GREENVILLE-SPARTANBURG INTERNATIONAL AIRPORT

2040 WINGSPAN

A VISION FOR THE FUTURE

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AIRPORT MASTER PLAN UPDATE

CHAPTER 4: ENVIRONMENTAL OVERVIEW

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4. Environmental Overview

4.1. INTRODUCTION

The operation and development of an airport has the potential to affect neighboring land-uses and natural and human environments, which are of fundamental concern in the airport planning process. Therefore, it is imperative to identify the resources and potential impacts to the environment and surrounding community during the initial stages of the planning process. This allows airport planners and engineers to incorporate measures in accordance with federal, state, and local rules and regulations to avoid, minimize, or mitigate potential impacts to the environment.

The National Environmental Policy Act (NEPA) of 1969 requires that all federal agencies consider the potential impacts their projects and policies have on the environment. The Federal Aviation Administration (FAA), an agency of the United States Department of Transportation (USDOT), has issued Order 1050.1F, *Environmental Impacts: Policies and Procedures* (effective date July 17, 2015), which ensures all FAA actions comply with NEPA. The FAA has also issued Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions* (effective date April 28, 2006). FAA Order 5050.4B guides NEPA compliance specifically for major federal actions at public-use airports.

FAA Orders 1050.1F and 5050.4B identify environmental categories that must be considered in relation to a proposed action to determine whether a significant impact would result and determine what actions would be appropriate to avoid or minimize an impact's effect. FAA Order 1050.1F specifies the threshold of significance for each of the categories addressed.

The following is a list of environmental impact categories, identified in Order 1050.1F, that may be relevant to FAA actions:

- Biotic resources (including fish, wildlife, and plants)
- Water resources (including wetlands, surface waters, wild and scenic rivers, floodplains, and groundwater)
- Coastal resources
- Department of Transportation Act, Section 4(f) Resources
- Historical, architectural, archeological, and cultural resources
- Farmlands
- Land use
- Noise and noise-compatible land use
- Visual effects (including light emissions)
- Air quality
- Hazardous materials, solid waste, and pollution prevention
- Energy supplies and natural resources
- Climate
- Socioeconomics, environmental justice, and children's environmental health and safety risks

This chapter provides a summary of the environmental conditions and constraints at the Greenville-Spartanburg International Airport. The information provided in this chapter will be carefully considered as part of the Alternatives Analysis that will be completed for this Master Plan Update (MPU). Future airport development proposed in this MPU will be reviewed in further detail in the subsequent environmental documentation to satisfy the requirements of NEPA. The information provided in this chapter is based on information obtained from the Airport and appropriate federal, state, and local agencies.

4.2. BIOTIC RESOURCES

Biotic resources refer to the various types of flora (plants) and fauna (fish, birds, reptiles, amphibians, mammals, etc.), including state and federally listed threatened and endangered species, in a particular area. It also encompasses the habitats supporting the various flora and fauna including rivers, lakes, wetlands, forests, and other ecological communities. Airport projects can affect these ecological communities and thereby affect vegetation and wildlife populations.

4.2.1. Ecological Communities

Most of the Airport and adjacent areas have been disturbed by airport and commercial development, and current and past agricultural and forestry operations. The major ecological community cover types on Airport property consist of maintained grassland, pine plantation, mixed forest, and paved/ gravel surfaces. All habitats identified at the Airport are common and secure within the region.

There are no habitats located on the site that are designated as “critical habitat” for any state or federally listed threatened or endangered species, or species of special concern. State or federally listed threatened or endangered species or species of special concern are discussed in Section 4.2.2.1. Further information regarding state and federally regulated waterways and wetlands is presented in Sections 4.3.2 and 4.3.3.

4.2.2. Flora and Fauna

Based on a review of the Airport’s 2009-2010 Wildlife Hazard Assessment (WHA), the maintained grasslands that comprise the majority of the Airport’s air operations area (AOA) are dominated by warm season grasses such as bermudagrass (*Cynodon dactylon*), ticklegrass (*Panicum capillare*), Johnsongrass (*Sorghum halepense*), purpletop (*Tridens flavus*), and goosegrass (*Eleusine indica*). The WHA also indicated that the most common bird species utilizing the Airport’s AOA were American crow (*Corvus brachyrhynchos*), European starling (*Sturnus vulgaris*), eastern meadowlark (*Sturnella magna*), mourning dove (*Zenaida macroura*), and killdeer (*Charadrius vociferus*), while observed mammals within the AOA included raccoon (*Procyon lotor*), gray fox (*Urocyon cinereoargenteus*), and coyote (*Canis latrans*).

Information on potential rare, threatened, and endangered species on, or in the vicinity of, the Airport is provided in the following sub-section.

4.2.2.1. Threatened and Endangered Species

The Endangered Species Act (ESA) directs all federal agencies to work to conserve federally listed endangered and threatened species and to use their authorities to further the purposes of the ESA. Section 7 of the ESA, titled "*Interagency Cooperation*," is the mechanism by which federal agencies ensure the actions they take, including those they fund or authorize, do not jeopardize the existence of any federally listed species. Endangered species are those which are in danger of extinction throughout their range or a significant portion of its range. Threatened species are those which are likely to become endangered within the foreseeable future throughout all or a significant portion of their range. Candidate species are species for which the United States Fish and Wildlife Service (USFWS) has sufficient information on the biological vulnerability and threats to support issuance of a proposal list, but issuance of a proposed rule is currently precluded by higher priority listing actions. Candidate species do not receive substantive or procedural protection under the ESA. However, USFWS does encourage federal agencies and other appropriate parties to consider these species in the planning process.

South Carolina's threatened and endangered species program protects all federally listed threatened and endangered species as well as state listed threatened and endangered species. The South Carolina Department of Natural Resources (SCDNR) is the state agency primarily responsibility for administering the State's threatened and endangered species program under South Carolina Code of State Regulations Section 123-150: Non-Game and Endangered Species and South Carolina Code of Laws Title 50, Chapter 15: Nongame and Endangered Species. Under current South Carolina law and regulations, state level designations of threatened and endangered species are limited to "non-game species", which are defined as: "*…any wild mammal, bird, amphibian, reptile, fish, mollusk, crustacean, or other wild animal not otherwise legally classified by statute or regulation of this State as a game species*". There are no current state laws or regulatory provisions to protect rare plants or ecological communities.

McFarland Johnson conducted a review of SCDNR's website regarding county level distribution of state listed threatened or endangered species on October 29, 2017. The list, as shown in **Table 4-1**, indicated several state listed threatened or endangered species known to occur within Greenville County, no species were listed for Spartanburg County.

An official species list from the USFWS was obtained on October 9, 2017 and is also included in **Appendix A**. The list, as shown in **Table 4-2**, indicates that there are several listed species under the ESA within the vicinity of the Airport. The correspondence also indicated that there are no critical habitats within the project area (Airport property).

Table 4-1: State Listed Threatened and Endangered Species

Common Name	Scientific Name	State Status
Rafinesque's Big-eared Bat	*Corynorhinus rafinesquii*	Endangered
American Peregrine Falcon	*Falco peregrinus anatum*	Threatened
Bog Turtle	*Glyptemys muhlenbergii*	Threatened
Eastern Small-footed Myotis	*Myotis leibii*	Threatened

*Source: SCDNR (*http://www.dnr.sc.gov/species/county.html*)*

Table 4-2: Federally Listed Threatened and Endangered Species

Common Name	Scientific Name	Federal Status
Northern Long-Eared Bat	*Myotis septentrionalis*	Threatened
Bog Turtle	*Clemmys muhlenbergii*	Threatened
Bunched Arrowhead	*Sagittaria fasciculata*	Endangered
Dwarf-flowered Heartleaf	*Hexastylis naniflora*	Threatened
Mountain Sweet Pitcher-plant	*Sarracenia rubra ssp. jonesii*	Endangered
Small Whorled Pogonia	*Isotria medeoloides*	Threatened
Swamp Pink	*Helonias bullata*	Threatened
White Fringeless Orchid	*Platanthera integrilabia*	Threatened
White Irisette	*Sisyrinchium dichotomum*	Endangered
Rock Gnome Lichen	*Gymnoderma lineare*	Endangered

Source: USFWS Official Species List- Consultation Code: 04ES1000-2018-SLI-0030

As specific Airport development alternatives are identified and considered, the potential to affect State or federally listed rare, threatened, and endangered species will be re-assessed on an individual basis and in consultation with the SCDNR, USFWS, and FAA.

