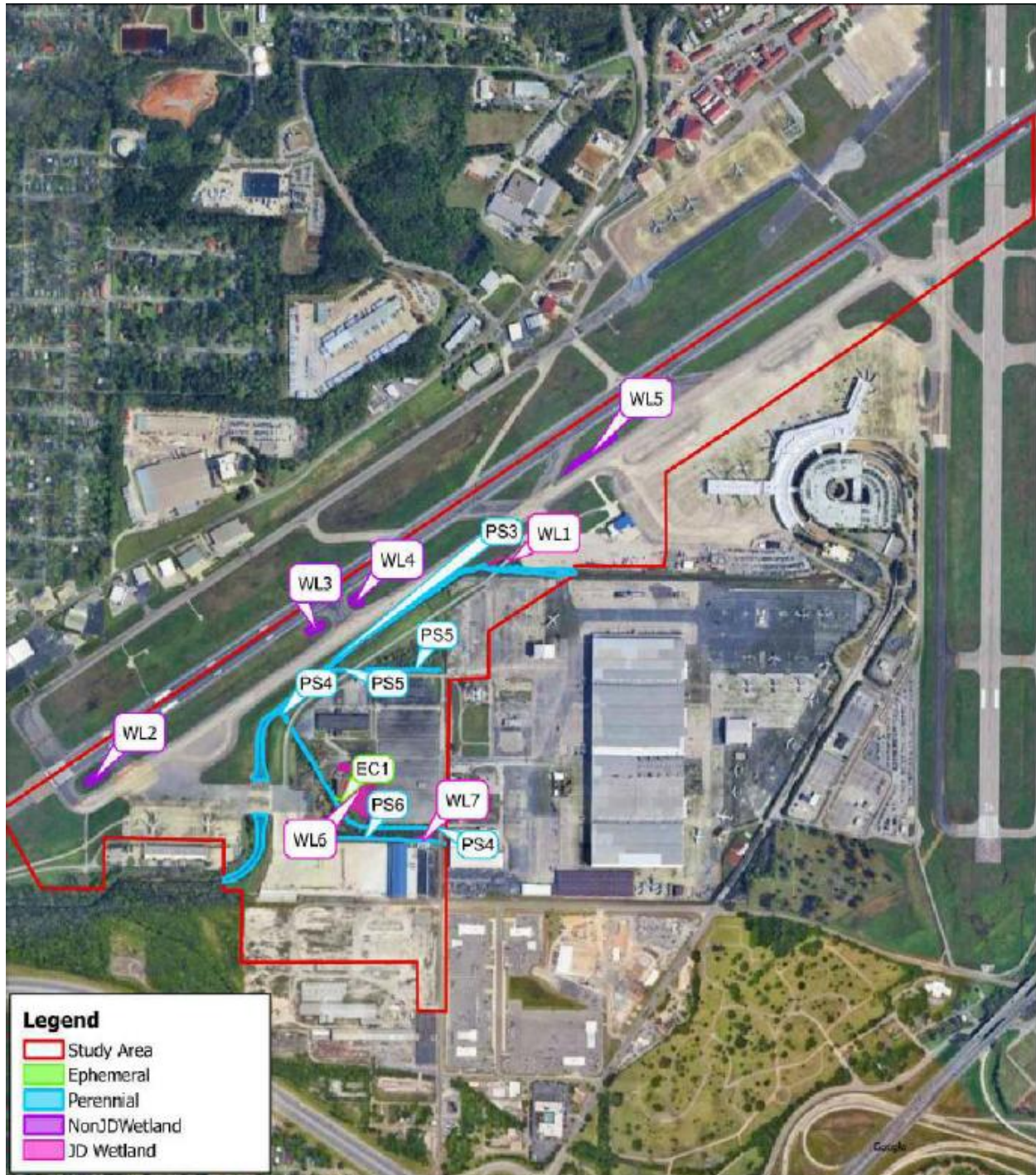
BIRMINGHAM SHUTTLESWORTH
INTERNATIONAL AIRPORT
ENVIRONMENTAL ASSESSMENT

Figure D1: National Wetlands Inventory
BAA Taxiway A Relocation
Birmingham, Jefferson County, Alabama



