

FINAL

Environmental Assessment for the Proposed Deice Pad

Charlotte Douglas International Airport
Charlotte, North Carolina

PREPARED FOR
CHARLOTTE DOUGLAS INTERNATIONAL AIRPORT

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
As lead Federal Agency pursuant to the National Environmental Policy Act of 1969

PREPARED BY
Landrum & Brown, Incorporated

July 2020

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

Responsible FAA Official

Date

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Acronyms

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

AC	Advisory Circular
ACEP	Airport Capacity Enhancement Plan
ACM	Asbestos Containing Material
ADG	Airplane Design Group
ALP	Airport Layout Plan
APE	Area of Potential Effect
ATCT	Air Traffic Control Tower
BFE	Base Flood Elevations
BMP	Best Management Practice
C&D	Construction and Demolition
CAA	Clean Air Act (as amended in 1990)
CBP	Customs and Border Patrol
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
C.F.R.	Code of Federal Regulations
CH ₄	Methane
CLOMR	Conditional Letter of Map Revision
CLT	Charlotte Douglas International Airport
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CTA	Central Terminal Area
dB(A)	Decibel - A weighted
DMS	North Carolina Division of Mitigation Services
DOT	Department of Transportation
EA	Environmental Assessment
EAT	End-Around Taxiway
FAA	Federal Aviation Administration
FBFM	Flood Boundary and Floodway Map
FEMA	Federal
FIRM	Flood Insurance Rate Map
GA	General Aviation
GAO	General Accounting Office
GHG	Greenhouse Gas
HFC	Hydrofluorocarbon
H ₂ O	Water Vapor
HUC	Hydrologic Unit Code
ICAO	International Civil Aviation Organization
ILS	Instrument Landing System

LOMR	Letter of Map Revision
LWCA	Land and Water Conservation Act
N ₂ O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NCANG	North Carolina Air National Guard
NCDEQ	North Carolina Department of Environmental Quality
NEM	Noise Exposure Map
NEPA	National Environmental Policy Act of 1969, as amended
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO _x	Nitrogen Oxide
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places
O ₃	Ozone
PM _{2.5}	particulate matter less than 2.5 microns in diameter
PM ₁₀	particulate matter less than 10 microns in diameter
RCRA	Resource Conservation and Recovery Act of 1976
SF ₆	Sulfur Hexafluoride
SFHA	Special Flood Hazard Areas
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SPCC	Spill Prevention, Control and Countermeasure
SWPPP	Stormwater Pollution Prevention Plan
TSCA	Toxic Substances Control Act of 1976
USACE	U.S. Army Corps of Engineers
U.S.C.	U.S. Code
USEPA	United States Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	Underground Storage Tank
VOC	Volatile Organic Compound

1 INTRODUCTION AND BACKGROUND

This Environmental Assessment (EA) has been prepared pursuant to the National Environmental Policy Act of 1969 (NEPA), as amended (40 C.F.R. 1500-1508),¹ in accordance with Federal Aviation Administration (FAA) Orders 1050.1F, *Environmental Impacts: Policies and Procedures* and 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*. This EA analyzes the potential environmental effects of a Proposed Action involving improvements to the south airfield area at Charlotte Douglas International Airport (CLT or Airport). The EA has been prepared in compliance with NEPA because the project will require FAA to approve a change to the Airport Layout Plan (ALP) for CLT, which is a Federal action, and because Federal funds may be used to implement the Proposed Action.

1.1 BACKGROUND

CLT is a publicly-owned airport operated by the City of Charlotte and managed by the Aviation Department. CLT is located on approximately 6,000 acres of land in the City of Charlotte, in west Mecklenburg County, North Carolina. The Airport is bounded to the north by parallel transportation corridors, I-85 and US 74 (Wilkinson Boulevard) and the Norfolk Southern Railroad. To the east, the Airport is bounded by Billy Graham Parkway (a limited-access highway) which connects the Airport to I-85 to the north and I-77 to the southeast, as well as providing access to other areas in south Charlotte. To the south, there is no single boundary feature, but Douglas Drive and Pine Oaks Drive serve as road boundaries for the Airport. To the west, CLT is bounded by the I-485 Outer Beltway. **Exhibit 1-1, *Airport Location***, shows the general Airport location and surroundings.

The airfield system consists of four runways, of which include three parallel runways and a crosswind runway. The three parallel runways (18R/36L, 18C/36C, and 18L/36R) are oriented in a north-south direction. Runway 05/23, the crosswind runway, is oriented in a northeast to southwest direction and intersects Runway 18L/36R. All eight runway ends have Instrument Landing System (ILS) approaches.

The passenger terminal at CLT is located at the center of the airfield, between Runway 18L/36R and Runway 18C/36C, and north of Runway 05/23. The Airport's terminal consists of one main building with five passenger concourses designated Concourses A through E. CLT currently utilizes three areas during a deicing operation: Runway 05/23, the northwest ramp adjacent to Concourse A, and the south cargo ramp. Runway 05/23 is used for deicing as it is not active during daytime hours, has four deice positions, and allows for a more efficient deicing operation by keeping deice trucks in one location. During nighttime hours either the northwest ramp or south cargo ramp is used depending on the aircraft's assigned departure runway. These two areas are not used during daytime hours as they would spilt the deicing operation, resulting in more inefficient deicing operation.

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

1.2 DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action involves the construction of a new approximately 780,000 square foot deice pad located on the south airfield, east of Runway 36C. The Proposed Action and its connected actions are described in detail below and are shown in **Exhibit 1-2, *Proposed Action***.

Proposed Action

- Construction of a new deice pad, that is approximately 780,000 square feet, located on the south airfield, east of Runway 36C, to provide up to four positions for Airplane Design Group (ADG) V aircraft or nine ADG III aircraft

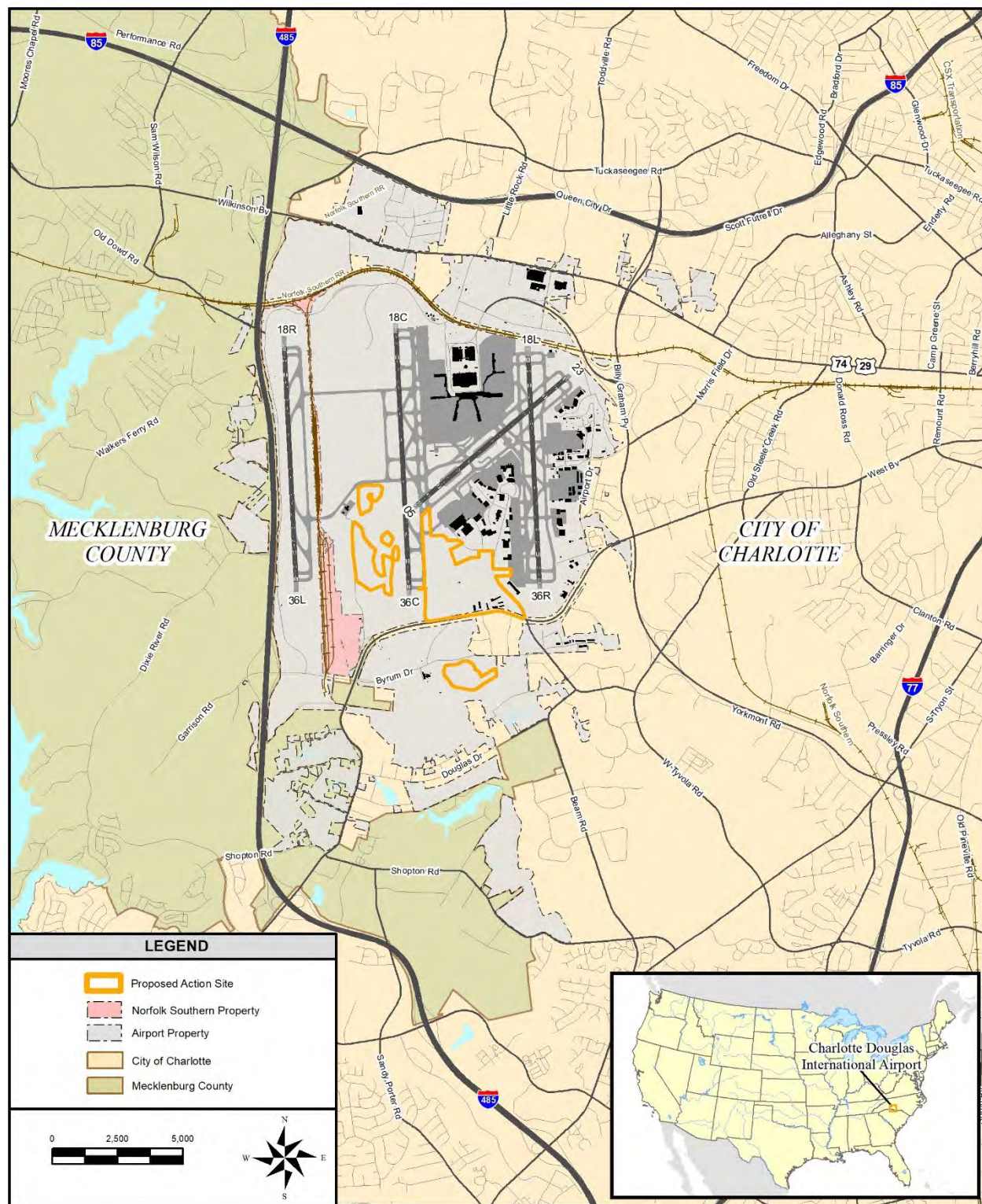
Connected Actions

- Extension of Taxiway F by approximately 3,000 feet to provide access to the proposed deice pad
- Construction of a new approximately 3,100 foot long crossfield taxiway to connect Taxiway C and Taxiway E/F on the south side of the airfield to prevent aircraft departing on Runway 18L/36R from exceeding the holdover² time after deicing
- Construction of a new approximately 2,500 foot long service road parallel to the new crossfield taxiway connecting the east apron area to the new deice pad to provide additional access to the proposed deice pad
- Construction of new apron lighting, taxiway edge and centerline lighting, and additional roadway lighting on Yorkmont Road and under-bridge lighting at the taxiway bridge
- Realignment of Yorkmont Road to ensure constructability of the crossfield taxiway and service road bridge to preserve access to the South Cargo Ramp area
- Clearing and grading of approximately 50 acres to provide a designated construction staging area
- Demolition of Building 206 and the former Robert McGinn House located in the south airfield to allow for construction of the Proposed Action
- Excavation of approximately 2 million square feet in the west airfield area to provide fill for the construction of the new deice pad
- Construction of an open detention pond south of Byrum Drive for stormwater management

² Federal Aviation Administration, Advisory Circular 150/5300-14C defines holdover time as the estimated time the application of anti-icing fluid will prevent the formation of frozen contamination on the protected surfaces of an aircraft. The exceedance of holdover time typically occurs when aircraft taxi times exceed the allowed time to arrive at the departure runway or because the taxi route encounters a variety of weather conditions.

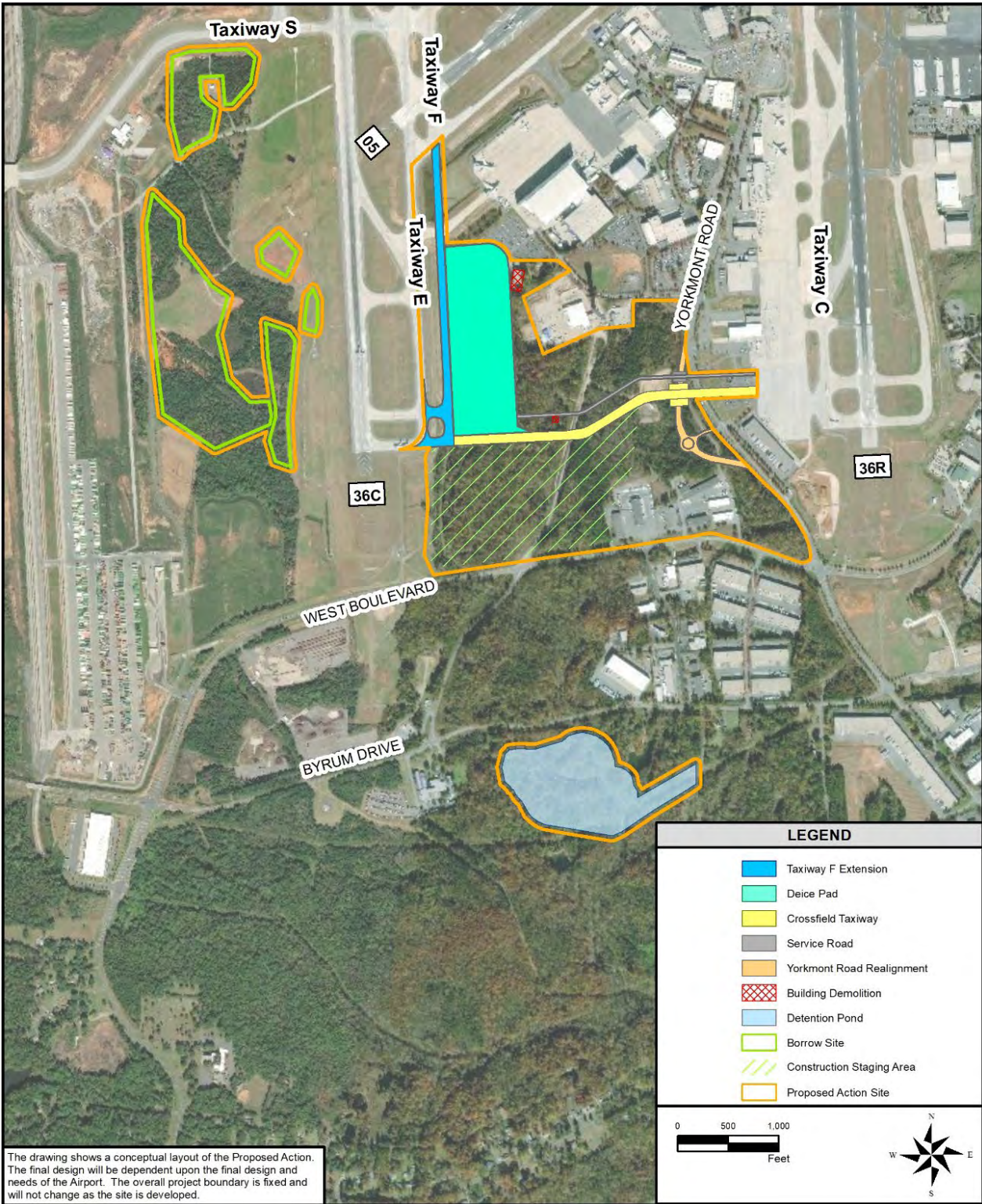
CHARLOTTE DOUGLAS INTERNATIONAL AIRPORT
ENVIRONMENTAL ASSESSMENT FOR THE
PROPOSED DEICE PAD

EXHIBIT 1-1, AIRPORT LOCATION



Source: L&B, 2020

EXHIBIT 1-2, PROPOSED ACTION



Source: L&B, 2020

1.3 DOCUMENT CONTENT AND ORGANIZATION

This document is organized as follows:

- Chapter 2.0 describes the purpose and need for the Proposed Action
- Chapter 3.0 describes alternatives to the Proposed Action
- Chapter 4.0 describes the affected environment
- Chapter 5.0 describes the potential environmental impacts of the Proposed Action and of the No Action Alternative

An EA is a disclosure document prepared for the Federal agency (in this case the FAA) responsible for approving a proposed Federal or Federally-funded action, in compliance with the requirements set forth by the Council on Environmental Quality (CEQ) in its regulations implementing NEPA. The purpose of this EA is to investigate, analyze, and disclose the potential impacts of the Proposed Action and its reasonable alternatives. In this case, the FAA is responsible for reviewing and approving actions that pertain to airports and their operation. As such, this EA has been prepared in accordance with FAA Orders 1050.1F Change 1, *Environmental Impacts: Policies and Procedures* and 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects* and took into consideration guidance included in the *FAA Environmental Desk Reference for Airport Actions*.

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

- Federal Aviation Act of 1958 recodified as 49 U.S.C. §§4010 et seq.
- Aviation Safety and Noise Abatement Act of 1979, 49 U.S.C. §§47501 et seq.
- The Airport and Airway Improvement Act of 1982, 49 U.S.C. §47108, as amended
- Clean Air Act, 42 U.S.C. §7401, et seq., and implementing regulations at 40 C.F.R. Parts 51 and 93
- Clean Water Act, 33 U.S.C. §1251 et seq.
- The Department of Transportation Act, 49 U.S.C., §303 (formerly Section 4(f))
- Land and Water Conservation Fund Act of 1965, 16 U.S.C. §§4601 et seq.
- Endangered Species Act, 16 U.S.C. §§661 et seq., as amended
- 49 U.S.C., §40114, as amended (codifying Public Law 103-272, Section 1(e), 1994) (Reports and Records)
- 49 U.S.C., §§47101 et seq. (codifying Public Law 103-272, Section 1(e), 1994) (Airport Improvement)
- National Historic Preservation Act, 16 U.S.C. §470(f), as amended
- 36 C.F.R. Part 800, Advisory Council on Historic Preservation

- Archaeological and Historic Preservation Act, 16 U.S.C. §469(a)
- Archaeological Resource Protection Act, 16 U.S.C. §§470 et seq.
- Farmland Protection Policy Act, 7 U.S.C. §73, and implementing regulations at 7 C.F.R. §658
- Federal Facilities Compliance Action, 42 U.S.C. §6961
- Hazardous Materials Transportation Act of 1975, 49 U.S.C. §§5101 et seq.
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Community Environmental Response Facilitation Act of 1992, 42 U.S.C. §§9601 et seq.
- Resource Conservation and Recovery Act of 1976, as amended by the Solid Waste Disposal Act of 1980, 42 U.S.C. §§6901 et seq.
- 33 C.F.R. Parts 320-330, Regulatory Programs of the Corps of Engineers
- Magnuson-Stevens Fishery Conservation and Management Act of 1976, 16 U.S.C. §§1801 et seq., as amended
- Migratory Bird Treaty Act, 16 U.S.C. §§703 et seq.
- Energy Independence and Security Act, 42 U.S.C. §§17001 et seq.
- Executive Order 11990, *Protection of Wetlands*
- Executive Order 11988, *Floodplain Management*
- Executive Order 11593, *Protection and Enhancement of the Cultural Environment*
- Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*
- Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act, 74 Fed Reg. 66495 et seq. (2009)
- U.S. Department of Transportation (DOT) Order 5610.2, Environmental Justice in Minority Populations and Low-Income Populations, was issued on April 15, 1997. Order 5610.2(a), *Department of Transportation Updated Environmental Justice Order*, was issued on May 2, 2012
- Other laws, regulations, and policies as applicable

Notice about the subject project was published in the Charlotte Observer. Copies of this document are available online at <https://www.airportprojects.net/clt-deice-pad-ea/>.

2 PURPOSE AND NEED

The City of Charlotte Aviation Department has identified deficiencies in the current deicing operation at CLT. This EA analyzes the proposed solution (purpose) to meet the needs of the identified deficiencies.

2.1 PURPOSE

The Proposed Action would provide a centralized deice facility that complies with FAA guidance and improves the efficiency of deicing operations and deicing fluid runoff collection.

2.2 NEED

The primary need for the Proposed Action is that CLT is lacking a sufficient deice pad location in a centralized and efficient area on the airfield. As previously mentioned, CLT does not have a centrally located deice pad and currently utilizes three areas for deicing aircraft: Runway 05/23, the northwest ramp located west of Concourse A, and the south cargo ramp as shown in **Exhibit 2-1, Existing Deice Locations**. None of these locations are intended for a deicing operation nor are they located in an efficient area on the airfield. FAA Advisory Circular (AC) 150/5300-14C, *Design of Aircraft Deicing Facilities* recommends that a deicing facility should be constructed along taxi routes leading to the departure runway(s) on a designated apron or on an apron away from the terminal area.

Runway 05/23 currently accommodates four ADG III deice positions. A runway is not ideal for deice operations because is not intended to act as a dual-purpose area and is not designed for deicing aircraft. Runway 05/23 is not an efficient location for a deice operation for multiple reasons. First, the runway is designated as the Airport's nighttime noise abatement runway. Therefore, this runway is only available to deice during daytime hours when the runway is not active. Second, aircraft deicing on Runway 05/23 must line up nose-to-tail in the deicing positions. Once an aircraft enters the runway to be deiced, options for exiting the runway are limited and can cause delay. Aircraft in the middle two positions must wait to exit the runway until the aircraft in front has moved. Finally, deicing on Runway 05/23 interferes with taxi flows around the terminal area. Aircraft, waiting to deice on Runway 05/23, queue on Taxiway B and Taxiway F, reducing efficiency in the terminal area due to blocking taxiways and taxilanes used for movement around the terminal.

The northwest ramp accommodates five ADG III deice positions. This area is inefficient because the Airport typically operates in north flow during a deicing operation, which means aircraft depart from Runway 36C or Runway 36R. As a result, aircraft must exit the deice pad onto Taxiway E to taxi south. This requires coordination between ground control and the Air Traffic Control Tower (ATCT), causing ground delays on the airfield. In addition, deicing trucks have to travel across aircraft movement areas numerous times during the deicing operation to the fueling and deicing storage material facility located in the south airfield. This current deice arrangement is not efficient and creates additional congestion on the airfield.

The south cargo ramp accommodates two ADG III deice positions and is only used when Runway 05/23 is not available for a deicing operation (i.e., nighttime hours). This area is currently congested, because it is primarily used for cargo operations that involve loading and unloading aircraft. It is also an

inefficient location, since it results in long taxi times for aircraft departing Runway 18C/36C. Long taxi times could potentially result in aircraft exceeding holdover times of applied glycols, requiring additional deicing.

Construction of the proposed deice pad within the south airfield would provide a centralized deicing pad location in accordance with FAA guidance. A deice pad within the south airfield would alleviate inefficiencies associated with deicing on Runway 05/23, the northwest ramp, or the cargo ramp. The deice pad would allow multiple aircraft to line up in a wing-to-wing configuration to be deiced simultaneously. The wing-to-wing configuration is optimal and would allow aircraft to exit the deice pad more quickly and allow a new aircraft to enter the deice pad when a position becomes available. This would alleviate the congestion that is currently experienced when aircraft line up in single file on Runway 05/23 by reducing the time aircraft would otherwise wait in a single-file line for the preceding aircraft to be deiced.

Additionally, FAA AC 150/5300-14C, 1.1.b(2) states that centralized aircraft deicing facilities built closer to departure runways and taxi routes minimize aircraft taxi times to the departure runways. Minimized taxi times of aircraft using the deicing facility en route to departure runways prevent the potential of exceeding the holdover time of applied glycols. If an aircraft exceeds the holdover time of applied glycols, the aircraft would be required to deice again prior to departure. For this reason, the centralized facility must be located in a manner that provides efficient taxi routes to departure runways.

2.3 IMPLEMENTATION

Construction of the Proposed Action is planned to occur between February 2021 and December 2023.

2.4 REQUIRED LAND USE/ENVIRONMENTAL PERMITS

Federal

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

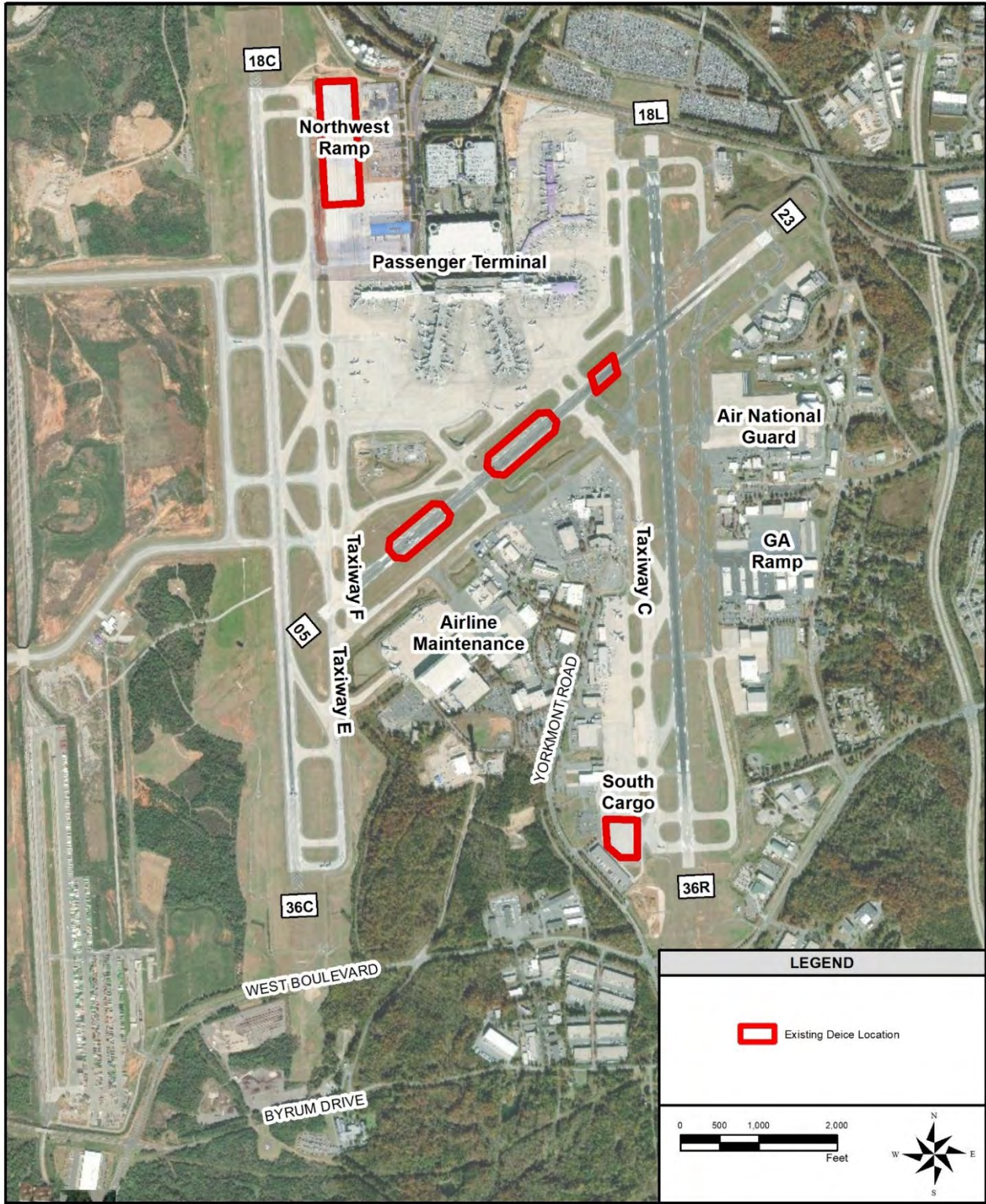
State

- Approval per State Environmental Policy Act
- Updated National Pollutant Discharge Elimination System (NPDES) Permit administered by the North Carolina Department of Division of Energy, Mineral, and Land Resources
- Permit to construct & operate Air Pollution Abatement facilities and/or Emission Sources as per 15 A NCAC (2Q.O100 through 2Q.0300)
- Erosion and sedimentation control plan approval and coverage under NCG01 construction
- Demolition or renovations of structures containing asbestos material must be in compliance with 15 A NCAC 20.1110 (a) (1) which requires notification and removal prior to demolition.

Local

- Mecklenburg County building permit
- Floodplain development permit

EXHIBIT 2-1, EXISTING DEICE LOCATIONS



Source: L&B, 2020

3 ALTERNATIVES

The Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA)³ require that the Federal Aviation Administration (FAA), as Federal decision-maker for this project, perform the following tasks when preparing an Environmental Assessment (EA):

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

This section describes the Proposed Action and alternatives to the Proposed Action (including the No Action alternative) and evaluates the ability of each to meet the Purpose and Need described in Chapter 2, *Purpose and Need*. The Proposed Action would fulfill the Purpose and Need for the project. The No Action alternative would not meet the Purpose and Need; however, it is analyzed in this EA, pursuant to the requirements of FAA Orders 1050.1F and 5050.4B, NEPA and CEQ regulations.

Federal and state guidelines concerning the environmental review process require that all prudent, feasible, reasonable, and practicable alternatives that might accomplish the objectives of a project be identified and evaluated. Federal agencies may consider the applicant's purposes and needs and common sense realities of a given situation in the development of alternatives.⁴ Federal agencies may also afford substantial weight to the alternative preferred by the applicant, provided there is no substantially superior alternative from an environmental standpoint.

3.1 ALTERNATIVES CONSIDERED FOR FURTHER ENVIRONMENTAL EVALUATION

Various alternatives were considered for further detailed environmental review. If the alternative did not meet the stated needs in Chapter 2, the alternative was eliminated and not evaluated in Chapter 5, *Environmental Consequences*. The following summarizes the alternatives considered. The alternatives are shown in **Exhibit 3-1, Alternative Deice Pad Locations**.

Alternative 1 - Central Terminal Area (CTA)

The Central Terminal Area (CTA) is located between Runway 18C/36C and Runway 18L/36R and is north of Runway 05/23. The area consists of the existing passenger terminal and associated apron and automobile parking. As previously mentioned, this area is an inefficient location for a deice pad due to the additional requirements of coordination with the ground control and the Air Traffic Control Tower (ATCT) as aircraft taxi from the north to the south. In addition, this area requires deicing trucks to cross

³ CEQ regulations codified at 40 C.F.R. 1502.14

⁴ Guidance Regarding NEPA Regulations, CEQ, 48 Federal Register 34263 (July 28, 1983).

aircraft movement areas numerous times to access the fueling facility on the south airfield. Therefore, the CTA was eliminated from further analysis.

Alternative 2 - Airline Maintenance Facility

The Airline Maintenance facility is located south of Runway 05/23. The area is built out and has no space to accommodate an aircraft deice pad. Therefore, this area was eliminated from further analysis.

Alternative 3 - South Cargo Ramp

The South Cargo Ramp is located on the southeast side of the airfield at CLT just west of Runway 36R. The ramp is adjacent to several air cargo buildings. Currently, aircraft are deiced on this cargo ramp; however, the ramp lacks the space for additional deice positions without taking space dedicated for other cargo-related uses. Therefore, expanding deice operations within the south cargo area was eliminated from further analysis.

Alternative 4 - East Airfield (GA Ramp and NC Air National Guard Facility)

The East Airfield is located east of Runway 18L/36R and includes the North Carolina Air National Guard (NCANG) facility and General Aviation (GA) Ramp. This area is currently built out, and there is little vacant space available to accommodate a deice pad. Furthermore, the terrain within the East Airfield limits redevelopment options. Therefore, the East Airfield was eliminated from further analysis.

Alternative 5 - West Airfield

The West Airfield includes land between Runway 18C/36C and Runway 18R/36L. Deicing within the West Airfield is impractical due to the distance from Runway 18L/36R, which would require aircraft departing from this runway to cross Runway 18C/36C when taxiing from a deice pad to the departure runway, resulting in aircraft taxi times that exceed holdover times of applied glycols. Therefore, the West Airfield was eliminated from further analysis.

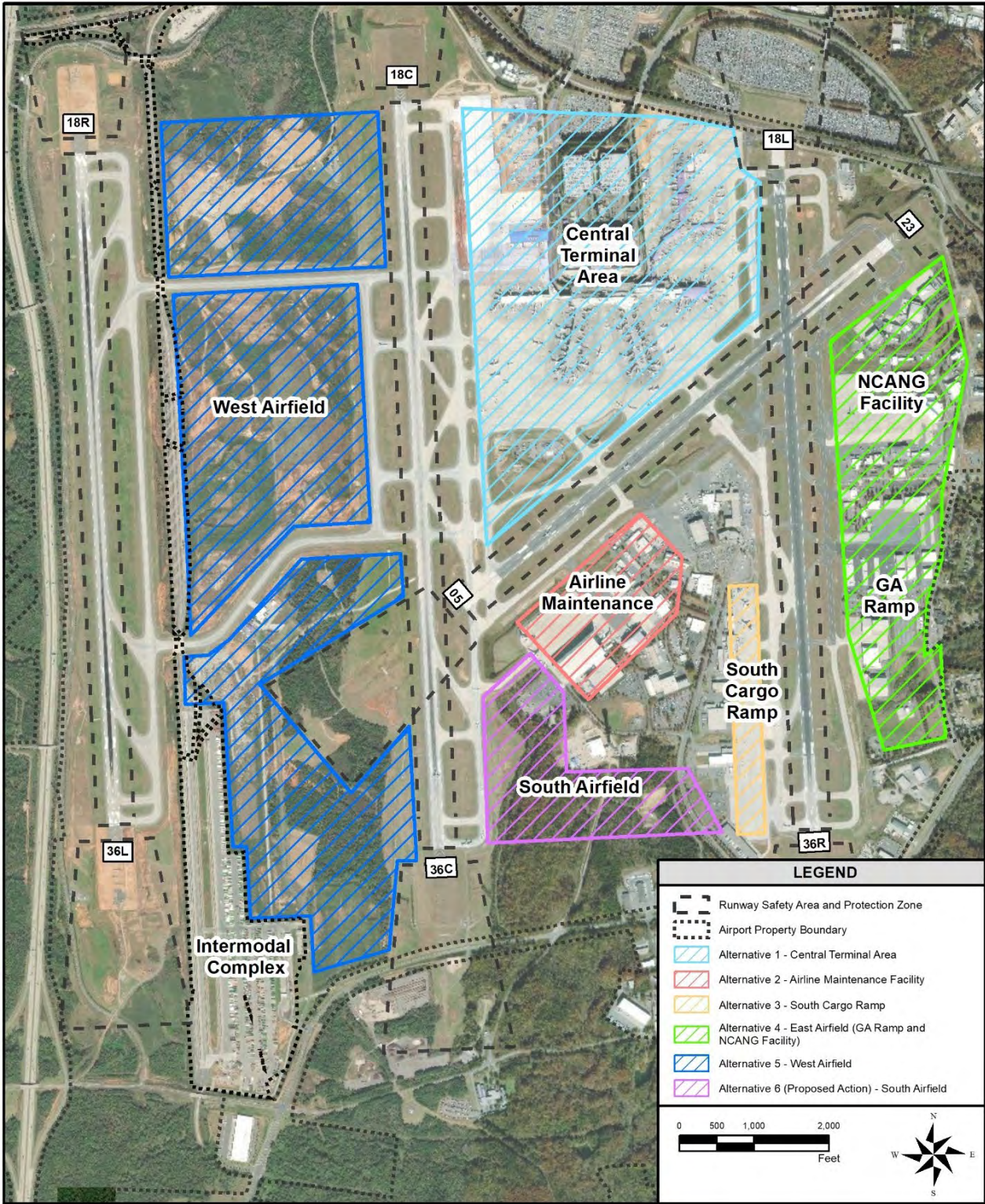
Alternative 6 (Proposed Action) - South Airfield

This alternative includes construction of a new deice pad located on the south airfield. A deice pad within the south airfield would allow multiple aircraft to line up in a wing-to-wing configuration to be deiced simultaneously. The wing-to-wing configuration would allow aircraft to exit the deice pad more quickly and allow a new aircraft to enter the deice pad when a position becomes available. This would alleviate the congestion that is currently experienced when aircraft line up in single file on Runway 05/23 by reducing the time aircraft would otherwise wait in a single-file line for the preceding aircraft to be deiced. The construction of a new crossfield taxiway to connect Taxiway C and Taxiway E/F on the south side of the airfield would prevent aircraft departing on Runway 18L/36R from exceeding the holdover time after deicing. Therefore, this alternative is being carried forward for detailed environmental review.

TABLE 3-1: ALTERNATIVES EVALUATION SUMMARY

ALTERNATIVE	PROPOSED ACTION NEEDS			CARRIED FORWARD FOR FURTHER ENVIRONMENTAL REVIEW?
	WOULD THE ALTERNATIVE ALLOW FOR A CENTRALIZED DEICING PAD LOCATION?	WOULD THE ALTERNATIVE ALLOW FOR AN EFFICIENT DEICING OPERATION?	WOULD THE ALTERNATIVE COMPLY WITH FAA GUIDANCE FOR DEICE PADS?	
No Action Alternative	No	No	No	Yes
Alternative 1 – Central Terminal Area	No	No	No	No
Alternative 2 – Airline Maintenance Facility	No	No	No	No
Alternative 3 – South Cargo Ramp	No	No	No	No
Alternative 4 – East Airfield (GA Ramp and NC Air National Guard Facility)	No	No	No	No
Alternative 5 – West Airfield	No	No	No	No
Alternative 6 (Proposed Action) – South Airfield	Yes	Yes	Yes	Yes

EXHIBIT 3-1, ALTERNATIVE DEICE PAD LOCATIONS



Source: L&B, 2020

4 AFFECTED ENVIRONMENT

Federal Aviation Administration (FAA) Order 5050.4B states the affected environment section of an Environmental Assessment (EA) should succinctly describe only those environmental resources the Proposed Action and its reasonable alternatives, are likely to affect. The amount of information on potentially affected resources should be based on the expected impact and be commensurate with the impact's importance. The following provides a description of the existing environmental conditions in and around the vicinity of the Charlotte Douglas International Airport (CLT or Airport).

4.1 PROPOSED ACTION SETTING

CLT is an international airport located on approximately 6,000 acres of land within Mecklenburg County, North Carolina. The Proposed Action is located within the south airfield, east of Runway 18C/36C. The Proposed Action would occur on property that is currently owned by the City of Charlotte. Exhibit 1-2, *Proposed Action*, shows the location of the Proposed Action Site.

4.2 ENVIRONMENTAL RESOURCES

4.2.1 Air Quality

Under the federal Clean Air Act (CAA), as amended, the US Environmental Protection Agency (USEPA) has developed National Ambient Air Quality Standards (NAAQS) for the following air pollutants, referred to as criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), sulfur dioxide (SO₂), lead (Pb), particulate matter up to 10 micrometers in size (PM₁₀), and particulate matter smaller than 2.5 micrometers in size (PM_{2.5}). Individual states are required to identify general geographic areas where the NAAQS for these criteria air pollutants are not met. A state with a nonattainment or maintenance area must prepare a State Implementation Plan (SIP) that describes the programs and requirements that the state will implement to attain or maintain the NAAQS by the deadlines specified in the CAA, as well as subsequent related documents promulgated by the USEPA.

The Airport is located within the Metropolitan Charlotte Interstate Air Quality Region.⁵ In the past, Mecklenburg County was designated as nonattainment for ozone. However, the USEPA determined the area had attained the 2008 8-Hour ozone standard on August 27, 2015, re-designating the region to attainment for the pollutant. The area operates under a maintenance plan for ozone. Mecklenburg County was determined to be compliant with all other Federally-regulated air quality standards in effect at the time of the preparation of this document (see **Appendix B, Air Quality**).

4.2.2 Biological Resources

According to FAA Order 1050.1F, biological resources are valued for their intrinsic, aesthetic, economic, and recreational qualities and include fish, wildlife, plants, and their respective habitats. Typical categories of biological resources include terrestrial and aquatic plant and animal species;

⁵ Title 40 Protection of the Environment. Code of Federal Regulations (C.F.R.) Chapter 1, Subchapter C, Part 81 Subpart B §81.75 Metropolitan Charlotte Interstate Air Quality Control Region (2012).

game and non-game species; special status species (state or Federally-listed threatened or endangered species, marine mammals, or species of concern, such as species proposed for listing or migratory birds); and Environmentally-sensitive or critical habitats.

Biological surveys and habitat assessments of the Proposed Action Site were completed in August 2018, May 2019, December 2019, and January 2020. The purpose of the surveys was to determine the potential occurrence of Federal or state-listed species or habitat to exist on the Proposed Action Site at CLT. The following ground cover/vegetation types were identified in the survey areas:

- **Forest Edge** consists of sun-exposed transition area between the Maintained Open Area and the Mixed Hardwood Forest, White Pine forest, and Stream Bank and Riparian forest.
- **Mixed Hardwood Forest** contains well-drained, moderately moist soils in upland areas with a tree canopy layer, shrub/sapling layer and an herbaceous/vine layer.
- **White Pine Forest** includes a white pine habitat with a sparsely developed shrub/herbaceous layer.
- **Stream Bank and Riparian Forest** includes the streambanks of flowing waters with a tree canopy layer, shrub/sapling layer, and an herbaceous/vine layer.
- **Abandoned Borrow Pit** consists of an approximately 1-acre old borrow pit.
- **Maintained Open Area** consists of maintained turfgrass areas near the airfield, recently disturbed land under construction, and periodically maintained easements and hillslopes.
- **Early Successional Clear Cut** consists of a recently clear cut forest edge and an unmaintained open field that includes some small trees.
- **Piedmont Dry Oak-Hickory Forest** consists of hilltops and hillslopes forested by a variety of oak, pine, and hickory species.
- **Piedmont Floodplain Forest** consists of species that are tolerant to wetter conditions than those found in the piedmont dry oak-hickory habitat.
- **Palustrine Edge** runs along the margins of the open water feature in the new drainage pond area.
- **Maintained Disturbed Area** consists of a gravel driveway edge, pipeline corridor, roadside margin, and cleared hilltop.

4.2.2.1 THREATENED AND ENDANGERED SPECIES

According to the U.S. Fish and Wildlife Service (USFWS), the following Federal listed species of plants and animals, shown in **Table 4-1**, are found or have the potential to be found in Mecklenburg County.

TABLE 4-1: FEDERAL THREATENED AND ENDANGERED SPECIES

TAXONOMIC GROUP	COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS
Bird	Bald eagle	<i>Haliaeetus leucocephalus</i>	BGPA
Mammal	Northern long-eared bat	<i>Myotis septentrionalis</i>	Threatened
Freshwater Bivalve	Carolina Heelsplitter	<i>Lasmigona decorata</i>	Endangered
Insect	Rusty-patched bumble bee	<i>Bombus affinis</i>	Endangered
Vascular Plant	Michaux's Sumac	<i>Rhus michauxii</i>	Endangered
Vascular Plant	Schweinitz's Sunflower	<i>Helianthus schweinitzii</i>	Endangered
Vascular Plant	Smooth Coneflower	<i>Echinacea laevigata</i>	Endangered

Note: BGPA denotes protection under the Bald and Golden Eagle Protection Act
Source: <http://www.fws.gov/raleigh/species/cntylist/mecklenburg.html>, May 2019.

4.2.2.2 STATE DESIGNATED THREATENED, ENDANGERED, OR SPECIAL STATUS SPECIES

In addition to the USFWS information, the North Carolina Natural Heritage Program database was reviewed. The list of the North Carolina state designated threatened, endangered or special concern species that are found in Mecklenburg County is provided in **Appendix C, Biological Resources**.

4.2.2.3 SURVEY FINDINGS

On-site habitat assessments found suitable summer habitat for the northern long-eared bat, Schweinitz's sunflower, and Michaux's sumac. Schweinitz's sunflower surveys were conducted outside of and during the flowering period within the Proposed Action Site. No Schweinitz's sunflower was identified during the flowering season surveys. In addition, no Michaux's sumac was observed. Suitable habitat was not present for any of the other federal species in Mecklenburg County. See Appendix C, *Biological Resources* for additional information on the habitat assessments.

4.2.3 Climate

Greenhouse gases (GHGs) are gases that trap heat in the earth's atmosphere. Both naturally occurring and man-made GHGs primarily include water vapor (H₂O), carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons, and sulfur hexafluoride (SF₆). Sources that require fuel or power at an airport are the primary sources that would generate GHGs.

Research has shown there is a direct correlation between fuel combustion and GHG emissions. In terms of U.S. contributions, the General Accounting Office (GAO) reports that "domestic aviation contributes about three percent of total carbon dioxide emissions, according to EPA data," compared with other industrial sources including the remainder of the transportation sector (20 percent) and

power generation (41 percent).⁶ The International Civil Aviation Organization (ICAO) estimates that GHG emissions from aircraft account for roughly three percent of all anthropogenic (man-made) GHG emissions globally.⁷ Climate change due to GHG emissions is a global phenomenon, so the affected environment is the global climate.⁸

4.2.4 Coastal Resources

FAA Order 1050.1F defines coastal resources as all natural resources occurring within coastal waters and their adjacent shorelands. The Airport is not located within a coastal zone; therefore, no discussion of coastal resources is included in this EA.

4.2.5 Department of Transportation Act (DOT) Section 4(f)

The U.S. Department of Transportation Act of 1966 (DOT Act) protects publicly owned parks, recreation areas, wildlife and waterfowl refuge areas, or public and private historic sites. Section 4(f) of the DOT Act provides that "...the Secretary of Transportation will not approve any program or project that requires the use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance or land from an historic site of national, state, or local significance as determined by the officials having jurisdiction thereof, unless there is no feasible and prudent alternative to the use of such land and such program, and the project includes all possible planning to minimize harm resulting from the use."

A review of records maintained by the National Park Service (NPS), the North Carolina State Historic Preservation Office (SHPO), and the City of Charlotte Mecklenburg County was conducted to identify known Section 4(f) resources near the Proposed Action Site. There are no parks, recreation areas, or wildlife/waterfowl refuges within the Proposed Action Site. Historic resources are discussed in Section 4.2.8 and shown on **Exhibit 4-2, Historic Resources** and listed in **Table 4-2**. Based on the NPS, the closest resource on or eligible for the National Register of Historic Places (NRHP) is the Steele Creek Presbyterian Church and Cemetery which is located approximately one mile southwest of the Proposed Action Site.

4.2.6 Farmlands

FAA Order 1050.1F defines farmlands as those agricultural areas considered important and protected by Federal, state, and local regulations. No farmlands are located within the Proposed Action site; therefore, no discussion of farmlands is included in this EA.

⁶ Aviation and Climate Change. GAO Report to Congressional Committees, (2009).

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

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

4.2.7 Hazardous Materials, Solid Waste, and Pollution Prevention

FAA Order 1050.1F states that hazardous materials, solid waste, and pollution prevention includes an evaluation of the waste streams, potential hazardous materials, and pollution prevention procedures used at the Airport.

4.2.7.1 HAZARDOUS MATERIALS

According to the USEPA website, there are no sites on the National Priorities List located in the vicinity of the Airport.⁹ However, according to the North Carolina Department of Environmental Quality (NCDEQ), there is one known past underground storage tank (UST) release site within the Proposed Action Site (south of Taxiway S), as shown in **Exhibit 4-1, Hazardous Material Sites**. Active permitted or inactive waste sites, other USTs, and past spills are in the vicinity of, but not within, the Proposed Action Site. There are no existing sites that contain hazardous materials known to be present within the Proposed Action Site.

According to NCDEQ records, a UST release occurred within the Proposed Action Site south of Taxiway S in 1989. The UST served as the fuel storage for an emergency power generator.¹⁰ The UST was removed, and cleanup activities were conducted at the site. On June 5, 1995, the North Carolina Division of Environmental Management issued a letter of no further action for the incident.^{11,12} Additionally, a UST release occurred near the Proposed Action Site west of Taxiway C in 1993 at a former rental car facility. The UST was removed, and cleanup was conducted at the site. The North Carolina Division of Water Quality issued a letter of no further action for the incident on July 1996.

4.2.7.2 SOLID WASTE AND POLLUTION PREVENTION

Solid waste, in the form of construction and demolition (C&D) debris, is a common by-product of airport development. There are several waste management landfills in Mecklenburg County that can accept solid waste and C&D debris. These include: Foxhole Recycling/Yard Waste Center, Hickory Grove Recycling/Yard Waste Center, N. Mecklenburg Recycling/Yard Waste Center, and Compost Central & Recycling Center.¹³

⁹ <http://www.epa.gov/superfund/sites/query/queryhtm/nplmapsg.htm>

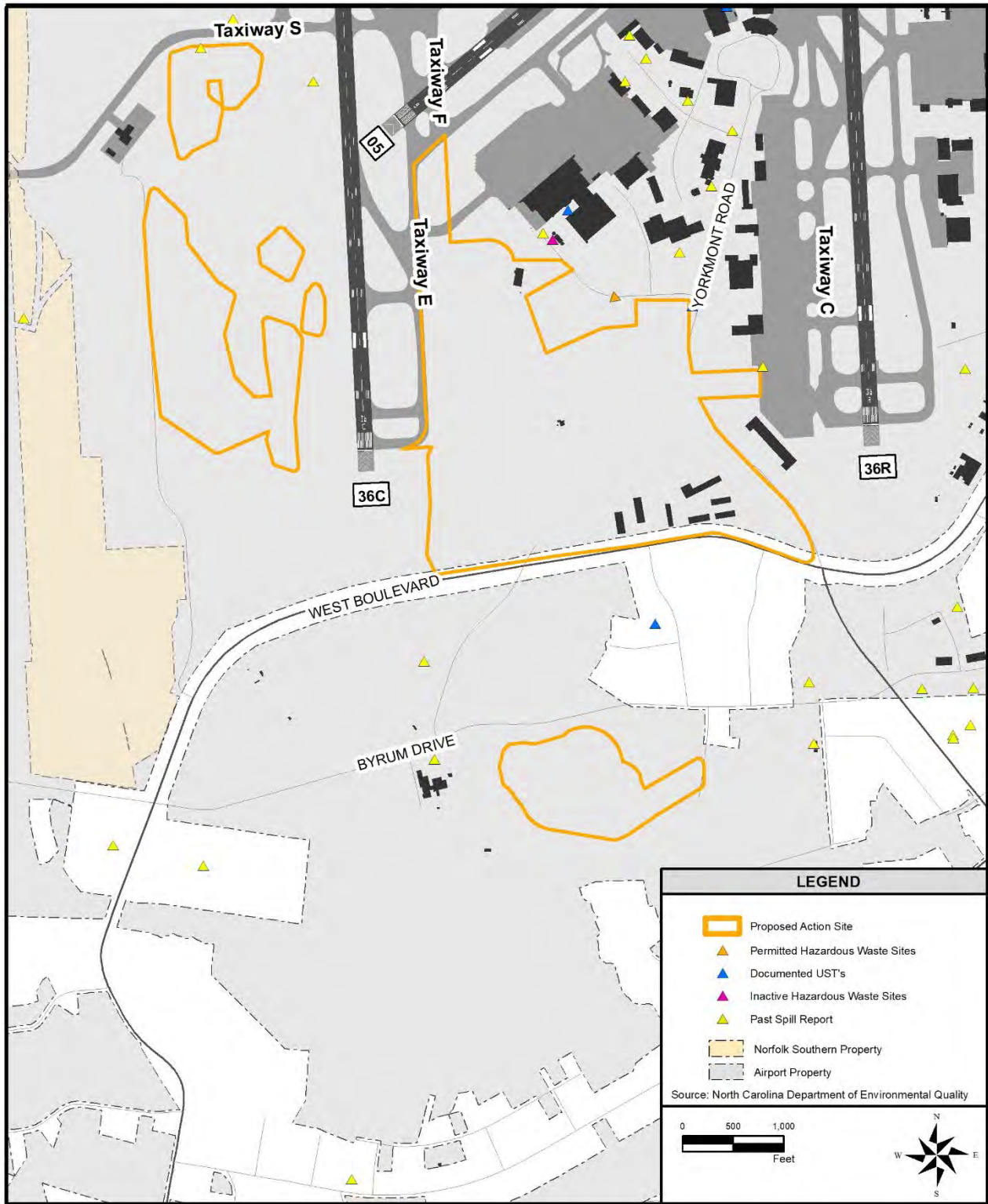
¹⁰ Department of the Army Wilmington District, Corps of Engineers, Letter to the North Carolina Department of Environment, Health, and Natural Resources, Division of Environmental Management, Groundwater Section, July 16, 1992

¹¹ RE: Soil Sample Results from Underground Storage Tank Closure, Douglas International Airport, Mecklenburg County, N.C., North Carolina Department of Environmental Health and Natural Resources, Division of Environmental Management, Letter to the Federal Aviation Administration, June 5, 1995.

¹² EDR Area/Corridor Report, Environmental Data Resources Inc., August 14, 2018. See pages 366-368 for Incident Number 15879.

¹³ Mecklenburg County, Mecklenburg County's Full-Service Recycle Centers, Online at: <https://www.mecknc.gov/LUESA/SolidWaste/Disposal-Recycling/Pages/Full-Service-Centers.aspx>, Accessed: July 27, 2018.

EXHIBIT 4-1, HAZARDOUS MATERIAL SITES



Ongoing pollution prevention measures include the Airport's series of Spill Prevention, Control and Countermeasure (SPCC) plans for multiple onsite facilities that are designed to minimize spill risk and identify measures to be used to respond to spills that do occur. The SPCC plans are reviewed at least every five years and revised if necessary. These plans include the CLT Airport SPCC Master Plan, the Hourly Parking Deck and Consolidated Rental Car Facility SPCC Plan, and the Airfield Fuel System Master Plan. Some airport tenants also prepare, certify, and maintain their own SPCC Plans, which must also abide by state and federal regulations.

4.2.8 Historic, Architectural, Archaeological, And Cultural Resources

The National Historic Preservation Act (NHPA) is the primary Federal law governing the preservation of historic and prehistoric resources, encompassing art, architecture, archaeological, and other cultural resources. Section 106 of the NHPA requires that, prior to approval of a Federal or Federally-assisted project, or before the issuance of a license, permit, or other similar approval, Federal agencies take into account the effect of the project on properties that are on or eligible for listing on the National Register of Historic Places (NRHP). The NRHP is maintained by the U.S. National Park Service (NPS). The North Carolina State Historic Preservation Office (SHPO) maintains records of other sites of local significance.

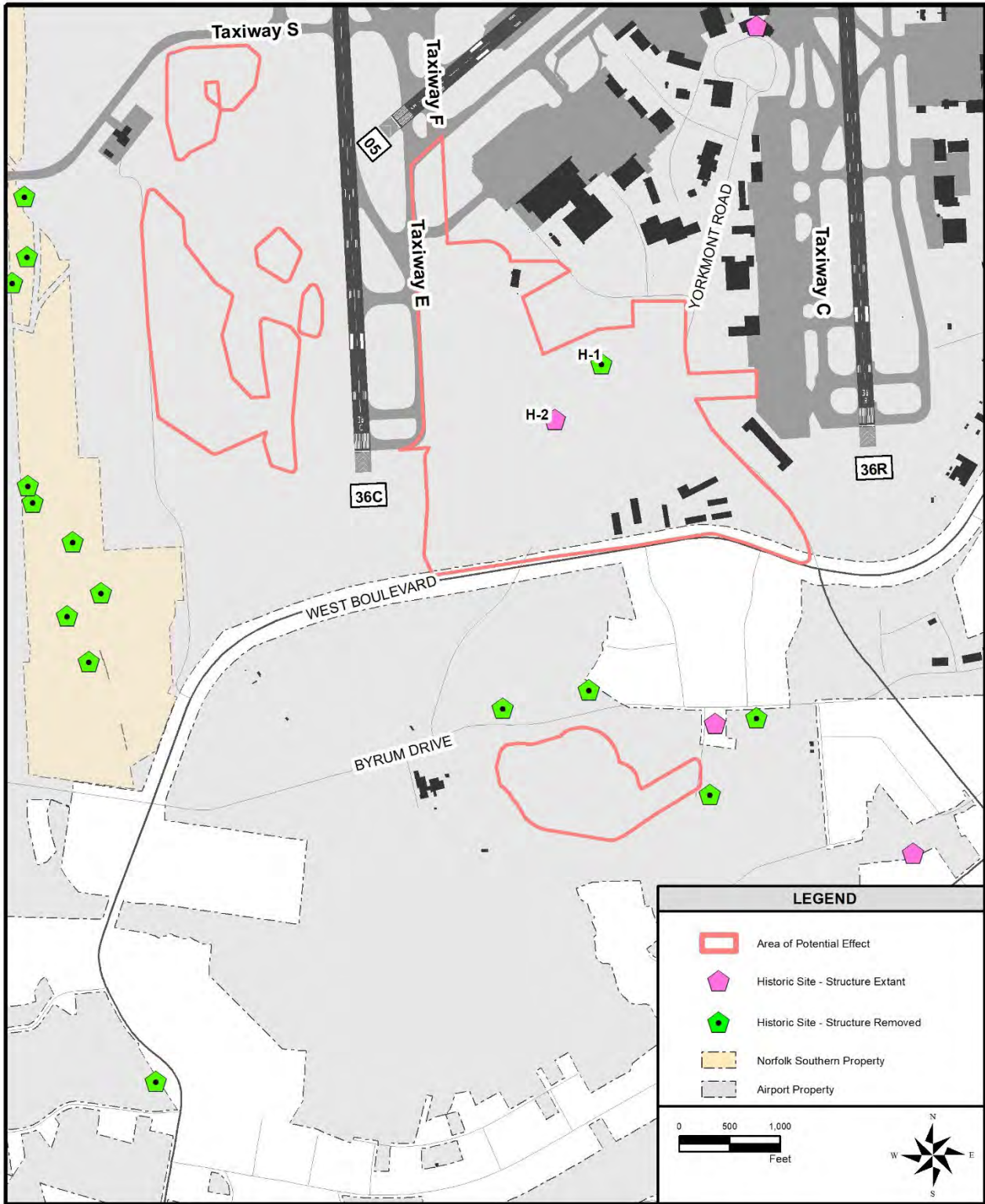
The Area of Potential Effect (APE) is "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties" (36 C.F.R. § 800.16(d)). For purposes of Section 106, the term "historic properties" can include architectural,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

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

A review of records maintained by the NPS and the SHPO was conducted to identify historic properties in or adjacent to the APE. As shown in **Exhibit 4-2, Historic Resources**, and **Table 4-2**, two historic properties were identified within the APE. The J.W. Auten House was surveyed in 1990; however, no determination for NRHP eligibility was made. The Robert McGinn House was built circa 1855 and was surveyed in 1990; however, no determination for NRHP eligibility was made.

A survey conducted in December 2018 confirmed the J.W. Auten House is no longer extant. Furthermore, a survey of the Robert McGinn House was conducted in March 2019 which confirmed the structure is extant but no longer has the integrity needed for eligibility; therefore, the property was not recommended for NRHP eligibility. See **Appendix D, Historic, Archaeological, and Cultural Resources** for more information. As previously stated, the closest resource on or eligible for the NRHP is the Steele Creek Presbyterian Church and Cemetery which is located approximately one mile southwest of the project site.

EXHIBIT 4-2, HISTORIC RESOURCES



Source: L&B, 2020

TABLE 4-2: HISTORIC RESOURCES

MAP ID	NAME	RESOURCE TYPE
H-1	J. W. Auten House	Historic Property
H-2	Robert McGinn House	Historic Property

Source: U.S. National Park Service, North Carolina State Historic Preservation Office, Landrum & Brown analysis, 2019.

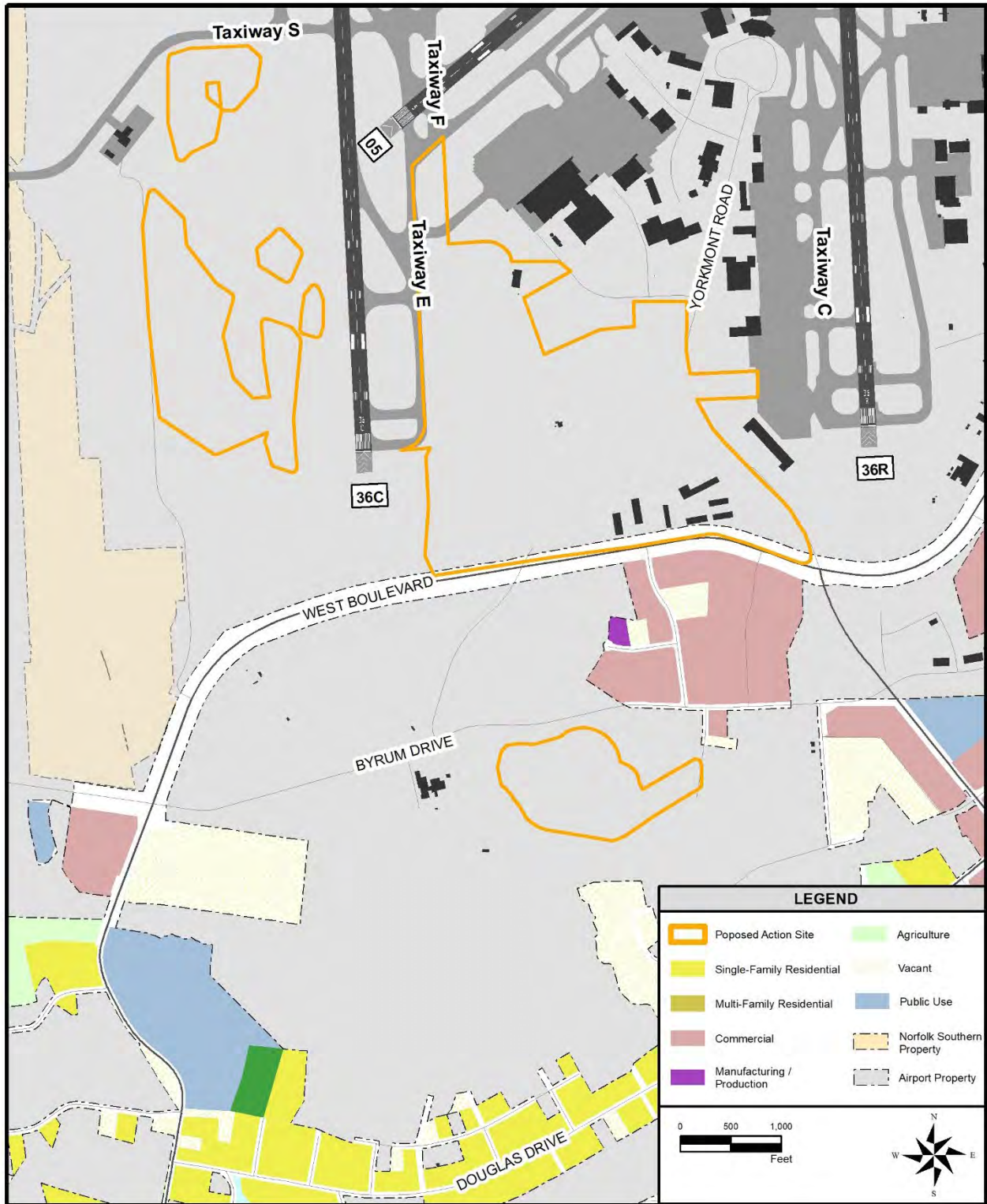
It is assumed that the entire APE would be graded, cleared, or disturbed from its current state. As a result, Phase I archaeological surveys were completed and consisted of a literature search and archaeological field survey to determine potential impacts to archaeological resources. The literature review collected data on known cultural resources within the vicinity of the APE. Several previously recorded sites were found in the vicinity of the Airport; however, none of the sites were located within or adjacent to the APE.

The archaeological surveys conducted within the APE in December 2018 and December 2019 identified ten total archaeological sites. It was concluded these archaeological resource sites are not considered eligible for inclusion on the NRHP under Criteria A, B, C, or D. See Appendix D for more information.

4.2.9 Land Use

Land use refers to the types of activities or development that occurs on the land. **Exhibit 4-3, Generalized Existing Land Use**, depicts the land uses surrounding the Proposed Action Site in terms of the generalized use categories. The Proposed Action would occur entirely on Airport property surrounded by Airport pavement and other airport-compatible uses, including industrial land uses and vacant land. The nearest residential land uses are located approximately 2,000 feet south of the Proposed Action Site north of Douglas Drive.

EXHIBIT 4-3, GENERALIZED EXISTING LAND USE



Source: L&B, 2020

4.2.10 Natural Resources and Energy Supply

FAA Order 1050.1F states that natural resources and energy supply identifies the consumption of natural resources and use of energy supplies. Consumption of natural resources and use of energy supplies may result from construction and operation of the Airport.

4.2.10.1 NATURAL RESOURCES

Materials that may be needed for construction of new runways and taxiways, terminal facilities, parking, and roadways include lumber, aggregate, concrete, gravel, steel, asphalt, sand, and water. These materials are not in short supply in the Charlotte area. Asphalt, cement, sand, gravel, and aggregate can be found at multiple vendor locations in and near Mecklenburg County, including the Charlotte Quarry, Mallard Creek Quarry, Matthews Quarry, Arrowwood Quarry, and Bonds Gravel Pit. Building materials are readily available and provided by numerous vendors in the Charlotte area.

4.2.10.2 ENERGY SUPPLY

Buildings and other structures at the Airport require electricity and natural gas for lighting, cooling, and heating. Electricity is used for cooling and lighting for buildings, lighting for aircraft and vehicle parking areas, airfield lighting systems, roadway lighting, and other facilities. CLT is located within a highly urbanized area with adequate access to natural resources for Airport operations, aircraft operations, and construction projects. Duke Energy, which is headquartered in Charlotte, provides electricity to 3.4 million customers in North Carolina, including CLT, and has over 49,500 megawatts of electric generating capacity.¹⁴ Natural gas is provided to CLT by Piedmont Natural Gas, which operates as a business unit of Duke Energy.

4.2.11 Noise and Noise Compatible Land Use

FAA Order 1050.1F states that sound is a physical phenomenon consisting of pressure fluctuations that travel through a medium, such as air, and are sensed by the human ear. Noise is considered unwanted sound that can disturb routine activities (e.g., sleep, conversation, student learning) and can cause annoyance. Noise levels in the vicinity of CLT are a function of various Airport and non-airport sources. Noise sources include aircraft operations and roadway traffic on the main highways surrounding CLT. Future growth in operations would occur with or without the Proposed Action. Therefore, the Proposed Action would not result in a change in the noise environment at the Airport. The existing noise condition is consistent with the Airport's Noise Exposure Maps (NEMs) developed in 2016.¹⁵ As a result, an existing contour is not presented in this EA.

¹⁴ Duke Energy. 2018. Fast Facts.

¹⁵ Noise Exposure and Contour Maps, Noise, Charlotte Douglas International Airport, 2019, Available on-line: <https://www.cltairport.com/community/noise/maps/> Accessed January 2020.

4.2.12 Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks

Socioeconomic conditions describe the elements of the human environment such as population, employment, housing, public services, and transportation.

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, requires all Federal agencies to identify and address disproportionate and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Executive Order also directs Federal agencies to incorporate environmental justice into their overall missions by conducting their programs and activities in a manner that provides minority and low-income populations an opportunity to participate in agency programs and activities.

DOT Order 5610.2(a) defines minorities as people who are Black, Hispanic or Latino, Asian American, American Indian, Alaskan Native, Native Hawaiian, or other Pacific Islander. Minority populations are defined as "any readily identifiable groups of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed DOT program, policy or activity."¹⁶ The DOT Order defines a low-income population as "any readily identifiable group" of persons whose median household income is at or below the poverty guidelines of the U.S. Department of Health and Human Services, "who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed DOT program, policy or activity."¹⁷

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

CLT is located in the City of Charlotte within Mecklenburg County, North Carolina. As shown in Exhibit 1-2, Proposed Action, the Project Site is entirely on Airport property. As such, no environmental justice communities are located within or adjacent to the Proposed Action Site. Additionally, there are no schools or day care centers where the potential for a child to be exposed to environmental health risks would occur. **Table 4-3** presents a comparison of the socioeconomic characteristics of the City of Charlotte and Mecklenburg County.

¹⁶ Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, February 11, 1994.

¹⁷ Ibid.

TABLE 4-3: EXISTING POPULATION AND DEMOGRAPHICS

	CITY OF CHARLOTTE	MECKLENBURG COUNTY
Population	826,060	1,034,290
Not Hispanic	710,681	901,341
White	348,789	495,078
Black / African American	285,294	318,010
Native American / Alaskan Native	1,763	2,162
Asian	51,259	56,769
Native Hawaiian or Pacific Islander	454	484
Other	2,616	2,984
Hispanic	115,379	132,949
Percent Hispanic	14.0%	12.9%
Percent Total Minority	57.8%	52.1%
Percent Below Poverty Level*	14.9%	13.4%

*Note: For 2017, the U.S. Census Bureau determined the poverty threshold to be an income of \$12,488 for an individual and \$25,094 for a family of four.

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates; Landrum & Brown, 2019.

CLT ranks as the nation's sixth busiest airport in operations and provides service to 178 destinations throughout the world.¹⁸ CLT is also a major employment center. Employers who maintain staff on-site have nearly 30,000 workers, including airlines, tenants, other businesses and the City of Charlotte's Aviation Department. The economic activity that CLT generates is a major contributor to the region's economy. The Airport also contributes nearly \$23 billion in annual total economic impact to the region. Additionally, more than 300,000 jobs in the region are directly or indirectly related to the Airport and its services. Those workers earn \$12.6 billion in wages and salaries. CLT's state and local tax contribution is approximately \$1.1 billion.

¹⁸ CLT Fast Facts. Available online: https://assets.ctfassets.net/jaw4bomip9l3/5F2nIKBcnnqIGJqEMaU3X/b29e68b6a9d680ee215eef1ed4412ad0/Fast_Facts-Jan._2020.pdf Accessed January 2020.

4.2.13 Visual Effects

FAA Order 1050.1F states that the Visual Effects environmental impacts category deals with the extent to which the proposed action would have the potential to either 1) produce light emissions that create annoyance or interfere with normal activities; or 2) affect the nature of the visual resources or visual character of the area. As such, light emissions and the visual character of the Airport are discussed in the following paragraphs.

4.2.13.1 LIGHT EMISSIONS

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

4.2.13.2 VISUAL RESOURCES/VISUAL CHARACTER

As previously mentioned, the Proposed Action Site is located on the Airport and is surrounded by similar uses.

4.2.14 Water Resources

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

4.2.14.1 WETLANDS AND STREAMS

The Proposed Action Site was delineated in 2019.^{19,20} Linear footage of streams within the Proposed Action Site consists of approximately 8,050 linear feet of streams and 0.14 acres of wetlands. The wetlands and streams are shown on **Exhibit 4-4, Wetlands and Streams**. See **Appendix E, Water Resources**, for more information.

4.2.14.2 FLOODPLAINS

Floodplains are defined as the lowland and relatively flat areas adjoining inland and coastal waters including flood-prone areas of offshore islands, including at a minimum, that area subject to a one-percent or greater chance of flooding in any given year (i.e., 100-year floodplain).²¹ Floodplains within

¹⁹ HDR environmental scientists conducted field surveys throughout the Airport on April 29th – May 3rd, May 13th, May 14th, September 17th, and October 1st– 11th, 2019.

²⁰ HDR to USACE, *Preliminary Jurisdictional Determination Verification Request*, November 1, 2019.

²¹ FAA Order 5050.4B, *NEPA Implementing Instructions for Airport Actions*, April 28, 2006.

the Proposed Action Site are depicted on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panels 3710451300K, 3710452300K, and 3710451200K (effective September 2, 2015) as reproduced in **Exhibit 4-5, Floodplains**. As shown in this exhibit, the Proposed Action Site is located in an area that is designated as a 100-year floodplain.

4.2.14.3 SURFACE WATERS

The Airport lies within the Catawba River Drainage Basin. Surface drainage flows from the Airport by numerous conveyances, such as ditches, creeks, and streams, and eventually enters the Catawba River or one of its impoundments. Most of the existing Airport drains southeast into Taggart Creek and south into Coffey Creek. Ticer Branch drains the northwest corner, Little Paw Creek drains the west side, and Beaverdam Creek drains the southwest corner of the Airport.

The primary source of drinking water in Mecklenburg County is the Catawba River. Water is pumped from the river either at Mountain Island Lake or Lake Norman intakes, to one of three treatment plants where the water is cleaned, tested, and pumped into the distribution system. The Catawba River is located to the west of CLT and several tributaries flow from CLT property into the Catawba River.

CLT property is situated within two watersheds as denoted by the 8-digit hydrologic unit codes (HUC) 03050101 (Upper Catawba) and 03050103 (Lower Catawba). The boundary between the two watersheds runs roughly northeast to southwest through CLT property between Runway 18C/36C and Runway 18R/36L. The HUC 03050101, which is located on the western side of CLT property, is designated by Mecklenburg County as a drinking water protection watershed. As shown in **Exhibit 4-6, Watershed Protection Areas**, the Proposed Action Site is not in an area designated by Mecklenburg County as a drinking water protection watershed. Stormwater drainage from the Proposed Action Site enters the Catawba River downstream from the raw water intakes on Lake Norman, Mountain Isle Lake, and Lake Wylie. The nearest municipal water supply intake on the Catawba River is approximately 32 miles downstream from the Proposed Action Site.²²

In North Carolina, stormwater discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) as administered by the NCDEQ Division of Energy, Mineral, and Land Resources. CLT currently holds an individual NPDES Permit (Permit No. NC0083887) for industrial/commercial activity.

4.2.14.4 GROUNDWATER

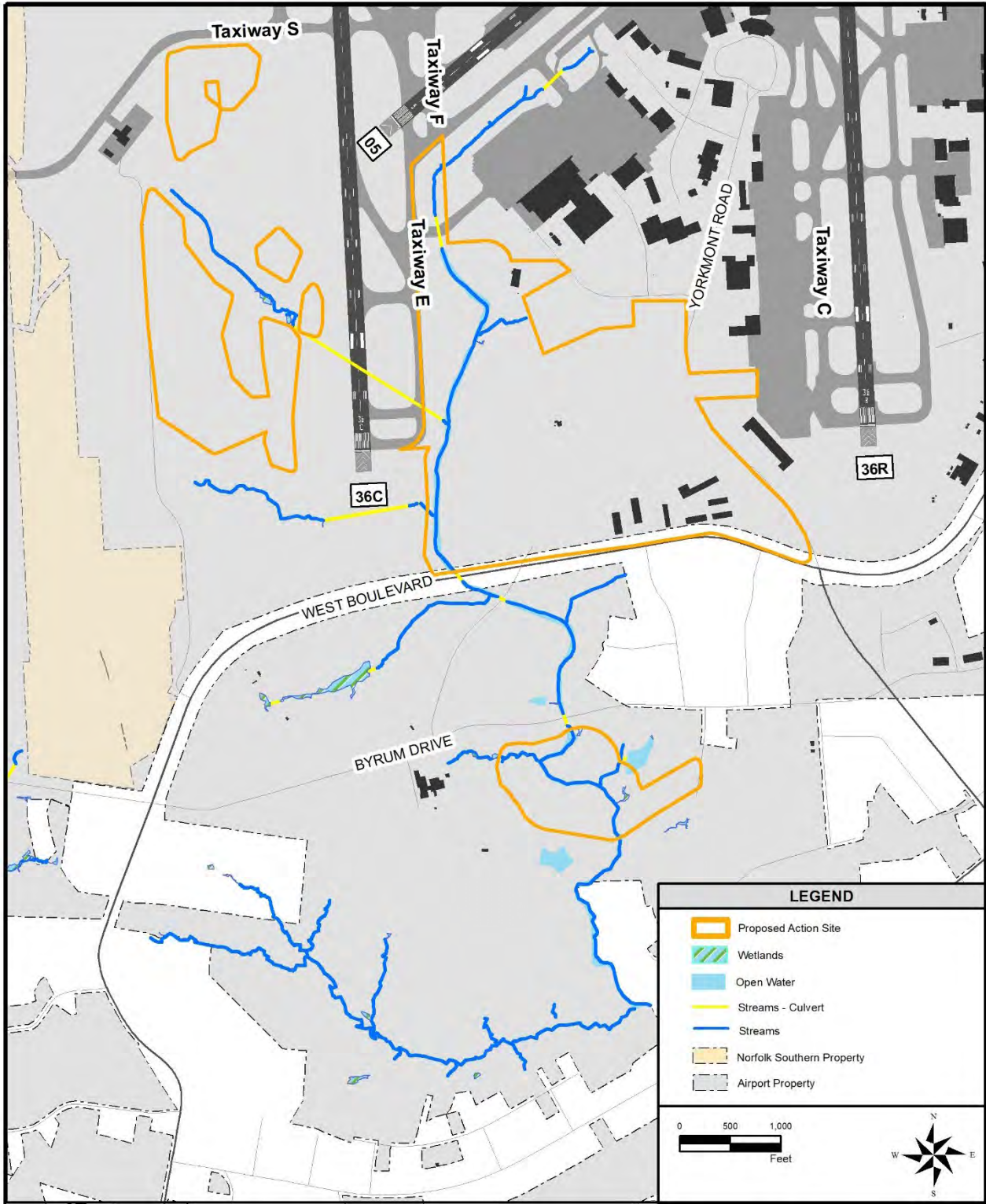
Approximately 15 percent of the water supply in Mecklenburg County comes from groundwater. Groundwater is obtained via wells that extract water from aquifers for drinking, irrigation, and industrial uses. There are no public drinking water wells located within the Proposed Action Site.

4.2.14.5 WILD AND SCENIC RIVERS

No wild and scenic rivers are present in Mecklenburg County.

²² HDR, Catawba-Wateree River Basin Water Supply Master Plan, Figure 15-3 and Figure 15-4, May 2014

EXHIBIT 4-4, WETLANDS AND STREAMS



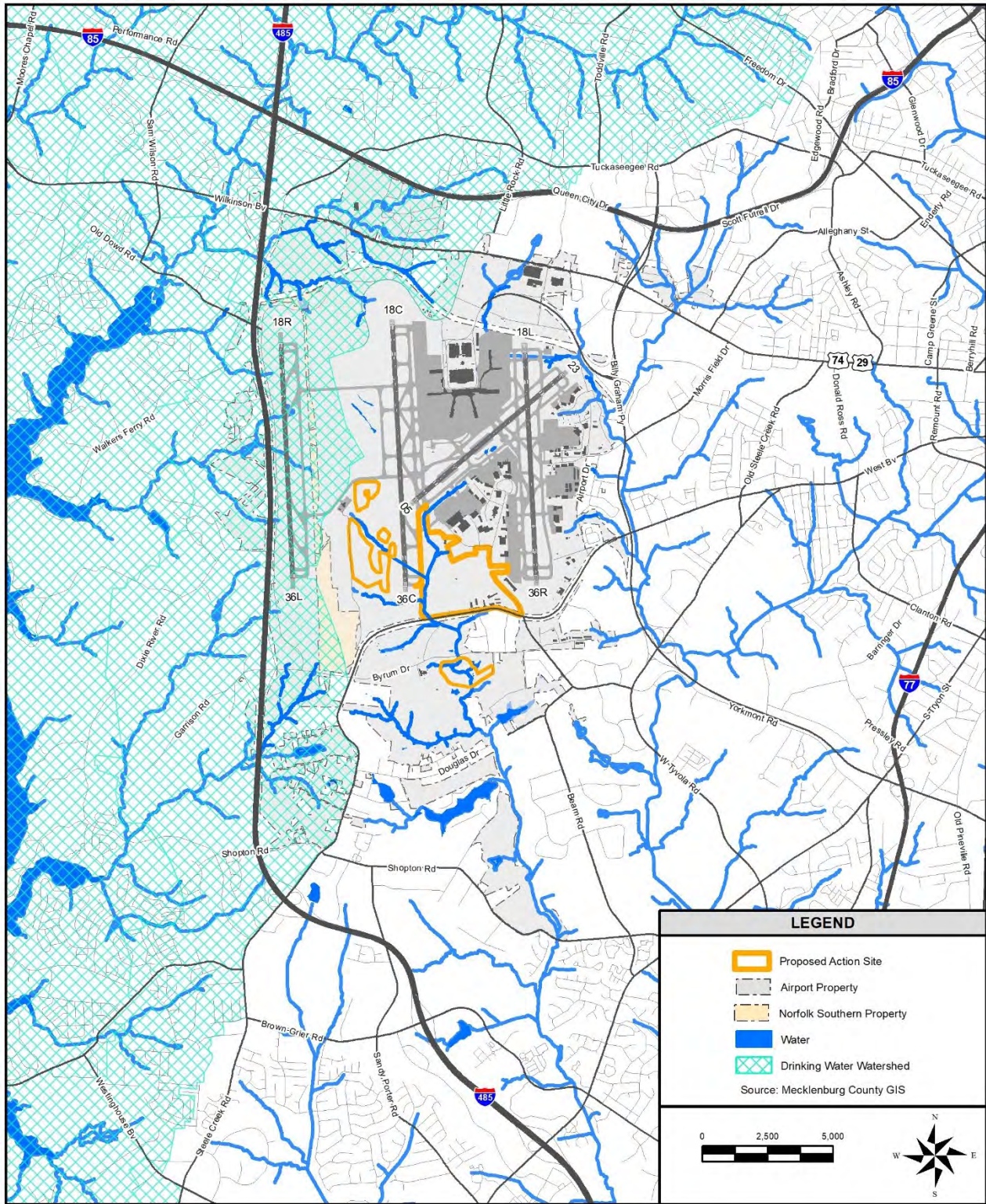
Source: L&B, 2020

EXHIBIT 4-5, FLOODPLAINS



Source: L&B, 2020

EXHIBIT 4-6, DRINKING WATER PROTECTION AREAS



Source: L&B, 2020

5 ENVIRONMENTAL CONSEQUENCES

This chapter presents the assessment of environmental impacts addressed in considering reasonably foreseeable environmental consequences of the Proposed Action and the No Action alternative.

As required by the Federal Aviation Administration (FAA) Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects*, and FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, the environmental categories listed below are addressed in this Environmental Assessment (EA). Construction activities could result in potential impacts to multiple categories. Per FAA Order 1050.1F, the assessment of potential construction related impacts is discussed where applicable for each of the categories listed.

- Air Quality
- Biological Resources
- Climate
- Coastal Resources
- Department of Transportation (DOT) Section 4(f)
- Farmlands
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Historical, Architectural, Archeological, and Cultural Resources
- Land Use
- Natural Resources and Energy Supply
- Noise and Noise Compatible Land Use
- Socioeconomics, Environmental Justice, and Children’s Environmental Health and Safety Risks
- Visual Effects
 - Light Emissions
 - Visual Resources and Visual Character
- Water Resources
 - Wetlands
 - Floodplains
 - Surface Waters
 - Groundwater
 - Wild and Scenic Rivers

5.1 AIR QUALITY

The Proposed Action would be implemented in Mecklenburg County, North Carolina, which the U.S. Environmental Protection Agency (USEPA) has designated as maintenance for ozone (O₃). At the time of the preparation of this EA, the County was designated attainment for all the other Federally regulated pollutants. Therefore, the net emissions of the Proposed Action are limited to less than 100 tons per year for the ozone precursor pollutants, nitrogen oxides (NO_x) and volatile organic compounds (VOC).

The impacts to air quality due to the Proposed Action were determined in accordance with the guidelines provided in FAA, *Aviation Emissions and Air Quality Handbook Version 3, Update 1*²³ and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, which together with the guidelines of FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, constitute compliance with all the relevant provisions of NEPA and the Clean Air Act (CAA), as amended in 1990.

No Action

The No Action alternative does not involve any development and therefore would not cause any impacts to air quality from construction activity.

Proposed Action

Table 5-1 shows that the estimated net emissions from construction of the Proposed Action would be less than the applicable *de minimis* thresholds. Because construction of the Proposed Action would not result in increased emissions above the applicable *de minimis* thresholds, no further analysis is required under the General Conformity Rule and the Proposed Action is determined to conform to the State Implementation Plan (SIP). For more information see Appendix B, *Air Quality*.

²³ FAA, *Aviation Emissions and Air Quality Handbook Version 3, Update 1*, January 2015.