4.3. WATER RESOURCES

This section discusses potential affects to water resources including groundwater, wetlands, surface waters (streams, rivers, ponds, and lakes), and floodplains.

4.3.1. Groundwater

Groundwater serves as an important potable water supply for many individual households, small communities, and larger municipalities. Potential impacts from airport development projects can include reduced groundwater recharge and potential contamination through chemical, toxin, or other pollutant releases.

The Environmental Protection Agency (EPA) Sole Source Aquifer (SSA) program was established under the Safe Drinking Water Act (SDWA). According to the EPA, a SSA is defined as one that supplies at least 50 percent of the drinking water for its service area, and wherein which there is no reasonably available alternative drinking water sources should the aquifer become contaminated. The SSA program allows for EPA review of federally funded projects that have the potential to affect designated SSAs and their source areas.

According to the EPA, Airport property is not located over a SSA and therefore potential projects are not subject to EPA Section 1424(e) of the Safe Drinking Water Act. However, future proposed projects will take measures in design and construction to avoid, minimize, or mitigate any possible adverse impacts to groundwater.

4.3.2. Wetlands

The United States Army Corps of Engineers (USACE) regulates activities in wetlands that have a significant nexus to Traditional Navigable Waters of the United States (TNWs) under Section 404

of the Clean Water Act (CWA). The USACE requires that an area have hydrophytic vegetation primacy, hydric soils, and wetland hydrology present in order to be considered a wetland.

South Carolina has no current regulatory provisions to provide for wetland protection, however Section 401 of the CWA provides states with the authority to ensure that federal agencies do not issue permits or licenses that violate their water quality standards. The South Carolina Department of Health and Environmental Control (DHEC) implements Section 401 compliance through a certification process called Water Quality Certification (WQC). Through the DHEC WQC regulations, permittees must demonstrate avoidance and minimization of potential wetland impacts, and provided for mitigation for unavoidable wetland impacts.

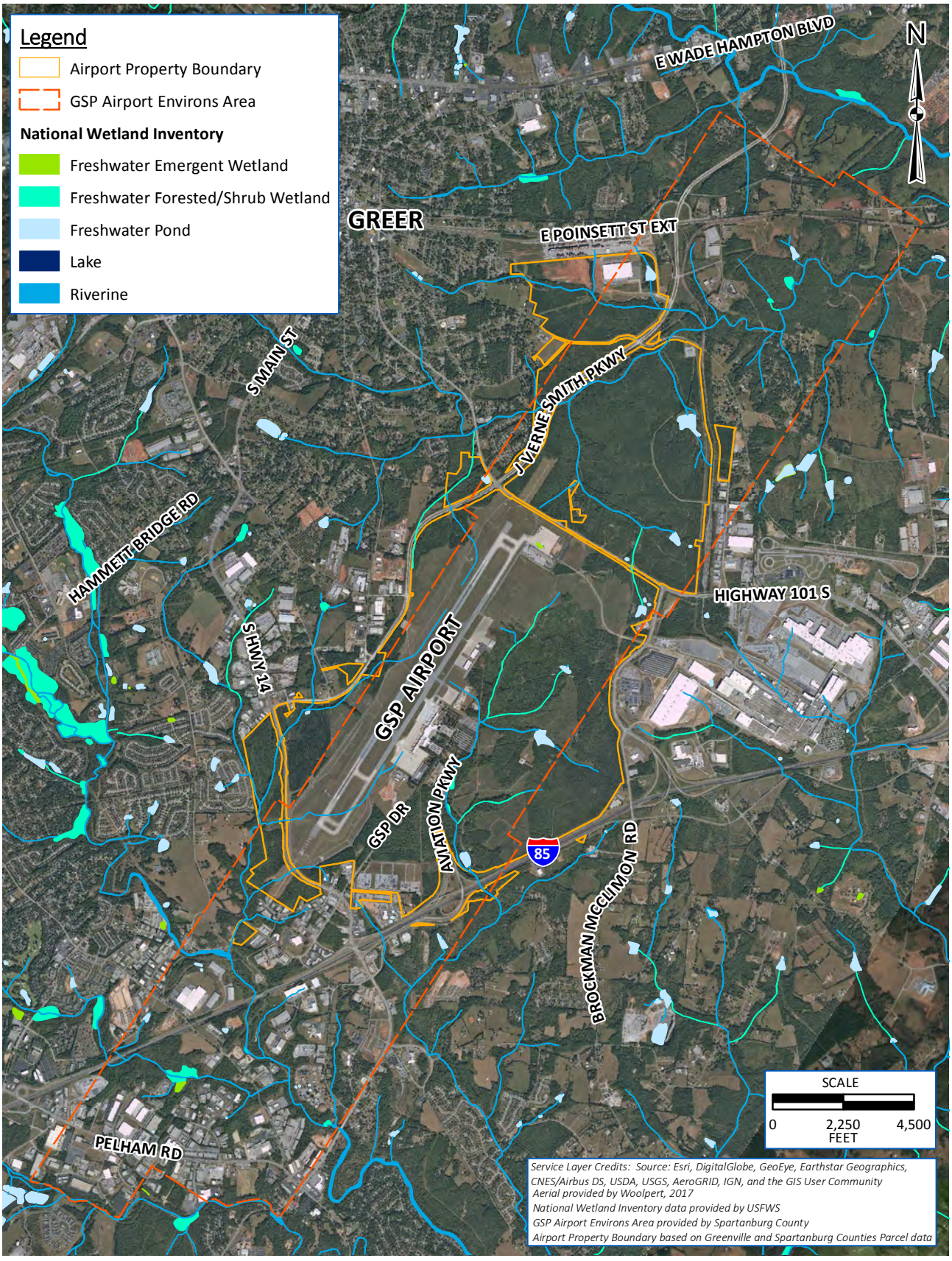
In addition, Executive Order (EO) 11990 - *Protection of Wetlands*, states that federal agencies shall provide leadership and shall take action to the destruction, loss, or degradation of wetlands, and to preserve and enhance natural and beneficial values of wetlands in carrying out the agency's responsibilities. Under EO 11990, wetlands are defined as those areas that are inundated by surface or ground water with a frequency sufficient to support and under normal circumstances does or would support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.

National Wetlands Inventory (NWI) mapping prepared by the USFWS indicated the potential for several small forested wetlands, freshwater ponds and streams to exist on Airport property. NWI mapping does not have any regulatory consequence, but rather indicates areas that may meet federal wetland criteria as identified by the USFWS using aerial photography. NWI mapping of Airport owned property is shown as Figure 4-1.

Future proposed projects will take measures in design and construction to avoid, minimize, or mitigate any possible adverse impacts to wetland resources to the degree possible. The use of Best Management Practices (BMPs) during construction projects will minimize indirect impacts to wetland resources. Projects that have no practicable alternatives to avoid direct impacts to federally regulated wetlands will require a Section 404 permit from the USACE and Section 401 WQC from the DHEC. In addition, when impacts to wetlands cannot be avoided, an EO 11990 "Wetland Finding" must be prepared to document compliance with the order and that the wetland impacts are justified.