Source: Volkert, 2025

FIGURE D2
MAPPED WATER RESOURCES



bhm
Source: Volkert, 2025

BIRMINGHAM SHUTTLESWORTH
INTERNATIONAL AIRPORT
ENVIRONMENTAL ASSESSMENT

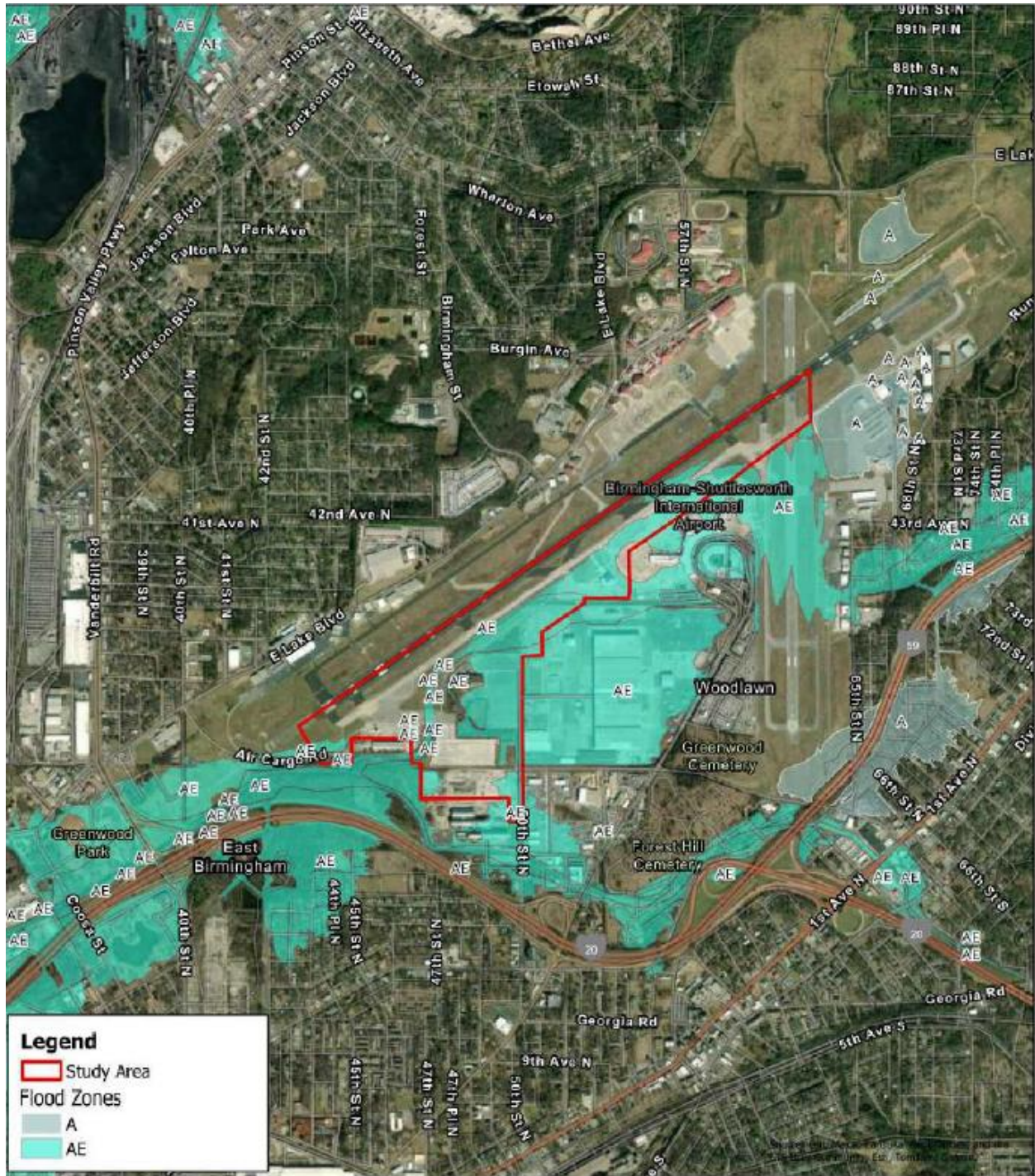
Figure D2: Mapped Resources
BAA Taxiway A Relocation
Birmingham, Jefferson County, Alabama