TABLE 5-1: CONSTRUCTION EMISSIONS INVENTORY - PROPOSED ACTION

ANNUAL EMISSIONS SUMMARY						
EMISSION SOURCES	CRITERIA AND PRECURSOR POLLUTANTS (short tons per year)					
	CO	VOC	NO _x	SO _x	PM ₁₀	PM _{2.5}
	CAA DE MINIMIS THRESHOLDS					
	NA	100	100	NA	NA	NA
CONSTRUCTION YEAR 1						
Building Demolition	0.4	0.1	0.8	0.0	0.0	0.0
Tree Clearing	0.5	0.1	0.3	0.0	0.0	0.0
Borrow Area	3.4	0.5	6.4	0.0	0.4	0.4
<i>Construction Year 1 Subtotal</i>	<i>4.3</i>	<i>0.7</i>	<i>7.4</i>	<i>0.0</i>	<i>0.5</i>	<i>0.5</i>
CONSTRUCTION YEAR 2						
Taxiway F Extension	2.2	0.2	2.1	0.0	0.9	0.2
Borrow Area	3.4	0.5	6.4	0.0	0.4	0.4
Detention Basin	11.5	0.8	7.8	0.0	0.5	0.5
Yorkmont Road Realignment	1.5	0.3	0.8	0.0	0.1	0.1
De-Ice Pad	6.0	0.5	4.7	0.0	1.7	0.4
Crossfield Taxiway	2.6	0.1	1.1	0.0	0.4	0.1
Taxiway Bridge	0.4	0.0	0.4	0.0	0.1	0.0
<i>Construction Year 2 Subtotal</i>	<i>27.7</i>	<i>2.4</i>	<i>23.1</i>	<i>0.1</i>	<i>4.1</i>	<i>1.8</i>
CONSTRUCTION YEAR 3						
De-Ice Pad	6.0	0.5	4.7	0.0	1.7	0.4
Crossfield Taxiway	5.3	0.3	2.2	0.0	0.9	0.2
Taxiway Bridge	0.9	0.1	0.8	0.0	0.1	0.1
<i>Construction Year 3 Subtotal</i>	<i>12.2</i>	<i>0.8</i>	<i>7.7</i>	<i>0.0</i>	<i>2.8</i>	<i>0.7</i>
CAA DE MINIMIS THRESHOLDS EXCEEDED?	NA	NO	NO	NA	NA	NA

NA Not Applicable

Note Total emissions may not sum exactly due to rounding.

Source: Landrum & Brown analysis, 2019.

While the construction of the Proposed Action would be expected to contribute to fugitive dust in and around the construction site, the City of Charlotte Aviation Department (Sponsor) would ensure that all possible measures would be taken to reduce fugitive dust emissions by adhering to guidelines included

in FAA Advisor Circular, *Standard Specifications for Construction of Airports*.²⁴ Methods of controlling dust and other airborne particles would be implemented to the maximum possible extent and may include, but not limited to, the following:

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

5.2 BIOLOGICAL RESOURCES

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

- A long-term or permanent loss of unlisted plant or wildlife species (i.e., extirpation of the species from a large project area);
- Adverse impacts to special status species (e.g., state species of concern, species proposed for listing, migratory birds, bald and golden eagles) or their habitats;
- Substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats or their populations; or
- Adverse impacts on a species' reproductive success rates, natural mortality rates, non-natural mortality (e.g., road kills and hunting), or ability to sustain the minimum population levels required for population maintenance.

²⁴ FAA Advisory Circular, *Standard Specifications for Construction of Airports, Item C-102, Temporary Air and Water Pollution, Soil Erosion, and Siltation Control*, AC 150/5370-10H (December 21, 2018).

No Action

The No Action alternative does not involve any development and therefore would not cause any impacts to biological resources.

Proposed Action

As discussed in Chapter Four, *Affected Environment*, the Proposed Action Site contains potentially suitable habitat for endangered species, including the Michaux's sumac and the Schweinitz's sunflower. However, neither species were observed during the habitat assessments. The Proposed Action Site also contains suitable summer habitat for the northern long-eared bat, which is a threatened species. However, the Proposed Action Site is not located within a hydrologic unit code identified as having known identified occurrences of hibernation or maternity sites for the northern long eared bat. Furthermore, incidental take of the northern long eared bat or its habitat with the proposed activity would be exempt under the 4(d) rule. Additionally, Best Management Practices (BMPs) will be implemented to avoid tree clearing during the maternity roosting season for bats (May 15-August 15). Therefore, the implementation of the Proposed Action is not likely to adversely affect federally threatened or endangered species. See Appendix C, *Biological Resources*, for the habitat survey reports.

5.3 CLIMATE

Although there are no federal standards for aviation-related greenhouse gas (GHG) emissions, it is well-established that GHG emissions can affect climate.²⁵ The Council on Environmental Quality (CEQ) has indicated that climate should be considered in NEPA analyses.

No Action

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

Proposed Action

Table 5-2 provides an estimate of the yearly GHG emissions inventory. These estimates are provided for information only as no Federal NEPA standard for the significance of GHG emissions from individual projects on the environment has been established.

²⁵ See *Massachusetts v. E.P.A.*, 549 U.S. 497, 508-10, 521-23 (2007).

TABLE 5-2: YEARLY GHG EMISSIONS INVENTORY – PROPOSED ACTION

METRICS	ANNUAL METRIC TONS		
	CO ₂	CH ₄	N ₂ O
CONSTRUCTION YEAR 1			
Construction	5,300	0.05	0.00
GWP ₁₀₀	1	25	298
CO _{2e}	5,300	1.21	0.00
CO _{2e} Net Emissions	5,301		
CONSTRUCTION YEAR 2			
Construction	16,923	0.16	0.00
GWP ₁₀₀	1	25	298
CO _{2e}	16,923	4.12	0.00
CO _{2e} Net Emissions	16,927		
CONSTRUCTION YEAR 3			
Construction	5,046	0.06	0.00
GWP ₁₀₀	1	25	298
CO _{2e}	5,046	1.58	0.00
CO _{2e} Net Emissions	5,047		

CO₂: Carbon Dioxide

CO_{2e}: Carbon Dioxide equivalent

CH₄: Methane

N₂O: Nitrous oxide

GWP: Global Warming Potential

Total emissions may not sum exactly due to rounding.

Source: L&B Analysis, 2019.

5.4 COASTAL RESOURCES

The Airport is not located within a coastal zone therefore no significant impacts to coastal resources would occur with implementation of the No Action or Proposed Action.

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

The Federal statute that governs impacts in this category is commonly known as the Department of Transportation (DOT) Act of 1966, Section 4(f) provisions. Section 4(f) of the DOT Act was recodified and renumbered as Section 303(c) of U.S. Code Title 49 (49 U.S.C.). FAA Orders 5050.4B and 1050.1F continue to refer to this statute as Section 4(f) to avoid confusion. Section 4(f) provides that the “Secretary of Transportation may approve a transportation program or project requiring the use of publicly-owned land of a park, recreational area, or wildlife and waterfowl refuge of national, state, or local significance or land of a historic site of national, state, or local significance as determined by the official having jurisdiction over those resources only if: there is no prudent and feasible alternative that would avoid using those resources, and the program or project includes all possible planning to minimize harm resulting from the use.”²⁶ Two types of impacts to a Section 4(f) resource, physical or constructive use, can occur from a Proposed Action. A physical use would occur if the Proposed Action or alternative(s) would involve an actual physical taking of Section 4(f) property through purchase of land or a permanent easement, physical occupation of a portion or all of the property, or alteration of structures or facilities on the property. Constructive use occurs when the impacts of a project on a Section 4(f) property are so severe that the activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired. The FAA may also make a *de minimis* impact determination with respect to a physical use of Section 4(f) property if, after taking into account any measures to minimize harm, the result is either:

- A determination that the project would not adversely affect the activities, features, or attributes qualifying a park, recreation area, or wildlife or waterfowl refuge for protection under Section 4(f); or
- A Section 106 finding of no adverse effect or no historic properties affected.
- Section 6(f) of the Land and Water Conservation Act (LWCA) is also pertinent to Section 4(f) lands. Section 6(f) prohibits recreational facilities funded under the LWCA from being converted to non-recreational use unless approval is received from the director of the grantor agency.

No Action

The No Action alternative would not cause any impacts to Section 4(f) resources.

Proposed Action

Section 4.2.5 of Chapter Four, *Affected Environment*, determined that there are no known Section 4(f) resources within or near the vicinity of the Proposed Action Site. Based on the NPS, the closest resource on or eligible for the NRHP is the Steele Creek Presbyterian Church and Cemetery which is located approximately one mile southwest of the project site.

²⁶ FAA Environmental Desk Reference for Airport Actions, Section 7.1(b), Section 4(f) Resources, October 2007.

Because there are no Section 4(f) resources within the Proposed Action Site, no Section 4(f) resources would be directly impacted by the Proposed Action. Therefore, the Proposed Action would not result in the physical use of any Section 4(f) resource. In addition, the Proposed Action is limited to the construction of a deice pad and the implementation of its connected actions. The Proposed Action would create a temporary increase in noise due to the construction of the Proposed Action. However, construction noise would be temporary and is not expected to be at sufficient enough levels to cause impacts that would result in a direct or indirect taking of a Section 4(f) resource for transportation purposes. Therefore, the Proposed Action would not result in a constructive use Section 4(f) resources. Therefore, no significant impacts to Section 4(f) resources would result from the Proposed Action.

5.6 FARMLANDS

No farmlands are located in the Proposed Action area; therefore, no significant impacts to farmlands would occur with the implementation of the No Action or Proposed Action.

5.7 HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION

The potential impacts resulting from hazardous materials, solid waste collection, control, and disposal due to airport projects are assessed under four primary laws that govern the handling and disposal of hazardous materials, chemicals, substances, and wastes:

- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), (as amended by the Superfund Amendments and Reauthorization Act of 1986 and the Community Environmental Response Facilitation Act of 1992);²⁷
- Pollution Prevention Act of 1990;²⁸
- Toxic Substances Control Act of 1976, as amended (TSCA);²⁹ and
- Resource Conservation and Recovery Act of 1976 (RCRA), (as amended by the Superfund Amendments and Reauthorization Act of 1986 and the Community Environmental Response Facilitation Act of 1992).³⁰

The two statutes of most pertinence to FAA actions to construct and operate airport facilities and navigational aids are RCRA and CERCLA. RCRA governs the generation, treatment, storage, and disposal of hazardous wastes. CERCLA provides for consultation with natural resources' trustees and cleanup of any release of a hazardous substance (excluding petroleum) into the environment.

²⁷ 42 U.S.C. 9601-9675.

²⁸ 42 U.S.C. 1310-1319.

²⁹ 15 U.S.C. 2601-2692

³⁰ 42 U.S.C. 6901-6992(k)

No Action

With the No Action alternative, the existing conditions at CLT would remain in place. Therefore, there would be no hazardous materials or solid waste impacts not already occurring or expected to occur.

Proposed Action

As discussed in Section 4.2.7, there are no contaminated sites within, or in the immediate vicinity, of the Proposed Action Site. Therefore, there would not be any significant long-term solid waste or hazardous materials impacts with the implementation of the Proposed Action.

Short-term temporary environmental impacts due to solid and hazardous waste generated during construction may occur. The implementation of the Proposed Action includes the demolition of two structures, including the former Robert McGinn House and the Building 206, which is currently vacant. Due to their age, the structures may contain lead- and asbestos-containing materials (ACMs). Lead and asbestos testing of the structures would be conducted prior to demolition of the structures. If lead and/or ACMs are present, their removal (including abatement and disposal) would be conducted by qualified and properly licensed asbestos abatement contractors prior to demolition. Furthermore, all demolition activities would be conducted with regard to worker safety and according to all applicable regulations, including the RCRA. Solid waste would be generated from the Proposed Action in the form of soil resulting from the construction of the Proposed Action. Building materials and debris would be recycled to the greatest extent feasible. Materials that cannot be recycled would be disposed of in accordance with all Federal, state, and local regulations.

If any soils excavated during demolition or construction show evidence of petroleum contamination, they would be reported immediately to all relevant agencies, including the local Fire Marshall, and treated with respect to NCDEQ standards. Additionally, appropriate permits and notifications would be pursued. Furthermore, BMPs identified in the Airport's Stormwater Pollution Prevention Plan (SWPPP) will be implemented during construction of the Proposed Action. Therefore, the Proposed Action would not result in unique or significant impacts to hazardous materials, solid waste management, or pollution prevention plans.

5.8 HISTORICAL, ARCHITECTURAL, ARCHEOLOGICAL, AND CULTURAL RESOURCES

The *National Historic Preservation Act of 1966* (NHPA)³¹ and the *Archeological and Historic Preservation Act of 1974*³² are primary Federal laws governing the preservation of historic and prehistoric resources, encompassing art, architecture, archeological, and other cultural resources. Section 106 of the NHPA requires that, prior to approval of a Federal or Federally-assisted project, or before the issuance of a license, permit, or other similar approval, Federal agencies take into account the effect of the project on properties that are on or eligible for listing on the National Register of Historic Places (NRHP).

³¹ Public Law 89-665; 16 U.S.C. 470 et seq.

³² Public Law 86-523, 16 U.S.C. 469-469c-2

No Action

The No Action alternative would not cause any impacts to historic or archeological resources.

Proposed Action

As previously discussed in Chapter Four, one known historic structure was identified within the APE, the former Robert McGinn House. However, a survey of the Robert McGinn House was conducted in March 2019 which confirmed the structure is extant but no longer has the integrity needed for eligibility; therefore, the property was not recommended for NRHP eligibility.

An archeological survey of previously undisturbed areas in APE was conducted. Archeological field investigations on the site conducted in December 2018 and December 2019 resulted in identifying ten total archeological sites. The sites do not meet any of the NRHP eligibility criteria and are recommended as being not eligible for the NRHP. As such, a finding of no historic properties affected was made. Therefore, no significant impacts due to the Proposed Action would occur to historical, architectural, archaeological, and cultural resources.

5.9 LAND USE

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

No Action

The No Action alternative would not cause any changes to existing land use; therefore, no land use compatibility impacts would occur.

Proposed Action

The Proposed Action would be constructed entirely on Airport property. The site is surrounded by airport pavement and other airport-compatible uses, including industrial land uses and vacant land. The Proposed Action would include construction of additional airfield pavement for a deice pad and taxiways as well as a detention pond for stormwater management. The Proposed Action is not inconsistent with local plans or laws related to land use and development. In addition, the detention basin contains design measures that would ensure it would not create a new wildlife attractant or create an obstruction to navigation per 14 C.F.R. Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*. See Section 5.14.3 for more information. Therefore, no significant impacts to land use would occur with implementation of the Proposed Action.

5.10 NATURAL RESOURCES AND ENERGY SUPPLY

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

No Action

The No Action alternative would not cause any impacts to natural resources or the supply of energy.

Proposed Action

The Proposed Action includes the expansion of existing airfield pavement, which would require the installation of airfield lighting that would require the use of electricity. Construction of the proposed deice pad and taxiways would require natural resources such as gravel, sand, aggregate, concrete, asphalt, water, and other paving materials. These materials are not in short supply in the Charlotte area and consumption of these materials is not expected to deplete existing supplies. Additionally, construction equipment would require fuel. However, operation of the proposed deice pad is expected to decrease aircraft delay, which would decrease fuel consumption. The Proposed Action would not deplete the supply of natural resources, nor would it use a substantial amount of fuel or electricity that would exceed local supplies; therefore, the Proposed Action would not cause a significant impact to the supply of energy or natural resources.

5.11 NOISE AND NOISE-COMPATIBLE LAND USE

As previously stated, the Proposed Action is limited to the construction of a deice pad and the implementation of its connected actions. The Proposed Action would not result in an increase in operations, change fleet mix, or create new flight tracks. Therefore, the Proposed Action would not result in changes to the noise environment at the Airport. As such, the existing noise condition is consistent with the Airport's Noise Exposure Maps (NEMs) developed in 2016.³³ As a result, noise contours are not presented in this EA.

The Proposed Action would create a temporary increase in noise due to the construction of the Proposed Action. Per FAA guidance, noise due to construction of a Proposed Action should be assessed in an environmental document. Therefore, the following section addresses potential noise impacts related to the construction of the Proposed Action.

No Action

The No Action alternative would not include construction; therefore, no noise impacts would occur due to the construction of the Proposed Action.

³³ Noise Exposure and Contour Maps, Noise, Charlotte Douglas International Airport, 2019, Available on-line: <https://www.cltairport.com/community/noise/maps/> Accessed January 2020.

Proposed Action

Table 5-3 depicts an estimate of the typical maximum sound level energy from various construction equipment that is likely to be used during construction of the Proposed Action. The total sound energy would be a product of a machine's sound level, the number of such machines in service, and the average time they operate.

Construction activities associated with the Proposed Action are not expected to result in noise impacts to residential or other public land uses due to the limited amount of time the construction activity would occur and distance to the nearest residence. Major construction activities would be limited to daylight hours. Additionally, noise from construction equipment would likely not be discernible from other background noise sources such as aircraft and roadway noise in most locations. Therefore, no significant noise impacts would occur with the implementation of the Proposed Action.

TABLE 5-3: CONSTRUCTION EQUIPMENT NOISE

CONSTRUCTION EQUIPMENT	TYPICAL MAXIMUM SOUND LEVEL (LMAX) IN DB(A) AT 50 FEET
Backhoe	78
Concrete Mixer Truck	79
Dozer	82
Dump Truck	76
Excavator	81
Generator	81
Jackhammer	89
Paver	77
Pump	81
Pneumatic Tools	85
Rock Drill	81
Scraper	84

Source: Federal Highway Administration, *Construction Noise Handbook, 9.0 Construction Equipment Noise Levels and Ranges*. August 2006, Updated August 24, 2017 online at http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm, Accessed April 2, 2020.

5.12 SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, AND CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISKS

5.12.1 Socioeconomics

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

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

No Action

The No Action alternative would not change any of the physical characteristics of the Airport and would have no impact on or off the Airport.

Proposed Action

Inducing Growth: The construction and implementation of the Proposed Action would not result in long-term economic growth for the area near the Airport. Temporary growth in economic activity from the creation of construction jobs is likely to occur during construction.

Disruption of Communities, Relocation of Residences, and Relocation of Businesses: The Proposed Action would not cause the relocation of housing, relocation of businesses, or the disruption of an established community. While the Proposed Action includes the demolition of Building 206 and the former Robert McGinn House, both structures are vacant and their demolition would not require any form of relocation. Therefore, no relocation of housing, relocation of businesses, or the disruption of an existing community would occur as a result of the Proposed Action.

Disruptions of Local Traffic Patterns: The Proposed Action includes the relocation of a 300-foot segment of Yorkmont Road north of West Boulevard that provides access to the South Cargo Area. The relocated roadway would maintain public access to the South Cargo Area. While temporary changes would occur to Yorkmont Road during the construction of the taxiway and service road bridges, traffic access would be maintained on this route through the implementation of control measures, such as temporary lanes and flaggers.

Temporary construction impacts could include increased commercial traffic, increased traffic congestion, increased travel distances, and increased travel times for drivers. However, a construction management plan would be prepared which, based on the selected contractor(s) haul plan, would specify hours of operation, haul routes, and similar controls. It is expected that such a plan would be consistent with normal contracting practices, because it is not likely that a contractor would schedule haul activities during extreme congestion periods or weather conditions because it could increase costs to the contractor and affect the schedule. Therefore, no significant changes in traffic patterns would occur as a result of the Proposed Action.

Substantial Loss in Community Tax Base: The construction and implementation of the Proposed Action would not result in a substantial loss in community tax base. The Proposed Action has the potential to temporarily increase the community tax base.

In conclusion, no significant socioeconomic impacts would occur with the implementation of the Proposed Action.

5.12.2 Environmental Justice

A specific significance threshold for Environmental Justice has not been defined by the FAA. However, potential impacts would occur if disproportionately high environmental impacts in one or more environmental categories were to occur to minority or low-income populations. In addition, unique impacts to a minority or low-income population should also be considered even if there is no significant impact from other environmental categories.

No Action

Under the No Action alternative, no changes would occur that would cause impacts to minority or low-income populations.

Proposed Action

Under the Proposed Action, no significant or disproportionate impacts would occur to minority or low-income populations. The Proposed Action Site is located entirely on Airport property. An environmental justice population is located south of the Proposed Action Site north of Douglas Drive. However, the Proposed Action would not adversely impact minority and/or low-income populations because there are no significant impacts to other environmental impact categories. Therefore, no significant environmental justice impacts would occur from the Proposed Action.

5.12.3 Children's Health and Safety Risks

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

No Action

Under the No Action alternative, no changes would occur to create environmental health risks or safety risks for any persons, regardless of age.

Proposed Action

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

5.13 VISUAL EFFECTS

According to FAA Order 1050.1F, visual effects include light emissions and visual resources/visual character. These factors should be considered in an environmental review.

5.13.1 Light Emissions

No Action

Under the No Action alternative, no changes would occur that would cause impacts from light emissions.

Proposed Action

The potential lighting sources that could impact the closest residential area, which is located south of the Proposed Action Site north of Douglas Drive, would be airfield lighting for the deice pad and Taxiway F extension. The lighting would be located approximately one mile north of Douglas Drive and it would only illuminate the immediate area surrounding the deice pad and taxiway. Furthermore, the light would be shielded or directed at angles that would not cause lighting impacts to the residences. Light emissions during the construction of the Proposed Action are not anticipated to cause any impact to the surrounding areas as most of the construction would occur during daytime hours. No significant increase in light intensity is expected to occur within residential areas due to parking facilities and Wilkinson Boulevard separating the proposed development from residences and the existing light emissions in the vicinity of the Proposed Action Site. Therefore, no significant impacts from light emissions would occur.

5.13.2 Visual Resources/Visual Character

No Action

Under the No Action alternative, no changes would occur that would cause visual impacts.

Proposed Action

The Proposed Action would occur on sites surrounded by CLT property and visibility of these sites from residential areas would be limited. Therefore, the Proposed Action would not significantly alter the views from these areas and no significant visual impacts would occur.

5.14 WATER RESOURCES

In FAA Order 1050.1F, water resources include wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers, which function as a single, integrated natural system. Disruption of any one part of this system can have consequences to the functioning of the entire system.

5.14.1 Wetlands

The U.S. Army Corps of Engineers (USACE) and the USEPA define wetlands as: "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

No Action

Under the No Action alternative, no development would occur that would cause impacts to wetlands or streams.

Proposed Action

As discussed in Chapter Four, the Proposed Action Site was delineated in 2019.³⁴ The Proposed Action would result in permanent impacts to approximately 4,435 linear feet of stream, consisting of 4,402.5 linear feet of perennial tributary and 32.5 linear feet of intermittent tributary. Additionally, the Proposed Action would result in permanent impacts to 0.14 acres of wetlands. See Appendix E, *Water Resources*, for more information.

Implementation of the Proposed Action would not result in significant impacts to wetlands and streams because compensatory mitigation will be provided. A detailed compensatory mitigation plan would be required to obtain the necessary authorizations to construct the Proposed Action. With implementation of a mitigation plan to compensate for the losses of wetland and streams resulting from the construction of the Proposed Action, the environmental impact of the Proposed Action would not be significant.

³⁴ HDR environmental scientists conducted field surveys throughout the Airport on April 29th – May 3rd, May 13th, May 14th, September 17th, and October 1st– 11th, 2019.

Coordination with the USACE and the City of Charlotte is underway to obtain a permit per the U.S. Clean Water Act (CWA) and identify mitigation requirements. All permit and mitigation conditions would be met; therefore, no significant impacts would occur to wetlands and streams. Section 5.14.5 outlines detailed mitigation measures for the impacts to the streams and wetlands.

In order for the USACE to issue a CWA permit, the proposed activity must comply with the CWA Section 404 (b) (1) Guidelines. As discussed in Chapter Three, *Alternatives*, the alternative sites do not meet the project purpose; therefore, they are considered not practicable. As no other alternative site was determined practicable, the Proposed Action is identified as the least environmentally damaging practicable alternative that meets the overall purpose of the proposed project. Implementation of the Proposed Action would meet the requirements of EO 11990, *Protection of Wetlands* and DOT Order 5660.1A, *Preservation of the Nation's Wetlands*, because there is no less environmentally damaging practicable alternative to constructing the proposed project than the Proposed Action.

5.14.2 Floodplains

Floodplains are defined by Executive Order 11988, Floodplain Management, as “the lowland and relatively flat areas adjoining inland and coastal waters including flood-prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year” (i.e., area inundated by a 100-year flood). U.S. DOT Order 5650.2 defines the values served by floodplains to include “natural moderation of floods, water quality maintenance, groundwater recharge, fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, and forestry.”

Executive Order 11988, Floodplain Management, directs Federal agencies to take actions to reduce the risk of flood loss, minimize flood impacts on human safety, health, and welfare and restore and preserve floodplain natural and beneficial values. According to FAA guidance contained in the FAA Order 1050.1F, encroachment upon a floodplain is considered significant if it would cause one or more of the following:

- A considerable probability of loss of human life;
- 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; or
- A notable adverse impact on natural and beneficial floodplain values.

No Action

Under the No Action alternative, no development would occur. Therefore, there would be no impacts to floodplains not already occurring or expected to occur.

Proposed Action

The Proposed Action would include development within the 100-year floodplain. As discussed in Chapter Two, *Purpose and Need*, and Chapter Three, *Alternatives*, no other alternative sites meet the project purpose. Therefore, it is not practicable to implement the Proposed Action without constructing in an area currently in the 100-year floodplain.

The Proposed Action would impact approximately 17 acres of a 100-year floodplain designated Zone AE through construction of the Deice Pad and detention pond.³⁵ However, these impacts would not be significant and would not result in: 1) a considerable probability of the loss of human life; 2) likely future damage associated with the encroachment that could be substantial in cost or extent, including interruption of service or loss of vital transportation facility; or 3) a notable adverse impact on natural and beneficial floodplain values. Design measures considered to minimize floodplain encroachments include culverting Coffey Creek and construction of a detention basin downstream of the proposed deice pad.

Development within a FEMA regulated stream requires approval and possible FEMA flood map revisions governed by the State of North Carolina and Mecklenburg County. Discussions with Mecklenburg County confirmed that the planned improvements (both detention basin and upstream Coffey Creek culvert) are within a regulated floodplain requiring a new hydraulic model and revised mapping to be submitted to Mecklenburg County and subsequently to the State Floodplain Mapping Program for approval. A hydraulic model analysis was conducted in coordination with Mecklenburg County and the State Floodplain Mapping Program is ongoing. A Conditional Letter of Map Revision (CLOMR) would be submitted to the Federal Emergency Management Agency (FEMA) to demonstrate any modifications to the existing regulatory floodway, Base Flood Elevations (BFEs), or Special Flood Hazard Areas (SFHAs) that would be generated by the construction. After construction, a Letter of Map Revision (LOMR) would be submitted to FEMA to modify the Flood Insurance Rate Map (FIRM) or Flood Boundary and Floodway Map (FBFM), as applicable. Additionally, a Floodplain Development Permit would be required from the local Floodplain Administrator. Construction would not take place without approvals from both FEMA and from the Floodplain Administrator, satisfying both federal and local requirements.

Mecklenburg County will require the study area both upstream and downstream of the detention basin to be modeled and flood maps revised to show the effect with and without the detention basin embankment in place. The County will coordinate with State Floodplain Mapping officials as part of their review and approval. As such, it is anticipated that there would be no significant impact to floodplains due to the Proposed Action.

³⁵ Zone AE is an area inundated by the 1 percent annual chance flooding event.

5.14.3 Surface Waters

No Action

Under the No Action alternative, no development would occur and no additional impervious surface area would be created. Stormwater runoff would continue to occur from existing impervious surface areas and would be subject to the limits outlined in the existing NPDES permit.

Proposed Action

The construction and implementation of the Proposed Action would result in impacts to surface waters. A new detention basin is proposed for the development to provide post-construction stormwater quantity and quality control for stormwater runoff, in accordance with NCDEQ and City of Charlotte land development ordinances. The new detention basin would accommodate the increase in stormwater runoff due to the increase of approximately 46 acres in impervious surfaces. The amount of increase in impervious surface includes the new paved surfaces, including the deice pad, Taxiway F extension, south crossfield taxiway and service road, and Yorkmont Relocation.

The detention basin would be constructed to provide peak discharge control for the 2-year, 10-year, and 25-year events limiting the peak flow to pre-development conditions. Additionally, the attenuation of detention is designed to occur within 48 hours, in accordance with FAA requirements for glare and waterfowl attraction, both dangerous to aircraft operations. The detention basin is proposed in-line detention on Coffey Creek that will maintain baseflow conditions of Coffey Creek and associated tributaries. During storm events, the creeks would overtop their banks and flood the detention areas. The proposed detention basin would reflect the following additional design features and characteristics to comply with SD1 requirements for stormwater quantity control and quality control basins (dry extended detention basins), as well as FAA requirements for managing hazardous wildlife attractants.

Furthermore, BMPs will be incorporated into the construction of the Proposed Action. Contractors would be required to comply with all applicable Federal, state, and local laws and regulations, including FAA guidance contained in AC 150/5370-10H, *Standard Specifications for Construction of Airports*, including Item C-102, *Temporary Air and Water Pollution, Soil Erosion and Siltation Control*; AC 150/5320-15A, *Management of Airport Industrial Waste*; and AC 150/5320-5D, *Subsurface Drainage Design*. Additionally, the use of biodegradable and wildlife-friendly sediment and erosion control devices will be considered and utilized, if appropriate. As such, no significant impacts would occur to surface waters as a result of the implementation of the Proposed Action.

5.14.4 Groundwater

No Action

Under the No Action alternative, no development would occur; thus, no potential new impacts to groundwater would occur.

Proposed Action

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

5.14.5 Mitigation, Avoidance, and Minimization Measures

The City of Charlotte Aviation Department has initiated coordination for the anticipated compensatory mitigation. There are no private mitigation banks within HUC 03050103; therefore, compensatory mitigation for all permanent impacts will be ensured through purchase of stream and wetlands mitigation credits from either the City of Charlotte's Stream and Wetland Mitigation Bank or the North Carolina Division of Mitigation Services (DMS) In-Lieu Fee Program. The mitigation requirements for the Proposed Action are shown in **Table 5-4**.

TABLE 5-4: MITIGATION REQUIREMENTS FOR WETLAND AND STREAM IMPACTS

Waterbody	Type	Quality	Ratio	Amount	Proposed Credit
Wetlands	Wetland	High	2:1	0.14	0.75
Stream	Intermittent	High	2:1	32.5	65.0
Stream	Perennial	High	2:1	834.0	1,668.0
Stream	Perennial	Medium	1.75:1	41.5	72.6
Stream	Perennial	Low	1.5:1	913.0	1,369.5
Stream	Perennial	-	1:1	2,614.0	2,614.0
Total Wetland				0.14	0.75
Total Stream				4,435	5,789.1

Source: HDR to USACE, Preliminary Jurisdictional Determination Verification Request, November 1, 2019

Based on the conversations with the City of Charlotte's Stream and Wetland Mitigation Bank, credits are available for purchase. Formal, final USACE decision regarding compensatory mitigation amount has not yet been issued. Upon USACE approval of the proposed mitigation, the City of Charlotte will finalize negotiations.

As previously discussed, stormwater facilities would meet all applicable state and local regulations and stormwater discharges would comply with the existing NPDES permit. BMPs will be incorporated into the construction of the Proposed Action, including those identified in the Airport's SWPPP. Contractors would be required to comply with all applicable Federal, state, and local laws and regulations, including FAA guidance contained in AC 150/5370-10H, *Standard Specifications for Construction of Airports*, including Item C-102, *Temporary Air and Water Pollution, Soil Erosion and Siltation Control*; AC 150/5320-15A, *Management of Airport Industrial Waste*; and AC 150/5320-5D, *Subsurface Drainage Design*. Additionally, the use of biodegradable and wildlife-friendly sediment and erosion

control devices will be considered and utilized, if appropriate. Furthermore, the Airport is subject to the Surface Water Improvement and Management buffers, Water Supply Watershed Buffers, and Post-Construction Buffers as administered and reviewed by the City of Charlotte. Buffer disturbance would be approved and mitigated appropriately, as needed.

5.15 CUMULATIVE IMPACTS

The CEQ NEPA regulations (40 C.F.R. 1508.7) define a cumulative impact as "...the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency, Federal or non-Federal, or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time." This cumulative impact analysis was conducted to comply with the intent of FAA Order 1050.1F, DOT Order 5610.1C, and the January 1997 CEQ guidance.

The construction of the Proposed Action is planned to occur from 2021 through 2023, which would overlap with several other projects at CLT. With the exception of temporary construction-related impacts, the cumulative environmental impact of the Proposed Action is expected to be minimal. Extensive preventive procedures would be put into place to avoid and minimize any potential adverse impacts during construction. As described in the following sections, the Proposed Action is consistent with the overall planning mission of the City of Charlotte and would not result in adverse cumulative impacts.

5.15.1 Past Projects

Past projects are actions that occurred in the past five years and may warrant consideration in determining the environmental impacts of an action. Past projects at the Airport include property acquisition and demolition, taxiway rehabilitations, terminal expansions, and parking lot expansions.

5.15.2 Present Projects

Present projects are any other actions that are occurring in the same general time frame as the Proposed Action. The following projects are currently under construction or construction is planned to begin in 2021.

On-Airport Projects

- Central Energy Plant – This project will construct a single-story 89,600 square foot Central Energy Plant on CLT property on a portion of the existing Daily North Parking Lot. The project is scheduled to be completed by August 2021.
- Concourse A Phase II – This project includes the construction of one new concourse to the north of the second Concourse A pier to accommodate existing and short-term demand and the paving of apron to the north of the new Concourse A pier. This project is scheduled to begin April 2020 with a duration of 26 months.

- Replacement of the Joint Sealant of Runway 18C/36C and Associated Taxiway E Connectors – This project includes the replacement of the concrete pavement to include joint sealant on Runway 18C/36C and associated Taxiway E connectors. This project will begin July 2020 and be completed by January 2021.

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

Off-Airport Projects

- North Bridge Over Interstate 85 – This project will construct a bridge over Interstate 85 that will connect Research Drive to J.W. Clay Boulevard to accommodate motorists, bicyclists, pedestrians, and public transit users.
- Morris Field Drive Bridge Replacement – This project will replace a bridge on Morris Field Drive that spans the Norfolk southern railroad tracks. The bridge, which has reached the end of its functional life, will be replaced with a structure that will handle cars as well as pedestrians.
- Catawba Avenue Improvements – This project will improve congestion on Catawba Avenue from Furr Road (N.C. 73) north to Jetton Road in Mecklenburg County. The project will improve connections between Cornelius and Huntersville, improve route to I-77 that enhances regional travel options, additional lanes on Catawba Avenue from N.C. 73 to Jetton Road, and enhance safety for all types of travel (driving, public transit, walking, and bicycling).
- East John Street/Old Monroe Road Widening – This project will widen approximately 6.5 miles of East John Street and Old Monroe Road from Trade Street to Wesley Chapel-Stouts Road. Proposed work would improve traffic flow, reduce travel delays, and allow for more vehicles to travel in the area. Bicyclists and pedestrians would also have accommodations along the project corridor.

5.15.3 Reasonably Foreseeable Future Projects

Reasonably foreseeable future projects are actions that may affect projected impacts of a Proposed Action and are not remote or speculative.

- Capacity Enhancing Projects (Fourth Parallel Runway, Terminal Development, Support Facilities) – The City of Charlotte Aviation Department prepared an Airport Capacity Enhancement Plan (ACEP). The study identified long-term recommendations to improve the existing airfield, terminal, and support facilities to address deficiencies and meet forecasted demand, including the following major elements:
 - Construct 10,000-foot Fourth Parallel Runway 01/19 (including a partial north End-Around Taxiway (EAT) and a full south EAT)
 - Concourse B Expansion and Associated Ramp Expansion

- Concourse C Expansion and Associated Ramp Expansion
- Runway 18C/36C North End Around Taxiway, Hold Pads, and Associated Facilities – The City of Charlotte Aviation Department is proposing to provide a safe means of movement around runways to minimize runway crossings. This project includes the construction of an end-around taxiway on the north end of Runway 18C/36C, two hold pads, and associated facilities.

Potential environmental impacts are unknown. However, for purposes of disclosing potential cumulative impacts it is assumed these projects would result in an increase in impervious surface at the Airport, which would increase stormwater runoff. In addition, it is assumed this project would require removal of solid waste.

5.15.4 Cumulative Impacts by Environmental Category

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

5.15.4.1 AIR QUALITY

The Proposed Action would cause a temporary change in the net emissions due to the operation of construction equipment (see Appendix B, *Air Quality*). However, the emissions were shown to be *de minimis* under the Clean Air Act (as amended in 1990) General Conformity Rule. Furthermore, the *de minimis* emissions are assumed to comply with the SIP and are not expected to cause an exceedance of any of the National Ambient Air Quality Standards (NAAQS), delay the attainment of any NAAQS, or worsen an existing violation of any NAAQS.

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

5.15.4.2 CLIMATE

The cumulative impact of this Proposed Action on the global climate when added to other past, present, and reasonably foreseeable future actions is not currently scientifically predictable. Aviation has been calculated to contribute approximately 3 percent of global carbon dioxide (CO₂) emissions; this contribution may grow to 5 percent by 2050. Actions are underway within the U.S. and by other nations to reduce aviation's contribution through such measures as new aircraft technologies to reduce emissions and improve fuel efficiency, renewable alternative fuels with lower carbon footprints, more efficient air traffic management, market-based measures and environmental regulations including an aircraft CO₂ standard.

5.15.4.3 HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION

The Proposed Action would not increase the quantity of hazardous materials present in the environment or exacerbate existing contamination. Based on the list of recent, ongoing, and future projects, there does not appear to be other projects that, when combined with the Proposed Action, would result in significant adverse cumulative impacts from hazardous materials. Therefore, the Proposed Action would not contribute to any cumulative impacts from future actions with respect to hazardous materials.

Solid waste would be generated from the Proposed Action in the form of soil resulting from the construction of the Proposed Action. Building materials and debris would be recycled to the greatest extent feasible. Materials that cannot be recycled would be disposed of in accordance with all Federal, state, and local regulations. There is sufficient disposal capacity in the area to handle the waste load. None of the other projects would result in significant amounts of solid waste. Therefore, the Proposed Action would not contribute to any cumulative impacts from future actions with respect to solid waste.

5.15.4.4 SURFACE AND GROUND WATER

The Proposed Action would increase the amount of impervious surfaces at the Airport. The other past, present, and future projects have the potential to increase stormwater runoff due to an increase in impervious surfaces. However, it is anticipated that any direct or cumulative impacts to surface water or groundwater quality resulting from these projects would be negligible, as it would be mandatory for all projects to comply with existing and future water quality permit requirements and regulations. In addition, CLT has prepared a Storm Water Master Plan to manage the impacts of runoff as a result of new development and redevelopment. Therefore, impacts to water quality, when combined with other past, present, and reasonably foreseeable future actions are not expected to cause significant impacts to water quality.

5.15.5 Summary of Cumulative Impacts

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

6 PUBLIC INVOLVEMENT

To satisfy requirements for public involvement, an advertisement announcing the availability of the Draft EA was published in the Charlotte Observer on April 10, 2020. The advertisement informed the public on how to obtain a copy of the Draft EA, the public comment period, and how to submit a comment on the Draft EA. A copy of this notice is provided in **Appendix A, Agency and Public Involvement**. Also provided in Appendix A are agency comments on the Draft EA. No public comments were received during the comment period (April 10, 2020 through May 11, 2020).

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

<https://www.airportprojects.net/clt-deice-pad-ea/>

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

Mr. David Shaeffer
U.S. Army Corps of Engineers:
Asheville Regulatory Field Office
151 Patton Avenue, Room 208
Asheville, NC 28801

Ms. Renee Gledhill-Earley
North Carolina State Historic Preservation
Office
109 East Jones St, MSC 4617
Raleigh, NC 27699

Mr. Byron Hamstead
U.S. Fish and Wildlife Service
Asheville Field Office
160 Zillicoa Street, Suite B
Asheville, NC 28801

Ms. Crystal Best
North Carolina State Environmental Review
Clearinghouse
1301 Mail Service Center,
Raleigh, NC 27699

7 LIST OF PREPARERS

7.1 Federal Aviation Administration

Tommy Dupree, Assistant ADO Manager, provided input on the Environmental Assessment.

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

7.2 Charlotte Douglas International Airport

Amber Leathers, C.M., A.A.E., Planning & Environmental Manager, provided input and Airport information throughout the process and responsible for managing and review of the Environmental Assessment.

7.3 Landrum & Brown

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

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

Gaby Elizondo, AICP, Consultant, assisted with the preparation of the Environmental Assessment.

8 REFERENCES

15 U.S.C. 2601-2692

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<https://www.fws.gov/raleigh/species/cntylist/mecklenburg.html>, June 27, 2018.

Mecklenburg County, Mecklenburg County's Full-Service Recycle Centers, Online at:
<https://www.mecknc.gov/LUESA/SolidWaste/Disposal-Recycling/Pages/Full-Service-Centers.aspx>

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U.S. Environmental Protection Agency (USEPA), 40 C.F.R. Part 93.153, Applicability, July 1, 2006.

Appendix A, Agency and Public Involvement

Appendix A

Agency and Public Involvement

This appendix includes documentation of the agency and public involvement conducted after the publication of the Draft Environmental Assessment (EA) for the Proposed Deice Pad at the Charlotte Douglas International Airport (CLT). The public comment period was from April 10, 2020 to May 11, 2020. The following agencies and stakeholders, as shown in **Table E-1**, were coordinated with throughout the development of the EA.

TABLE E-1, AGENCY COORDINATION

Federal	
Mr. David Shaeffer U.S. Army Corps of Engineers: Asheville Regulatory Field Office 151 Patton Avenue, Room 208 Asheville, NC 28801	Mr. Byron Hamstead U.S. Fish and Wildlife Service Asheville Field Office 160 Zillicoa Street, Suite B Asheville, NC 28801
State	
Ms. Renee Gledhill-Earley North Carolina State Historic Preservation Office 109 East Jones St, MSC 4617 Raleigh, NC 27699	Ms. Crystal Best North Carolina State Environmental Review Clearinghouse 1301 Mail Service Center, Raleigh, NC 27699

Comments received by the agencies are provided on the following pages in Section 1, *Comments Received on the Draft EA*. Responses to comment letters received are located in Section 2, *Responses to Comments Received on the Draft EA*. The published Notice of Availability and transmittal letters are included in Section 3, *Notification of Availability*.



1 Comments Received on the Draft EA

This section includes two comment letters that were received from the North Carolina State Environmental Clearinghouse, which included individual comments from multiple state agencies in the review of the Draft EA.



STATE OF NORTH CAROLINA
DEPARTMENT OF ADMINISTRATION

ROY COOPER
GOVERNOR

MACHELLE SANDERS
SECRETARY

May 11, 2020

Ms. Sarah Potter
Charlotte Douglas International Airport
c/o Landrum & Brown
4445 Lake Forest Drive
Cincinnati, OH 45242

Re: SCH File # 20-E-0000-0235; Proposed project is for the Deice Pad at Charlotte Douglas International Airport.

Dear Ms. Potter:

The above referenced environmental impact information has been submitted to the State Clearinghouse under the provisions of the National Environmental Policy Act. According to G.S. 113A-10, when a state agency is required to prepare an environmental document under the provisions of federal law, the environmental document meets the provisions of the State Environmental Policy Act. Attached to this letter for your consideration are comments made by the agencies in the review of this document.

If any further environmental review documents are prepared for this project, they should be forwarded to this office for intergovernmental review.

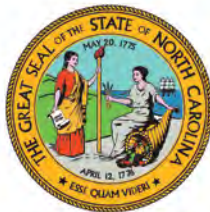
Should you have any questions, please do not hesitate to call.

Sincerely,

A handwritten signature in cursive script that reads "Crystal Best".

Crystal Best
State Environmental Review Clearinghouse

Attachments
cc: Region F



NORTH CAROLINA
Environmental Quality

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

JAMIE RAGAN
Director

MEMORANDUM

To: Crystal Best
State Clearinghouse Coordinator
Department of Administration

From: Lyn Hardison
Division of Environmental Assistance and Customer Service
Environmental Assistance and Project Review Coordinator
Washington Regional Office

RE: 20-0235
Environmental Assessment - Proposed project is for the
Deice Pad at Charlotte Douglas International Airport.
Mecklenburg County

Date: May 5, 2020

1.1

The Department of Environmental Quality has reviewed the proposal for the referenced project. Due to the increase in survey effort, new records of undescribed crayfish species have been documented in the Catawba River basin. Therefore the NC Wildlife Resources Commission is requesting the applicant to conduct a on-site survey along Coffey Creek and its unnamed tributaries within the site area for state-listed rare, threatened, or endangered species. Please contact Olivia Munzer, Western Piedmont Coordinator Habitat Conservation, at (919) 707-0364 or email, Olivia.munzer@ncwildlife.org, for further guidance. The comments are attached for the applicant's review.

The Department agencies will continue to be available to assist the applicant through any environmental review or permitting processes.

Thank you for the opportunity to respond.

Attachments






⊠ North Carolina Wildlife Resources Commission ⊠

Gordon Myers, Executive Director

MEMORANDUM

TO: Lyn Hardison, Environmental Assistance and SEPA Coordinator
NCDEQ Division of Environmental Assistance and Customer Services

FROM: Olivia Munzer, Western Piedmont Coordinator
Habitat Conservation 

DATE: 4 May 2020

SUBJECT: Environmental Assessment for the Proposed Deicing Pad at the Charlotte Douglas International Airport, Charlotte, Mecklenburg County, North Carolina. DEQ Project No. 20-0235.

Biologists with the North Carolina Wildlife Resources Commission (NCWRC) have reviewed the subject documents. Comments are provided in accordance with certain provisions of the National Environmental Policy Act, North Carolina (N.C.) Environmental Policy Act (G.S. 113A-1 through 113A-10; 1 NCAC 25), and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

On behalf of the Charlotte Douglas International Airport and US Department of Transportation Federal Aviation Administration, Landrum & Brown, Inc. has submitted an Environmental Assessment for the proposed Deicing Pad at the Charlotte Douglas International Airport (CLT) in Charlotte, Mecklenburg County, North Carolina. The proposed project would include the construction of an approximately 780,000-square foot deice pad on the south airfield, east of Runway 36C. Associated projects would include an approximately 3,000-foot (ft) extension of Taxiway F; construction of an approximately 3,100-ft crossfield taxiway between Taxiway C and Taxiway E/F; construction of an approximately 2,500-ft service road to the new crossfield taxiway; new lighting for the new apron, taxiway edge, centerline lighting, taxiway bridge, and on Yorkmont Road; realignment of Yorkmont Road; clearing and grading of 50 acres; demolition of two buildings; excavation for fill; and construction of the open detention pond for stormwater management.

Coffey Creek and its unnamed tributaries occur within the site. Coffey Creek occurs in the Catawba River basin and is classified as a Class C stream by the NC Division of Water Resources (NCDWR). The proposed project would permanently impact 4,402.5 linear feet (lf) of perennial stream, 32.5 lf of intermittent stream, and 0.14 acre of wetland.

We have no known current records of the federal or state rare, threatened, or endangered species at or adjacent to the proposed project areas. Due to the increase in survey effort, new records of

- 1.1** [undescribed crayfish species have been documented in the Catawba River basin; therefore, we recommend surveys are conducted in Coffey Creek and its unnamed tributaries within the site.
- 1.2** [Although we have no known current records of federally or state-listed rare, threatened, or endangered species within or adjacent to the site, the lack of records from the project area does not imply or confirm the absence of state-listed species. An on-site survey is the only definitive means to determine if the proposed project would impact state-listed rare, threatened, or endangered species.

We are concerned with the amount of proposed impacts to the streams and wetlands, and the 100-year floodplain. Some of the streams to be impacted are rated as High Quality according to NC Stream Assessment Method (NCSAM). Development impacts to streams are occurring throughout North Carolina at unprecedented rates. As such, NCWRC would prefer the impacts to the streams, including Coffey Creek, are further minimized.

- 2.1** [1. Rather than piping the stream, NCWRC suggest relocating the stream channel around the Deicing Pad using natural channel design methods or shift the deicing pad east and providing bridges/culverts for the planes to access the deicing pad, if feasible. Avoiding piping the stream would reduce the risk of flooding, minimize impacts to water quality and aquatic habitat, and reduce future costs associated with repairing aging pipes.

- 2.2** [2. NCWRC has concerns for the impacts to surface waters and the 100-year floodplain for an in-line detention basin. Minimal information on the in-line detention basin has been provided. Based upon the information, we prefer the detention basins are off line, especially since the streams are rated High Quality according to NCSAM. Since the purpose of stormwater control is to protect streams and wetlands, no stormwater control measures or best management practices should be installed within any stream (perennial or intermittent) or wetland.

According to the EA, the detention basin would provide peak discharge control for the 2-year, 10-year, and 25-year events limiting the peak flow to pre-development conditions. During storm events, the creeks would overtop their banks and flood the detention areas. However, the detention basin occurs at least 0.5 mile downstream of the deicing pad and impervious surface at the airport. Furthermore, it is unclear on the effectiveness of these in-line detention areas during higher flood events (i.e., 100-year flood) and the potential for increased sedimentation, erosion, and water quality of the streams; the frequency and intensity of flood events continue to increase with urbanization and climate change. Specifically, we have concerns for the water quality of the stormwater runoff from the deicing pad that would enter streams, especially since the detention basin is located 0.5 mile downstream.

We recommend the airport consider other options for a detention basin, such as modifying current stormwater detention areas to accommodate some stormwater, or off-line detention areas.

- 2.3** [3. We have concerns with the impacts to aquatic species and water quality from deicing fluid, which can impact dissolved oxygen in streams and, fish kills, and other issues. In addition, it has been found to impact drinking water treatment processes and drinking water quality (Swietlik 2009). We recommend all deicing fluid is recycled and it is not discharged into aquatic systems.

We offer the applicant the additional general recommendations to minimize impacts to aquatic and terrestrial wildlife resources.

- 2.4** [1. Maintain a minimum 100-foot undisturbed, native, forested buffer along perennial streams, and a minimum 50-foot buffer along intermittent streams and wetlands. Maintaining

- 2.4**
(CONT'D) [undisturbed, forested buffers along these areas will minimize impacts to aquatic and terrestrial wildlife resources, water quality, and aquatic habitat both within and downstream of the project area. Also, wide riparian buffers are helpful in maintaining stability of stream banks and for treatment of pollutants associated with urban stormwater.
- 1.3** [2. Due to the decline in bat populations, avoid tree clearing activities during the maternity roosting season for bats (May 15 – August 15).
- 1.4** [3. Disturbed areas should be re-seeded with native seed mixtures. We recommend avoiding lespedeza, which is nonnative and invasive. Furthermore, lespedeza provides wildlife cover and forage, and attract pollinators; therefore, it is not recommended around airports.
- 2.5** [4. All mechanized equipment operated near surface waters should be inspected and maintained regularly to prevent contamination from fuels, lubricants, hydraulic fluids or other toxic materials.
- 2.6** [5. The use of **biodegradable and wildlife-friendly** sediment and erosion control devices is strongly recommended. Silt fencing, fiber rolls and/or other products should have loose-weave netting that is made of **natural fiber materials with movable joints** between the vertical and horizontal twines. Silt fencing that has been reinforced with plastic or metal mesh should be avoided as it impedes the movement of terrestrial wildlife species. These measures should be routinely inspected and properly maintained. Excessive silt and sediment loads can have numerous detrimental effects on aquatic resources including destruction of spawning habitat, suffocation of eggs, and clogging of gills of aquatic species.

Thank you for the opportunity to provide input for this project. If I can provide further assistance or provide free technical guidance, please call (919) 707-0364 or email Olivia.munzer@ncwildlife.org.

Literature Cited

Swietlik, W. 2009. The Impacts of Airport Deicing Operations on Water Quality. Available at <https://apps.dtic.mil/dtic/tr/fulltext/u2/a554090.pdf>. Accessed pm 04 May 2020.

State of North Carolina Department of Environmental Quality
INTERGOVERNMENTAL REVIEW PROJECT COMMENTS

Reviewing Regional Office: MRO
Project Number: 20-0235 Due Date: 5/4/2020
County: Mecklenburg

After review of this project it has been determined that the DEQ permit(s) and/or approvals indicated may need to be obtained in order for this project to comply with North Carolina Law. Questions regarding these permits should be addressed to the Regional Office indicated on the reverse of the form. All applications, information and guidelines relative to these plans and permits are available from the same Regional Office.

	PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Processing Time (statutory time limit)
<input type="checkbox"/>	Permit to construct & operate wastewater treatment facilities, non-standard sewer system extensions & sewer systems that do not discharge into state surface waters.	Application 90 days before begins construction or award of construction contracts. On-site inspection may be required. Post-application technical conference usual.	30 days (90 days)
<input type="checkbox"/>	Permit to construct & operate, sewer extensions involving gravity sewers, pump stations and force mains discharging into a sewer collection system	Fast-Track Permitting program consists of the submittal of an application and an engineer's certification that the project meets all applicable State rules and Division Minimum Design Criteria.	30 days (N/A)
<input checked="" type="checkbox"/>	NPDES - permit to discharge into surface water and/or permit to operate and construct wastewater facilities discharging into state surface waters.	Application 180 days before begins activity. On-site inspection. Pre-application conference usual. Additionally, obtain permit to construct wastewater treatment facility-granted after NPDES. Reply time, 30 days after receipt of plans or issue of NPDES permit-whichever is later.	90-120 days (N/A)
<input type="checkbox"/>	Water Use Permit	Pre-application technical conference usually necessary.	30 days (N/A)
<input type="checkbox"/>	Well Construction Permit	Complete application must be received and permit issued prior to the installation of a groundwater monitoring well located on property not owned by the applicant, and for a large capacity (>100,000 gallons per day) water supply well.	7 days (15 days)
<input type="checkbox"/>	Dredge and Fill Permit	Application copy must be served on each adjacent riparian property owner. On-site inspection. Pre-application conference usual. Filling may require Easement to Fill from N.C. Department of Administration and Federal Dredge and Fill Permit.	55 days (90 days)
<input checked="" type="checkbox"/>	Permit to construct & operate Air Pollution Abatement facilities and/or Emission Sources as per 15 A NCAC (2Q.O100 thru 2Q.0300)	Application must be submitted and permit received prior to construction and operation of the source. If a permit is required in an area without local zoning, then there are additional requirements and timelines (2Q.0113).	90 days
<input checked="" type="checkbox"/>	Any open burning associated with subject proposal must be in compliance with 15 A NCAC 2D.1900	N/A	60 days (90 days)
<input checked="" type="checkbox"/>	Demolition or renovations of structures containing asbestos material must be in compliance with 15 A NCAC 20.1110 (a) (1) which requires notification and removal prior to demolition. Contact Asbestos Control Group 919-707-5950	Please Note - The Health Hazards Control Unit (HHCU) of the N.C. Department of Health and Human Services, must be notified of plans to demolish a building, including residences for commercial or industrial expansion, even if no asbestos is present in the building.	60 days (90 days)
<input checked="" type="checkbox"/>	The Sedimentation Pollution Control Act of 1973 must be properly addressed for any land disturbing activity. An erosion & sedimentation control plan will be required if one or more acres are to be disturbed. Plan must be filed with and approved by applicable Regional Office (Land Quality Section) at least 30 days before beginning activity. A NPDES Construction Stormwater permit (NCG010000) is also usually issued should design features meet minimum requirements. A fee of \$65 for the first acre or any part of an acre. An express review option is available with additional fees.		20 days (30 days)
<input type="checkbox"/>	Sedimentation and erosion control must be addressed in accordance with NCDOT's approved program. Particular attention should be given to design and installation of appropriate perimeter sediment trapping devices as well as stable Stormwater conveyances and outlets.		(30 days)
<input type="checkbox"/>	Sedimentation and erosion control must be addressed in accordance with _____ Local Government's approved program. Particular attention should be given to design and installation of appropriate perimeter sediment trapping devices as well as stable Stormwater conveyances and outlets.		Based on Local Program
<input type="checkbox"/>	Compliance with 15A NCAC 2H .0126 - NPDES Stormwater Program which regulates three types of activities: Industrial, Municipal Separate Storm Sewer System & Construction activities that disturb ≥1 acre.		30-60 days (90 days)
<input type="checkbox"/>	Compliance with 15A NCAC 2H 1000 -State Stormwater Permitting Programs regulate site development and post-construction stormwater runoff control. Areas subject to these permit programs include all 20 coastal counties, and various other counties and watersheds throughout the state.		45 days (90 days)

State of North Carolina Department of Environmental Quality
INTERGOVERNMENTAL REVIEW PROJECT COMMENTS

Reviewing Regional Office: MRO
Project Number: 20-0235 Due Date: 5/4/2020
County: Mecklenburg

	PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Processing Time (statutory time limit)
<input type="checkbox"/>	Mining Permit	On-site inspection usual. Surety bond filed with DEQ Bond amount varies with type mine and number of acres of affected land. Affected area greater than one acre must be permitted. The appropriate bond must be received before the permit can be issued.	30 days (60 days)
<input type="checkbox"/>	Dam Safety Permit	If permit required, application 60 days before begin construction. Applicant must hire N.C. qualified engineer to: prepare plans, inspect construction, and certify construction is according to DEQ approved plans. May also require a permit under mosquito control program. And a 404 permit from Corps of Engineers. An inspection of site is necessary to verify Hazard Classification. A minimum fee of \$200.00 must accompany the application. An additional processing fee based on a percentage or the total project cost will be required upon completion.	30 days (60 days)
<input type="checkbox"/>	Oil Refining Facilities	N/A	90-120 days (N/A)
<input type="checkbox"/>	Permit to drill exploratory oil or gas well	File surety bond of \$5,000 with DEQ running to State of NC conditional that any well opened by drill operator shall, upon abandonment, be plugged according to DEQ rules and regulations.	10 days N/A
<input type="checkbox"/>	Geophysical Exploration Permit	Application filed with DEQ at least 10 days prior to issue of permit. Application by letter. No standard application form.	10 days N/A
<input type="checkbox"/>	State Lakes Construction Permit	Application fee based on structure size is charged. Must include descriptions & drawings of structure & proof of ownership of riparian property	15-20 days N/A
<input checked="" type="checkbox"/>	401 Water Quality Certification	Compliance with the T15A 02H .0500 Certifications are required whenever construction or operation of facilities will result in a discharge into navigable water as described in 33 CFR part 323.	60 days (130 days)
<input type="checkbox"/>	Compliance with Catawba, Goose Creek, Jordan Lake, Randleman, Tar Pamlico or Neuse Riparian Buffer Rules is required. Buffer requirements: http://deq.nc.gov/about/divisions/water-resources/water-resources-permits/wastewater-branch/401-wetlands-buffer-permits/401-riparian-buffer-protection-program		
<input type="checkbox"/>	Nutrient Offset: Loading requirements for nitrogen and phosphorus in the Neuse and Tar-Pamlico River basins, and in the Jordan and Falls Lake watersheds, as part of the nutrient-management strategies in these areas. DWR nutrient offset information: http://deq.nc.gov/about/divisions/water-resources/planning/nonpoint-source-management/nutrient-offset-information		
<input type="checkbox"/>	CAMA Permit for MAJOR development	\$250.00 - \$475.00 fee must accompany application	75 days (150 days)
<input type="checkbox"/>	CAMA Permit for MINOR development	\$100.00 fee must accompany application	22 days (25 days)
<input checked="" type="checkbox"/>	Abandonment of any wells, if required must be in accordance with Title 15A. Subchapter 2C.0100.		
<input checked="" type="checkbox"/>	Notification of the proper regional office is requested if "orphan" underground storage tanks (USTS) are discovered during any excavation operation.		
<input type="checkbox"/>	Plans and specifications for the construction, expansion, or alteration of a public water system must be approved by the Division of Water Resources/Public Water Supply Section prior to the award of a contract or the initiation of construction as per 15A NCAC 18C .0300 et. seq., Plans and specifications should be submitted to 1634 Mail Service Center, Raleigh, North Carolina 27699-1634. All public water supply systems must comply with state and federal drinking water monitoring requirements. For more information, contact the Public Water Supply Section, (919) 707-9100.		30 days
<input type="checkbox"/>	If existing water lines will be relocated during the construction, plans for the water line relocation must be submitted to the Division of Water Resources/Public Water Supply Section at 1634 Mail Service Center, Raleigh, North Carolina 27699-1634. For more information, contact the Public Water Supply Section, (919) 707-9100.		30 days
<input checked="" type="checkbox"/>	Plans and specifications for the construction, expansion, or alteration of the <u>Charlotte</u> water system must be approved through the <u>Charlotte</u> delegated plan approval authority. Please contact them at <u>704-336-1015</u> for further information.		

4.1
CONT'D

State of North Carolina Department of Environmental Quality
INTERGOVERNMENTAL REVIEW PROJECT COMMENTS

Reviewing Regional Office: MRO
Project Number: 20-0235 Due Date: 5/4/2020
County: Mecklenburg

Other Comments (attach additional pages as necessary, being certain to comment authority)

Division	Initials	No comment	Comments	Date Review
DAQ	PW*	<input type="checkbox"/> 4.2	Implementation of the Clean Air Act in the County has been delegated to staff within the Land Use and Emergency Services Agency (LUESA). You should contact them directly for all information related to this program. https://www.mecknc.gov/LUESA/Pages/Home.aspx . Any portable engines should adhere to federal 42 regulations.	4/23/20
DWR-WQROS (Aquifer & Surface)	AHP &	<input type="checkbox"/> 2.7 2.8	Properly abandon any wells that may be located within the project area (box checked). A 401 certificate is necessary for stream and wetland impacts that were identified (box checked), WQROS will defer to DWR-401 & Buffer Transportation Permitting Branch for any additional comment as this is a transportation related project. Modification of NPDES permit NC0083887 may be necessary (box checked) Note that the report references DWR as the permitting authority for stormwater permitting, which is incorrect, that activity falls under DEMLR. &	4/22/20 / /
DWR-PWS	JHW	<input type="checkbox"/>	See above comments	4/13/20
DEMLR (LQ & SW)	ZSK	<input type="checkbox"/> 4.1	NCDEQ E&SC plan approval and coverage under NCG01 construction stormwater is required for land disturbing project 1 acre or more. Also, they may need to revise the existing SWPP for the industrial stormwater permit.	4/13/20
DWM – UST	RHT	<input type="checkbox"/> 3.1 3.2 3.3	RE: Project Review Form: 20-0235 I have read through the scoping document for the proposed project. The following comments are pertinent to my review: 1. The Mooresville Regional Office (MRO) UST Section recommends removal of any abandoned or out-of-use petroleum USTs or petroleum above ground storage tanks (ASTs) within the project area. The UST Section should be contacted regarding use of any proposed or on-site petroleum USTs or ASTs. We may be reached at 704-663-1699. 2. Any petroleum spills must be contained, and the area of impact must be properly restored. Petroleum spills of significant quantity must be reported to the North Carolina Department of Environment & Natural Resources – Division of Waste Management Underground Storage Tank Section in the Mooresville Regional Office at 704-663-1699. 3. Any soils excavated during demolition or construction that show evidence of petroleum contamination, such as stained soil, odors, or free product must be reported immediately to the local Fire Marshall to determine whether explosion or inhalation hazards exist. Also, notify the UST Section of the Mooresville Regional Office at 704-663-1699. Petroleum contaminated soils must be handled in accordance with all applicable regulations. If you have any questions or need additional information, please contact me at Ron.Taraban@ncdenr.gov or by phone at 704-235-2167.	4/28/20
Other Comments		<input type="checkbox"/>		/ /

REGIONAL OFFICES

Questions regarding these permits should be addressed to the Regional Office marked below.

State of North Carolina Department of Environmental Quality
INTERGOVERNMENTAL REVIEW PROJECT COMMENTS

☐ **Asheville Regional Office**
2090 U.S. 70 Highway
Swannanoa, NC 28778-8211
Phone: 828-296-4500
Fax: 828-299-7043

☐ **Fayetteville Regional Office**
225 Green Street, Suite 714,
Fayetteville, NC 28301-5043
Phone: 910-433-3300
Fax: 910-486-0707

☒ **Mooreville Regional Office**
610 East Center Avenue, Suite 301,
Mooreville, NC 28115
Phone: 704-663-1699
Fax: 704-663-6040

☐ **Raleigh Regional Office**
3800 Barrett Drive,
Raleigh, NC 27609
Phone: 919-791-4200
Fax: 919-571-4718

☐ **Washington Regional Office**
943 Washington Square Mall,
Washington, NC 27889
Phone: 252-946-6481
Fax: 252-975-3716

☐ **Wilmington Regional Office**
127 Cardinal Drive Ext.,
Wilmington, NC 28405
Phone: 910-796-7215
Fax: 910-350-2004

☐ **Winston-Salem Regional Office**
450 Hanes Mill Road, Suite 300,
Winston-Salem, NC 27105
Phone: 336-776-9800
Fax: 336-776-9797



NORTH CAROLINA
Environmental Quality

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

MICHAEL SCOTT
Director

Date: April 16, 2020

To: Michael Scott, Director
Division of Waste Management

Through: Janet Macdonald
Inactive Hazardous Sites Branch – Special Projects Unit

From: Bonnie S. Ware
Inactive Hazardous Sites Branch

Subject: NEPA Project #20-0235, Charlotte Douglas International Airport/FAA, Mecklenburg County, North Carolina

The Superfund Section has reviewed the proximity of sites under its jurisdiction to the Charlotte Douglas International Airport/FAA project. Proposed project is for the Deice Pad at Charlotte Douglas International Airport.

Five (5) total sites were identified within one mile of the project as shown on the attached report. The Superfund Section recommends that site files be reviewed to ensure that appropriate precautions are incorporated into any construction activities that encounter potentially contaminated soil or groundwater. Superfund Section files can be viewed at: <http://deq.nc.gov/waste-management-laserfiche>.

Please contact Janet Macdonald at 919.707.8349 if you have any questions.



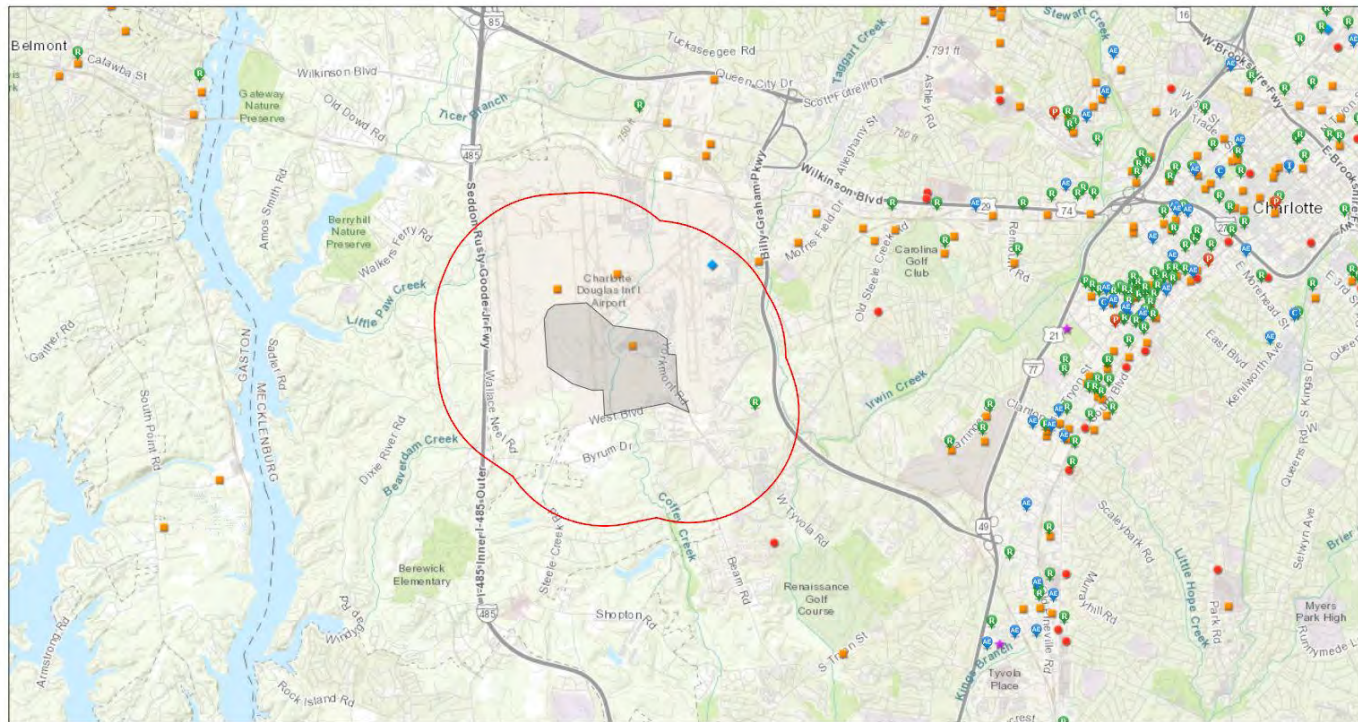


SEPA/NEPA Review Report

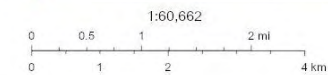
Area of Interest (AOI) Information

Area : 5,058.59 acres

Apr 16 2020 16:10:56 Eastern Daylight Time



- | | | |
|------------------------------|----------------------------|-------------------------------|
| NC Brownfields Location_View | Inactive Eligible | Pre Regulatory Landfill Sites |
| Recorded | Pending | DSCA_Certified - Copy |
| Complete | Federal Remediation Branch | Inactive Hazardous Sites |
| Active Eligible | | |



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

20-0235 Mecklenburg County

Summary

Name	Count	Area(acres)	Length(mi)
Certified DSCA Sites	0	N/A	N/A
Federal Remediation Branch Sites	1	N/A	N/A
Inactive Hazardous Sites	3	N/A	N/A
Pre-Regulatory Landfill Sites	0	N/A	N/A
Brownfields Program Sites	1	N/A	N/A

Federal Remediation Branch Sites

#	SITE_ID	SITE_NAME	Count
1	DODNC0002	CHARLOTTE AIR NATIONAL GUARD	1

Inactive Hazardous Sites

#	EPAID	SITENAME	Count
1	NONCD0002657	US AIRWAYS MAINTENANCE FACILITY	1
2	NONCD0002697	WARREN ROAD	1
3	NONCD0001480	CHARLOTTE DOUGLAS AIRPORT 7	1

Brownfields Program Sites

#	BF_ID	BF_Name	Count
1	1301109060	Kolortex Facility	1



NORTH CAROLINA
Environmental Quality

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

MICHAEL SCOTT
Director

DATE: May 4, 2020

TO: Michael Scott, Division Director through Sharon Brinkley

FROM: Deb Aja, Western District Supervisor - Solid Waste Section

RE: NEPA Project 20-0235, Mecklenburg County, N.C.
Charlotte Douglas International Airport – Deice Pad Project

3.5

The Solid Waste Section has reviewed the Draft Environmental Assessment for the City of Charlotte proposed Deice Pad project at the Charlotte Douglas International Airport, located in Charlotte, Mecklenburg County, North Carolina. The review has been completed and has found no adverse impact on the surrounding community and likewise knows of no situations in the community, which would affect this project from a solid waste perspective.

3.6

During the project, every feasible effort should be made to minimize the generation of waste, to recycle materials for which viable markets exist, and to use recycled products and materials in the development of this project where suitable. Any waste existing at the site or

3.7

generated by this project that cannot be beneficially reused or recycled must be disposed of at a solid waste management facility approved to manage the respective waste type. The Section strongly recommends that any contractors are required to provide proof of proper disposal for all waste generated as part of the project.

A list of permitted solid waste management facilities is available on the Solid Waste Section portal site at: <http://deq.nc.gov/about/divisions/waste-management/waste-management-rules-data/solid-waste-management-annual-reports/solid-waste-permitted-facility-list>

Questions regarding the management of solid waste for this project should be directed to Joseph Hack, Mecklenburg County Land Use & Environmental Services, at (980) 314-3864.

Cc: Jason Watkins, Field Operations Branch Head
Teresa Bradford, Environmental Senior Specialist
Joseph Hack, Mecklenburg County



**NORTH CAROLINA STATE CLEARINGHOUSE
DEPARTMENT OF ADMINISTRATION
INTERGOVERNMENTAL REVIEW**

COUNTY: MECKLENBURG

F03: AIRPORTS

STATE NUMBER: 20-E-0000-0235

DATE RECEIVED: 04/09/2020

AGENCY RESPONSE: 05/04/2020

REVIEW CLOSED: 05/08/2020

MS CINDY WILLIAMS
CLEARINGHOUSE COORDINATOR
DPS - DIV OF EMERGENCY MANAGEMENT
FLOODPLAIN MANAGEMENT PROGRAM
4218 MAIL SERVICE CENTER
RALEIGH NC

REVIEW DISTRIBUTION

CENTRALINA COG
DEPT OF AGRICULTURE
DEPT OF ENVIRONMENTAL QUALITY
DEPT OF NATURAL & CULTURAL RESOURCE
DEPT OF TRANSPORTATION
DNCR - NATURAL HERITAGE PROGRAM
DOA - COMMISSION OF INDIAN AFFAIRS
DPS - DIV OF EMERGENCY MANAGEMENT

PROJECT INFORMATION

APPLICANT: Charlotte Douglas International Airport
TYPE: National Environmental Policy Act
Environmental Assessment

DESC: Proposed project is for the Deice Pad at Charlotte Douglas International Airport.
- View document at: <https://www.airportprojects.net/clt-deice-pad-ea/>

The attached project has been submitted to the N. C. State Clearinghouse for intergovernmental review. Please review and submit your response by the above indicated date to 1301 Mail Service Center, Raleigh NC 27699-1301.

If additional review time is needed, please contact this office at (919)807-2425.

AS A RESULT OF THIS REVIEW THE FOLLOWING IS SUBMITTED: ☐ NO COMMENT ☒ COMMENTS ATTACHED

SIGNED BY:



DATE: 29 April 2020



North Carolina Department of Public Safety

Emergency Management

Roy Cooper, Governor
Erik A. Hooks, Secretary

Michael A. Sprayberry, Director

April 29, 2020

State Clearinghouse
N.C. Department of Administration
1301 Mail Service Center
Raleigh, North Carolina 27699-1301

Subject: Intergovernmental Review State Number: 20-E-0000-0235
Deice Pad at Charlotte Douglas International Airport, City of Charlotte, NC

As requested by the North Carolina State Clearinghouse, the North Carolina Department of Public Safety Division of Emergency Management Risk Management reviewed the proposed project listed above and offers the following comments:

2.9

1) The project site is located in City of Charlotte. City of Charlotte participates in the National Flood Insurance Program and enforces a Flood Damage Prevention Ordinance that requires a Floodplain Development Permit be issued for all development located in the Special Flood Hazard Area (SFHA) within its jurisdiction. Please ensure the City's Floodplain Administrator reviews and issues permits for each part of the proposed project within a SFHA.

2.10

2) The site outlined in the application encroaches on the SFHA. Please see Flood Insurance Rate Map Panels 3710451300K and 37104515200K. Any grading, fill or placement of equipment or materials in the SFHA will require a floodplain development permit issued by City of Charlotte.

2.11

3) From the documentation provided, it appears that the proposed project area will encroach on the floodway of Coffey Creek. If there is any encroachment, construction, or storage of equipment and materials in the floodway, then a hydraulic analysis shall be performed to determine the impact on flood levels during the base flood discharge due to the proposed construction. An increase in flood levels will require approval of a Conditional Letter of Map Revision prior to construction. No structures shall be impacted by the increase in flood levels. If there are no increases in flood levels, a "No-Rise" study and certification will be required prior to construction.

MAILING ADDRESS:
4218 Mail Service Center
Raleigh NC 27699-4218
www.ncdps.gov
www.ncfloodmaps.com



An Equal Opportunity Employer

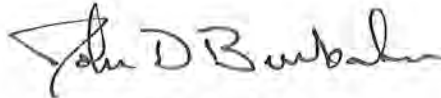
RM OFFICE LOCATION:
4105 Reedy Creek Road
Raleigh, NC 27607
Telephone: (919) 825-2341
Fax: (919) 825-0408

2.12

- 4) All structures and utilities should be protected to the regulatory flood protection elevation as described in the City of Charlotte ordinance and 44 CFR 60.3.

Thank you for your cooperation and consideration. If you have any questions concerning the above comments, please contact me at (919) 825-2300, by email at dan.brubaker@ncdps.gov or at the address shown on the footer of this document.

Sincerely,



John D. Brubaker, P.E., CFM
NFIP Coordinator
Emergency Management

cc: Terry Foxx, NFIP Western Branch Planner
Jintao Wen, NFIP Engineer

David Goode, Floodplain Administrator, City of Charlotte

File

NORTH CAROLINA STATE CLEARINGHOUSE
DEPARTMENT OF ADMINISTRATION
INTERGOVERNMENTAL REVIEW

COUNTY: MECKLENBURG

F03: AIRPORTS

STATE NUMBER: 20-E-0000-0235

DATE RECEIVED: 04/09/2020

AGENCY RESPONSE: 05/04/2020

REVIEW CLOSED: 05/08/2020

MS JEANNE STONE
CLEARINGHOUSE COORDINATOR
DEPT OF TRANSPORTATION
STATEWIDE PLANNING - MSC #1554
RALEIGH NC

REVIEW DISTRIBUTION

CENTRALINA COG
DEPT OF AGRICULTURE
DEPT OF ENVIRONMENTAL QUALITY
DEPT OF NATURAL & CULTURAL RESOURCE
DEPT OF TRANSPORTATION
DNCR - NATURAL HERITAGE PROGRAM
DOA - COMMISSION OF INDIAN AFFAIRS
DPS - DIV OF EMERGENCY MANAGEMENT

PROJECT INFORMATION

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TYPE: National Environmental Policy Act
Environmental Assessment

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If additional review time is needed, please contact this office at (919)807-2425.

4.3 ☒ AS A RESULT OF THIS REVIEW THE FOLLOWING IS SUBMITTED: ☒ NO COMMENT ☐ COMMENTS ATTACHED

SIGNED BY: Dominique L. Boyd

DATE: 05/04/2020



STATE OF NORTH CAROLINA
DEPARTMENT OF ADMINISTRATION

ROY COOPER
GOVERNOR

MACHELLE SANDERS
SECRETARY

May 19, 2020

Ms. Sarah Potter
Charlotte Douglas International Airport
c/o Landrum & Brown
4445 Lake Forest Drive
Cincinnati, OH 45242

Re: SCH File # 20-E-0000-0235; Proposed project is for the Deice Pad at Charlotte Douglas International Airport.

Dear Ms. Potter:

The above referenced environmental impact information has been submitted to the State Clearinghouse under the provisions of the National Environmental Policy Act. According to G.S. 113A-10, when a state agency is required to prepare an environmental document under the provisions of federal law, the environmental document meets the provisions of the State Environmental Policy Act. Attached to this letter are **additional comments** made by the agencies in the review of this document.

If any further environmental review documents are prepared for this project, they should be forwarded to this office for intergovernmental review.

Should you have any questions, please do not hesitate to call.

Sincerely,

A handwritten signature in cursive script that reads "Crystal Best".

Crystal Best
State Environmental Review Clearinghouse

Attachments
cc: Region F

Received:
5/6/2020

NORTH CAROLINA STATE CLEARINGHOUSE
DEPARTMENT OF ADMINISTRATION
INTERGOVERNMENTAL REVIEW

COUNTY: MECKLENBURG F03: AIRPORTS STATE NUMBER: 20-E-0000-0235
DATE RECEIVED: 04/09/2020
AGENCY RESPONSE: 05/04/2020
REVIEW CLOSED: 05/08/2020

ER 20-0890

MS RENEE GLEDHILL-EARLEY
CLEARINGHOUSE COORDINATOR
DEPT OF NATURAL & CULTURAL RESOURCE
STATE HISTORIC PRESERVATION OFFICE
MSC 4617 - ARCHIVES BUILDING
RALEIGH NC

Due: 5/14/2020

REVIEW DISTRIBUTION

CENTRALINA COG
DEPT OF AGRICULTURE
DEPT OF ENVIRONMENTAL QUALITY
DEPT OF NATURAL & CULTURAL RESOURCE
DEPT OF TRANSPORTATION
DNCR - NATURAL HERITAGE PROGRAM
DOA - COMMISSION OF INDIAN AFFAIRS
DPS - DIV OF EMERGENCY MANAGEMENT

A--

H--

PROJECT INFORMATION

APPLICANT: Charlotte Douglas International Airport
TYPE: National Environmental Policy Act
Environmental Assessment

DESC: Proposed project is for the Deice Pad at Charlotte Douglas International Airport.
- View document at: <https://www.airportprojects.net/clt-deice-pad-ea/>

The attached project has been submitted to the N. C. State Clearinghouse for intergovernmental review. Please review and submit your response by the above indicated date to 1301 Mail Service Center, Raleigh NC 27699-1301.

If additional review time is needed, please contact this office at (919)807-2425.

4.3 ☒ AS A RESULT OF THIS REVIEW THE FOLLOWING IS SUBMITTED: ☒ NO COMMENT ☐ COMMENTS ATTACHED

SIGNED BY: Renee Gledhill-Earley DATE: 05/18/2020

2 Responses to Comments Received on the Draft EA

This section responds to comments grouped into four categories: biological resources, water resources, hazardous materials, and general. **Table E-2** identifies each commenter and **Table E-3** presents each comment, the commenter, and the Airport's response.

Table E-2
INDEX OF COMMENTS RECEIVED ON THE DRAFT EA

NAME	ORGANIZATION	DATE	COMMENT NUMBER
Lyn Hardison	North Carolina Department of Environmental Quality (NCDEQ) Division of Environmental Assistance and Customer Service (DEACS)	5/5/2020	1.1
Olivia Munzer	North Carolina Wildlife Resources Commission (NCWRC)	5/4/2020	1.1, 1.2, 2.1, 2.2, 2.3, 2.4, 1.3, 1.4, 2.5, 2.6
N/A	NCDEQ Mooresville Regional Office (MRO)	5/4/2020	4.1
PW	NCDEQ MRO Division of Air Quality (DAQ)	4/23/2020	4.2
AHP	NCDEQ MRO Division of Water Resources (DWR) Water Quality Regional Operations Section (WQROS)	4/22/2020	2.7, 2.8
ZSK	NCDEQ MRO Division of Energy, Mineral, and Land Resources (DEMLR)	4/13/2020	4.1
RHT	NCDEQ MRO Division of Waste Management (DWM) Underground Storage Tank (UST) Section	4/28/2020	3.1, 3.2, 3.3
Bonnie S. Ware	NCDEQ DWM Inactive Hazardous Sites (IHS) Branch	4/16/2020	3.4
Deb Aja	NCDEQ DWM Solid Waste Section (SWS)	5/4/2020	3.5, 3.6, 3.7
John Brubaker, P.E., CFM	North Carolina Department of Public Safety (NCDPS) Emergency Management (EM)	4/29/2020	2.9, 2.10, 2.11, 2.12
Dominique L Boyd	Department of Transportation Statewide Planning (NCDOT)	5/4/2020	4.3
Renee Gledhill-Easley	North Carolina Department of Natural & Cultural Resource State Historic Preservation Office (NCSHPO)	5/18/2020	4.3

Table E-3
RESPONSE TO COMMENTS RECEIVED ON THE DRAFT EA

COMMENT #	COMMENT/SUBJECT	COMMENTER	RESPONSE
1	Biological Resources		
1.1	Requests an on-site survey along Coffey Creek and its unnamed tributaries within the Proposed Action Site for the undescribed crayfish species newly documented in the Catawba River basin.	NCDEQ DEACS / NCWRC	As stated in Chapter 4, Section 4.2.2, <i>Biological Resources</i> , on-site habitat assessments were conducted to determine the potential for species listed as federally and state-listed rare, threatened and/or endangered to exist within the Proposed Action Site. Based on U.S. Fish and Wildlife Service (USFWS) and North Carolina (NC) Natural Heritage Program (NHP) records, undescribed crayfish species are not known to be documented in Mecklenburg County. As such, the Proposed Action Site was not surveyed for the undescribed crayfish species and the Airport respectfully declines to conduct the requested on-site survey along Coffey Creek and its unnamed tributaries within the Proposed Action Site.
1.2	Requests an on-site survey be conducted within the project area for state-listed rare, threatened, or endangered species.	NCWRC	As stated in Chapter 4, Section 4.2.2, <i>Biological Resources</i> , on-site habitat assessments were conducted to determine the occurrence of species listed as federally and state-listed rare, threatened and/or endangered to exist within the Proposed Action Site.
1.3	Recommends tree clearing be avoided during the maternity roosting season for bats (May 15 – August 15)	NCWRC	Best management practices will be utilized to avoid tree clearing from May 15 through August 15. See Chapter 5, Section 5.2, <i>Biological Resources</i> , for the updated discussion.
1.4	Recommends disturbed areas should be re-seeded with native seed mixtures (excluding lespedeza).	NCWRC	Plant and seed mixtures containing lespedeza will not be utilized; however, the Airport has committed to the Wildlife Hazard Management Plan enforced by Federal Aviation Administration (FAA) 14 Code of Federal Regulations (CFR) Part 139 which would avoid the use of anything that attracts wildlife for airfield and aircraft safety. Therefore, while lespedeza will be avoided, seed mixtures will not be conducive for wildlife on or near areas of the Airport.