Compensatory wetland mitigation may be required as a permit condition depending on the specific details of the proposed project(s). Mitigation is required by the USACE when impacts to federally regulated wetlands exceed 0.10 acres. Wetland mitigation can come in the form of restoration, establishment, enhancement, and/or preservation of wetlands.

Figure 4-1: National Wetland Inventory Map



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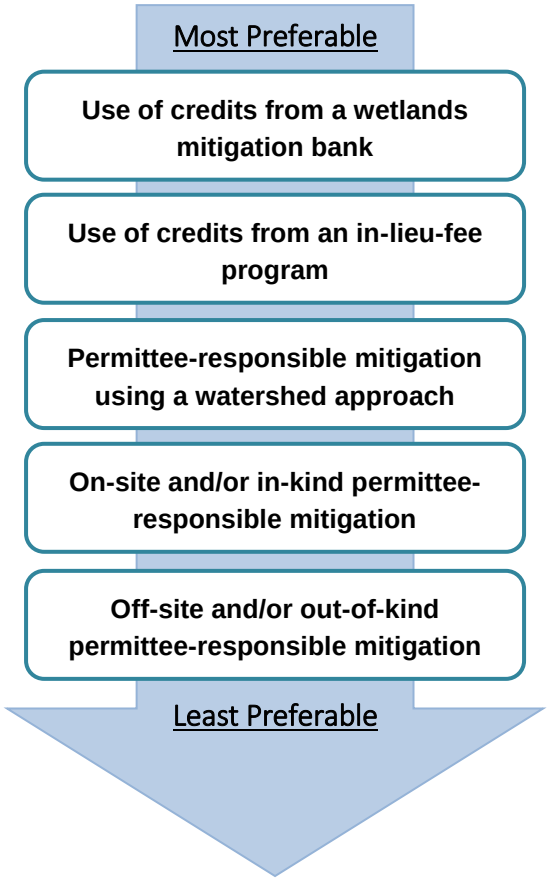
Based on regulations promulgated by the Department of Defense and Environmental Protection Agency in *Mitigation for Losses of Aquatic Resources; Final Rule* (Fed. Reg. Vol. 73, No. 70, April 10, 2008) a graphic presenting the hierarchy of preferred wetland mitigation options for impacts to federally regulated wetlands is presented as Figure 4-2.

The USACE Charleston District has established a method to calculate the number of mitigation credits required to offset adverse impacts to aquatic resources and the number of mitigation credits generated by a compensatory mitigation plan. The most current method is presented in the Charleston District's *Compensatory Mitigation Guidelines*, last revised on October 7, 2010[1].

Five federal agencies, including the FAA and USACE, signed a Memorandum of Agreement (MOA) in July 2003 to facilitate interagency cooperation on aircraft-wildlife strikes related issues, including wetland management at airports. As part of the MOA, the signatory agencies are required to diligently consider the siting criteria recommendations as stated in FAA Advisory Circular (AC) 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports*.

Figure 4-2: Preferred Wetland Mitigation Option Hierarchy



[1] *http://www.sac.usace.army.mil/Missions/Regulatory/Compensatory-Mitigation*

FAA AC 150/5200-33B recommends separation distances between the AOA and potential wildlife hazards, including proposed wetland mitigation sites. These siting distances are:

- 5,000 feet of a runway that serves piston-powered aircraft
- 10,000 feet of a runway that serves turbine-powered aircraft
- 5 statute miles if the attractant could cause hazardous wildlife movement into or across the approach or departure airspace

The above siting criteria will also be taken into consideration when considering potential wetland mitigation options and site selection.

4.3.3. Surface Waters

The USACE regulates surface waters under Section 10 of the Rivers and Harbors Appropriation Act (RHA) that are considered to be a TNW as defined specifically there within. The USACE also regulates surface water bodies through Section 404 of the CWA that have a significant nexus to a TNW as defined in Section 10 of the RHA or a TNW as defined Section 404 of the CWA. A significant nexus is generally defined as having more than an insubstantial or speculative effect on the chemical, physical, or biological integrity of a downstream TNW. Surficial open waterbodies, including streams, ponds, and lakes, are delineated by their Ordinary High Water Mark (OHWM) as defined in Title 33, Code of Federal Regulations, Part 328 (33 CFR 328).

South Carolina's primary regulatory provision to provide for surface water protection is through Section 401 of the CWA which provides states with the authority to ensure that federal agencies do not issue permits or licenses that violate their water quality standards. The DHEC implements Section 401 compliance through a WQC. Through the DHEC WQC regulations, permittees must demonstrate avoidance and minimization of potential impacts to surface waters, and provide for mitigation for unavoidable impacts.

Future proposed projects will take measures in design and construction to avoid, minimize, or mitigate any possible adverse impacts to surface water resources to the degree possible. The use of BMPs during construction project will minimize indirect impacts to wetland resources. Projects that have no practicable alternatives to avoid direct impacts to federally regulated surface waters will require a Section 404 permit from the USACE and Section 401 WQC from the DHEC.

4.3.4. Wild and Scenic Rivers

The National Wild and Scenic Rivers Act (Public Law 90-542) provides protection for several of the nation's free-flowing rivers that exhibit exceptional natural, cultural, and recreational values.

The South Carolina Scenic Rivers Act of 1989 (South Carolina Code of Laws Title 49-Chapter 29, as amended) provides for protection of selected rivers and river segments within the state that possess unique or outstanding scenic, recreational, geologic, botanical, fish, wildlife, historic, or cultural values.

There are no state or federally designated wild, scenic, or recreational rivers on or adjacent to Airport property.

4.3.5. Floodplains

Floodplains are low lying land areas typically associated with bodies of water that are likely to become inundated during a flooding event. Floodplains serve an important function in retaining storm waters to protect against downstream flooding, property damage, and potential loss of life.

EO 11988, *Floodplain Management,* directs all federal agencies to avoid the direct and indirect support of floodplain development wherever there is a practicable alternative.

The area or magnitude of a floodplain will vary according to the magnitude of the storm event as determined by the storm interval occurrences. For example, a five-year storm has a magnitude that can be expected once every five years. FEMA utilizes a 100-year storm interval for flood preparation. Flooding related to a 100-year storm statistically has a one-percent chance of occurring during any given year. The 100-year period has been selected as having special significance for floodplain management because it is the maximum level of flooding that can reasonably be expected and planned for during a project's expected life span.

According to the most current FEMA Flood Insurance Rate Maps (FIRM), portions of Airport property are mapped within a designated 100-year floodplain area. Figure 4-3, FEMA Floodplain Map, shows the location of flood zones on and near the Airport.

As specific Airport developments are identified, and analyzed as part of this MPU and through future NEPA documentation requirements, their potential to encroach upon a FEMA designated floodplains will be evaluated.