**Mead
& Hunt**

4.8.4.2 Floodplains

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for the study area was reviewed to determine if the Proposed Action encroaches on a FEMA regulated flood zone (see **Figure D3**). FEMA flood zone designations include: Zone A (subject to inundation by the 1% annual-chance flood event with no base flood elevation (BFE) determined), Zone AE (subject to be inundation by the 100% annual-chance flood event with a BFE determined), Zone VE (subject to inundation by the 1% annual-chance flood event with additional hazards due to storm waves, BFE determined), and Zone X (minimal risk areas outside the 1% and 0.2% annual-chance floodplains with no BFE or base flood depths determined). The project site is located on FEMA FIRM 01073C0392H for the city of Birmingham (effective 3/21/2019). The FIRM indicated that the study area encroaches on the Zone AE floodplain and regulatory floodway for Village Creek (refer to Section 4.8.5 for a discussion of floodplain encroachment and its significance for the various Alternatives). A regulatory floodway is defined as a channel of a river or watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

FIGURE D3
FEMA FLOOD ZONES



Source: Volkert, 2025

Figure D3: FEMA Flood Zone
BAA Taxiway A Relocation
Birmingham, Jefferson County, Alabama



4.8.4.3 Surface Waters

Surface waters within the study area were located and mapped during the Aquatic Resource Delineation on May 15, 2025, and July 11, 2025. Four (4) perennial streams (PS3, PS4, PS5, and PS6) and one (1) ephemeral channel (EC1) were identified within the study area.

According to the ADEM's Assessed Waters GIS mapping, the segment of Village Creek (PS3) located within the study area is listed on ADEM's 2024 §303(d) list for pesticides and has an approved total maximum daily load (TMDL) for pathogens (E.coli) and siltation. This segment of Village Creek also falls within the Village Creek Watershed that has a TMDL for siltation, pH, and zinc.

4.8.5 Environmental Consequences

4.8.5.1 Alternative 2 (Preferred Alternative) and Alternative 5

Wetlands

The Preferred Alternative and Alternative 5 will include the placement and fill into wetland areas (refer to Section 4.8.7 for a discussion of permitting and approval requirements). **Table 4-3** itemizes the anticipated wetland impacts for the Preferred Alternative and Alternative 5.

TABLE 4-3

ANTICIPATED WETLAND IMPACTS OF THE PREFERRED ALTERNATIVE AND ALTERNATIVE 5

Wetland	Total Square Feet	Total Acreage	Acreage of Impact	Jurisdictional/Non-Jurisdictional
WL1	6,098	0.01	0.01	Jurisdictional
WL2	9,017	0.21	0.09	Non-Jurisdictional
WL3	8,538	0.20	0.13	Non-Jurisdictional
WL4	7,536	0.17	0.17	Non-Jurisdictional
WL5	11,935	0.27	0.27	Non-Jurisdictional
WL6	77,406	1.78	0	Jurisdictional
WL7	4,182	0.10	0	Jurisdictional
Total Impacts	124,712	2.74	0.67	

Source: Volkert, 2025

Floodplains

The Preferred Alternative and Alternative 5 will include the relocation and backfilling of existing Village Creek; and the placement of culverts to fill in the regulated floodway/floodplain to construct the vehicle service road and Taxiway A. These alternatives will encroach the floodplain; however, it is not considered a significant encroachment under DOT Order 5650.2. The alternatives are not anticipated to cause considerable probability of loss of human life or likely future damage associated with the encroachment that could be substantial in cost or extent, including interruption of service on or loss of a vital

transportation facility. The Preferred Alternative and Alternative 5 are also not expected to have a notable adverse impact on natural and beneficial floodplain values. The existing floodplain has already been altered due to development and the proposed design will mimic the existing natural floodplain functions to the maximum extent practical. During the design phase of this project, a FEMA Conditional Letter of Map Revision (CLOMR) will be submitted and approved prior to construction to account for any floodplain impacts. Post-construction, a FEMA Letter of Map Revision (LOMR) will be submitted to document as-built conditions and revise the floodplain mapping.

The Preferred Alternative and Alternative 5 are not expected to decrease existing floodplain capacity or function; however, the Zone AE floodplain and regulated floodway will be relocated. Early coordination with the City of Birmingham's Deputy Director of Planning, Urban Design, Watershed Management, and Hazard Mitigation Service's was conducted (see **Appendix E**). They responded that if the project altered or relocated Village Creek, the guidelines set forth in Article II, Title 1, Chapter 8, Floodplain Overlay, Section 7, B.9 and B.10 of the City of Birmingham Zoning Ordinance will apply. The City of Birmingham floodplain regulations require assurance that the carrying capacity of any altered or relocated watercourse is maintained. During the CLOMR/LOMR process, hydraulic modeling will be performed to ensure the flood carrying capacity of the relocated channel is maintained. The relocated channel will be designed to mimic the existing channel geomorphology and hydraulic dimensions. During the final design phase, the CLOMR analysis will be submitted to the City of Birmingham for review and comment. Once their concerns are addressed, the CLOMR analysis will be forwarded to FEMA and the Alabama Department of Economic and Community Affairs/Office of Water Resources for approval.