Table E-3 (Continued)
RESPONSE TO COMMENTS RECEIVED ON THE DRAFT EA

COMMENT #	COMMENT/SUBJECT	COMMENTER	RESPONSE
2	Water Resources		
2.1	Alternatives to piping Coffey Creek should be considered	NCWRC	Alternatives to piping Coffey Creek were considered; however, there is insufficient space for a relocated channel. To the west is the existing airfield and the east is the proposed Deice Pad. The Deice Pad's location is unable to shift further east due to the Air Traffic Control's lease boundary and existing sanitary sewer infrastructure.
2.2	Alternatives to an in-line detention basin should be considered	NCWRC	Alternatives to in-line detention basins were previously considered. The strategy of in-line stormwater detentions was outlined in the Airport's Stormwater Master Plan which follows the City of Charlotte Stormwater Ordinance (Chapter 18, Article IV of the City Code of Ordinances) and FAA design criteria (Advisory Circular [AC] 150/5200-33C, Chapter 2.3). The in-line detention basin was selected due to its ability to handle peak discharge, be constructed on airport property, minimize impacts due to construction of multiple smaller basins, and be constructed without need for relocation due to future Airport project impacts.
2.3	Expresses concerns with the impacts to the aquatic species and water quality from the deice fluid that would enter streams; recommends all deicing fluid is recycled and not discharged into the aquatic system	NCWRC	The Airport's deicing fluid usage is regulated by the NCDEQ Division of Water Quality's National Pollutant Discharge Elimination System (NPDES) permitting unit. CLT operates under an Individual Permit which requires monitoring, creek sampling, and reporting of usage quantities. The permit does not require any capture or recycling of deicing fluids. CLT will comply with any requirements set forth in the NPDES permit should they change at the time of renewal.

Table E-3 (Continued)
RESPONSE TO COMMENTS RECEIVED ON THE DRAFT EA

COMMENT #	COMMENT/SUBJECT	COMMENTER	RESPONSE
2.4	Recommends maintaining a minimum 100-foot undisturbed, native, forested buffer along perennial streams, and a minimum 50-foot buffer along intermittent streams and wetlands	NCWRC	The Airport is subject to the Surface Water Improvement and Management buffers, Water Supply Watershed Buffers, and Post-Construction Buffers as administered and reviewed by the City of Charlotte. Buffer disturbance will be approved and mitigated for appropriately, as needed.
2.5	Recommends all mechanized equipment operated near surface waters should be inspected and maintained regularly to prevent contamination from fuels, lubricants, hydraulic fluids, or other toxic materials.	NCWRC	The Airport recognizes the importance of protecting water resources. The Airport's Stormwater Pollution Prevention Plan (SWPPP) addresses this recommendation in Appendix E, Section BMP 2.1. See Chapter 5, Section 5.7, <i>Hazardous Materials, Solid Waste, and Pollution Prevention</i> , for the updated discussion on pollution prevention.
2.6	Recommends the use of biodegradable and wildlife-friendly sediment and erosion control devices	NCWRC	Best management practices for the use of wildlife-friendly sediment and erosion control measures will be considered and utilized, if appropriate. Erosion and sediment control measures are designed according to the NCDEQ's <i>Erosion and Sediment Control Planning and Design Manual</i> and the City of Charlotte Soil Erosion and Sedimentation Control Ordinance. See Chapter 5, Section 5.14.3, <i>Surface Waters</i> , for the updated discussion.
2.7	Properly abandon any wells that may be located within the project area	NCDEQ MRO DWR WQROS	As discussed in Chapter 4, Section 4.2.14.4, <i>Groundwater</i> , no public drinking water wells have been identified in the Proposed Action Site. If an undocumented drinking water well is identified, CLT will ensure that the well is abandoned in accordance to any Federal, state, or local regulations.



Table E-3 (Continued)
RESPONSE TO COMMENTS RECEIVED ON THE DRAFT EA

COMMENT #	COMMENT/SUBJECT	COMMENTER	RESPONSE
2.8	Note that the report references DWR as the permitting authority for stormwater permitting, which is incorrect, that activity falls under DEMLR	NCDEQ MRO DWR WQROS	Comment addressed. Chapter 2, Section 2.4, <i>Required Land Use/Environmental Permits</i> , and Chapter 4, Section 4.2.14.3, <i>Surface Waters</i> , was updated respectively.
2.9	Please ensure the City of Charlotte's Floodplain Administrator reviews and issues permits for each part of the proposed project within a Special Flood Hazard Area (SFHA)	NCDPS EM	Coordination with the City of Charlotte is ongoing to ensure all of the appropriate permits and approvals are acquired prior to the construction of the Proposed Action.
2.10	Any grading, fill, or placement of equipment or materials in the SFHA will require a floodplain development permit issued by the City of Charlotte	NCDPS EM	As identified in Chapter 2, Section 2.4, <i>Required Land Use/Environmental Permits</i> , and Chapter 5, Section 5.14.2, <i>Floodplains</i> , a floodplain development permit from the City of Charlotte Floodplain Administrator will be acquired prior to the construction of the Proposed Action.
2.11	A hydraulic analysis shall be performed to determine the impact on flood levels during the base flood discharge due to the proposed construction that would encroach on the floodway of Coffey Creek	NCDPS EM	The Airport ensures that a hydraulic analysis has been completed as part of the Conditional Letter of Map Revision (CLOMR) process for the Proposed Action. CLT will submit the CLOMR to the FEMA to demonstrate any modifications to the existing regulatory floodway, Base Flood Elevations (BFEs), or Special Flood Hazard Areas (SFHAs) that would be generated by the construction.
2.12	All structures and utilities should be protected to the regulatory flood protection elevation as described in the City of Charlotte ordinance and 44 CFR 60.3	NCDPS EM	While no structures are being proposed as part of the Proposed Action, CLT will ensure all utilities will be protected according to City of Charlotte ordinances and 44 CFR 60.3.

Table E-3 (Continued)
RESPONSE TO COMMENTS RECEIVED ON THE DRAFT EA

COMMENT #	COMMENT/SUBJECT	COMMENTER	RESPONSE
3	Hazardous Materials, Solid Waste, and Pollution Prevention		
3.1	Recommends removal of any abandoned or out-of-use petroleum USTs or petroleum above-ground storage tanks (ASTs) within the project area	NCDEQ MRO DWM UST Section	As stated in Chapter 4, Section 4.2.7, <i>Hazardous Materials, Solid Waste, and Pollution Prevention</i> , there are no known documented or abandoned underground storage tanks (USTs) within the Proposed Action Sites. However, if any abandoned or out-of-use USTs or petroleum above-ground storage tanks (ASTs) are discovered during construction of the Proposed Action, they would be removed per NCDEQ guidelines.
3.2	Any petroleum spills must be contained, and the area of impact must be properly restored; petroleum spills must be reported to the NCDENR DWM – UST	NCDEQ MRO DWM UST Section	As stated in Chapter 5, Section 5.14.4, <i>Groundwater</i> , construction and operation of the proposed development would abide by all applicable regulations related to spill prevention and control regulations to prevent spills from causing significant adverse impacts to groundwater. If any petroleum spills were to occur, they would be reported and contained to NCDENR DWM - UST requirements.
3.3	Any soils excavated during demolition or construction that show evidence of petroleum contamination must be reported immediately to the local Fire Marshall	NCDEQ MRO DWM UST Section	Comment noted. See Chapter 5, Section 5.7, <i>Hazardous Materials, Solid Waste, and Pollution Prevention</i> , for the updated discussion.
3.4	Recommends that inactive hazardous site files be reviewed to ensure that appropriate precautions are incorporated into any construction activities that encounter potentially contaminated soil or groundwater	NCDEQ DWM IHS Branch	As stated in Chapter 4, Section 4.2.7, <i>Hazardous Materials, Solid Waste, and Pollution Prevention</i> , there are no known inactive hazardous waste sites within the Proposed Action Site. However, if any unknown inactive hazardous sites are discovered during construction of the Proposed Action, they would be removed per NCDEQ guidelines.

Table E-3 (Continued)
RESPONSE TO COMMENTS RECEIVED ON THE DRAFT EA

COMMENT #	COMMENT/SUBJECT	COMMENTER	RESPONSE
3.5	Identified no adverse impact on the surrounding community and likewise knows of no situations in the community, which would affect this project from a solid waste perspective.	NCDEQ DWM SWS	Comment noted.
3.6	Every feasible effort should be made to minimize the generation of waste, to recycle materials for which viable markets exist, and to use recycled products and materials in the development of this project where suitable.	NCDEQ DWM SWS	As stated in Chapter 5, Section 5.7, <i>Hazardous Materials, Solid Waste, and Pollution Prevention</i> , and Chapter 5, Section 5.15.4.3, <i>Hazardous Materials, Solid Waste, and Pollution Prevention</i> , building materials and debris would be recycled to the greatest extent feasible. Materials that cannot be recycled would be disposed of in accordance with all Federal, state, and local regulations.
3.7	Any waste existing at the site or generated by this project that cannot be beneficially reused or recycled must be disposed of at a solid waste management facility approved to manage the respective waste type.	NCDEQ DWM SWS	As stated in Chapter 5, Section 5.7, <i>Hazardous Materials, Solid Waste, and Pollution Prevention</i> , and Chapter 5, Section 5.15.4.3, <i>Hazardous Materials, Solid Waste, and Pollution Prevention</i> , building materials and debris would be recycled to the greatest extent feasible. Materials that cannot be recycled would be disposed of in accordance with all Federal, state, and local regulations.
4	General		
4.1	Identifies DEQ permits and/or approvals needed for the project to comply with North Carolina Law	NCDEQ MRO / NCDEQ MRO DEMLR	Comment noted. See Chapter 2, Section 2.4, <i>Required Land Use/Environmental Permits</i> , for an updated list of permits required for construction of the Proposed Action.



Table E-3 (Continued)
RESPONSE TO COMMENTS RECEIVED ON THE DRAFT EA

COMMENT #	COMMENT/SUBJECT	COMMENTER	RESPONSE
4.2	Contact the Land Use and Emergency Services Agency (LUESA) for information related to implementation of the Clean Air Act as necessary	NCDEQ MRO DAQ	Comment noted.
4.3	No Comment	NCDOT / NCSHPO	Noted.

3 Notification of Availability

This section contains the published Notice of Availability, affidavit of publication, and transmittal letters to agencies.

Notice of Availability of a Draft Environmental Assessment (EA) for the Proposed Deice Pad at the Charlotte Douglas International Airport (CLT). The project would include: the construction of a new deice pad; extension of Taxiway F; construction of a new crossfield taxiway and service road; construction of new apron lighting, taxiway edge and centerline lighting, and additional roadway lighting; construction of associated stormwater facilities; realignment of Yorkmont Road; and demolition of two structures. This notice and opportunity for public involvement is pursuant to FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*. As part of the EA, formal consultation is ongoing between the Federal Aviation Administration and the North Carolina State Historic Preservation Office per Section 106 of the National Historic Preservation Act. The results of this consultation will be incorporated into the Final EA document.

FAA provides notice pursuant to Executive Order 11998, *Floodplain Management*, that the project would encroach on 17 acres of the 100-year floodplain. However, floodplain encroachment would be minimized by the culverting of Coffey Creek and construction of a detention basin downstream of the proposed deice pad. Therefore, implementation of the project would not result in a significant impact on the 100-year floodplain.

A Public Hearing can be held if an interest is presented to address the Proposed Action, potential economic, social, and environmental impacts, and the project's consistency with the goals and objectives of the area's land use or planning strategy. Should anyone wish to attend a public hearing on this Proposed Action or submit a comment on the proposed development please state your request or comment in writing to:

Sarah Potter, Associate Vice President, Landrum & Brown, 4445 Lake Forest Dr., Suite 700, Cincinnati, OH 45242 or email: spotter@landrum-brown.com.

Written requests for a public hearing will be accepted until 5:00 p.m. (EDT) Friday, April 24, 2020.

The Draft EA is available for public review until May 11, 2020 online at: <https://www.airportprojects.net/clt-deice-pad-ea/>. Copies of the Draft EA have also been provided to relevant Federal, state, and local agencies.

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

AFFIDAVIT OF PUBLICATION

Account #	Ad Number	Identification
669343	0004618359	Notice of Availability of a Draft Environmental Assessment (EA) for the P

Attention: Gaby Elizondo

LANDRUM & BROWN
4445 LAKE FOREST DRIVE
SUITE 700
CINCINNATI, OH 45242

North Carolina } ss

Mecklenburg County }

Before the undersigned, a Notary Public of said County and State, duly authorized to administer oaths affirmations, etc., personally appeared, being duly sworn or affirmed according to law, doth depose and say that he/she is a representative of The Charlotte Observer Publishing Company, a corporation organized and doing business under the laws of the State of Delaware, and publishing a newspaper known as The Charlotte Observer in the city of Charlotte, County of Mecklenburg, and State of North Carolina and that as such he/she is familiar with the books, records, files, and business of said Corporation and by reference to the files of said publication, the attached advertisement was inserted. The following is correctly copied from the

1

Insertion(s)

Published On:

April 10, 2020

NOTICE OF AVAILABILITY

of a Draft Environmental Assessment (EA) for the Proposed Deice Pad at the Charlotte Douglas International Airport (CLT). The project would include: the construction of a new deice pad; extension of Taxiway F; construction of a new crossfield taxiway and service road; construction of new apron lighting, taxiway edge and centerline lighting, and additional roadway lighting; construction of associated stormwater facilities; realignment of Yorkmont Road; and demolition of two structures. This notice and opportunity for public involvement is pursuant to FAA Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions. As part of the EA, formal consultation is ongoing between the Federal Aviation Administration and the North Carolina State Historic Preservation Office per Section 106 of the National Historic Preservation Act. The results of this consultation will be incorporated into the Final EA document.

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

LP4618359

Cherri St. Foster

Cherri Foster, Regional Office Associate

In Testimony Whereof I have hereunto set my hand and affixed my seal on the 14th day of April, 2020

Judith M. Sears

Electronic Notary Public State of North Carolina

My Commission Expires May 17, 2021



Monday, April 6, 2020

Transaction Type: **Payment**

Order Number: **0004618359**

Payment Method: **Credit Card**

Bad Debt: **-**

Credit Card Number: *******5604**

Credit Card Expire Date: **5/28/2023**

Payment Amount: **1,012.60**

Reference Number: **014058**

Charge to Company: **Charlotte**

Category: **Classified**

Transaction Number: **P2246478**

Credit to Transaction Number: **P2246478**

Payment Invoice Text:

Payment Invoice Notes:

Order Invoice Text: **Public Notice-Proposed Deice Pad**

Customer Type: **Commercial**

Customer Category: **Miscellaneous**

Customer Status:

Customer Group: **Local**

Customer Trade: **None**

Account Number: **669343**

Phone Number: **9563572778**

Company / Individual: **Company**

Customer Name: **LANDRUM & BROWN**

LANDRUM & BROWN

Customer Address: **4445 LAKE FOREST DRIVE
SUITE 700
CINCINNATI, OH 45242 USA**

Check Number:

Routing Number:

From: [Gaby Elizondo](#)
To: [Alexander, Timothy L \(FAA\)](#)
Cc: [Sarah Potter](#); [Leathers, Amber](#)
Subject: CLT Deice Pad EA - Draft EA Notice of Availability
Date: Thursday, April 9, 2020 1:20:00 PM

Good Afternoon Tim,

The *DRAFT Environmental Assessment (EA) for the Proposed Deice Pad at the Charlotte Douglas International Airport (CLT)* is available online for your review at: <https://www.airportprojects.net/clt-deice-pad-ea/>. Note that the website includes the Notice of Availability that will be published in the Charlotte Observer on Friday, April 10, 2020. This document will be made available to the public, at a minimum, through May 11, 2020.

Please let me know if you have any questions or issues accessing the document.

Best,

Gaby Elizondo, AICP

Consultant

Landrum & Brown

Global Aviation Planning & Development

T +1 513 530 1205 M +1 956 357 2778

landrum-brown.com

The content of this email is confidential and intended for the recipient specified in message only. It is strictly forbidden to share any part of this message with any third party, without written consent of the sender. If you received this message by mistake, please reply to this message and follow with its deletion, so that we can ensure such a mistake does not occur in the future.

From: [Gaby Elizondo](#)
To: [State Clearinghouse](#)
Cc: [Leathers, Amber](#); [Sarah Potter](#)
Subject: CLT Deice Pad EA - Draft EA Notice of Availability
Date: Thursday, April 9, 2020 1:21:00 PM
Attachments: [Transmittal Letter - NC Env Clearinghouse.pdf](#)
Importance: High

Good Afternoon Ms. Best,

The *DRAFT Environmental Assessment (EA) for the Proposed Deice Pad at the Charlotte Douglas International Airport (CLT)* is available online for your review at: <https://www.airportprojects.net/clt-deice-pad-ea/>. Alternatively, the document can be downloaded through the link at the bottom of this email. According to Federal Aviation Administration (FAA) Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, we are making this document available for public and regulatory agency review and comment.

We request that any comments you may have be returned by May 11, 2020 to Sarah Potter at spotter@landrum-brown.com. If you have any questions or issues accessing the document, please contact me at (513) 530-1205. Thank you in advance for your time and assistance in this matter.

Click on this link to access the CLT Deice Pad Draft EA (link expires June 9, 2020):
<https://filesend.landrum-brown.com/download.aspx?f=20520-JXWDMVC7vt9V>

Sincerely,

Gaby Elizondo, AICP

Consultant

Landrum & Brown

Global Aviation Planning & Development

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landrum-brown.com

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4445 Lake Forest Dr
Cincinnati, OH 45242
USA
T +1 513 530 5333
F +1 513 530 1278
landrum-brown.com

April 9, 2020

Ms. Crystal Best
State Environmental Review Clearinghouse
1301 Mail Service Center
Raleigh, NC 27699

**Subject: Charlotte Douglas International Airport
Availability of DRAFT Environmental Assessment Document**

Dear Ms. Best:

The *DRAFT Environmental Assessment (EA) for the Proposed Deice Pad at the Charlotte Douglas International Airport (CLT)* is available online for your review at: <https://www.airportprojects.net/clt-deice-pad-ea/>. According to Federal Aviation Administration (FAA) Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, we are making this document available for public and regulatory agency review and comment.

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Sincerely,

A handwritten signature in blue ink that reads "Gaby Elizondo".

Gaby Elizondo
Consultant
Landrum & Brown, Incorporated

From: [Gaby Elizondo](#)
To: [Hamstead, Byron](#)
Cc: [Leathers, Amber](#); [Sarah Potter](#)
Subject: CLT Deice Pad EA - Draft EA Notice of Availability
Date: Thursday, April 9, 2020 1:21:00 PM

Good Afternoon Mr. Hamstead,

The *DRAFT Environmental Assessment (EA) for the Proposed Deice Pad at the Charlotte Douglas International Airport (CLT)* is available online for your review at: <https://www.airportprojects.net/clt-deice-pad-ea/>. As discussed in Chapter 5, Section 5.2, no impacts to threatened and endangered species are expected with this project as no species or habitat are present on the project site.

According to Federal Aviation Administration (FAA) Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, we are making this document available for public and regulatory agency review and comment. This document is also being sent to the North Carolina State Environmental Review Clearinghouse to coordinate the review by state agencies.

We request that any comments you may have be returned by May 11, 2020 to Sarah Potter at spotter@landrum-brown.com. If you have any questions or issues accessing the document, please contact me at (513) 530-1205. Thank you in advance for your time and assistance in this matter.

Best,

Gaby Elizondo, AICP

Consultant

Landrum & Brown

Global Aviation Planning & Development

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From: [Gaby Elizondo](#)
To: [Gledhill-earley, Renee](#); david.l.shaeffer@usace.army.mil
Cc: [Sarah Potter](#); [Leathers, Amber](#)
Subject: CLT Deice Pad EA - Draft EA Notice of Availability
Date: Thursday, April 9, 2020 1:21:00 PM

Good Afternoon,

The *DRAFT Environmental Assessment (EA) for the Proposed Deice Pad at the Charlotte Douglas International Airport (CLT)* is available online for your review at: <https://www.airportprojects.net/clt-deice-pad-ea/>. According to Federal Aviation Administration (FAA) Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*, we are making this document available for public and regulatory agency review and comment. This document is also being sent to the North Carolina State Environmental Review Clearinghouse to coordinate the review by state agencies.

We request that any comments you may have be returned by May 11, 2020 to Sarah Potter at spotter@landrum-brown.com. If you have any questions, please contact me at (513) 530-1205. Thank you in advance for your time and assistance in this matter.

Sincerely,

Gaby Elizondo, AICP

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Appendix B, Air Quality



Air Quality Technical Report

Proposed Deice Pad Environmental Assessment

January 2020

PREPARED FOR
Charlotte Douglas International
Airport

PRESENTED BY
Landrum & Brown, Incorporated



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1 INTRODUCTION

The Proposed Deice Pad development (Proposed Action) involves the construction of a new approximately one million square foot deice pad located on the south airfield, east of Runway 36C. The Proposed Action and its connected actions are described in detail below.

Proposed Action

- Construction of a new deice pad, that is approximately 780,000 square feet, located on the south airfield, east of Runway 36C, to provide up to four positions for Airplane Design Group (ADG) V aircraft or nine ADG III aircraft

Connected Actions

- Extension of Taxiway F by approximately 3,000 feet to provide access to the proposed deice pad
- Construction of a new approximately 3,100 foot long crossfield taxiway to connect Taxiway C and Taxiway E/F on the south side of the airfield to prevent aircraft departing on Runway 18L/36R from exceeding the holdover¹ time after deicing
- Construction of a new approximately 2,500 foot long service road parallel to the new crossfield taxiway connecting the east apron area to the new deice pad to provide additional access to the proposed deice pad
- Construction of new apron lighting, taxiway edge and centerline lighting, and additional roadway lighting on Yorkmont Road and under-bridge lighting at the taxiway bridge
- Realignment of Yorkmont Road to ensure constructability of the crossfield taxiway and service road bridge to preserve access to the South Cargo Ramp area
- Clearing and grading of approximately 50 acres to provide a designated construction staging area
- Demolition of Building 206 and the former McGinn House located in the south airfield to allow for construction of the Proposed Action
- Excavation of approximately 2 million square feet in the west airfield area to provide fill for the construction of the new deice pad
- Construction of an open detention pond south of Byrum Drive for stormwater management

¹ Federal Aviation Administration, Advisory Circular 150/5300-14C defines holdover time as the estimated time the application of anti-icing fluid will prevent the formation of frozen contamination on the protected surfaces of an aircraft. The exceedance of holdover time typically occurs when aircraft taxi times exceed the allowed time to arrive at the departure runway or because the taxi route encounters a variety of weather conditions.

2 REGULATORY SETTING

NATIONAL AMBIENT AIR QUALITY STANDARDS

The Clean Air Act, including the 1990 Amendments, (CAA) provides for the establishment of standards and programs to evaluate, achieve, and maintain acceptable air quality in the U.S. Under the CAA, the U.S. Environmental Protection Agency (USEPA) established a set of standards, or criteria, for six pollutants determined to be potentially harmful to human health and welfare.² A discussion on the criteria pollutants is provided in Attachment 1. The USEPA considers the presence of the following six criteria pollutants to be indicators of air quality:

- Ozone (O₃);
- Carbon monoxide (CO);
- Nitrogen dioxide (NO₂);
- Particulate matter (PM₁₀ and PM_{2.5});
- Sulfur dioxide (SO₂); and,
- Lead (Pb).

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

A nonattainment area is a homogeneous geographical area³ (usually referred to as an air quality control region) that is in violation of one or more NAAQS and has been designated as nonattainment by the USEPA as provided for under the CAA. Some regulatory provisions, for instance the CAA conformity regulations, apply only to areas designated as nonattainment or maintenance.

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

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

³ A homogeneous geographical area, with regard to air quality, is an area, not necessarily bounded by state lines, where the air quality characteristics have been shown to be similar over the whole area. This may include several counties, encompassing more than one state, or may be a very small area within a single county.

Table 1: NATIONAL AMBIENT AIR QUALITY STANDARDS

POLLUTANT		PRIMARY/ SECONDARY	AVERAGING TIME	LEVEL	FORM
Carbon Monoxide		primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
Lead		primary and secondary	Rolling 3 month average	0.15 µg/m ³ ⁽¹⁾	Not to be exceeded
Nitrogen Dioxide		primary	1-hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	Annual	53 ppb ⁽²⁾	Annual Mean
Ozone		primary and secondary	8-hour	0.075 ppm ⁽³⁾	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particulate Matter	PM _{2.5}	primary	Annual	12 µg/m ³	annual mean, averaged over 3 years
		secondary	Annual	15 µg/m ³	annual mean, averaged over 3 years
		primary and secondary	24-hour	35 µg/m ³	98th percentile, averaged over 3 years
	PM ₁₀	primary and secondary	24-hour	150 µg/m ³	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide		primary	1-hour	75 ppb ⁽⁴⁾	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Notes: ppm is parts per million; ppb is parts per billion, and µg/m³ is micrograms per cubic meter.

Sources: <https://www.epa.gov/criteria-air-pollutants/naaqs-table>.

- (1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m³ as a calendar quarter average) also remain in effect.
- (2) The level of the annual NO₂ standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.
- (3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O₃ standards additionally remain in effect in some areas. Revocation of the previous (2008) O₃ standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.
- (4) The previous SO₂ standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010)

standard has not been submitted and approved and which is designated nonattainment under the previous SO₂ standards or is not meeting the requirements of a State Implementation Plan (SIP) call under the previous SO₂ standards (40 CFR 50.4(3)). A SIP call is a USEPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

MECKLENBERG COUNTY AIR QUALITY STATUS

The Airport is located within the Metropolitan Charlotte Interstate Air Quality Region. In the past, Mecklenburg County was designated as nonattainment for ozone. However, the USEPA determined the area had attained the 2008 8-Hour ozone standard on August 27, 2015, re-designating the region to attainment for these pollutants. The area operates under a maintenance plan for ozone. Mecklenburg County was determined to be compliant with all other Federally-regulated air quality standards in effect at the time of the preparation of this document.

The construction of the Proposed Action would cause emissions related to construction activities. As such, the Proposed Action at CLT would be subject to the General Conformity provisions under the CAA, which are required to ensure compliance with the North Carolina State Implementation Plan (SIP).⁴ In addition to the CAA, the impacts of the Proposed Action would require assessment under the provisions of the National Environmental Policy Act (NEPA) to determine compliance to the NAAQS.

GENERAL CONFORMITY RULE APPLICABILITY

The General Conformity Rule under the CAA establishes minimum values, referred to as the *de minimis* thresholds, for the criteria and precursor pollutants⁵ for the purpose of:

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

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

- Federally-funded or Federally-approved;
- Not a highway or transit project⁸;
- Not identified as an exempt project⁹ under the CAA;

⁴ The SIP is the State air agency document that sets forth the strategy intended to reduce air emissions in an area of poor air quality and maintain the quality of the air relevant to the Federal air quality standards.

⁵ Precursor pollutants are pollutants that are involved in the chemical reactions that form the resultant pollutant. Ozone precursor pollutants are NO_x and VOC.

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

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

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

⁹ The Proposed Project is not listed as an action exempt from a conformity determination pursuant to 40 CFR Part 93.153(c). An exempt project is one that the USEPA has determined would clearly have no impact on air quality at the facility, and any net increase in emissions would be so small as to be considered negligible.

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

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

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

The Federal *de minimis* thresholds established under the CAA are given in **Table 2**. Conformity to the *de minimis* thresholds is relevant only with regard to those pollutants and the precursor pollutants for which the area is nonattainment or maintenance. Notably, there are no *de minimis* thresholds to which a Federal agency would compare ozone emissions. This is because ozone is not directly emitted from a source. Rather, ozone is formed through photochemical reactions involving emissions of the precursor pollutants NO_x and VOC in the presence of abundant sunlight and heat. Therefore, emissions of ozone on a project level are evaluated based on the rate of emissions of NO_x and VOC.

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

Table 2: *De Minimis* Thresholds

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

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

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

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

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

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

If the General Conformity evaluation for this air quality assessment were to show that any of the applicable thresholds were equaled or exceeded due to the Proposed Action, further, more detailed analyses to demonstrate conformity would be required, which is referred to as a General Conformity Determination.¹¹ Conversely, if the General Conformity evaluation were to show that none of the relevant thresholds were equaled or exceeded, the Proposed Action at CLT would be presumed to conform to the applicable North Carolina SIP and no further analysis would be required under the CAA.

TRANSPORTATION CONFORMITY RULE APPLICABILITY

Although airport improvement projects are usually considered under the General Conformity regulations, there can be elements of a Federal action or its alternatives that may require an analysis to demonstrate Transportation Conformity, such as actions relating to transportation plans, programs, projects developed, funded, or approved under Title 23 United States Code (U.S.C.) or the Federal

¹¹ 40 CFR Part 93.153.

Transit Act (FTA),¹² or involve Federal highways. In such cases, the sponsoring Federal agency would be required to coordinate with the Federal Highway Administration (FHWA), the state Department of Transportation (DOT), and the local metropolitan planning organization (MPO) to assist in completing a Transportation Conformity evaluation.

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

STATE IMPLEMENTATION PLANS

The SIPs must include a strategy for air quality improvement in local areas for each criteria pollutant that exceeds the NAAQS. The SIP must also include a plan to maintain acceptable air quality in areas that did not meet the NAAQS in recent past. As previously stated, Mecklenburg County is considered maintenance for 8-hour ozone and for CO. Therefore, the state of North Carolina has prepared the applicable SIPs, including the Redesignation Demonstration and Maintenance Plan for the Charlotte-Gastonia-Salisbury, North Carolina 2008 8-hour Ozone Marginal Nonattainment Area submitted April 16, 2015 and USEPA approved August 27, 2015.

INDIRECT SOURCE REVIEW

Some states require an air quality review when a Federal action has the potential to cause an increase in net emissions from indirect sources. Indirect sources cause emissions that occur later in time or are farther removed from the Federal action. Depending on the state, indirect sources may be identified as motor vehicles on highways, parking at sports and entertainment facilities, or an increase in aircraft operations. The state requirement may be referred to as the indirect source review (ISR) and each state requiring an ISR sets thresholds for increased operation of the indirect sources. When a Federal action has the potential to exceed these thresholds, an air quality review is required to assess the character and impact of the additional emissions and determine whether a permit is required, which is separate from the analyses required under NEPA or the CAA.

The state of North Carolina did have indirect source review thresholds known as the Transportation Facility Permitting (TFP) regulations; however, these regulations were repealed by the North Carolina Division of Air Quality effective January 1, 2015.¹³

AIR QUALITY PERMITS

In order to be in compliance with Federal or state requirements, a proposed project may be required to obtain certain air quality permits before construction or implementation can occur. The Mecklenburg County Air Quality (MCAQ), a division of the Mecklenburg County Land Use and Environmental Services Agency (LUESA), has identified common activities and industry types that are required to have air quality permits in Mecklenburg County. The Proposed Action does not include any abrasive blasting, use of printing presses, or the operation of any combustion sources such as a generator or

¹² USEPA, 40 CFR Part 93.153, Applicability, July 1, 2006.

¹³ North Carolina Air Quality Rules Subchapter 2Q Air Quality Permit Procedures Section 0600 Transportation Facility Procedures.

boiler. Therefore, no air quality permits would be required for construction and operation of the Proposed Action.

AIR QUALITY MONITORING IN REGION

MCAQ maintains four air quality monitoring sites that measure concentrations of criteria air pollutants.¹⁴

- Garinger (ID 37-119-0041)
- Montclair (ID 37-119-0042)
- Remount (ID 37-119-0045)
- University Meadows (ID 37-119-0046)

The Remount site, which is the closest to the Airport, is located approximately three miles due east of the Airport and provides nitrogen dioxide concentrations in the near-road environment.



Mecklenburg County overall ambient (outdoor) air quality continues to improve. At the end of 2019, Mecklenburg County monitoring data continues to demonstrate compliance with all federal, health-based air quality standards.

¹⁴ Mecklenburg County Air Quality, 2018-2019 Annual Monitoring Network Plan – Mecklenburg County Air Quality, 2018.

3 EMISSIONS INVENTORY

The impacts to air quality due to the Proposed Action were determined in accordance with the guidelines provided in the Federal Aviation Administration (FAA), *Aviation Emissions and Air Quality Handbook Version 3, Update 1*,¹⁵ and FAA Order 5050.4B¹⁶, NEPA Implementing Instructions for Airport Actions, which together with the guidelines of FAA Order 1050.1F,¹⁷ Environmental Impacts: Policies and Procedures, constitute compliance with all the relevant provisions of NEPA and the CAA.

The construction and operation of the Proposed Action would result in short-term emissions. The estimated emissions due to the implementation of the Proposed Action is provided in **Table 3**.

CONSTRUCTION EMISSIONS

Short-term temporary air quality impacts would be caused by construction of the Proposed Action expected to begin early 2021 with a duration of up to 36 months. The estimated emissions are provided in Table 3.

¹⁵ FAA, *Aviation Emissions and Air Quality Handbook Version 3, Update 1*, July 2015.

¹⁶ FAA Order 5050.4B, *NEPA Implementing Instructions for Airport Actions*, April 28, 2006.

¹⁷ FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, July 16, 2015.

TABLE 3: CONSTRUCTION EMISSIONS INVENTORY

ANNUAL EMISSIONS SUMMARY						
EMISSION SOURCES	CRITERIA AND PRECURSOR POLLUTANTS (short tons per year)					
	CO	VOC	NO _x	SO _x	PM ₁₀	PM _{2.5}
	CAA DE MINIMIS THRESHOLDS					
	NA	100	100	NA	NA	NA
CONSTRUCTION YEAR 1						
Building Demolition	0.4	0.1	0.8	0.0	0.0	0.0
Tree Clearing	0.5	0.1	0.3	0.0	0.0	0.0
Borrow Area	3.4	0.5	6.4	0.0	0.4	0.4
<i>Construction Year 1 Subtotal</i>	<i>4.3</i>	<i>0.7</i>	<i>7.4</i>	<i>0.0</i>	<i>0.5</i>	<i>0.5</i>
CONSTRUCTION YEAR 2						
Taxiway F Extension	2.2	0.2	2.1	0.0	0.9	0.2
Borrow Area	3.4	0.5	6.4	0.0	0.4	0.4
Detention Basin	11.5	0.8	7.8	0.0	0.5	0.5
Yorkmont Road Realignment	1.5	0.3	0.8	0.0	0.1	0.1
Deice Pad	6.0	0.5	4.7	0.0	1.7	0.4
Crossfield Taxiway	2.6	0.1	1.1	0.0	0.4	0.1
Taxiway Bridge	0.4	0.0	0.4	0.0	0.1	0.0
<i>Construction Year 2 Subtotal</i>	<i>27.7</i>	<i>2.4</i>	<i>23.1</i>	<i>0.1</i>	<i>4.1</i>	<i>1.8</i>
CONSTRUCTION YEAR 3						
Deice Pad	6.0	0.5	4.7	0.0	1.7	0.4
Crossfield Taxiway	5.3	0.3	2.2	0.0	0.9	0.2
Taxiway Bridge	0.9	0.1	0.8	0.0	0.1	0.1
<i>Construction Year 3 Subtotal</i>	<i>12.2</i>	<i>0.8</i>	<i>7.7</i>	<i>0.0</i>	<i>2.8</i>	<i>0.7</i>
CAA DE MINIMIS THRESHOLD EXCEEDED?	NA	NO	NO	NA	NA	NA

Source: Landrum & Brown analysis, 2019.

4 SIGNIFICANCE DETERMINATION

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

Construction of the Proposed Action would result in short term air quality impacts from exhaust emissions from construction equipment and from fugitive dust emissions from vehicle movement and soil excavation. As provided in Table 3, emissions due to construction equipment would not exceed applicable thresholds.

While the construction of the Proposed Action would be expected to contribute to fugitive dust in and around the construction site, the City of Charlotte would ensure that all possible measures would be taken to reduce fugitive dust emissions by adhering to guidelines included in FAA Advisor Circular 150/5370-10H, *Standard Specifications for Construction of Airports, including Item C-102, Temporary Air and Water Pollution, Soil Erosion and Siltation Control*.¹⁸

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

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

¹⁸ FAA Advisory Circular 150/5370-10H, Standard Specifications for Construction of Airports, including Item C-102, Temporary Air and Water Pollution, Soil Erosion and Siltation Control, December 21, 2018.

5 CLIMATE

AFFECTED ENVIRONMENT

Greenhouse gases (GHG) are gases that trap heat in the earth's atmosphere. Naturally occurring and man-made GHGs primarily include water vapor (H₂O), carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). Sources that require fuel or power at an airport are the primary sources that would generate GHGs. Aircraft are probably the most often cited air pollutant source, but they produce the same types of emissions as ground access vehicles.

Research has shown there is a direct correlation between fuel combustion and GHG emissions. In terms of U.S. contributions, the General Accounting Office (GAO) reports that "domestic aviation contributes about three percent of total carbon dioxide emissions, according to [USEPA] data," compared with other industrial sources including the remainder of the transportation sector (20 percent) and power generation (41 percent).¹⁹ The International Civil Aviation Organization (ICAO) estimates that GHG emissions from aircraft account for roughly three percent of all anthropogenic GHG emissions globally.²⁰ Climate change due to GHG emissions is a global phenomenon, so the affected environment is the global climate.²¹

CLIMATE ENVIRONMENTAL CONSEQUENCES

Although there are no federal standards for aviation-related GHG emissions, it is well-established that GHG emissions can affect climate.²² The Council on Environmental Quality (CEQ) has indicated that climate should be considered in NEPA analyses.

The following provides an estimate of GHG emissions. These estimates are provided for information only as no federal NEPA standard for the significance of GHG emissions from individual projects on the environment has been established. Under the No Action Alternative, there would be no increase in project specific GHG emissions. **Table 4** provides the GHG emissions inventory for the Proposed Action.

¹⁹ *Aviation and Climate Change*. GAO Report to Congressional Committees, (2009).

²⁰ Alan Melrose, "European ATM and Climate Adaptation: A Scoping Study," in *ICAO Environmental Report*. (2010).

²¹ As explained by the U.S. Environmental Protection Agency, "greenhouse gases, once emitted, become well mixed in the atmosphere, meaning U.S. emissions can affect not only the U.S. population and environment but other regions of the world as well; likewise, emissions in other countries can affect the United States." Climate Change Division, Office of Atmospheric Programs, U.S. Environmental Protection Agency, *Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act* 2-3 (2009).

²² See *Massachusetts v. E.P.A.*, 549 U.S. 497, 508-10, 521-23 (2007).

Table 4: GHG EMISSIONS INVENTORY

METRICS	ANNUAL METRIC TONS		
	CO ₂	CH ₄	N ₂ O
CONSTRUCTION YEAR 1			
Construction	5,300	0.05	0.00
GWP ₁₀₀	1	25	298
CO _{2e}	5,300	1.21	0.00
CO _{2e} Net Emissions	5,301		
CONSTRUCTION YEAR 2			
Construction	16,923	0.16	0.00
GWP ₁₀₀	1	25	298
CO _{2e}	16,923	4.12	0.00
CO _{2e} Net Emissions	16,927		
CONSTRUCTION YEAR 3			
Construction	5,046	0.06	0.00
GWP ₁₀₀	1	25	298
CO _{2e}	5,046	1.58	0.00
CO _{2e} Net Emissions	5,047		

CO₂: Carbon Dioxide

CO_{2e}: Carbon Dioxide equivalent

CH₄: Methane

N₂O: Nitrous oxide

GWP₁₀₀: Global Warming Potential (100-Year)

Total emissions may not sum exactly due to rounding.

Source: L&B Analysis, 2019.

CLIMATE CUMULATIVE IMPACTS

The cumulative impact of this Proposed Action on the global climate when added to other past, present, and reasonably foreseeable future actions is not currently scientifically predictable. Aviation contributes approximately three percent of global CO₂ emissions; this contribution may grow to five percent by 2050. Actions are underway within the U.S. and by other nations to reduce aviation's contribution through such measures as new aircraft technologies to reduce emissions and improve fuel efficiency, renewable alternative fuels with lower carbon footprints, more efficient air traffic management, market-based measures and environmental regulations including an aircraft CO₂ standard. At present, there are no calculations of the extent to which measures individually or cumulatively may affect aviation's CO₂ emissions. Moreover, there are large uncertainties regarding aviation's impact on climate. The FAA, with support from the U.S. Global Change Research Program and its participating federal agencies (e. g., NASA, NOAA, USEPA, and DOE), has developed the ACCRI in an effort to advance scientific understanding of regional and global climate impacts of aircraft emissions, with quantified uncertainties for current and projected aviation scenarios under changing atmospheric conditions.²³

²³

Nathan Brown, et. al. *The U.S. Strategy for Tackling Aviation Climate Impacts*, (2010). 27th International Congress of the Aeronautical Sciences.

ATTACHMENT 1

DESCRIPTION OF POLLUTANTS

Ozone (O₃) – Ozone is a pollutant, which is not directly emitted; rather, ozone is formed in the atmosphere through photochemical reactions between nitrogen oxides (NO_x), volatile organic compounds (VOC), sunlight, and heat. Ozone is the primary constituent of smog and, because it is formed in the atmosphere, may result in health problems many miles away from the pollutant sources.

People with lung disease, children, older adults, and people who are active can be affected when ozone levels are unhealthy. Numerous scientific studies have linked ground-level ozone exposure to a variety of problems, including:

- lung irritation that can cause inflammation much like a sunburn;
- wheezing, coughing, pain when taking a deep breath, and breathing difficulties during exercise or outdoor activities;
- permanent lung damage to those with repeated exposure to ozone pollution; and
- aggravated asthma, reduced lung capacity, and increased susceptibility to respiratory illnesses like pneumonia and bronchitis.

Carbon Monoxide (CO) - Carbon monoxide is a colorless, odorless gas primarily associated with the incomplete combustion of fossil fuels in motor vehicles. CO combines with hemoglobin in the bloodstream and reduces the amount of oxygen that can be circulated through the body. High CO concentrations can lead to headaches, aggravation of cardiovascular disease, and impairment of central nervous system functions. CO concentrations can vary greatly over comparatively short distances. Relatively high concentrations are typically found near crowded intersections, along heavily used roadways carrying slow moving traffic, and at or near ground level. Even under the most severe meteorological and traffic conditions, high concentrations of CO are limited to locations within a relatively short distance of heavily traveled roadways. Overall CO emissions are decreasing as a result of the Federal Motor Vehicle Control Program, which has mandated increasingly lower emission levels for vehicles manufactured since 1973.

Volatile Organic Compound (VOC) – VOCs are gases that are emitted from solids or liquids, such as stored fuel, paint, asphalt, and cleaning fluids. VOCs include a variety of chemicals, some which can have short and long term adverse health effects. VOCs are precursor pollutants that react with heat, sunlight and nitrogen oxides to form ozone. VOCs can also mix with other gases to form fine particulate matter (PM_{2.5}).

Nitrogen Dioxide (NO₂) - Nitrogen gas, normally relatively inert (unreactive), comprises about 80% of the air. At high temperatures (i.e., in the combustion process) and under certain other conditions it can combine with oxygen, forming several different gaseous compounds collectively called nitrogen oxides. Nitric oxide (NO) and NO₂ are the two most important compounds. Nitric oxide is converted to NO₂ in the atmosphere. NO₂ is a red-brown pungent gas. Motor vehicle emissions are the main source of NO_x in urban areas.

NO₂ is toxic to various animals as well as to humans. Its toxicity relates to its ability to form nitric acid with water in the eye, lung, mucus membrane and skin. In animals, long-term exposure to nitrogen oxides increases susceptibility to respiratory infections lowering their resistance to such diseases as pneumonia and influenza. Laboratory studies show susceptible humans, such as asthmatics, exposed to high concentrations of NO₂ can suffer lung irritation and potentially, lung damage. Epidemiological studies have also shown associations between NO₂ concentrations and daily mortality from respiratory and cardiovascular causes and with hospital admissions for respiratory conditions.

While the NAAQS only addresses NO₂, NO and the total group of nitrogen oxides is of concern. NO and NO₂ are both precursors in the formation of ozone and secondary particulate matter. Therefore, NO_x emissions are typically examined when assessing potential air quality impacts.

Sulfur Dioxide (SO₂) - Sulfur oxides (SO_x) constitute a class of compounds of which SO₂ and sulfur trioxide (SO₃) are of greatest importance. SO₂ is commonly expressed as SO_x since it is a larger subset of SO₂. SO₂ is a colorless gas that is typically identified as having a strong odor and is formed when fuel-containing sulfur, like coal, oil, and/or jet fuel, is burned. SO₂ combines easily with water vapor, forming aerosols of sulfurous acid (H₂SO₃), a colorless, mildly corrosive liquid. This liquid may then combine with oxygen in the air, forming the even more irritating and corrosive sulfuric acid (H₂SO₄). Peak levels of SO₂ in the air can cause temporary breathing difficulty for people with asthma who are active outdoors. Longer-term exposures to high levels of SO₂ gas and particles cause respiratory illness and aggravate existing heart disease.

Particulate Matter (PM₁₀ and PM_{2.5}) - Particulate matter includes both aerosols and solid particles of a wide range of size and composition. PM₁₀ is considered coarse particles with a diameter of 10 micrometers or less, and PM_{2.5}, fine particles with a diameter of 2.5 micrometers or less. Emissions of PM_{2.5} are a subset of emissions of PM₁₀. Particulate matter can be any particle of these sizes, including dust, dirt, and soot. Smaller particulates are of greater concern because they can penetrate deeper into the lungs than large particles.

PM_{2.5} is directly emitted in combustion exhaust and formed from atmospheric reactions between various gaseous pollutants including NO_x, sulfur oxides, and volatile organic compounds. PM₁₀ is generally emitted directly as a result of mechanical processes that crush or grind larger particles or the resuspension of dust, most typically through construction activities and vehicular movements. PM_{2.5} can remain suspended in the atmosphere for days and weeks and can be transported over long distances. PM₁₀ generally settles out of the atmosphere rapidly and is not readily transported over large distances.

The principal health effect of airborne particulate matter is on the respiratory system. Short-term exposures to high PM_{2.5} levels are associated with premature mortality, increased hospital admissions, and emergency room visits. Long-term exposures to high PM_{2.5} levels are associated with premature mortality and development of chronic respiratory disease.

Appendix C, Biological Resources

February 7, 2020

Byron Hamstead
U.S. Fish & Wildlife Service
Asheville Ecological Services Field Office
160 Zillicoa St.
Asheville, NC 28801

**RE: CLT Crossfield Taxiway and Drainage Area
Federally Protected Species Reports
Mecklenburg County, North Carolina**

Dear Mr. Hamstead,

The City of Charlotte, Aviation Department is proposing a new deicing pad and associated infrastructure within the property of the Charlotte Douglas International Airport (CLT) in Mecklenburg County. The project will require federal authorization from the Federal Aviation Administration. As such, Section 7 consultation is being conducted. Clearwater submits this consultation on behalf of the Aviation Department so that you can provide your concurrence with our assessment and determination of potential effects of the Proposed Action on the federally listed threatened and endangered species and their critical habitat (**Attachments 1 & 2**). **Attachment 3** is a USFWS letter dated April 4, 2018 in response to previous scoping of subject project's "Borrow Area" in which USFWS records indicate no federally listed species or their habitats occur in the project area.

The Proposed Action involves the construction of an approximately 780,000 square foot deice pad located on the south airfield, east of Runway 36C, as shown in **Exhibit 1, Proposed Action**. The Proposed Action's enabling projects include the construction of a crossfield taxiway, extension of Taxiway F, a new service road, realignment of Yorkmont Road, building demolition, and construction of a new detention pond.

Please do not hesitate to contact me at 828-698-9800 if you have any questions or comments.

Sincerely,

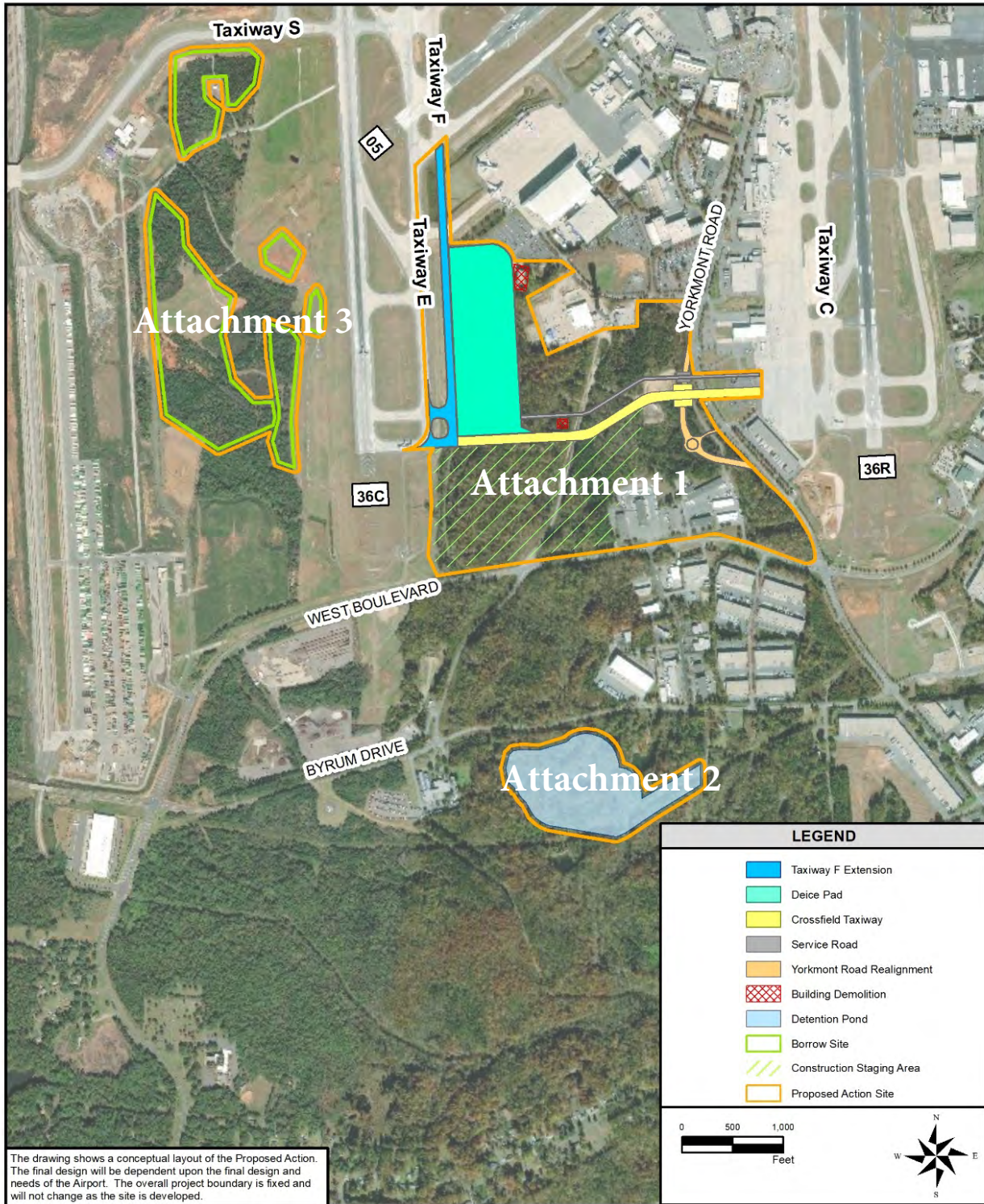
Tyson Kurtz
Biologist

R. Clement Riddle, P.W.S.
Principal

Attachment 1: CLT De-Ice Pad T&E Survey and Habitat Assessment

Attachment 2: CLT – South Drainage Area T&E Review and Habitat Assessment

Attachment 3: USFWS Letter: ER 18/144, Proposed Capacity Enhancements and Other Improvements at CLT



	<p>Environmental Assessment</p> <p>CHARLOTTE DOUGLAS INTERNATIONAL AIRPORT</p>	<p>Proposed Action</p>	<p>EXHIBIT: 1</p>
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Attachment 1
CLT De-Ice Pad T&E Survey
and Habitat Assessment

CLT De-Ice Pad Threatened and Endangered Species Survey and Habitat Assessment

**Approximately 177 acres
Mecklenburg County, North Carolina**

Prepared For

Landrum & Brown Inc.
11279 Cornell Park Dr.
Cincinnati, OH
45242

Prepared By

ClearWater Environmental Consultants, Inc.
32 Clayton Street
Asheville, NC 28801

May 14, 2019

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US Fish and Wildlife Service County Database Information
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Appendix B:
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1.0 INTRODUCTION

The following report details the habitat assessment and results of the survey for the potential occurrence of threatened and endangered (T&E) species for the proposed CLT De-Ice Pad project site. The referenced site is generally located in the middle of the southern extent of Charlotte Douglas International Airport, north of West Boulevard and west of Yorkmont Road, in Mecklenburg County, North Carolina. The site ranges in elevation from approximately 650-700 feet above mean sea level (Figures 1-3).

A survey was conducted at the project site to determine the occurrence of or the potential for animal and plant species listed as federally threatened and/or endangered to exist on the proposed site. Completion of this survey was directed by and complies with current state and federal regulations [Federal Endangered Species Act of 1973 (16 USC 1531-1543) and the North Carolina Endangered Species Act (N.C.G.S. Sect. 113 article 25) and North Carolina Plant Protection and Conservation Act of 1979 (N.C.G.S. Sect. 19b 106: 202.12-22)].

2.0 METHODOLOGY

The protected species survey and habitat assessment was conducted by ClearWater Environmental Consultants, Inc. (CEC) on August 30-31, 2018 and an additional 10.8 acres was surveyed on May 8, 2019 to determine the potential for occurrences of animal and plant species in the approximate 177-acre project area listed as endangered or threatened by current federal regulations.

A database search from the US Fish and Wildlife Service (FWS) dated June 20, 2018 and May 7, 2019 provided existing data concerning the presence or potential occurrence of threatened or endangered species in Mecklenburg County, North Carolina (Appendix A). The FWS lists the following seven federally protected species as occurring or potentially occurring in Mecklenburg County, N.C. The species listed below were included in the surveys and assessment.

Table 1. Federally threatened and endangered species listed as occurring or potentially occurring.

Common Name	Scientific Name	Status
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGPA
Northern long-eared bat	<i>Myotis septentrionalis</i>	Threatened
Carolina heelsplitter	<i>Lasmigona decorata</i>	Endangered
Rusty-patched Bumble bee	<i>Bombus affinis</i>	Endangered
Michaux's sumac	<i>Rhus michauxii</i>	Endangered
Schweinitz's sunflower	<i>Helianthus schweinitzii</i>	Endangered
Smooth coneflower	<i>Echinacea laevigata</i>	Endangered

A database search from the NC Natural Heritage Program (NHP) dated August 29, 2018 and May 2019 provided existing data concerning the presence or potential occurrences of federal and state listed species within 1 mile of the project site. No federally listed threatened or endangered species was listed within one mile of the site (Appendix A). There is a known

historic reference to the state endangered Tall larkspur (*Delphinium exaltatum*) within 1 mile of the project site.

The protected species audit consisted of a pedestrian survey by CEC staff. During the field survey, site habitats were identified and compared with recognized habitats for each of the species as potential flora and fauna were identified to the taxonomic unit level necessary to determine if the observed specimen was a protected species.

3.0 HABITAT CLASSIFICATION

During the visit to the project sites on August 30-31, 2018 and May 8, 2019, CEC consultants, identified seven habitats: Forested Edge, Mixed Hardwood Forest, White Pine Forest, Stream Bank and Riparian Forest, Abandoned Borrow Pit, Maintained Open Area, and Early Successional Clear Cut.

3.1 Forested Edge

This habitat consists of sun-exposed transition area between the Maintained Open Area and the Mixed Hardwood Forest, White Pine forest, and Stream Bank and Riparian Forest. The habitat was observed along the eastern edge of the maintained airport taxiway, on either side of a maintained sewer line right of way running the length of Coffey Creek, on either side of Piney Top Drive; a gravel construction access road running north-south along the center of the project area, along the edge of a construction clearing in the north west portion of the project area, and along the western and southern edges of the project area. Typical canopy species in the Forested Edge habitat included winged elm (*Ulmus alata*), sweet gum (*Liquidambar styraciflua*), willow oak (*Quercus phellos*), box elder (*Acer negundo*), Virginia pine (*Pinus virginiana*), white pine (*Pinus strobus*), mimosa (*Albizia julibrissin*) and Bradford pear (*Pyrus calleryana*) with occasional black cherry (*Prunus serotina*), white oak (*Quercus alba*), blackjack oak (*Quercus marilandica*), sassafras (*Sassafras albidum*), smooth sumac (*Rhus glabra*), and basswood (*Tilia americana*). Wetter areas on the forested edge had a prevalence of black walnut (*Juglans nigra*), sycamore (*Platanus occidentalis*), and green ash (*Fraxinus pennsylvanica*) in the canopy. Species in the shrub layer consisted of younger representation of the above canopy species, along with Russian olive (*Elaeagnus angustifolia*), Chinese privet (*Ligustrum sinense*), eastern redcedar (*Juniperus virginiana*) with occasional ironwood (*Carpinus caroliniana*), redbud (*Cercis canadensis*), multiflora rose (*Rosa multiflora*) and elderberry (*Sambucus nigra*). Commonly observed woody vines included wild grape (*Vitis sp.*), Virginia creeper (*Parthenocissus quinquefolia*), poison ivy (*Toxicodendron radicans*), trumpet creeper (*Campsis radicans*), catbriar (*Smilax rotundifolia*), cross vine (*Bignonia capreolata*) and kudzu (*Pueraria montana*). Herbs included horse nettle (*Solanum carolinense*), Japanese stilt grass (*Microstegium vimineum*), clear weed (*Pilea pumila*), dog fennel (*Eupatorium capillifolium*), Boneset (*eupatorium sp.*), moonflower/morning glory (*Ipomoea purpurea*), soft rush (*Juncus effusus*), yellow aster (*aster sp.*), Johnson grass

(*Sorghum halepense*), barnyard grass (*Echinochloa crus-galli*), big bluestem (*Andropogon gerardii*), sericea lespedeza (*Lespedeza cuneata*), yellow woodsorrel (*Oxalis stricta*), mullein (*Verbascum thapsus*), yellow nutsedge (*Cyperus esculentus*), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), honeysuckle (*Lonicera japonica*), common dandelion (*Taraxacum officinale*), deer tongue grass (*Dichanthelium clandestinum*), and gamma grass (*Tripsacum dactyloides*).

3.2 Mixed Hardwood Forest

This Mixed Hardwood forest community consisted of the area between the sewer line easement along Coffey Creek and the Piney Top Drive access road, with some additional representation east of the access road. Typical canopy species included Tulip poplar (*Liriodendron tulipifera*), green ash, red maple (*Acer rubrum*), basswood, sweetgum, sugarberry (*Celtis laevigata*), black cherry, mockernut hickory (*Carya tomentosa*), cucumber magnolia (*Magnolia acuminata*), northern red oak (*Quercus rubra*) with occasional American holly (*Ilex opaca*), white pine, loblolly (*Pinus taeda*), and Virginia pine. In addition to saplings of the above trees, the understory/shrub layer included winged elm, redbud, and pawpaw (*Asimina triloba*). The understory/shrub layer was thickly dominated with Russian olive, Chinese privet, and multiflora rose in places, to the exclusion of other species. Vines included poison ivy, catbriar, and Virginia creeper. The herbaceous layer was sparse, consisting of the occasional yellow woodsorrel, Virginia creeper, wild grape, catbrier, ebony spleenwort (*Asplenium platyneuron*), Japanese stilt-grass, partridge berry (*Mitchella repens*) and boneset.

3.3 White Pine Forest

This habitat was observed in patches to the east of Piney Top Drive and was characterized by a white pine dominated canopy, with a sparsely developed understory/shrub layer or herbaceous layer. Chinese wisteria (*Wisteria sinensis*) was dominant in the vine layer, with occasional poison ivy. The herbaceous layer was very sparse, and included occasional ebony spleenwort, yellow aster, and a variety of sedge (*Carex sp.*).

3.4 Stream Bank and Riparian Forest

This habitat included the streambanks along Coffey Creek, unnamed tributaries to Coffey Creek, and areas of flowing water to the east of Piney Top Dr. Coffey Creek is a 15-20 ft wide channel with a cobble, gravel and sand dominated substrate, with steep 4-5 ft tall banks. Most tributaries were less than 2 ft wide and had low banks. Dominant canopy species included sycamore, black walnut, basswood, sweetgum, sugarberry, persimmon (*Diospyros virginiana*), black willow (*Salix nigra*), green ash, and willow oak. In addition to saplings of the above trees, the understory/shrub layer included witch-hazel (*Hamamelis virginiana*), box elder, pawpaw, elderberry and sassafras. Vines included wild

grape, Virginia creeper, poison ivy and kudzu. The herbaceous layer included Japanese stilt grass, river cane (*Arundinaria gigantea*), deer tongue grass, sedge, soft rush, spike rush (*Eleocharis sp.*), woolgrass (*Scirpus cyperinus*), yellow nut sedge, gamma grass, seed box (*Ludwigia alternifolia*), goldenrod (*Solidago sp.*), jewelweed (*Impatiens capensis*), rough bedstraw (*Galium asprellum*), yellowroot (*Xanthorhiza simplicissima*), and boneset.

3.5 Abandoned Borrow Pit

This habitat consists of what appears to be an old borrow pit approximately ~1 acre. The site is a flat and clay dominated area surrounded by manmade steep excavated edges. The vegetation in this area is characterized by a sparse immature canopy, relative lack of understory/shrub layer and more abundant herbaceous plants. The disturbance within this area consisting of bare clay and absent canopy is visible on the 1998 Aerial Map. The species assemblage in this abandoned borrow pit included Virginia pine, wax myrtle (*Myrica cerifera*), eastern redcedar, Bradford pear, green ash, sweetgum, tulip poplar and winged elm. Herbaceous vegetation included boneset, big bluestem, and partridge pea (*Chamaecrista fasciculata*).

3.6 Maintained Open Area

This habitat consists of consistently maintained turfgrass areas near the airport taxiway, recently disturbed land under construction, periodically mowed easements (including utility rights-of-way), and periodically maintained hillslopes adjacent to the maintained turfgrasses and construction land. FAA regulations require turfgrasses on the airport taxiway to be maintained no greater than 3 inches tall, and that fence lines are maintained with no vegetation. The forest edge and fence lines in this area were noticeably bare from vegetation and are maintained with herbicide. Mowed areas within the taxiway included Kentucky bluegrass (*Poa pratensis*), red top (*Agrostis gigantea*), dallisgrass (*Paspalum dilatatum*), pineapple weed (*Matricaria discoidea*), and partridge pea. In sections of maintained open area too steep to maintain by mowing, the following species flourished: sassafras, mimosa, black raspberries (*Rubus sp.*), smooth sumac, winged sumac (*Rhus copallinum*), Johnson grass Indian hemp (*Apocynum cannabinum*), horseweed (*Erigeron canadensis*), sericea lespedeza, trumpet creeper, goldenrod, common dandelion, broomsedge (*Andropogon virginicus*), white clover, poison ivy, and honeysuckle. Flatter easement areas included, red top, big bluestem, bermudagrass (*Cynodon dactylon*), and gamma grass.

3.7 Early Successional Clear Cut

This habitat consists of an area of recently clearcut forest edge and frequently disturbed land that is not undergoing consistent maintenance. This habitat was observed on the southeastern portion of the project area. The following species were observed: Groundsel tree (*Baccharis halimifolia*), eastern cottonwood

(*Populus deltoides*), black willow, princes tree (*Paulownia tomentosa*) white pine, willow oak, winged sumac, wax myrtle, sycamore, poke weed (*Phytolacca americana*), smartweed (*polygonum* sp.), german millet, dallis grass, big bluestem, bermudagrass, barnyardgrass, jimsonweed (*Datura stramonium*), yellow nut sedge, boneset and moon flower.

4.0 SOILS

The CLT De-Ice project site is located within the Piedmont region of North Carolina. The soil series present include the following: Cecil sandy clay loam, 2 to 8 percent slopes, moderately eroded (CeB2); Cecil sandy clay loam, 8 to 15 percent slopes, moderately eroded (CeD2); Cecil-Urban land complex, 2 to 8 percent slopes (CuB); Enon sandy loam, 8 to 15 percent slopes (EnD); Helena sandy loam, 2 to 8 percent slopes (HeB), Monacan loam, 0 to 2 percent slopes, frequently flooded (MO); Mecklenburg fine sandy loam, 2 to 8 percent slopes (MeB); Pacolet sandy loam, 15 to 25 percent slopes (PaE); Urban land (Ur); Wilkes loam, 8 to 15 percent slopes (WkD) (Figure 4).

5.0 PROTECTED SPECIES

The following is a brief description of each federally listed species included in the survey, its recognized habitat, and comments regarding survey results for that species.

5.1 Bald Eagle

Bald eagles (*Haliaeetus leucocephalus*) were removed from the endangered species list in August 2007 because their populations recovered sufficiently. Bald and Golden eagles are protected under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Act (BGPA)

Distinguished by a white head and white tail feathers, bald eagles are powerful, brown birds that may weigh 14 pounds and have a wingspan of 8 feet. Male eagles are smaller, weighing as much as 10 pounds and have a wingspan of 6 feet. Sometimes confused with golden eagles, bald eagles are mostly dark brown until they are four to five years old and acquire their characteristic coloring.

Bald eagles live near rivers, lakes, and marshes where they can find fish, their staple food. Bald eagles will also feed on waterfowl, turtles, rabbits, snakes, and other small animals and carrion. Bald eagles require a good food base, perching areas, and nesting sites. Their habitat includes estuaries, large lakes, reservoirs, rivers, and some seacoasts. In winter, the birds congregate near open water in tall trees for spotting prey and night roosts for sheltering. No bald eagle nests were observed on the site. It is the opinion of CEC that the proposed project is not likely to adversely affect the bald eagle.

5.2 Northern long-eared bat

The Northern long-eared bat (*Myotis septentrionalis*), is a medium-sized bat about 3 to 3.7 inches in length but with a wingspan of 9 to 10 inches. As its name suggests, this bat is distinguished by its long ears, particularly as compared to other bats in its genus, *Myotis*, which are actually bats noted for their small ears (*Myotis* means mouse-eared). The northern long-eared bat is found across much of the eastern and north central United States and all Canadian provinces from the Atlantic coast west to the southern Northwest Territories and eastern British Columbia. Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula. They typically use large caves or mines with large passages and entrances; constant temperatures; and high humidity with no air currents. No naturally occurring suitable wintering habitat for the northern long-eared bat exists within the property boundary. Summer habitat for the Northern long-eared bat consists of the cavities, hollows, cracks, or loose bark of live or dead trees typically greater than three inches DBH (diameter at breast height). Suitable summer habitat for the Northern long-eared bat was observed within the proposed site.

CEC consulted the FWS's "Northern Long-Eared Bat Consultation Areas" map for Mecklenburg County. The proposed project site is not in a Hydrologic Unit Code (HUC) identified as having known occurrences of hibernation or maternity sites. It is the opinion of CEC that any incidental take associated with proposed activities would be exempt under the 4(d) rule.

5.3 Carolina Heelsplitter

The Carolina heelsplitter (*Lasmigona decorata*) was first described in 1852. It has an ovate, trapezoid-shaped shell. The outer surface of the shell varies from greenish brown to dark brown in color, and shells from younger specimens have faint greenish brown or black rays. The nacre (inside surface) is often pearly white to bluish white, grading to orange in the deepest part of the shell. However, in older specimens the entire nacre may be a mottled pale orange. The shell of the largest known specimen of the species measures 4.6 inches in length.

The Carolina heelsplitter requires cool, clean, well-oxygenated water. Stable, silt-free stream bottoms appear to be critical to the species. Typically stable areas occur where the stream banks are well-vegetated with trees and shrubs.

The streams on site do not have suitable habitat for Carolina heelsplitter likely due to watershed conditions at the site. Due to these conditions, it is the opinion of CEC that this project is not likely to adversely affect the Carolina heelsplitter.

5.4 Rusty-patched bumble bee

Rusty-patched bumble bee (*Bombus affinis*), is listed under Historic Record Status in Mecklenburg County. Rusty patched bumble bees once occupied grasslands and tallgrass prairies of the Upper Midwest and Northeast, but most grasslands and prairies have been lost, degraded, or fragmented by conversion to other uses. Bumble bees need areas that provide nectar and pollen from flowers, nesting sites (underground and abandoned rodent cavities or clumps of grasses), and overwintering sites for hibernating queens (undisturbed soil). Rusty patched bumble bees live in colonies that include a single queen and female workers. The colony produces males and new queens in late summer. Queens are the largest bees in the colony, and workers are the smallest. All rusty patched bumble bees have entirely black heads, but only workers and males have a rusty reddish patch centrally located on the back. Bumble bees gather pollen and nectar from a variety of flowering plants. The rusty patched emerges early in spring and is one of the last species to go into hibernation. It needs a constant supply and diversity of flowers blooming throughout the colony's long life, April through September.

Suitable habitat for rusty patched bumble bee does not exist within the project site nor was it observed during the survey. It is the opinion of CEC that the proposed project is not likely to adversely affect the rusty patched bumble bee.

5.5 Michaux's sumac

Michaux's sumac (*Rhus michauxii*) is a rhizomatous, densely hairy shrub, with erect stems from 1 - 3 feet (ft) (30.5 – 91 centimeters, cm) in height. The compound leaves contain evenly serrated, oblong to lanceolate, acuminate leaflets. Most plants are unisexual; however, more recent observations have revealed plants with both male and female flowers on one plant. The flowers are small, borne in a terminal, erect, dense cluster, and colored greenish yellow to white. Flowering usually occurs from June to July; while the fruit, a red drupe, is produced through the months of August to October.

Michaux's sumac grows in sandy or rocky open woods in association with basic soils. Apparently, this plant survives best in areas where some form of disturbance has provided an open area. Several populations in North Carolina are on highway rights-of way, roadsides, or on the edges of artificially maintained clearings. Two other populations are in areas with periodic fires, and two populations exist on sites undergoing natural succession.

Suitable habitat exists on site in the form of maintained forest edge and clearings; however, no species were observed. It is the opinion of CEC that this project is not likely to adversely affect the Michaux's sumac.

5.6 Schweinitz's sunflower

Schweinitz's sunflower (*Helianthus schweinitzii*) is a perennial that regularly grows approximately 6.5 feet (2.0 meters) tall (though it can be shorter if young or injured) and can occasionally reach heights of 16 feet (4.8 meters). The stem is purplish in color, and the upper third bears secondary branches at 45-degree angles. The leaves are arranged in pairs on the lower part of the stem but usually occur singly (or alternate) on the upper parts. Leaves are attached to the stem at right angles, and the tips of the leaves tend to droop. The leaves are thick and stiff, with a rough upper surface. The upper leaf surfaces have broad spiny hairs that are directed toward the tip and soft white hairs cover the underside. The plant produces small yellow flowers from late August until frost. This species is able to colonize through the dispersal of seeds that readily germinate without a dormant period.

Schweinitz's sunflower occurs in full to partial sun and is found in areas with poor soils, such as thin clays that vary from wet to dry. It is believed that this species once occurred in natural forest openings or grasslands. Many of the remaining populations occur along roadsides.

A sewer line easement, early successional open areas, and an old borrow pit with clay soils are present on site. These habitats are suitable for Schweinitz's sunflower and were targeted during the pedestrian survey; however, no species were observed. It is the opinion of CEC that the proposed project is not likely to adversely affect the Schweinitz's sunflower.

5.7 Smooth coneflower

Smooth coneflower (*Echinacea laevigata*) is a perennial herb in the Aster family (*Asteraceae*) that grows up to 3.3 feet (ft) (1 meter; m) tall from a vertical root stock. The large elliptical to broadly lanceolate basal leaves may reach 8 inches (in) (20 centimeters; cm) in length and 3.0 in (7.5 cm) in width and taper into long petioles toward the base. They are smooth to slightly rough in texture. The stems are smooth, with few leaves. The mid-stem leaves are smaller than the basal leaves and have shorter petioles. Flower heads are usually solitary. The rays of the flowers (petal-like structures) are light pink to purplish in color, usually drooping, and 2 – 3.2 in (5 - 8 cm) long. Flowering occurs from late May through mid July and fruits develop from late June to September. The fruiting structures often persist through the fall.

Smooth coneflower is typically found in open woods, glades, cedar barrens, roadsides, clearcuts, dry limestone bluffs, and power line rights-of-way, usually on magnesium and calcium rich soils associated with amphibolite, dolomite or limestone (in Virginia), gabbro (in North Carolina and Virginia), diabase (in North Carolina and South Carolina), and marble (in South Carolina and Georgia). Smooth coneflower occurs in plant communities that have been described as xeric

hardpan forests, diabase glades or dolomite woodlands. Optimal sites are characterized by abundant sunlight and little competition in the herbaceous layer. Natural fires, as well as large herbivores, historically influenced the vegetation in this species' range. Many of the herbs associated with Smooth coneflower are also sun-loving species that depend on periodic disturbances to reduce the shade and competition of woody plants.

Suitable habitat for the smooth coneflower does not exist in the project area nor was it observed during the survey. It is the opinion of CEC that this project is not likely to adversely affect the smooth coneflower.

5.8 Tall larkspur

The Tall larkspur (*Delphinium exaltatum*) is a species of flowering plant in the buttercup family. Larkspurs have distinctive flowers with four blue petals and one sepal elongated into a slender spur. The leaves are deeply lobed into irregular segments. It typically grows 4-6 feet tall and blooms in the summer. It is a state listed endangered species in North Carolina and is listed as having a Natural Heritage element occurrence documented within a one-mile radius of the project area. However, the last observation date of this occurrence was listed as being in the 1800s with accuracy being rated "Very Low". The remaining two known locations occurring in the Piedmont are found along powerline and sewerline right-of-ways at elevations of about 90-150 m. These sites are found over diabase rock, in formerly fire-maintained communities. Associated plant species include *Cercis canadensis*, *Cirsium virginianum*, *Echinacea laevigata*, *Rhus aromatica* and *Viburnum rafinesquianum*. Elevations of both extant and historic populations range from 90 to 1928 m (North Carolina Natural Heritage Program 1993, Weakley pers. comm. 1993).

Suitable habitat for the Tall larkspur does not exist in the project area nor was it observed during the survey. It is the opinion of CEC that this project is not likely to adversely affect the Tall larkspur.

6.0 CONCLUSION AND RECOMMENDATIONS

A protected species survey and habitat assessment was conducted by CEC on August 30-31, 2018 and an additional 10.8 acres was surveyed on May 8, 2019 to determine the potential for occurrences of animal and plant species in the approximate 177-acre project area listed as endangered or threatened by current federal regulations. During the species habitat assessments for the CLT Airport, CEC observed suitable habitat for the Schweinitz's sunflower, Michaux's sumac and northern long eared bat. The survey was conducted within these habitats to determine the presence or absence of these species. Potential flora were identified to the taxonomic unit level necessary to determine if the observed specimen was a protected species. Schweinitz's sunflower and Michaux's sumac species were not observed within the project boundary. Likewise, no helianthus species were observed

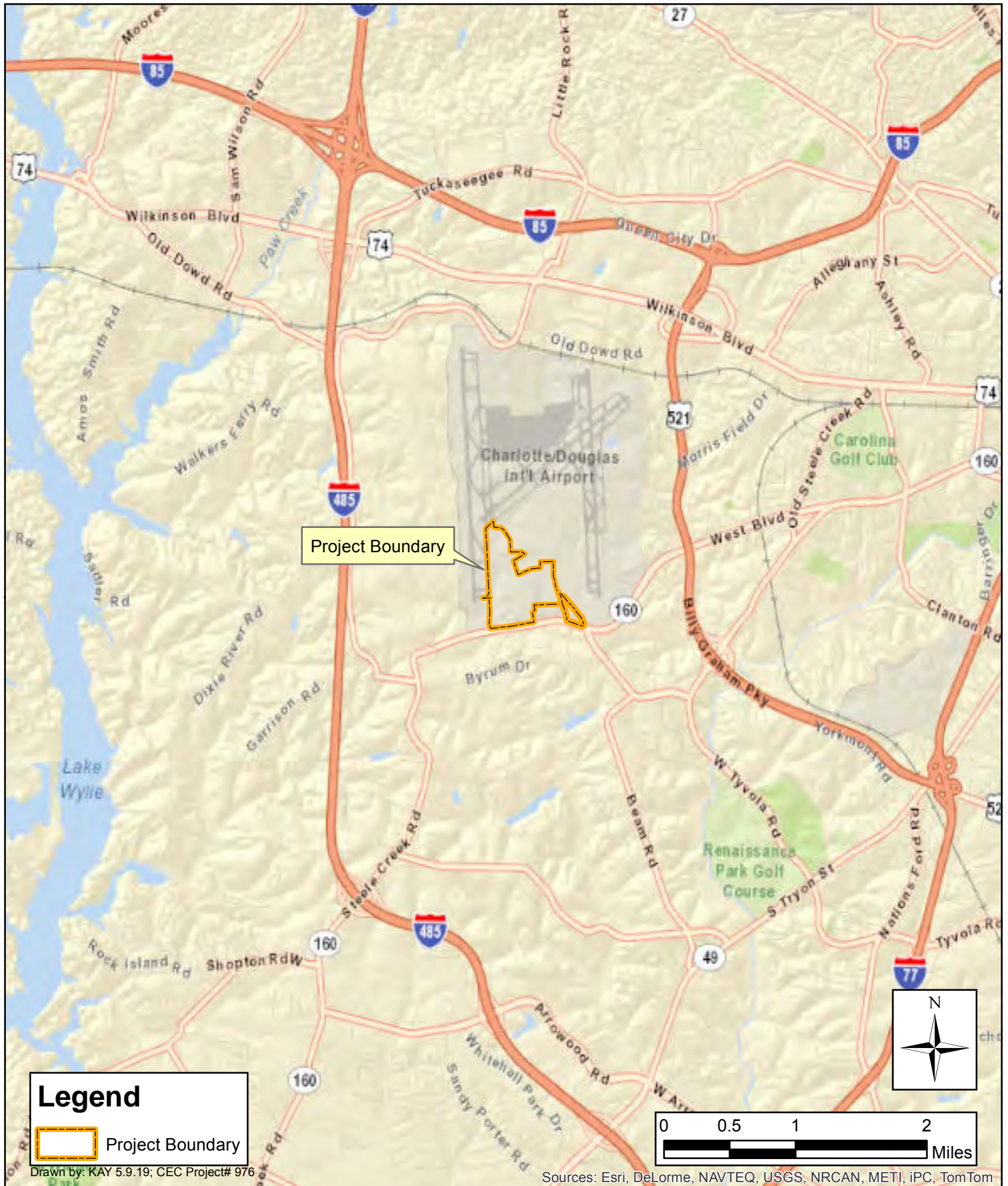
during either survey. The proposed project is not located within a hydrologic unit code identified as having known identified occurrences of hibernation or maternity sites. Incidental take of northern long eared bat with the proposed activity would be exempt under the 4(d) rule.

As such, development of the CLT Airport de-icing pad is not likely to adversely affect federally threatened or endangered species. Because of the transitory nature of some of the listed threatened and endangered species and the particular flower/fruitlet periods of some plants; it is possible that endangered species populations and locations may change over time. Therefore, any potential findings at a later date should be fully investigated and coordinated with appropriate agencies to prevent potential adverse impacts.