4.4. COASTAL RESOURCES

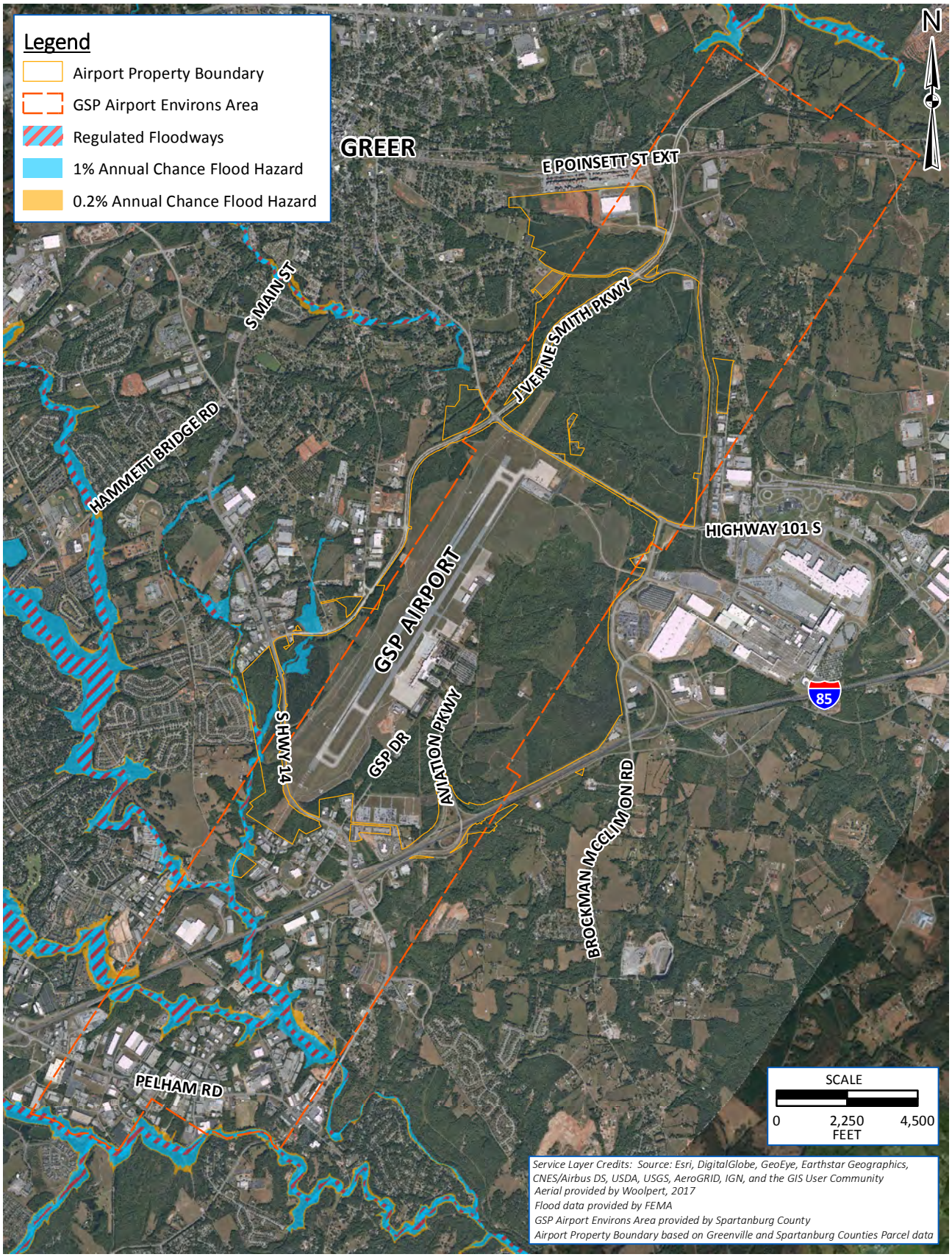
The federal Coastal Barrier Resources Act (CBRA) provides for review of federally funded projects undertaken within the Coastal Barrier Resources System (CBRS). The CBRS contains undeveloped coastal barriers along the coasts of the Atlantic Ocean, Gulf of Mexico, and Great Lakes.

The Airport is not located within a CBRS and the CBRA will not apply to any proposed improvements at the Airport.

The Coastal Zone Management Act (CZMA) is a federal program that provides for management and protection of all of the nation's ocean and Great Lakes coasts. In South Carolina, the management authority has been delegated to the DHEC's Office of Ocean and Coastal Resource Management. Under South Carolina's Coastal Management Program (CMP), the DHEC develops coastal policies and establishes state consistency requirements.

The Airport is not located within or adjacent a designated coastal zone, and the provisions of the CZMA will not apply to any proposed improvements at the Airport.

Figure 4-3: FEMA Floodplain Map



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4.5. DEPARTMENT OF TRANSPORTATION SECTION 4(F) RESOURCES

Section 4(f) of the Department of Transportation Act of 1966 protects publicly owned parks, recreation areas, wildlife and waterfowl refuges, and historic sites of national, state, or local significance from development unless there are no feasible alternatives.

There are no publicly owned parks, recreation areas, or wildlife and waterfowl refuges on or immediately adjacent to Airport property.

A review of the South Carolina State Historic Preservation Office (SHPO) online cultural resource geographic information system (ArchSite), conducted on October 9, 2017, did not indicate the presence of known historic properties listed in or eligible for listing in the National Register of Historic Places on Airport property.

An impact to historic sites of national, state, or local significance on or near the Airport may be considered a use under Section 4(f). As specific developments are identified, and analyzed as part of this MPU and through future NEPA documentation requirements, their potential to effect historic resources or other resources protected under Section 4(f) will be assessed on an individual basis.

4.6. HISTORICAL, ARCHITECTRUAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

According to 36 CFR Part 800, a historic property is "any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places (NHRP)". Section 106 of The National Historic Preservation Act (NHPA) requires that federal agencies, such as the FAA, consider the effects of their actions on historic properties via consultation with SHPO.

As previously mentioned, review of the SHPO ArchSite did not indicate the presence of known historic properties listed in or eligible for listing in the National Register of Historic Places on Airport property.

When a specific airport development is proposed, the required documentation, including detailed descriptions and pictures of structures to be affected, will be sent to SHPO for a determination of that project's potential effect on historic or cultural resources as part of future studies to comply with NEPA.

4.7. FARMLANDS

The Farmland Protection Policy Act (FPPA), 7 CFR Part 658, requires federal agencies to consider project alternatives that will minimize unnecessary and irreversible conversion of farmland to nonagricultural uses. For the purposes of the FPPA, farmland refers to soils classified as prime farmland, unique farmland, and farmland of statewide or local importance.

According to the U.S. Natural Resource Conservation Service (NRCS) *Web Soil Survey,* accessed on October 11, 2017, approximately 29.9 percent (1065.4 acres) of Airport property is classified as prime farmland and 20.5 percent (731.6 acres) is classified as Farmland of Statewide Importance. An additional 4.7 percent (167.2 acres) is classified as prime farmland if drained and either protected from flooding or not frequently flooded during the growing season.

The FPPA does not apply to land already committed to urban development. Airport property has already been previously committed to urban development or current airport utilization and development and would not be subject to the FPPA regulations.

There are no local municipality zoned agricultural areas near the Airport.

4.8. LAND USE

When considering improvement projects that meet an airport's development goals, it is important early in the planning process to identify potential impacts to existing land uses on airport property and in the surrounding area and to determine how potential airport projects will affect future land use and development patterns. This will enable the project to incorporate measures into the future design and layout of airport developments that will avoid or minimize land use conflicts as well as improve on existing conflicts when practicable.

Some land uses that are considered more susceptible to impacts from airport development include, but are not limited to, residential areas, public schools, religious institutions, hospitals, and certain public places such as parks, recreational areas, and cemeteries, where quiet is an expected part of the user experience.

The area surrounding the Airport is mostly residential to the north- and southwest with some intermitted industrial and institutional land use to the direct west and the southeast. A small amount of commercial land is located to the southeast as well. The area to east of the Airport, consists predominately of undeveloped lands.

There are currently no parks, public schools, religious institutions, hospitals, or cemeteries located adjacent the Airport. However, there are adjacent residential properties, as well as several parks, religious institutions, hospitals and schools located in the vicinity of the Airport that may be considered noise sensitive.