Surface Waters

The Preferred Alternative and Alternative 5 will include the relocation of existing Village Creek and the placement of culverts and fill into surface waters to construct the vehicle service road and Taxiway A. The Preferred Alternative will impact ~3,200 linear feet of existing Village Creek (PS3) and will be replaced with ~3,000 linear feet of relocated Village Creek. This will result in the loss of ~200 linear feet of Village Creek. **Table 4-4** itemizes the anticipated surface water impacts for the Preferred Alternative and Alternative 5. Refer to Section 4.8.7 for a discussion of permitting and approval requirements.

TABLE 4-4

ANTICIPATED SURFACE WATER IMPACTS OF THE PREFERRED ALTERNATIVE AND ALTERNATIVE 5

Stream	Total Square Feet	Total Acreage	Linear Feet	Acreage of Impact	Linear Feet of Impact	Jurisdictional/Non-jurisdictional
PS3 (Village Creek)	104,980	2.41	4,234	2.20	3,200	Jurisdictional
PS4	3,528	0.08	1,667	0.06	315	Jurisdictional
PS5	5,097	0.12	729	0.11	606	Jurisdictional
PS6	4,051	0.09	1,003	0	0	Jurisdictional
EC1	218	0.01	96	0	0	Non-Jurisdictional
Total Impacts	117,874	2.71	7,729	2.37	4,121	

Source: Volkert, 2025

4.8.5.2 Alternative 4

Wetlands

Alternative 4 will include the placement of fill into wetland areas. **Table 4-5** itemizes the anticipated wetland impacts for Alternative 4.

TABLE 4-5

ANTICIPATED WETLAND IMPACTS OF ALTERNATIVE 4

Wetland	Total Square Feet	Total Acreage	Acreage of Impact	Jurisdictional/Non-Jurisdictional
WL1	6,098	0.01	0.01	Jurisdictional
WL2	9,017	0.21	0.13	Non-Jurisdictional
WL3	8,538	0.20	0.13	Non-Jurisdictional
WL4	7,536	0.17	0.17	Non-Jurisdictional
WL5	11,935	0.27	0.13	Non-Jurisdictional
WL6	77,406	1.78	0	Jurisdictional
WL7	4,182	0.10	0	Jurisdictional
Total Impacts	124,712	2.74	0.57	

Source: Volkert, 2025

Floodplains

Alternative 4 will include the relocation and backfilling of existing Village Creek and the placement of culverts and fill in the regulated floodway and floodplain to construct the vehicle service road and Taxiway A. A FEMA CLOMR will be submitted and approved prior to construction to account for any floodplain impacts. Post-construction, a FEMA LOMR will be submitted to document as-built conditions and revise the floodplain mapping.

Alternative 4 is not expected to decrease floodplain capacity or function; however, the Zone AE floodplain and regulated floodway will be relocated. The City of Birmingham floodplain regulations require assurance that the carrying capacity of any altered or relocated watercourse is maintained. During the CLOMR/LOMR process, hydraulic modeling will be performed to ensure the flood carrying capacity of the relocated channel is maintained. The relocated channel will be designed to mimic the existing channel geomorphology and hydraulic dimensions.

Surface Waters

Alternative 4 will include the relocation and backfilling of existing Village Creek and the placement of culverts and fill into surface waters to construct the vehicle service road and Taxiway A. **Table 4-6** itemizes the anticipated surface water impacts for Alternative 4.