7.0 REFERENCES

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Charlotte Airport De-Icing Pad (+/- 177 AC)



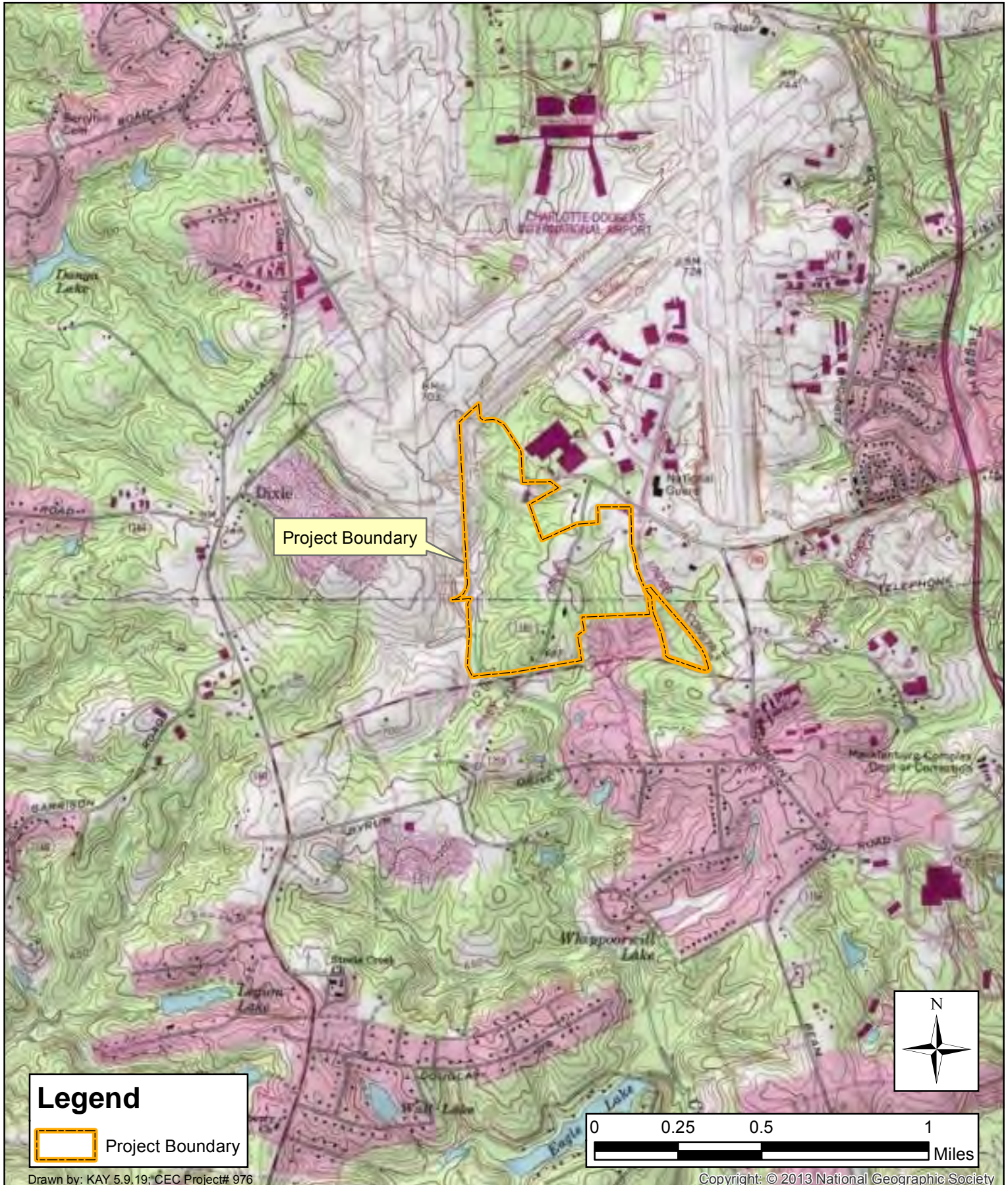
Mecklenburg County,
North Carolina

ClearWater

32 Clayton Street
Asheville, North Carolina 28801

Vicinity Map
Figure 1

Charlotte Airport De-Icing Pad (+/- 177 AC)



Mecklenburg County,
North Carolina

ClearWater

32 Clayton Street
Asheville, North Carolina 28801

USGS Topographic Map
Charlotte West Quad
Figure 2



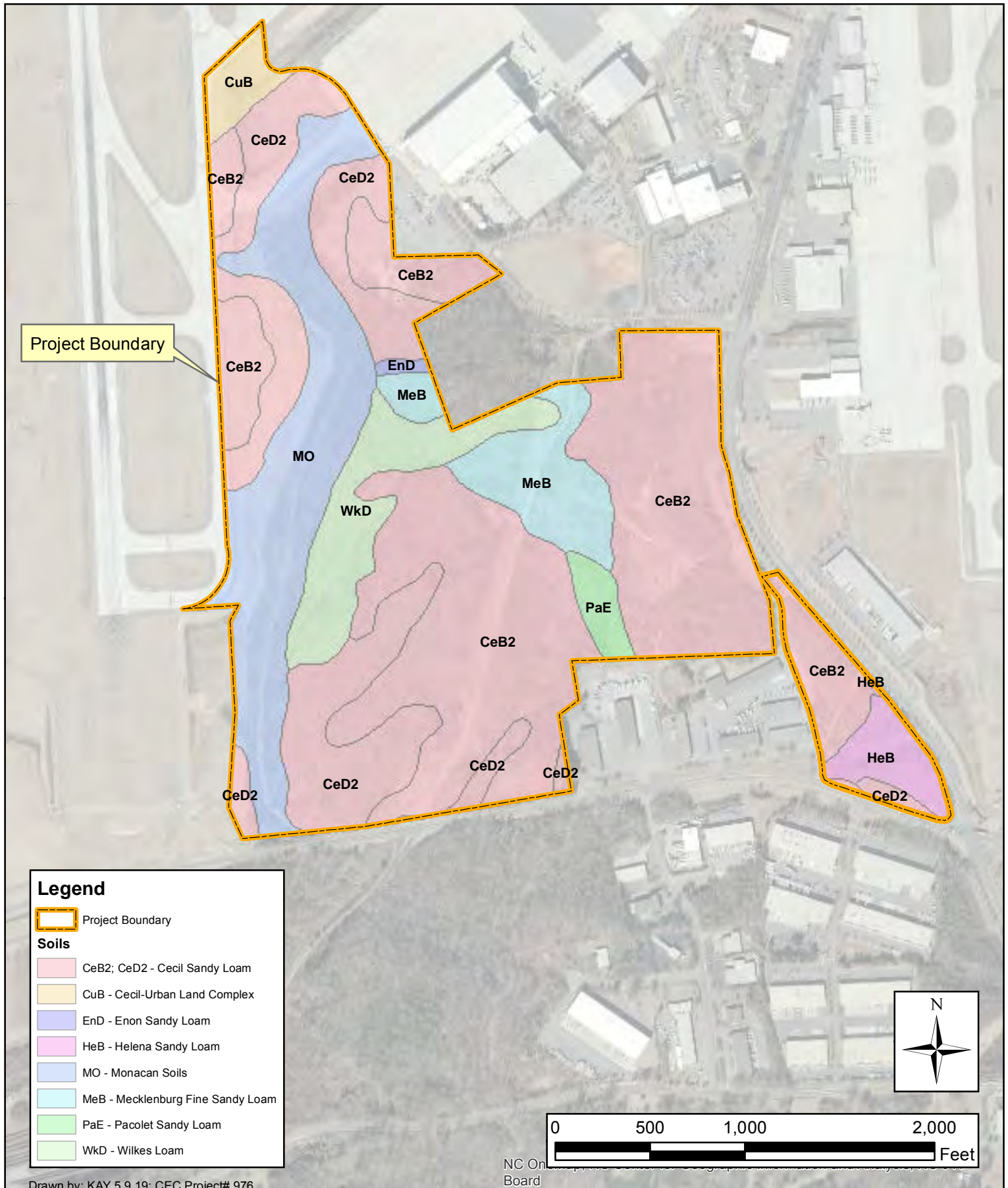
Mecklenburg County,
North Carolina

CLEARWATER

Environmental Consultants, Inc.
32 Clayton Street
Asheville, NC 28801
828-698-9800

Aerial Photograph
Figure 3

Charlotte Airport De-Icing Pad (+/- 177 AC)



Drawn by: KAY 5.9.19; CEC Project# 976

Mecklenburg County,
North Carolina

ClearWater

32 Clayton Street
Asheville, North Carolina 28801

USDA Soil Map
Figure 4

Appendix A

U.S. Fish & Wildlife Service

Endangered Species, Threatened Species, Federal Species of Concern, and Candidate Species,

Mecklenburg County, North Carolina



Updated: 06-27-2018

Common Name	Scientific name	Federal Status	Record Status
Vertebrate:			
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGPA	Current
Carolina darter	<i>Etheostoma collis collis</i>	FSC	Current
Northern long-eared bat	<i>Myotis septentrionalis</i>	T	Probable/Potential
Invertebrate:			
Carolina creekshell	<i>Villosa vaughaniana</i>	FSC	Current
Carolina heelsplitter	<i>Lasmigona decorata</i>	E	Current
Rusty-patched bumble bee	<i>Bombus affinis</i>	E	Historic
Vascular Plant:			
Carolina Hemlock	<i>Tsuga caroliniana</i>	ARS	Historic
Georgia aster	<i>Symphotrichum georgianum</i>	C	Current
Michaux's sumac	<i>Rhus michauxii</i>	E	Current
Piedmont aster	<i>Eurybia mirabilis</i>	FSC	Current
Schweinitz's sunflower	<i>Helianthus schweinitzii</i>	E	Current
Smooth coneflower	<i>Echinacea laevigata</i>	E	Current
Nonvascular Plant:			
Lichen:			

Definitions of Federal Status Codes:

E = endangered. A taxon "in danger of extinction throughout all or a significant portion of its range."

T = threatened. A taxon "likely to become endangered within the foreseeable future throughout all or a significant portion of its range."

C = candidate. A taxon under consideration for official listing for which there is sufficient information to support listing. (Formerly "C1" candidate species.)

BGPA = Bald and Golden Eagle Protection Act. See below.

ARS = [At Risk Species](#). Species that are Petitioned, Candidates or Proposed for Listing under the Endangered Species Act. Consultation under Section 7(a)(2) of the ESA is not required for Candidate or Proposed species;

although a Conference, as described under Section 7(a)(4) of the ESA is recommended for actions affecting species proposed for listing.

FSC=Federal Species of Concern. FSC is an informal term. It is not defined in the federal Endangered Species Act. In North Carolina, the Asheville and Raleigh Field Offices of the US Fish and Wildlife Service (Service) define Federal Species of Concern as those species that appear to be in decline or otherwise in need of conservation and are under consideration for listing or for which there is insufficient information to support listing at this time. Subsumed under the term "FSC" are all species petitioned by outside parties and other selected focal species identified in Service strategic plans, State Wildlife Action Plans, or Natural Heritage Program Lists.

T(S/A) = threatened due to similarity of appearance. A taxon that is threatened due to similarity of appearance with another listed species and is listed for its protection. Taxa listed as T(S/A) are not biologically endangered or threatened and are not subject to Section 7 consultation. See below.

EXP = experimental population. A taxon listed as experimental (either essential or nonessential). Experimental, nonessential populations of endangered species (e.g., red wolf) are treated as threatened species on public land, for consultation purposes, and as species proposed for listing on private land.

P = proposed. Taxa proposed for official listing as endangered or threatened will be noted as "PE" or "PT", respectively.

Bald and Golden Eagle Protection Act (BGPA):

In the July 9, 2007 Federal Register(72:37346-37372), the bald eagle was declared recovered, and removed (delisted) from the Federal List of Threatened and Endangered wildlife. This delisting took effect August 8, 2007. After delisting, the Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. 668-668d) becomes the primary law protecting bald eagles. The Eagle Act prohibits take of bald and golden eagles and provides a statutory definition of "take" that includes "disturb". The USFWS has developed National Bald Eagle Management Guidelines to provide guidance to land managers, landowners, and others as to how to avoid disturbing bald eagles. For more information, visit <http://www.fws.gov/migratorybirds/baldeagle.htm>

Threatened due to similarity of appearance(T(S/A)):

In the November 4, 1997 Federal Register (55822-55825), the northern population of the bog turtle (from New York south to Maryland) was listed as T (threatened), and the southern population (from Virginia south to Georgia) was listed as T(S/A) (threatened due to similarity of appearance). The T(S/A) designation bans the collection and interstate and international commercial trade of bog turtles from the southern population. The T(S/A) designation has no effect on land management activities by private landowners in North Carolina, part of the southern population of the species. In addition to its official status as T(S/A), the U.S. Fish and Wildlife Service considers the southern population of the bog turtle as a Federal species of concern due to habitat loss.

Definitions of Record Status:

Current - the species has been observed in the county within the last 50 years.

Historic - the species was last observed in the county more than 50 years ago.

Obscure - the date and/or location of observation is uncertain.

Incidental/migrant - the species was observed outside of its normal range or habitat.

Probable/potential - the species is considered likely to occur in this county based on the proximity of known records (in adjacent counties), the presence of potentially suitable habitat, or both.



Roy Cooper, Governor
Susi Hamilton, Secretary
Walter Clark, Director, Land and Water Stewardship

NCNHDE-8972

ClearWater Environmental Consultants, Inc.
ClearWater Environmental Consultants, Inc.
32 Clayton Street
Asheville, NC 28801
RE: CLT De-Ice Pad

Dear ClearWater Environmental Consultants, Inc.:

The North Carolina Natural Heritage Program (NCNHP) appreciates the opportunity to provide information about natural heritage resources for the project referenced above.

Based on the project area mapped with your request, a query of the NCNHP database indicates that there are no records for rare species, important natural communities, natural areas, and/or conservation/managed areas within the proposed project boundary. Please note that although there may be no documentation of natural heritage elements within the project boundary, it does not imply or confirm their absence; the area may not have been surveyed. The results of this query should not be substituted for field surveys where suitable habitat exists. In the event that rare species are found within the project area, please contact the NCNHP so that we may update our records.

The attached 'Potential Occurrences' table summarizes rare species and natural communities that have been documented within a one-mile radius of the property boundary. The proximity of these records suggests that these natural heritage elements may potentially be present in the project area if suitable habitat exists. Tables of natural areas and conservation/managed areas within a one-mile radius of the project area, if any, are also included in this report.

If a Federally-listed species is found within the project area or is indicated within a one-mile radius of the project area, the NCNHP recommends contacting the US Fish and Wildlife Service (USFWS) for guidance. Contact information for USFWS offices in North Carolina is found here: <https://www.fws.gov/offices/Directory/ListOffices.cfm?statecode=37>.

Please note that natural heritage element data are maintained for the purposes of conservation planning, project review, and scientific research, and are not intended for use as the primary criteria for regulatory decisions. Information provided by the NCNHP database may not be published without prior written notification to the NCNHP, and the NCNHP must be credited as an information source in these publications. Maps of NCNHP data may not be redistributed without permission.

The NC Natural Heritage Program may follow this letter with additional correspondence if a Dedicated Nature Preserve, Registered Heritage Area, Clean Water Management Trust Fund easement, or Federally-listed species are documented near the project area.

If you have questions regarding the information provided in this letter or need additional assistance, please contact Rodney A. Butler at rodney.butler@ncdcr.gov or 919-707-8603.

Sincerely,
NC Natural Heritage Program

Natural Heritage Element Occurrences, Natural Areas, and Managed Areas Within a One-mile Radius of the Project Area
CLT De-Ice Pad
May 13, 2019
NCNHDE-8972

Element Occurrences Documented Within a One-mile Radius of the Project Area

Taxonomic Group	EO ID	Scientific Name	Common Name	Last Observation Date	Element Occurrence Rank	Accuracy	Federal Status	State Status	Global Rank	State Rank
Vascular Plant	13743	Delphinium exaltatum	Tall Larkspur	1800s	H?	5-Very Low	---	Endangered	G3	S2

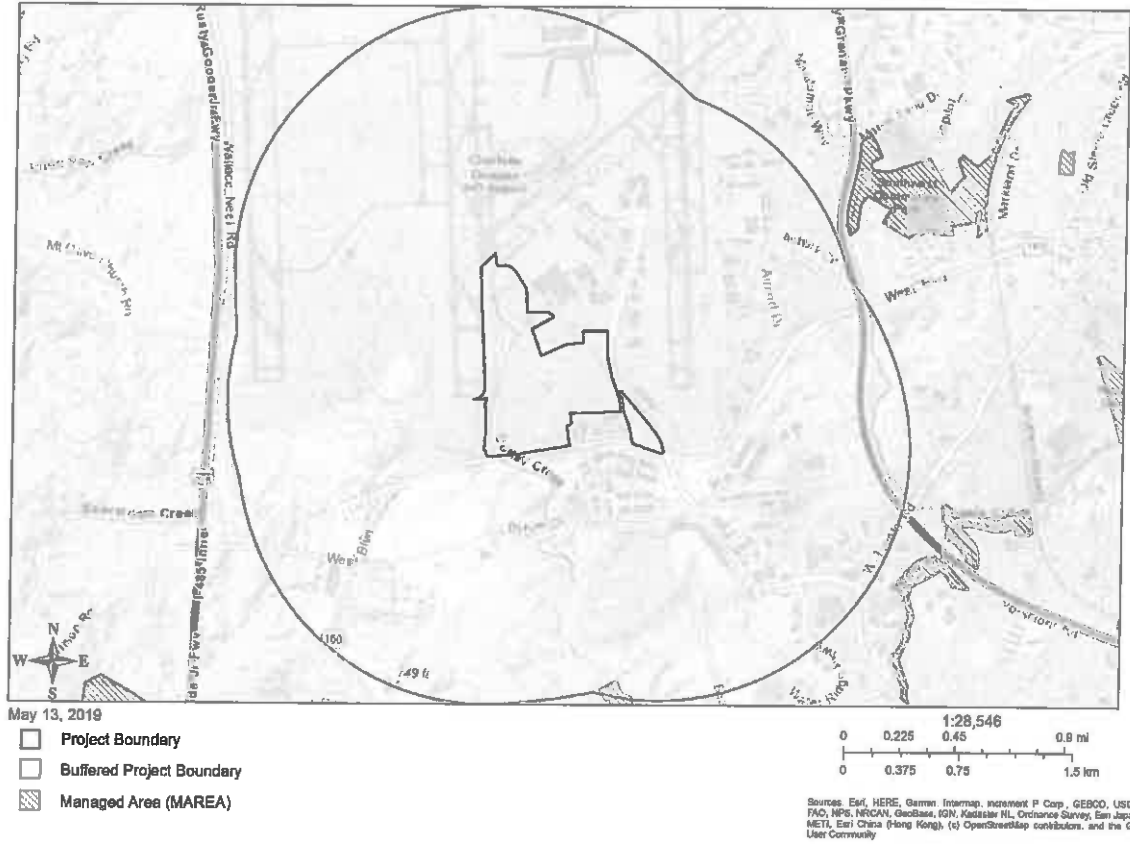
No Natural Areas are Documented Within a One-mile Radius of the Project Area

Managed Areas Documented Within a One-mile Radius of the Project Area

Managed Area Name	Owner	Owner Type
Mecklenburg County Open Space	Mecklenburg County	Local Government

Definitions and an explanation of status designations and codes can be found at <https://ncnhde.natureserve.org/content/help>. Data query generated on May 13, 2019; source: NCNHP, Q2 Apr 2019. Please resubmit your information request if more than one year elapses before project initiation as new information is continually added to the NCNHP database.

NCNHDE-8972: CLT De-Ice Pad



Appendix B



Photo 1. Forested Edge.



Photo 2. Forested Edge.



Photo 3. Mixed Hardwood Forest.



Photo 4: White Pine Forest.



Photo 5: Stream Bank and Riparian Forest.



Photo 6: Stream Bank and Riparian Forest.



Photo 7. Abandoned Borrow Pit.



Photo 8. Maintained Open Area.



Photo 9. Early Successional Clear Cut.

Attachment 2
CLT – South Drainage Area
T&E Review and Habitat
Assessment

**Charlotte Douglass International Airport – South Drainage Area
Approximately 58 Acres
Mecklenburg County, NC**

Threatened and Endangered Species Review and Habitat Assessment

Prepared For
Landrum & Brown, Inc.
4445 Lake Forest Dr., Suite 700
Cincinnati, Ohio 45242

Prepared By
ClearWater Environmental Consultants, Inc.
32 Clayton Street
Asheville, NC 28806

February 6, 2020

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Appendix A: US Fish and Wildlife Service County Database Information and NC Natural Heritage Program Data

Appendix B: Photolog

1.0 INTRODUCTION

The following report includes methods used and results for a threatened and endangered species survey and habitat assessment for the proposed approximately 58-acre project known as Charlotte Douglass International Airport (CLT) – South Drainage Area. The project is located directly south of CLT, in the southwest corner of the intersection of Byrum Drive and Timberly Place, Mecklenburg County, North Carolina (Figure 1). The site ranges in elevation from 612 feet to 698 feet above mean sea level (MSL) (Figure 2).

The threatened and endangered species survey was conducted to determine the occurrence of or the potential for existence of federally listed threatened and endangered animal and plant species on the proposed site. This survey also considered the occurrence of or the potential for existence of tall larkspur (*Delphinium exaltum*), listed as endangered by the state of North Carolina. Completion of this survey was directed by and complies with three current state and federal regulations: the Federal Endangered Species Act of 1973 (16 USC 1531-1543), the North Carolina Endangered Species Act (N.C.G.S. Sect. 113 article 25), and the North Carolina Plant Protection and Conservation Act of 1979 (N.C.G.S. Sect. 19b 106: 202.12-22).

2.0 METHODOLOGY

The protected species survey and habitat assessment was conducted on December 19, 2019 on the 58-acre project by ClearWater Environmental Consultants, Inc. (CEC) to determine the potential for occurrences of animal and plant species listed as endangered or threatened by current federal regulations as well as tall larkspur. A second survey to investigate the possible presence of Schweinitz's sunflower was conducted by CEC on January 22, 2020. The second survey was conducted after visiting a documented reference population of Schweinitz's sunflower at Latta Nature Preserve, approximately 11.5 miles north of the project site.

A database search from the US Fish and Wildlife Service (FWS) dated November 13, 2019 provided existing data concerning the presence or potential occurrence of threatened or endangered species in Mecklenburg County, North Carolina (Appendix A). The FWS lists six federally threatened and endangered species as occurring or potentially occurring in Mecklenburg County, N.C.

Table 1. Federally protected species* listed as occurring or potentially occurring in Mecklenburg County.

Common Name	Scientific Name	Status
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGPA ¹
Carolina heelsplitter	<i>Lasmigona decorate</i>	Endangered
Michaux's sumac	<i>Rhus michauxii</i>	Endangered
Northern long-eared bat	<i>Myotis septentrionalis</i>	Threatened ²
Rusty patched bumble bee	<i>Bombus affinis</i>	Endangered ³
Schweinitz's sunflower	<i>Helianthus schweinitzii</i>	Endangered
Smooth coneflower	<i>Echinacea laevigata</i>	Endangered
Tall Larkspur	<i>Delphinium exaltatum</i>	State Endangered*

* Tall larkspur is listed as Endangered by North Carolina but does not have a federal listing status.

¹ Protected by the Bald and Golden Eagle Protection Act.

² Probable/Potential record status (Definition in Appendix A).

³ Historic record status (Definition in Appendix A).

A database search from the NC Natural Heritage Program (NHP) dated December 16, 2019 provided existing data concerning the presence or potential occurrences of federal and state listed species in Mecklenburg County, North Carolina within 1 mile of the site (Appendix A).

The NHP indicates an element occurrence (EO) of tall larkspur (*Delphinium exaltatum*) as occurring within a one-mile radius of the project area. This EO (EO ID: 13743) is an historic record that was observed in the "Charlotte" area sometime around the 1800s. The accuracy of this EO is very low due to a lack written data outlining the location of where the specimen was observed in flower. No other threatened or endangered species EOs were found in the NHP database as occurring within one mile of the project boundary.

During pedestrian field surveys conducted by CEC biologists, site habitats were identified and compared with recognized habitats for seven federally protected species and one state endangered species potentially occurring on the site. Potential flora were identified to the taxonomic unit level necessary to determine if the observed specimen was a protected species.

3.0 HABITAT CLASSIFICATION

During our site visit on December 19, 2019 Alea Tuttle and Tyson Kurtz with CEC identified five habitats: piedmont dry oak-hickory forest, piedmont floodplain forest, palustrine edge, open water, and maintained/disturbed (Figures 3-5). A description of the open water habitat is not provided due to a lack of observed vascular plant species.

The project site is mostly undeveloped and covers approximately 58 acres. Coffey Creek bisects the site, running north to south. Coffey Creek is a perennial creek approximately 20-25 feet wide. The visible substrate consists primarily of boulder, cobble, and sediment. Excessive sedimentation is obvious throughout the reach of Coffey Creek within the project area. Coffey Creek's urban watershed has a very high percentage of impervious surface and very low cover of forested land. The project site also contains two open water

features (impounded unnamed tributaries to Coffey Creek) and a maintained pipeline corridor. The remainder of the project site is forested.

3.1 Piedmont Dry Oak-Hickory Forest

The majority of the site can be characterized as piedmont dry oak-hickory forest. This habitat occupies the hilltops and hillslopes throughout the site. This forested habitat is dominated by a variety of oak, pine and hickory species. The understory is moderately sparse and has dry, somewhat rocky soils. Some patches of this community type have been more recently disturbed than others and have a higher cover of weedy species.

The dominant canopy species include white oak (*Quercus alba*), northern red oak (*Q. rubra*), southern red oak (*Q. falcata*), Virginia pine (*Pinus virginiana*), shortleaf pine (*P. echinata*), tulip poplar (*Liriodendron tulipifera*) and mockernut hickory (*Carya tomentosa*). Other tree species observed include common hackberry (*Celtis occidentalis*), black walnut (*Juglans nigra*), slippery elm (*Ulmus rubra*), black cherry (*Prunus serotina*), eastern redcedar (*Juniperus virginiana*), common persimmon (*Diospyros virginiana*), sweetgum (*Liquidambar styraciflua*), ironwood (*Carpinus caroliniana*), southern sugar maple (*Acer floridanum*), eastern redbud (*Cercis canadensis*), crapemyrtle (*Lagerstroemia indica*), and red maple (*Acer rubrum*). Hearts-a-bustin' (*Euonymus americanus*), Chinese privet (*Ligustrum sinense*), and autumn olive (*Elaeagnus umbellata*) were observed as the dominant shrub species. Other species in the shrub layer include young individuals of the canopy species listed previously and several ornamental holly species (*Ilex spp.*). The herbaceous layer was relatively sparse over the majority of this community type. Herbaceous species observed include Christmas fern (*Polystichum acrostichoides*), Japanese stiltgrass (*Microstegium vimineum*), wild garlic (*Allium vineale*), bigleaf periwinkle (*Vinca major*), lenten-rose (*Helleborus orientalis*), and a sedge (*Carex sp.*). Exotic wisteria (*Wisteria sp.*) was found growing in very dense, localized patches in the vine stratum. Other vine species observed include poison ivy (*Toxicodendron radicans*), grape (*Vitis sp.*), and multiples species of greenbrier (*Smilax spp.*).

3.2 Piedmont Floodplain Forest

The piedmont floodplain forest habitat occupies the floodplain and riparian areas surrounding Coffey Creek. This mesic habitat includes species that are tolerant to wetter conditions than those found in the piedmont dry oak-hickory habitat. Dominant tree species observed include American beech (*Fagus grandifolia*), sycamore (*Platanus occidentalis*), sweetgum, sourwood (*Oxydendrum arboreum*), and boxelder (*Acer negundo*). Additional tree species overserved in this habitat type include black walnut, eastern redcedar, sugarberry (*Celtis laevigata*), ironwood, Northern catalpa (*Catalpa speciosa*), black cherry, shortleaf pine, Bradford pear (*Pyrus calleryana*), American elm (*Ulmus americana*), eastern cottonwood (*Populus*

deltoides), green ash (*Fraxinus pennsylvanica*), slippery elm, and sweet bay (*Magnolia virginiana*). The moderately dense shrub stratum was dominated by two exotic and invasive shrub species: Chinese privet and autumn olive. Additional woody species observed in the shrub stratum include American holly (*Ilex opaca*), laurel oak (*Quercus laurifolia*), northern red oak, smooth sumac (*Rhus glabra*), winged sumac (*Rhus copallinum*), hearts-a-bustin', pawpaw (*Asimina triloba*), and Leatherleaf mahonia (*Mahonia bealei*). Japanese stiltgrass, an exotic invasive species, is the dominant ground cover throughout this habitat. Other herbaceous species observed include Japanese honeysuckle (*Lonicera japonica*), common chickweed (*Stellaria media*), wild garlic, three-awn grass (*Aristida sp.*), ebony spleenwort (*Asplenium platyneuron*), heartleaf (*Hexastylis sp.*), giant cane (*Arundinaria gigantea*), multiple species of sedge (*Carex spp.*) and multiple asters, not of the *Helianthus* or *Echinacea* genera. Cat greenbrier (*Smilax glauca*), roundleaf greenbrier (*S. rotundifolia*), and clematis (*Clematis sp.*) were observed growing in the vine stratum.

3.3 Palustrine Edge

The palustrine edge habitat runs along the margins of the open water feature near the center of the project area. This habitat type was dominated by common rush (*Juncus effusus*). Additional species observed growing along the bank include three-way sedge (*Dulichium arundinaceum*), hop sedge (*Carex lupulina*), American water horehound (*Lycopus americanus*), seedbox (*Ludwigia alternifolia*), Japanese stiltgrass, sweetgum saplings, bushy bluestem (*Andropogon glomeratus*), clematis (*Clematis sp.*), woolgrass (*Scirpus cyperinus*), and saw greenbrier (*Smilax bona-nox*). The other open water feature in the southwest corner of the project site lacked a distinct edge community.

3.4 Maintained Disturbed

Multiple patches of maintained/disturbed habitat occur within the project site. The four patches include the area surrounding the gravel driveway, the pipeline corridor, the roadside margin, and a recently cleared area in the southeast corner of the project site. All these patches are regularly maintained to control plant growth or have been very recently disturbed. This habitat contains a high cover of non-native and invasive species.

3.4.1 Gravel Driveway Edge

The area surrounding the edge of the driveway contained several large northern red oak and shortleaf pine canopy trees. The remainder of the species in the sparse tree stratum include eastern redcedar, several ornamental holly species (*Ilex spp.*), sweetgum, pignut hickory (*Carya glabra*), boxelder, willow oak (*Quercus phellos*), and black walnut. The shrub stratum was composed of tree saplings with some thickets of Chinese privet. Additional species observed in the shrub stratum include American holly, Japanese privet (*Ligustrum japonicum*), tulip poplar,

cottonwood, green ash, Bradford pear, and Himalayan hawthorn (*Pyracantha crenulata*). The herbaceous stratum was dominated by a variety of native and non-native weedy species including bigleaf periwinkle, Japanese honeysuckle, Japanese stiltgrass, common chickweed (*Stellaria media*), wild garlic, goldenrod (*Solidago sp.*), wild strawberry (*Fragaria virginiana*), purple deadnettle (*Lamium purpureum*), thistle (*Cirsium sp.*), violet (*Viola sp.*), henbit (*Lamium amplexicaule*), sedge (*Carex sp.*), fescue grass (*Festuca sp.*), broomsedge bluestem (*Andropogon virginicus*), English ivy (*Hedera helix*), blackberry (*Rubus sp.*), and dogfennel (*Eupatorium capillifolium*). Japanese honeysuckle and English ivy were also observed in the vine stratum.

3.4.2 Pipeline Corridor

A maintained corridor for a utility pipeline runs laterally across the southern portion of the study area. This corridor appears to be sprayed or mowed to control woody growth. Only the margins of the corridor contain woody species in the shrub stratum which include staghorn sumac (*Rhus typhina*), sweetgum, Bradford pear, and eastern redcedar. The herbaceous stratum was dominated by Chinese lespedeza (*Lespedeza cuneata*) and blackberry (*Rubus sp.*). Additional species observed in herbaceous stratum include dogfennel, goldenrod (*Solidago sp.*), ironweed (*Vernonia sp.*), wild garlic, Japanese honeysuckle, bedstraw (*Galium sp.*), horsenettle (*Solanum carolinense*), purple deadnettle, Japanese stiltgrass, wild strawberry, broomsedge bluestem, deertongue (*Dichanthelium clandestinum*), exotic wisteria (*Wisteria sp.*), arrowleaf tearthumb (*Polygonum sagittatum*), and switchgrass (*Panicum virgatum*). Species observed in the vine stratum include Japanese honeysuckle, exotic wisteria (*Wisteria sp.*), chocolate-vine (*Akebia quinata*), and multiple species of greenbrier (*Smilax spp.*).

3.4.3 Roadside Margin

The northern edge of the project area is bounded by Byrum Drive. The southern roadside margin consists of the road right-of-way (ROW) and a powerline ROW. The roadside margin is regularly maintained for woody species and ranges from 20-50 feet wide. Within the ROW, a dense cover of weedy, herbaceous species was observed. One eastern hemlock (*Tsuga canadensis*) and a couple of blue spruce (*Picea pungens*) trees were observed along the edge of the roadway. Shrub species observed include eastern redcedar, Japanese privet, winged elm (*Ulms alata*), an ornamental holly (*Ilex sp.*), Chinese privet, staghorn sumac, and Virginia pine. Blackberry (*Rubus sp.*), goldenrod (*Solidago sp.*), and Japanese honeysuckle were observed as the dominant species in the herbaceous stratum. Additional species observed in the herbaceous layer include curly dock (*Rumex crispus*), late purple aster (*Symphyotrichum patens*), geranium (*Geranium sp.*), yellow foxtail (*Setaria pumila*), wild garlic,

dandelion (*Taraxacum officinale*), vetch (*Vicia sp.*), Queen Anne's lace (*Daucus carota*), fescue (*Festuca sp.*), narrowleaf plantain (*Plantago lanceolata*), common rush, bigleaf periwinkle, clematis (*Clematis sp.*), pokeberry (*Phytolacca americana*), broomsedge bluestem, iris (*Iris sp.*), thistle (*Cirsium sp.*), Adam's needle (*Yucca filamentosa*), bushy bluestem, and multiple other asters, not of the *Helianthus* or *Echinacea* genera.

3.4.4 Cleared Hilltop

In the southeast corner of the project area, there is disturbed hilltop area, half of which was recently stabilized with seed and straw. An undetermined species of grass was beginning to sprout at the time of the survey. The remainder of this open area was covered with kudzu (*Pueraria montana*).

3.5 Soils

Soils mapped by the Natural Resources Conservation Service (NRCS) Mecklenburg County Soil Survey are listed in Table 2 and shown in Figure 4 (NRCS 2019).

Table 2. USDA Soil Units occurring within the project boundary.

Map Unit Symbol	Map Unit Name
CeB2	Cecil sandy clay loam, 2-8% slopes, moderately eroded
CeD2	Cecil sandy clay loam, 8-15% slopes, moderately eroded
EnB	Enon sandy loam, 2-8% slopes
MO	Monacan loam, 2-8% slopes, frequently flooded
PaE	Pacolet sandy loam, 15-25% slopes
W	Water

4.0 PROTECTED SPECIES

The following is a brief description of each federally listed species included in the survey, its recognized habitat, and comments regarding survey results for that species.

4.1 Bald Eagle

Bald eagles (*Haliaeetus leucocephalus*) were removed from the endangered species list in August 2007 because their populations recovered sufficiently. Bald and Golden eagles are protected under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Act (Eagle Act)

Distinguished by a white head and white tail feathers, bald eagles are powerful, brown birds that may weigh 14 pounds and have a wingspan of 8 feet. Male eagles are smaller, weighing as much as 10 pounds and have a wingspan of 6 feet. Sometimes confused with golden eagles, bald eagles are mostly dark brown until they are four to five years old and acquire their characteristic coloring.

Bald eagles live near rivers, lakes, and marshes where they can find fish, their staple food. Bald eagles will also feed on waterfowl, turtles, rabbits, snakes, and other small animals and carrion. Bald eagles require a good food base, perching areas, and nesting sites. Their habitat includes estuaries, large lakes, reservoirs, rivers, and some seacoasts. In winter, the birds congregate near open water in tall trees for spotting prey and night roosts for sheltering.

Based on a desktop review using 2019 aerial imagery, the reach of Coffey Creek and the two small ponds within the project boundary are likely too small and urban to serve as a suitable feeding source for bald eagles. Bald Eagles typically nest within 1-mile of suitable feeding sources. A review of the area within a mile of the project was found to contain multiple potential feeding sources: Whippoorwill Lake, Eagle Lake, and Watt Lake. CEC conducted a foot survey of the study area to identify possible eagle nest, due to the proximity of potential feeding sources.

No bald eagle nests were observed on site during the foot survey. Additionally, a review of the NCNHP database on December 16, 2019 revealed no known occurrences of this species within 1.0 mile of the project study area. The closest recorded observation of bald eagles in the NCNHP database is approximately four miles to the west along the Catawba River.

Due to the results of the survey, lack of known occurrences, and minimal impact anticipated for this project, it is the opinion of CEC that the proposed project is not likely to adversely affect the bald eagle.

4.2 Carolina Heelsplitter

The Carolina heelsplitter (*Lasmigona decorata*) was first described in 1852. It has an ovate, trapezoid-shaped shell. The outer surface of the shell varies from greenish brown to dark brown in color, and shells from younger specimens have faint greenish brown or black rays. The nacre (inside surface) is often pearly white to bluish white, grading to orange in the deepest part of the shell. However, in older specimens the entire nacre may be a mottled pale orange. The shell of the largest known specimen of the species measures 4.6 inches in length.



The Carolina heelsplitter requires cool, clean, well-oxygenated water. Stable, silt-free stream bottoms appear to be critical to the species. Typically, stable areas occur where the stream banks are well-vegetated with trees and shrubs.

In Mecklenburg county, the Carolina heelsplitter is known by the USFWS and WRC to occur in the Goose Creek watershed. The Goose Creek watershed is in the Pee Dee River watershed. The project site is in Catawba River watershed, on the other side of the county.

The reach of Coffey Creek that is within the project boundary is affected by excessive sedimentation that has embedded much of the native substrate. The stream and its banks appear to be highly unstable, likely a factor of the amount of impervious surface in the urban watershed. It is of the opinion of CEC that suitable habitat does not exist on site for the Carolina heelsplitter and that this project will not affect this species.

4.3 Michaux's Sumac

Michaux's sumac (*Rhus michauxii*) is a rhizomatous, densely hairy shrub, with erect stems from 1 - 3 feet (ft) (30.5 – 91 centimeters, cm) in height. The compound leaves contain evenly serrated, oblong to lanceolate, acuminate leaflets. Most plants are unisexual; however, more recent observations have revealed plants with both male and female flowers on one plant. The flowers are small, borne in a terminal, erect, dense cluster, and colored greenish yellow to white. Flowering usually occurs from June to July; while the fruit, a red drupe, is produced through the months of August to October.



Michaux's sumac grows in sandy or rocky open woods in association with basic soils. Apparently, this plant survives best in areas where some form of disturbance has provided an open area. Several populations in North Carolina are on highway rights-of way, roadsides, or on the edges of artificially maintained clearings. Two other populations are in areas with periodic fires, and two populations exist on sites undergoing natural succession.

Suitable habitat for Michaux's sumac was not identified on site. The soils on site were not sandy and the forested areas had dense canopy cover. The maintained/disturbed areas had poor soils with dense ground cover. Although out of the optimal survey window (May – October), CEC biologists did not observe any Michaux's sumac individuals during the survey. Additionally, the recovery plan published by the USFWS in 1993 lists no known extant populations in Mecklenburg County. It is the opinion of CEC that this project will not affect Michaux's sumac.

4.4 Northern Long-eared Bat

The Northern long-eared bat (NLEB) (*Myotis septentrionalis*), is a medium-sized bat about 3 to 3.7 inches in length but with a wingspan of 9 to 10 inches. As its name suggests, this bat is distinguished by its long ears, particularly as compared to other bats in its genus, *Myotis*, which are actually bats noted for their small ears (*Myotis* means mouse-eared). The NLEB is found across much of the eastern and north central United States and all Canadian provinces from the Atlantic coast west to the southern Northwest Territories and eastern British Columbia. NLEBs spend winter hibernating in caves and mines, called hibernacula. They typically use large caves or mines with large passages and entrances; constant temperatures; and high humidity with no air currents. Summer habitat for the NLEB consists of the cavities, hollows, cracks, or loose bark of live or dead trees typically greater than three inches DBH (diameter at breast height).

No naturally occurring suitable wintering habitat for the NLEB exists within the property boundary. Potentially suitable summer habitat for NLEBs was observed on site in the form of multiple large snags and rocky outcrops in and around the riparian corridor. CEC biologists did not conduct a bat survey to confirm or deny the presence of protected bat species.

CEC consulted the UFWS's maps of North Carolina counties that contain confirmed hibernation or maternity sites. Mecklenburg County does not contain any confirmed hibernation or maternity sites. Additionally, the NCNHP report does not list any known occurrences of the NLEB within a one-mile radius of the project boundary. Therefore, satisfying the 4(d) rule and consultation with USFWS is not required. It is of the opinion of CEC that the project is unlikely to adversely affect the NLEB. The UFWS recommends avoiding tree clearing during NLEB pup season (June 1 to July 31) and/or active season (April 1 to October 31) as a voluntary conservation measure. This project is not likely to affect the NLEB.

4.5 Rusty Patched Bumble Bee

Rusty patched bumble bee (*Bombus affinis*), is listed under Historic Record Status in Mecklenburg County. Rusty patched bumble bees once occupied grasslands and tallgrass prairies of the Upper Midwest and Northeast, but most grasslands and prairies have been lost, degraded, or fragmented by conversion to other uses. Bumble bees need areas that provide nectar and pollen from flowers, nesting sites (underground and abandoned rodent cavities or clumps of grasses), and overwintering sites for hibernating queens (undisturbed soil). Rusty patched bumble bees live in colonies that include a single queen and female workers. The colony produces males and new queens in late summer. Queens are the largest bees in the colony, and workers are the smallest. All rusty patched bumble bees have entirely black heads, but only workers and males have a rusty reddish patch centrally located on the back. Bumble bees gather pollen and nectar from a variety

of flowering plants. The rusty patched emerges early in spring and is one of the last species to go into hibernation. It needs a constant supply and diversity of flowers blooming throughout the colony's long life, April through September.

Potentially suitable habitat for rusty patched bumble bee was not found on site. The only areas that contained relatively abundant wildflower cover are located within the maintained/disturbed corridors. These corridors are frequently disturbed by activities such as vehicle traffic, mowing, clearing, or herbicide application. It is our understanding that the UFWS assume that the state of North Carolina is unoccupied by the rusty patched bumble bee.

It is the opinion of CEC that the project is not likely to have an adverse effect on the rusty patched bumble bee.

4.6 Schweinitz's Sunflower

Schweinitz's sunflower (*Helianthus schweinitzii*) is a perennial that regularly grows approximately 6.5 feet (2.0 meters) tall (though it can be shorter if young or injured) and can occasionally reach heights of 16 feet (4.8 meters). The stem is purplish in color, and the upper third bears secondary branches at 45-degree angles. The leaves are arranged in pairs on the lower part of the stem but usually occur singly (or alternate) on the upper parts. Leaves are attached to the stem at right angles, and the tips of the leaves tend to droop. The leaves are thick and stiff, with a rough upper surface. The upper leaf surfaces have broad spiny hairs that are directed toward the tip and soft white hairs cover the underside. The plant produces small yellow flowers from late August until frost. This species is able to colonize through the dispersal of seeds that readily germinate without a dormant period.



Schweinitz's sunflower occurs in full to partial sun and is found in areas with poor soils, such as thin clays that vary from wet to dry. It is believed that this species once occurred in natural forest openings or grasslands. Many of the remaining populations occur along roadsides.

Potentially suitable habitat for the Schweinitz's sunflower was found on site. Several maintained/disturbed areas along the roadside and pipeline corridor were observed as having suitable habitat (Figure 5). These areas had poor soils, moderate herbaceous cover, minimal competition from woody species, and experience full-partially full sun.

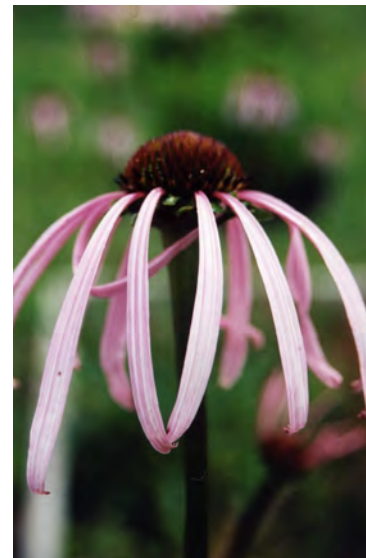
No *Helianthus schweinitzii* individuals were identified during the surveys. Although out of the flowering window, the Schweinitz's sunflowers at Latta Plantation were still erect and intact on the morning of the second survey (January

22, 2020). The Schweintiz's sunflowers in the reference population had enough identifiable structure (seed heads, stems, leaves) to be able to confidently identify the target species from other *Helianthus* species (Photolog: Photo 7).

Based on observations of this species and associated habitat in a proximal reference location hours before the second survey, in which no *Helianthus schweinitzii* individuals were identified within the project boundary, it is of the opinion of CEC that this project would not have an effect on *Helianthus schweinitzii*.

4.7 Smooth Coneflower

Smooth coneflower (*Echinacea laevigata*) is a perennial herb in the Aster family (*Asteraceae*) that grows up to 3.3 feet (ft) (1 meter; m) tall from a vertical root stock. The large elliptical to broadly lanceolate basal leaves may reach 8 inches (in) (20 centimeters; cm) in length and 3.0 in (7.5 cm) in width and taper into long petioles toward the base. They are smooth to slightly rough in texture. The stems are smooth, with few leaves. The mid-stem leaves are smaller than the basal leaves and have shorter petioles. Flower heads are usually solitary. The rays of the flowers (petal-like structures) are light pink to purplish in color, usually drooping, and 2 – 3.2 in (5 - 8 cm) long. Flowering occurs from late May through mid July and fruits develop from late June to September. The fruiting structures often persist through the fall.



Smooth coneflower is typically found in open woods, glades, cedar barrens, roadsides, clearcuts, dry limestone bluffs, and power line rights-of-way, usually on magnesium and calcium rich soils associated with amphibolite, dolomite or limestone (in Virginia), gabbro (in North Carolina and Virginia), diabase (in North Carolina and South Carolina), and marble (in South Carolina and Georgia). Smooth coneflower occurs in plant communities that have been described as xeric hardpan forests, diabase glades or dolomite woodlands. Optimal sites are characterized by abundant sunlight and little competition in the herbaceous layer. Natural fires, as well as large herbivores, historically influenced the vegetation in this species' range. Many of the herbs associated with Smooth coneflower are also sun-loving species that depend on periodic disturbances to reduce the shade and competition of woody plants.

Suitable habitat was not identified within the project boundary for the smooth coneflower. Although some maintained clearings are present of site, those areas contained poor, rocky soils that are not typical of where smooth coneflower is

found. The herbaceous layer was observed to be moderately dense in these areas and would likely be too competitive for the smooth coneflower.

No *Echinacea* individuals were observed during the survey, although it was conducted outside of the USFWS optimal survey window (late may – October). It is the opinion of CEC that this project is unlikely to adversely affect the smooth coneflower.

4.8 Tall Larkspur

Tall larkspur (*Delphinium exaltatum*) is a perennial herb of the buttercup family (*Ranunculaceae*) that typically grows 2 – 6 feet (0.7 - 2.0 meters) tall. The stems are round and smooth. Each leaf has a petiole that goes directly to the main stem. The leaves are segmented into 3-5 sections, each section being deeply lobed. The leaves closer to the base have more lobes and longer petioles than those nearer to the inflorescence, giving the tall larkspur a conical shape. The purple flowers of the tall larkspur are laterally orientated and have a straight spur, opposite of the flower's opening. The tall larkspur can be differentiated from other larkspurs by the height of its influences in addition to its relatively broader, cuneate leaf sections. This species typically flowers sometime between July and September and is pollinated by insects.



The tall larkspur is usually found on dry, rocky slopes in semi-open forests and barrens that have well drained calcareous or mafic soils. This species usually grows in full sun but can tolerate partial shade and small amounts of disturbance. Populations have been found along the edges of artificial clearings that mimic glade or barren habitats. Red cedar has been known to overcrowd this species habitat.

Suitable habitat for the tall larkspur was not identified within the project boundary. The areas on site that have a relatively open canopy experience frequent disturbance as a form of regular maintenance. The soils of these areas are not those in which tall larkspur is known to occupy.

Based on the low accuracy and historic nature of the EO in combination with the lack of potentially suitable habitat, it is of the opinion of CEC that this project will have no effect on the tall larkspur.

5.0 CONCLUSION AND RECOMMENDATIONS

During completion of threatened and endangered species habitat assessments for the South Drainage Area, CEC observed potentially suitable habitat for Schweinitz's sunflower. Multiple surveys were conducted within these habitats to determine the presence or absence of Schweinitz's sunflower. Although outside of the USFWS optimal survey window (late August – October), Schweinitz's sunflowers were easily identifiable at a documented reference population near the project site. The reference population was visited prior to the second survey for the Schweinitz's sunflower, in which no *Helianthus Schweinitzii* individuals were observed within the project boundaries. Potential flora were identified to the taxonomic unit level necessary to determine if the observed specimen was a protected species.

As such, development of South Drainage Area is not likely to adversely affect federally threatened or endangered species listed in Mecklenburg County. This study also investigated the possibility of tall larkspur (listed as state endangered) occurring within the project boundary. The findings of the survey indicate that tall larkspur is not likely to be affected by the development of the South Drainage Area due to a lack of suitable habitat.

Because of the transitory nature of some of the listed threatened and endangered species and the particular flower/fruiting periods of some plants; it is possible that endangered species populations and locations may change over time. Therefore, any potential findings at a later date should be fully investigated and coordinated with appropriate agencies to prevent potential adverse impacts.

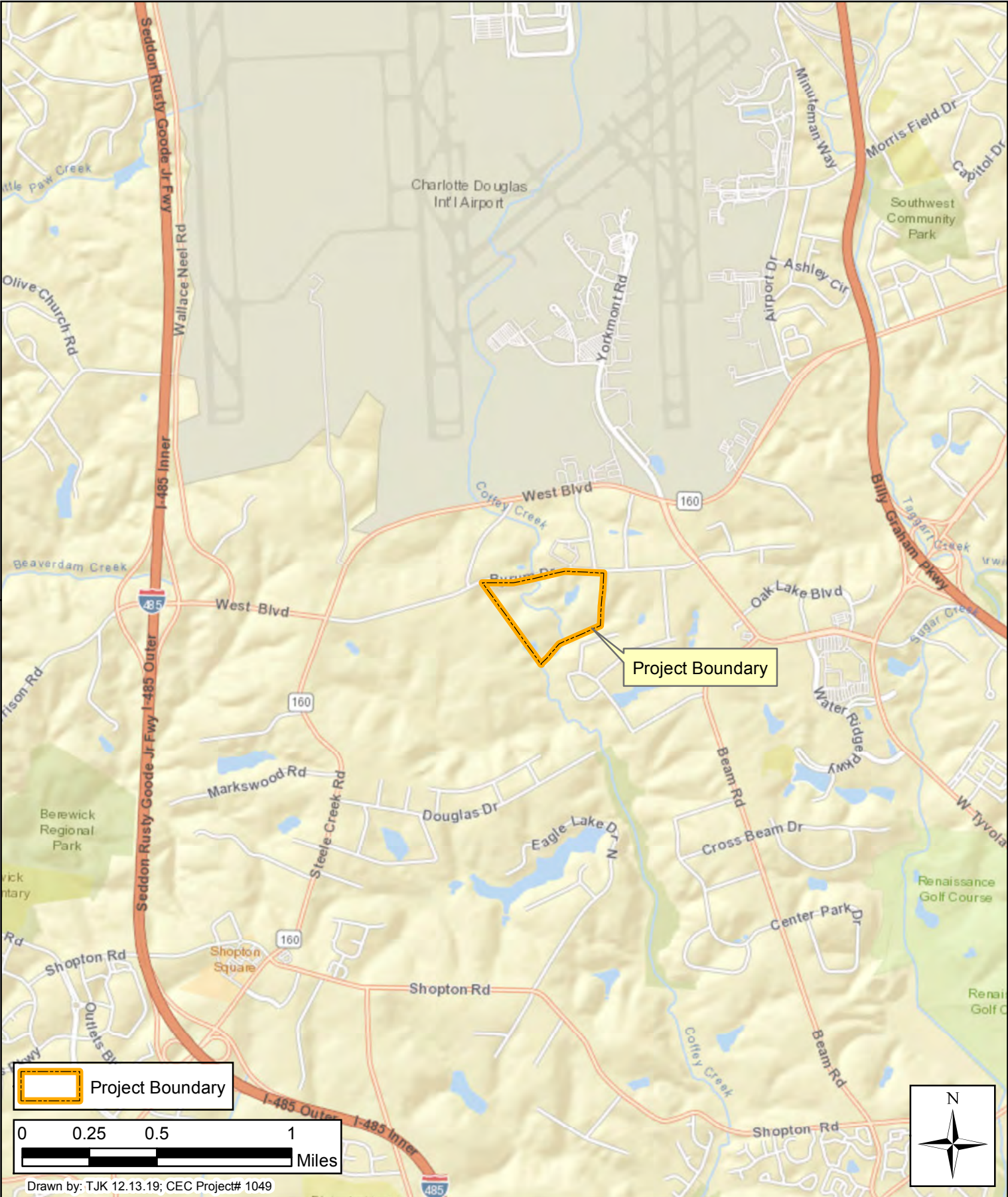
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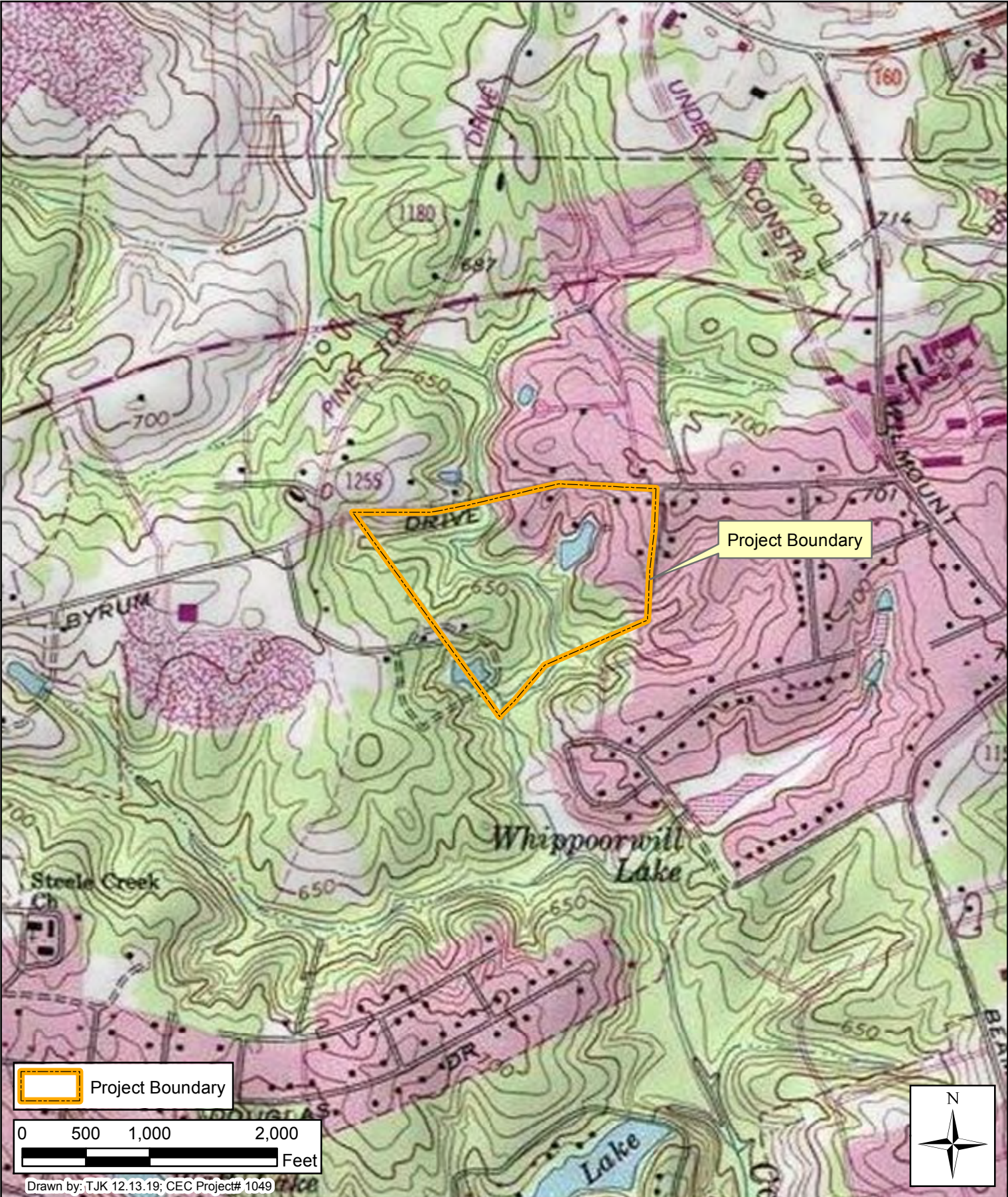
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Figures

CLT 4th Runway: Crossfield Taxiway Drainage Area (+/- 58 AC)



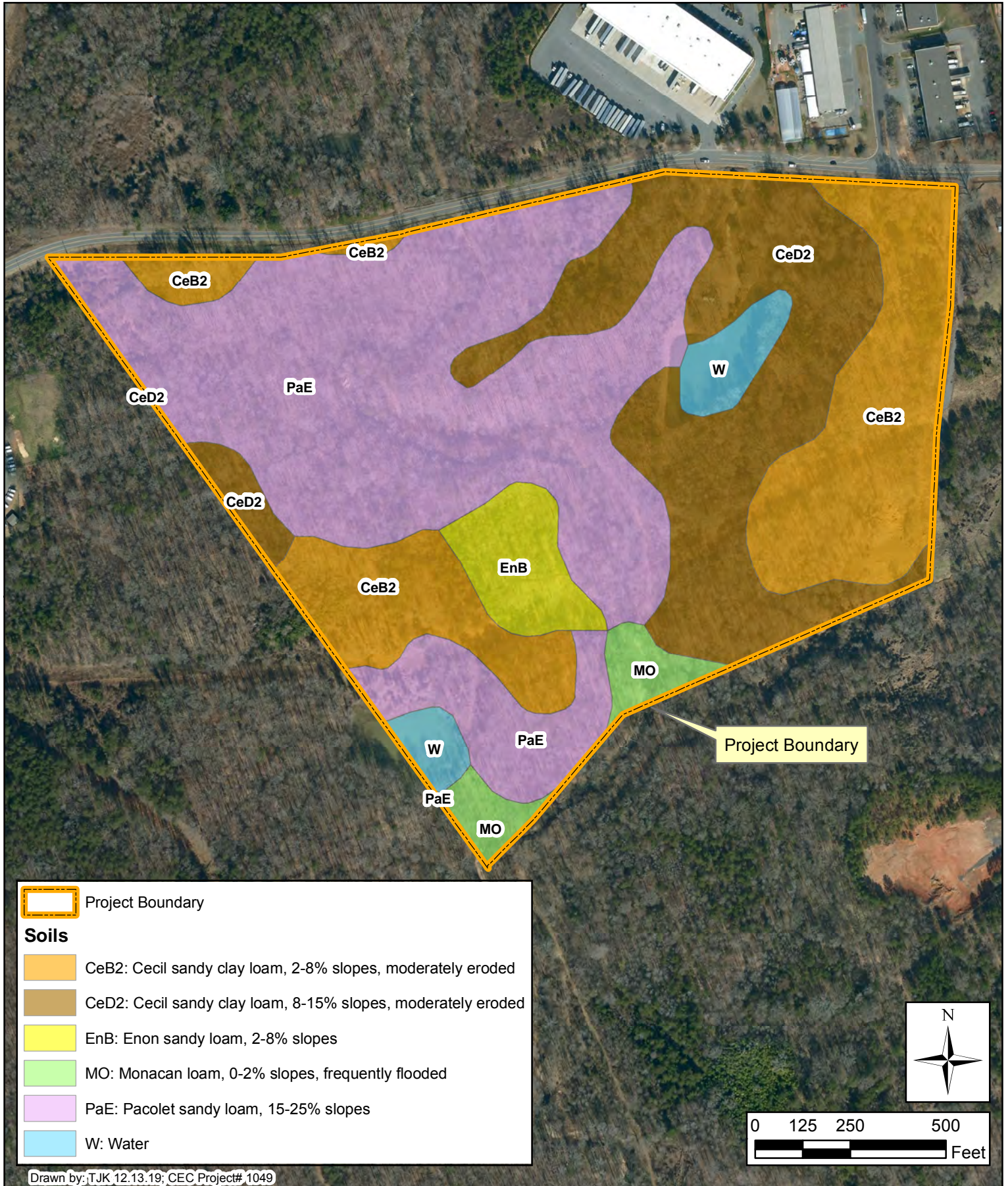
CLT 4th Runway: Crossfield Taxiway Drainage Area (+/- 58 AC)



CLT 4th Runway: Crossfield Taxiway Drainage Area (+/- 58 AC)



CLT 4th Runway: Crossfield Taxiway Drainage Area (+/- 58 AC)



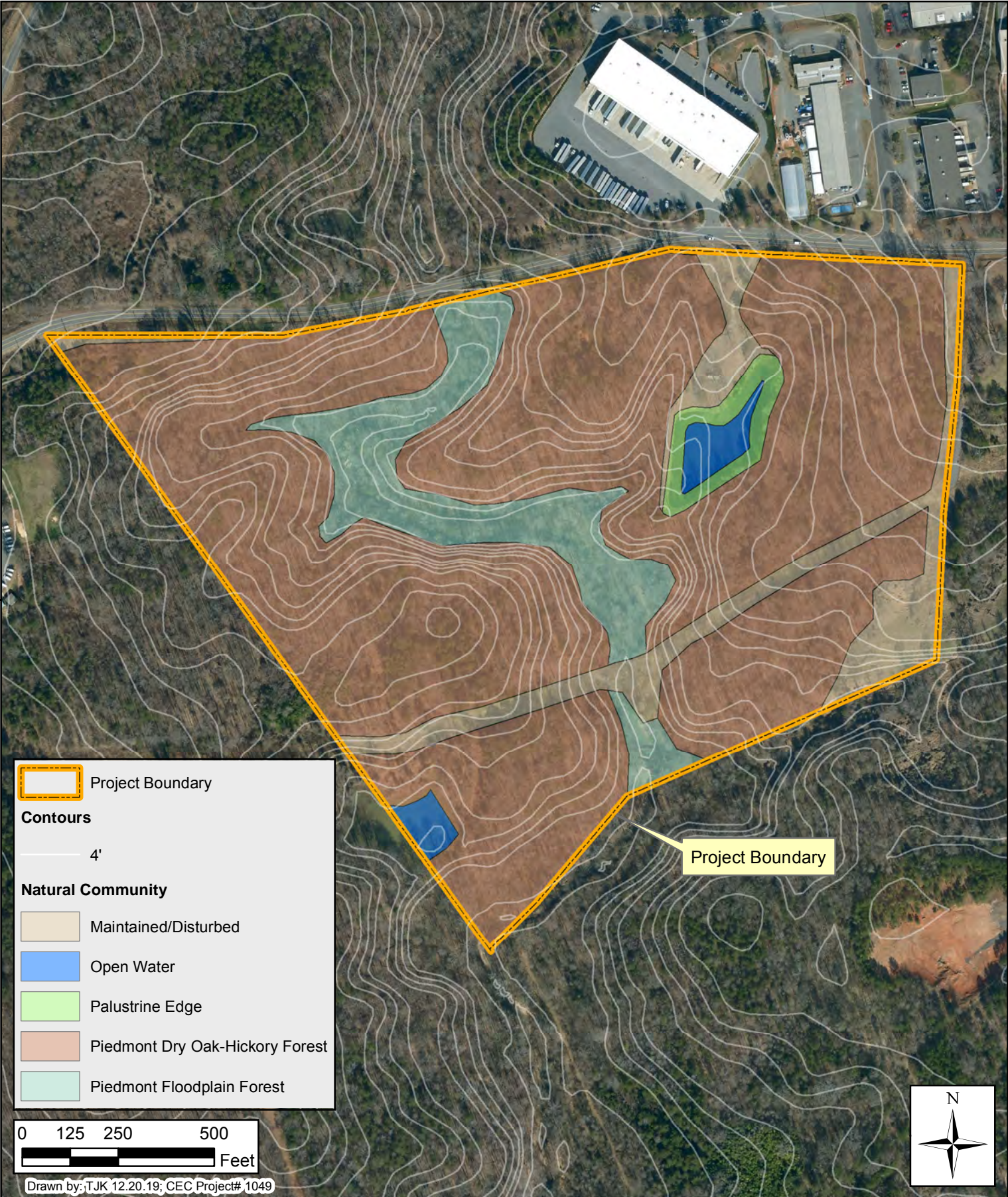
Mecklenburg County,
North Carolina

ClearWater

32 Clayton Street
Asheville, North Carolina 28801

USDA Soils Maps
NRCS Web Soil Survey
Figure 4

CLT 4th Runway: Crossfield Taxiway Drainage Area (+/- 58 AC)



Appendix A:

US Fish and Wildlife Service County
Database Information and NC Natural
Heritage Program Data

U.S. Fish & Wildlife Service

Endangered Species, Threatened Species, Federal Species of Concern, and Candidate Species,

Mecklenburg County, North Carolina



Updated: 06-27-2018

Common Name	Scientific name	Federal Status	Record Status
Vertebrate:			
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGPA	Current
Carolina darter	<i>Etheostoma collis collis</i>	FSC	Current
Northern long-eared bat	<i>Myotis septentrionalis</i>	T	Probable/Potential
Invertebrate:			
Carolina creekshell	<i>Villosa vaughaniana</i>	FSC	Current
Carolina heelsplitter	<i>Lasmigona decorata</i>	E	Current
Rusty-patched bumble bee	<i>Bombus affinis</i>	E	Historic
Vascular Plant:			
Carolina Hemlock	<i>Tsuga caroliniana</i>	ARS	Historic
Georgia aster	<i>Symphotrichum georgianum</i>	C	Current
Michaux's sumac	<i>Rhus michauxii</i>	E	Current
Piedmont aster	<i>Eurybia mirabilis</i>	FSC	Current
Schweinitz's sunflower	<i>Helianthus schweinitzii</i>	E	Current
Smooth coneflower	<i>Echinacea laevigata</i>	E	Current

Nonvascular Plant:**Lichen:****Definitions of Federal Status Codes:**

E = endangered. A taxon "in danger of extinction throughout all or a significant portion of its range."

T = threatened. A taxon "likely to become endangered within the foreseeable future throughout all or a significant portion of its range."

C = candidate. A taxon under consideration for official listing for which there is sufficient information to support listing. (Formerly "C1" candidate species.)

BGPA =Bald and Golden Eagle Protection Act. See below.

ARS = [At Risk Species](#). Species that are Petitioned, Candidates or Proposed for Listing under the Endangered Species Act. Consultation under Section 7(a)(2) of the ESA is not required for Candidate or Proposed species; although a Conference, as described under Section 7(a)(4) of the ESA is recommended for actions affecting species proposed for listing.

FSC=Federal Species of Concern. FSC is an informal term. It is not defined in the federal Endangered Species Act. In North Carolina, the Asheville and Raleigh Field Offices of the US Fish and Wildlife Service (Service) define Federal Species of Concern as those species that appear to be in decline or otherwise in need of conservation and are under consideration for listing or for which there is insufficient information to support listing at this time. Subsumed under the term "FSC" are all species petitioned by outside parties and other selected focal species identified in Service strategic plans, State Wildlife Action Plans, or Natural Heritage Program Lists.

T(S/A) = threatened due to similarity of appearance. A taxon that is threatened due to similarity of appearance with another listed species and is listed for its protection. Taxa listed as T(S/A) are not biologically endangered or threatened and are not subject to Section 7 consultation. See below.

EXP = experimental population. A taxon listed as experimental (either essential or nonessential).

Experimental, nonessential populations of endangered species (e.g., red wolf) are treated as threatened species on public land, for consultation purposes, and as species proposed for listing on private land.

P = proposed. Taxa proposed for official listing as endangered or threatened will be noted as "PE" or "PT", respectively.

Bald and Golden Eagle Protection Act (BGPA):

In the July 9, 2007 Federal Register(72:37346-37372), the bald eagle was declared recovered, and removed (de-listed) from the Federal List of Threatened and Endangered wildlife. This delisting took effect August 8, 2007. After delisting, the Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. 668-668d) becomes the primary law protecting bald eagles. The Eagle Act prohibits take of bald and golden eagles and provides a statutory definition of "take" that includes "disturb". The USFWS has developed National Bald Eagle Management Guidelines to provide guidance to land managers, landowners, and others as to how to avoid disturbing bald eagles. For mor information, visit <http://www.fws.gov/migratorybirds/baldeagle.htm>

Threatened due to similarity of appearance(T(S/A)):

In the November 4, 1997 Federal Register (55822-55825), the northern population of the bog turtle (from New York south to Maryland) was listed as T (threatened), and the southern population (from Virginia south to Georgia) was listed as T(S/A) (threatened due to similarity of appearance). The T(S/A) designation bans the collection and interstate and international commercial trade of bog turtles from the southern population. The T(S/A) designation has no effect on land management activities by private landowners in North Carolina, part of the southern population of the species. In addition to its official status as T(S/A), the U.S. Fish and Wildlife Service considers the southern population of the bog turtle as a Federal species of concern due to habitat loss.

Definitions of Record Status:

Current - the species has been observed in the county within the last 50 years.

Historic - the species was last observed in the county more than 50 years ago.

Obscure - the date and/or location of observation is uncertain.

Incidental/migrant - the species was observed outside of its normal range or habitat.

Probable/potential - the species is considered likely to occur in this county based on the proximity of known records (in adjacent counties), the presence of potentially suitable habitat, or both.



Roy Cooper, Governor
Susi Hamilton, Secretary
Walter Clark, Director, Land and Water Stewardship

NCNHDE-10945

December 16, 2019

ClearWater Environmental Consultants, Inc.
ClearWater Environmental Consultants, Inc.
32 Clayton Street
Asheville, NC 28801
RE: CLT 4th Runway - Crossfield Taxiway Drainage Area; 1049

Dear ClearWater Environmental Consultants, Inc.:

The North Carolina Natural Heritage Program (NCNHP) appreciates the opportunity to provide information about natural heritage resources for the project referenced above.

Based on the project area mapped with your request, a query of the NCNHP database indicates that there are no records for rare species, important natural communities, natural areas, and/or conservation/managed areas within the proposed project boundary. Please note that although there may be no documentation of natural heritage elements within the project boundary, it does not imply or confirm their absence; the area may not have been surveyed. The results of this query should not be substituted for field surveys where suitable habitat exists. In the event that rare species are found within the project area, please contact the NCNHP so that we may update our records.

The attached 'Potential Occurrences' table summarizes rare species and natural communities that have been documented within a one-mile radius of the property boundary. The proximity of these records suggests that these natural heritage elements may potentially be present in the project area if suitable habitat exists. Tables of natural areas and conservation/managed areas within a one-mile radius of the project area, if any, are also included in this report.

If a Federally-listed species is found within the project area or is indicated within a one-mile radius of the project area, the NCNHP recommends contacting the US Fish and Wildlife Service (USFWS) for guidance. Contact information for USFWS offices in North Carolina is found here:
<https://www.fws.gov/offices/Directory/ListOffices.cfm?statecode=37>.

Please note that natural heritage element data are maintained for the purposes of conservation planning, project review, and scientific research, and are not intended for use as the primary criteria for regulatory decisions. Information provided by the NCNHP database may not be published without prior written notification to the NCNHP, and the NCNHP must be credited as an information source in these publications. Maps of NCNHP data may not be redistributed without permission.

The NC Natural Heritage Program may follow this letter with additional correspondence if a Dedicated Nature Preserve, Registered Heritage Area, Clean Water Management Trust Fund easement, or Federally-listed species are documented near the project area.

If you have questions regarding the information provided in this letter or need additional assistance, please contact Rodney A. Butler at rodney.butler@ncdcr.gov or 919-707-8603.

Sincerely,
NC Natural Heritage Program

Natural Heritage Element Occurrences, Natural Areas, and Managed Areas Within a One-mile Radius of the Project Area
 CLT 4th Runway - Crossfield Taxiway Drainage Area
 Project No. 1049
 December 16, 2019
 NCNHDE-10945

Element Occurrences Documented Within a One-mile Radius of the Project Area

Taxonomic Group	EO ID	Scientific Name	Common Name	Last Observation Date	Element Occurrence Rank	Accuracy	Federal Status	State Status	Global Rank	State Rank
Vascular Plant	13743	Delphinium exaltatum	Tall Larkspur	1800s	Hi?	5-Very Low	---	Endangered	G3	S2

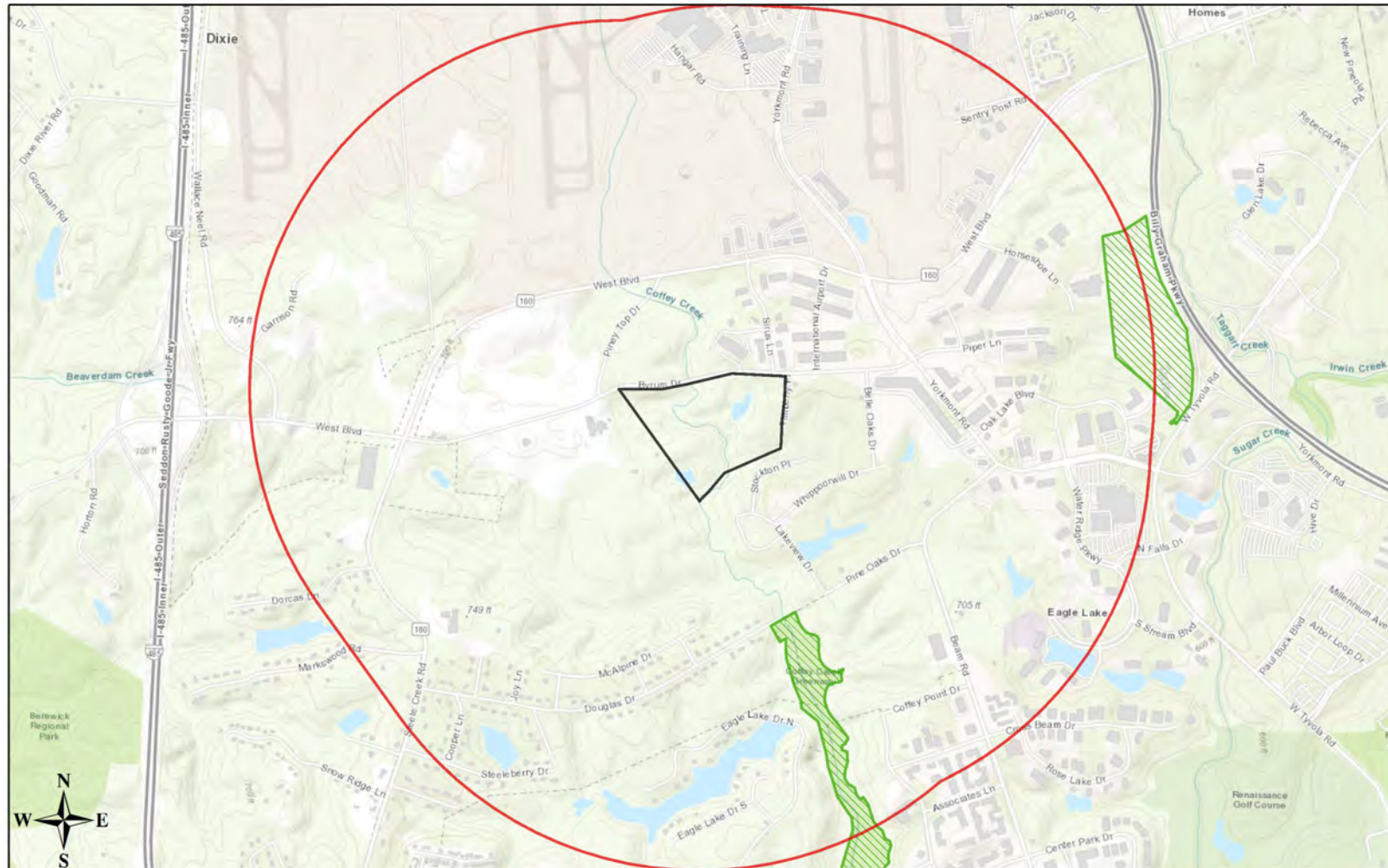
No Natural Areas are Documented Within a One-mile Radius of the Project Area

Managed Areas Documented Within a One-mile Radius of the Project Area

Managed Area Name	Owner	Owner Type
Coffey Creek Greenway	Mecklenburg County	Local Government
Former Charlotte Correctional Center	NC Department of Public Safety	State

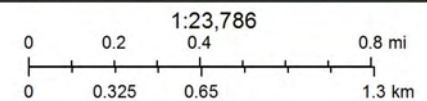
Definitions and an explanation of status designations and codes can be found at <https://ncnhde.natureserve.org/content/help>. Data query generated on December 16, 2019; source: NCNHP, Q4 Oct 2019. Please resubmit your information request if more than one year elapses before project initiation as new information is continually added to the NCNHP database.

NCNHDE-10945: CLT 4th Runway - Crossfield Taxiway Drainage Area



December 16, 2019

- Project Boundary
- Buffered Project Boundary
- Managed Area (MAREA)



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Appendix B:

Photo Log



Photo 1. Piedmont dry oak-hickory forest.



Photo 2. Piedmont floodplain forest.



Photo 3. Coffey Creek.



Photo 4. Palustrine edge.



Photo 5. Maintained/disturbed – pipeline corridor. Potentially suitable Schweinitz's sunflower habitat.



Photo 6. Maintained/disturbed – roadside. Potentially suitable Schweinitz's sunflower habitat.



Photo 7. Reference habitat and population of Schweinitz's sunflower at Latta Nature Preserve.



Photo 8. Second survey for Schweinitz's sunflower in the maintained/disturbed habitat.

Attachment 3

USFWS Letter: ER 18/144,
Proposed Capacity
Enhancements and Other
Improvements at CLT



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Asheville Field Office
160 Zillicoa Street Suite #B
Asheville, North Carolina 28801

April 4, 2018



Ms. Kristi Ashley
FAA Environmental Specialist
Memphis Airports District Office
2600 Thousand Oaks Blvd., Ste. 2250
Memphis, TN 38118

Dear Ms. Ashley:

Subject: ER 18/144, Proposed Capacity Enhancements and Other Improvements at Charlotte Douglas International Airport, Charlotte, Mecklenburg County, North Carolina

We received (via email) the Notice of Intent for the subject project on March 22, 2018. The following comments are provided in accordance with the provisions of the National Environmental Policy Act (42 U.S.C. § 4321 et seq.) and section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act).

Because the project area provides little natural habitat, we have no major concerns with the project. However, the increase in impervious surfaces will contribute to the quantity and quality of storm water entering project area waterways. Recent studies ¹have shown that areas of 10- to 20-percent impervious surface (such as roofs, roads, and parking lots) double the amount of storm-water runoff compared to natural cover and decrease deep infiltration (groundwater recharge) by 16 percent. At 35- to 50-percent impervious surface, runoff triples, and deep infiltration is decreased by 40 percent. Above 75-percent impervious surface, runoff is 5.5 times higher than natural cover, and deep infiltration is decreased by 80 percent. Additionally, the adequate treatment of storm water in development areas is essential for the protection of water quality and aquatic habitat in developing landscapes. Additionally, these impervious surfaces collect pathogens, metals, sediment, and chemical pollutants and quickly transmit them (via storm-water runoff) to receiving waters. According to the Environmental Protection Agency, this nonpoint-source pollution is one of the major threats to water quality in the United States, posing one of the greatest threats to aquatic life, and is also linked to chronic and acute illnesses in human populations from exposure through drinking water and contact recreation.

Increased storm-water runoff also directly damages aquatic and riparian habitat, causing stream-bank and stream-channel scouring. In addition, impervious surfaces reduce groundwater

recharge, resulting in even lower than expected stream flows during drought periods, which can induce potentially catastrophic effects for fish, mussels, and other aquatic life. Accordingly, we recommend that all new developments, regardless of the percentage of impervious surface area they will create, implement storm-water-retention and -treatment measures designed to replicate and maintain the hydrograph at the preconstruction condition in order to avoid any additional impacts to habitat quality within the watershed.

We recommend the use of low-impact-development techniques², such as reduced road widths, grassed swales in place of curb and gutter, rain gardens, and wetland retention areas, for retaining and treating storm-water runoff rather than the more traditional measures, such as large retention ponds, etc. These designs often cost less to install and significantly reduce environmental impacts from residential development.

Where detention ponds are used, storm-water outlets should drain through a vegetated area prior to reaching any natural stream or wetland area. Detention structures should be designed to allow for the slow discharge of storm water, attenuating the potential adverse effects of storm-water surges; thermal spikes; and sediment, nutrient, and chemical discharges. Also, because the purpose of storm-water-control measures is to protect streams and wetlands, no storm-water-control measures or best management practices should be installed within any stream (perennial or intermittent) or wetland.

We also recommend that consideration be given to the use of pervious materials (i.e., pervious concrete, interlocking/open paving blocks, etc.) for the construction of roads, driveways, sidewalks, etc. Pervious surfaces minimize changes to the hydrology of the watershed and can be used to facilitate groundwater recharge. Pervious materials are also less likely to absorb and store heat and allow the cooler soil below to cool the pavement. Additionally, pervious concrete requires less maintenance and is less susceptible to freeze/thaw cracking due to large voids within the concrete.

According to our records and a review of the information you provided, no federally listed species or their habitats occur in the project area. Therefore, we believe the requirements under section 7 of the Act are fulfilled. However, obligations under section 7 of the Act must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered, (2) this action is subsequently modified in a manner that was not considered in this review, or (3) a new species is listed or critical habitat is determined that may be affected by the identified action.

We appreciate the opportunity to provide these comments. If we can be of assistance or if you have any questions, please contact Mr. Allen Ratzlaff of our staff at 828/258-3939, Ext. 229. In any future correspondence concerning this project, please reference our Log Number 4-2-18-204.

E-Copy:

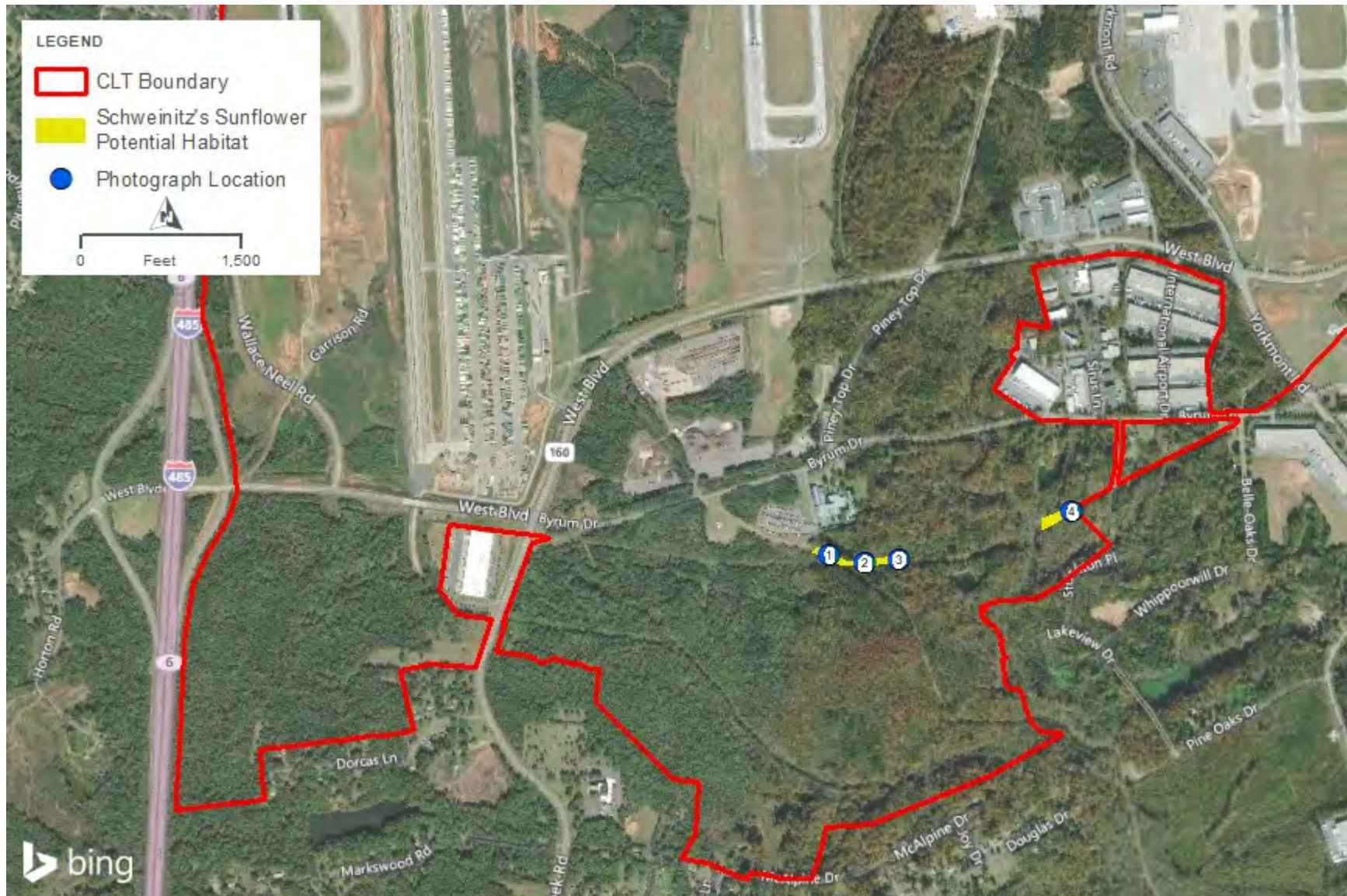
Olivia Munzer, North Carolina Wildlife Resources Commission, olivia.munzer@ncwildlife.org

¹ Federal Interagency Stream Restoration Working Group (15 federal agencies of the United States Government). Published October 1998, Revised August 2001. Stream Corridor Restoration: Principles, Processes, and Practices. GPO Item No. 0120-A; SuDocs No. A 57.6/2:EN 3/PT.653. ISBN-0-934213-59-3.

² We recommend visiting the Environmental Protection Agency's Web site (<http://www.epa.gov/polluted-runoff-nonpoint-source-pollution/urban-runoff-low-impact-development>) for additional information and fact sheets regarding the implementation of low-impact-development techniques.

On March 6, 2020, a site visit with the U.S. Army Corp of Engineers was conducted in the south drainage area. During that site visit, the area formerly identified as potential habitat for Schweinitz's sunflower, has been totally cleared, re-seeded with grass by the utility and no longer appears as suitable habitat. Photos are included on the following pages of the area during October 2019 (flowering survey window) and on March 6, 2020.

Email from Kelly Thames, PWS, Environmental Project Manager, HDR, to Amber Leathers, A.A.E., ACE, Planning and Environmental Manager, Charlotte Douglas International Airport.





Photograph 1 – Gas line easement facing east – October, 2019



Photograph 2 – Gas line easement facing east – October, 2019



Photograph 3 – Gas line easement facing east – October, 2019



Photograph 4 – Gas line easement facing west – March, 2020

Appendix D, Historic Resources



U.S. Department
of Transportation
**Federal Aviation
Administration**

Memphis Airports District Office
2600 Thousand Oaks Blvd., Suite 2250
Memphis, TN 38118

Phone (901) 322-8180

April 3, 2020

Renee Gledhill-Earley
State Historic Preservation Office
109 E. Jones St. MSC 4617
Raleigh, NC 27699-4617

**RE: Section 106 Consultation Proposed Crossfield Taxiway and Deice Pad
Relocation at Charlotte Douglas International Airport (CLT)
North Carolina Environmental Review Number: 15-1391**

Dear Ms. Gledhill-Earley:

As part of the Federal Aviation Administration's (FAA's) Section 106 review and pursuant to 36 CFR § 800.4, the FAA has undertaken identification efforts for the proposed crossfield taxiway and deice pad relocation at the Charlotte Douglas International Airport (CLT), Mecklenburg County, Charlotte, NC. Based on the results of these efforts, the FAA has determined the following finding of effect is appropriate for this undertaking. This letter clarifies the determinations and comments received to date regarding this undertaking.