Alternatively, there are some land uses that can negatively impact the operation of the Airport and are considered incompatible with Airport activity. These land uses can include park and recreational areas, golf courses, landfills, open water areas, and other land uses that have the potential to serve as wildlife attractants, and commercial and industrial facilities that generate high-voltage electricity, utilize bright lights, or create a significant amount of glare, smoke, or steam.

FAA AC 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports*, provides guidance on certain land uses that have the potential to attract hazardous wildlife on or near airports. Potential wildlife attractants and congregation areas can include areas such as shopping malls, agricultural fields, livestock operations, golf courses, parks, waste handling facilities, waterbodies, wetlands, and water management facilities.

The Greenville-Spartanburg Airport Environs Commission has established the *Greenville-Spartanburg Airport Environs Area Zoning Ordinance*, to manage airport hazards and incompatible uses of land within the vicinity of the Airport. Specific information regarding this zoning ordinance was previously presented in Section 2.6.2.

As future improvements are considered as part of this MPU, the presence of incompatible land uses within the vicinity of the Airport will be considered.

4.9. NOISE AND NOISE-COMPATIBLE LAND USE

Aircraft noise emissions, inherent to the operation of an airport, can adversely impact land use compatibility between an airport and surrounding properties, particularly in the presence of noise-sensitive receptors. Churches, hospitals, schools, amphitheaters, and residential districts are receptors that are sensitive to elevated noise levels. Recreational areas and some commercial uses are moderately sensitive to elevated noise levels. Therefore, it is important to predict any change in noise levels associated with airport development, to determine the significance, if any, of the impact to noise sensitive land-uses. Then, abatement measures can be incorporated into airport development plans to avoid or minimize the impacts.

In order to evaluate the noise impacts of aviation activity on surrounding areas, the FAA has developed the Aviation Environmental Design Tool (AEDT), Version 2C. The noise modeling component within AEDT identifies locations that are exposed to specific levels of aircraft-generated noise and is based on algorithms which use aircraft specific data to estimate noise accounting for specific operation mode, thrust setting, and source-receiver geometry, acoustic directivity and other environmental factors. Inputs into AEDT can include aviation activity forecasts and runway configurations for various scenarios, as well as terrain and weather information. This computer model calculates cumulative aircraft noise at ground level expressed in decibels (dB), using the Day-Night Average Level (DNL). The DNL is the yearly day-night average sound level. All operations that occur between 10:00 pm and 6:59 am, also known as nighttime operations, incur an additional 10 dB weight within the model. Decibels are measured in A-weighted units, which approximate the range of human hearing. The FAA considers the 65 dB DNL level to be the threshold of impact for noise-sensitive areas. In order to help put the 65 dB DNL into perspective, the typical ambient noise level in suburban residential areas is 55 dB DNL. Table 4-3 shows the typical noise levels associated with specific areas commonly encountered every day. Table 4-4 presents the day-night average noise levels (DNL, dB), that are used by the FAA to evaluate land use compatibility with respect to airports.

Table 4-3: Typical Outdoor Day-Night Noise Levels

DNL Day-Night Noise Level (dB)	Location
50 dB	Small town residential area or quiet suburban area
55 dB	Suburban residential area
60 dB	Urban residential
65 dB	Noisy urban residential area
70 dB	Very noisy urban residential area
80 dB	City Noise (Downtown of a Major Metropolitan Area)
80 dB	3rd Floor Apartment in a Major City Next to a Freeway

Source: Noise Fundamentals Training Document, Highway Noise Fundamentals, U.S. Department of Transportation, Federal Highway Administration

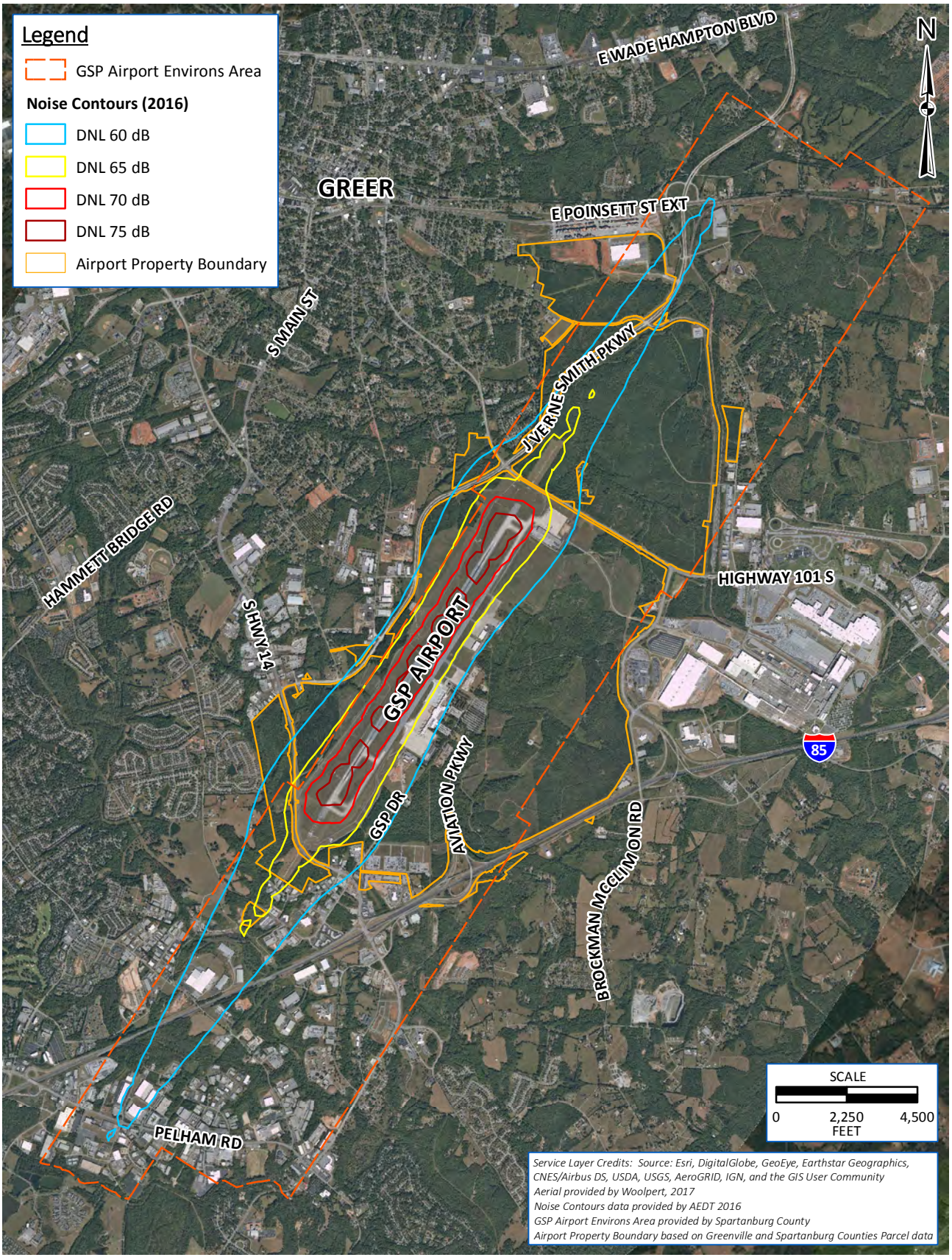
Table 4-4: Land Use Compatibility

Land Use	Yearly Day-Night Average Noise Level (DNL, dB)		
	Compatible Below 65	Compatible Between 65 and 70	Compatible Between 70 and 75
Residential	YES	NO*	NO*
Mobile Home Parks	YES	NO	NO
Transient Lodgings	YES	NO*	NO*
Schools	YES	NO*	NO*
Hospitals/Nursing Homes	YES	YES*	YES*
Churches/Auditoriums	YES	YES*	YES*
Governmental Services	YES	YES	YES*
Transportation/Parking	YES	YES*	YES*
Offices/Business/Professional	YES	YES	YES*
Wholesale and Retail	YES	YES	YES*
Utilities	YES	YES	YES*
Communications	YES	YES	YES*
Manufacturing	YES	YES	YES*
Photographic/Optical	YES	YES	YES*
Agriculture and Forestry	YES	YES*	YES*
Livestock Farming	YES	YES*	YES*
Mining/Fishing	YES	YES	YES
Outdoor Sports Arenas	YES	YES*	YES*
Outdoor Music Shells	YES	NO	NO
Nature Exhibits/Zoos	YES	YES	NO
Amusements/Parks/Camps	YES	YES	YES
Golf Courses/Stables	YES	YES	YES*