TABLE 4-6

ANTICIPATED SURFACE WATER IMPACTS OF ALTERNATIVE 4

Stream	Total Square Feet	Total Acreage	Linear Feet	Acreage of Impact	Linear Feet of Impact	Jurisdictional/Non- Jurisdictional
PS3 (VILLAGE CREEK)	104,980	2.41	4,234	2.20	3,200	Jurisdictional
PS4	3,528	0.08	1,667	0.05	285	Jurisdictional
PS5	5,097	0.12	729	0.10	576	Jurisdictional
PS6	4,051	0.09	1,003	0	0	Jurisdictional
EC1	218	0.01	96	0	0	Non-Jurisdictional
Total Impacts	117,874	2.71	7,729	2.35	4,061	

Source: Volkert, 2025

4.8.5.3 No Action Alternative

The No Action Alternative will result in only minor construction activities being conducted at the Airport (i.e. correcting the non-standard taxiway connectors). There will be no impact to floodplains or surface waters. The No Action Alternative will have minor impacts to wetlands. Wetland impacts will include the placement and fill into the non-jurisdictional wetland WL5. These impacts will be less than the Preferred Alternative, Alternative 4, and Alternative 5.

4.8.6 Avoidance and Minimization of Water Resources Impacts

4.8.6.1 Wetlands

Complete avoidance of wetland impacts is not feasible. Wetland impacts have been minimized to the greatest extent practicable and impacts to Section 404 jurisdictional

wetlands are considered minor. All Section 404 jurisdictional wetland impacts will be mitigated. Refer to Section 4.8.8.1 for a discussion of the wetland mitigation plan. BMPs will be implemented during construction to minimize potential impacts to wetlands from stormwater runoff and sedimentation.

4.8.6.2 Floodplains

Complete avoidance of floodplain impacts is not feasible; however, it is anticipated that floodplain impacts will be minor; therefore, mitigation will not be required.

4.8.6.3 Surface Waters

Complete avoidance of surface water impacts is not feasible. Surface water impacts have been minimized to the greatest extent possible. Village Creek will be relocated and will function as it currently does as an open-air creek. All Section 404 jurisdictional surface water impacts will be mitigated. BMPs will be implemented during construction to minimize potential impacts to water quality.

4.8.7 Consultations, Permits, and Other Approvals for Water Resources Impacts

4.8.7.1 Wetlands

Section 10 of the RHA of 1899 (33 U.S.C. 403) and Section 404 of the CWA (33 U.S.C. 1344) are regulated by the USACE. Section 401 and Section 402 of the CWA regulatory authority has been designated to ADEM.

Section 10 requires USACE authorization prior to performing any work in, or affecting navigable waters of the U.S. There appears to be no navigable waters of the U.S. found in the proposed project area; therefore, the project will not be subject to regulation under Section 10. Discharge of dredged and/or fill material into jurisdictional waters of the U.S. including wetlands will be subject to Section 404 permitting and Section 401 water quality certification. Construction activities will be regulated under Section 402 of the CWA.

4.8.7.2 Floodplains

Due to the proposed encroachment within a regulatory floodway, a FEMA application for a CLOMR will be required prior to construction. A CLOMR is a formal review and comment by FEMA as to whether a proposed project complies with the minimum NFIP floodplain management criteria. A CLOMR does not revise effective FIRM, Flood Boundary and Floodway Maps, or Flood Insurance Studies. Following construction, a LOMR submittal will be required. A LOMR is a revision based on technical data that, usually due to manmade changes, shows changes to flood zones, flood elevations, floodplain and floodway delineations, and planimetric features.

A City of Birmingham Floodplain Development Permit will also be required due to the proposed development within a FEMA flood zone and regulated floodway.

4.8.7.3 Surface Waters

Section 10 of the RHA of 1899 (33 U.S.C. 403) and Section 404 of the CWA (33 U.S.C. 1344) are regulated by the USACE. Section 401 and Section 402 of the CWA regulatory authority has been designated to ADEM. Section 10 requires USACE authorization prior to performing

any work in, or affecting navigable waters of the U.S. There appears to be no navigable waters of the U.S. found in the study area; therefore, the project will not be subject to regulation under Section 10. Discharge of dredged and/or fill material into jurisdictional waters of the U.S. will be subject to Section 404 permitting and Section 401 water quality certification. Construction activities will be regulated under Section 402 of the CWA.

4.8.8 Mitigation of Water Resources Impacts

4.8.8.1 Wetlands

Impacts to jurisdictional wetlands will be mitigated through the purchase of wetland credits from a USACE Mobile District approved mitigation bank.

4.8.8.2 Floodplains

It is anticipated that floodplain impacts will be negligible; therefore, no mitigation will be required.

4.8.8.3 Surface Waters

Impacts to jurisdictional streams will be mitigated through the purchase of stream credits from a USACE Mobile District approved mitigation bank.