Proposed Action: The City of Charlotte Aviation Department has identified the need to provide a dedicated aircraft deicing location. As a result, the following Proposed Action, shown in attached **Exhibit 1**, is being evaluated:

- Construction of a new deice pad, that is approximately 780,000 square feet, located on the south airfield, east of Runway 36C, to provide up to four positions for Airplane Design Group (ADG) V aircraft or nine ADG III aircraft

Connected actions include:

- Extension of Taxiway F approximately 3,000 feet
- Construction of a new crossfield taxiway and service road
- Construction of new apron lighting, taxiway edge and centerline lighting, and additional roadway lighting
- Construction of associated stormwater facilities
- Realignment of Yorkmont Road
- Demolition of a structure built in 1985 and the former McGinn House

- Excavation of previously disturbed fill material located between Runway 18C/36C and Runway 18R/36L.

It should be noted that the Proposed Action would not result in an increase in aircraft operations.

Area of Potential Effects: The Area of Potential Effects (APE), shown in attached **Exhibit 2**, is approximately 300 acres and was defined as the area in which the project may cause physical disturbance and any areas that would be used for staging equipment and supplies during construction. Because the proposed undertaking would not result in an increase in noise and is located on the airfield of the airport, no indirect impacts would result due to the proposed undertaking.

Identification Efforts: The FAA, through a series of cultural and architectural resource surveys, identified eleven (11) potential historic sites within the APE. All eleven (11) of the sites are recommended not eligible for listing in the National Register of Historic Places (NRHP). **Table 1** presents the sites, a description of the site, and the eligibility determination. The corresponding survey reports are enclosed with this letter.

Table 1: Sites Identified within the APE and Eligibility Recommendation

	ASM SITE NUMBER	DESCRIPTION	NRHP ELIGIBILITY RECOMMENDATION
1	MK1710	McGinn Family House	Not eligible
2	31MK1143	Prehistoric lithic isolated find	Not eligible
3	31MK1144	Prehistoric lithic scatter and historic domestic artifact scatter with above-ground architectural remains	Not eligible
4	31MK1145	Historic domestic artifact scatter with above-ground architectural remains	Not eligible
5	31MK1148	Unknown Lithic	Not eligible
6	31MK1149	Unknown Lithic	Not eligible
7	31MK1150	Middle Woodland	Not eligible
8	31MK1151	20th-century extant shed and artifact scatter	Not eligible
9	31MK1152	20th-century artifact scatter	Not eligible
10	31MK1153	20th-century artifact scatter	Not eligible
11	31MK1154	20th-century extant structure	Not eligible

Source:

Archaeological Survey Investigations, Proposed South Crossfield Taxiway and FedEx/Amazon Parking Lot Expansion at the Charlotte-Douglas International Airport, Berryhill Township, Mecklenburg County, North Carolina, Legacy Research Associates, April, 2019.

Determination of Eligibility, McGinn Family House (Robert McGinn House), 4939 Hangar Road, Charlotte, Mecklenburg County, Airport Crossfield Taxiway and De-ice Pad Relocation, Charlotte Douglas International Airport, Mattson, Alexander and Associates, Inc., April 2019

Archaeological Survey and Evaluation, Proposed Drainage Area for the South Crossfield Taxiway at the Charlotte-Douglas International Airport, Berryhill Township, Mecklenburg County, North Carolina, North Carolina Environmental Review Number 15-1391

Finding of Effect: The FAA has made a finding of No Historic Properties Affected for this undertaking as no NRHP-eligible historic properties have been identified within the APE.

Summary: Based on the results of the studies and an assessment of effects to historic properties, the FAA has determined that this proposed undertaking will have no adverse effect on historic properties. Please review this finding and the enclosed documentation in accordance with 36 CFR Part 800.8.

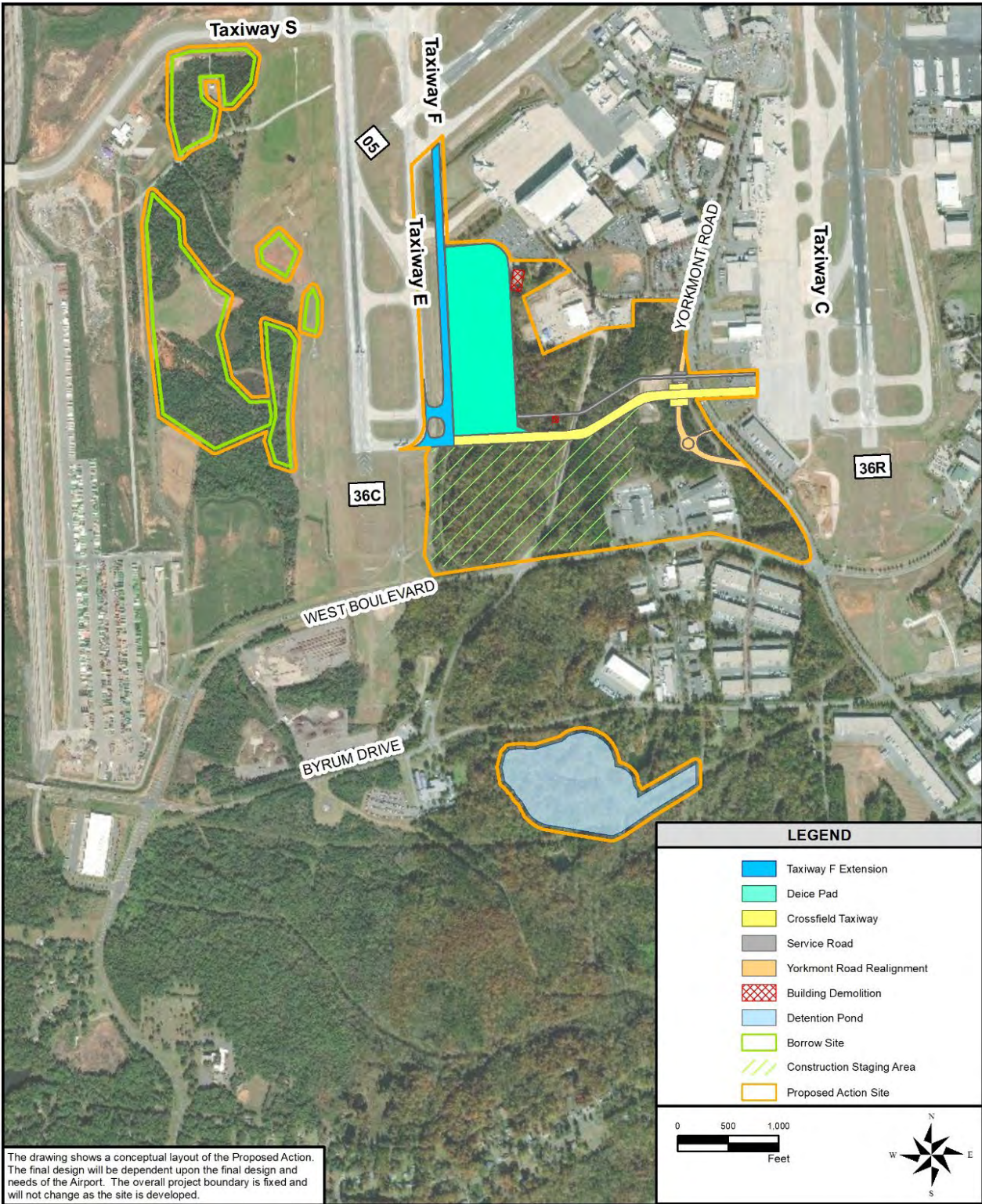
If you have any questions regarding the Environmental Assessment or this request, please contact Tim Alexander of my staff at (901) 322-8188 or by email at Timothy.L.Alexander@faa.gov.

Sincerely,

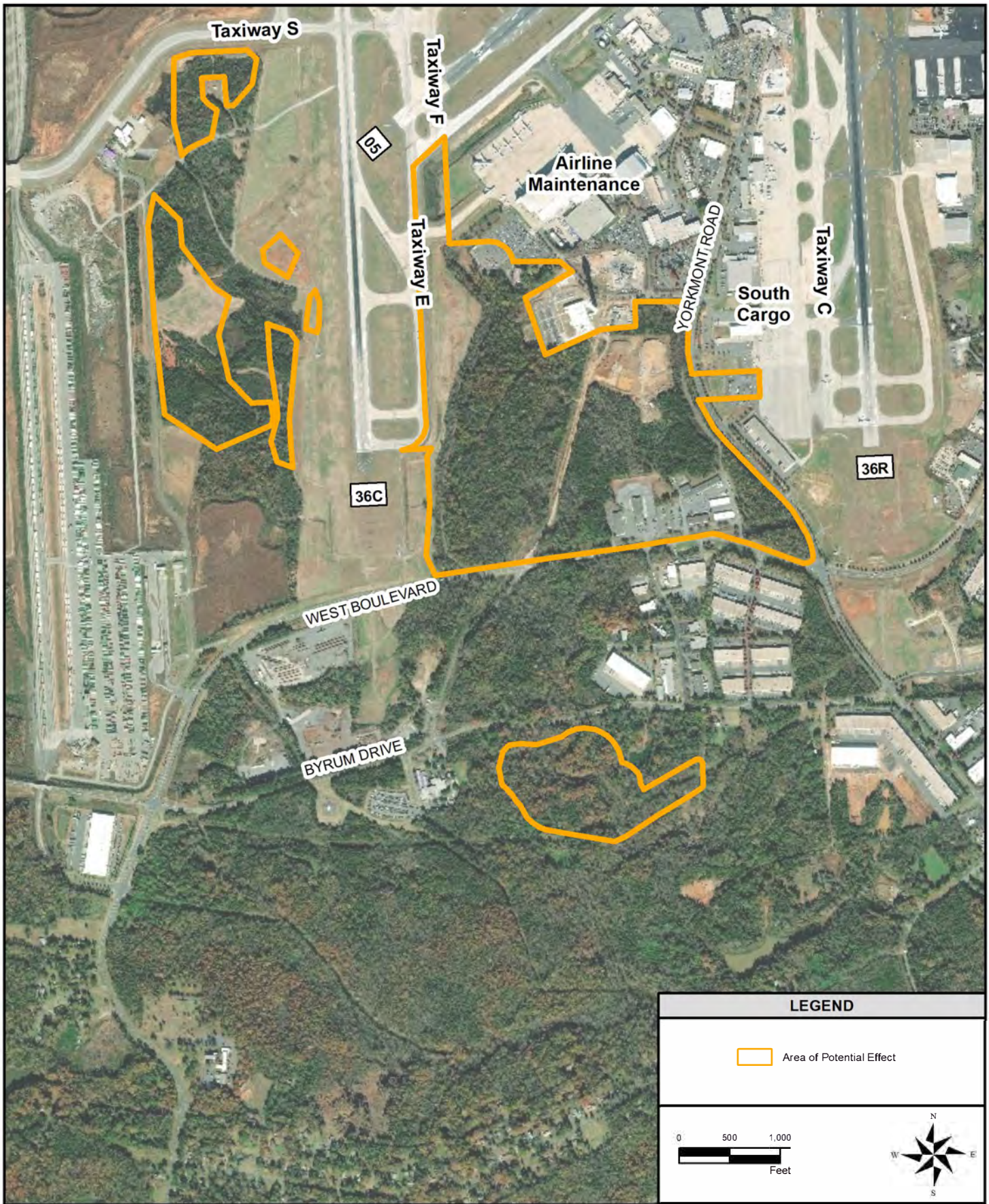
Tommy L. Dupree
Acting Manager, Memphis Airports District Office




Enclosures

EXHIBIT 1, PROPOSED ACTION



Source: L&B, 2020



LEGEND	
	Area of Potential Effect
	
	

DETERMINATION OF ELIGIBILITY

**MCGINN FAMILY HOUSE (ROBERT MCGINN HOUSE)
4939 HANGAR ROAD
CHARLOTTE, MECKLENBURG COUNTY**

**AIRPORT CROSSFIELD TAXIWAY AND DE-ICE PAD RELOCATION
CHARLOTTE DOUGLAS INTERNATIONAL AIRPORT**

Prepared by:

**Mattson, Alexander and Associates, Inc.
2228 Winter Street
Charlotte, North Carolina 28205
(704) 219-4983**

Prepared for:

**Landrum & Brown
Global Aviation Planning and Development
Cincinnati, Ohio 45242**

April 18, 2019

DETERMINATION OF ELIGIBILITY

**MCGINN FAMILY HOUSE (ROBERT MCGINN HOUSE)
4939 HANGAR ROAD
CHARLOTTE, MECKLENBURG COUNTY**

**AIRPORT CROSSFIELD TAXIWAY AND DE-ICE PAD RELOCATION
CHARLOTTE DOUGLAS INTERNATIONAL AIRPORT**

Prepared by:

**Frances Alexander, Project Manager
Mattson, Alexander and Associates, Inc.
2228 Winter Street
Charlotte, North Carolina 28205**

Prepared for:

**Landrum & Brown
Global Aviation Planning and Development
Cincinnati, Ohio 45242**

April 18, 2019

MATTSON, ALEXANDER AND ASSOCIATES, INC.

Frances P. Alexander

Frances P. Alexander, M.A.

Richard L. Mattson, Ph.D.

April 18, 2019

Date

Date

MANAGEMENT SUMMARY

This City of Charlotte, Aviation Department project is entitled, *Airport Crossfield Taxiway and De-Ice Pad Relocation, Charlotte Douglas International Airport*, and the project is located in Charlotte, Mecklenburg County. Prepared as part of the environmental assessment for the project, this technical report contains the determination of eligibility for the McGinn Family House (MK1710) which was initially surveyed in 1989 as the Robert McGinn House. The house is located within the airport property. The project location is depicted in **Figure 1**.

This architectural resources investigation consisted of background research into the history of the McGinn house and a field investigation of the property. The evaluation does not recommend the now ruinous house for National Register eligibility (**Table 1**).

Table 1

Property Name	PIN	Survey Site Number	Eligibility Recommendation	Criteria
McGinn Family House (Robert McGinn House)	14102318	MK1710	Not Eligible	N/A

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I. Introduction	3
II. Property Evaluation of Eligibility	5
McGinn Family House (Robert McGinn House)	5
III. Bibliography	23

I. INTRODUCTION

This eligibility report was prepared in conjunction with the This City of Charlotte, Aviation Department project entitled, *Airport Crossfield Taxiway and De-Ice Pad Relocation, Charlotte Douglas International Airport*. Shown in **Figure 1**, the project is located in Charlotte, Mecklenburg County.

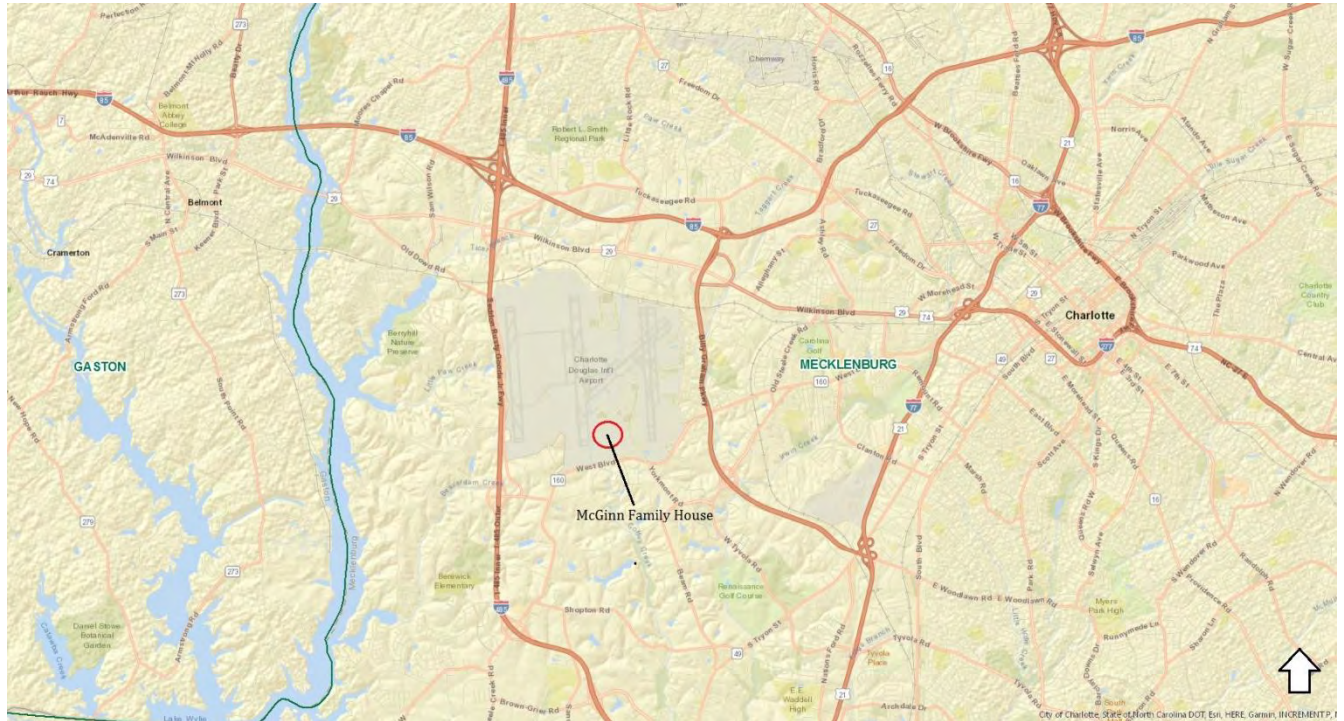
The McGinn Family House (MK1710) is the only resource being evaluated for National Register eligibility in this report (see Table 1 in the Management Summary). Surveyed originally in 1989 and recorded as the Robert McGinn House, the evaluated building was originally a ca. 1855 log house that was substantially enlarged and remodeled with frame additions between the 1890s and early twentieth century. Vacant since 1990, the building is now in ruinous condition.

This investigation was conducted to evaluate this one resource for National Register eligibility. The current evaluation of eligibility report is part of the environmental assessment undertaken by the City of Charlotte, Aviation Department and is on file at the North Carolina Historic Preservation Office (HPO), Raleigh, North Carolina. This documentation complies with the National Environmental Policy Act (NEPA) of 1969, the National Historic Preservation Act of 1966, as amended (36 CFR 800), the National Register criteria set forth in 36 CFR 61, and the *Report Standards for Historic Structure Survey Reports/Determinations of Eligibility/Section 106/110 Compliance Reports in North Carolina* established by the North Carolina Historic Preservation Office. Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effect of federally funded, licensed, or permitted projects on properties listed in, or eligible for listing in, the National Register of Historic Places and to afford the Advisory Council on Historic Preservation and the North Carolina Historic Preservation Office a reasonable opportunity to comment.

The eligibility evaluation consisted of research into the history and architecture of the McGinn Family House and a field survey of the property. The field work took place in February 2019. The house as well as landscape features on the site were examined and documented with photographs to assess the level of current integrity. The property is shown on the site plans included in the evaluation (**Figures 2-3**).

For the research phase, the principal investigators examined both primary and secondary sources, including deeds, the HPO survey files, local landmark reports for Mecklenburg County, and published local histories. The investigation does not recommend this resource for National Register eligibility. Because of its ruinous condition, the house no longer has the integrity needed for eligibility.

Figure 1
General Location Map



Source: North Carolina Historic Preservation Office, GIS Service

Scale: 1" = 2.5 miles

II. PROPERTY EVALUATION OF ELIGIBILITY

McGinn Family House (Robert McGinn House) (MK1710) (PIN 14102318)

4939 Hangar Road (West Side of Piney Top Drive
(SR1180)
Charlotte, Mecklenburg County

Eligibility Recommendation: Not Eligible
Date(s) of Construction: ca. 1855; ca. 1900

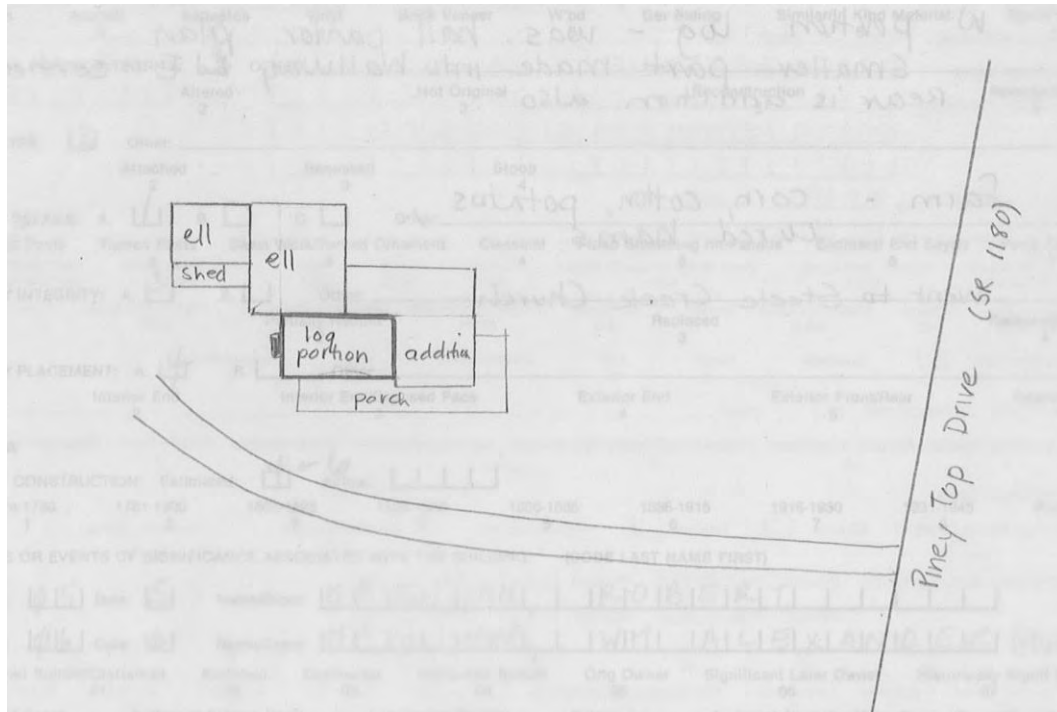


Physical Description (Figures 2-3)

Now in ruinous condition, the McGinn Family House is located at the southern edge of Charlotte-Douglas International Airport on a 174-acre commercial and industrial tract owned by the City of Charlotte. West Boulevard borders the south side of the property, and there is restricted access to the house via Piney Top Drive north of West Boulevard. Formerly a two-lane rural roadway, Piney Top Drive is currently being widened and improved for airport use. The house site on the west side of the road is heavily overgrown, and no associated yard, cultivated fields, or agricultural buildings remain. The tract as a whole is now a mix of overgrowth and modern development related to the airport, including the south end of a runway located west of the house site.

McGinn Family House—1989 North Carolina Historic Preservation Office (HPO) Survey

Recorded as the Robert McGinn House in the 1989 HPO survey file, the dwelling was intact at that time and retained its one-story, cross-gable form. The house incorporated the original log house (ca. 1855) with its hall-parlor plan as well as several major additions constructed between the 1890s and early twentieth century. The dwelling was primarily weatherboarded although flush beaded boards covered the facade. Typical of the Piedmont, the log dwelling had probably been weatherboarded when constructed or soon thereafter. The style-conscious house featured a wraparound front porch with a pedimented entry bay and chamfered posts. The log section on the west side contained the main entrance, hallway, and living room. During the remodeling, its original doorway and windows on the façade were rearranged and its gable-end chimney replaced with a single-shoulder, brick chimney. The later, frame sections of the house contained bedrooms and the kitchen.



McGinn Family House, 1989 Documentary Site Plan. Source: HPO File.



McGinn Family House, 1989 Documentary Photo, Façade, Looking North. Source: HPO File.



McGinn Family House, 1989 Documentary Photo, West Elevation, Rear Ell, and Well House (Right Foreground), Looking East. Source: HPO File.



McGinn Family House, 1989 Documentary Photo, Rear Ell and Well House (Right), Looking Northeast. Source: HPO File.

McGinn Family House-2019

After the 1989 survey, the house fell into disrepair following the departure of its long-time owner and resident, Laura McGinn. Vacant since 1990, the house is now ruinous. Sections of the roof have collapsed, and the front porch no longer survives. Exterior doors and window sash are gone, and the weatherboards and beaded-boarded siding are severely deteriorated or have been stripped away. As the sidings have deteriorated in the past thirty years, sections of the exterior were tar papered. The framing as well as log members have rotted although intact hewn logs with half-dovetailed notching are evident along the upper level of the façade, where later beaded-board siding has been lost. Now exposed to the elements, the interior (now inaccessible) no longer retains mantels, most of its doors, and sections of wooden ceilings and flooring. Plaster walls are in decay. The log section, which is supported by fieldstone piers, retains its board-and-batten ceiling and enclosed corner stairway leading to the attic.

In addition to the remains of the dwelling, the property includes a deteriorated and altered, ca. 1900, frame well house. Located just west of the dwelling in the former farmyard, the weatherboarded, one-bay structure has a projecting, gable-front roof.



McGinn Family House, Facade, Looking North.



McGinn Family House, Façade, ca. 1900 Frame Addition, Looking Northeast.



McGinn Family House, Façade, ca. 1900 Frame Addition, Side (East) Elevation, Looking Southwest.



McGinn Family House, Façade, ca. 1855 Log Section, Looking North.



McGinn Family House, Façade, ca. 1855 Log Section, Detail of Log Notching.



McGinn Family House, West Gable End and Chimney, ca. 1855 Log Section, Tar Papered Exterior, Looking East.



McGinn Family House, Rear Ell and Shed, Looking North.



McGinn Family House, Rear Ell and Shed, West Gable End, Looking East.



McGinn Family House, Interior, Board-and-Batten Ceiling, ca. 1855 Log Section.



McGinn Family House, Interior, ca. 1855 Log Section.



McGinn Family House, Interior, Rear Ell.



McGinn Family House, Interior, Rear Ell.



McGinn Family House, Well House, Looking North.



McGinn Family House, Overgrown Farmyard, Looking North from House.



McGinn Family House, View from Piney Top Drive, Looking West.



McGinn Family House, Piney Top Drive, Looking North.

Historical Background

Probably during the mid-1850s, Robert F. McGinn (1832-1864) constructed a one-story, log farmhouse on his small tract of land in western Mecklenburg County. A son of James Madison McGinn (1796-1844) and Jane C. McCord (1800-1867), he inherited the land from his father's estate. The 1844 James M. McGinn will had divided the property equally among his wife, Jane, and their six children. The 1850 census shows that the widowed Jane McGinn was the head of a household that included one daughter, Lucinda, and five sons, William, Robert, Harvey, Wilson, Hooper, and George. In 1850, the modest-sized McGinn farm was valued at \$160.00 (U.S. Census, Mecklenburg County, Population Schedule 1850; Mecklenburg County Superior Court Record of Wills, 1763-1965; HPO File 1989).

Between the 1850s and early 1860s, Robert F. McGinn established his own farmstead on his portion of the family land. On the eve of the Civil War, the 1860 census records that his young family included wife, Mary Jane Herron (1841-1875), and daughter, Mary Eldora (1858-1927). Their farm in that year was worth \$500.00. The McGinns' personal property was valued at \$1,150.00, and the 1860 census reveals a Robert A. McGinn in this neighborhood owning one enslaved individual—a twelve-year-old black male. The McGinn household soon included two sons: Isaac Wilson (1860-1944) and William Alexander (1862-1931). In 1863, Robert McGinn enlisted in the Confederate States Army, serving in A Company, Eleventh Infantry (North Carolina). He died on February 2, 1864 as a prisoner of war at Point Lookout, Maryland, and was buried at the Point Lookout Confederate Cemetery ([PointLookoutConfederateCemetery, www.findagrave.com](http://www.findagrave.com); U.S. Census, Mecklenburg County, Population and Slave Schedules 1860).

Younger son, William Alexander McGinn, inherited the portion of the family farm that held the log farmhouse, and between the 1890s and early 1900s, he proceeded to expand the farm and enlarge the dwelling. He married Blanche Robinson (1869-1940) in 1889, and the couple had five children—Marie, Ruth, Harry, Laura, and William. Deed records show McGinn buying thirty-three acres of land near his farmstead in Berryhill Township in 1890 and purchasing an additional twenty-six acres in 1909. During this period, the original log house was remodeled extensively. The household contained not only the immediate family but also McGinn's sister, Mary, Aunt Esther Herron, and a servant, Alice Nance. The 1930 census valued the improved McGinn house at \$3,500.00 (U.S. Census, Mecklenburg County, Population Schedule 1930; Mecklenburg County Deed Books 71: 471; 179: 678; 242: 144).

William and Blanche McGinn's daughter, Laura (1900-2002), inherited the house and land from her father's estate in 1931. According to her 2002 obituary, Laura lived in the homeplace for ninety years before moving to a retirement facility in 1990. The 1940 census records Laura as the head of a household that also numbered her sister and brother-in-law—Ruth and George Brown—and the Browns' two children. The McGinn residence was no longer the seat of a family farm. George Brown commuted to work at the Ford Motor Company in Charlotte, and Laura was a stenographer for Traveler's Insurance Company downtown. Laura had been educated at nearby Dixie School (now gone), and for three years attended Queens College (now Queens University) in Charlotte. Like many of the residents of this part of the county, she was a member of Steele Creek Presbyterian Church (Mecklenburg County Will Book V: 617; U.S. Census, Mecklenburg County, Population Schedule 1940; *Charlotte Observer*, 7 July 2002).

Through the mid-to-late twentieth century, sections of the McGinn property were gradually sold or subdivided among family members. While Laura McGinn continued to reside in the dwelling, the 1989 HPO survey file noted that the house—though still in good condition--was "slated for demolition by Charlotte-Douglas International Airport". Vacant since 1990, the residence fell into disrepair in the ensuing years and is now ruinous (Mecklenburg County Deed Books 568: 509; 911: 372; 3612: 4; HPO File).

National Register Criteria Evaluation

For purposes of compliance with Section 106 of the National Historic Preservation Act (NHPA), the McGinn Family House (MK1710) is recommended **not eligible** for the National Register under any criterion because of a loss of integrity. Previously surveyed as the Robert McGinn House in 1989, the dwelling was vacated permanently in 1990 and is now ruinous.

Integrity

The McGinn Family House does not retain the seven aspects of integrity needed for National Register eligibility. Although located on its original site and thus retaining its integrity of location, the dwelling no longer possesses integrity of setting, feeling, and association. The heavily overgrown property does not have historically associated farmland or agricultural outbuildings, and modern construction—including a Charlotte-Douglas International Airport runway—and modern roadways now characterize the general vicinity. The ruinous house also lacks the integrity of design, materials, and workmanship needed for eligibility. The roofing and walls are deteriorated severely, and sections have collapsed, exposing the interior to the elements. The front porch no longer survives, and exterior doors and window sash are now gone. In similar fashion,

interior ceilings, flooring, doors, mantels, and other features are heavily deteriorated or no longer remain extant.

Criterion A

The McGinn Family House is recommended **not eligible** under Criterion A (event). To be eligible under Criterion A, the property must retain integrity and must be associated with a specific event marking an important moment in American prehistory or history or a pattern of events or historic trend that made a significant contribution to the development of a community, a state, or a nation. Furthermore, the property must have existed at the time and be documented to be associated with the events. Finally, the property's specific association must be important as well (National Park Service, *National Register Bulletin 15: 12*).

The McGinn property is not recommended for eligibility under Criterion A because the property no longer has sufficient integrity to illustrate either a specific event or a pattern of events that was important within a local, state, or national context.

Criterion B

The McGinn Family House is **not eligible** for the National Register under Criterion B (Person). For a property to be eligible for significance under Criterion B, it must retain integrity and 1) be associated with the lives of persons significant in our past, i.e. individuals whose activities are demonstrably important within a local, state, or national historic context; 2) be normally associated with a person's productive life, reflecting the time period when he/she achieved significance; and 3) should be compared to other associated properties to identify those that best represent the person's historic contributions. Furthermore, a property is not eligible if its only justification is that it was owned or used by a person who is or was a member of an identifiable profession, class, or social or ethnic group (National Park Service, *National Register Bulletin 15: 14*).

The property is not eligible under Criterion B because it is not associated with individuals whose activities were demonstrably important within a local, state, or national historic context.

Criterion C

The McGinn Family House is **not eligible** for the National Register under Criterion C (design/construction). For a property to be eligible under this criterion, it must retain integrity and either 1) embody distinctive characteristics of a type, period, or method of construction; 2) represent the work of a master; 3) possess high artistic value; or 4) represent a significant and distinguishable entity whose components may lack individual distinction (National Park Service, *National Register Bulletin 15: 17*).

Because of its loss of integrity, the McGinn Family House does not have the architectural significance needed for eligibility under Criterion C. In ruinous condition, and without intact significant architectural features, the house is no longer an important surviving example of either mid-nineteenth-century log architecture or late-nineteenth-century domestic design in rural Mecklenburg County.

In common with other counties in the North Carolina Piedmont, Mecklenburg County has a log building tradition. Rooted in European building customs, log construction became familiar to all

the cultural groups that settled the region. In Mecklenburg County, log construction was used primarily by Ulster Scots and some Germans during the early settlement period of the mid-eighteenth century, and the tradition persisted into the post-Civil War years. Log buildings marked the first generation of settlement and remained a common choice through the second and third generations. As farmsteads developed in the nineteenth century, log houses were often larger and more carefully finished than their eighteenth-century predecessors. They were nearly always covered with weatherboards, and the finer examples expressed popular architectural styles in their mantels, cornices, and door and window surrounds (Bishir and Southern 2003: 17-18; 26-27; Bishir 1996: 142-148).

Local builders constructed log houses along traditional lines. The basic unit of design varied little: a single, four-walled room, or “pen”, which could be easily multiplied or partitioned into several smaller rooms, according to circumstance. The logs on these dwellings were hewn on two sides, producing flat surfaces on both the outside and inside walls, and secured together with tight-fitting corner notches. Two notching types were prevalent in the region—the v-notch and the half-dovetail. With v-notch construction, the logs were cut to resemble an inverted letter, “V”. In half-dovetail notching, the top side of the hewn log was splayed (Jordan 1985: 23-30).

As elsewhere in the region, log houses have become increasingly rare in urbanizing Mecklenburg County. Seven log dwellings that predate 1900 (including the McGinn House) have been previously surveyed and still stand on their original sites. The most imposing are Beaver Dam (MK0002) (National Register 1979) and Potts Plantation (MK1296) (National Register 1998), both of which are early-nineteenth-century plantation seats in northern Mecklenburg County. Both are substantial, two-story, log-constructed houses with original weatherboarding and sophisticated Federal-style detailing. The oldest portion of the ca. 1800 Hugh Torrance House and Store (MK0005) (Local Landmark 1993) in northern Mecklenburg is a one-and-one-half-story, log house. The original log house was incorporated into a larger, frame house in the early 1800s and is now the rear ell of the house. In the western part of the county, the ca. 1785 Cooper Log House (MK1359) (Local Landmark 1984) survives as a two-story, hall-parlor, log dwelling with frame additions dating to the mid-nineteenth century. More typical of the county’s early log houses are the Oehler Log House (MK1311) (Determination of Eligibility 1990) and the Albert Wallace Log House (MK3724) (Local Landmark 2018) in eastern Mecklenburg County. Located in the Mallard Creek community, the antebellum Oehler Log House retains its single-pen form and partitioned interior. However, since the 1990 determination of eligibility, the house has lost its chimney, and the dwelling has deteriorated. Although the antebellum Wallace Log House in the Reedy Creek community has later siding and additions, the dwelling still clearly displays its original single-pen, one-and-one-half-story form with an intact one-room plan. Finally, the 1881 McAuley Log House (MK1305) (Local Landmark 1990) remains a well-preserved, two-story, log dwelling with half-dovetailed notching and hall-parlor plan. Despite having been moved in recent years from its original site to Latta Plantation along the Catawba River, the McAuley house illustrates the persistence of traditional log building patterns in the county into the late nineteenth century.

Criterion D

The McGinn Family House is **not eligible** for the National Register under Criterion D (potential to yield information). For a property to be eligible under Criterion D, it must meet two requirements: 1) the property must have, or have had, information to contribute to our understanding of human history or prehistory; and 2) the information must be considered important (National Park Service, *National Register Bulletin 15*: 21).

The property is not eligible under Criterion D because it is not likely to yield any new information pertaining to the history of building design or technology.

Figure 2

**McGinn Family House
Overall Site Plan**



Source: North Carolina Historic Preservation Office, GIS Service

Scale: 1" = 1,000'

Figure 3
McGinn Family House
Detailed Site Plan of House in 2010



Source: North Carolina Historic Preservation Office, GIS Service

Scale: 1" = 500'

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REVISED DRAFT REPORT

Archaeological Survey Investigations
Proposed South Crossfield Taxiway at the Charlotte-Douglas International Airport, Berryhill Township,
Mecklenburg County, North Carolina

North Carolina Environmental Review Number 15-1391

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6 May 2019

MANAGEMENT SUMMARY

This document provides the results of the archaeological survey that was conducted for Landrum & Brown, Inc. (L&B) in Cincinnati, Ohio, on behalf of the Charlotte-Douglas International Airport (CLT) in Mecklenburg County, North Carolina (NC) by Legacy Research Associates (Legacy) in Durham, NC. The lead Federal agency for this Project is the Federal Aviation Administration (FAA). The work was conducted in compliance with Section 106 of the National Historic Preservation Act.

The work was conducted in response to the Request for Proposal (RFP) received by Legacy from L&B on November 15, 2017, and a revised RFP on August 31, 2018.

The objective of investigation was to identify the general distribution, location, and nature of cultural resources within the Area of Potential Effects (APE). The APE covers approximately 176 acres that are proposed for ground-disturbing activities associated with the South Crossfield Taxiway.

Field investigations of the Project APE were conducted by Legacy and subconsultant, Environmental Services Inc. (ESI) in December 2018. Most of the property was deemed to have a low probability for the presence of archaeological sites. The remaining acres were investigated with pedestrian survey and systematic shovel testing. As a result of the investigations, three archaeological sites (31MK1143, 31MK1144, and 31MK1145) were recorded (Figure 1). All three sites contain small and/or disturbed artifact assemblages that lack potential to contribute meaningful knowledge to the history or prehistory of the area. These sites are recommended as being not eligible for the National Register of Historic Places. No further archaeological work is recommended for the Project as it is currently planned.

Table 1 summarizes the three archaeological sites.

Table 1. Archaeological Site Summary.				
Site	Component	Time Period	Site Assessment	Recommendations
31MK1143	Prehistoric Lithic Isolated Find	Unknown	Not Eligible	No Further Work
31MK1144	Prehistoric Lithic Scatter	Unknown	Not Eligible	No Further Work
	Historic Domestic Artifact Scatter with above-ground architectural remains	20 th century	Not Eligible	No Further Work
31MK1145	Historic Domestic Artifact Scatter with above-ground architectural remains	19 th to 20 th century	Not Eligible	No Further Work

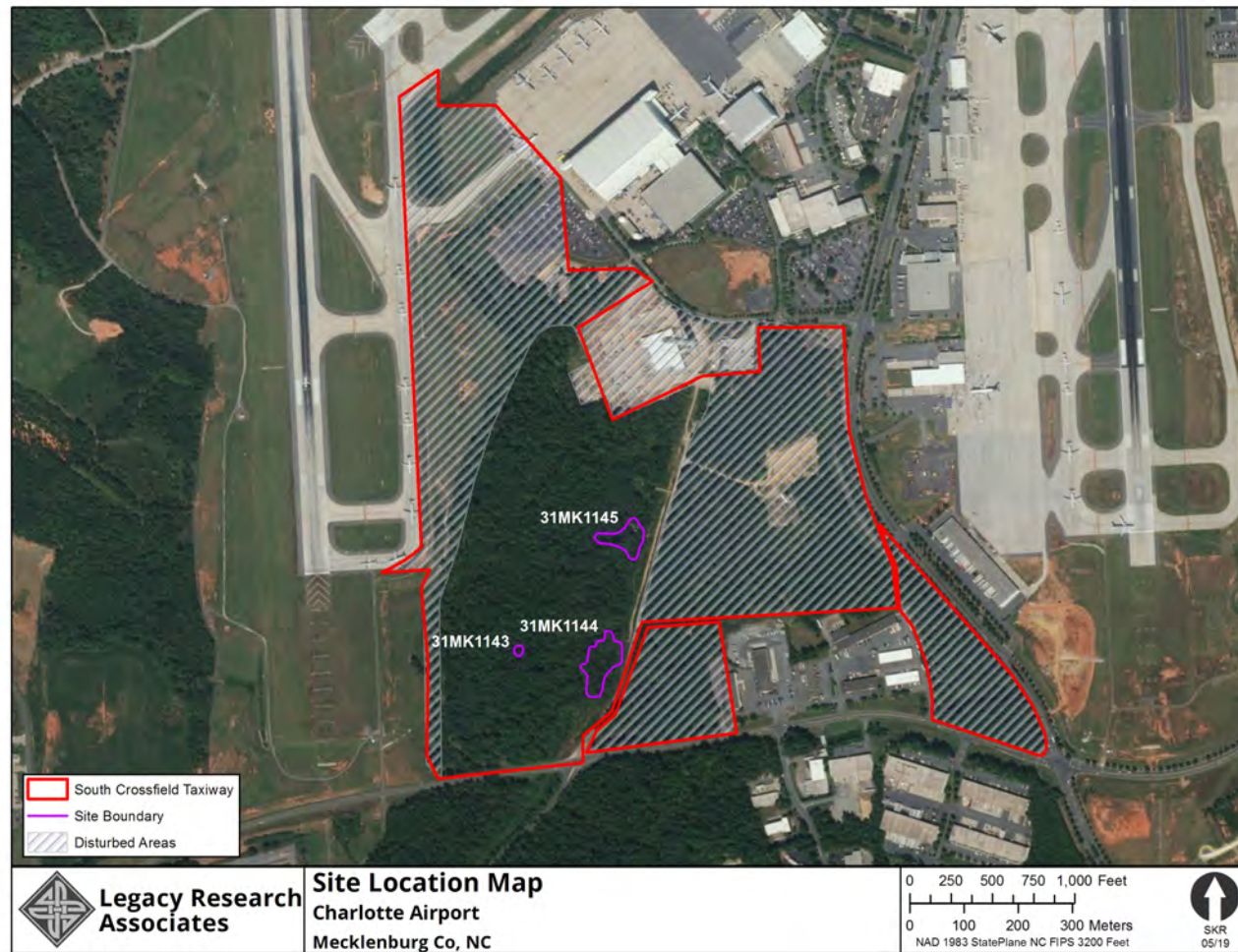


Figure 1. Archaeological Site Location Map showing Project Boundaries and Areas of Disturbance.

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Archaeological Survey
Proposed South Crossfield Taxiway at the Charlotte-Douglas International Airport, Berryhill Township, Mecklenburg
County, North Carolina
North Carolina Environmental Review Number 15-1391

INTRODUCTION

This document provides the results of the archaeological survey that was conducted for Landrum & Brown, Inc. (L&B) in Cincinnati, Ohio, on behalf of the Charlotte-Douglas International Airport (CLT) in Mecklenburg County, North Carolina (NC) by Legacy Research Associates (Legacy) in Durham, NC. The lead Federal agency for this Project is the Federal Aviation Administration (FAA).

The work was conducted in response to the Request for Proposal (RFP) received by Legacy from L&B on November 15, 2017, and a revised RFP on August 31, 2018.

PROJECT DESCRIPTION

The Project is situated in the southeastern part of the CLT property. It covers approximately 165 acres located north of West Boulevard and east of Yorkmount Road. Historic Piney Top Drive bisects the survey on a north-south axis. This road is depicted on the 1888 TJ Orr Map of Mecklenburg County and the 1911 Spratt Map of Mecklenburg County.

The project land is proposed for land-disturbing activities associated with construction of the South Crossfield Taxiway. Figure 2 depicts the 176-acre Area of Potential Effects (APE).

The following report sections provide the environmental setting, prehistoric and historic cultural context, previous research, research design, methodology, results, and recommendations.

ENVIRONMENTAL SETTING

A discussion of the environmental setting of the Project area (topography, hydrology, geology, soils, and climate) follows.

Topography

Mecklenburg County is in the south-central part of North Carolina and adjoins York and Lancaster counties in South Carolina (Figure 3). The county is within the southern Piedmont region that extends from southern portions of New York into Alabama. The Piedmont is one of three geographic divisions in North Carolina and comprises almost half the land in the state (Figure 4). The Piedmont region begins along the southeastern slope of the Blue Ridge Mountains and continues eastward to the edge of the Coastal Plain. The region is characterized by broad, gently rolling interstream areas and by steeper slopes along drainages.



Figure 2. Project APE in 2002 (Google Earth v. 7.3.2. December 12, 2018) Piney Top Drive, Mecklenburg County, NC. Image Date: 3/31/2002. UTM Coordinates: 17S 505189.69 m E 3985431.980 m N).



Figure 3. Location of Mecklenburg County in North Carolina (<http://ncpedia.org/geography/mecklenburg/>).

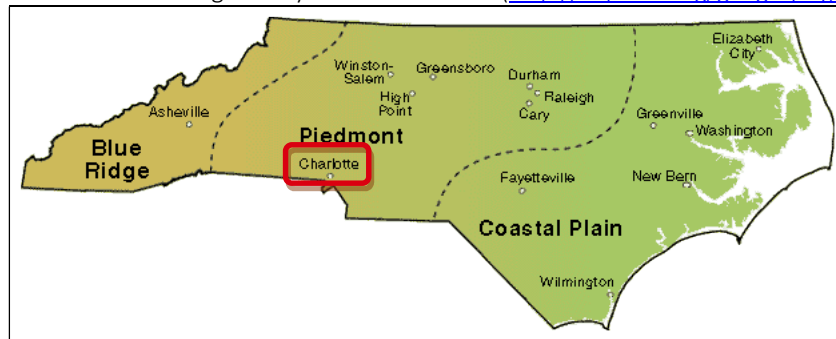


Figure 4. North Carolina Physiographic Regions showing Charlotte in the south-central Piedmont (http://nc.water.usgs.gov/projects/index_physio.html).

Hydrology

Mecklenburg County lies within the Catawba River basin, which is in the southwestern region of the state (Figure 5). It is the eighth largest river system in the state and contains 3,042 miles of streams (<http://www.bae.ncsu.edu/bae/programs/extension/wqg/programs/catawbaprg.html>).

Three large creeks – Irwin, Little Sugar, and Briar – drain most of the urban area around Charlotte. These tributaries flow southward through the county and converge with Sugar Creek before it enters the Catawba River in Lancaster County, SC. The Project lies within the Sugar Creek and Paw Watersheds that are in western and southeastern Charlotte. Coffey Creek drains the Project area.

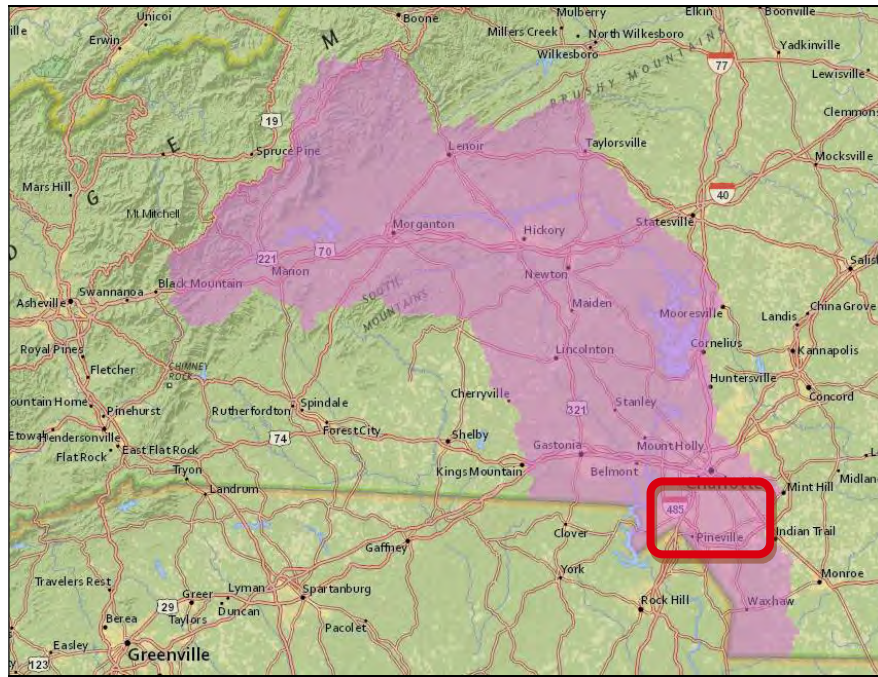


Figure 5. Catawba River Drainage Basin in North Carolina with the Charlotte area highlighted in red (<http://www.eenorthcarolina.org/riverbasins-gis-map.asp>).

Geology

The Project is in the Charlotte Belt (Figure 6), which is composed of igneous, meta-igneous rock, diorite-gabbro, and granite. The oldest rocks are commonly mafic gneiss, amphibolite, and metavolcanic. Gold-bearing rocks are present in the Charlotte Belt and are found in lode and placer deposits. Lodes are narrow veins of variable length and trend to the northeast and placer deposits are found in stream channels usually in streams with moderate gradient that widen or change direction, in gravel beds, and inside bends of stream channels (Carpenter 1993).

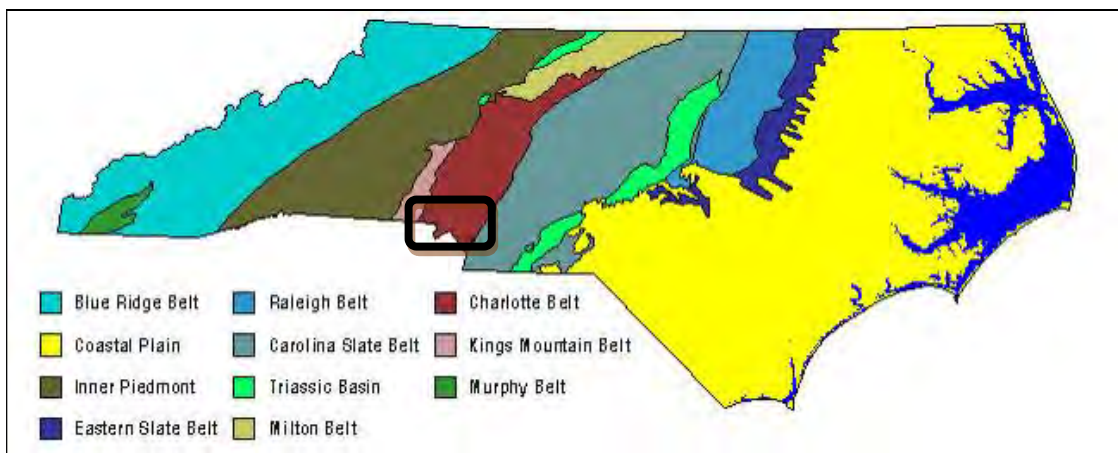


Figure 6. North Carolina Geological Regions with the general Charlotte area highlighted in black (<http://ncpedia.org/geology>).

Climate

The climate of the Project is moderate with hot and humid summers and moderately cold but short winters because the mountains to the west protect the county against cold fronts. Precipitation is evenly distributed throughout the year, but generally falls in April to September, which is the growing season for many crops. Every few years in late summer to early autumn, tropical storms bring heavier rainfall. Average seasonal snowfall is six inches, although every few years a heavy snow covers the ground for a few days to a week.

Soils

The Mecklenburg County Soil Survey identified eight soil types within the APE (Table 2). Most of the Project, approximately 116.5 acres or 66 percent of the APE, is located on Cecil soil types coded as CeB2, CeD2, and CeU (Figure 7). Cecil type soils are well-drained acidic soils found on gently to strongly sloping topography that was formed from igneous and metamorphic strata. Both CeB2 and CeD2 are described as eroded sandy clay loam. Soils classified as having steep slopes between 15 and 25 percent (PaE and WkE) cover 14.6 acres or 8.3 percent of the APE. Approximately 29 acres or 16.5 percent of the APE are poorly drained soils along streams and drainageways (MO).

Table 2. Soils within the Project APE.				
Type	Soil Survey Code	Description	Acreage within the APE	Percent of APE
Cecil	CeB2	Sandy clay loam, 2-8 percent slopes, eroded	78.6	44.5
	CeD2	Sandy clay loam, 8-15 percent slopes, eroded	35.3	20
Cecil-Urban Land Complex	CuB	Disturbed	2.6	1.5
Enon	EnD	Sandy loam, 8-15 percent slopes	0.5	0.3
Helene	HeB	Sandy loam, 2-6 percent slopes along streams and drainageways	4.8	2.7
Mecklenburg	MeB	Fine sandy loam, 2-8 percent slopes	11	6.2
Monacon	MO	Poorly drained soil along streams and drainageways	29.1	16.5
Pacolet	PaE	Sandy loam, 15-25 percent slopes	2.5	1.4
Wilkes	WkE	Loam, 15-25 percent slopes	12.1	6.9
			176.5	100

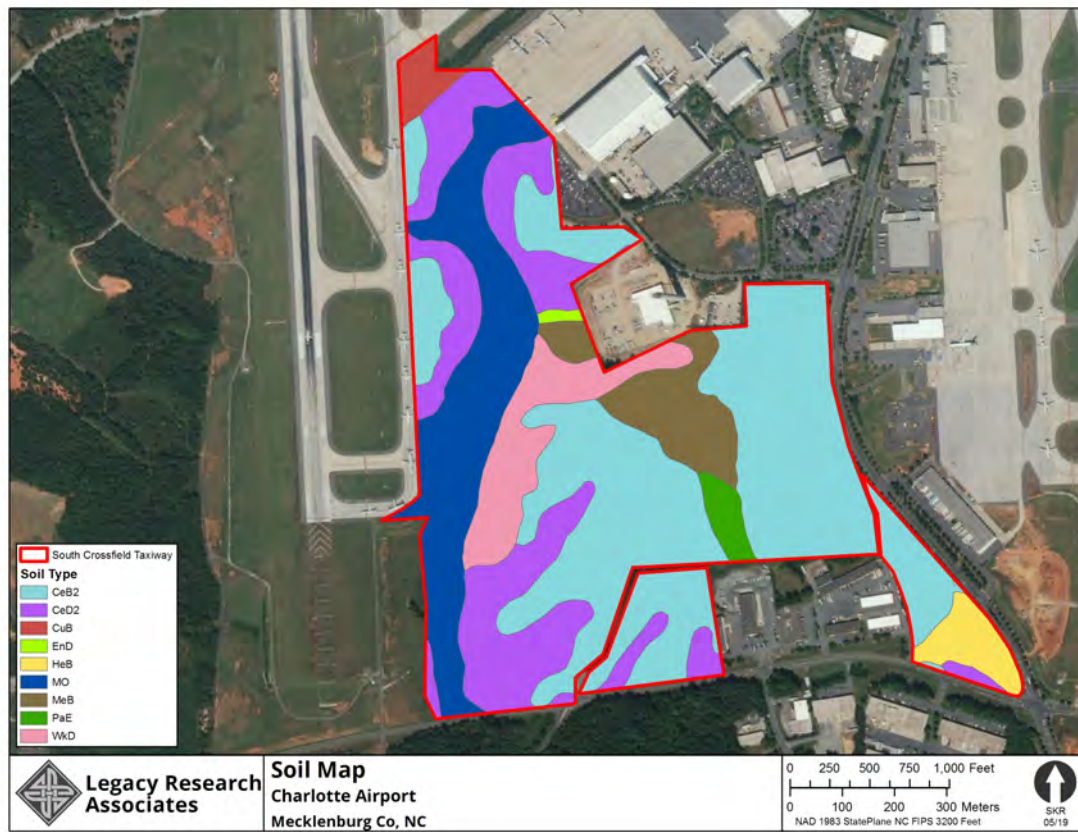


Figure 7. Project boundaries showing soil types within the APE.

PREHISTORIC CULTURAL CONTEXT

The chronological sequence for the prehistory of the North Carolina Piedmont region is presented in Table 3. It provides a synopsis of the regional cultural stages beginning with the earliest occupation, known as the Paleo-Indian period, and ending with the Woodland period that lasted until the time of European Contact with indigenous populations of the present-day southeastern United States during the sixteenth century.

Table 3. Prehistoric Cultural Sequence for the North Carolina Piedmont Region.			
Date	Cultural Period	Sub-Period/Era	Regional Phase
1600			
AD BC	Woodland	Late (AD 1000-European Contact)	Uwharrie and Dan River
		Middle (AD 800-1000)	Yadkin and Uwharrie
		Early (500 BC-AD 800)	Badin and Yadkin
500			
	Archaic	Late (2500-500 BC)	Gypsy and Savannah River
		Middle (6000-2500 BC)	Stanly, Halifax, Morrow Mountain, and Guilford
		Early (8000-6000 BC)	MacCorkle-St. Albans-LeCroy, Palmer, Big Sandy, Rowan, and Kirk
8000			
	Paleo-Indian		Clovis, Dalton, Cumberland, Hardaway, Hardaway-Dalton, Suwannee, and Simpson
10,000			

Paleo-Indian Period

The earliest documented occupation of the North Carolina Piedmont region occurred at the end of the last glacial advance and is referred to as the Paleo-Indian period (10,000-8000 BC). Paleo-Indian culture consisted of small nomadic bands that subsisted by hunting and gathering (Purrrington 1983). Fluted and unfluted projectile points/knives from Paleo-Indian sites suggest that early inhabitants hunted bear, deer, elk, and possibly caribou (Chapman 1977) or smaller game (Anderson et al. 1992).

Among the diagnostic Paleo-Indian period lithics, fluted Clovis types are the earliest, followed by fluted Cumberland, Suwannee, and Simpson projectile points/knives. Dalton, Hardaway, and Hardaway-Dalton types generally date to the end of the Paleo-Indian period. Evidence of Paleo-Indian occupation in North Carolina is mainly represented by isolated projectile point/knife surface finds.

Paleo-Indian settlements were likely small and briefly occupied. Paleo-Indian lithic artifacts have been recovered from high elevations suggesting hunting in a tundra habitat as well as on ridge tops and river terraces. Lithics are often heavily curated and of a high-grade material. Researchers suggest that the roaming range of groups was influenced by known primary stone sources (Anderson et al. 1990; Goodyear et al. 1989).

One important site (Hardaway) in North Carolina that has a Paleoindian component is located along the Yadkin River in Stanly County. Hardaway points represent the earliest occupation at this site. Archaeological investigations identified stratified deposits that have formed the basis of the Paleoindian and Early Archaic period cultural sequences defined for the Carolina Piedmont region (Coe 1964).

Archaic Period

Environmental warming associated with the end of the Ice Age resulted in a cultural adaptation referred to as the Archaic period (8000-500 BC); it is the longest prehistoric cultural phase in the Piedmont region. Diagnostic artifacts associated with exploiting temperate forest resources characterize this transition (Chapman 1977; Coe 1964; Purrington 1983). The earliest of these is the Hardaway-Dalton projectile point/knife, which dates to the late Paleo-Indian/Early Archaic period; these points are eared and feature vestigial fluting.

Archaic period sites are typically found on upland hills, in floodplains, and on the banks of small streams (Bass 1977). The Archaic period has three divisions – Early, Middle, and Late – defined primarily by changes in stemmed projectile point/knife styles with side or corner notching and/or bifurcate bases. More Archaic period sites have been documented in the North Carolina Piedmont than Paleo-Indian sites.

During the Early Archaic period (8000-6000 BC) hunting was the dominant subsistence activity; it was supplemented by fishing aquatic resources, gathering plant foods, and trapping small game. Settlements consisted of base camps on alluvial terraces with smaller hunting camps in the uplands (Chapman 1977). Early Archaic diagnostic projectile point/knife types include Palmer, Big Sandy, Rowan, Kirk (corner-notched and stemmed), and MacCorkle-St. Albans-LeCroy; the latter is associated with the transition from the Early to Middle Archaic period.

Settlement patterns changed from the alluvial terraces and uplands to the rivers during the Middle Archaic period (6000-2500 BC). This change is believed to be the result of exploitation of plant foods and aquatic resources (Frankenberg and Herrmann 2000). Populations increased, and smaller band territories emerged.

Middle Archaic sites are found in various settings but tend to be similar in size and artifact diversity. These attributes suggest that groups were highly mobile during this time. Local lithic materials including quartz, quartzite, and metavolcanic were used with greater frequency. Stanly, Halifax, Morrow Mountain, and Guilford projectile point/knife styles, as well as an increase in groundstone tool production, such as atlatl weights, axes, and pestles occurred during this time.

By the Late Archaic period (2500-500 BC) there is archaeological evidence of plant cultivation including squash, goosefoot, knotweed, little barley, maygrass, sumpweed, and sunflower. Archaeological evidence shows that three of these were domesticated during the Late Archaic period: sunflower by 2000 BC, goosefoot by 1500-1000 BC, and sumpweed between 1000 and 500 BC (Scarry 1994).

During the Late Archaic period, groups became more sedentary, which allowed for regional social, technological, and economic specializations. The manufacture of soapstone vessels, grooved stone axes, ornaments, and copper items occurred during this time. Late Archaic diagnostic lithic artifacts include broad and square-stemmed Savannah River and small-stemmed Gypsy projectile points/knives.

Due to the semi-sedentary nature of people during this time, Archaic period archaeological sites in the Carolina Piedmont region represent temporary camps. Camps and settlements were usually established near rivers or other water resources and tended to be in upland areas. Groups moved between locations according to the seasons and resources available where they engaged in both hunting and gathering activities.

Woodland Period

The development of ceramics and the bow and arrow are markers of the beginning of the Woodland period (500 BC-European Contact). A shift towards permanent settlement during this time reflects growing dependence on horticulture and population growth. Maize was introduced during the Early and Middle Woodland periods, although wild plant resources continued to be major food sources into the Late Woodland period (Scarry 1994).

Early evidence of the Woodland period in the North Carolina Piedmont is the Badin culture that is characterized by hard-paste, sandy ceramics and large triangular projectile points. Early Woodland period (500 BC-AD 800) sites are

often found in the fertile bottomlands, but they are also documented in the uplands. Subsistence and economic patterns that developed during the Late Archaic period continued into the Early Woodland period. Although the data is sparse, there is good evidence that settlements moved to the bottomlands during the succeeding phases (Davis 1990). Ceramic styles shifted from Badin series to the Yadkin and Uwharrie series during the Middle Woodland period (AD 800-1000). Both have similar surface treatments and feature coarse-sand or crushed-quartz temper. Dan River ceramics with crushed quartz and coarse river sand temper appear in the Late Woodland period.

During the Late Woodland period, people from present-day South Carolina or northern Georgia migrated into the present-day Charlotte region bringing a more complex cultural tradition that was like the southeastern Mississippian cultures (Ward and Davis 1999). Their ceramics were made with well-mixed fine-sand-tempered clay that was smoothed and burnished and had complicated stamped surface treatments.

Late Prehistoric/Protohistoric Period

The Late Prehistoric/Protohistoric period is noted for complex societies organized in chiefdoms, platform mounds associated with a public plaza, and houses constructed of wattle and daub. Cleared field agriculture with maize as the dominant crop was an important subsistence activity. Changes in subsistence were accompanied by changes in settlement patterns that selected areas capable of yielding abundant and predictable resources (Scarry 1994:21).

Approximately 5,000 Catawba were living in the region prior to the arrival of Spanish explorers (Lee 1968). During the mid-sixteenth century, both Hernando de Soto and Juan Pardo identified many Catawba settlements along the Catawba and Wateree Rivers. These include: *Joara*, *Guaquiri*, *Quinahaqui*, *Yssa*, *Otari*, *Aracuchi*, *Tagaya*, *Tagaya* the Lesser, and *Cofitachequi* (Moore 2002). Pardo's account of his expeditions was the first written reference made to the Catawba.

Joara has been recorded as archaeological site 31BK22, also known as the Berry Site. Pardo came to *Joara* in 1567 and established Fort San Juan at the settlement (Moore 2002). He left approximately 30 Spanish men there hoping to expand the Spanish territory from the Santa Elena colony. Excavations at the site have revealed many Spanish artifacts including olive jars, majolica, glass beads, nails, and other metal objects like buttons and knife fragments (Moore 2002).

Cofitachequi is in Kershaw County, South Carolina, and is recorded as archaeological site 38KE12. It is also known as the Mulberry Site that consists of large earthen mounds and an associated village that served as the capital of *Cofitachequi*; it was occupied between AD 1100 and 1700. During the early-nineteenth century, as many as 10 earthen mounds were observed at the site. Archaeological excavations have revealed square house structures and a stockade around one mound.

Around AD 1660, after years of conflict over land possession and a bloody battle at Nation Ford, the Catawba and Cherokee tribes created a neutral territory between the Broad River and the Catawba River (Moore 2002). Thereafter, the Cherokee mainly inhabited western portions of North Carolina in the Blue Ridge Mountains. The Catawba populations declined after initial contact with the Spanish. This was due in large part to epidemic diseases like smallpox.

John Lawson's early-eighteenth-century account of Native American settlements around the present-day North and South Carolina border identifies several tribes: *Esaw*, *Sugaree*, and *Kadapu* (Moore 2002). They were living near Sugar Creek and the Catawba River, between present-day Charlotte, NC, and Rock Hill, SC.

The Catawba Nation was noted by Lawson for its large population; at the time, the Catawba Nation had about 1,200 people (Rights 1957). The Nation formed in 1716 after the Yemassee War from several groups that were once part of the *Cofitachequi* confederation, which included *Cheraw*, *Congaree*, *Wateree*, and *Waxhaw* (Hicks 1998).

A 1715 census of Native American populations in South Carolina identified only seven Catawba villages, suggesting the Upper Catawba Valley had been largely depopulated by that time (Moore 2002). Additionally, maps dating to this time show no major Native American settlements east of the Blue Ridge Mountains and west of the Occaneechi Trail.

In 1763, the Catawba were granted a reservation covering 15 square miles along both sides of the Catawba River in York and Lancaster counties, SC (Rights 1957). Recent archaeological investigations by the University of North Carolina-Chapel Hill Research Laboratories of Archaeology has resulted in locating the two Catawba villages depicted on a 1772 map of the Catawba Nation. These villages are located along the Catawba River and are identified as “Old Town” and “New Town.” Old Town was occupied before the American Revolution and New Town between 1800 and 1820. In 1826, some of this land was leased to nearby white settlers. By this time, the Catawba population had dwindled to 110.

HISTORIC CULTURAL CONTEXT

Prior to settlement by Scotch-Irish, the present-day Mecklenburg County area was inhabited by *Eswataroa* (now more commonly called *Catawba*). Early European exploration of the region relates to Hernando de Soto of 1539 to 1543. There are several interpretations as to the route taken by de Soto; however, it is likely that regardless of the route the effects of Europeans in present-day Piedmont Carolina exposed native people to disease and warfare that brought about the decline in population of the Catawba.

Beginning in 1749, John Beatty acquired approximately 944 acres on the west bank of the Catawba River (Brotherton 1993). Soon afterwards, Charles, James, and Henry Connor obtained land on the eastern side of the river across from Beatty. John Beatty established Beattie’s Ford where an island and flat rocks made crossing the Catawba River manageable by pedestrians, horses, and wagons. Native Americans had used this natural ford as part of a trading path for centuries.

Beattie’s Ford played an important role in the transportation and migration of many settlers in the region. During the mid-nineteenth century, it served as a stagecoach station and was home to Hutchins G. Burton, who served as governor of North Carolina from 1824 to 1827 (Brotherton 1993). Early maps show that seven roads converged at Beattie’s Ford. Use of the ford declined during the late-nineteenth and early-twentieth centuries as railroads, automobiles, and bridges rendered Beattie’s Ford obsolete. The name “Beattie’s Ford” had been conferred to road names in Mecklenburg, Catawba, and Lincoln counties. Beattie’s Ford is now under Lake Norman.

Mecklenburg County was established in 1762 from a part of Anson County and included, at that time, parts of what are now Cabarrus, Union, Lincoln, Rutherford, Cleveland, and Gaston counties (Corbitt 1950). The county, in its present boundaries, was established in 1842. Early settlers chose the name “Mecklenburg” after Queen Charlotte who was born in Mecklenburg province in Germany. Queen Charlotte was the wife of England’s King George III. The city of Charlotte, incorporated on November 7, 1768, was named for Queen Charlotte.

In February 1781, a Revolutionary War Battle between General Cornwallis and General William Lee Davidson occurred at Cowan’s Ford (Lincoln County Heritage Book Committee 1997). General Davidson succeeded in slowing Cornwallis’ advance; however, he was killed during the battle. The Cowan’s Ford Chapter established a monument at the ford to commemorate the battle (Lincoln County Heritage Book Committee 1997).

Following the Revolutionary War in 1799, gold was discovered near Concord in Cabarrus County, then a part of Mecklenburg (Carpenter 1993). Charlotte became the gold-mining capital of the United States until the discovery of gold in California in 1849. The quantity of rich ore in the region led to the establishment of a US Treasury mint in Charlotte in 1836.

By 1900, Mecklenburg County had a population of more than 55,000; by 1950, the population had tripled and by the 1970s more than doubled. The forerunner of the Douglas Municipal Airport was opened in 1936 and

commercial development was enhanced by the excellent transportation facilities in the area that included the Charlotte-Douglas International Airport and Wilkinson Boulevard.

In 1935, the Charlotte-Douglas International Airport was established as “Charlotte Municipal Airport.” In 1954, a 70,000-ft² passenger terminal opened, and the airport was renamed “Douglas Municipal Airport” after former Charlotte mayor Ben Elbert Douglas, Sr. The airport gained its current name in 1982.

METHODOLOGY

The methodology used for the archaeological survey at the Project is described below. The services are pursuant to the National Historic Preservation Act of 1966 (as amended), the Archeological and Historical Preservation Act of 1974, Executive Order 11593, and 36 CFR Parts 60-66 and 800 (as appropriate).

Background Research

Background research was conducted at the NC Department of Cultural Resources, State Historic Preservation Office (SHPO) and Office of State Archaeology (OSA), in Raleigh. Online research included the NC SHPO Architectural Database (<http://gis.ncdcr.gov/hpoweb/>), Mecklenburg County GIS Data Browser (<http://charmec.org/mecklenburg/county/LUESA/GIS/Pages/Default.aspx>), Mecklenburg County GIS Polaris (<http://polaris3g.mecklenburgcountync.gov/>), Mecklenburg County Register of Deeds (<http://charmec.org/mecklenburg/county/ROD/Pages/default.aspx>), Google Earth historical image from 1993, 2002, 2004, 2010, and 2013 (<https://www.google.com/earth/>), and USGS historic maps that provided topographic maps from 1948, 1968, 1980, and 1993 (<http://historicalmaps.arcgis.com/usgs/index.html>). Other historic maps include the 1888 JT Orr Map of Mecklenburg County and the 1911 Spratt Map of Mecklenburg County.

Research to locate information about previously surveyed areas, previously recorded archaeological sites, and previously recorded architectural resources in the Project area was conducted prior to the initiation of fieldwork.

Deed Research

The Project APE falls across two parcels (Table 4). Figure 8 depicts the Project APE (red and yellow) overlaying the two property boundaries (green) identified as Parcel ID numbers 14102318 and 14119101. Figure 9 is a general view of the project west of Piney Top Drive. Figure 9 is a general view of the project west of Piney Top Drive. Figure 10 is a general view of the project east of Piney Top Drive.

Both are properties are owned by the City of Charlotte and were acquired in 1974 (DB 3612:4) and 1991 (DB 6638:218). A description of the two properties follows.

Table 4. City of Charlotte Property Ownership within the Project APE.				
Location	Parcel ID	Land Area	Date Acquired	Deed Book: Page
West of Piney Top Drive	14102318	174 acres	4/4/1974	3612:4
East of Piney Top Drive	14119101	64.48 acres	9/23/91	6638: 218

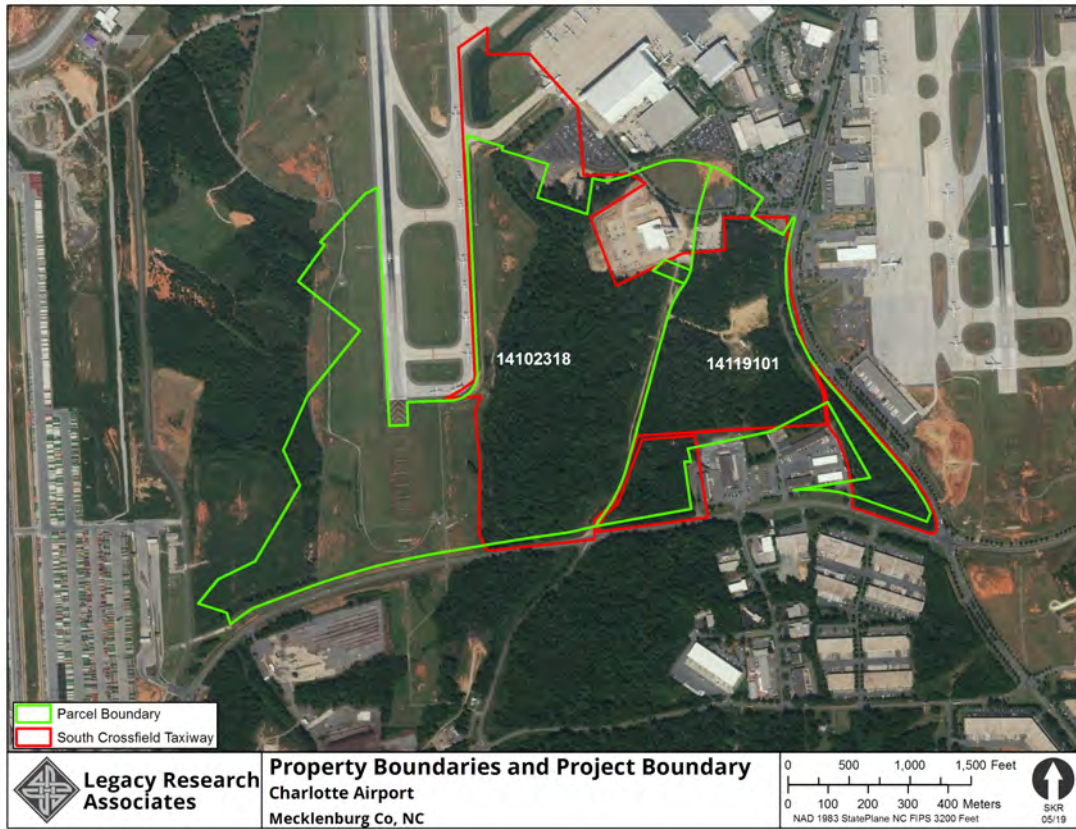


Figure 8. Parcel Boundaries overlaid on the Project APE (<http://polaris3g.mecklenburgcountync.gov/>).



Figure 9. General view of Project APE along Piney Top Drive, view west (ESI December 2018).



Figure 10. General view of Project APE along Piney Top Drive, view east (ESI December 2018).

Archaeological Field Work

Field investigations were conducted by Legacy and ESI from December 17-20, 2018. Deborah Joy with Legacy served as Project Manager. ESI conducted the field investigations: Terri Russ served as Principal Investigator, Melissa McKay was Field Director, Kyle Obermiller, and Elizabeth Mastrangelo assisted.

As a result of the investigation, 267 shovel tests were excavated and three (n=3) new archaeological sites (31MK1343, 31MK1344, and 31MK1345) were recorded.

The field investigation included surface reconnaissance in areas with 50 percent or more ground-surface visibility, subsurface investigations with systematic transect shovel testing and some judgmentally placed shovel tests, site assessment investigations with radial and grid shovel testing and, when deemed appropriate, test unit excavation.

Surface Reconnaissance. Surface reconnaissance consisted of systematically examining bare ground to determine if artifacts or surface traces indicative of an archaeological site are present. Experience has proven that surface survey is effective only in situations where 50 percent or more of the ground surface is visible and where there is no potential for buried (and thus obscured) archaeological resources. It is not effective in areas where less than 50 percent of the surface is exposed, or in places where alluvial or colluvial soil deposits are likely to be present; these areas will be inspected with subsurface testing.

Subsurface Investigations. Subsurface testing consisted of systematically excavating shovel tests at 66-ft (20-m) intervals. Shovel tests were not excavated in areas where slope exceeded 15 percent, in areas of standing water, or in hydric soils. Each shovel test measured about 15 in (38 cm) in diameter and was excavated to sterile subsoil or bedrock. All removed soil was screened through ¼-inch mesh hardware cloth to ensure uniform artifact recovery. Each shovel test was described in terms of depth, stratigraphy, and artifact recovery; the texture and *Munsell* soil color of all soils in each shovel test was recorded.

Site Assessment. Archaeological sites were defined as at least one artifact or feature greater than 50 years of age. When a site was encountered, standard procedures were followed to gather preliminary data on cultural affiliation,

site size and boundaries, integrity, and significance in terms of eligibility for the NRHP. These procedures began with radial shovel tests excavated at 33-ft (10-m) intervals in cardinal directions from the positive shovel test to establish the extent of the deposits. Once the extent was determined, then a 33-ft (10-m) interval grid of shovel tests was established across the site to further identify potential subsurface activity areas and to recover cultural artifacts and temporal data useful in producing an evidence-based evaluation of the site's NRHP eligibility. Some selectively placed shovel tests were also deemed necessary in high-probability areas that lie outside the survey transect to complete the NRHP site assessment.

Site assessment included the following:

- establish a datum
- designate a numbering system for shovel tests and stratigraphic levels keyed to drawings, written records, and photographs
- use standard size excavation units
- hand-screen excavated soils through ¼-inch mesh
- excavate levels that conform to natural soil strata
- describe soils using *Munsell* Soil color charts
- maintain a photographic record of excavations

The Principal Investigator and Field Director maintained detailed notes on the survey methodology, sites identified during the survey, testing methodology, artifact recovery, and relevant environmental factors. Standardized Field Forms designed for Test Unit and Feature excavation was used to document stratigraphy and artifact recovery.

A sketch map of each site discovered was produced. The location of each shovel test was placed on the site sketch map, and notes were maintained on the soil profiles and artifact content of each shovel test. Each site was photographed, and notes were taken concerning site location and condition. All site locations were recorded with a global positioning system (GPS) receiver with sub-meter accuracy. Sites that were less than 100x100 ft (30x30 m) in size were recorded as point data; sites greater than 100x100 ft (30 x30 m) were recorded as polygons.

Technical Documentation

Technical documentation details the results of the background research and survey. The report includes a description of the archaeological resources located during the survey and recommendations for additional work to determine site significance and NRHP-eligibility. The summary for each site is documented with maps and photographs.

The documentation complies with the Secretary of the Interior's Standards for Intensive Archaeological Survey (FR 44739) and meets the requirements of the Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716) and North Carolina Office of State Archaeology standards and guidelines for archaeological reports (<https://archaeology.ncdcr.gov/programs/forms>). The draft documentation was submitted in digital format to L&B for review and transmittal to CLT and the FAA.

NATIONAL REGISTER OF HISTORIC PLACES EVALUATION

Cultural resources identified during the field investigation were inspected at the survey level that included an assessment of eligibility for listing in the NRHP. In general, cultural resources are evaluated using criteria for NRHP eligibility as specified by the Department of Interior (36 CFR Part 60). A recommendation on the significance of cultural resources (archaeological sites) is based on the NRHP-eligibility criteria described in 36 CFR 60.4, as follows:

Sites, objects, districts, structures, and buildings are determined as worthy of inclusion on the NRHP if "The quality of significance in American history, architecture, engineering and culture is present" in these resources and if they "possess integrity of location, design, setting, materials, workmanship, feeling, association and

Criterion a: are associated with events that have made a significant contribution to the broad patterns of our history; or

Criterion b: are associated with the lives of persons significant in our past; or

Criterion c: embody the distinctive characteristics of a type, period, or method of construction that represents the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

Criterion d: have yielded, or may be likely to yield, information important in prehistory or history.”

Most archaeological sites that are deemed significant and thus eligible for inclusion on the NRHP fall under the last criterion (d) because of the information that can be retrieved from analysis of archaeological materials. In order to assess the potential of a resource for contributing new or collaborative information to the theoretical and substantive knowledge of archaeology, its significance must be determined (Butler 1987:822-823, 828; Townsend et al. 1993). Consequently, researchers must consider how each site does or does not address the questions within the research design and within the framework of other regional research questions.

To assess the archaeological sites for NRHP eligibility under Criterion d, the following attribute evaluations were considered.

Site Integrity – Does the site contain intact cultural deposits?

Preservation – Does the site contain material suited to in-depth analysis and/or absolute dating, such as preserved features, botanical and/or faunal remains, or human skeletal remains?

Uniqueness – Is the information contained in the site redundant in comparison to that available from similar sites, or do the remains provide a unique or insightful perspective on research concerns of regional importance?

Relevance to Current and Future Research – Would additional work at this site contribute to our knowledge of the past? Would preservation of this site protect valuable information for future studies?

Prehistoric Component Assessment Considerations

The prehistoric sites identified during this investigation (31MK1143 and 31MK1144) are either isolated finds of modified lithic material (fewer than three artifacts) or lithic scatters. Typically, these types are not studied because of limited artifact recovery, small distribution of artifacts, the presence of deflated soils, the lack of diagnostic artifacts, and the absence of cultural features or buried cultural horizons. Isolated finds of prehistoric lithic material do not meet minimum density thresholds and as such they are often not considered to be sites. As a result, very little information is known about variability of these site types and how they fit into local and regional land-use history. Relegating isolated finds and sparse lithic scatters to being not eligible for the NRHP results in missing an opportunity to make meaningful inferences regarding the nature of prehistoric land use and to attempt to develop useful settlement models for a given landscape (Cain 2012: 213).

Because the prehistoric sites/components identified during this investigation are lithic scatters or isolated finds of prehistoric lithic material, they are the only representation of prehistoric activity in the study area. Work by Chartkoff (1995) proposes a tiered approach to analyses for prehistoric lithic scatters that includes the following:

Level 1 – Within-Site Context – Variation within the Site

Identification of variation and patterning within the site that includes stages of lithic reduction and raw material; comparison with other sites will determine if the lithic scatter shares patterns with nearby sites or possesses unique patterns.

Level 2 – Assemblage as a Whole – The Site as a Unit

Characterization of the assemblage in terms of types and percentages of raw materials, artifact forms, and stages of lithic reduction.

Level 3 – A Site in its Environmental Context

Identification of the local terrain gradient, water sources, and raw materials.

Historic Component Assessment Considerations

Sites with historic components identified as “farmstead” sites will be evaluated following guidance from Miller and Klein (2001) who devised “A System for Ranking the Research Potential of 19th- and 20th-Century Farmstead Sites.” Miller and Klein identified several attributes that can aid making a determination about whether or not a farmstead is significant that included the fact that farmsteads were generally isolated and therefore have had less intrusion from other sites, farmsteads often have a higher level of documentation because the occupants moved less frequently, and farmsteads were occupied by diverse social, economic, and ethnic groups that include wealthy farmers with large estates to tenant farmers and freed slaves. In addition, Miller and Klein point out that a wide range of agricultural activities occurred at farms across the region. Their proposed ranking scheme that “... provides a systematic and informed means to evaluate site significance” includes the following: site type, structural evidence, archaeological evidence, documentation, oral history, occupation period, and length of occupation.