Source: 14 CFR 150, Airport Noise Compatibility Planning
**Measures must be incorporated into the design of the structure or use that will allow this activity to continue at the indicated noise exposure level*

A review of aerial photography, along with land use maps of the area, indicates that much of the land surrounding the Airport to the east, south, and west, would not be considered noise sensitive, as much of these lands are vacant, categorized as agricultural land use, or are developed with commercial uses. There are several noise sensitive land uses, primarily residences, located in the vicinity of the Airport, including Chartwell Estates and Chartwell Townhomes west of the Runway 4 approach end and the Maplewood subdivision north of the Runway 22 approach end. **Figure 4-4** displays the 2016 Noise Contours Map.

Figure 4-4: Noise Contour Map



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A noise analysis will be completed as part of the Land Use Plan included in the Airport Layout Plan (ALP) set. This analysis will include the forecasted number of future operations and will utilize a fleet mix anticipated to occur at the Airport, and will be based on the final infrastructure improvements recommended as part of this MPU. The Land Use Plan will identify land uses of adjacent properties and the noise contours generated will be utilized to identify any potential impacts associated with the proposed development.

4.10. VISUAL EFFECTS

A visual effect refers to the potential effects due to light emissions, as well as the potential effects to visual resources and character.

4.10.1. Light Emissions

Airport improvements may include the installation of additional lighting or change the location of lighting on airport property to accommodate the construction of the infrastructure improvements. These installations can alter the existing lighting conditions both on-airport and in the vicinity of an airport. Light emissions are typically one of the greatest concerns for residents in neighborhoods, as well as users of other incompatible land uses, adjacent to an airport that could be directly impacted by a change in lighting.

Further analysis will be required during the NEPA evaluation process to ensure that potential light emission effects of Airport development projects do not significantly negatively effects adjacent landowners.

4.10.2. Visual Resources and Character

The Airport is located within an area of undeveloped land, light commercial land uses, and residential development. There are no buildings, sites, traditional cultural properties, and other natural or manmade landscape features that are visually important or have unique characteristics in the vicinity of the Airport. Any potential development at the Airport would be in character with the existing surrounding area land uses and would not negatively affect the visual character of the surrounding area.

4.11. AIR QUALITY

An increase in vehicle exhaust emissions, caused by development related increases in aircraft activity and automobile traffic, may affect air quality. However, the air quality impact attributable to potential development is expected to be negligible at the Airport.

Under Section 176(c) of the Clean Air Act (CAA) Amendments of 1977, the FAA is responsible for ensuring that federal airport actions conform to the State Implementation Plan (SIP), which protects against regional air pollution impacts. The criteria and procedures for implementing this conformity are detailed in Title 40 CFR, Part 93, *Determining Conformity of Federal Actions to State or Federal Implementation Plans.* Many federal actions on an airport are considered to be general conformity actions. Presently, the general conformity rules only apply in areas that have been determined by the United States EPA to be in nonattainment or maintenance for the CAA's National Ambient Air Quality Standards (NAAQS) of the six priority pollutants (ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead). Under NEPA, the FAA

may be required to prepare detailed air quality analysis for proposed projects whose air quality emissions have the potential to cause violations of the NAAQS for the six criteria pollutants.

The EPA does not currently list Greenville County or Spartanburg County as areas of nonattainment or maintenance for NAAQS. Most Airport projects will not cause or create a reasonably foreseeable emission increase, which can be sufficiently documented and disclosed through a qualitative air quality assessment to satisfy the requirements of the CAA and NEPA. If large scale projects are proposed that may create an increase in emissions, a full emissions inventory will be required.

4.12. HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION

4.12.1. Hazardous Waste

A Hazardous Waste/Contaminated Material (HWCM) desktop screening was conducted to determine the potential for the presence of HWCM on or near Airport property. The screening involved the review of online governmental databases and the Environmental Radius Database Report provided by NETROnline Environmental Database Network. An environmental regulatory agency records review of this nature is based on publicly available information from state and federal agencies.

Review of the USEPA Envirofacts Database did not indicate the potential for the release of chemical, hazardous, or petroleum materials at or in the immediate vicinity of the Airport. The Environmental Radius Database Report indicated two records of leaking underground storage tanks associated with Stevens Aviation, Inc., located at 2100 GSP Drive.

It is possible that there were incidents on or near the Airport property involving chemical, hazardous, or petroleum related materials that were not reported. If previously unidentified chemical, hazardous, or petroleum related wastes are encountered during the construction of any future proposed projects, direct consultation will occur with the DHEC and the wastes will be handled and disposed of in accordance with all applicable federal, state, and local regulations.

4.12.2. Solid Waste

Currently, the Airport has a solid waste collection and disposal services contract with Waste Connections of the Carolinas, a local waste management company located in Duncan, South Carolina. All municipal solid waste is transported approximately 26 miles southwest to the Anderson Regional Landfill, a RCRA Subtitle “D” landfill, located in Belton, South Carolina. The Anderson Regional Landfill is also owned and operated by the Waste Connections of the Carolinas. The Anderson Regional Landfill is permitted to accept municipal solid waste, industrial solid waste, sewage sludge, nonhazardous municipal solid waste incinerator ash, and other nonhazardous waste.

According to the South Carolina Solid Waste Management Annual Report for Fiscal Year 2016, the Anderson Regional Landfill has a permitted annual intake limit of 438,000 tons per year, with an estimated 6,241,144 tons of remaining capacity. Based the permitted annual intake limit, the anticipated life span of the landfill is approximately 14.2 years, while based on the 2016 intake (347,828 tons), the estimated life span of the landfill is 17.9 years. Based on the permitted landfill

capacity and estimated landfill life span, adequate space for the disposal of solid waste attributable to any Airport development is available.

4.12.3. Pollution Prevention

The Clean Water Act authorizes the EPA and states, which are delegated the authority by EPA, to regulate point sources that discharge pollutants into waters of the United States through the National Pollutant Discharge Elimination System (NPDES) permit program. So-called "point sources" are generated from a variety of municipal and industrial operations, including treated wastewater, process water, cooling water, and stormwater runoff from drainage systems. In South Carolina, the NPDES program is delegated to DHEC. See Section 4.12.4 for further information specific to stormwater discharges.

Although the DHEC does not regulate AST systems, it does regulate underground storage tanks (USTs) for the entire life of the tank system under the Underground Storage Tank Control Regulations (R.61-92).

The Airport operates a fueling facility through its fixed-base operator (FBO) to the east of the airfield near the intersection of GSP Drive and Stevens Road. The farm contains five 30,000-gallon USTs of Jet A fuel and one 12,000-gallon UST of Avgas. All tanks have a 95 percent max capacity level with high level auto switch off controls at 95 percent and high-level alarms at 90 percent. All fuel trucks that refill at the storage facility have three separate high level shut off systems to prevent overfill including a Scully System. The np is responsible for compliance with all applicable local, state and federal petroleum bulk storage requirements in order to minimize the potential for spills.

4.12.4. Stormwater

Airport development projects may potentially affect surface and groundwater quality. The implementation of stormwater management measures, designed to avoid or minimize the impacts to water quality during a project's construction and operation phase, is required for many types of development projects. The specific stormwater management measures required are dependent upon the magnitude of the impact.

The DHEC issues NPDES Construction General Permits (CGP) under the statutory and regulatory provisions of the South Carolina Pollution Control Act (S.C. Code Sections 48-1-10) and South Carolina Stormwater Management and Sediment Reduction Regulations (R.72-300).

In general, automatic permit coverage under the NPDES CGP applies to sites that comprise 0.5 acres and less of land disturbance, are not part of a larger common plan, and drain within 0.5 miles of a coastal receiving water. For all other projects not meeting these conditions, an Individual NPDES or General NPDES Permit for Stormwater Construction Activities issued by the DHEC, is required. The issuance of a NPDES CGP requires the preparation of a site-specific Stormwater Pollution Prevention Plan.

Future projects that will result in earth disturbances will require coordination with the DHEC to determine the level of specific stormwater management measures and permits required.

4.13. ENERGY SUPPLIES AND NATURAL RESOURCES

Use of energy supplies and natural resources is closely linked to construction of airport improvements and operations. Anticipated growth and development at the Airport is likely to increase the use of energy and natural resources. However, energy and natural resources are relatively abundant in Northwestern South Carolina and planned growth at the Airport is not of sufficient magnitude to alter regional energy demand or limit natural resource availability.

Each proposed project, including those that will lead to an increase in aircraft operations, will be evaluated for the potential effect upon these resources and methods to reduce potential energy uses will be developed and considered during the review process.

4.14. CLIMATE

Climate change is a global phenomenon that has been attributed to increasing concentrations of greenhouse gases (GHGs) in the atmosphere. GHGs include carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6).

Under EO 13693, *Planning for Federal Sustainability*, federal agencies must make efforts to measure, report, and reduce their GHGs emissions from direct and indirect activities.

The FAA has not identified a significance threshold for GHG emissions as there is no current accepted method of determining the level of significance applicable to airport projects given the small percentage of emissions they contribute. Any increase in emissions of GHGs as the result of a proposed action at the Airport would be considered negligible in comparison with U.S. annual emissions and therefore would not have a significant impact on global climate change.

4.15. SOCIOECONMICS, ENVIRONMENTAL JUSTICE, AND CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISKS

Under the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR Part 1502.1), federal agencies are required to consider the effects to the area population's health, safety risks to children, and socioeconomic impacts. Under 40 CFR 1508.14, the CEQ requires that the human environment be considered for federal projects to address the relationship of people with their natural and physical environments.

4.15.1. Socioeconomics

Principal impacts to be considered include the displacement of families or businesses, effects to neighborhood characteristics, dividing or disrupting established communities, changing ground transportation patterns, disruption of orderly planned community developments, or creating measurable changes in employment. If land acquisition were necessary for proposed Airport development alternatives, it would be accomplished in accordance with 49 CFR Part 24, *Uniform Relocation Assistance and Real Property Acquisition Policies Act* (Uniform Act), and FAA AC 150/5100-17, *Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects*. The Uniform Act standardizes real property acquisition policies and requires the uniform and equitable treatment of persons relocated due to a federally assisted project.

Proposed projects will be evaluated for the potential effects to the community economy, social structure, and necessary community health and safety services as specific alternatives are developed during the design process.

4.15.2. Environmental Justice

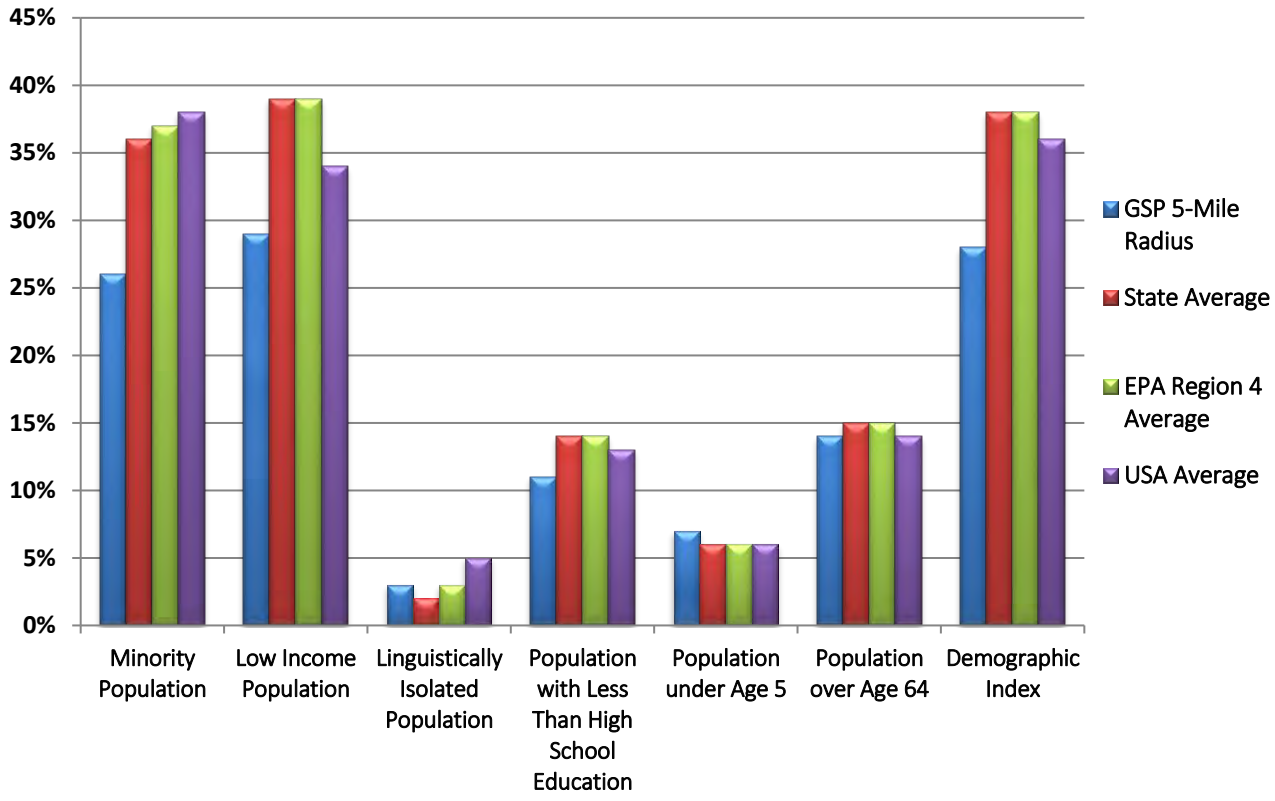
EO 12898 - *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* directs federal agencies to consider the potential effects of federal actions, including those involving federally obligated airports, to cause a disproportionate and adverse effect upon low-income or minority populations.