Research by Linda France Stine examined the frequency that historic farmstead sites were recorded with the NC OSA found that there was a “... need for the development of a regional archaeological context for farmstead and planation research” (Stine 2011:20-2). Stine citing Mrozowski 2006 reported that early farmers “... cut and milled old growth timber, tilled the soils, built small dams and millraces along many creeks, constructed and maintained roads, brought in non-native plants (crops and weeds) and animals, and planted orchards.” They also “... constructed farm buildings...” that through time “...reflected changes in technology, access to materials, and the intermixing of cultural ideas and practices...” (Stine 2011: 20-3). According to Stine’s research, prehistoric sites are recorded at a rate of 3:1 over historic sites; it was suggested that there is an “inconsistency in recorded farmsteads and postbellum historic scatters that are often viewed as just “whiteware or glass in a plowed field” (Stine 2011: 20-6). Stine’s research suggests that questions relevant to farmstead/agrarian archaeological sites include (1) processes of acculturation, assimilation, and resistance; (2) the change from subsistence to cash-based farming; and (3) the transformation from a mercantile-based economy to a capitalistic one and its effect on the family plantation or farm.

The 2001 Annual NC SHPO meeting included a NRHP Workshop about twentieth-century archaeological sites that are “...frequently ... thought of as unimportant or modern and as such may not be considered for evaluation under the National Register Criteria or as part of the Section 106 process” (NC SHPO 2001:1). The workshop identified three concepts (visibility, survivability, and uniqueness) that have been used “in determining the significance of archaeological sites from the recent past.” Twentieth-century sites can provide information about “...major, dramatic changes in all aspect of everyday life in the twentieth century” that include technological innovations, social behavior, and consumerism (NC SHPO 2001:6).

BACKGROUND RESEARCH RESULTS

Previously Recorded Archaeological Sites

Research found that there were no previously recorded archaeological sites located within the Project APE. However, several sites have been recorded to the south and west of the APE (Figure 11). A summary of these sites follows.

PROPOSED CHARLOTTE-DOUGLAS INTERNATIONAL AIRPORT EXPANSION - ER 96-E-0000-0362

Most of the previously surveyed areas in the vicinity of the Project APE was conducted between 1995 and 1997 by Anthony Tolonen with KEMRON Environmental Services in Atlanta, Georgia, and Laura Clifford with Environment and Archaeology LLC in Verona, Kentucky. Their work covered 3,000 acres and identified 52 archaeological sites (Tolonen and Clifford 1998). Two sites were found to have enough integrity, size, and potential for intact cultural remains to be eligible for the National Register of Historic Places. These two sites are 31MK811 and 31MK814. Both sites yielded a large amount of lithic debitage, flakes tools, chipped stone stones, and a low number of groundstone tools and fire cracked rock.

The Wynn Site (31MK811) was situated on an upland ridgetop overlooking the headwaters of an unnamed tributary of Lake Wylie at an elevation of 220 m amsl. The site is in an agricultural field and site soils were thin. Site soils are CeB2 types and the adjacent slopes have eroded Cecil and steep Pacolet soil types. The site was estimated to cover approximately 1,750 m². A total of 251 artifacts were recovered from the site. Additionally, the landowner has a private collection of 53 diagnostic chipped stone tools and 17 non- diagnostic bifaces and biface fragments. The area with the greatest recovery was in a plowed field that yielded 273 artifacts. Known cultural affiliations include Late Paleo-Indian, Early, Middle, and Late Archaic, and Early Middle and Late Woodland. No prehistoric ceramics or temporally diagnostic ground stone artifacts were found.

The Ertle Site (31MK814) was situated on an eroded upland ridgetop, near the headwaters of Little Paw Creek with an elevation of 223 m amsl. The site had been plowed and was a possible artifact hunting area. Site soils were thin and eroded. The site was situated on Helena-Urban complex soils, but the adjacent areas had Pacolet sandy loam with 25-45 percent slopes, and eroded Cecil soils. The site covered approximately 250 m² and the survey recovered 189 artifacts from the site area.

Sites 31MK811 and 31MK814 were recommended as being eligible for the NRHP and Phase 2 testing was proposed. The remaining sites were found to consist of small and/or disturbed artifact assemblages lacking potential to contribute meaningful knowledge to the history or prehistory of the area. No additional work was recommended for these sites.

PROPOSED RUNWAY 18C - ER 18-1381

A recent review of the proposed Runway 18C (ER 18-1381) resulted in a recommendation by the NC SHPO that no survey was required.

A total of 35 archaeological sites have been recorded within the vicinity of the Project APE. None were recommended as being eligible for the NRHP (Table 5).

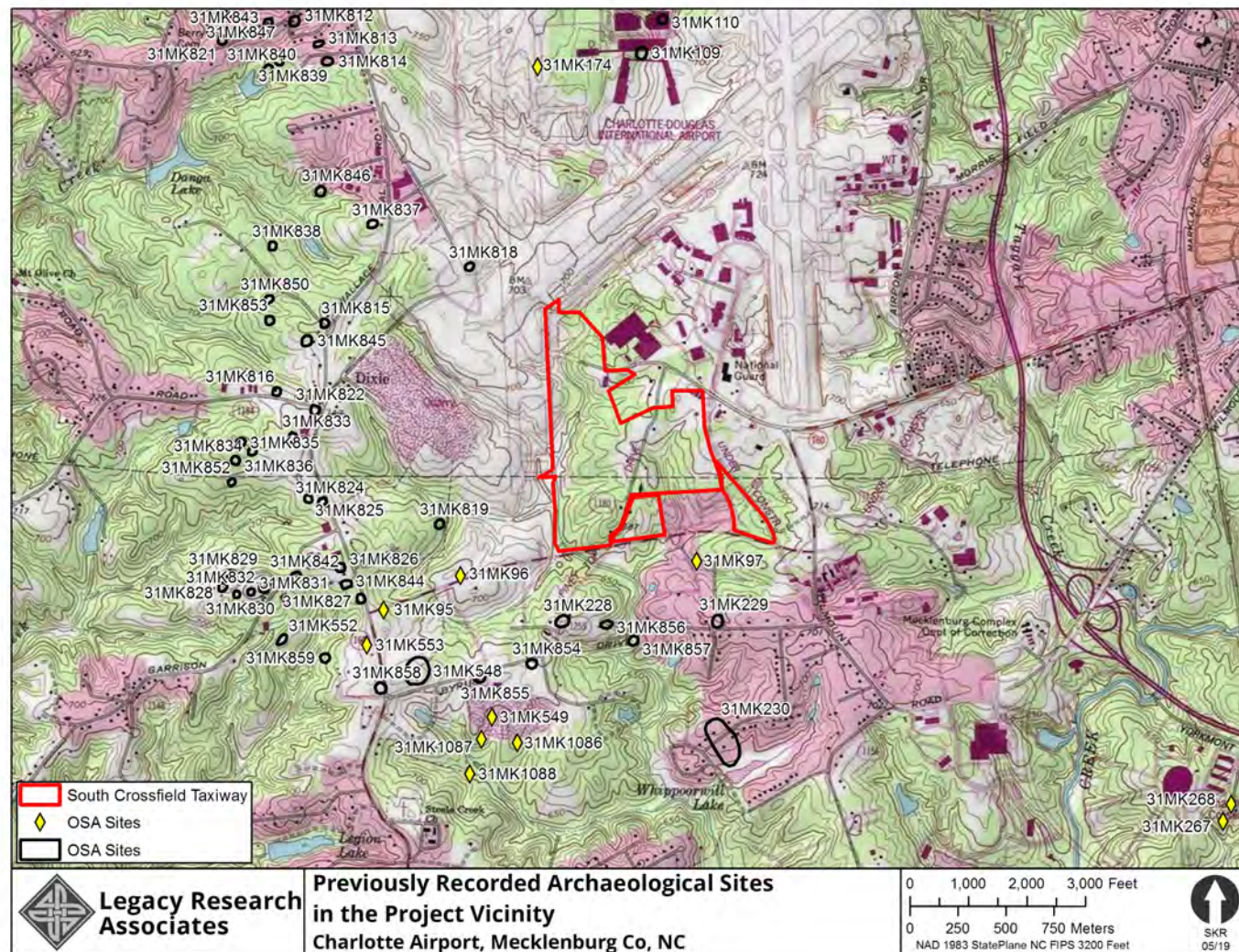


Figure 11. Previously Recorded Archaeological Sites in the vicinity of the Project APE.

Table 5. Summary of 1998 Phase 1 Survey Sites within the Vicinity of the Project APE.

Site Number	Cultural Component	Description	Site Assessment	Recommendations
31MK228	Unknown prehistoric	Lithic scatter	Not eligible	No further work
31MK548	Unknown prehistoric	Lithic scatter	Not eligible	No further work
31MK815	Unknown prehistoric	Lithic scatter	Not eligible	No further work
31MK816	Multicomponent prehistoric/historic	Lithic scatter	Not eligible	No further work
31MK818	Unknown prehistoric	Lithic isolated find	Not eligible	No further work
31MK819	Unknown prehistoric	Lithic scatter	Not eligible	No further work
31MK822	Unknown prehistoric	Lithic isolated find	Not eligible	No further work
31MK824	Unknown prehistoric	Lithic isolated find	Not eligible	No further work
31MK825	Late Archaic	Lithic scatter	Not eligible	No further work
31MK826	Late Archaic	Lithic scatter	Not eligible	No further work
31MK827	Early Archaic - Late Prehistoric	Aggregate scatter	Not eligible	No further work
31MK828	Unknown prehistoric	Lithic scatter	Not eligible	No further work
31MK829	Late Archaic	Lithic isolated find	Not eligible	No further work
31MK830	Unknown prehistoric	Lithic isolated find	Not eligible	No further work
31MK831	Unknown prehistoric	Lithic scatter	Not eligible	No further work
31MK832	Unknown prehistoric	Lithic isolated find	Not eligible	No further work
31MK833	Unknown prehistoric	Lithic isolated find	Not eligible	No further work
31MK834	Unknown prehistoric	Lithic scatter	Not eligible	No further work
31MK835	Unknown prehistoric	Lithic isolated find	Not eligible	No further work
31MK836	Unknown prehistoric	Lithic isolated find	Not eligible	No further work
31MK837	Unknown prehistoric	Lithic scatter	Not eligible	No further work
31MK838	Unknown prehistoric	Lithic isolated find	Not eligible	No further work
31MK842	Unknown prehistoric	Lithic isolated find	Not eligible	No further work
31MK844	Multicomponent prehistoric/historic	Lithic scatter	Not eligible	No further work
31MK845	Unknown prehistoric	Lithic isolated find	Not eligible	No further work
31MK846	Unknown prehistoric	Lithic scatter	Not eligible	No further work
31MK850	Unknown prehistoric	Lithic isolated find	Not eligible	No further work
31MK852	Unknown prehistoric	Lithic isolated find	Not eligible	No further work
31MK853	Unknown prehistoric	Lithic scatter	Not eligible	No further work
31MK854	Unknown prehistoric	Lithic isolated find	Not eligible	No further work
31MK855	Unknown prehistoric	Lithic isolated find	Not eligible	No further work
31MK856	Unknown prehistoric	Lithic isolated find	Not eligible	No further work
31MK857	Unknown prehistoric	Lithic isolated find	Not eligible	No further work
31MK858	Historic	Scatter	Not eligible	No further work
31MK859	Unknown prehistoric	Lithic isolated find	Not eligible	No further work

Previously Recorded Architectural Resources

Two architectural resources (JW Auten Homesite MK1698 and the Robert McGinn, father of WA McGinn, Homesite MK1710) have been recorded with the NC SHPO in the Project APE (Figure 12). Both are depicted on the 1911 Spratt Map of Mecklenburg County (Figure 13).

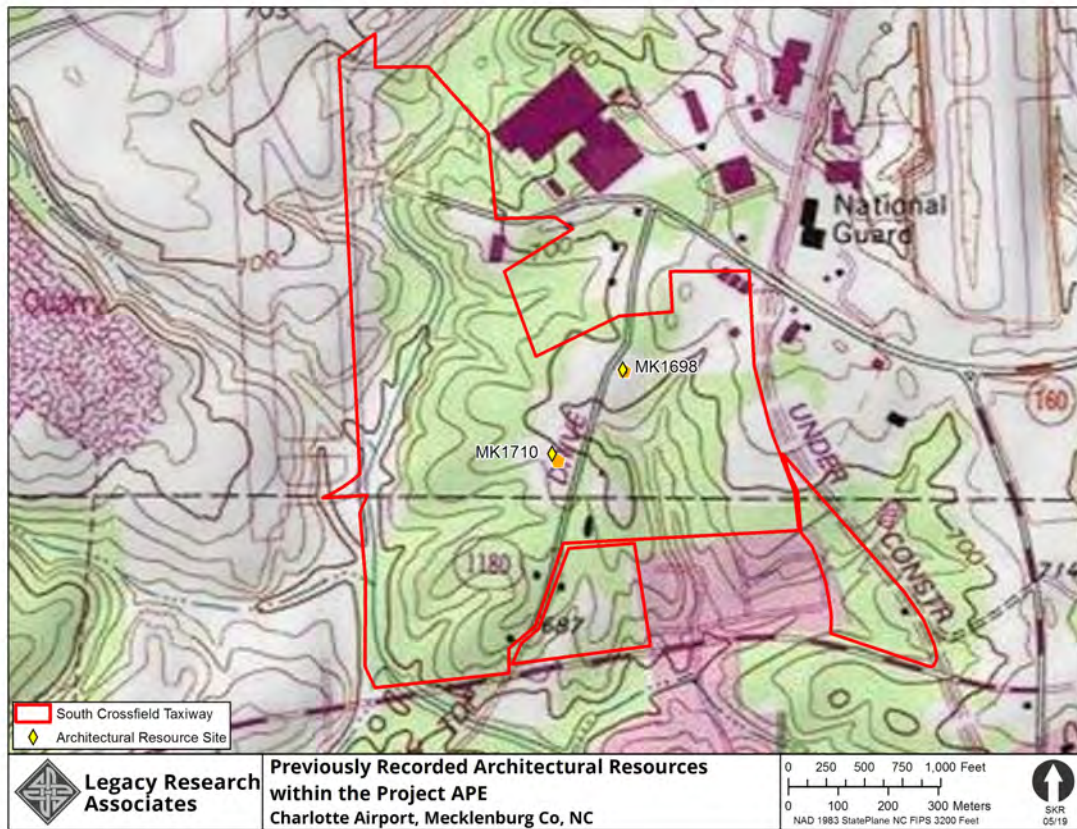


Figure 12. Previously Recorded Architectural Resources in the Project APE.

The JW Auten House (MK1698) is no longer extant. The archaeological survey in the JW Auten House area found extensively disturbed soils; therefore, no archaeological component was recorded.

The Robert McGinn homesite (MK1710) was extant at the time of the December 2018 survey. The archaeological component at this location has been recorded as 31MK1143.

The SS Heron Homesite depicted on Figure 13 was not extant at the time of the December 2018 survey. The homesite falls within a high-probability area and has been recorded as 31MK1144.

A summary of the two architectural resources (MK1698 and MK1710) recorded with the NC SHPO follows.

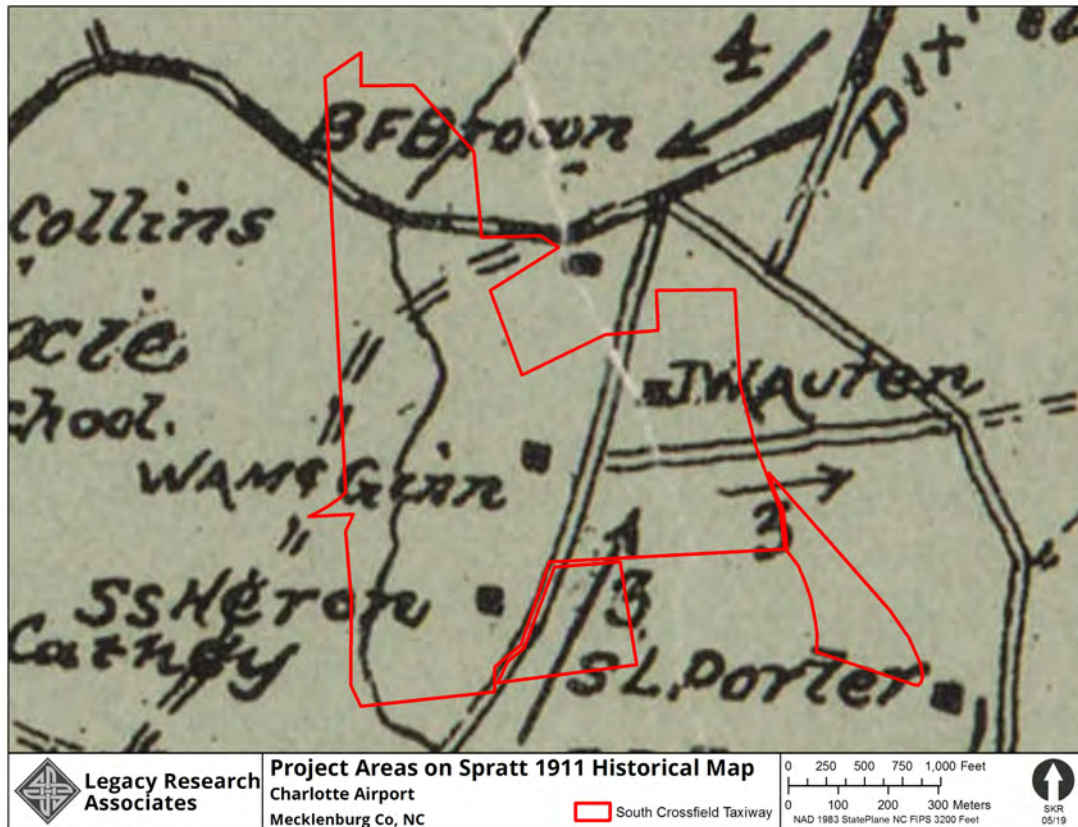


Figure 13. Previously Recorded Architectural Resources (JW Auten MK1698 and WA McGinn MK1710) in the Project APE on the 1911 Spratt Map of Mecklenburg County, NC.

JW AUTEN HOUSE – MK1698

According to the NC SHPO architectural site files, the JW Auten House was acquired by the airport in 1989 and destroyed by fire in 1990 (NCHPO WEB <http://gis.ncdcr.gov/hpoweb/>).

ROBERT MCGINN HOUSE – MK1710

The Robert McGinn House (MK1710) was recorded in 1989 by MB Gatza during the Rural Mecklenburg County Survey. The house was revisited in 2015 by Mattson and Alexander for the Charlotte Phase 2 Survey. At that time, the structure had been reported as having been acquired by the airport in 1989 and demolished in 1995. An inspection of the Project APE in 2018 found that the house was extant. The NC SHPO deleted the demolished reference to the Robert McGinn House in December 2018 (NCHPO WEB <http://gis.ncdcr.gov/hpoweb/>).

The structure was described as a small log house built around the 1850s or early 1860s. Robert McGinn died during the Civil War and his son, William Alexander (WA) McGinn (1862-1931) inherited the property. He enlarged and improved his father's log home. WA McGinn married Blanche Robinson. They had five children, one resided in the house at the time of a 1989 interview (89-year-old Laura McGinn, granddaughter of Robert McGinn).

The original log core of the house was not initially visible when it was recorded, but a close inspection of the foundation found large stones beneath the house and in the base of the chimney. When WA McGinn remodeled the house, he added a projecting bay to the east side, a rear ell, and a front porch. The new house resembled a one-story “front-gable-and-wing” type that was prevalent in the county. The exterior and chimney on the log section were also rebuilt. The chimney was described as “a single-shoulder chimney laid in a common bond brick on a fieldstone base.” A second, interior, chimney was in the front-gabled section. The front porch wrapped across the facade and one bay of the east elevation and featured chamfered columns and a shallow pediment over the entry.

ARCHAEOLOGICAL SURVEY RESULTS

Field investigations were conducted by Legacy and ESI from December 17-20, 2018. Deborah Joy with Legacy served as Project Manager. ESI conducted the field investigations. Terri Russ served as Principal Investigator, Melissa McKay was Field Director, Kyle Obermiller, and Elizabeth Mastrangelo assisted.

Much of the Project APE was determined to have a low probability for the presence of archaeological sites based on the presence of eroded and/or disturbed soils or steep slopes. The investigation found that approximately 64 percent of the Project APE was disturbed from agricultural activities, soil erosion, existing and previous construction. The remaining 36 percent (62.7 acres) was systematically surveyed with 267 shovel tests. This work resulted in identifying three (n=3) new archaeological sites (31MK1143, 31MK1144, and 31MK1145). Table 6 summarizes the three sites and National Register of Historic Places eligibility recommendation.

Table 6. Summary of Archaeological Sites and National Register Eligibility Recommendations.					
Site	Accession	Component	Time Period	Assessment	National Register Recommendation
31MK1143	2018.0766	Prehistoric	Unknown	Not Eligible	No Further Work
31MK1144	2018.0767	Prehistoric	Unknown	Not Eligible	No Further Work
		Historic	20 th century	Not Eligible	No Further Work
31MK1145	2018.0768	Historic	19 th to 20 th century	Not Eligible	No Further Work

Figure 14 shows the location of the three new sites on a USGS topographic map. A description of the three sites follows.

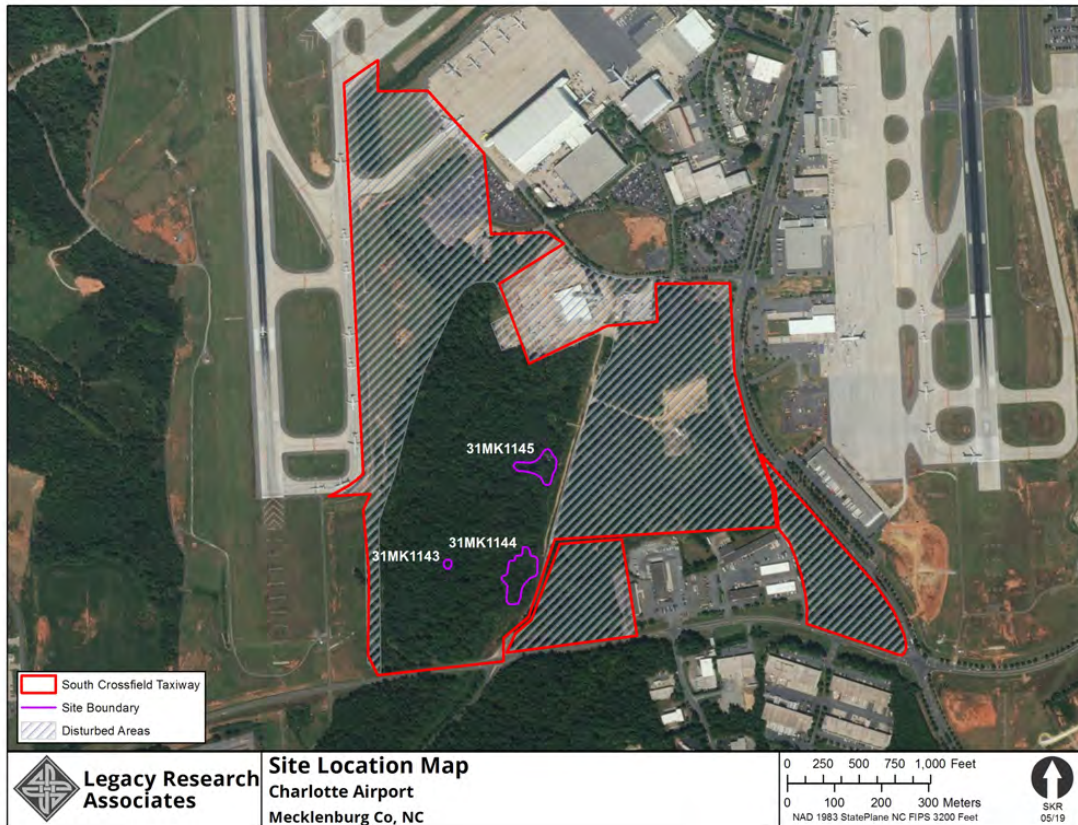


Figure 14. Project APE showing site locations and disturbed areas.

Site 31MK1143

UTM Coordinates: 17S 504853m E 3895092m N

Site Size: 177m²

Elevation: 682 feet amsl

Environmental Setting: Wooded

Nearest Water: 150 m west, Coffey Creek

Surface Visibility: <25%

Field Procedures: Shovel Testing (n=9)

Cultural Affiliation: Prehistoric–Lithic, Unknown subperiod

Site Function: Isolated Artifact

Site Integrity: Poor

Recommendations: Not Eligible; No Further Work

Site Description: Shovel testing along a wooded ridgetop on December 17, 2018, recovered a single piece of quartz debitage from shovel test (ST)8-4 (Table 7). Delineation shovel testing at 15-m intervals around ST8-4 recovered no additional artifacts.

Figure 15 is a general view of the wooded ridgetop at 31MK1143.

Figure 16 and Figure 17 depict site testing at 31MK1143.

Soils in the shovel tests typically consisted of 5 cm of dark brown sandy loam over 15 cm or less of reddish-brown sandy clay loam. Subsoil was a yellowish red clay, encountered around 25 cm below surface.

Table 7. Summary of cultural material recovered from 31MK1143.								
Transect	Shovel Test	Stratigraphic Zone	Depth below surface (cm)	Artifact Type	Artifact Material	Artifact Description	Count	Weight (g)
8	4	1	0-25	Prehistoric	Lithic	quartz tertiary flake	1	0.6

This site is recommended as being not eligible for the National Register. No further archaeological work is recommended.



Figure 15. Site 31MK1143 general view, view east (ESI December 2018).

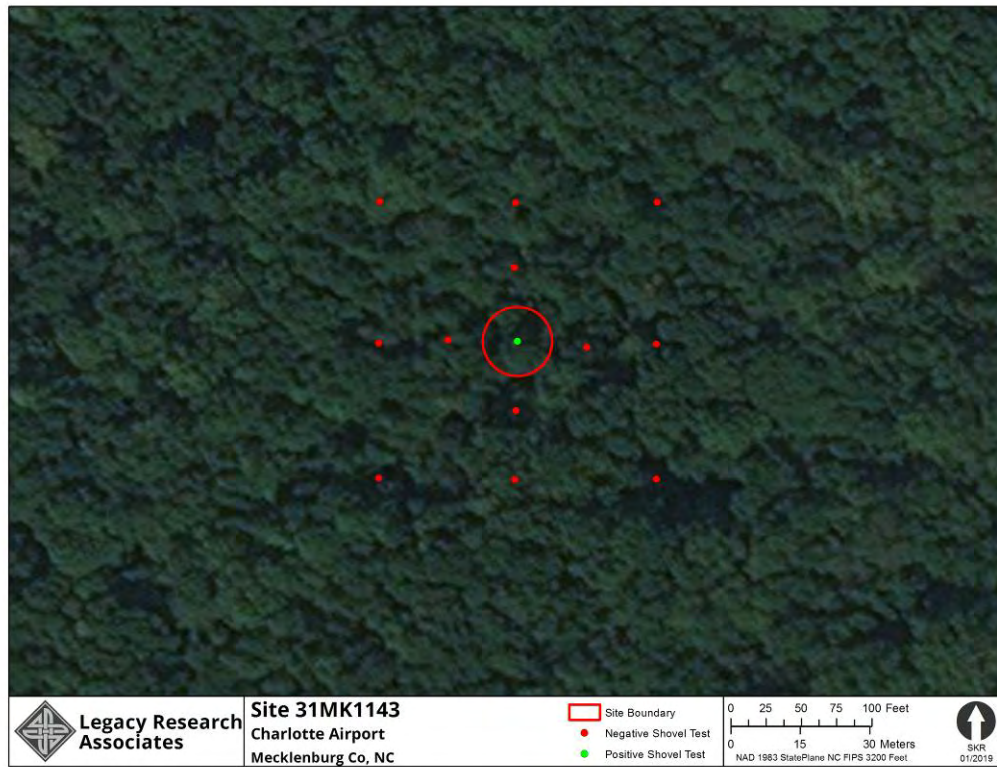


Figure 16. Site 31MK1143 site plan on current aerial image.

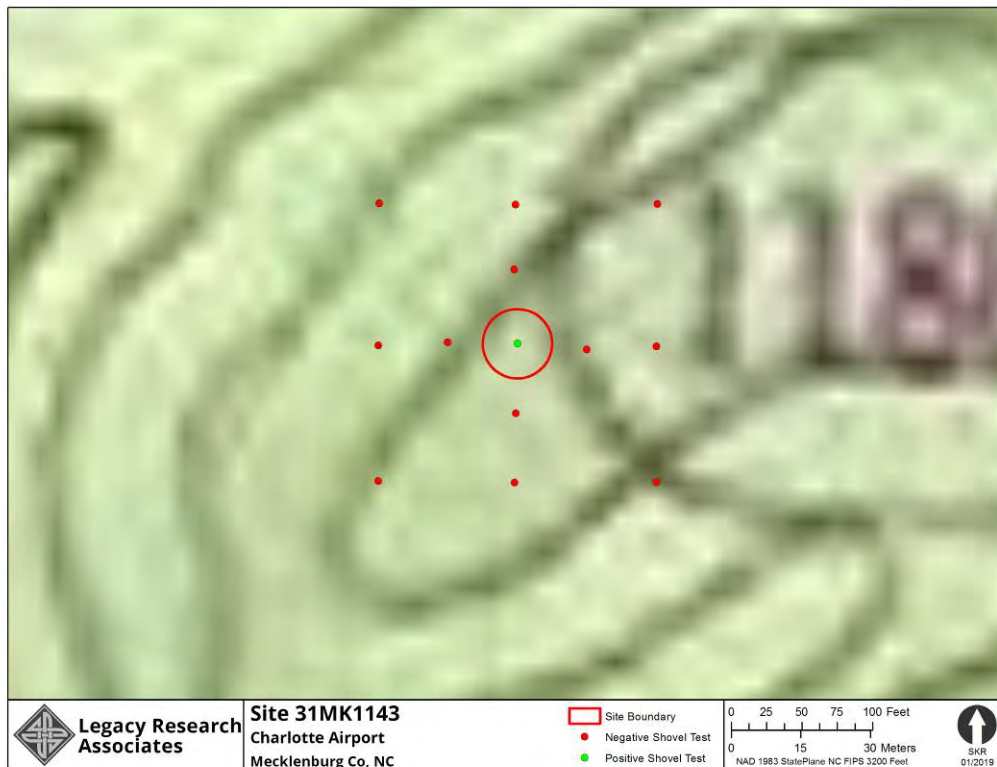


Figure 17. Site 31MK1143 site plan on a USGS topographic map.

Site 31MK1144 – Herron House

UTM Coordinates: 17S 505006m E 3895074m N

Site Size: 4,900m²

Elevation: 690 feet amsl

Environmental Setting: Wooded

Nearest Water: 300 m west, Coffey Creek

Surface Visibility: <25%

Field Procedures: Visual Inspection and Shovel Testing (n=48)

Cultural Affiliation: Prehistoric Unknown Time Period and Historic–20th Century

Site Function: Domestic/Agricultural

Site Integrity: Poor

Recommendations: Not Eligible; No Further Work

Site Description: Visual inspection along a wooded ridgetop adjacent to Piney Top Drive revealed a stacked stone, brick, and cement foundation. Shovel testing approximately 75 m north of the structural remains recovered historic materials from two adjacent transect shovel tests (ST8-9 and ST8-10).

Delineation shovel testing at 15-m intervals around the two positive shovel tests and the structural remains recovered cultural materials from nine (n=9) additional shovel tests (d1, d2, d3, d5, d6, d9, d10, d15, and d16). Soils in the shovel tests typically consisted of 10 to 15 cm of dark brown or brown sandy loam over red clay subsoil.

Figure 18 and Figure 19 depict site testing at 31MK1144.

In addition to the subsurface artifacts, several piles of debris were noted at the site. A small, stacked pile of three-hole brick was noted adjacent to d16 (appears to have been stacked for later use; possibly salvage after the structure was demolished). A pile of rotted telephone/power poles was also noted in this area (likely associated with repairs to the adjacent powerline located to the east). A pile of tires and a cinderblock foundation (approximately 3-x-3 m) was recorded between ST7-2 and d35.

A wood and metal clothesline were located adjacent to d9, and a small pile of cinderblock rubble was noted about 15 m south of the clothesline (adjacent to d1). Bulldozer scars were noted throughout the site and are likely associated with the structure's demolition.

The foundation remains located in the southern portion of the site consisted of stacked fieldstone capped with brick and cement. The western portion of the foundation was partially collapsed, and consisted of an approximately 11.3-m long, 30- to 45-cm-tall wall of stacked fieldstone capped with brick and cement (~60–65 cm total height). The north and south wall of the structure consisted of an approximately four-meter-long area of visible stone; the remaining portion of the foundation appeared to have been demolished. The east wall of the structure was not visible.

Figure 20 is detailed mapping of the foundation remains.

Figure 25 to Figure 28 are photographs of the stone-and-brick foundation at 31MK1144.

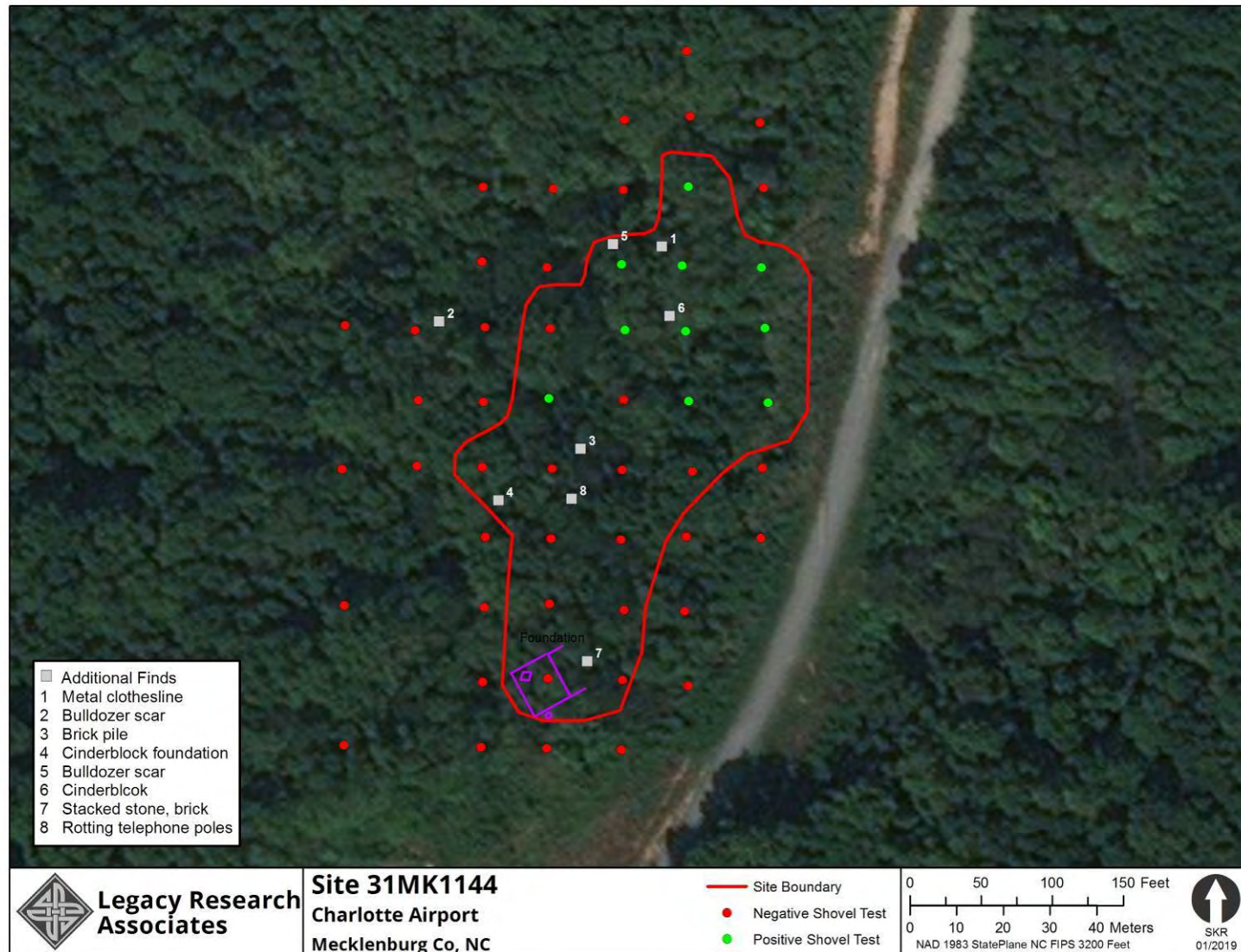


Figure 18. Site 31MK1144 site plan on current aerial image.

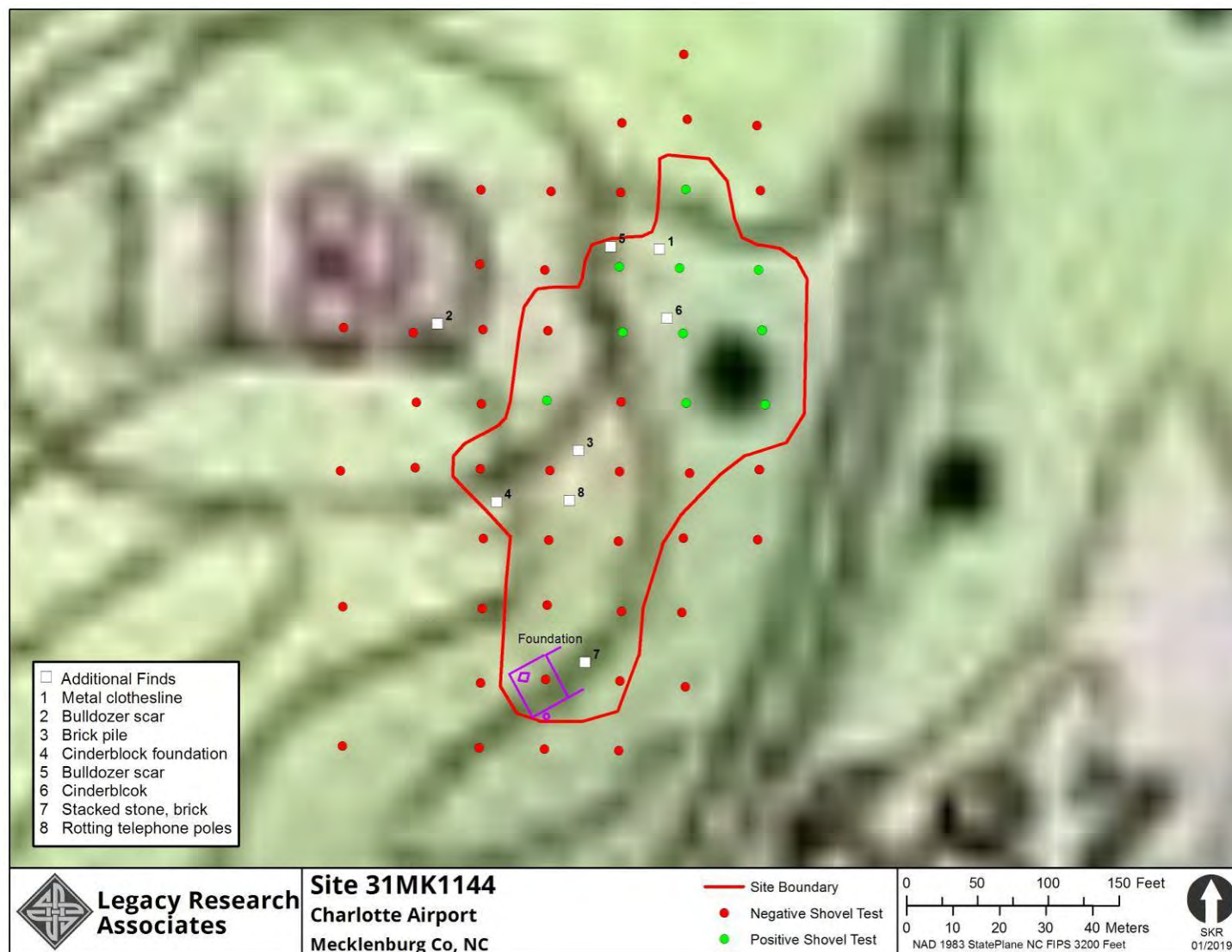


Figure 19. Site 31MK1144 site plan on current USGS topographic map.

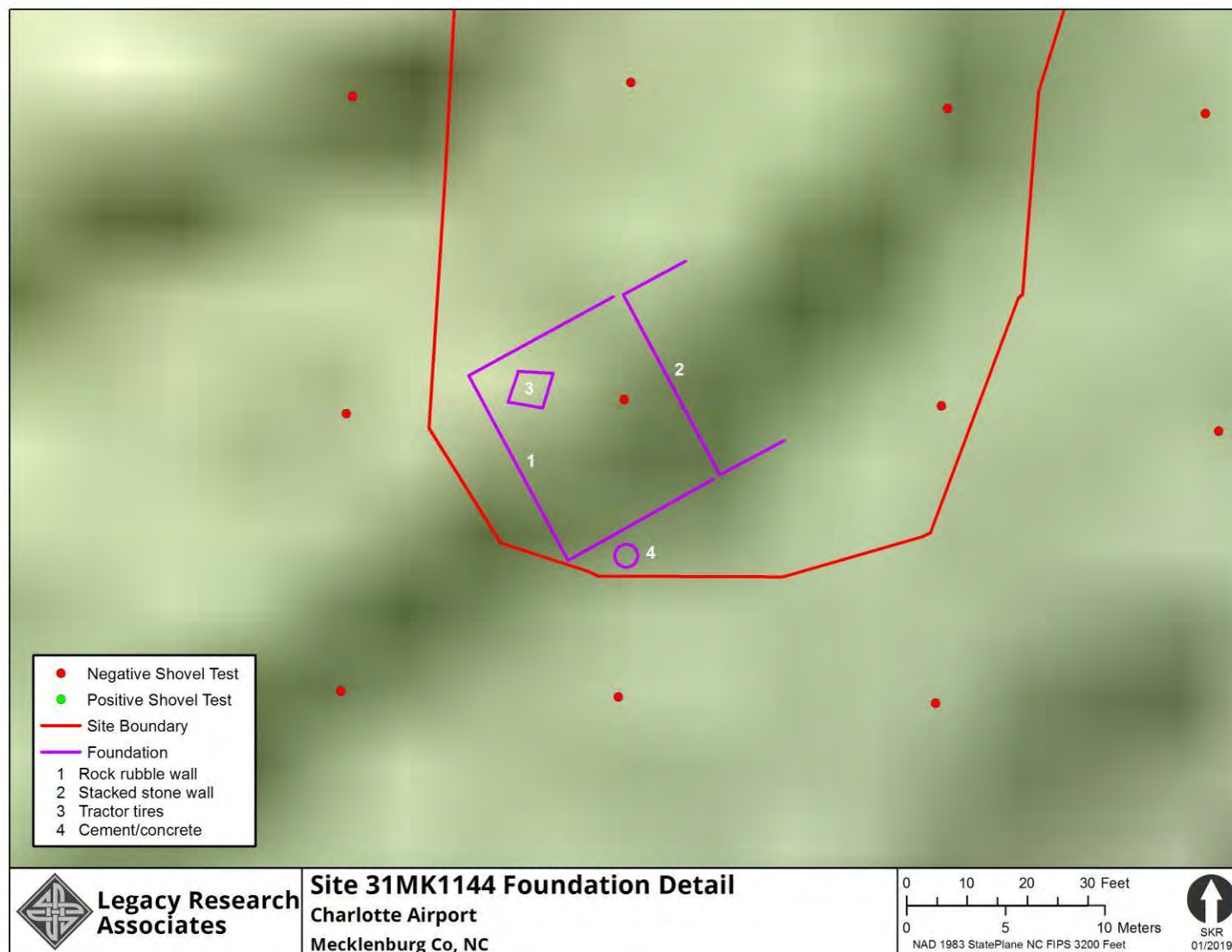


Figure 20. Site 31MK1144 foundation detail on current USGS topographic map.



Figure 21. Site 31MK1144, stone-and-brick foundation, view northeast (ESI December 2018).



Figure 22. Site 31MK1144 stone-and-brick foundation, view east ((ESI December 2018).



Figure 23. Site 31MK1144, close-up of stone-and-brick foundation, view northeast (ESI December 2018).



Figure 24. Site 31MK1144, overview of foundation, view northwest (ESI December 2018).

Immediately west of the foundation remnants was an approximately 8.8 m by 11.3 m “wall” of rock rubble. The material did not appear to be structural building stone (it resembled rip rap used for construction drainage). The material was loosely piled with no mortar or fill. Within this roughly rectangular area was a pile of cement drainage piles, concrete chunks, and what appeared to be cement stair treads. A pile of tractor tires was noted along the south of this “wall.”

The survey recovered 50 artifacts from 31MK1144. Most are historic (n=48), the prehistoric component is represented by two (n=2) artifacts (Table 8).

The prehistoric component is comprised of two (n=2) artifacts. These include one (n=1) interior flake made from locally available quartz. It was recovered from Radial Shovel Test d15 from 5-15 cm bs, along with two (n=2) historic artifacts from the early to mid-twentieth century (whiteware and manganese-dioxide tinted glass). The other prehistoric artifact was recovered from Radial Test d5. This is a uniface, also made from locally available quartz. It was recovered along with a fragment of a twentieth-century whiteware plate fragment.

Cultural material (n=48) associated with the historic occupation of the property are Architectural-related activities (nails, brick, window glass, and asbestos roofing/siding), Kitchen-related activities (ceramics, bottle glass, and Heating-related activities (cinders and coal). Diagnostic ceramic artifacts include Bristol-glazed stoneware with Albany slip-glazed interior, alkaline-glazed stoneware, Rockingham glazed yellowware, and undecorated whiteware. These date to the early to mid-twentieth century.

This site is identified on the 1911 Spratt Map as the SS (Samuel Stewart) Herron farmstead (Figure 25). SS (Samuel Stewart) Herron (1851-1914) was the cousin of William A. McGinn. SS Herron’s father was William A. McGinn’s maternal uncle.

Archaeological Survey Investigations
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North Carolina Environmental Review Number 15-1391

Table 8. Summary of cultural material recovered from 31MK1144.									
Transect	Radial	Shovel Test	Level	Depth cm bs	Component	Artifact Type	Description	Count	Weight (g)
8		9	1	0-15	Historic	Architectural	asbestos roofing/siding	2	6.9
					Historic	Architectural	brick fragment	1	6.1
					Historic	Glass	melted glass clear	1	0.6
8		10	1	0-10	Historic	Architectural	brick fragment	1	6.7
					Historic	Metal	ferrous ring	1	9.1
	d01		2	10-30	Historic	Ceramic	whiteware fragment undecorated	1	2.8
					Historic	Ceramic	whiteware fragment undecorated	1	2.3
					Historic	Ceramic	Alkaline-glazed stoneware fragment	2	3
					Historic	Glass	brown machine-made bottle	1	1
					Historic	Other	handmade brick bat	1	183.2
	d02		2	2-12	Historic	Architectural	brick fragment	1	5.5
					Historic	Other	Coal	1	1.1
					Historic	Ceramic	whiteware fragment undecorated	1	4.1
					Historic	Glass	colorless machine-made bottle fragments	2	1.3
	d03		1	5-15	Historic	Architectural	asbestos siding	1	19.4
	d05		2	20-30	Historic	Ceramic	whiteware fragment partial makers mark indeterminate	1	0.8
					Prehistoric	Lithic	quartz uniface	1	5.6
	d06		2	10-20	Historic	Ceramic	whiteware fragment undecorated	1	3.7
	d09		1	0-25	Historic	Ceramic	Alkaline-glazed stoneware fragment	3	10.8
					Historic	Ceramic	Rockingham glazed yellowware fragment	1	6.4
					Historic	Other	Cinders	3	8.3
					Historic	Other	Coal	1	2.4
					Historic	Metal	wire nail fragments	3	11.3
					Historic	Glass	colorless machine-made bottle fragment	6	24.5
					Historic	Glass	brown bottle fragment	1	4.9
	d10		2	5-20	Historic	Glass	white milk glass canning jar lid fragment	1	0.3
					Historic	Ceramic	Alkaline-glazed stoneware fragment	1	10.1
	d15		1	5-15	Historic	Ceramic	whiteware body fragment undecorated	1	1
					Historic	Glass	Manganese-dioxide tinted bottle finish fragment	1	19.8
					Prehistoric	Lithic	Metavolcanic interior flake	1	2.1
	d16		1	0-10	Historic	Ceramic	stoneware utility vessel base Albany slip-glazed exterior and interior fragment	1	381.2
					Historic	Glass	colorless machine-made bottle fragment	2	2.5
					Historic	Glass	window pane fragment	1	1
					Historic	Ceramic	ironstone fragment undecorated	1	1.6
					Historic	Ceramic	stoneware Albany slip-glazed interior Bristol-glazed exterior fragment	1	46.9
Total								50	798.3

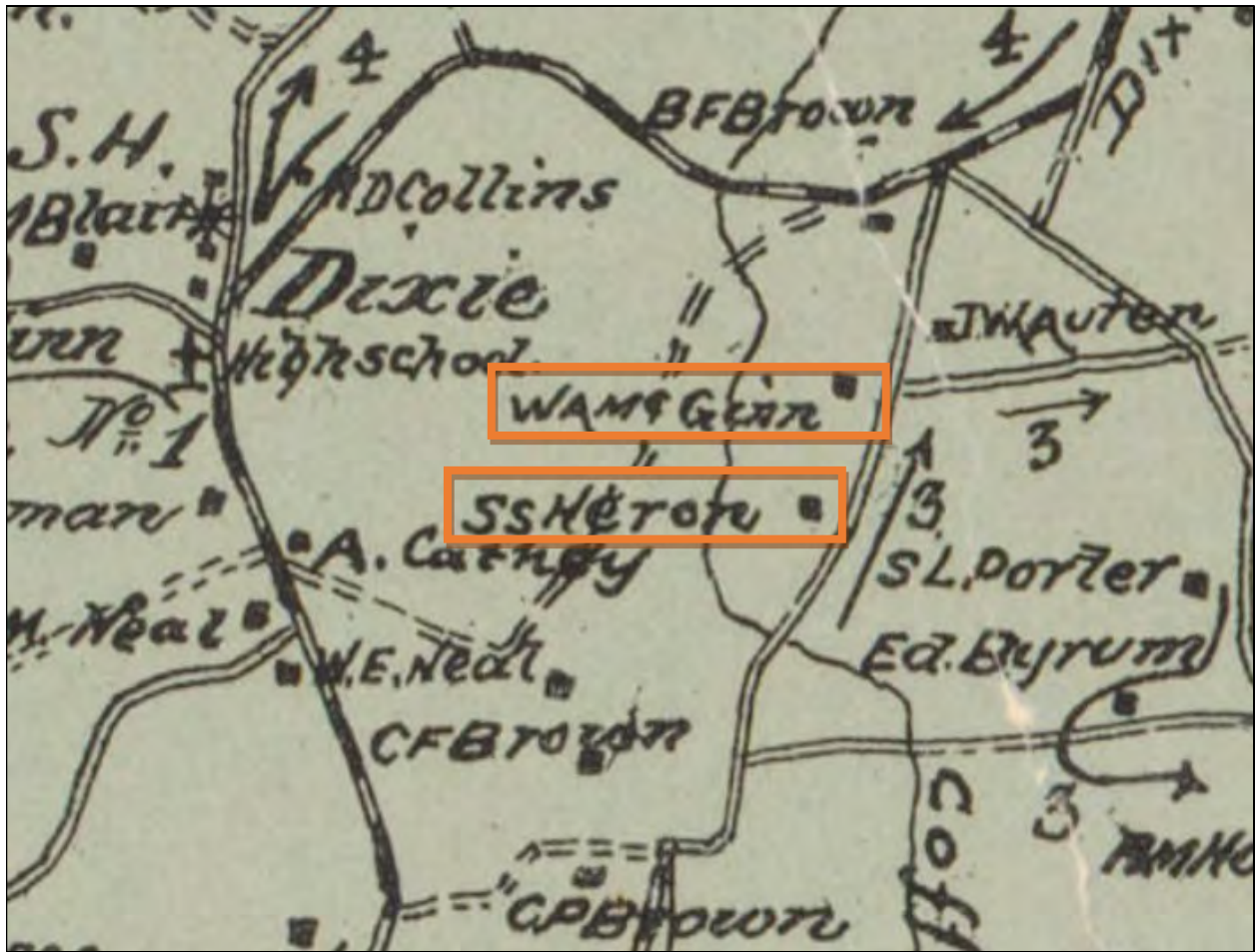


Figure 25. Excerpt of the 1911 Spratt Map of Mecklenburg County showing the WA McGinn and SS Herron farmsteads (<https://dc.lib.unc.edu/cdm/ref/collection/ncmaps/id/959>).

Site 31MK1145 – McGinn House

UTM Coordinates: 17S 505055m E 3895306m N

Site Size: 3,200m²

Elevation: 700 feet amsl

Environmental Setting: Wooded/ Overgrown and Clear Cut

Nearest Water: 300 m west, Coffey Creek

Surface Visibility: <25%

Field Procedures: Visual Inspection and Shovel Testing (n=31)

Cultural Affiliation: Historic–19th to 20th Century

Site Function: Domestic

Site Integrity: Poor

Recommendations: Not Eligible; No Further Work

SURVEY

Site Description: This site has a historic component associated with the McGinn House and one outbuilding identified as a well house.

Shovel testing around the McGinn House resulted in three (n=3) positive transect shovel tests (ST14-9, 15-4, and 16-8). Delineation shovel testing at 15-m intervals as well as judgmental shovel testing within the site boundaries and surrounding the structural remains revealed no additional subsurface artifacts.

Figure 26 and Figure 27 show the testing plan at 31MK1145.

Soils in the shovel tests consisted of 20 cm of brown silty clay loam or silty loam over red clay subsoil.

General Observations:

A large pile of modern trash (plastic bags of trash, a computer, a bike, carpeting, lumber, and other construction debris) was observed east of d15. All was identified as being modern and were not collected. It is unclear whether these materials were removed from the McGinn House or were dumped from elsewhere.

A smaller pile of modern and historic trash was observed adjacent to T15-4. The historic materials were collected, and the shovel test was counted as a positive recovery. Modern materials included beer cans and plastic debris that were not collected.

A pile of modern materials observed between d10 and ST14-7. These materials are identified as window screen, plastic prescription bottles, plastic soda bottles, and beer cans. None of these were collected. An old hot water heater and some modern trash was observed at d12. Like the pile of modern materials between d10 and ST14-7, described above, none were collected.

There appears to have been an old road/driveway extending from the south side of the house and running west along the top of the landform. The area was slightly raised and compact, with gravel noted. Modern trash was observed along Transect 14 (bottles, a toilet, and plastic debris) west of the site but was not collected nor included in the site boundaries. It appears likely that the road trace was an old farm road that has been used as a convenient place to dump garbage.



Figure 26. Site 31MK1145 McGinn House site plan on current aerial image.

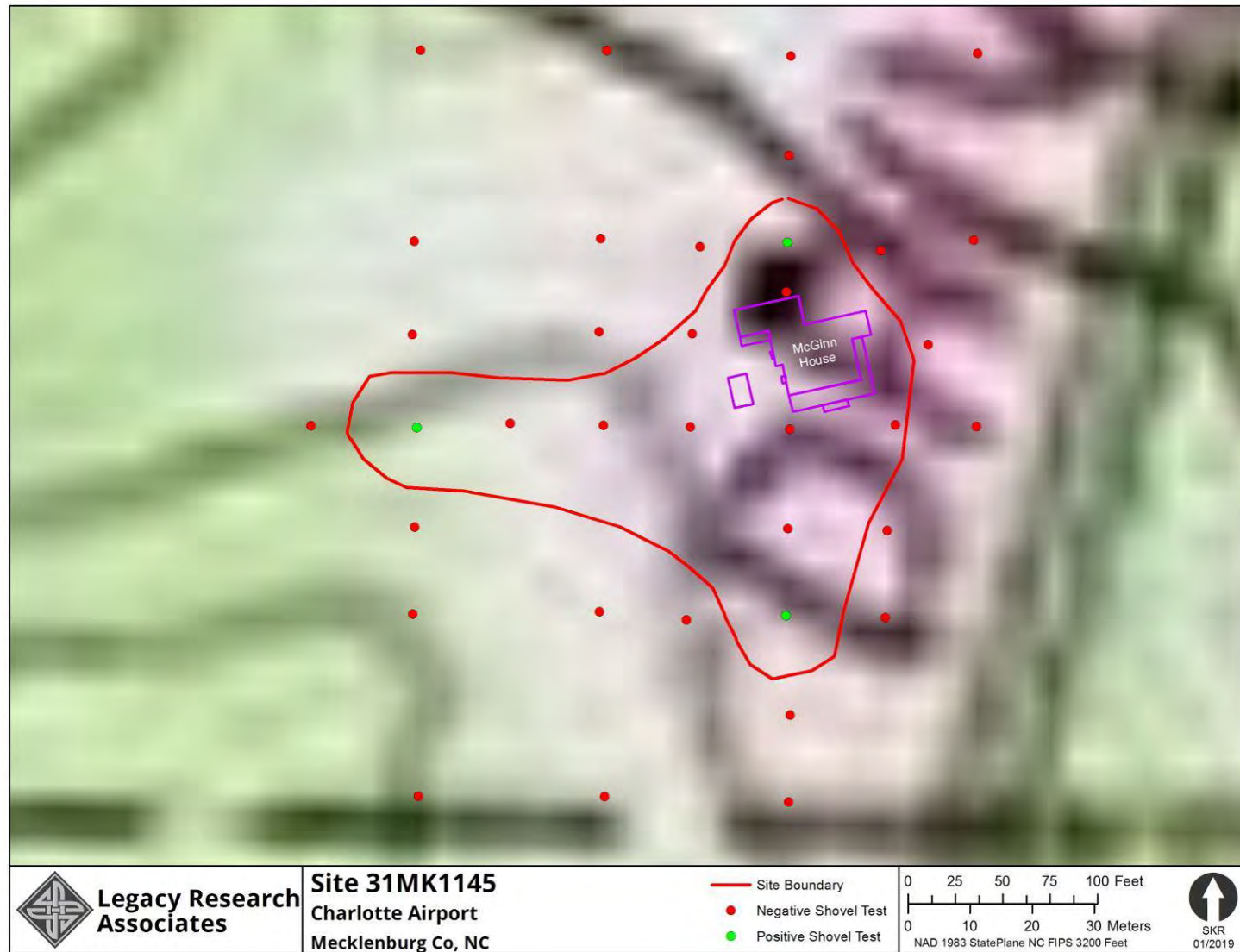


Figure 27. Site 31MK1145 McGinn House site plan on USGS topographic map.

There were only a few mature trees immediately surrounding the house. The remaining area appeared to have been clear cut. Numerous cedar “stobs” and younger tree saplings were observed in the area around the house.

According to the historic structures form, the house was clad in asbestos siding at the time it was recorded. During the current investigation, it was noted that the asbestos siding had been removed (likely abatement prior to demolition), exposing the wood siding (and along the south elevation, the original log construction). Only one chimney was intact, the interior was stripped of all mantles, etc.

The well house was intact. A poured cement pad likely covered the original well. The well house has a pump and PVC piping. No other outbuildings were noted.

Figure 28 is detailed mapping of the house foundations.

Figure 29 and Figure 30 are general views of the wooded area surrounding the abandoned homesite.

Figure 31, Figure 32, and Figure 33 are representative photographs of the McGinn House (MK1710).

The 1911 Spratt Map of Mecklenburg County shows the W. A. (William Alexander) McGinn house within the Project APE (see Figure 25). William Alexander McGinn (1862-1931) was the son of Robert F. McGinn (1832-1864) and Mary Jane Herron McGinn (1841-1875). He inherited the property from his father, Robert F. McGinn, who owned the property at the time of his death on February 2, 1864, while serving in the 11th Infantry North Carolina (Company A). Robert F. McGinn is buried at Point Lookout Confederate Cemetery, Maryland ([Point Lookout Confederate Cemetery](https://www.findagrave.com/memorial/29098033/robert-f_-mcginn) https://www.findagrave.com/memorial/29098033/robert-f_-mcginn).

Historic research found that William Alexander McGinn’s wife, Mary Blanche Robinson McGinn, died in 1940 and was buried at Steele Creek Presbyterian Church Cemetery in Charlotte (<https://www.findagrave.com/memorial/27128795>).

Robert F. McGinn is the son of James Madison McGinn (1796-1844) and Jane C. McCord (1800-1867). He acquired the property from his father’s estate in 1844 (Mecklenburg County Superior Court Record of Wills, 1763-1965).

Census data from 1800 to 1840 reveal that James Madison McGinn was not a slaveowner. He was buried at Paw Creek Presbyterian Church Cemetery in 1844 (<https://www.findagrave.com/memorial/19411245>). His wife, Jane C. McCord McGinn died 23 years later and was buried alongside her husband (<https://www.findagrave.com/memorial/19411246/jane-c-mcginn>).

Research indicates that it is highly unlikely that there is a McGinn family cemetery on the property.



Figure 28. Site 31MK1145 McGinn House detail of foundation on current aerial image.



Figure 29. 31MK1145, landform edge near T14-6., view east (ESI December 2018).



Figure 30. 31MK1145, near ST d12, view east (ESI December 2018).



Figure 31. McGinn House (31MK1145) south elevation, view north (ESI December 19, 2018).



Figure 32. McGinn well house (31MK1145), view north (ESI December 19, 2018).



Figure 33. McGinn House (31MK1145) chimney west elevation (ESI December 19, 2018).

CULTURAL MATERIAL

The survey recovered 16 artifacts from 31MK1145 (Table 9). Most (n=14 or 87.5 percent) were recovered from the ground surface near the McGinn House. The other two (n=2) artifacts were recovered from subsurface testing.

Cultural material (n=16) associated with the historic occupation of the property are Architectural-related activities (brick and window glass, Kitchen-related activities (ceramic plate and cup, a bottle fragment, and a condiment bottle), Personal-activities (bisque toy doll leg, pharmaceutical and patent medicine bottles, nail polish bottle, and shoe polish bottle).

Table 9. Summary of cultural material recovered from 31MK1145.								
Transect	Shovel Test	Zone	Depth bs (cm)	Component	Material	Description	Count	Weight (g)
				Historic	Glass	colorless pharmaceutical cylindrical bottle, 3.5 inches high, 2-inch base diameter, 1.5-inch finish diameter	1	109.1
				Historic	Glass	colorless patent medicine octagonal bottle embossed HENRY K WAMPOLE & COMPANY 8.5 inches high, 2-inch base diameter, 1.5-inch finish diameter	1	500.1
				Historic	Glass	colorless pharmaceutical rectangular bottle 4 ounces w/ cc and oz measurements, 5.5 inches high	1	123.2
				Historic	Glass	Aqua-tinted patent medicine hexagonal bottle, one panel embossed PEPTO MAGNAN GUDE, base embossed D A GUDE AND CO and a raised heart, 6.75 inches high	1	307.8
				Historic	Glass	amber cylindrical bottle embossed in script on the shoulder, <i>Lysol</i> , and on the base LYSOL INCORPORATED BLOOMFIELD NEW JERSEY, 5.5 inches high, cork stopper	1	201.2
				Historic	Glass	colorless cylindrical bottle embossed on the on the side CURTICE & BROTHERS PRESERVERS ROCHESTER NY, 10 inches high	1	378
				Historic	Glass	colorless cylindrical bottle embossed on the side ESQUIRE LANO WAX; 4 inches high	1	91.5
				Historic	Glass	colorless rectangular nail polish bottle with brush, threaded finish, 2.25 inches high	1	34.1
				Historic	Glass	aqua cylindrical bottle fragment with blob top finish, cork	1	68.5
				Historic	Ceramic	McCoy brown glazed stoneware bowl fragment, early 20th century	1	281.9
				Historic	Ceramic	whiteware plate fragment Willow design	1	112.1
				Historic	Ceramic	undecorated whiteware cup with broken handle, 3 inches high	1	204.2
				Historic	Other	brick fragment	1	45.2
				Historic	Glass	plate window glass fragment	1	23.8
16	8	1	0-20	Historic	Ceramic	bisque porcelain doll leg with brown glazed shoe, 2 inches high	1	10.5
14	9	1	0-10	Historic	Ceramic	utility vessel fragment, alkaline glazed stoneware	1	2.5
Total							16	2493.7

CERAMICS

Five of the 16 artifacts are ceramic. Of these five, four are related to kitchen activity and one is a toy part. The Kitchen-related ceramics are refined earthenware (n=2) and stoneware (n=2).

The refined earthenware artifacts are whiteware that dates from the late 1800s to present day. One whiteware artifact is undecorated cup with a broken handle and the other is a fragment of a plate that has a dark blue Willow pattern. The original willow pattern was created in 1780 by the Royal Stafford factory. This artifact is difficult to date because it has been produced by many English factories and is still being made today. The willow pattern is a European design that is strongly influenced by eighteenth-century Chinese export porcelain (https://en.wikipedia.org/wiki/Blue_and_white_pottery).

The two stoneware artifacts are an alkaline-glazed fragment, probably from a utility vessel (crock or storage jar), and a McCoy pottery brown glazed bowl fragment.

Alkaline-glazed stoneware has a durable, shiny transparent glaze that ranges in color from olive green, yellowish green and dark to pale brown, depending on the mineral content, particularly iron, in the glaze and the paste (Zug 1986). Alkaline glazed vessels range from having a smooth even texture to having streaks and runny glaze. Alkaline glazes were used in the United States as early as 1810 and continue to be made in North Carolina to the present day.

McCoy pottery was produced the United States in the early-twentieth century. It is probably the most collected pottery in the nation. They continued until about 1990 but had to close because of declining profits.

One ceramic recovered from 31MK1145 was a bisque doll leg with a brown glazed shoe. There were no markings on the artifact. It belonged to a china-limb doll (a doll with a head and limbs made of porcelain attached to a non-porcelain body). The leg fragment recovered has a brown shoe with a heel, which suggests that it post-dated 1870, when heeled shoes became increasing popular.

GLASS

Of the 16 artifacts recovered from 31MK1145, ten or are identified as glass. Of the 10 glass artifacts, one (n=1) is architectural (window glass), two (n=2) are personal (nail polish and shoe polish bottles), two (n=2) are pharmaceutical medicine bottles, two (n=2) are patent medicine bottles, two (n=2) are related to Kitchen activities (Ketchup and Lysol bottles), and one (n=1) is an indeterminate bottle fragment.

Diagnostic glass artifacts recovered from the site include five complete bottles that date from the late 1800s to late 1900s, which is consistent with the occupation of the site by the McGinn Family.

These artifacts are: Henry K Wampole & Company Perfected and Tasteless Preparation, Dr. Gude's Pepto-Mangan, Curtice Brothers Preservers Blue Label Ketchup, Lysol, and Esquire Lano Wax. A description of these artifacts follows.

HENRY K WAMPOLE & COMPANY PERFECTED AND TASTELESS PREPARATION

One surface recovery was a complete bottle embossed on two sides with "Henry K Wampole & Company (Figure 34). The bottle dates from the nineteenth to mid-twentieth century and was probably filled with *Wampole's Perfected and Tasteless Preparation*, an extract of cod liver oil with imported alcohol and refined glycerin Java cane sugar. The company claimed that it contained malt and wild cherry syrup (Figure 35). An independent analysis of the

product found that it had a 17 percent alcohol content and that the chief component of the product was cod liver oil that lacks therapeutic value (AMA 1916).



Figure 34. Wampole's Perfected and Tasteless Preparation bottle.

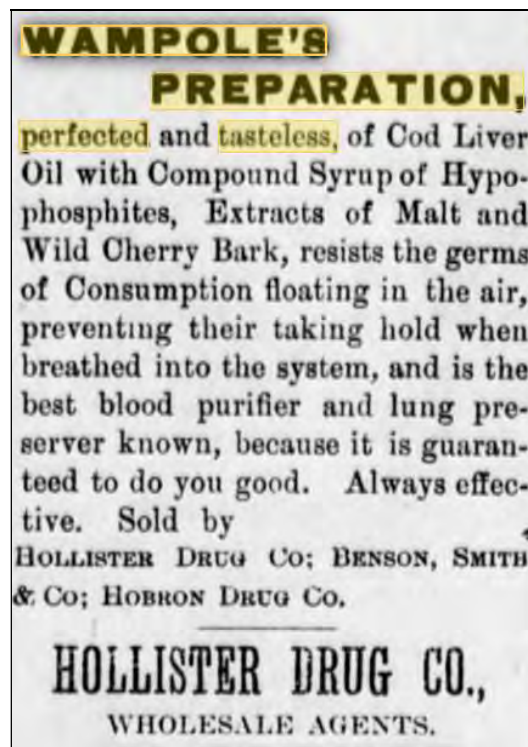


Figure 35. Wampole's Perfected and Tasteless Preparation 1898 advertisement in Hawaii (*The Hawaiian Star*, June 9, 1896, page 2.)

DR. GUDE'S PEPTO-MANGAN

Another surface recovery from the site was a complete bottle embossed *Pepto-Mangan Gude* (Figure 36). This patent medicine product was manufactured in Leipzig by Dr. A Gude & Company as early as 1892. The product was a solution of manganese and iron that was advertised as a "Blood Maker" for anemia, rickets, chlorosis, and amenorrhea (<https://baybottles.com/2018/04/21/gudes-pepto-mangan/>). It claimed to provide greater increase of red corpuscles than any known remedy and was used throughout hospitals in Europe and America (Figure 37). Pepto-Mangan was still being sold in the 1970s (Figure 38).



Figure 36. Dr. Gude's Pepto-Mangan bottle.



Figure 37. Dr. Gude's Pepto-Mangan label.

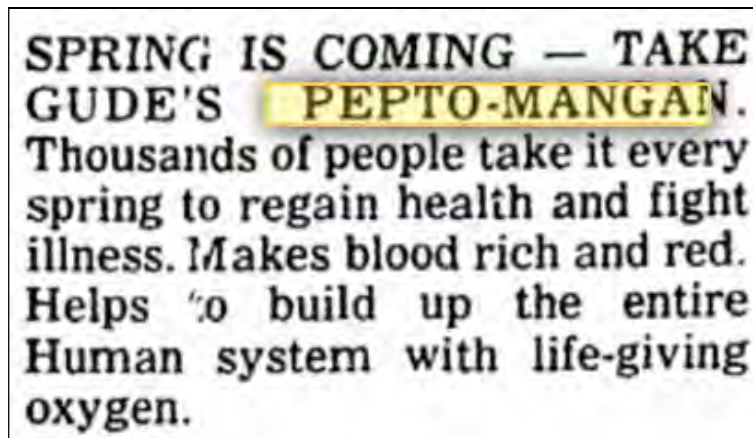


Figure 38. Dr. Gude's Pepto-Mangan advertisement in *The News* (Frederick, Maryland) March 2, 1971, page 4.

LEHN AND FINK'S LYSOL

Lysol was introduced in 1889 at the Paris Exposition. The product is described as a water-soluble disinfectant developed by Dr. Gustav Raupenstrauch [1859-1943]. Initially, Lehn & Fink imported Lysol in 100-gram and 500-gram bottles from a Hamburg manufacturer, but as sales increased, they began buying the product by the barrel and bottling it themselves. Lehn & Fink advertised Lysol disinfectant as an effective protection against the influenza virus during the Spanish flu pandemic (<http://cosmeticsandskin.com/companies/lehn-fink.php>).

Figure 39 is an example of an early-twentieth-century advertisement for Lysol.

The bottle from 31MK1145 is amber colored and would have been closed with a cork stopper (Figure 40). There is no label.



Figure 39. Lysol advertisement in the *American Druggist* 1913.



Figure 40. Early-twentieth-century Lysol bottle.

CURTICE BROTHERS PRESERVERS BLUE LABEL KETCHUP

Curtice Brothers Company was founded in 1868 by Simeon and Edgar Curtice in Rochester, New York (Peck 1908). They are pioneers in the canning and preserving food products. In the early twentieth-century, their ketchup rivaled the more well-known Heinz.

The bottle was mouth blown and made in a two-piece mold with a cup bottom. The finish (the lip of the bottle) is externally threaded for a screw cap (<https://sha.org/bottle/finishes.htm>). This type of bottle began appearing in advertisements around 1890, and in 1929 the company unveiled a wide-mouth bottle type (<https://sha.org/bottle/food.htm#Catsup>).

Figure 41 is a close-up of the bottle embossing and Figure 42 is a 1901 advertisement for the product.

The following summary of the Curtice Brothers Company has been extracted from (<https://baybottles.com/2017/11/23/curtice-brothers-co-preserves-rochester-n-y/>).

The Curtice Brothers' Blue Label Ketchup was a casualty of one of the first federal consumer protection regulations, the Pure Food and Drug Act of 1906, a precursor to the Food and Drug Administration. This Act sought to inform and protect consumers from drugs and additives that were perceived as dangerous. One of those dangerous additives was benzoate of soda, then a common preservative in many condiments, including Curtice Brothers' ketchup. Unfortunately for the company in the long run, Curtice Brothers refused to change their ketchup recipe as they believed benzoate of soda was necessary and posed no threat. On the other side of the argument was Heinz Company, which began producing ketchup using a different recipe that omitted benzoate of soda but sold at a higher price. Despite initial successful legal pushback (note the language of the above advertisement in Figure 43 referencing the endorsement of the US government), ultimately public opinion and government regulation against the additive won out and Curtice Brothers "Blue Label Ketchup" lost its market share to Heinz.



Figure 41. Close up of the Curtice Brothers Preservers embossing on the Blue Label Ketchup Bottle (<https://baybottles.com/2017/11/23/curtice-brothers-co-preserves-rochester-n-y/>).



Figure 42. ca. 1910 advertisement for Blue Label Ketchup (<https://baybottles.com/2017/11/23/curtice-brothers-co-preserves-rochester-n-y/>).

ESQUIRE LANO-WAX

The fifth diagnostic bottle recovered from 31MK1145 was for shoe polish. This bottle is embossed ESQUIRE LANO-WAX (Figure 43). Esquire Lano-Wax was introduced to the public in 1957 during a commercial on the Sid Caesar Show in NBC (Morse 1957).

It is reported as having been the best-selling shoe polish brand in American from the 1940s to 1960s (https://en.wikipedia.org/wiki/Esquire_Shoe_Polish). The Sara Lee Company bought the product in 1987 and discontinued it in favor of their Kiwi brand.



Figure 43. Esquire Lano-Wax example with screw top.

RECOMMENDATIONS

Three (n=3) archaeological sites were recorded during the survey of the Project APE. These include one (n=1) isolated find of prehistoric lithic material, one (n=1) multicomponent prehistoric lithic/historic farmstead, and one (n=1) historic farmstead. A summary of the recommendations for these sites follows.

Prehistoric Components

In all, two (n=2) prehistoric components were identified in the Project APE. These are one isolated find (31MK1143) and one lithic scatter at a multicomponent site (31MK1144). No diagnostic lithic artifacts were recovered.

Lithic scatters and isolated finds are the only evidence of prehistoric occupation in the Project APE. The artifacts are predominately debitage that was produced during tool production and maintenance. There was no evidence of occupation midden, stratigraphic deposits, or features. Therefore, none of the prehistoric components (sites and isolated finds) are being recommended as being eligible for the NRHP individually. No further archaeological work is recommended for the prehistoric lithic resources.

Historic Components

In all, two historic sites (31MK1144 and 31MK1145) were identified in the Project APE. Both are farmsteads associated with Agricultural activity and have above-ground structural remains. These two sites contained cultural material indicative of a late-nineteenth- to mid-twentieth-century occupation. These two Agricultural-related sites do not appear to contain information that will add to our understanding of the history of the area. Therefore, they are recommended as being not eligible for the NRHP. No further archaeological work is recommended for these sites.

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DRAFT REPORT

Archaeological Survey and Evaluation
Proposed Drainage Area for the South Crossfield Taxiway at the Charlotte-Douglas International Airport
Berryhill Township, Mecklenburg County, North Carolina
North Carolina Environmental Review Number 15-1391

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20 January 2020

MANAGEMENT SUMMARY

This report provides the results of an archaeological survey and site evaluation that was conducted for Landrum & Brown, Inc. (L&B) in Cincinnati, Ohio, on behalf of the Charlotte-Douglas International Airport (CLT) in Mecklenburg County, North Carolina (NC), by Legacy Research Associates (Legacy) in Durham, NC.

The lead Federal agency for this Project is the Federal Aviation Administration (FAA). The services were pursuant to the National Historic Preservation Act of 1966 (as amended), the Archeological and Historical Preservation Act of 1974, Executive Order 11593, and 36 CFR Parts 60-66 and 800 (as appropriate) and were conducted in compliance with Section 106 of the National Historic Preservation Act of 1966 (as amended).

The objective of the investigation was to identify the general distribution, location, and nature of archaeological sites within an approximate 58-acre Area of Potential Effects (APE) that is proposed for the CLT South Crossfield Taxiway Drainage Area.

Field investigations were conducted by Legacy and Legacy's subconsultant, Environmental Services Inc. (ESI), between December 16 and December 20, 2019. A total of 261 grid points at 30-m intervals were established across the APE, 80 were unexcavated due to steep slopes, extensive ground disturbance, or wetlands. Systematic shovel testing was conducted at the remaining 181 grid points, of these six or 3.3 percent yielded cultural material. The remaining 175 shovel tests (or 97.2 percent of the excavated shovel tests) did not yield cultural material.

The investigation recorded seven archaeological sites (31MK1148-31MK1154) (Table 1). All consist of small and/or disturbed artifact assemblages that lack potential to contribute meaningful knowledge to the history or prehistory of the area. These sites are recommended as being not eligible for the National Register of Historic Places (National Register). No further archaeological work is recommended for the Project as it is currently planned.

Table 1. Summary of Archaeological Sites and National Register Eligibility Recommendations.				
Site	Component	Time Period	National Register Assessment	National Register Recommendation
31MK1148	Prehistoric	Unknown Lithic	Not Eligible	No Further Work
31MK1149	Prehistoric	Unknown Lithic	Not Eligible	No Further Work
31MK1150	Prehistoric	Middle Woodland	Not Eligible	No Further Work
31MK1151	Historic	20 th -century extant shed and artifact scatter	Not Eligible	No Further Work
31MK1152	Historic	20 th -century artifact scatter	Not Eligible	No Further Work
31MK1153	Historic	20 th -century artifact scatter	Not Eligible	No Further Work
31MK1154	Historic	20 th -century extant structure	Not Eligible	No Further Work

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INTRODUCTION

This report provides the results of an archaeological survey and site evaluation that was conducted for Landrum & Brown, Inc. (L&B) in Cincinnati, Ohio, on behalf of the Charlotte-Douglas International Airport (CLT) in Mecklenburg County, North Carolina (NC), by Legacy Research Associates (Legacy) in Durham, NC.

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The Project Area of Potential Effects (APE) covers approximately 58 acres of woodland located in the southwest quadrant of the Byrum Drive and Timberly Place intersection in Charlotte, NC. The project land is proposed for land-disturbing activities associated with construction of drainage areas for the South Crossfield Taxiway. Figure 1 depicts the Project APE situated south of CLT.

Archaeological investigations were conducted by Legacy and Legacy's subconsultant, Environmental Services Inc. (ESI), between December 16 and December 20, 2019. Deborah Joy with Legacy served as Principal Investigator. Terri Russ with ESI served as Field Director; Becky Sponseller, Thomas Evans, and Rhiannon Graham assisted.

The objective of the investigation was to identify the general distribution, location, and nature of archaeological sites within the APE and assess the sites for National Register of Historic Places (National Register) eligibility.

The following report sections describe the environmental setting, archaeological and cultural background, methodology, results, significance evaluation and recommendations, and reference cited.

ENVIRONMENTAL SETTING

A discussion of the environmental setting of the Project area follows. It includes the following categories: topography, hydrology, geology, climate, and soils.

Topography

Mecklenburg County is in the south-central part of North Carolina (Figure 2). The county is in the southern Piedmont region that extends from southern portions of New York into Alabama. The Piedmont is one of three geographic divisions in North Carolina and comprises almost half the land in the state (Figure 3). The Piedmont region begins along the southeastern slope of the Blue Ridge Mountains and continues eastward to the edge of the Coastal Plain. The region is characterized by broad, gently rolling interstream areas and by steeper slopes along drainages.

Hydrology

Mecklenburg County lies within the Catawba River drainage basin (Figure 4). It is the eighth largest river system in the state and contains 3,042 miles of streams

(<http://www.bae.ncsu.edu/bae/programs/extension/wgg/programs/catawbaprg.html>).

Three large creeks – Irwin, Little Sugar, and Briar – drain most of the urban area around Charlotte. These tributaries flow southward through the county and converge with Sugar Creek before it flows into the Catawba River in South Carolina. The Project APE lies within the Sugar Creek Watershed. Coffey Creek, a tributary of Sugar Creek, flows north-south through the APE.

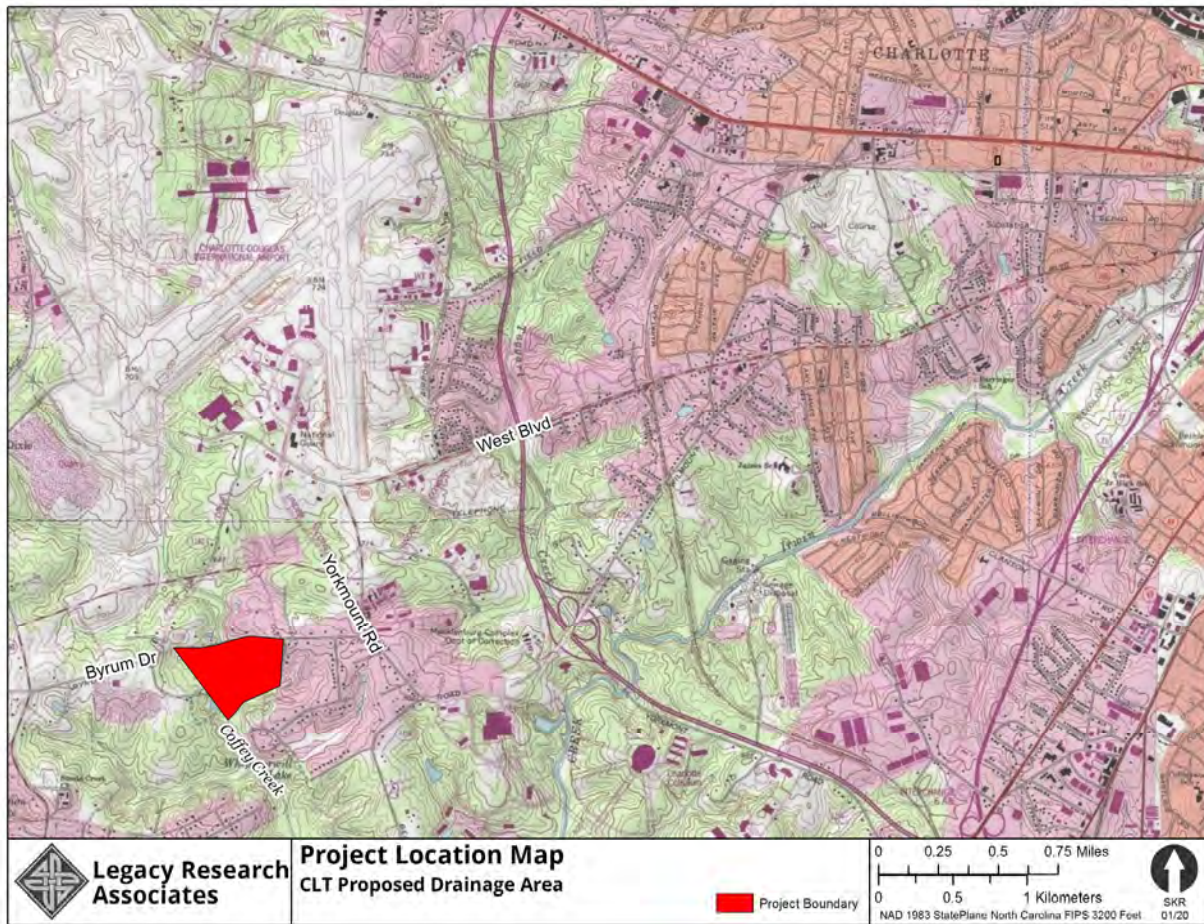


Figure 1. Project Location Map. Basemap: 1993 Charlotte West USGS topographic quadrangle 7.5-minute series.