An environmental justice (EJ) screening of the area within a 5-mile radius centered on the Airport was conducted using the EPA's EJ mapping and screening tool EJSCREEN. EJSCREEN evaluates seven select demographic indicators calculated from the Census Bureau's American Community Survey 2008-2012. These demographic indicators include:

- **Percent Minority -** Percent minority as a fraction of population, where minority is defined as all but Non-Hispanic White Alone.
- **Percent Low-income -** Percent of individuals whose ratio of household income to poverty level in the past 12 months was less than 2 (as a fraction of individuals for whom ratio was determined).
- **Percent Less Than High School Education -** Percent of individuals age 25 and over with less than high school degree.
- **Percent in Linguistic Isolation -** Percent of households in which no one age 14 and over speaks English "very well" or speaks English only (as a fraction of households).
- **Percent Over Age 64 -** Percent of individuals over age 64 as a fraction of the population.
- **Percent Under Age 5 -** Percent of individuals under age 5 as a fraction of population.
- **Demographic Index -** The Demographic Index in EJSCREEN is a combination of percent low-income and percent minority, the two demographic factors that were explicitly named in EO 12898 on EJ. For each census block group, these two numbers are simply averaged together. The formula is as follows: Demographic Index = (percent minority + percent low-income) / 2.

Review of the EJSCREEN data indicates the area within a 5-mile radius of the Airport has a lower minority population and low income population percentages compared to EPA Region 4, State, and United States of America (USA) averages. The lower minority population and low income population percentages have a positive correlation with the demographic index, which is also lower than EPA Region 4, State, and USA averages. All other demographic indices are generally aligned with EPA Region 4, State, and USA data averages. A graphical presentation of the comparison of the data of the area from within a 5-mile radius of the Airport to EPA Region 4, State, and USA data is shown in **Figure 4-5**, Demographic Profile Comparison Graph.

Figure 4-5: Demographic Profile Comparison Graph



Source: EPA EJSCREEN, Accessed October 30, 2017

Based on the aforementioned information, Airport development is not likely to result in a disproportionately high and adverse human health or environmental effect to children, elderly or minority populations. Further analysis will be required during the NEPA evaluation process to ensure that Airport development projects do not significantly adversely effect low-income populations in the vicinity of the Airport.

4.15.3. Children's Environmental Health and Safety Risks

Pursuant to EO 13045 - *Protection of Children from Environmental Health Risks and Safety Risks*, federal agencies are directed to make identification and assessment of environmental health and safety risks that may disproportionately affect children a high priority. Federal agencies are encouraged to ensure that their policies, programs, and activities address any disproportionate risks children may incur from environmental health and safety risks. These risks are generally 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 to which they may be exposed.

The Airport development alternatives under consideration will not disproportionately affect children or products and substances they are likely to come in contact with.

4.16. AIRPORT RECYCLING, REUSE AND WASTE REDUCTION

Airports generate various types of solid waste that could be reduced, reused, or recycled. The FAA Modernization and Reform Act (FMRA) of 2012 compels airports to explore solid waste recycling at their facilities. Specifically, the FMRA expanded the definition of airport planning to include, "developing a plan for recycling and minimizing the generation of airport solid waste, consistent with applicable State and local recycling laws." Other sections of the FMRA specifically discuss addressing issues related to solid waste and recycling at airport as part of a new or updated master plan. This effort is to include:

- The feasibility of solid waste recycling at the airport;
- Minimizing the generation of solid waste at the airport;
- Operation and maintenance requirements;
- Review of waste management contracts;
- The potential for cost savings or the generation of revenue.

4.16.1. Existing Waste Sources

Waste streams at an airport can come from a variety of sources and be handled in multiple ways. Various groups, agreements, operational styles, and collection/disposal processes play into the overall generation and management of waste at an airport. Although a waste audit was not performed as part of this study, four primary sources of waste at GSP were identified. These include, the airfield, the terminal building, airport tenant hangars, and cargo/MRO facilities. Guidance available from the FAA suggests exploring sources of waste relative to three categories of control, including:

- Areas where the airport has direct control of waste management (public space, office space, terminal building, airfield). These areas are controlled by the Airport and they can introduce recycling, reuse, and waste reduction programs directly.
- Areas where the Airport has no direct control but can influence waste management (tenants). These are areas owned by the airport; however, they are leased out to tenants. The Airport can recommend that recycling, reuse, and waste reduction programs be used and can include language in the tenant contracts, but realistically can't control what is done.
- Areas where the Airport has no control or influence over waste management. These are areas the Airport neither owns or leases.

Table 4-5 identifies typical waste generated at GSP from the four airport waste sources identified as well as the level of control the Airport has over that waste stream.

Table 4-5: Waste Sources and Control

Area	Waste Generated	Control
Airfield	General debris, potentially construction material (asphalt, concrete, wood, metal)	Direct Control
Terminal Building	Plastic, glass, mixed paper, aluminum, oil, batteries, commercial food waste, general refuse	Direct Control
Tenant Hangars	Plastics, glass, mixed paper, aluminum, oil, batteries, general refuse	No Direct Control, Has Influence
Cargo/MRO Facilities	Tires, equipment fluid, wooden pallets, plastic packing material, lightbulbs, electronics, batteries, general refuse	No Direct Control, Has Influence

Source: McFarland Johnson, 2017.

4.16.2. Local Recycling and Waste Management Programs

As previously mentioned, solid waste collection and disposal services at GSP is managed by Waste Connections of the Carolinas, a local waste management company located in Duncan, South Carolina through contract with the Airport. Waste Connections of the Carolinas is a responsible partner in properly disposing of waste and working to reduce its environmental impact. The company is capable of supporting recycling services to commercial businesses, multi-tenant buildings, industrial facilities and construction sites.

4.16.3. Overview of Airport Recycling, Reuse, and Waste Management Practices and Opportunities

Presently GSP engages in multiple initiatives focused on minimizing solid waste streams to landfills as well as the on-site reuse of materials as able. These include:

- Stockpiling of suitable earthen fill for use in future development projects on Airport property.
- Collect used oil and coordinate with a recycler for pickup.
- Stockpile recyclables not regularly picked up for an annual event, such as electronics, batteries, etc. and coordinate an annual or semi-annual pickup.
- Selling surplus equipment and other goods through an internet auction site (GovDeals).
- Removal and recycle existing pavement that is not required for future use.
- Providing maintenance group recycling opportunities for tires, bulbs, skids, etc.

Wastes generated at the Airport are, for the most part, similar in nature to that which is developed in a residential community and in volumes that are not excessive or which could put undue burden on the contracted waste disposal company. In addition to the existing recycling and reuse initiatives in place at GSP, opportunity exist to:

- Provide strategically located recycling receptacles, with recyclable sorting directions, within the commercial terminal building.[2]
- Encouraging the recycling of aluminum, glass, plastics, paper, newspapers, magazines, phone books, and corrugate cardboard.[3]
- Implement a Green Concessions Program that would recommend Airport concessionaires reduce the amount of non-biodegradable packaging

Over time, GSP's ability to increase its commitment to airport recycling, reuse and waste reduction will be reliant upon the larger Greenville-Spartanburg community's ability to support and retain quality recycling providers offering a diverse range of recycling services at a reasonable price. The potential economic impact to the Airport should be fully considered prior to implementing any new recycling and reuse initiative.

[2] GSP teamed up with SCDHEC 10 years ago during an initiative to make recycling more attractive in SC. SCDHEC donated recycle receptacles to GSP which were located throughout the parking garages, terminal and concourses. However, they were not being utilized for recycling efforts as trash was comingled inside them and all the trash was placed into a dumpster as municipal solid waste (MSW). The receptacles could have been utilized as recycle containers, but GSP would have needed to install other receptacles for MSW to prevent the comingling that occurred.

[3] An initiative similar to this has been attempted previously with a company named Evergreen Recycling in Anderson SC with a focus on office paper 10+ years ago but was dropped. In 2017, costs were explored for a recycle dumpster provided by Waster Connections. The unit to be placed at GSP would capture cardboard, plastic and aluminum; no decision was made. One limiting factor is placement of the unit in a convenient location for tenant access and having ample ground space for the container inside the secured area. If it's not in a convenient location it won't be utilized.