Figure 2. Location of Mecklenburg County in North Carolina (<http://ncpedia.org/geography/mecklenburg>).

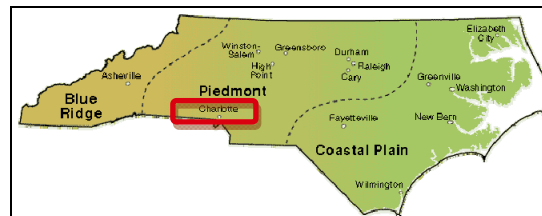


Figure 3. North Carolina physiographic regions showing Charlotte in the south-central Piedmont (http://nc.water.usgs.gov/projects/index_physio.html).

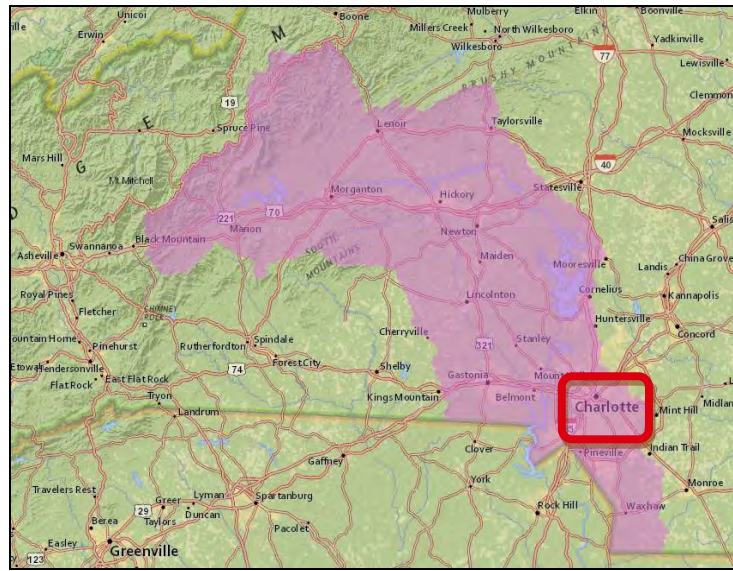


Figure 4. Catawba River Drainage Basin (pink-shaded area) with the Charlotte area outlined in red (<http://www.eenorthcarolina.org/riverbasins-gis-map.asp>).

Geology

The Project APE is in the Charlotte Belt (Figure 5), which is composed of igneous, meta-igneous rock, diorite-gabbro, and granite. The oldest rocks are commonly mafic gneiss, amphibolite, and metavolcanic. Gold-bearing rocks in the Charlotte Belt are found in lode and placer deposits. Lodes are narrow veins of variable length and trend to the northeast and placer deposits are found in stream channels usually in streams with moderate gradient that widen or change direction, in gravel beds, and inside bends of stream channels (Carpenter 1993). No known gold deposits are within the Project APE.

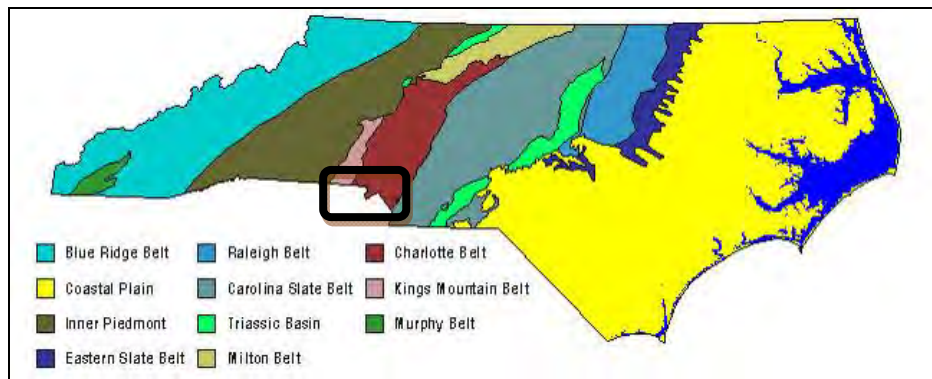


Figure 5. North Carolina geological regions with the general Charlotte area outlined in black (<http://ncpedia.org/geology>).

Climate

The Mecklenburg County climate is moderate with hot and humid summers and moderately cold but short winters because mountains to the west protect the county against cold fronts. Precipitation is evenly distributed throughout the year, but generally falls between April and September, which is the growing season for many crops. Every few years in late summer to early autumn, tropical storms bring heavier rainfall. Average seasonal snowfall is six inches, although every few years a heavy snow covers the ground for a few days to a week.

Soils

The USDA Natural Resources Conservation Service (NRCS) identified four soil types within the APE (Table 2 and Figure 6). Most of the Project, approximately 26.59 acres or 45.7 percent, is located on Cecil soil types coded CeB2 and CeD2. Cecil type soils are well-drained acidic soils found on gently to strongly sloping topography that was formed from igneous and metamorphic strata. Both CeB2 and CeD2 soils are described as eroded sandy clay loam. Soils classified as having 15 and 25 percent slopes (PaE) cover 25.67 acres or 44.1 percent of the APE. Approximately 1.6 acres or 2.9 percent of the APE has poorly drained soils along streams and drainageways (MO), and stream impoundments cover 1.91 acres of the APE. Most of the Project APE would be classified as having a low probability for the presence of archaeological sites because of soil erosion, steep slopes, and wetland lands. The Enon sandy loam with 2-8 percent slopes that covers 2.3 acres or 4 percent of the APE would seem likely as having a high probability for the presence of archaeological sites.

Table 2. Soils within the Project APE.				
Type	USDA Soil Code	Description	Acreage within the APE	Percent of APE
Cecil	CeB2	Sandy clay loam, 2-8 percent slopes, eroded	12.79	22.0
	CeD2	Sandy clay loam, 8-15 percent slopes, eroded	13.80	23.7
Enon	EnB	Sandy loam, 2-8 percent slopes	2.32	4.0
Monacon	MO	Poorly drained soil along streams and drainageways	1.69	2.9
Pacolet	PaE	Sandy loam, 15-25 percent slopes	25.67	44.1
Water			1.91	3.3
Total			58.18	100

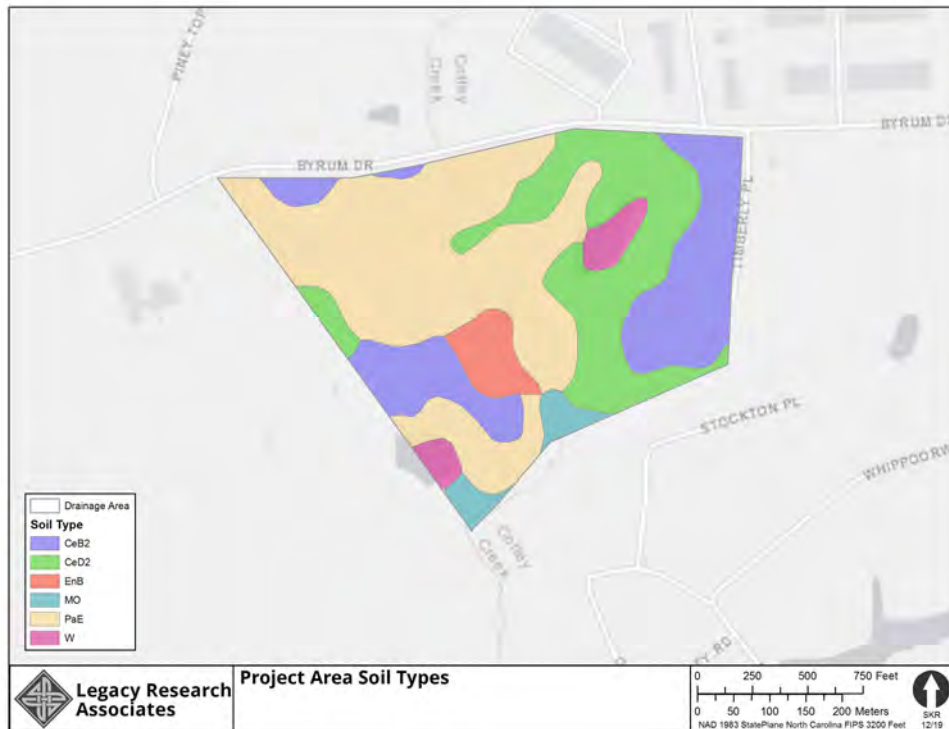


Figure 6. Soil Types within the APE (<https://www.nrcs.usda.gov/wps/portal/nrcs/site/soils/home/>).

ARCHAEOLOGICAL AND CULTURAL BACKGROUND

This section of the report summarizes the prehistoric and historic cultural context relevant to the Project APE and the previous archaeological research within a mile of the APE.

PREHISTORIC CULTURAL CONTEXT

The chronological sequence for the prehistory of the North Carolina Piedmont region is presented in Table 3. It provides a synopsis of the regional cultural stages beginning with the earliest occupation, known as the Paleo-Indian period, and ending with the Woodland period that lasted until the time of European Contact with indigenous populations of the present-day southeastern United States around AD 1600.

Table 3. Prehistoric Cultural Sequence for the North Carolina Piedmont Region.			
Date	Cultural Period	Sub-Period/Era	Regional Phase
500 BC- AD 1600	Woodland	Late (AD 1000-European Contact)	Uwharrie and Dan River
		Middle (AD 800-1000)	Yadkin and Uwharrie
		Early (500 BC-AD 800)	Badin and Yadkin
8,000-500 BC	Archaic	Late (2500-500 BC)	Gypsy and Savannah River
		Middle (6000-2500 BC)	Stanly, Halifax, Morrow Mountain, and Guilford
		Early (8000-6000 BC)	MacCorkle-St. Albans-LeCroy, Palmer, Big Sandy, Rowan, and Kirk
10,000-8,000 BC	Paleo-Indian		Clovis, Dalton, Cumberland, Hardaway, Hardaway-Dalton, Suwannee, and Simpson

Paleo-Indian Period

The earliest documented occupation of the North Carolina Piedmont region occurred at the end of the last glacial advance and is referred to as the Paleo-Indian period (10,000-8000 BC). Paleo-Indian culture consisted of small nomadic bands that subsisted by hunting and gathering (Purrinton 1983). Fluted and unfluted projectile points/knives from Paleo-Indian sites suggest that early inhabitants hunted bear, deer, elk, and possibly caribou (Chapman 1977) or smaller game (Anderson et al. 1992).

Among the diagnostic Paleo-Indian period lithics, fluted Clovis types are the earliest, followed by fluted Cumberland, Suwannee, and Simpson projectile points/knives. Dalton, Hardaway, and Hardaway-Dalton types generally date to the end of the Paleo-Indian period. Evidence of Paleo-Indian occupation in North Carolina is mainly represented by isolated projectile point surface finds.

Paleo-Indian settlements were likely small and briefly occupied. Paleo-Indian lithic artifacts have been recovered from high elevations suggesting hunting in a tundra habitat as well as on ridge tops and river terraces. Lithics are often heavily curated and of a high-grade material. Researchers suggest that the roaming range of groups was influenced by known primary stone sources (Anderson et al. 1990; Goodyear et al. 1989).

One important site (Hardaway) in North Carolina that has a Paleoindian component is located along the Yadkin River in Stanly County. Hardaway points represent the earliest occupation at this site. Archaeological investigations identified stratified deposits that have formed the basis of the Paleoindian and Early Archaic period cultural sequences defined for the Carolina Piedmont region (Coe 1964).

Archaic Period

Environmental warming associated with the end of the Ice Age resulted in a cultural adaptation referred to as the Archaic period (8000-500 BC); it is the longest prehistoric cultural phase in the Piedmont region. Diagnostic artifacts associated with exploiting temperate forest resources characterize this transition (Chapman 1977; Coe 1964; Purrinton 1983). The earliest of these is the Hardaway-Dalton projectile point, which dates to the late Paleo-Indian/Early Archaic period; these points are eared and feature vestigial fluting.

Archaic period sites are typically found on upland hills, in floodplains, and on the banks of small streams (Bass 1977). The Archaic period has three divisions – Early, Middle, and Late – defined primarily by changes in stemmed projectile point styles with side or corner notching and/or bifurcate bases. More Archaic period sites have been documented in the North Carolina Piedmont than Paleo-Indian sites.

During the Early Archaic period (8000-6000 BC) hunting was the dominant subsistence activity; it was supplemented by fishing aquatic resources, gathering plant foods, and trapping small game. Settlements consisted of base camps on alluvial terraces with smaller hunting camps in the uplands (Chapman 1977). Early Archaic diagnostic projectile point types include Palmer, Big Sandy, Rowan, Kirk (corner-notched and stemmed), and MacCorkle-St. Albans-LeCroy; the latter is associated with the transition from the Early to Middle Archaic period.

Settlement patterns changed from the alluvial terraces and uplands to the rivers during the Middle Archaic period (6000-2500 BC). This change is believed to be the result of exploitation of plant foods and aquatic resources (Frankenberg and Herrmann 2000). Populations increased, and smaller band territories emerged.

Middle Archaic sites are found in various settings but tend to be similar in size and artifact diversity. These attributes suggest that groups were highly mobile during this time. Local lithic materials including quartz, quartzite, and metavolcanic were used with greater frequency. Stanly, Halifax, Morrow Mountain, and Guilford projectile point styles, as well as an increase in groundstone tool production, such as atlatl weights, axes, and pestles occurred during this time.

By the Late Archaic period (2500-500 BC) there is archaeological evidence of plant cultivation including squash, goosefoot, knotweed, little barley, maygrass, sumpweed, and sunflower. Archaeological evidence shows that three of these were domesticated during the Late Archaic period: sunflower by 2000 BC, goosefoot by 1500-1000 BC, and sumpweed between 1000 and 500 BC (Scarry 1994).

During the Late Archaic period, groups became more sedentary, which allowed for regional social, technological, and economic specializations. The manufacture of soapstone vessels, grooved stone axes, ornaments, and copper items occurred during this time. Late Archaic diagnostic lithic artifacts include broad and square-stemmed Savannah River and small-stemmed Gypsy projectile points/knives.

Due to the semi-sedentary nature of people during this time, Archaic period archaeological sites in the Carolina Piedmont region represent temporary camps. Camps and settlements were usually established near rivers or other water resources and tended to be in upland areas. Groups moved between locations according to the seasons and resources available where they engaged in both hunting and gathering activities.

Woodland Period

The development of ceramics and the bow and arrow are markers of the beginning of the Woodland period (500 BC-European Contact). A shift towards permanent settlement during this time reflects growing dependence on horticulture and population growth. Maize was introduced during the Early and Middle Woodland periods, although wild plant resources continued to be major food sources into the Late Woodland period (Scarry 1994).

Early evidence of the Woodland period in the North Carolina Piedmont is the Badin culture that is characterized by hard-paste, sandy ceramics and large triangular projectile points. Early Woodland period (500 BC-AD 800) sites are often found in the fertile bottomlands, but they are also documented in the uplands. Subsistence and economic patterns that developed during the Late Archaic period continued into the Early Woodland period. Although the data is sparse, there is good evidence that settlements moved to the bottomlands during the succeeding phases (Davis 1990). Ceramic styles shifted from Badin series to the Yadkin and Uwharrie series during the Middle Woodland period (AD 800-1000). Both have similar surface treatments and feature coarse-sand or crushed-quartz temper. Dan River ceramics with crushed quartz and coarse river sand temper appear in the Late Woodland period.

During the Late Woodland period, people from present-day South Carolina or northern Georgia migrated into the present-day Charlotte region bringing a more complex cultural tradition that was like the southeastern Mississippian cultures (Ward and Davis 1999). Their ceramics were made with well-mixed fine-sand-tempered clay that was smoothed and burnished and had complicated stamped surface treatments.

Late Prehistoric/Protohistoric Period

The Late Prehistoric/Protohistoric period is noted for complex societies organized in chiefdoms, platform mounds associated with a public plaza, and houses constructed of wattle and daub. Cleared field agriculture with maize as the dominant crop was an important subsistence activity. Changes in subsistence were accompanied by changes in settlement patterns that selected areas capable of yielding abundant and predictable resources (Scarry 1994:21).

Approximately 5,000 Catawba were living in the region prior to the arrival of Spanish explorers (Lee 1968). During the mid-sixteenth century, both Hernando de Soto and Juan Pardo identified many Catawba settlements along the Catawba and Wateree Rivers. These include: *Joara*, *Guaquiri*, *Quinahaqui*, *Yssa*, *Otari*, *Aracuchi*, *Tagaya*, *Tagaya* the Lesser, and *Cofitachequi* (Moore 2002). Pardo's account of his expeditions was the first written reference made to the Catawba.

Joara has been recorded as archaeological site 31BK22, also known as the Berry Site. Pardo came to *Joara* in 1567 and established Fort San Juan at the settlement (Moore 2002). He left approximately 30 Spanish men there hoping to expand the Spanish territory from the Santa Elena colony. Excavations at the site have revealed many Spanish artifacts including olive jars, majolica, glass beads, nails, and other metal objects like buttons and knife fragments (Moore 2002).

Cofitachequi is in Kershaw County, South Carolina, and is recorded as archaeological site 38KE12. It is also known as the Mulberry Site that consists of large earthen mounds and an associated village that served as the capital of *Cofitachequi*; it was occupied between AD 1100 and 1700. During the early-nineteenth century, as many as 10 earthen mounds were observed at the site. Archaeological excavations have revealed square house structures and a stockade around one mound.

Around AD 1660, after years of conflict over land possession and a bloody battle at Nation Ford, the Catawba and Cherokee tribes created a neutral territory between the Broad River and the Catawba River (Moore 2002). Thereafter, the Cherokee mainly inhabited western portions of North Carolina in the Blue Ridge Mountains. The Catawba populations declined after initial contact with the Spanish. This was due in large part to epidemic diseases like smallpox.

John Lawson's early-eighteenth-century account of Native American settlements around the present-day North and South Carolina border identifies several tribes: *Esaw*, *Sugaree*, and *Kadapu* (Moore 2002). They were living near Sugar Creek and the Catawba River, between present-day Charlotte, NC, and Rock Hill, SC.

The Catawba Nation was noted by Lawson for its large population; at the time, the Catawba Nation had about 1,200 people (Rights 1957). The Nation formed in 1716 after the Yemassee War from several groups that were once part of the *Cofitachequi* confederation, which included *Cheraw*, *Congaree*, *Wateree*, and *Waxhaw* (Hicks 1998).

A 1715 census of Native American populations in South Carolina identified only seven Catawba villages, suggesting the Upper Catawba Valley had been largely depopulated by that time (Moore 2002). Additionally, maps dating to this time show no major Native American settlements east of the Blue Ridge Mountains and west of the Occaneechi Trail.

In 1763, the Catawba were granted a reservation covering 15 square miles along both sides of the Catawba River in York and Lancaster counties, SC (Rights 1957). Recent archaeological investigations by the University of North Carolina-Chapel Hill Research Laboratories of Archaeology has resulted in locating the two Catawba villages depicted

on a 1772 map of the Catawba Nation. These villages are located along the Catawba River and are identified as “Old Town” and “New Town.” Old Town was occupied before the American Revolution and New Town between 1800 and 1820. In 1826, some of this land was leased to nearby white settlers. By this time, the Catawba population had dwindled to 110.

HISTORIC CULTURAL CONTEXT

Prior to settlement by Scotch-Irish, the present-day Mecklenburg County area was inhabited by *Eswataroa* (now more commonly called *Catawba*). Early European exploration of the region relates to Hernando de Soto of 1539 to 1543. There are several interpretations as to the route taken by de Soto; however, it is likely that regardless of the route the effects of Europeans in present-day Piedmont Carolina exposed native people to disease and warfare that brought about the decline in population of the Catawba.

Beginning in 1749, John Beatty acquired approximately 944 acres on the west bank of the Catawba River (Brotherton 1993). Soon afterwards, Charles, James, and Henry Connor obtained land on the eastern side of the river across from Beatty. John Beatty established Beattie’s Ford where an island and flat rocks made crossing the Catawba River manageable by pedestrians, horses, and wagons. Native Americans had used this natural ford as part of a trading path for centuries.

Beattie’s Ford played an important role in the transportation and migration of many settlers in the region. During the mid-nineteenth century, it served as a stagecoach station and was home to Hutchins G. Burton, who served as governor of North Carolina from 1824 to 1827 (Brotherton 1993). Early maps show that seven roads converged at Beattie’s Ford. Use of the ford declined during the late-nineteenth and early-twentieth centuries as railroads, automobiles, and bridges rendered Beattie’s Ford obsolete. The name “Beattie’s Ford” had been conferred to road names in Mecklenburg, Catawba, and Lincoln counties. Beattie’s Ford is now under Lake Norman.

Mecklenburg County was established in 1762 from a part of Anson County and included, at that time, parts of what are now Cabarrus, Union, Lincoln, Rutherford, Cleveland, and Gaston counties (Corbitt 1950). The county, in its present boundaries, was established in 1842. Early settlers chose the name “Mecklenburg” after Queen Charlotte who was born in Mecklenburg province in Germany. Queen Charlotte was the wife of England’s King George III. The City of Charlotte, incorporated on November 7, 1768, was named for Queen Charlotte.

In February 1781, a Revolutionary War battle between General Cornwallis and General William Lee Davidson occurred at Cowan’s Ford (Lincoln County Heritage Book Committee 1997). General Davidson succeeded in slowing Cornwallis’ advance; however, he was killed during the battle. The Cowan’s Ford Chapter established a monument at the ford to commemorate the battle (Lincoln County Heritage Book Committee 1997).

Following the Revolutionary War in 1799, gold was discovered near Concord in Cabarrus County, then a part of Mecklenburg (Carpenter 1993). The quantity of rich ore in the region led to the establishment of a US Treasury mint in Charlotte in 1836. Charlotte remained the gold-mining capital of the United States until the discovery of gold at Sutter’s Mill in California in 1848.

By 1900, Mecklenburg County had a population of more than 55,000; by 1950, the population had tripled and by the 1970s more than doubled. The forerunner of the Douglas Municipal Airport was opened in 1936 and commercial development was enhanced by the excellent transportation facilities in the area that included the Charlotte-Douglas International Airport and Wilkinson Boulevard.

In 1935, the Charlotte-Douglas International Airport was established as “Charlotte Municipal Airport.” In 1954, a 70,000-ft² passenger terminal opened, and the airport was renamed “Douglas Municipal Airport” after former Charlotte mayor Ben Elbert Douglas, Sr. The airport gained its current name in 1982.

Land use of the Project study area has been documented in several historic maps and aerial images. The 1905 USGS Charlotte topographic map shows that there were no structures within the APE (Figure 7).

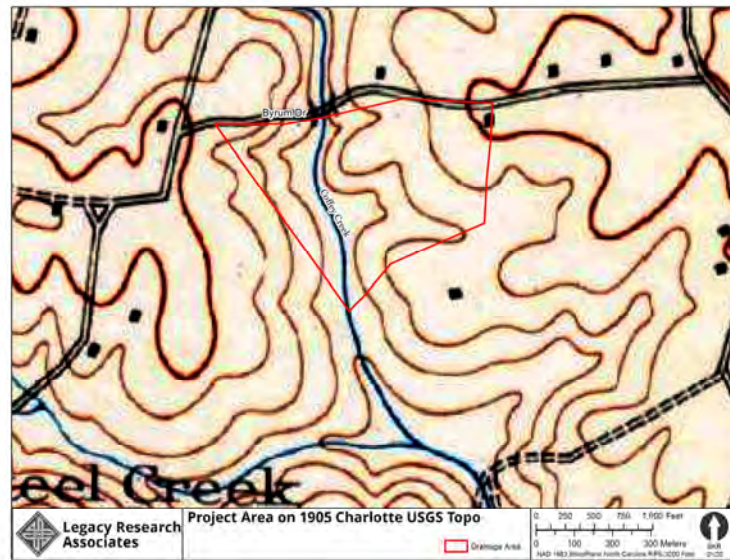


Figure 7. Project APE on the 1905 Charlotte USGS topographic quadrangle map (https://legacy.lib.utexas.edu/maps/topo/north_carolina/txu-pclmaps-topo-nc-charlotte-1905.jpg).

Similarly, the 1910 Mecklenburg County Soil Survey Map (<https://dc.lib.unc.edu/cdm/ref/collection/ncmaps/id/298>) and the 1911 Spratt Map of Mecklenburg County (<https://dc.lib.unc.edu/cdm/ref/collection/ncmaps/id/959>) do not reveal historic occupation or land use in the APE.

In 1948, USGS mapping depicted three structures (a house and two outbuildings) in the northeast corner of the APE and a house in the northwest corner of the APE (Figure 8). This map also reveals that in 1948 much of the APE was deciduous forest (green) and the remainder was agricultural fields (white).

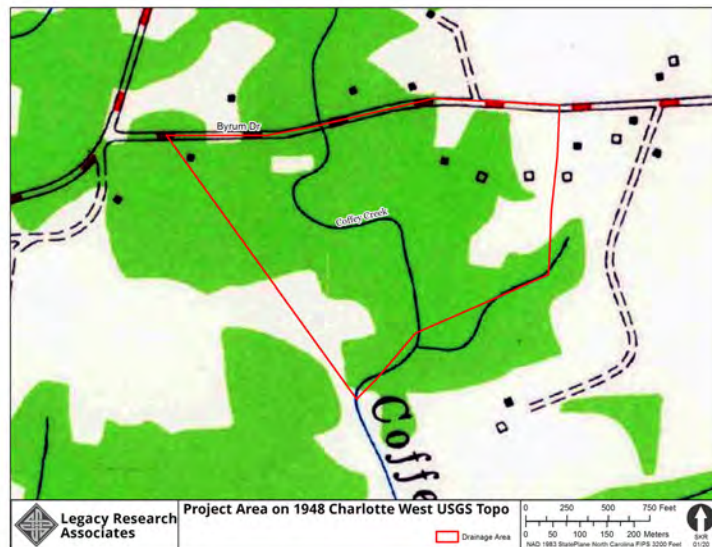


Figure 8. Project APE on the 1948 Charlotte West USGS topographic quadrangle map (<http://historicalmaps.arcgis.com/usgs/index.html>).

By 1968, the USGS mapping revealed several changes in the southwest corner of the APE. These include three ponds, an unpaved road, and a house (Figure 9). Much of the land remained wooded (green) with some expansion of agricultural fields in the northeast quadrant, and Timberly Place had been constructed along the eastern boundary of the APE.



Figure 9. Project study area on the 1968 Charlotte West USGS topographic quadrangle map (<http://historicalmaps.arcgis.com/usgs/index.html>).

The 1993 aerial image shows extensive residential development in the northeast corner and northwest tip of the APE (Figure 10) with the majority of the land being woodland.

By 2002, many of the structures seen on the 1993 aerial were no longer extant; only one building is seen north of the pond and the agricultural fields shown in the 1993 aerial had reverted to woodland (Figure 11).

The 2008 aerial image depicts the recently constructed sewer line that crosses roughly east-west through the lower third of the APE (Figure 12).

These maps and aerial images indicate that it was highly likely that the survey crew would encounter several areas that had disturbed by construction and building demolition and several areas that could not be surveyed because of the presence of impoundments and the sewer line corridor.



Figure 10. Aerial Image of the Project APE in 1993 (Goggle Earth Pro January 2020).



Figure 11. Aerial Image of the Project APE in 2002 (Goggle Earth Pro January 2020).



Figure 12. Aerial Image of the Project APE in 2008 (Goggle Earth Pro January 2020).

PREVIOUS ARCHAEOLOGICAL RESEARCH

Research conducted at the North Carolina OSA in December 2019 found that there are two previously recorded archaeological sites located within the APE and 31 archaeological sites located within one mile of the APE. These 33 sites were recorded as a result of archaeological investigations that date from 1978 to 2018. A summary of the 33 sites follows.

Previously Recorded Archaeological Sites within the Area of Potential Effects

The two previously recorded archaeological sites (31MK0857 and 31MK1146) in the APE along Byrum Drive are summarized below (Table 4 and Figure 13). Both were previously recommended as being not eligible for the National Register and were not revisited during the 2019 survey of the APE.

Table 4. Summary of Previously Recorded Archaeological Sites within the APE.				
Site Number	Component	Description	Condition	National Register Eligibility Recommendation
31MK0857	Prehistoric	Lithic Scatter	Lack of Integrity	Not Eligible
31MK1146	Historic	Domestic Artifact Scatter – 20 th century	Lack of Integrity	Not Eligible

31MK857 was recorded by Tolonen and Clifford for a proposed airport expansion in 1998. It is a prehistoric lithic scatter that was found on the surface of an abandoned logging road that had been extensively disturbed. The recovered artifacts were identified as finishing flakes and a biface thinning flake. No evidence of cultural features or intact soils was noted. The site was recommended as being not eligible for the National Register.

31MK1146 was recorded by New South Associates for the proposed relocation of West Boulevard in 2018. It is an historic artifact scatter and ornamental vegetation at a former house site. The site is situated on a south-facing bluff covered with mature oaks, small cedars, periwinkle, ornamental yucca, and flowering bulbs. Shovel testing exposed 15 cm of strong brown (7.5YR 5/8) clay subsoil; one shovel test uncovered a 20-cm thick gravel roadbed underneath 5 cm of strong brown (7.5YR 5/6) clay. Artifacts recovered include twentieth-century asphalt shingle fragments, milk glass, brick, and mortar. The investigation determined that past road construction and subsequent slope wash had affected artifact deposit integrity. The recovery of building debris and the absence of identifiable activity areas indicated that the site had limited research potential. It was recommended as being not eligible for the National Register.



Figure 13. Previously recorded archaeological sites within the APE. Basemap: 1993 Charlotte West USGS topographic quadrangle 7.5-minute series.

Previously Recorded Archaeological Sites within a Mile of the Area of Potential Effects

The 31 archaeological sites located within a mile of the APE are summarized below (Figure 14 and Table 5). Three have not been assessed for the National Register (31MK230, 31MK553, and 31MK1088). The other 28 were found to lack integrity and were recommended as being not eligible for the National Register.

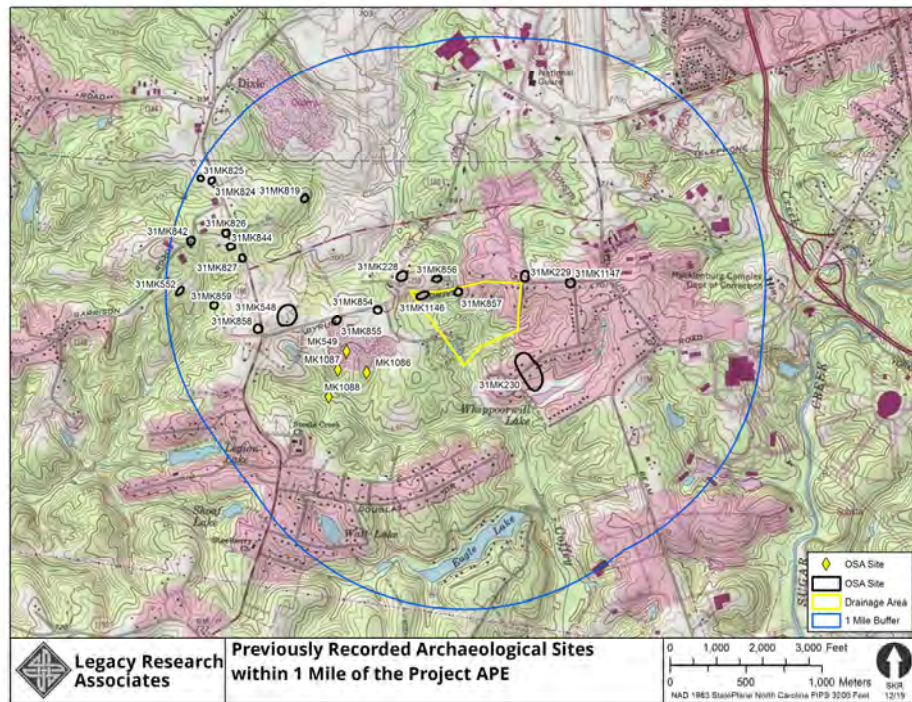


Figure 14. Previously recorded archaeological sites within a mile of the APE. Basemap: 1993 Charlotte West NC USGS topographic quadrangle 7.5-minute series.

Table 5. Summary of Previously Recorded Archaeological Sites within a Mile of the APE.				
Site Number	Component	Description	Condition	National Register Eligibility Recommendation
31MK0095	Prehistoric	Lithic Scatter	Lack of Integrity	Not Eligible
	Historic	Ceramic Scatter - 19 th to 20 th century	Lack of Integrity	Not Eligible
31MK0096	Prehistoric	Lithic Scatter	Lack of Integrity	Not Eligible
31MK0097	Prehistoric	Lithic Scatter	Lack of Integrity	Not Eligible
31MK0228	Prehistoric	Lithic Scatter - Archaic	Lack of Integrity	Not Eligible
31MK0229	Prehistoric	Lithic Scatter - Archaic	Lack of Integrity	Not Eligible
31MK0230	Prehistoric	Lithic Scatter	Unknown	Unassessed
31MK0548	Prehistoric	Lithic Scatter - Archaic	Lack of Integrity	Not Eligible
31MK0549	Prehistoric	Lithic Scatter	Lack of Integrity	Not Eligible
	Historic	Domestic Artifact Scatter - 18th to 19th century	Lack of Integrity	Not Eligible
31MK0550	Prehistoric	Lithic Scatter	Lack of Integrity	Not Eligible
31MK0551	Prehistoric	Lithic Scatter	Lack of Integrity	Not Eligible
31MK0552	Prehistoric	Lithic Scatter	Lack of Integrity	Not Eligible
31MK0553	Historic	Domestic Artifact Scatter - 18th to 19th century	Former House Site	Unassessed
31MK0819	Prehistoric	Lithic Scatter	Lack of Integrity	Not Eligible
31MK0824	Prehistoric	Lithic Scatter	Lack of Integrity	Not Eligible
31MK0825	Prehistoric	Lithic Scatter - Late Woodland	Lack of Integrity	Not Eligible
31MK0826	Prehistoric	Lithic Scatter - Middle Woodland	Lack of Integrity	Not Eligible
	Historic	Ceramic Scatter - 19 th to 20 th century	Lack of Integrity	Not Eligible
31MK0827	Prehistoric	Lithic Scatter - Late Archaic to Middle Woodland	Lack of Integrity	Not Eligible
31MK0842	Prehistoric	Lithic Scatter	Lack of Integrity	Not Eligible
31MK0844	Prehistoric	Lithic Scatter	Lack of Integrity	Not Eligible
	Historic	Ceramic Scatter - 19 th to 20 th century	Lack of Integrity	Not Eligible
31MK0854	Prehistoric	Lithic Scatter	Lack of Integrity	Not Eligible
31MK0855	Prehistoric	Lithic Scatter - possibly Early Archaic	Lack of Integrity	Not Eligible
31MK0856	Prehistoric	Lithic Scatter	Lack of Integrity	Not Eligible
31MK0858	Prehistoric	Lithic Scatter	Lack of Integrity	Not Eligible
31MK0859	Prehistoric	Lithic Scatter	Lack of Integrity	Not Eligible
31MK1086	Historic	Former House Site - late 19 th century	Lack of Integrity	Not Eligible
31MK1087	Historic	Former House Site - 20th century	Lack of Integrity	Not Eligible
31MK1088	Historic	Possible Brick Manufacturing - 19 th century		Unassessed
31MK1143	Prehistoric	Lithic Scatter	Lack of Integrity	Not Eligible
31MK1144	Prehistoric	Lithic Scatter	Lack of Integrity	Not Eligible
	Historic	Former House Site - 20 th century	Lack of Integrity	Not Eligible
31MK1145	Prehistoric	Lithic Scatter	Lack of Integrity	Not Eligible
	Historic	Former House Site - 20 th century	Lack of Integrity	Not Eligible
31MK1147	Historic	Former House Site - 20 th century	Lack of Integrity	Not Eligible

The 31 previously recorded sites within a mile of the APE predominately represent prehistoric occupation (Chart 1). All the prehistoric components are identified as lithic scatters; most (77 percent) lack diagnostic artifacts (Chart 2). The other 23 percent have diagnostic artifacts from the Archaic and Woodland periods. Most (91 percent) of the historic components are identified as domestic (Chart 3). The historic sites have diagnostic artifacts that date from the eighteenth to twentieth century with the twentieth century being the most prevalent time period in the assemblage (Chart 4).

Based on the result of previous archaeological research is it expected that most sites found during the survey will be prehistoric lithic scatters with non-diagnostic artifacts and that historic sites will be domestic artifact scatters probably dating from the nineteenth and twentieth century.

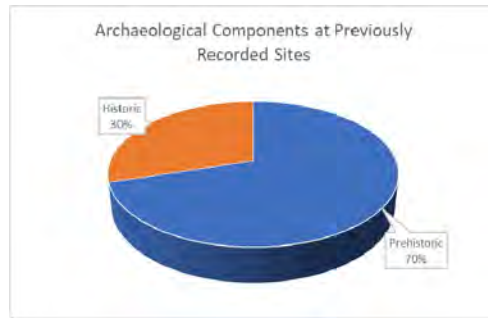


Chart 1. Comparison of Historic and Prehistoric Components at Previously Recorded Sites.

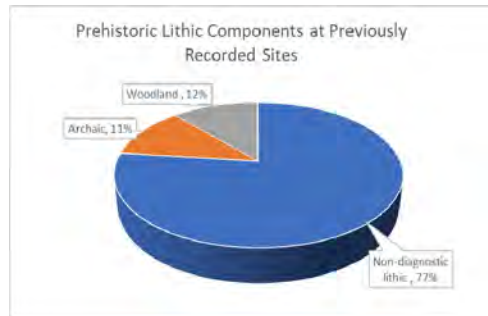


Chart 2. Prehistoric Lithic Components at Previously Recorded Sites.

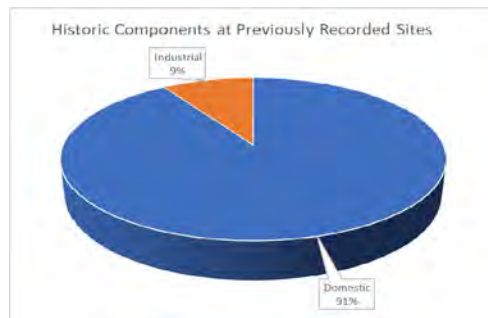


Chart 3. Historic Components at Previously Recorded Sites.



Chart 4. Historic Occupation Time Periods at Previously Recorded Sites.

SURVEY OF THE PROPOSED RELOCATION OF NC 160 SOUTH OF THE CHARLOTTE-DOUGLAS AIRPORT (MATHIS 1978)

In 1978, a survey of a proposed right-of-way for NC 160 south of the Charlotte-Douglas Airport recorded three prehistoric lithic sites (31MK95, 31MK96, and 31MK97) that are within a mile of the Project APE. These sites were determined to be ineligible for the National Register (Mathis 1978).

31MK95 is a prehistoric lithic scatter in a cultivated field. The recovered artifacts are quartz flakes. The site was determined to have been extensively disturbed and was recommended as being not eligible for the National Register.

31MK96 is a prehistoric lithic scatter of quartz flakes and a biface. The site was determined to have been extensively disturbed and was recommended as being not eligible for the National Register.

31MK97 is a prehistoric lithic scatter of quartz flakes and a scraper. The site was determined to have been extensively disturbed and was recommended as being not eligible for the National Register.

SURVEY OF THE COFFEY CREEK DRAINAGE (FISCHER 1980)

In 1978, an archaeological survey was conducted in the Coffey Creek drainage (Fischer 1980). The report discusses three sites (31MK228, 31MK229, and 31MK230) that are located within a mile of the APE. These sites were not evaluated for the National Register in 1980. Two (31MK228 and 31MK229) were revisited in 2018 and evaluated for the National Register (see Archaeological Investigations of the Proposed West Boulevard Relocation at the Charlotte-Douglas International Airport (New South Associates 2018)). One (31MK230) has not been revisited and evaluated for the National Register.

31MK228 contained Early, Middle, and Late Archaic period points (Palmer, Guilford, and Savannah River).

31MK229 yielded an Early Archaic period Kirk point.

31MK230 was a prehistoric lithic scatter with no diagnostic artifacts.

RECONNAISSANCE SURVEY OF THE PROPOSED CHARLOTTE OUTER LOOP FROM I-77 TO NC 27 (HARGROVE 1998-1990)

In 1998, Archaeological Research Consultants (ARC) conducted a reconnaissance survey of proposed corridors for a 13-mile section of the Charlotte Outer Loop (Western Section) from I-77 to NC 27 (Hargrove 1990). The survey recorded 25 archaeological sites and revisited 31MK95 that had been recorded in 1978 (see Survey of the Proposed Relocation of NC 160 south of the Charlotte-Douglas Airport (Mathis 1978)). Most of the sites are prehistoric lithic scatters with a few diagnostic artifacts that date to the Early, Middle and Late Archaic periods. Five are historic (two gold mines, one eighteenth-century house site, an antebellum plantation, and a late-nineteenth to early-twentieth-century house site). Of the 25 sites recorded by ARC in 1998, six (31MK95, and 31MK548-31MK553) are within one mile of the APE. A summary of these sites follows.

31MK95 - Revisit was in a fallow field partly covered with clover and wildflowers. Artifact recovery included prehistoric lithic artifacts (a biface, secondary flakes, and thinning flakes) and historic ceramic artifacts (salt-glazed stoneware and blue feather-edged whiteware). The site was situated on a small upland knoll overlooking Coffey Creek at the headwaters of Steele Creek on eroded Cecil sandy clay loam. The site was determined to have been extensively disturbed by agricultural activities and sheet erosion and was recommended as being not eligible for the National Register.

31MK548 is a prehistoric site that yielded an Early Archaic Palmer point, the base of a possible Middle Archaic Stanly point, and two Late Archaic Savannah River points. The collection from this site also included secondary flakes, biface thinning flakes, and a possible hammerstone. All the artifacts were recovered from

a surface inspection of a recently plowed field with 100-percent surface visibility. The site is situated on a broad ridgetop of Cecil sandy clay loam overlooking tributaries of Coffey Creek and Beaverdam Creek. The site was determined to have been extensively disturbed by agricultural activities, erosion, and possible road construction and was recommended as being not eligible for the National Register.

31MK549 is a multi-component prehistoric and historic site on a broad upland ridge of Cecil sandy clay loam. The prehistoric component was identified by the recovery of biface thinning flakes and a secondary flake. The lack of diagnostic artifacts made a date assignment to the prehistoric component impossible. The historic component was identified by the recovery of feather-edged pearlware, hand-painted pearlware, green lead-glazed earthenware, black transfer-printed ironstone willowware, undecorated ironstone, and a small brick fragment. The historic artifacts suggested a late-eighteenth- to early-nineteenth-century homesite. All the artifacts were recovered from a surface inspection of a recently bulldozed field with 100-percent surface visibility. The site was determined to have been destroyed by bulldozing activities and was recommended as being not eligible for the National Register.

31MK550 is a prehistoric lithic scatter of biface thinning flakes, secondary flakes, and a thinning flake. The lack of diagnostic artifacts made a date assignment to the prehistoric component impossible. All the artifacts were recovered from a surface inspection of a recently bulldozed field with 100-percent surface visibility. The site is situated on a small knoll on a ridgetop of Cecil sandy clay loam between tributaries of Coffey Creek. The site was determined to have been destroyed by bulldozing activities and was recommended as being not eligible for the National Register.

31MK551 is a prehistoric lithic scatter of quartz flakes. The lack of diagnostic artifacts made a date assignment to the prehistoric component impossible. All the artifacts were recovered from a surface inspection of a recently cleared lot with 70-percent surface visibility. The site is situated on a ridge toe of Cecil sandy clay loam. The site was determined to have been destroyed by land-clearing activities and was recommended as being not eligible for the National Register.

31MK552 is a prehistoric lithic scatter of secondary and thinning flakes. The lack of diagnostic artifacts made a date assignment to the prehistoric component impossible. All the artifacts were recovered from a surface inspection of a fallow field with 80- to 100-percent surface visibility. The site is situated on a ridgetop of Cecil sandy clay loam overlooking the headwaters of Beaverdam Creek. The site was determined to have been destroyed by plowing and soil erosion and was recommended as being not eligible for the National Register.

31MK553 is an historic house site (The Brown House, Bloomingdale Farm) that dates to the second half of the eighteenth century. The house and kitchen were leveled by a tornado in 1929 and the house foundations and chimney stones had been salvaged. The site is on a broad ridgetop of Cecil sandy clay loam overlooking the headwaters of Beaverdam Creek and Coffey Creek. The former house and kitchen sites were recommended for further work because they could have potential for studies of eighteenth- and nineteenth-century farm life in Mecklenburg County, especially when combined with the documents and oral history of the Brown family, whose Scotch-Irish settlers built the house soon after arriving in the Steele Creek area. The recommendation was for test excavations to determine site preservation and National Register significance.

SURVEY OF THE PROPOSED CHARLOTTE-DOUGLAS AIRPORT EXPANSION (TOLONEN AND CLIFFORD 1998)

Most of the previously surveyed areas within a mile of the Project APE were conducted between 1995 and 1997 by Anthony Tolonen with KEMRON Environmental Services in Atlanta, Georgia, and Laura Clifford with Environment and Archaeology LLC in Verona, Kentucky. Their work covered 3,000 acres and identified 52 archaeological sites. One site recorded by Tolonen and Clifford (31MK857) is within the APE and is described above (see Previously

Recorded Archaeological Sites within the Area of Potential Effects). Twelve sites recorded by Tolonen and Clifford in 1998 are within a mile of the APE. A summary of these sites follows.

31MK819 (also known as "Airport 9") is a prehistoric lithic scatter of debitage found on an upland ridgetop overlooking the headwaters of Coffey Creek. The site was in a dense secondary growth woodland. All artifacts were recovered from shovel testing. The site was determined to have been destroyed by agricultural activities and was recommended as being not eligible for the National Register.

31MK824 is a prehistoric lithic isolated find of an incomplete projectile point recovered from a shovel test. The site is situated on an upland ridgetop with Cecil sandy loam near the headwaters of Beaverdam Creek. The site was determined to have been destroyed by agricultural activities and was recommended as being not eligible for the National Register.

31MK825 is a prehistoric lithic scatter of cores, a biface, debitage, and a Late Woodland Savannah River point. All the artifacts were recovered from a surface inspection of a recently cleared lot with 70-percent surface visibility. The site is situated on an upland ridgetop with Cecil sandy loam near the headwaters of Beaverdam Creek. The site was determined to have been destroyed by agricultural activities and was recommended as being not eligible for the National Register.

31MK826 is a multicomponent site situated on an upland ridgetop with Cecil sandy loam near the headwaters of Beaverdam Creek. The prehistoric component is a lithic scatter of a possible groundstone tool, a core, a biface, debitage, and a Middle Woodland Swannanoa-type point. The historic component was comprised of late-nineteenth to twentieth-century ceramic fragments: undecorated refined earthenware and Bristol-glazed annularware stoneware. All the artifacts were recovered from a surface inspection of a recently cleared lot with 70-percent surface visibility. The site was determined to have been destroyed by agricultural activities and was recommended as being not eligible for the National Register.

31MK827 is a prehistoric lithic scatter of a core, biface, debitage, Late Archaic Savannah River point, Middle Woodland Swannanoa-type point, and fire-cracked rock. All the artifacts were recovered from a surface inspection of a recently cleared lot with 70-percent surface visibility. The site is situated on an upland ridgetop with Cecil sandy loam near the headwaters of Beaverdam Creek. The site was determined to have been destroyed by agricultural activities and was recommended as being not eligible for the National Register.

31MK842 is an isolated find of prehistoric debitage on an upland ridgetop with Cecil sandy loam near the headwaters of Beaverdam Creek. The lack of diagnostic artifacts made a date assignment to the prehistoric component impossible. The site was determined to have been destroyed by agricultural activities and was recommended as being not eligible for the National Register.

31MK844 is a multicomponent site situated on an upland ridgetop with Cecil sandy loam near the headwaters of Beaverdam Creek. The prehistoric component is a lithic scatter of bifaces and debitage. The lack of diagnostic artifacts made a date assignment to the prehistoric component impossible. The historic component was comprised of late-nineteenth to twentieth-century undecorated refined earthenware. The site was determined to have been destroyed by agricultural activities and was recommended as being not eligible for the National Register.

31MK854 is a prehistoric lithic scatter of debitage. The lack of diagnostic artifacts made a date assignment to the prehistoric component impossible. The site is situated on an upland ridgetop with Cecil sandy loam near the headwaters of Beaverdam Creek. The site was determined to have been destroyed by agricultural activities and was recommended as being not eligible for the National Register.

31MK855 is a prehistoric lithic isolated find of a possible Early Archaic period St. Charles point that was recovered along an unpaved road. The investigation determined that the artifact had been redeposited and was recommended as being not eligible for the National Register.

31MK856 is a prehistoric lithic isolated find of debitage. It was recommended as being not eligible for the National Register.

31MK857 is a prehistoric lithic scatter of debitage found along an old logging road that had been extensively disturbed. The site was recommended as being not eligible for the National Register.

31MK858 is a prehistoric lithic scatter of debitage. The site was recommended as being not eligible for the National Register.

31MK859 is a prehistoric lithic scatter of debitage and biface bases. The site was recommended as being not eligible for the National Register.

ARCHAEOLOGICAL INVESTIGATIONS OF A POSSIBLE CEMETERY AND DOCUMENTATION OF OTHER SITES ON PROPERTY OWNED BY THE CHARLOTTE-DOUGLAS INTERNATIONAL AIRPORT (ROBINSON 2007-2008)

In 2007, Wake Forest University Archaeology Laboratories investigated property owned by the Charlotte-Douglas International Airport to search for a possible unmarked slave cemetery, to document two historic dwelling sites, and to inspect the property to locate other sites, historic road traces, and other landscape features. This work resulted in documenting three archaeological sites (31MK1086, 31MK1087, and 31MK1088) that lie within a mile of the Project APE. No evidence of the possible unmarked slave cemetery was found. A description of the three sites follows.

31MK1086 - Dwelling Site 1 is the site of a late-nineteenth-century dwelling that is depicted on the 1905 Charlotte USGS topographic quadrangle map and the 1910 Mecklenburg County Soil Survey map. Two structures are depicted at this location on both maps. The house was demolished with the floor joists and foundation piers left intact. Cultural material identified at the site, but not recovered, included window glass, nails, clothing buttons and buckles, a brass trunk fragment, construction materials, door lock part, shoe and belt leather, and historic ceramics (alkaline-glazed stoneware and undecorated whiteware). Given the age of the site and extensive disturbance from demolition, it was determined that intensive investigations were not warranted because it was unlikely that they would add information to our understanding of twentieth-century Mecklenburg County. It was recommended as being not eligible for the National Register.

31MK1087 - Dwelling Site 2 is on a slightly sloping ridgetop that is wooded and overgrown with briars. A former house site is on a level ridge that extends several hundred feet. The primary feature of the dwelling is a two-sided brick fireplace and chimney on a stone foundation. The house was estimated to be approximately 25 ft by 35 ft and had been supported by brick and stone piers. It was speculated that the structure was a one-story residence. A review of the 1905 Charlotte USGS topographic map and the 1910 Mecklenburg County Soil Survey map found that a structure is not depicted at this location. Cultural material identified at the site, but not recovered, included window glass, nails, and building construction materials. Given the age of the site, it was determined that intensive investigations were not warranted because it was unlikely that they would add information to our understanding of twentieth-century Mecklenburg County. It was recommended as being not eligible for the National Register.

31MK1088 – Brick Feature is a large rectangular-shaped pile of brick along a tributary of Coffey Creek. It was suggested that this site was a brick-manufacturing site for the Steele Creek Presbyterian Church. Other interpretations include a mill site or residence. It was recommended that this site remain undisturbed until it could be archaeologically investigated. The site is unassessed for eligibility to the National Register.

ARCHAEOLOGICAL SURVEY OF THE PROPOSED SOUTH CROSSFIELD TAXIWAY AT THE CHARLOTTE-DOUGLAS INTERNATIONAL AIRPORT (LEGACY 2018)

In 2018, Legacy surveyed approximately 176 acres that are proposed for ground-disturbing activities associated with the construction of the South Crossfield Taxiway. This work identified three sites (31MK1143, 31MK144, and 31MK145) that are within a mile of the Project APE.

31MK1143 is a prehistoric lithic isolated find of debitage from a wooded ridgetop above Coffey Creek. The artifact was produced during tool production and maintenance. There was no evidence of an occupation midden, stratigraphic deposits, or features. Therefore, the site was recommended as being not eligible for the National Register.

31MK1144 is a multicomponent site. The prehistoric component was a sparse lithic scatter of an interior flake and a uniface. Shovel testing found no evidence of an occupation midden, stratigraphic deposits, or features. Therefore, the prehistoric component at this site was recommended as not being eligible for the National Register. The historic component is associated with the Herron House. Artifacts date to the early and mid-twentieth century (whiteware and manganese-dioxide tinted glass). Cultural material associated with the historic occupation of the property are Architectural-related (nails, brick, window glass, and asbestos roofing/siding), Kitchen-related (ceramics and bottle glass), and Heating-related (cinders and coal). Diagnostic ceramic artifacts include Bristol-glazed stoneware with Albany slip-glazed interior, alkaline-glazed stoneware, Rockingham-glazed yellowware, and undecorated whiteware. The historic component represents an early- to mid-twentieth-century farmstead with above-ground remains. The historic component was determined to lack information that will add to our understanding of the history of the area. Therefore, this site was recommended as being not eligible for the National Register.

31MK1145 is a multicomponent site. The prehistoric component is a sparse lithic scatter of debitage and a uniface. Shovel testing found no evidence of an occupation midden, stratigraphic deposits, or features. Therefore, the prehistoric component at this site was recommended as not being eligible for the National Register. The historic component is associated with the McGinn House. Cultural materials associated with the historic occupation of the property are indicative of Architectural-related activities (brick and window glass, Kitchen-related activities (whiteware ceramic plate and cup, a manganese-dioxide tinted bottle fragment, and a condiment bottle), and Personal-activities (bisque toy doll leg, pharmaceutical and patent medicine bottles, nail polish bottle, and shoe polish bottle). The historic component represents an early- to mid-twentieth-century farmstead with above-ground remains. The historic component was determined to lack information that will add to our understanding of the history of the area. Therefore, the historic component of the site was recommended as being not eligible for the National Register.

ARCHAEOLOGICAL INVESTIGATIONS OF THE PROPOSED WEST BOULEVARD RELOCATION AT THE CHARLOTTE-DOUGLAS INTERNATIONAL AIRPORT (NEW SOUTH ASSOCIATES 2018)

In 2018, New South Associates conducted an archaeological survey for the proposed relocation of West Boulevard at the Charlotte-Douglas International Airport. This work revisited and reevaluated two previously recorded sites (31MK228 and 31MK229) and identified and evaluated one new site (31MK1147) are located within a mile of the APE.

31MK228 – Revisit is a prehistoric lithic scatter that was recorded by Fred Fischer in 1978 (see Survey of the Coffey Creek Drainage (Fischer 1980). Cultural material from the site was identified as debitage. The 2018 New South inspection found that the location is on a low ridge with scrub vegetation, juvenile hardwoods, and grass. Shovel testing encountered sterile reddish brown (5YR 5/3) clay subsoil. The absence of cultural material and evidence of site disturbance indicated that the site had little integrity and it was recommended as being not eligible for the National Register.

31MK229 – Revisit is a prehistoric lithic scatter that was recorded by Fred Fischer in 1978 (see Survey of the Coffey Creek Drainage (Fischer 1980). At that time the site was extensively disturbed. In 2018, New South found that commercial development has impacted the site. Grading for an industrial park located northwest of the site removed six to ten feet of soil. Fiberoptic and gas lines were also present along the edge of Byrum Drive. Two shovel tests excavated on a rise uncovered 15 cm of reddish brown (5YR 5/3) clay subsoil that confirmed disturbance from grading, construction, and utility excavation. The site was determined to lack integrity and was recommended as being not eligible for the National Register.

31MK1147 is a historic artifact scatter near a grass lawn, several large oak trees, and a concrete driveway. Aerial photography from 1960 and the 1949 Charlotte West USGS topographic quadrangle map, 7.5-minute series, depict a structure at this location. Later aerial photography revealed that the structure was demolished between 1989 and 1998. Artifact recovery included brick and refined earthenware fragments. Shovel testing encountered sterile yellowish red (5YR 5/8) clay subsoil at the ground surface that indicated that the site has been extensively disturbed or eroded. The site appeared to have no potential to provide significant information about the historic occupation of the property. It was recommended as being not eligible for the National Register.

METHODOLOGY

The methodology used for the investigation is described below. It covers the Background Research, Archaeological Investigations, Lab Methods, National Registrar of Historic Places Evaluation Criteria, and Technical Documentation.

Background Research

Background research to locate information about previously surveyed areas and previously recorded archaeological sites within the APE and within a mile of the APE was conducted prior to the initiation of fieldwork at the NC Department of Cultural Resources (NCDRC), State Historic Preservation Office (SHPO), Office of State Archaeology (OSA) in Raleigh. Online research to collect information about historic occupation of the APE included a review of the NC SHPO Architectural Database (<http://gis.ncdcr.gov/hpweb/>), the Mecklenburg County GIS Data Browser <http://charmeck.org/mecklenburg/county/LUESA/GIS/Pages/Default.aspx>, Mecklenburg County GIS Polaris (<http://polaris3g.mecklenburgcountync.gov/>), Mecklenburg County Register of Deeds (<http://charmeck.org/mecklenburg/county/ROD/Pages/default.aspx>), and Google Earth historical images from 1993, 2002, and 2008 (<https://www.google.com/earth/>). Historic USGS topographical maps that depict the APE between 1948 and 1968 were accessed from the ARCGIS USGS Historical Topographic Map Explorer (<http://historicalmaps.arcgis.com/usgs/index.html>) and the 1905 USGS Charlotte NC topographic map was downloaded from the Perry-Castañeda Library Map Collection at the University of Texas (https://legacy.lib.utexas.edu/maps/topo/north_carolina/txu-pclmaps-topo-nc-charlotte-1905.jpg). Other historic maps that show the APE and were reviewed include the 1888 JT Orr Map of Mecklenburg County and the 1911 Spratt Map of Mecklenburg County that are archived at the University of North Carolina Library and accessed online (<https://web.lib.unc.edu/nc-maps/>).

Archaeological Investigations

The investigation resulted in recording seven new archaeological sites (31MK1148-31MK1154). Two previously recorded sites (31MK857 and 31MK1146) in the APE along Byrum Drive were not revisited as they had been previously evaluated and recommended as being not eligible for the National Register (see Previously Recorded Archaeological Sites within the Area of Potential Effects). Other areas not inspected during the survey include wetlands, impoundments, areas with slope that was more than 15 percent, and areas disturbed by construction activities.

The field investigation included a surface reconnaissance in areas with at least 50-percent ground-surface visibility, subsurface investigations with systematic transect shovel testing and some judgmentally placed shovel tests, and site assessment investigations with radial and grid shovel testing. All sites located during the survey were assessed

for National Register significance based on the results of shovel testing. No test unit excavation was deemed appropriate for sites discovered during the investigation.

Surface Reconnaissance. Surface reconnaissance consisted of systematically examining exposed ground surfaces to determine if artifacts or surface traces indicative of an archaeological site were present. Experience has found that a surface survey is effective only in situations where 50 percent or more of the ground surface is visible and where there is no potential for buried (and thus obscured) archaeological resources. It is not effective in areas where less than 50 percent of the surface is exposed or in places where alluvial or colluvial soil deposits are likely to be present; these areas were inspected with subsurface testing.

Subsurface Investigations. Subsurface testing consisted of systematically excavating shovel tests at 30-meter (m) intervals. Each shovel test measured about 38 centimeters (cm) in diameter and was excavated to sterile subsoil, bedrock, or the watertable. All removed soil was screened through ¼-inch mesh hardware cloth to ensure uniform artifact recovery. Each shovel test was described in terms of depth, stratigraphy, and artifact recovery; the texture and *Munsell* soil color of all soils in each shovel test was recorded.

Site Assessment. Archaeological sites were defined as at least one artifact or cultural feature greater than 50 years of age. For each site located during the survey, standard procedures were followed to gather preliminary data on cultural affiliation, site size and boundaries, integrity, and significance in terms of eligibility for the National Register. These procedures began with radial shovel tests excavated at 15-m intervals in cardinal directions from the positive shovel test or above-ground evidence of site occupation to establish the extent of the deposits.

Site assessments included the following:

- establish a datum
- designate a numbering system for shovel tests and stratigraphic levels keyed to drawings, written records, and photographs
- use standard size excavation units
- hand-screen excavated soils through ¼-inch mesh
- excavate in levels that conform to natural soil strata
- describe soils using *Munsell* Soil color charts
- maintain a photographic record of excavations

The Field Director maintained detailed notes on the survey methodology, sites identified during the survey, testing methodology, artifact recovery, and relevant environmental factors. Standardized Field Forms were used to document stratigraphy and artifact recovery.

A sketch map of each site discovered was produced in the field. The location of shovel tests excavated at every site was placed on the site sketch map. Sites were photographed, and notes were taken concerning the site location and condition. Site locations were recorded with a global positioning system (GPS) receiver with sub-meter accuracy. Sites that were less than 30x30 m were recorded as point data; sites greater than 30 x30 m were recorded as polygons.

Lab Methods

Once the fieldwork was completed, the archaeological materials were returned to Legacy's Durham facility for processing. They were first organized by provenience and then verified against the field tracking form and the CSV (comma separated values) database generated from downloaded survey field data. The artifacts were washed with a soft brush; some metal and brick artifacts were dry brushed. The artifacts were set on trays to dry; they were separated by provenience with their original field provenience card. No artifacts required conservation or stabilization. No specialized analysis of materials was required.

Once dry, the artifacts were rough sorted by artifact category and then examined closely for identification to determine the date or dates of occupation present and the range of activities carried out at each site. All artifacts were weighed in grams and counted. All artifact information was entered into a *Microsoft Access* database (Appendix A).

Some materials that had been incorrectly identified in the field as being cultural (unmodified rock) were discarded. Corrections (dated and initialed) were noted in the field books. Using field data and lab-verified inventory of cultural material, a site location map and site summary table was prepared for submission to NC OSA with a request for permanent site numbers and accession numbers.

The laboratory methodology included the following: artifact analysis, intra-site pattern analysis, and inter-site pattern analysis. Prehistoric lithic debitage artifacts were identified by flake type (bifacial thinning flakes, cortical flakes, interior flakes, linear flakes, notching flakes, and shatter). Primary flakes were identified by the presence of cortex on most of the dorsal surface; secondary flakes exhibit cortex on less than half the dorsal surface; and tertiary flakes had no evidence cortex. Other lithic artifact types include biface fragments. Prehistoric ceramic artifacts were identified by types generally accepted in North Carolina (Ward and Davis 1999).

Historic artifacts were identified using Stanley South's (1977) system for organizing historic period artifacts in eight functional groups (Kitchen, Architectural, Furniture, Arms and Ammunition, Clothing, Personal, and Tobacco, and Activities). By sorting artifacts from a site into each group and then counting them by group, the data can be compared to similar data generated from other sites.

Artifacts were labeled with the accession number assigned by the NC OSA, packed in 4-mil *Ziploc* bags with an acid-free provenience card, and boxed in acid-free archival storage containers. Legacy will temporarily curate all artifacts and records resulting from the fieldwork pending final curation and will prepare all materials for curation following NC OSA guidelines.

National Register of Historic Places Evaluation Criteria

Cultural resources identified during the systematic 30-m interval field survey were revisited for an assessment of eligibility for listing in the National Register. In general, cultural resources are evaluated using criteria for National Register eligibility as specified by the Department of Interior (36 CFR Part 60). A recommendation on the significance of cultural resources is based on the National Register-eligibility criteria described in 36 CFR 60.4, as follows:

Sites, objects, districts, structures, and buildings are determined as worthy of inclusion on the National Register if "The quality of significance in American history, architecture, engineering and culture is present" in these resources and if they "possess integrity of location, design, setting, materials, workmanship, feeling, association and

Criterion a: are associated with events that have made a significant contribution to the broad patterns of our history; or

Criterion b: are associated with the lives of persons significant in our past; or

Criterion c: embody the distinctive characteristics of a type, period, or method of construction that represents the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

Criterion d: have yielded, or may be likely to yield, information important in prehistory or history."

Most archaeological sites that are deemed significant and thus eligible for inclusion on the National Register fall under the last criterion (d) because of the information that can be retrieved from analysis of archaeological materials. In order to assess the potential of a resource for contributing new or collaborative information to the theoretical and substantive knowledge of archaeology, its significance must be determined (Butler 1987:822-823, 828; Townsend et al. 1993). Consequently, researchers must consider how each site does or does not address the questions within the research design and within the framework of other regional research questions.

To assess the archaeological sites for National Register eligibility under Criterion d, the following attribute evaluations were considered.

Site Integrity – Does the site contain intact cultural deposits?

Preservation – Does the site contain material suited to in-depth analysis and/or absolute dating, such as preserved features, botanical and/or faunal remains, or human skeletal remains?

Uniqueness – Is the information contained in the site redundant in comparison to that available from similar sites, or do the remains provide a unique or insightful perspective on research concerns of regional importance?

Relevance to Current and Future Research – Would additional work at this site contribute to our knowledge of the past? Would preservation of this site protect valuable information for future studies?

Technical Documentation

The technical documentation for this project details the results of the background research, the field investigation, artifact analysis, National Register assessment, and recommendations. The summary for each site is documented with maps and photographs.

The documentation complies with the Secretary of the Interior's Standards for Intensive Archaeological Survey (FR 44739) and meets the requirements of the Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716) and North Carolina Office of State Archaeology standards and guidelines for archaeological reports (<https://archaeology.ncdcr.gov/programs/forms>).

RESULTS

Field investigations were conducted by Legacy and ESI between December 16 and December 20, 2019. Deborah Joy with Legacy served as Principal Investigator. Terri Russ with ESI served as the Field Director; Becky Sponseller, Thomas Evans, and Rhiannon Graham assisted.

A total of 261 grid points at 30-m intervals were established across the 58-acre APE, 80 were unexcavated due to steep slopes, extensive ground disturbance, or wetlands. Systematic shovel testing was conducted at the remaining 181 grid points, of these six or 3.3 percent yielded cultural material. The remaining 175 shovel tests (or 97.2 percent of the excavated shovel tests) did not yield cultural material. Figure 15 shows the location of the 30-m interval shovel tests and identifies the unexcavated grid points and the excavated shovel tests indicating positive and negative artifact recovery.

This work resulted in identifying seven new archaeological sites (31MK1148-31MK1154) in the APE (Figure 16 and Table 6). The two previously recorded sites in the APE (31MK857 and 31MK1146) were not revisited. These sites had been previously assessed as being not eligible for the National Register (see Previously Recorded Archaeological Sites within the Area of Potential Effects). A description of the seven new sites (31MK1148-31MK1154) follows. None are recommended as being eligible for the National Register.

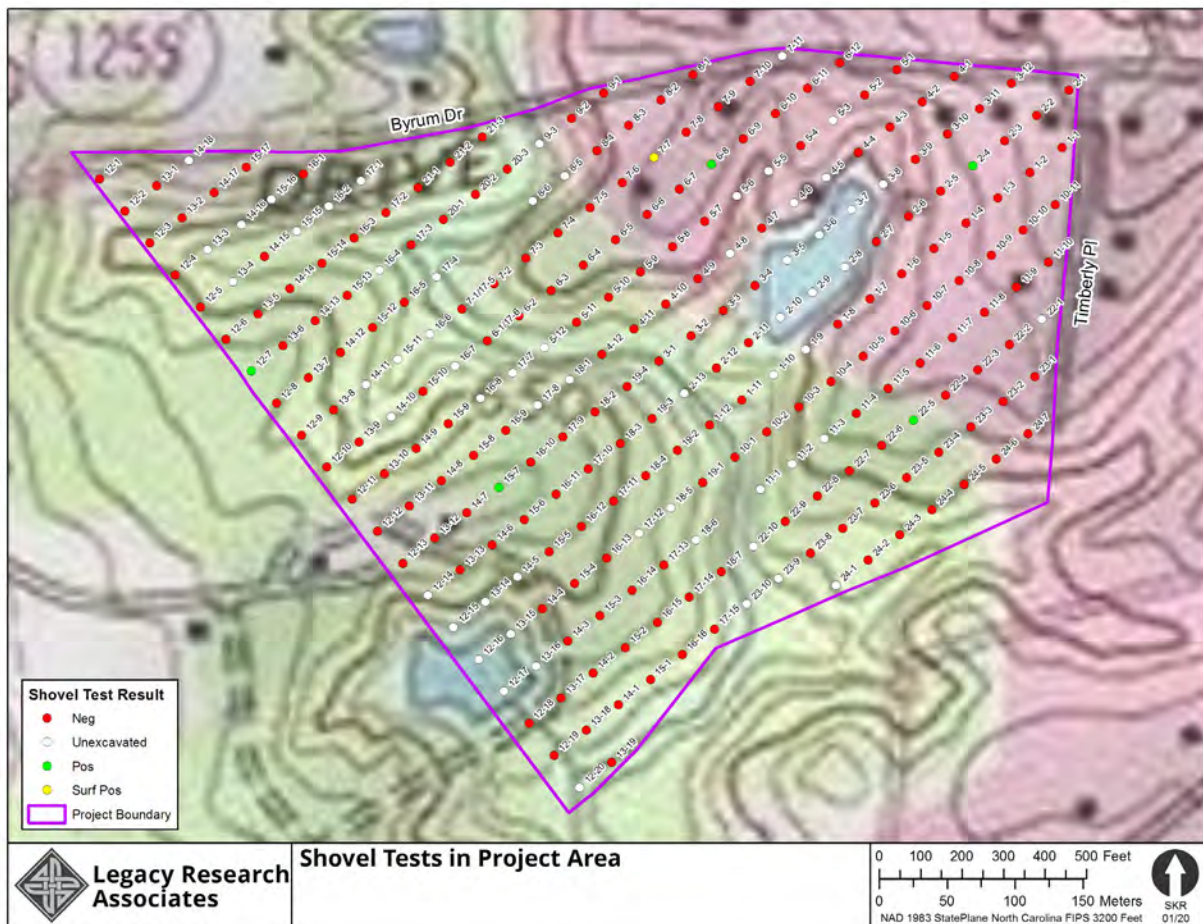


Figure 15. Shovel test locations (30-m-interval grid) in the APE. Basemap: 1993 Charlotte West USGS topographic quadrangle 7.5-minute series.



Figure 16. Location of the Newly Recorded Archaeological Sites within the APE. Basemap: 1993 Charlotte West USGS topographic quadrangle 7.5-minute series.

Site	Component	Time Period	National Register Assessment	National Register Recommendation
31MK1148	Prehistoric	Unknown Lithic	Not Eligible	No Further Work
31MK1149	Prehistoric	Unknown Lithic	Not Eligible	No Further Work
31MK1150	Prehistoric	Middle Woodland	Not Eligible	No Further Work
31MK1151	Historic	20 th -century extant shed and artifact scatter	Not Eligible	No Further Work
31MK1152	Historic	20 th -century artifact scatter	Not Eligible	No Further Work
31MK1153	Historic	20 th -century artifact scatter	Not Eligible	No Further Work
31MK1154	Historic	20 th -century extant structure	Not Eligible	No Further Work

31MK1148

UTM Coordinates: Zone 17S 3894244N 504932E

Site Size: 900m²

Elevation: 665 feet amsl

Environmental Setting: Wooded ridgetop

Nearest Water: 100 m (330 ft) west of Coffey Creek

Soils: Pacolet sandy loam with 15-25 slopes (PaE)

Surface Visibility: <25%

Field Procedures: Shovel Testing (n=23 – 3 were not excavated because of steep slopes)

Cultural Affiliation: Prehistoric–Lithic, Unknown subperiod

Site Function: Lithic Scatter (n=4)

Site Integrity: Poor

Recommendations: Not Eligible; No Further Work

Site Description: Shovel testing along a wooded ridgetop on December 18, 2019, recovered a quartz secondary flake from the upper 10 cm of Shovel Test (ST)12-7. Delineation shovel testing at 15-m intervals around ST12-7 on December 19, 2019, recovered two tertiary flakes from D3 and one quartz biface from D8. A total of 23 shovel tests were used to define and assess 31MK1148 for eligibility to the National Register (Table 7 and Figure 17). Three of the 23 were not excavated because of steep slopes above a wetland. Site soils were generally consistent with soils mapped by the NRCS, which identifies this location as having sandy loam with 15-25 percent slopes.

Three of the 23 shovel tests (ST12-7, D3, and D8) contained cultural material. A description of the soil stratigraphy and artifact recovery from these tests follows.

ST12-7 had 20 cm of brown (10YR 5/3) sandy loam overlying saprolitic strong brown (7.5YR 4/6) clay subsoil. One quartz secondary flake was recovered from the upper 10 cm of this test. Excavation terminated at 30 cm bs.

D3 had 5 cm of very dark brown (10YR 2/2) sandy loam overlying 15 cm of olive yellow (2.5Y 6/6) sandy clay. Light olive brown (2.5Y 5/6) saprolitic clay subsoil was encountered at 20 cm bs. Excavation of this test terminated at 35 cm bs. Two quartz tertiary flakes were recovered between 5 and 20 cm bs.

D8 had 15 cm of grayish brown (10YR 5/2) sandy clay loam overlying red (2.5YR 4/8) clay subsoil. Excavation terminated at 25 cm bs. One quartz biface was recovered from the upper 15 cm of this test.

Figure 18 is a general view of 31MK1148.

Figure 19 is the profile of D3 showing 5 cm of very dark brown (10YR 4/2) sandy loam overlying 15 cm of olive yellow (2.5Y 6/6) sandy clay. Light brown (2.5Y 5/6) saprolitic clay subsoil was encountered at 20 cm bs. Excavation was terminated at 35 cm bs.

Subsurface testing at this site found no evidence of an occupation midden, stratigraphic deposits, or features. The four prehistoric lithic artifacts recovered from shovel testing were manufactured from locally available quartz and are identified as debitage and a biface (Table 8). The sparse artifact recovery and the absence of intact buried cultural deposits indicates that this site has limited potential to add to our understanding of the prehistory of the area. Therefore, this site is recommended as being not eligible for the National Register under Criterion D. No further archaeological work is recommended.

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Table 7. Summary of Shovel Testing at 31MK1148.				
Shovel Test	Depth (cm bs)	Soil Color	Soil type	Notes
12-6	0-15	Brown (10YR 5/3)	Sandy loam	
	15-25	Red (2.5YR 4/8)	Clay subsoil	
12-7	0-20	Brown (10YR 5/3)	Sandy loam	Quartz Debitage
	20-30	Strong brown (7.5YR 4/6)	Saprolitic clay	
12-8	0-3	Reddish brown (2.5YR 4/4)	Sandy clay	
	3-25	Red (2.5YR 4/8)	Clay subsoil	
13-5	0-15	Dark brown (7.5YR 3/4) mottled with yellowish brown (10YR 5/6)	Silty clay loam	
	15-25	Yellowish brown (10YR 5/6)	Clay subsoil	
13-6	0-15	Dark grayish brown (2.5Y 4/2)	Sandy clay loam	
	15-25	Gray (7.5YR 6/1)	Clayey sand	
	25-35	Red (2.5YR 4/8)	Clay subsoil	
13-7	0-10	Dark reddish brown (5YR 3/4)	Sandy clay loam	
	10-20	Dark red (2.5YR 3/6)	Clay subsoil	
14-12	0-5	Dark brown (7.5YR 3/4)	Sandy loam	
	5-10	Reddish brown (2.5YR 4/4)	Sandy loam	
	20-25	Red (2.5YR 4/8)	Clay subsoil	
14-13	0-10	Dark brown (7.5YR 3/4)	Sandy loam	
	15-25	Strong brown (7.5YR 4/6)	Clay subsoil	
D1	0-15	Brown (10YR 5/3)	Sandy clay loam	
	15-25	Red (2.5YR 4/8)	Clay subsoil	
D2	0-5	Dark brown (7.5YR 3/4)	Sandy loam	
	5-15	Red (2.5YR 4/8)	Clay subsoil	
D3 - photo	0-5	Very dark brown (10YR 4/2)	Sandy loam	
	5-20	Olive yellow (2.5Y 6/6)	Sandy clay	Quartz Debitage
	20-35	Light olive brown (2.5Y 5/6)	Saprolitic clay	
D4	0-10	Dark brown (7.5YR 3/4)	Sandy loam	
	10-25	Light brown (7.5YR 6/3)	Sandy loam	
	25-30	Light brown (7.5YR 6/3)	Clay subsoil	
D5	0-15	Grayish brown (10YR 5/2)	Sandy clay loam	
	15-25	Reddish yellow (5YR 6/6) mottled with white (Gley 8/) clay	Clayey sand	
D6	0-5	Very dark gray (5YR 3/1)	Sandy loam	
	5-15	Light brown (7.5YR 6/3)	Sandy loam	
	15-25	Red (2.5YR 4/8)	Clay subsoil	
D7		Not excavated - steep slope		
D8	0-15	Grayish brown (10YR 5/2)	Sandy clay loam	Quartz Biface
	15-25	Red (2.5YR 4/8)	Clay subsoil	
D9	0-15	Very dark brown (10YR 2/2) mottled with olive brown (2.5Y 4/3)	Sandy clay loam	
	15-25	Olive brown (2.5Y 4/4)	Clay subsoil	
D10	0-10	Strong brown (7.5YR 4/6)	Clay subsoil	
D11	0-5	Dark brown (7.5YR 3/4) mottled with black (10YR 2/1)	Sandy loam	
	5-20	Light brown (7.5YR 6/3)	Clay	
	20-30	Yellowish red (5YR 5/8)	Clay	
D12	0-15	Dark olive brown (2.5Y 3/2)	Sandy clay loam	
	15-25	Olive brown (2.5Y 4/4)	Sandy clay	
	25-35	Olive brown (2.5Y 4/4)	Sandy clay	
	35-45	Yellowish brown (10YR 5/6)	Clay	
D13		Not excavated - steep slope		
D14	0-15	Grayish brown (10YR 5/2)	Sandy clay loam	
	15-25	Light brownish gray (10YR 6/2) mottled with red (2.5YR 4/8) clay	Sandy clay	
D15		Not excavated - steep slope		

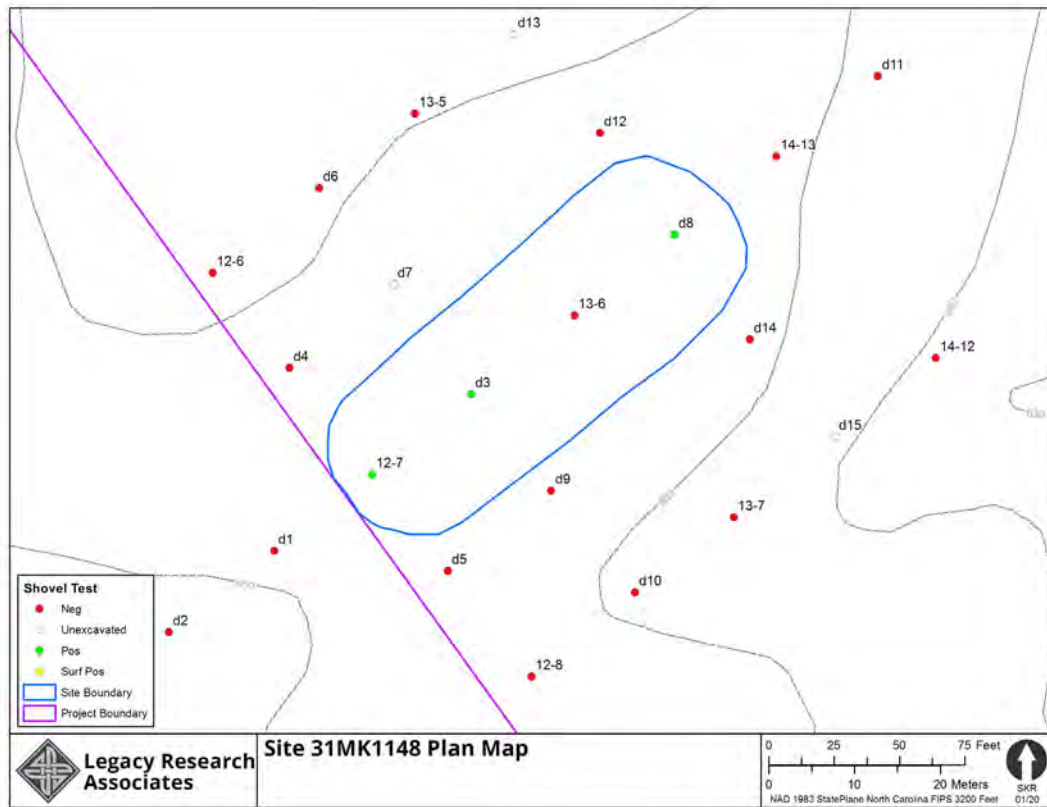


Figure 17. 31MK1148 Plan Map.

Table 8. Summary of Cultural Material from 31MK1148.								
Transect	Shovel Test	Stratigraphic Zone	Depth (cm bs)*	Component	Artifact Type	Artifact Description	Count	Weight (g)
12	7	1	0-10	Prehistoric	Lithic - Quartz	Debitage - secondary flake	1	1.2
	D3	2	5-20	Prehistoric	Lithic - Quartz	Debitage - tertiary flake	2	1.4
	D8	1	0-15	Prehistoric	Lithic - Quartz	Tool - biface	1	11.8
Total							4	14.4

*cm bs – centimeters below surface



Figure 18. 31MK1148, view southeast.



Figure 19. 31MK1148, Shovel Test D3, profile.

31MK1149

UTM Coordinates: Zone 17S 3894142N 505104E

Site Size: 450m²

Elevation: 670 feet amsl

Environmental Setting: Wooded Ridgetop

Nearest Water: 82 m (270 ft) southwest of Coffey Creek

Soils: Cecil sandy clay loam with 2-8 percent slopes, eroded (CeB2)

Surface Visibility: <25%

Field Procedures: Shovel Testing (n=19)

Cultural Affiliation: Prehistoric–Lithic, Unknown subperiod

Site Function: Lithic Scatter (n=3)

Site Integrity: Poor

Recommendations: Not Eligible; No Further Work

Site Description: Shovel testing along a wooded ridgetop on December 17, 2019, recovered prehistoric quartz debitage from the upper 15 cm of ST15-7. Delineation shovel testing at 15-m intervals around ST15-7 on December 19, 2019, recovered one quartz tertiary flake from the upper 10 cm of D1. A total of 19 shovel tests were used to define and evaluate 31MK1149 (Figure 20). Site soils were generally consistent with soils mapped by the NRCS, which identifies this location as having eroded sandy clay loam with 2-8 percent slopes.

Table 9 is a summary of the 19 shovel tests excavated to evaluate 31MK1149; only two yielded cultural material (ST15-7 and D1).

ST15-7 had 8 cm of dark brown (7.5YR 3/4) sandy clay loam overlying 7 cm reddish brown (2.5Y 4/4) sandy clay; red (2.5YR 4/8) clay subsoil was encountered at 15 cm bs. Excavation was terminated at 25 cm bs. Recovery from this test consisted of two prehistoric lithic debitage artifacts (quartz shatter and a quartz flake) from the upper 15 cm.

D1 had 5 cm of black (10YR 2/1) sandy clay mottled with dark reddish brown (2.5YR 3/3) clay overlying 5 cm of red (2.5YR 5/8) sandy clay. Red (2.5YR 4/8) clay subsoil was encountered at 10 cm bs. Excavation was terminated at 22 cm bs. Recovery from this test consisted of one prehistoric lithic debitage artifact (quartz flake) from the upper 10 cm.

Figure 21 is a general view of the wooded ridgetop at 31MK1149. Figure 22 is the profile of D1 showing 5 cm of red (2.5YR 5/8) sandy clay underlying 5 cm of black (10YR 2/1) sandy clay loam. Red (2.5Y 4/6) clay was encountered at 10 cm bs. Excavation was terminated at 22 cm bs.

Subsurface testing found no evidence of an occupation midden, stratigraphic deposits, or features. Three prehistoric lithic debitage artifacts manufactured from locally available quartz were recovered from the site (Table 10). The sparse artifact recovery and the absence of intact buried cultural deposits indicates that this site has limited potential to add to our understanding of the prehistory of the area. Therefore, this site is recommended as being not eligible for the National Register under Criterion D. No further archaeological work is recommended

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Table 9. Summary of Shovel Testing at 31MK1149.				
Shovel Test	Depth (cm bs)	Soil Color	Soil type	Notes
14-6	0-5	Dark brown (7.5YR 3/4)	Sandy loam	
	5-25	Reddish brown (2.5YR 4/4)	Sandy clay	
	25-30	Red (2.5YR 4/8)	Clay subsoil	
14-7	0-10	Dark brown (7.5YR 3/4)	Sandy loam	
	10-20	Strong brown (7.5YR 4/6)	Clay subsoil	
14-8	0-5	Dark brown (7.5YR 3/4)	Sandy loam	
	5-25	Reddish brown (2.5YR 4/4)	Sandy loam	
	25-30	Red (2.5YR 4/8)	Clay subsoil	
15-6	0-10	Red (2.5YR 4/8)	Clay subsoil	
15-7	0-8	Dark brown (7.5YR 3/4)	Sandy clay loam	Quartz debitage
	8-15	Dark red (2.5YR 3/6)	Sandy clay	Quartz debitage
	15-25	Red (2.5YR 4/8)	Clay subsoil	
15-8	0-5	Dark grayish brown (2.5Y 4/2)	Sandy clay loam	
	5-15	Strong brown (7.5YR 4/6)	Clay subsoil	
16-9	0-28	Mottled hydric	Hydric	
16-10	0-10	Mottled hydric	Hydric	
16-11	0-20	Brown (10YR 5/3) mottled with yellowish brown (10YR 5/6) and strong brown (7.5YR 4/6) clay	Sandy clay loam	
	20-30	Yellowish brown (10YR 5/6) mottled with strong brown (7.5YR 4/6)	Clay subsoil	
17-9	0-2	Dark brown (10YR 3/3)	Loam	
	2-15	Red (2.5YR 4/8)	Clay subsoil	
D1 – photo	0-5	Black (10YR 2/1) mottled with dark reddish brown (2.5YR 3/3)	Sandy clay loam	
	5-10	Red (2.5YR 5/8)	Sandy clay	Quartz debitage
	10-22	Red (2.5YR 4/8)	Clay subsoil	
D2	0-10	Very dark grayish brown (10YR 3/2)	Loam	
	10-20	Strong brown (7.5YR 4/6)	Clay subsoil	
D3	0-5	Dark brown (10YR 3/3)	Loam	
	5-20	Red (2.5YR 4/8)	Clay subsoil	
D4	0-10	Strong brown (7.5YR 4/6)	Clay subsoil	
D5	0-15	Red (2.5YR 4/8)	Sandy clay loam	
	15-25	Red (2.5YR 4/8)	Clay subsoil	
D6	0-10	Strong brown (7.5YR 4/6)	Clayey sand	
	10-20	Strong brown (7.5YR 4/6)	clay subsoil	
D7	0-5	Dark brown (10YR 3/3)	Loam	
	5-15	Red (2.5YR 4/8)	Clay subsoil	
D8	0-5	Dark brown (10YR 3/3)	Loam	
	5-10	Light brownish gray (2.5Y 6/2)	Loam	
	10-25	Red (2.5YR 4/8)	Clay subsoil	
D9	0-5	Dark grayish brown (2.5Y 4/2)	Sandy clay loam	
	5-30	Light yellowish brown (2.5YR 6/3)	Sandy clay	
	30-40	Red (2.5YR 4/8)	Clay subsoil	

Table 10. Summary of Cultural Material from 31MK1149.								
Transect	Shovel Test	Stratigraphic Zone	Depth (cm bs)	Artifact Type	Artifact Material	Artifact Description	Count	Weight (g)
15	7	1	0-8	Prehistoric	Lithic - Quartz	Debitage - shatter	1	0.5
		2	8-15	Prehistoric	Lithic - Quartz	Debitage - tertiary flake	1	2.8
	D1	2	5-10	Prehistoric	Lithic - Quartz	Debitage - tertiary flake	1	0.6
Total							3	3.9

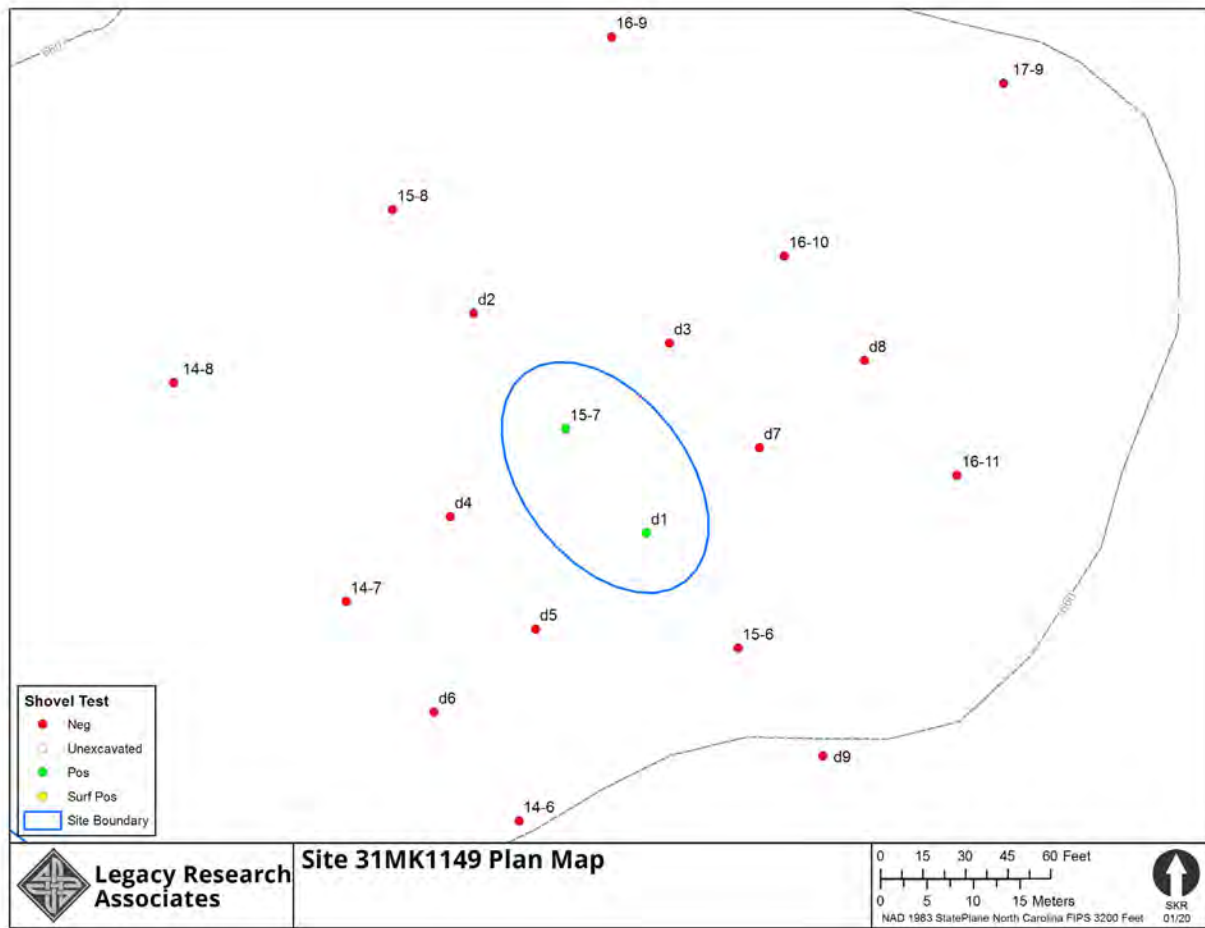


Figure 20. 31MK1149 Plan Map.



Figure 21. 31MK1149, view northeast.



Figure 22. 31MK1149, Shovel Test D1, profile.

31MK1150

UTM Coordinates: Zone 17S 3894203N 505402E

Site Size: 30m²

Elevation: 676 feet amsl

Environmental Setting: Wooded Ridgetop

Nearest Water: 143 m (470 ft) northwest of the confluence of two stream that drain into Coffey Creek

Soils: Cecil sandy clay loam with 2-8 percent slopes, eroded (CeB2)

Surface Visibility: <25%

Field Procedures: Shovel Testing (n=9)

Cultural Affiliation: Prehistoric–Ceramic, Middle Woodland (AD 800-1000)

Site Function: Ceramic Isolated Find (n=1)

Site Integrity: Poor

Recommendations: Not Eligible; No Further Work

Site Description: Shovel testing along a wooded ridgetop on December 18, 2019, recovered one eroded quartz-tempered prehistoric ceramic sherd from the upper 10 cm of ST22-5. Delineation shovel testing at 15-m intervals around ST22-5 on December 19, 2019, recovered no additional cultural material. Nine shovel tests were used to define and assess 31MK1150 (Table 11 and Figure 23). One of the nine (D4) was not excavated because it was in the pipeline corridor. Site soils were generally consistent with soils mapped by the NRCS, which identifies this location as having eroded sandy clay loam with 2-8 percent slopes. The exception is ST22-5 that contained the prehistoric sherd from the upper 10 cm of dark grayish brown (10YR 4/2) sandy loam that overlaid sterile red 7.5YR 5/6) clay subsoil.

Figure 24 is a general view of the wooded ridgetop at 31MK1150. Figure 25 is the profile of D1 showing the red (2.5YR 4/6) sandy clay subsoil under 5 cm of dark brown (10YR 3/3) sandy loam.

One prehistoric ceramic artifact was recovered from ST22-5 (Table 12). This artifact is an eroded quartz-tempered body sherd that possibly dates to the Middle Woodland period (AD 800-1000). Soil stratigraphy in ST22-5 was 10 cm of dark grayish brown (10YR 4/2) sandy loam overlying 30 cm of red (7.5YR 4/6) sandy clay that graded to clay at 35 cm bs. Excavation terminated at 40 cm bs.

Subsurface testing at this site encountered a thin layer of loam overlying subsoil, which indicates that soil on this landform deflated and eroded. No buried occupation zones or cultural features were found during the site inspection. The sparse artifact recovery of one eroded prehistoric ceramic sherd and the absence of intact buried cultural deposits indicates that this site has limited potential to add to our understanding of the prehistory of the area. Therefore, this site is recommended as being not eligible for the National Register under Criterion D. No further archaeological work is recommended.

Table 11. Summary of Shovel Testing at 31MK1150.				
Shovel Test	Depth (cm bs)	Soil Color	Soil type	Notes
11-5	0-20	Red (2.5YR 4/6)	Clay	
22-4	0-5	Dark brown (10YR 3/3)	Sandy loam	
	5-15	Red (2.5YR 4/6)	Clay	
22-5	0-10	Dark grayish brown (10YR 4/2)	Sandy loam	Sherd upper 5 cm
	10-40	Red (7.5YR 4/6)	Sandy clay grading to clay	
22-6	0-5	Dark brown (10YR 3/3)	Sandy loam	
	5-15	Red (2.5YR 4/6)	Clay	
23-4	0-12	Brown (7.5YR 5/3)	Sandy clay loam	
	12-22	Red (2.5YR 4/6)	Clay	
D1 - photo	0-12	Dark reddish brown (2.5YR 2.5/4)	Silty clay loam	
	12-22	Red (2.5YR 4/6)	Clay	
D2	0-5	Dark brown (10YR 3/3)	Sandy loam	
	5-25	Reddish brown (5YR 5/3)	Sandy clay	
	25-30	Red (2.5YR 4/6)	Clay subsoil	
D3	0-7	Dark brown (10YR 3/3)	Sandy clay loam	
	7-17	Strong brown (7.5YR 4/6)	Sandy clay	
D4		Not Excavated - pipeline corridor		

Table 12. Summary of Cultural Material from 31MK1150.								
Transect	Shovel Test	Stratigraphic Zone	Depth (cm bs)	Artifact Type	Artifact Material	Artifact Description	Count	Weight (g)
22	5	1	0-10	Prehistoric	Ceramic	eroded quartz-tempered body sherd, possibly Middle Woodland	1	11.9
Total							1	11.9

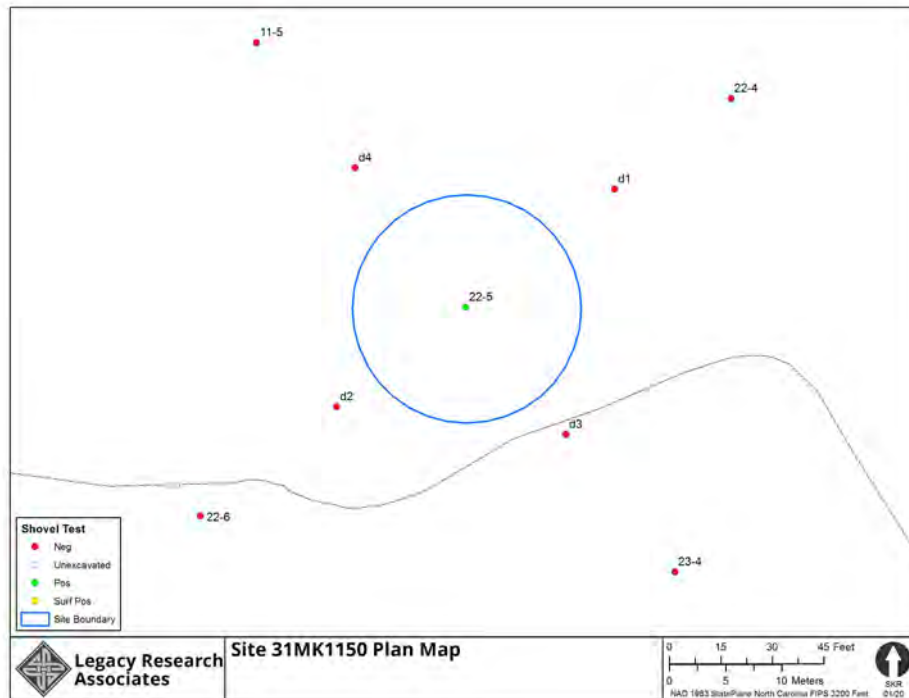


Figure 23. 31MK1150 Plan Map.



Figure 24. 31MK1150, view northeast.



Figure 25. 31MK1150, Shovel Test D1, profile.

31MK1151

UTM Coordinates: Zone 17S 3894393N 505442E

Site Size: 30m²

Elevation: 692 feet amsl

Environmental Setting: Wooded Ridge Slope

Nearest Water: 76 m (250 ft) northwest of Coffey Creek

Soils: Cecil sandy clay loam with 2-8 percent slopes, eroded (CeB2)

Surface Visibility: <25%

Field Procedures: Shovel Testing (n=9)

Cultural Affiliation: Historic, Modern

Site Function: Historic Abandoned Shed and Artifact Scatter (n=3)

Site Integrity: Poor

Recommendations: Not Eligible; No Further Work

Site Description: Shovel testing along a wooded ridge slope on December 16, 2019, recovered historic architectural materials (wire nail and window glass) from the upper 20 cm of ST2-4 located on the east side of an abandoned shed (Figure 26). Delineation shovel testing at 15-m intervals around ST2-4 on December 19, 2019, recovered no additional cultural material. In addition to ST2-3, eight shovel tests were excavated to define and assess 31MK1151 (Figure 27 and Table 13). None of the additional subsurface tests yielded cultural material. Site soils were generally consistent with soils mapped by the NRCS, which identifies this location as having eroded sandy clay loam with 2-8 percent slopes.

Figure 28 is the profile of D1 showing 15 cm of dark grayish brown (10YR 4/2) sandy clay loam overlaying 25 cm of red (5YR 4/6) clay subsoil. Excavation was terminated at 30 cm bs.

Three historic/modern artifacts were recovered from the site (Table 14). These are associated with Architectural activity (a 3-inch long ferrous wire nail) and Domestic activity (machine-made colorless bottle glass fragments).

An inspection of the abandoned structure found that it measures 16 ft by 8.5 ft. The one door attached to the structure is a common wooden, three-panel door with a glazed upper section (Figure 29). The building is wood-framed with wire nails and a hip roof. Inside the structure is divided into two rooms; each has an entrance door on the east-facing side of the structure and a sash window along the side wall (Figure 30). The window on the north elevation has fixed shutters (Figure 31).

The roof and floor of the shed were partially collapsed, so the photographs were taken from the doorways. Figure 32 shows the condition of the roof framing. The room on the south side of the shed had a linoleum counter/cabinet along the south and west walls and some shelving and an electrical outlet (Figure 33). The north room had wood paneling and a shelf above the window (Figure 34). It appears that the structure was used as a tool shed/workshop. The structure appears to lack sufficient integrity or significance for intensive-level investigation for National Register eligibility under Criterion C.

The nine shovel tests excavated in the site area encountered subsoil exposed on the ground surface or a thin layer of loam overlying subsoil, which indicates that soil on this landform deflated and eroded. The sparse artifact recovery and the deflated soils indicate that this site appears to contain limited information that add to our understanding of the history of the area and is recommended as being not eligible for the National Register under Criterion D. No further archaeological work is recommended.



Figure 26. 31MK1151, view northwest.

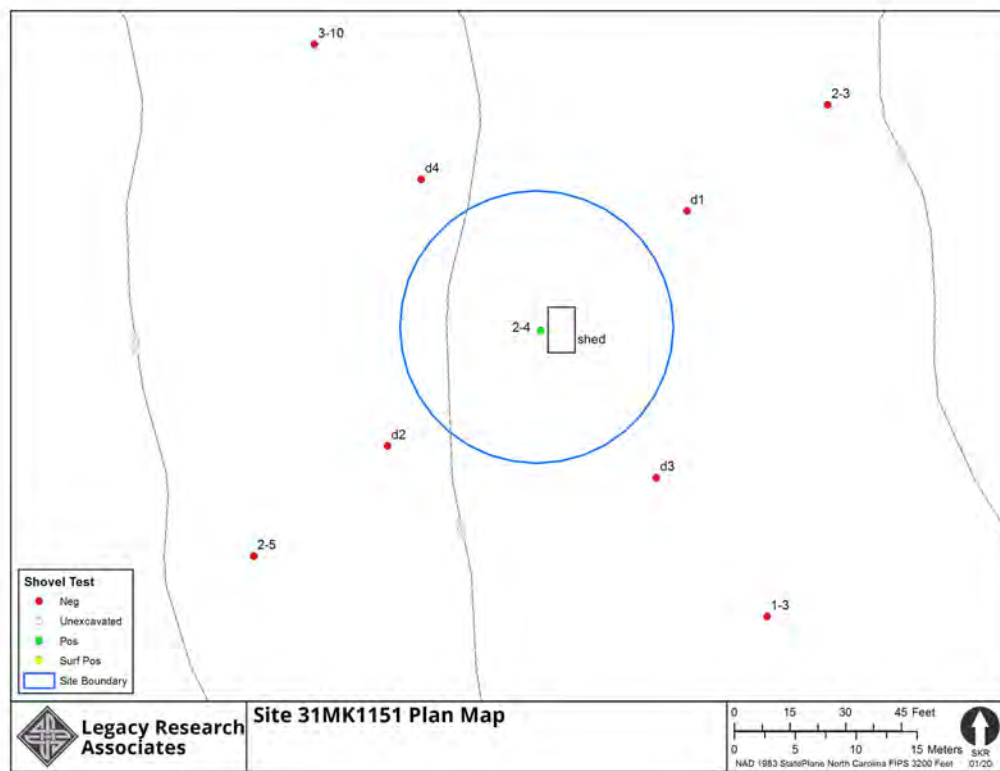


Figure 27. 31MK1151 Plan Map.

Table 13. Summary of Shovel Testing at 31MK1151.				
Shovel Test	Depth (cm bs)	Soil Color	Soil type	Notes
1-3	0-10	Dark brownish red (2.5YR 3/3)	Sandy clay loam	
	10-20	Strong brown (7.5YR 4/6)	Clay	
2-3	0-10	Brown (7.5YR 5/3)	Sandy clay loam	
	10-20	Strong brown (7.5YR 4/6)	Clay	
2-4	0-20	Dark brown (10YR 3/3)	Sandy clay loam	Nail and glass
	20-30	Red (5YR 4/6)	Sandy clay	
2-5	0-10	Brown (7.5YR 5/3)	Sandy clay loam	
	10-20	Strong brown (7.5YR 4/6)	Clay	
3-10	0-20	Red (5YR 4/6)	Clay fill	
D1 - photo	0-15	Dark grayish brown (10YR 4/2)	Sandy clay loam	
	15-30	Red (5YR 4/6)	Clay	
D2	0-30	Brown (7.5YR 5/3) mottled with strong brown (7.5YR 4/6) clay	Sandy clay loam	
	30-40	Strong brown (7.5YR 4/6)	Sandy clay	
D3	0-10	Dark reddish brown (5YR 3/2)	Sandy clay loam	
	10-20	Red (2.5YR 4/8)	Clay	
D4	0-25	Dark reddish brown (5YR 3/2)	Sandy loam	
	25-30	Red (2.5YR 4/8)	Clay subsoil	

Table 14. Summary of Cultural Material from 31MK1151.								
Transect	Shovel Test	Stratigraphic Zone	Depth (cm bs)	Artifact Type	Artifact Material	Artifact Description	Count	Weight (g)
2	4	1	0-20	Historic	Metal	Ferrous wire nail, 3-inches long	1	8.8
					Glass	Machine-made colorless bottle glass fragments	2	7.0
					Total		3	15.8



Figure 28. 31MK1151, Shovel Test D1, profile.



Figure 29. 31MK1151, Structure Exterior view west.



Figure 30. 31MK1151, Structure South Elevation, view north.



Figure 31. 31MK1151, Structure North Elevation, view south.



Figure 32. 31MK1151, Structure Interior Roof Framing.



Figure 33. 31MK1151, Structure Interior South-Facing Wall.



Figure 34. 31MK1151, Structure Interior North-Facing Wall.

31MK1152

UTM Coordinates: Zone 17S 3894394N 505256E

Site Size: 450m²

Elevation: 654 feet amsl

Environmental Setting: Wooded Ridge Slope

Nearest Water: 143 m (470 ft) northwest of Coffey Creek

Soils: Cecil sandy clay loam with 8-15 percent slopes, eroded (CeD2)

Surface Visibility: <25%

Field Procedures: Shovel Testing (n=12)

Cultural Affiliation: Historic, Modern

Site Function: Domestic and Architectural Artifact Scatter (n=2)

Site Integrity: Poor

Recommendations: Not Eligible; No Further Work

Site Description: Shovel testing along a wooded ridge slope on December 16, 2019, recovered one complete amber-colored machine-made cylindrical bottle with a threaded finish from the upper 25 cm of ST6-8. Delineation shovel testing at 15-m intervals around ST6-8 on December 19, 2019, recovered a complete 4-inch ferrous metal nail from the upper 10 cm of D2. A total of 12 shovel tests were excavated to define and assess 31MK1152 (Table 15 and Figure 35). One of the 12 shovel tests (ST5-6) was not excavated because of steep slopes above a wetland.

Site soils were consistent with mapped by the NRCS, which identifies this location as having eroded sandy clay loam with 8-15 percent slopes. Several shovel tests had 5 to 15 cm of very dark brown (10YR 2/2), very dark grayish brown (10YR 3/2), and dark gray (2.5Y 4/1) sandy loam overlying sterile subsoil.

Figure 36 is a general view of the wooded ridgetop at 31MK1152. Figure 37 is the profile of D2 showing 10 cm of dark brown (10YR 3/3) sandy clay loam overlying 15 cm of compact culturally sterile soil that was mottled with brownish yellow (10YR 6/8), strong brown (7.5YR 5/8), yellowish brown (10YR 5/6) sandy clay and had 20-percent gravel inclusions. Excavation was terminated at 25 cm bs.

Two historic/modern artifacts were recovered from the site (Table 16). One is a machine-made amber-colored cylindrical bottle with a threaded finish. The bottle measures 2 inches from the base to the finish and 0.75 inches in diameter. It is possibly a medicine bottle that falls within the Personal activity group. The other is an Architectural-related 4-inch long ferrous nail.

Subsurface testing at this site encountered a thin layer of loam overlying subsoil, which indicates that soil on this landform deflated and eroded. No buried occupation zones or cultural features were found during the site inspection. The sparse artifact recovery of two historic, possibly modern, artifacts and the absence of intact buried cultural deposits indicates that this site has limited potential to add to our understanding of the history of the area. Therefore, this site is recommended as being not eligible for the National Register under Criterion D. No further archaeological work is recommended.

Table 15. Summary of Shovel Testing at 31MK1152.				
Shovel Test	Depth (cm bs)	Soil Color	Soil type	Notes
5-6		Not excavated - steep slope to wetland		
6-7	0-7	Very dark grayish brown (10YR 3/2)	Sandy loam	
	7-35	Light reddish yellow (5YR 7/6) mottled with gray (5YR 6/1) clay	Sandy clay	
6-8	0-5	Very dark brown (10YR 2/2)	Sandy loam	
	5-25	Brown (10YR 5/3)	Sandy loam	Complete bottle
	25-30	Brown (10YR 5/3)	Sandy loam	
6-9	0-15	Very dark grayish brown (10YR 3/2)	Sandy loam	
	15-35	Light olive brown (2.5Y 6/6)	Sandy loam	
	35-40	Reddish yellow (5YR 6/6)	Clay subsoil	
7-8	0-15	Brown (10YR 5/3)	Sandy clay loam	
	15-25	Light yellowish brown (2.5Y 6/3) mottled with white (Gley 8/)	Saprolitic sandy clay	
D1	0-5	Dark brown (7.5YR 3/4)	Sandy loam	
	5-15	Pale yellow (2.5Y 6/3)	Sandy loam	
	15-20	Red (2.5YR 4/8)	Saprolitic clay	
D2 - photo	0-10	Dark brown (10YR 3/3)	Sandy loam	Ferrous nail
	10-25	Brownish yellow (10YR 6/8) mottled with strong brown (7.5YR 5/8) and yellowish brown (10YR 5/6) clay	Clayey sand	
D3	0-15	Dark gray (2.5Y 4/1)	Sandy loam	
	15-25	Pale yellow (2.5Y 7/3)	Sandy clay	
D4	0-5	Dark brown (7.5YR 3/4)	Sandy loam	
	5-20	Red (2.5YR 4/8)	Clay subsoil	
D5	0-10	Brown (10YR 5/3)	Sandy loam	
D6	0-10	Very dark grayish brown (10YR 3/2)	Sandy loam	
	10-20	Light yellowish brown (2.5Y 6/3) mottled with white (Gley 8/) clay	Sandy loam	
D7	0-15	Very dark grayish brown (10YR 3/2)	Sandy loam	
	15-30	Olive brown (2.5Y 4/3)	Clayey sand	

Table 16. Summary of Cultural Material from 31MK1152.								
Transect	Shovel Test	Stratigraphic Zone	Depth (cm bs)	Artifact Type	Artifact Material	Artifact Description	Count	Weight (g)
6	8	2	5-25	Historic	Glass	machine-made amber cylindrical bottle complete with threaded finish, height 2 inches, diameter 0.75 inches	1	21.7
	D2	1	0-10	Historic	Metal	Ferrous 4-inch nail	1	17.2
Total							2	38.9

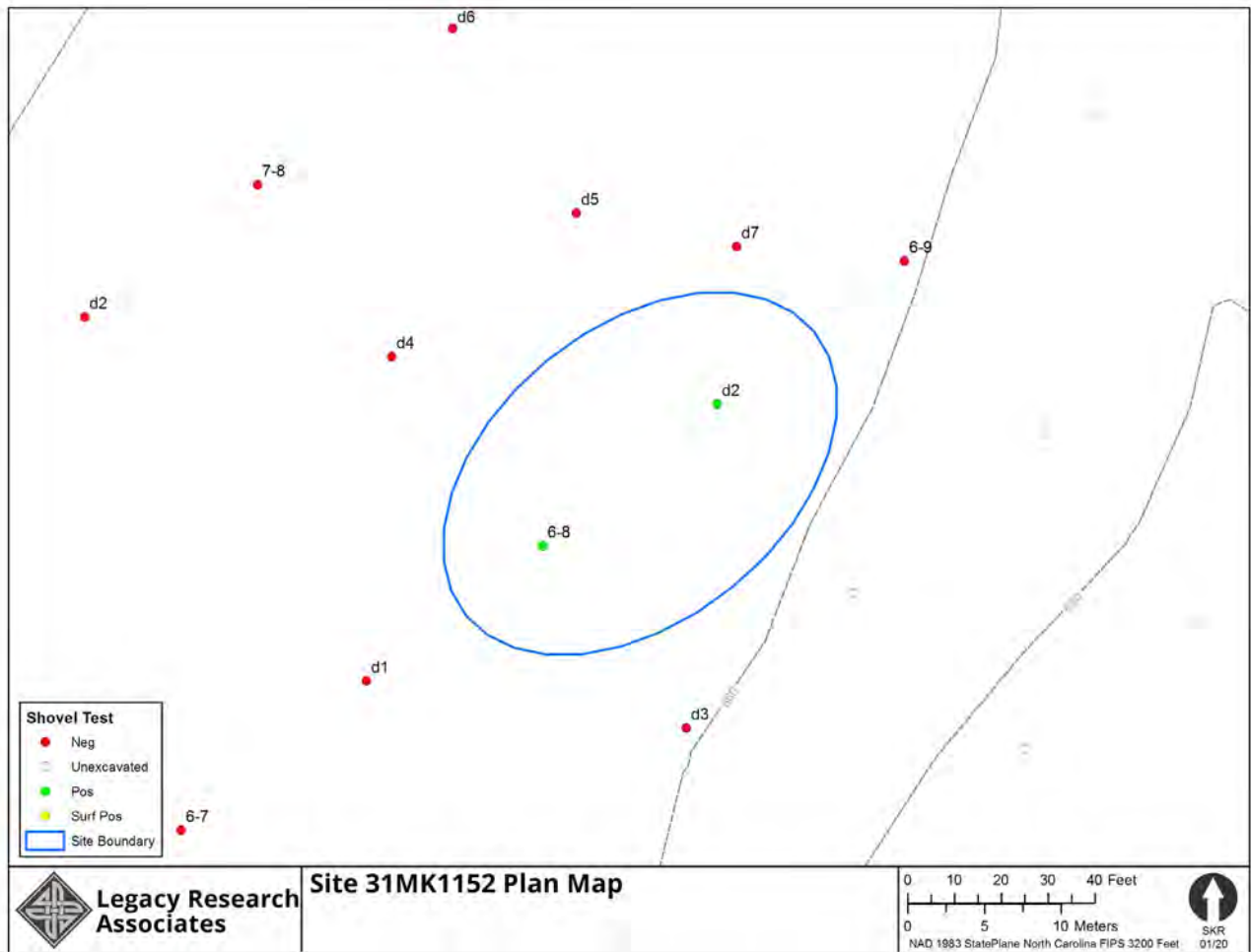


Figure 35. 31MK1152 Plan Map.



Figure 36. 31MK1152, view northeast.



Figure 37. 31MK1152, Shovel Test D2, profile.

31MK1153

UTM Coordinates: Zone 17S 3894389N 505203E

Site Size: 450m²

Elevation: 662 feet amsl

Environmental Setting: Wooded Ridge Slope

Nearest Water: 56 m (184 ft) east of Coffey Creek

Soils: Pacolet sandy loam with 15-25 slopes (PaE)

Surface Visibility: <25%

Field Procedures: Shovel Testing (n=16)

Cultural Affiliation: Historic, Modern

Site Function: Architectural Artifact Scatter (n=1)

Site Integrity: Poor

Recommendations: Not Eligible; No Further Work

Site Description: This site was identified by a pile of modern brick and a plumbing fixture on a wooded ridge slope near ST7-7 on December 17, 2019 (Figure 38). Delineation shovel testing at 15-m intervals around the structure on December 19, 2019, recovered one wire-cut machine-made brick fragment from the upper 10 cm of D2. A total of 16 shovel tests were used to define and assess 31MK1153 (Table 17 and Figure 39). Two of the 16 (ST8-4 and D9) were not excavated because of steep slopes. Site soils were not consistent with soils mapped by the NRCS, which identifies this location as having sandy loam with 15-25 percent slopes. Slope at this site is less than 10 percent.

Figure 40 is a general view of the wooded ridgetop at 31MK1153. Figure 41 is the profile of D1 showing 10 cm of very dark grayish brown (10YR 3/2) sandy clay loam overlying 10 cm of light grayish brown (10YR 6/3) sandy clay. Mottled subsoil was encountered at 20 cm bs and was described as light yellowish brown (10YR 6/4) sandy clay mottled with white (Gley 8/). Excavation was terminated at 30 cm bs.

One historic/modern artifact was recovered from the site (Table 18). This artifact is a wire-cut machine-made brick fragment. This artifact has limited potential to add to our understanding of the history of the area.

Subsurface testing at this site encountered a thin layer of loam overlying subsoil, which indicates that soil on this landform deflated and eroded. No buried occupation zones or cultural features were found during the site inspection. The sparse artifact recovery of one historic artifact and the absence of intact buried cultural deposits indicates that this site has limited potential to add to our understanding of the history of the area. Therefore, this site is recommended as being not eligible for the National Register under Criterion D. No further archaeological work is recommended.



Figure 38. 31MK1153, brick pile under tree in the foreground and plumbing fixture in the center, view north.

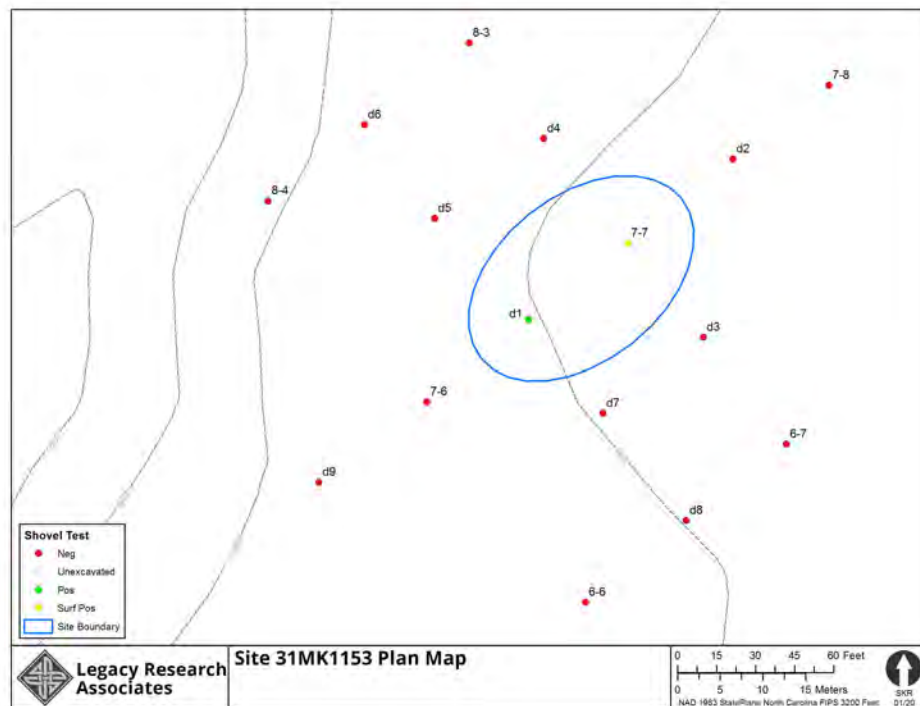


Figure 39. 31MK1153 Plan Map.

Table 17. Summary of Shovel Testing at 31MK1153.				
Shovel Test	Depth (cm bs)	Soil Color	Soil type	Notes
6-6	0-5	Dark brown (7.5YR 3/4)	Sandy loam	
	5-20	Light olive brown (2.5Y 6/6)	Sandy loam	
	20-25	Red (2.5YR 4/8)	Clay subsoil	
6-7	0-7	Very dark grayish brown (10YR 3/2)	Sandy loam	
	7-35	Light reddish yellow (5YR 7/6) mottled with gray (2.5Y 5/1)	Clay subsoil	
7-6	0-15	Very dark brown (10YR 2/2)	Sandy clay loam	
	15-20	Olive brown (2.5Y 4/4)	Sandy clay	
	20-30	Yellowish brown (10YR 5/8) mottled with strong brown (7.5YR 4/6)	Clay subsoil	
7-7	0-10	Dark grayish brown (2.5Y 4/2)	Sandy clay loam	Surface brick and plumbing fixture – not recovered
	10-20	Light yellowish brown (2.5Y 6/3)	Sandy clay	
	20-30	Light yellowish brown (2.5Y 6/3) mottled with white (Gley 8/)	Saprolitic sandy clay	
7-8	0-15	Brown (10YR 5/3)	Sandy clay loam	
	15-25	Light yellowish brown (2.5Y 6/3) mottled with white (Gley 8/)	Saprolitic sandy clay	
8-3	0-5	Dark brown (7.5YR 3/4)	Sandy loam	
	5-10	Reddish brown (2.5YR 4/4)	Sandy loam	
	10-15	Red (2.5YR 4/8)	Clay subsoil	
8-4		Unexcavated - edge of steep slope to wetland		
D1 – photo	0-10	Very dark grayish brown (10YR 3/2)	Sandy clay loam	
	10-20	Light brownish gray (10YR 6/3)	Sandy clay	
	20-30	Light brownish yellow mottled with white (Gley 8/) clay	Sandy clay	
D2	0-10	Very dark grayish brown (10YR 3/3)	Sandy loam	Brick fragment
	10-20	Light olive brown (2.5Y 5/6) mottled with yellowish brown (10YR 5/8)	Clay subsoil	
D3	0-15	Light olive brown (2.5Y 6/6)	Sandy loam	
	15-20	Red (2.5YR 4/8)	Clay subsoil	
D4	0-20	Brown (10YR 5/3)	Sandy clay loam	
	20-30	Light grayish brown mottled with white (Gley 8/) clay	Sandy clay	
D5	0-5	Dark brown (7.5YR 3/4)	Sandy loam	
	5-25	Light olive brown (2.5Y 6/6)	Sandy loam	
	25-30	Yellowish red (5YR 5/8)	Clay subsoil	
D6	0-10	Very dark grayish brown (10YR 3/2)	Sandy clay loam	
	10-20	Very dark red (7.5R 4/8) mottled with weak red (7.5R 4/4)	Clay subsoil	
D7	0-10	Very dark grayish brown (10YR 3/3)	Sandy loam	
	10-20	Light yellowish brown (10YR 6/6) mottled with white (Gley 8/)	Clay subsoil	
D8	0-15	Olive brown (2.5Y 4/4)	Sandy clay loam	
	15-30	Brownish yellow (10YR 6/8)	Sandy clay	
	30-40	Brownish yellow (10YR 6/8) mottled with yellowish brown (10YR 6/6)	Sandy clay	
D9		Not excavated – steep slope		

Table 18. Summary of Cultural Material from 31MK1153.								
Transect	Shovel Test	Stratigraphic Zone	Depth (cm bs)	Artifact Type	Artifact Material	Artifact Description	Count	Weight (g)
	D1	1	0-10	Historic	Ceramic	Brick wire-cut fragment	1	118.1
Total							1	118.1



Figure 40. 31MK1153, view northeast.



Figure 41. 31MK1153, Shovel Test D1 profile.

31MK1154

UTM Coordinates: Zone 17S 3894104N 505025E

Site Size: 750m²

Elevation: 688 feet amsl

Environmental Setting: Wooded Ridge Slope

Nearest Water: 280 m (920 ft) southwest of Coffey Creek

Soils: Cecil sandy clay loam with 2-8 percent slopes, eroded (CeB2)

Surface Visibility: <25%

Field Procedures: Shovel Testing (n=10)

Cultural Affiliation: Historic: Abandoned Structure (no artifact recovery)

Site Function: Domestic Occupation, 20th century

Site Integrity: Poor

Recommendations: Not Eligible; No Further Work

Site Description: Shovel testing along a wooded ridge slope on December 17, 2019, near ST12-13 identified an abandoned structure (Figure 42 and Figure 43). No cultural material was recovered from ST12-13. Delineation shovel testing was conducted at 15-m intervals around the structure. Ten shovel tests were excavated to define and assess 31MK1154 (Figure 44). Two of the 10 (ST12-14 and D4) were not excavated because one (ST12-14) was in the pipeline corridor and the other (D4) on a paved driveway. Site soils were consistent with mapped soils by the NRCS, which identifies this location as having eroded sandy clay loam with 2-8 percent slopes (Table 19). No cultural material was recovered from subsurface testing at this site.

Figure 45 is a general view of the wooded ridgetop at 31MK1154. Figure 46 is the profile of D2 showing 5 cm of reddish brown (2.5YR 4/4) sandy loam overlying red (2.5YR 4/8) clay subsoil. Excavation was terminated at 20 cm bs.

The examination of the wood-framed structure determined that it measures approximately 12 ft by 10 ft. The south-facing side of the structure has an entrance door, porch, and steps. The exterior was covered with asbestos shingles and wisteria vines (Figure 47). The interior has a center chimney made of brick that has been plastered and painted white (Figure 48). A limited inspection of the interior was made because of the structural unsafe floor.

The location of this structure roughly corresponds with a building depicted on the 1968 Charlotte West USGS topographic map (Figure 49). A structure at this location does not appear on the 1905 or 1948 USGS maps (see Figure 7 and Figure 8). Based on the USGS mapping and the modern construction materials (wire nails and asbestos shingles), it appears that this structure was likely constructed between 1948 and 1958. The structure appears to lack sufficient integrity or significance for intensive-level investigation for National Register eligibility under Criterion C.

Subsurface testing at this site encountered a thin layer of loam overlying subsoil, which indicates that soil on this landform deflated and eroded. No buried occupation zones or cultural features were found during the site inspection. No cultural material was recovered from testing around the abandoned house at 31MK1154. Therefore, the lack of cultural material from subsurface testing and the absence of intact buried cultural deposits indicates that this site has limited potential to add to our understanding of the history of the area. Therefore, this site is recommended as being not eligible for the National Register under Criterion D. No further archaeological work is recommended.



Figure 42. 31MK1154, structure near ST12-13, view west.



Figure 43. 31MK1154 structure near ST12-13, view southeast.

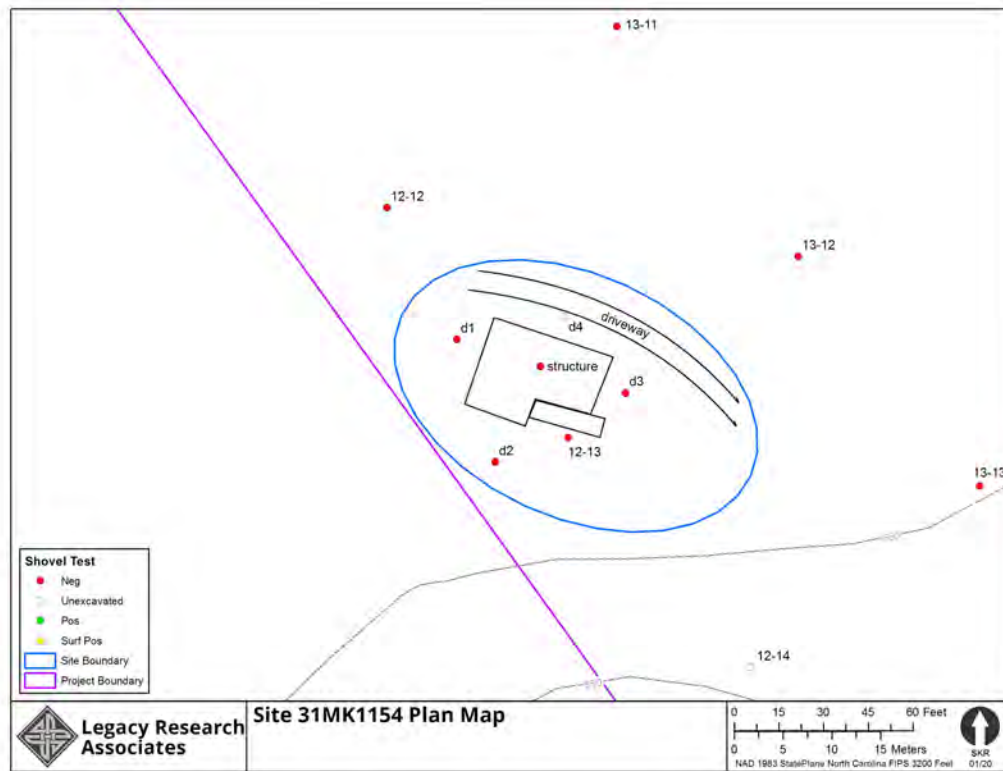


Figure 44. 31MK1154 Plan Map.



Figure 45. 31MK1154, view northeast.



Figure 46. 31MK1154, Shovel Test D2 profile.

Table 19. Summary of Shovel Testing at 31MK1154.				
Shovel Test	Depth (cm bs)	Soil Color	Soil type	Notes
12-12	0-10	Dark brown (7.5YR 3/4)	Clay loam	
	10-20	Strong brown (7.5YR 4/6)	Clay subsoil	
12-13	0-20	Dark grayish brown (2.5Y 4/2)	Sandy loam	
	20-30	Reddish yellow (5YR 6/6)	Clay subsoil	
12-14		Unexcavated - pipeline corridor		
13-11	0-10	Dark reddish brown (5YR 3/4) mottled with dark red (2.5YR 3/6)	Sandy clay loam	
	10-20	Dark red (2.5YR 3/6)	Clay subsoil	
13-12	0-12	Brown (10YR 5/3)	Sandy loam	
	12-22	Strong brown (7.5YR 4/6)	Clay subsoil	
13-13	0-20	Dark brown (7.5YR 3/4)	Sandy loam	
	20-30	Strong brown (7.5YR 4/6)	Clay subsoil	
D1	0-10	Very dark grayish brown (10YR 3/2)	Sandy loam	Bedrock at 10 cm bs
D2 – photo	0-5	Reddish brown (2.5YR 4/4)	Sandy loam	
	5-20	Red (2.5YR 4/8)	Clay subsoil	
D3	0-10	Strong brown (7.5YR 4/6)	Clay subsoil	
D4		Unexcavated - paved driveway		



Figure 47. 31MK1154 structure, view east.



Figure 48. 31MK1154 interior, view west.

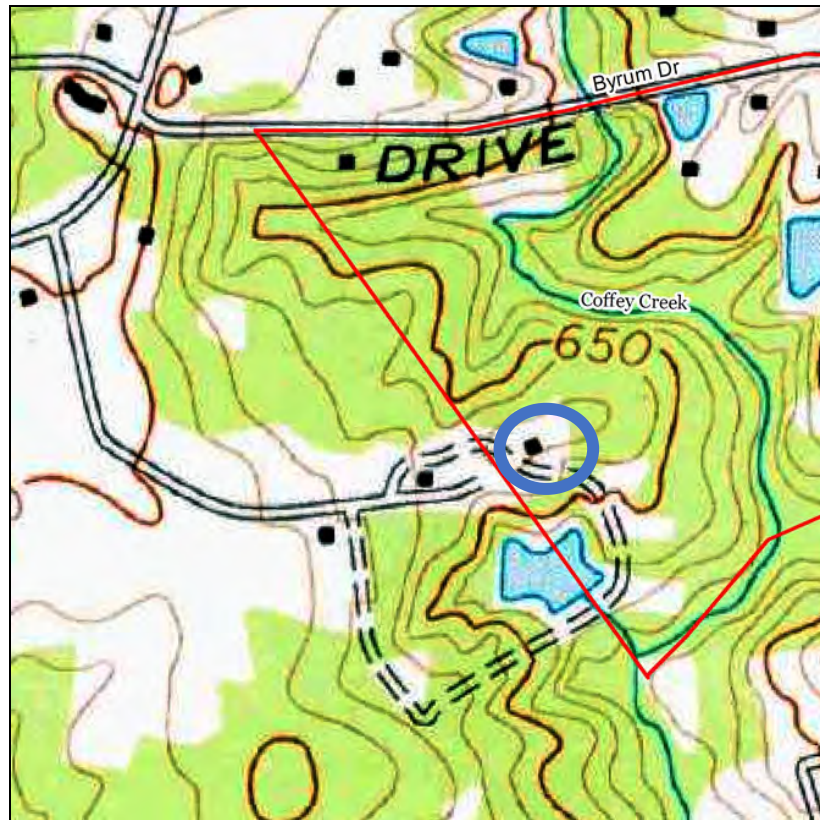


Figure 49. 31MK1154 location (circled blue) on the 1968 Charlotte West USGS topographic quadrangle map, 7.5 minute series (<http://historicalmaps.arcgis.com/usgs/index.html>).

Summary of Sites

Background research conducted for this project found that it was very likely that the field investigations would encounter steep slopes, wetlands, and eroded/disturbed soils throughout most of the APE.

Pre-fieldwork mapping identified 261 shovel test locations on a 30-m interval grid within the APE (Table 20). Of the 261 grid points, 80 were unexcavated due to steep slopes, extensive ground disturbance, or wetlands. Systematic shovel testing was conducted at the remaining 181 grid points, of these six or 3.3 percent yielded cultural material. The remaining 175 shovel tests (or 97.2 percent of the excavated shovel tests) did not yield cultural material.

Table 20. Project APE Systematic 30-Meter Interval Shovel Testing Summary.					
	Plotted 30-Meter Interval Shovel Test	Unexcavated Shovel Tests – steep slope, wetlands, extensive ground disturbance	Excavated Shovel Tests	Number of Shovel Tests with Artifact Recovery	Number of Shovel Tests without Artifact Recovery
Total	261	80	181	6	175

The six positive shovel test locations and one site with above-ground architectural remains without subsurface artifact recovery were examined further with 15-m interval shovel testing (Table 21 and Figure 15). The evaluation of archaeological sites in the APE incorporated 46 shovel tests of the 181 shovel tests excavated on the 30-m interval grid and 52 additional shovel tests excavated on a 15-m interval testing grid. In all, 98 shovel tests were used to evaluate the seven archaeological sites located in the APE. Of the 52 close-interval tests, five or 9.6 percent yielded cultural material. Combined with the six positive shovel tests excavated during the 30-m interval survey, the total number of positive shovel tests excavated during the survey of the APE is 11.

Table 21. Summary of Site Testing.								
	31MK1148	31MK1149	31MK1150	31MK1151	31MK1152	31MK1153	31MK1154	Total
Site Testing 30-m Interval Grid Tests	8	10	5	5	5	7	6	46
Site Testing 15-m Interval Tests	15	9	4	4	7	9	4	52
Total Number of Shovel Tests	23	19	9	9	12	16	10	98
	31MK1148	31MK1149	31MK1150	31MK1151	31MK1152	31MK1153	31MK1154	Total
Positive 30-m Interval Tests	1	1	1	1	1	1	0	6
Positive 15-m Interval Tests	2	1	0	0	1	1	0	5
Total Number of Positive Tests	3	2	1	1	2	2	0	11

The survey for the proposed South Crossfield Taxiway Drainage Area located seven new archaeological sites in the APE. Three have prehistoric components and four have historic components. A summary of the prehistoric and historic occupation/land use in the APE, by component, follows.

Prehistoric Sites

Three prehistoric sites were identified in the Project APE. These are two lithic scatters with non-diagnostic artifacts (31MK1148 and 31MK1149) and one isolated find of possible Middle Woodland period ceramic sherd (31MK1150).

Subsurface testing at 31MK1148, 31MK1149, and 31MK1150 documented deflated soils and yielded eight artifacts that are predominately non-diagnostic lithic debitage (Table 22). The results of the findings at the prehistoric sites are consistent with the information about the previously recorded prehistoric sites within a mile of the APE, which identified non-diagnostic lithic debitage representing 77 percent of the prehistoric sites (see Chart 2).

Table 22. Prehistoric Artifact Recovery from the APE.									
Site Number	Transect #	Shovel Test #	Grid Level	Depth cm bs	Artifact Type	Material Type	Description	Count	Weight (g)
31MK1148	12	7	1	0-10	Lithic	Quartz	secondary flake	1	1.2
			D3 2	5-20	Lithic	Quartz	tertiary flake	2	1.4
			D8 1	0-15	Lithic	Quartz	biface	1	11.8
			Site 31MK1148 Total					4	14.4
31MK1149	15	7	1	0-8	Lithic	Quartz	shatter	1	0.5
			2	8-15	Lithic	Quartz	tertiary flake	1	2.8
			D1 2	5-10	Lithic	Quartz	tertiary flake	1	0.6
			Site 31MK1149 Total					3	3.9
31MK1150	22	5	1	0-10	Ceramic	Quartz-tempered	eroded body sherd, possibly Middle Woodland	1	11.9
			Site 31MK1150 Total					1	8.9
Total Prehistoric Artifact Recovery								8	30.2

Historic Sites

Four new historic sites were identified in the Project APE during the 2019 survey. Three have above-ground evidence of occupation and/or land use (31MK1151, 31MK1153, and 31MK1154) and one (31MK1152) has subsurface evidence of historic land use/occupation. Subsurface testing at these four sites documented disturbed

and/or eroded soils and yielded six artifacts that represent twentieth-century architectural and domestic activity (Table 22). The results of the findings at the historic sites are consistent with the information about the previously recorded historic sites within a mile of the APE, which identified domestic twentieth-century occupation sites representing 37 percent of the historic sites (see Chart 3 and Chart 4).

Table 23. Historic Artifact Recovery from the APE.											
Site Number	Transect #	Shovel Test #	Grid Level		Depth cm	bs	Artifact Type	Material Type	Description	Count	Weight (g)
31MK1151	2	4	1		0-20		Glass	Domestic	Machine-made colorless bottle glass fragments	2	7.0
							Metal	Architectural	Ferrous 3-in nail	1	8.8
							Site 31MK1151 Total			3	15.8
31MK1152	6	8	2	2	5-25		Glass	Domestic	machine-made amber cylindrical bottle complete with threaded finish, height 2 in, diameter 0.75 in	1	21.7
			D2	1	0-10	Metal	Architectural	Ferrous 4-in nail	1	17.2	
			Site 31MK1152 Total			2	38.9				
31MK1153			D11	1	0-10		Ceramic	Architectural	Brick fragment, modern	1	118.9
			Site 31MK1153 Total			1	110.9				
Total Historic Artifact Recovery										6	172.8

SIGNIFICANCE EVALUATION AND RECOMMENDATIONS

The National Register assessment and recommendations for the seven new sites found during the survey for the proposed South Crossfield Drainage Area follows (Table 24).

Table 24. Summary of Archaeological Sites and National Register Eligibility Recommendations.				
Site	Component	Time Period	National Register Assessment	National Register Recommendation
31MK1148	Prehistoric	Unknown Lithic	Not Eligible	No Further Work
31MK1149	Prehistoric	Unknown Lithic	Not Eligible	No Further Work
31MK1150	Prehistoric	Middle Woodland	Not Eligible	No Further Work
31MK1151	Historic	20 th -century extant shed and artifact scatter	Not Eligible	No Further Work
31MK1152	Historic	20 th -century artifact scatter	Not Eligible	No Further Work
31MK1153	Historic	20 th -century artifact scatter	Not Eligible	No Further Work
31MK1154	Historic	20 th -century extant structure	Not Eligible	No Further Work

31MK1148 – Four prehistoric quartz lithic artifacts were recovered from deflated soil at 31MK1148. These artifacts (debitage and a biface) offer little research potential; therefore, this site is recommended as being not eligible for the National Register under Criterion D. The site does not have strong associations with significant individuals or historical events, and therefore is not eligible under Criteria A and B. The absence of above-ground remains removes any potential Criterion C eligibility. Because it does not meet any of the National Register eligibility criteria, 31MK1148 is recommended as being not eligible for the National Register. No further archaeological work is recommended.

31MK1149 – Three prehistoric quartz lithic artifacts were recovered from deflated soil at 31MK1149. These artifacts (debitage) offer little research potential; therefore, this site is recommended as being not eligible for the National Register under Criterion D. The site does not have strong associations with significant individuals or historical events, and therefore is not eligible under Criteria A and B. The absence of above-ground remains removes any potential Criterion C eligibility. Because it does not meet any of the National Register eligibility criteria, 31MK1149 is recommended as being not eligible for the National Register. No further archaeological work is recommended.

31MK1150 – One prehistoric sherd was recovered from deflated soil at 31MK1150. This artifact (eroded quartz-tempered sherd that probably dates to the Middle Woodland period) offers little research potential; therefore, this site is recommended as being not eligible for the National Register under Criterion D. The site does not have strong associations with significant individuals or historical events, and therefore is not eligible under Criteria A and B. The absence of above-ground remains removes any potential Criterion C eligibility. Because it does not meet any of the National Register eligibility criteria, 31MK1150 is recommended as being not eligible for the National Register. No further archaeological work is recommended.

31MK1151 – Three historic/modern artifacts were recovered from testing around the abandoned shed found near Transect ST2-4. These materials (a 3-inch long ferrous wire nail and machine-made colorless bottle glass fragments) offer little research potential; therefore, this site is recommended as being not eligible for the National Register under Criterion D. The site does not have strong associations with significant individuals or historical events, and therefore is not eligible under Criteria A and B. The poor condition of the abandoned shed removes any potential Criterion C eligibility. Because it does not meet any of the National Register eligibility criteria, 31MK1151 is recommended as being not eligible for the National Register. No further archaeological work is recommended.

31MK1152 – Two historic/modern artifacts were recovered from 31MK1152. These materials (a machine-made amber cylindrical bottle with threaded finish and a 4-inch long ferrous wire nail) offer little research potential; therefore, this site is recommended as being not eligible for the National Register under Criterion D. The site does not have strong associations with significant individuals or historical events, and therefore is not eligible under Criteria A and B. There are no above-ground remains associated with this site, which removes any potential Criterion C eligibility. Because it does not meet any of the National Register eligibility criteria, 31MK1152 is recommended as being not eligible for the National Register. No further archaeological work is recommended.

31MK1153 – One modern brick fragment was recovered from shovel testing around above-ground evidence of historic occupation (brick pile and plumbing fixture) at 31MK1153. The one piece of building debris recovered during the evaluation is evidence that the archaeological component at this site offers little research potential and it is recommended as being not eligible for the National Register under Criterion D. The site does not have strong associations with significant individuals or historical events, and therefore is not eligible under Criteria A and B. The absence of above-ground architectural remains removes any potential Criterion C eligibility. Because it does not meet any of the National Register eligibility criteria, 31MK1153 is recommended as being not eligible for the National Register. No further archaeological work is recommended.

31MK1154 - No cultural material was recovered from testing around the abandoned house at 31MK1154. Consequently, the archaeological component at this site offers no research potential and it is recommended as being not eligible for the National Register under Criterion D. The site does not have strong associations with significant individuals or historical events, and therefore is not eligible under Criteria A and B. The poor condition of the abandoned house removes any potential Criterion C eligibility. Because it does not meet any of the National Register eligibility criteria, it is recommended as being not eligible for the National Register. No further archaeological work is recommended.

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APPENDIX A – ARTIFACT INVENTORY

CLT Drainage Area Artifact Inventory														
Site Number	Accession #	Cat #	Transect #	Shovel Test #	Grid	Level	Depth cm bs	Component	Artifact Type	Material Type	Description	Count	Weight (g)	Date Collected
31MK1148	2020.0001	1	12	7		1	0-10	Prehistoric	Lithic	Quartz	secondary flake	1	1.2	12/18/19
31MK1148	2020.0001	2			D3	2	5-20	Prehistoric	Lithic	Quartz	tertiary flake	2	1.4	12/19/19
31MK1148	2020.0001	3			D8	1	0-15	Prehistoric	Lithic	Quartz	biface	1	11.8	12/19/19
31MK1149	2020.0002	1	15	7		1	0-8	Prehistoric	Lithic	Quartz	shatter	1	0.5	12/17/19
31MK1149	2020.0002	2	15	7		2	8-15	Prehistoric	Lithic	Quartz	tertiary flake	1	2.8	12/17/19
31MK1149	2020.0002	3			D1	2	5-10	Prehistoric	Lithic	Quartz	tertiary flake	1	0.6	12/19/19
31MK1150	2020.0003	1	22	5		1	0-10	Prehistoric	Ceramic	quartz-tempered	eroded body sherd	1	11.9	12/18/19
31MK1151	2020.0004	1	2	4		1	0-20	Historic	Glass		machine-made colorless bottle glass fragments	2	7	12/16/19
31MK1151	2020.0004	2	2	4		1	0-20	Historic	Architectural	Ferrous	3-inch nail	1	8.8	12/16/19
31MK1152	2020.0005	1	6	8		2	5-25	Historic	Glass		machine-made amber cylindrical bottle complete with threaded finish, height 2 inches, diameter 0.75 inches	1	21.7	12/16/19
31MK1152	2020.0005	1			D2	1	0-10	Historic	Architectural	Ferrous	4-inch nail	1	17.2	12/19/19
31MK1153	2020.0006	1			D1	1	0-10	Historic	Architectural	Brick	brick fragment	1	118.1	12/19/19
											Total	14	203	

Appendix E, Water Resources

Preliminary ORM Data Entry Fields for New Actions

ACTION ID #: SAW- 2018-01071

Begin Date (Date Received):

Prepare file folder ☐

Assign Action ID Number in ORM ☐

1. Project Name [PCN Form A2a]: Charlotte Douglas International Airport (Airport or CLT)

2. Work Type: ☐ Private ☐ Institutional ☒ Government ☐ Commercial

3. Project Description / Purpose [PCN Form B3d and B3e]:

Charlotte Douglas International Airport (CLT) intends increase airfield capacity to meet demand over the next 10 years, enhance terminal gate and ramp capacity to reduce delays, and to enhance the efficiency and operational safety of the Airport taxiway system. Therefore, a determination of Waters of the US is necessary.

4. Property Owner / Applicant [PCN Form A3 or A4]: City of Charlotte; POC: Brent Cagle

5. Agent / Consultant [PNC Form A5 – or ORM Consultant ID Number]:
HDR; Kelly Thames

6. Related Action ID Number(s) [PCN Form B5b]:

7. Project Location – Coordinates, Street Address, and/or Location Description [PCN Form B1b]:

Bordered on the north by Wilkinson Boulevard, east by various streets which border the CLT property, south by CLT property lines, and on the western side by Wallace Neel Road, in Charlotte, Mecklenburg County, North Carolina

8. Project Location – Tax Parcel ID [PCN Form B1a]: See Attachment C and Figure 3

9. Project Location – County [PCN Form A2b]: Mecklenburg County

10. Project Location – Nearest Municipality or Town [PCN Form A2c]: Charlotte

11. Project Information – Nearest Waterbody [PCN Form B2a]: Little Paw Creek, Ticer Branch, Beaverdam Creek, Coffey Creek

12. Watershed / 8-Digit Hydrologic Unit Code [PCN Form B2c]: Upper Catawba River Basin/03050101, Lower Catawba River Basin/03050103

Authorization: Section 10 ☐ Section 404 ☒ Section 10 and 404 ☐

Regulatory Action Type:

☐ Standard Permit
☐ Nationwide Permit #
☐ Regional General Permit #
☒ Jurisdictional Determination Request

☐ Pre-Application Request
☐ Unauthorized Activity
☐ Compliance
☐ No Permit Required



November 1st, 2019

Mr. David Shaeffer
U.S. Army Corps of Engineers
Wilmington Regulatory District
Charlotte Regulatory Field Office
8430 University Executive Park Drive, Suite 611
Charlotte, North Carolina 28262

**Subject: Charlotte Douglas International Airport (SAW-2018-01071)
Preliminary Jurisdictional Determination Verification Request
Charlotte, Mecklenburg County, North Carolina**

Dear Mr. Shaeffer:

The Aviation Division of the City of Charlotte proposes to increase airfield capacity to meet demand over the next 10 years, enhance terminal gate and ramp capacity to reduce delays, and to enhance the efficiency and operational safety of the Airport taxiway system at the Charlotte Douglas International Airport (Airport or CLT). The Project Site includes 4,652 acres within an identified boundary for the activities and is bordered on the north by Wilkinson Boulevard, the east by various streets which border the CLT property, the south by City of Charlotte and CLT property lines, and on the western side by Wallace Neel Road, located in Charlotte, Mecklenburg County, North Carolina (Figures 1 and 2, Attachment A). The City of Charlotte has authorized HDR to submit a Preliminary Jurisdictional Determination (PJD) on the 4,652 acres in addition to an Approved Jurisdictional Determination (AJD) area on 2.7 acres within the PJD area as a precursor to Section 404/401 permitting for the project (Attachment B). Landowner and parcel information is provided in Attachment C.

The majority of the Project Site consists of waters which have been established as jurisdictional through previous Jurisdictional Determinations or permitting actions, which are detailed in Tables 1 and 2 (Figures 7A – 7G, Attachment A). Areas which were not covered in previous on-site jurisdictional determinations or areas with expired verifications were investigated to verify and identify undocumented potentially jurisdictional waters during field visits in April, May, September, and October of 2019. This request would also combine multiple Corps file numbers into one file number (SAW-201801071).

Applicant Name: City of Charlotte; POC: Mr. Brent Cagle, Aviation Director

Project Location: 5601 Wilkinson Blvd Charlotte, NC 28208

Phone Number of Owner/Applicant: (704) 359-4000

Basin: Lower Catawba (Hydrologic Unit Code [HUC] 03050103) and Upper Catawba (HUC 03050101)

City/County: Charlotte, Mecklenburg County, NC

Center Decimal Degree Coordinates of AJD Area: -80.949995°, 35.213645°

Center Decimal Degree Coordinates of PJD Area: -80.944126°, 35.18903

USGS Quadrangle Name: Charlotte West, NC (1993)

Desktop Review

Prior to undertaking fieldwork, HDR scientists conducted a desktop review of the Project Site utilizing a number of resources including U.S. Geological Survey (USGS) topographic maps (Figure 2), aerial imagery (Figure 3), Natural Resources Conservation Service (NRCS) Soil Survey (Figure 4), and the USGS National Hydrography Dataset (NHD), U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI), and Federal Emergency Management Act (FEMA) floodplains (Figure 6).

According to the United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) Soils Survey of Mecklenburg County (Figure 4), on-site soils consist of twenty one (21) separate soil units with two units ranking as having hydric components between one (1) and thirty two (32) percent. These soils with hydric components make up 148.1 acres and are depicted on Figure 4. There are a total of 58.0 acres of FEMA floodplains listed as Zone AE within the site (FEMA FIRM Panel 3710451200K, 3710451400K, 3710452200K, 3710452300K, 3710452400K) (Figure 6).

Previous Permits and Jurisdictional Delineations

Multiple permit actions and jurisdictional delineation verifications have been carried out within the current Project Site. The associated details of the on-site actions are summarized in Tables 1 and 2 and on Figures 7A – 7G (Attachment A).

Table 1. Previous On-Site Permit Actions

Runway Expansion (includes West Blvd.)					
Action ID	2006-32521				
Verified	8/7/2009				
Expires	12/31/2024				
Summary of Permit Actions and Impacts Complete vs Incomplete					
Feature	Original Permit Impacts (3/21/07)	Permit Modification Impact Addition (8/7/09)	Permit Total^	Completed Impacts	Impacts Remaining Under Valid Permit
Streams (lf)	16,312	5,247	21,559	16,752	4,809
Wetlands (ac.)	0.432	0.716	1.148	0.728	0.42
Open Waters (ac.)	4.631	2.733	7.364	7.364	0

^ Public notice (dated May 20, 2009) and subsequent approval (dated August 7, 2009) indicate a discrepancy of total impact amounts for stream and open water impacts. Listed above are the impact numbers actual totaled; however, the documents indicate 7.522 acres of wetland impacts and 22,559 linear feet of stream impact as well.

Parking Deck	
Action ID	2008-03090
Verified	6/11/2012
Expired	12/31/2017
Impacts	
Streams (Linear Feet)	3,161
Wetland (Acres)	3.035
Open Water (Acres)	0

Taxiway D	
Action ID	2010-00837
Verified	7/6/2010
Expired	7/10/2015
Impacts	
Streams (Linear Feet)	149
Wetland (Acres)	0
Open Water (Acres)	0

Norfolk Southern (After-the-Fact Permit)	
Action ID	2013-00433
Verified	unknown
Expired	12/31/2018
Impacts	
Streams (Linear Feet)	1,807
Wetland (Acres)	0
Open Water (Acres)	0

Airport Traffic Control Tower (ATCT)	
Action ID	2014-0038
Verified	unknown
Expired	unknown
Impacts	
Streams (Linear Feet)	709
Wetland (Acres)	0
Open Water (Acres)	0

Table 2. Previous On-Site JDs

Rental Parking Expansion (JD Only)	
Action ID	2014-00838
Verified	7/15/2014
Expired	7/15/2019
Streams (Linear Feet)	0
Wetland (Acres)	0
Open Water (Acres)	0

2015 Improvement Areas (JD Only)	
Action ID	2014-00838
Verified	1/19/16
Expires	1/29/2021
Streams (Linear Feet)	7,007
Wetland (Acres)	1.05
Open Water (Acres)	0

Jurisdictional Delineation

On April 29th – May 3rd, May 13th, May 14th, September 17th, and October 1st– 11th, 2019, HDR environmental scientists, reviewed the Project Site for waters of the U.S. under Section 404 of the Clean Water Act (CWA). Jurisdictional waters of the U.S. were reviewed according to the methodology and guidance described in the U.S. Army Corps of Engineers (USACE) 1987 Wetland

Delineation Manual, USACE Post-Rapanos guidance, and the 2012 USACE Eastern Mountains and Piedmont Regional Supplement (Version 2.0). Streams were classified utilizing the methodology and guidance provided in Regulatory Guidance Letter (RGL) 05-05 and the North Carolina Division of Water Resources (NCDWR) Methodology for Identification of Intermittent and Perennial Streams and Their Origins (Version 4.11).

Areas that were previously delineated and verified were revisited. Any areas which did not concur with previously documented records, or had not been previously delineated were appropriately flagged in the field and mapped using a Trimble® Geo7X GPS unit capable of sub-meter accuracy. GPS points were post-processed utilizing Trimble® GPS Pathfinder Office software. A summary of on-site waters is provided in Attachment D, and supporting data forms and photographs are provided in Attachments E and F, respectively.

Results

The results of the on-site field investigation conducted by HDR indicate that there are fifty (50) potentially jurisdictional stream channels, forty (40) potentially jurisdictional wetlands, and three (3) potentially jurisdictional ponds (Figures 9A-9E) located within the Project Site. There is one (1) non-jurisdictional pond which is documented in the AJD portion of this application and is depicted on Figure 10.

The on-site surface waters on the western portion of the Project Site drain to Little Paw Creek and Beaverdam Creek in the Upper Catawba River Basin (HUC 03050101). On-site waters in the central and eastern portion of the Project Site drain to Coffey Creek and Sugar Creek in the Lower Catawba River Basin (HUC 03050103). All waters within the Project Site are classified as Class C Waters by the North Carolina Department of Environmental Quality – Division of Water Quality.

Jurisdictional Waters of the U.S.

On-site jurisdictional waters of the U.S. total approximately 60,276 linear feet (15.02 acre) of jurisdictional stream channel, 11.88 acre of jurisdictional wetlands, and 1.54 acres of jurisdictional ponds. (Figures 9A-9E). A summary of on-site jurisdictional waters of the U.S. are summarized in Attachment D. A single non-jurisdictional pond of 1.22 acres, dug out and surrounded by uplands is detailed in the AJD portion of this application (Figure 10).

The City of Charlotte is hereby requesting a PJD and AJD for the potentially jurisdictional waters identified within the Project Site. Should you have any questions or require additional information following your review of the enclosed materials, please contact me at (704) 338-6710 or kelly.thames@hdrinc.com.

Sincerely,



Kelly Thames, PWS
Environmental Project Manager
HDR



Benjamin Burdette, WPIT
Environmental Planner
HDR

Attachments:

A: Figures

- Figure 1. Project Vicinity
- Figure 2. USGS Topographic Quadrangles
- Figure 3. Aerial Imagery and Mecklenburg Co. Parcels
- Figure 4. NRCS Soils Survey of Mecklenburg County
- Figure 5. HUC 8 Watersheds
- Figure 6. NWI, NHD and FEMA Datasets
- Figure 7A-7G. Previous On-Site Actions
- Figure 8. Previously Impacted Waters
- Figure 9A-9E. Delineated Waters
- Figure 10. AJD – Delineated Waters of the U.S.

B: Request for Corps Jurisdictional Determination

- PJD Request for Corps Jurisdictional Determination
- AJD Request for Corps Jurisdictional Determination
- Preliminary Jurisdictional Determination Form
- Rapanos Form

C: Landowner and Parcel Information

D: Summary of On-Site Jurisdictional Waters

E: Data Forms

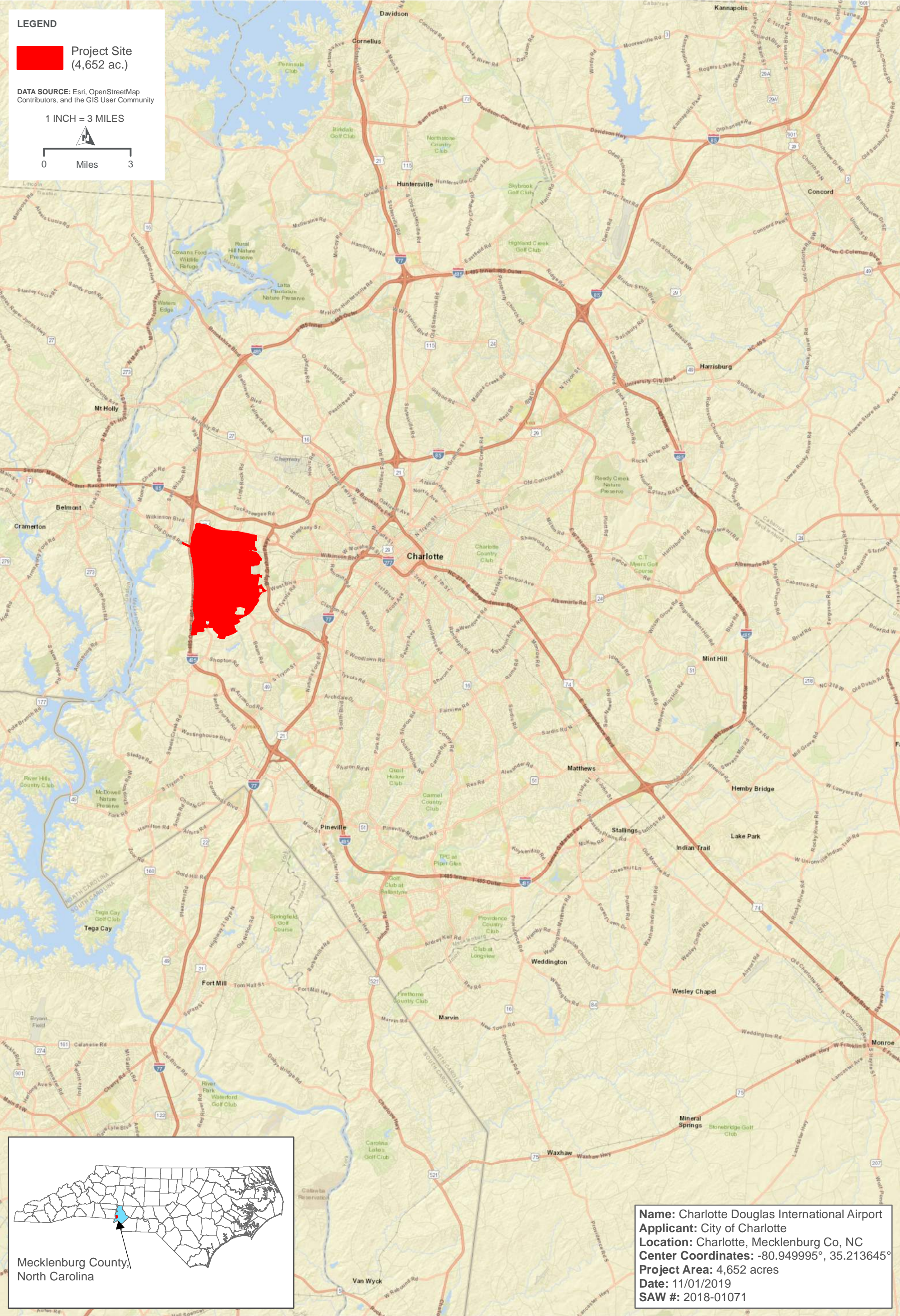
- USACE Wetland Determination Data Forms (DP1-DP40)
- Stream Classification Forms

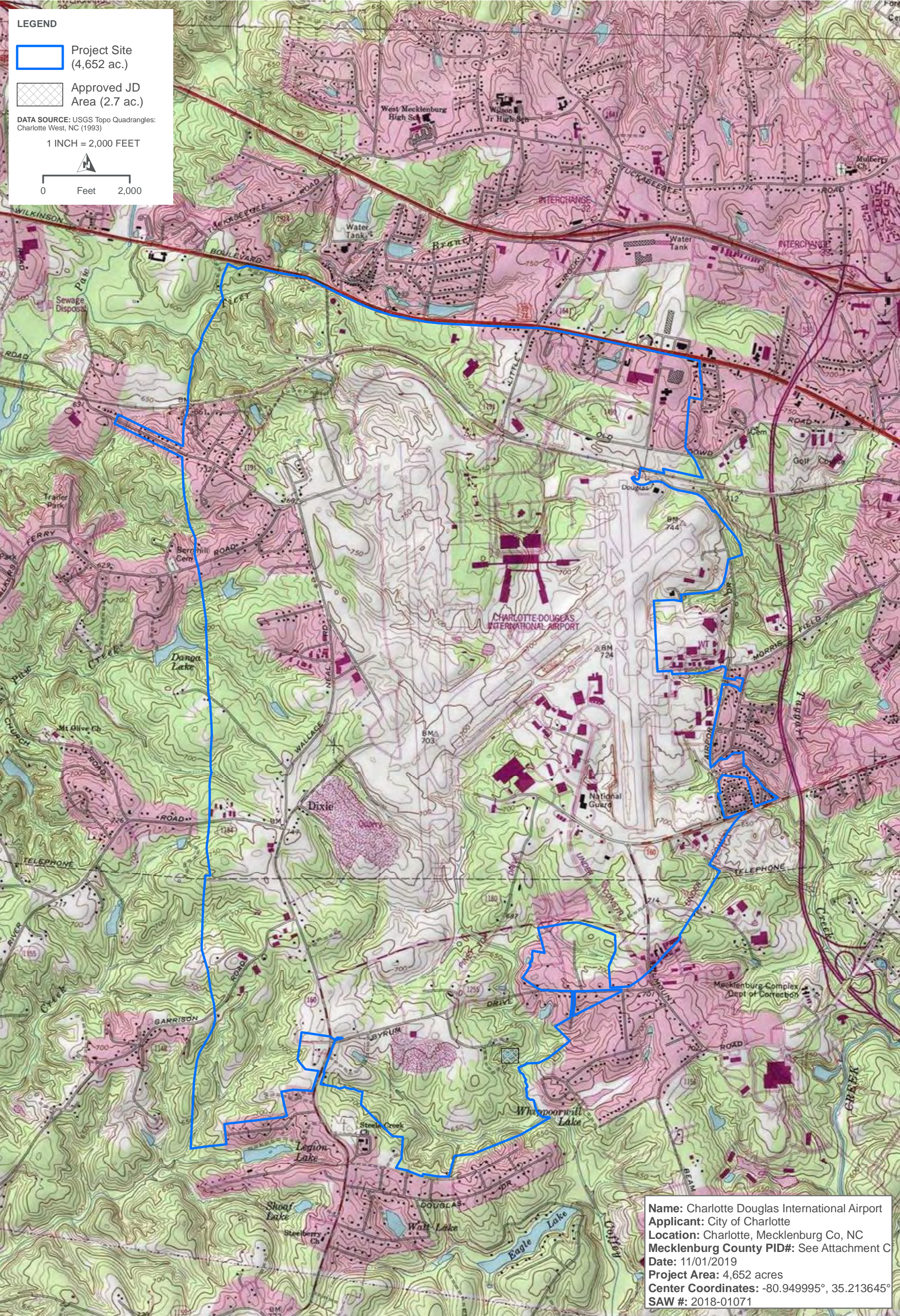
F: Representative Site Photographs



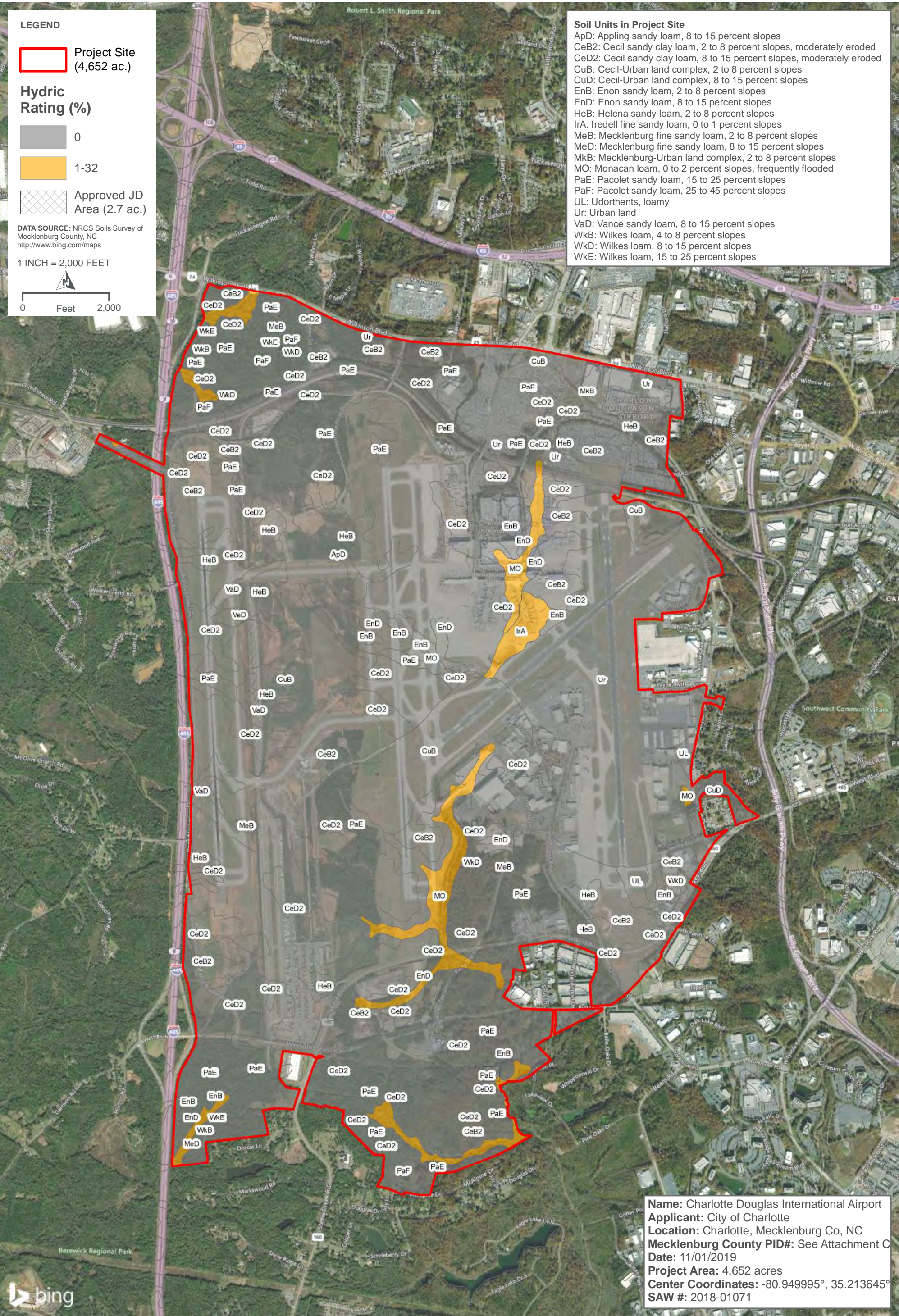
Attachment A

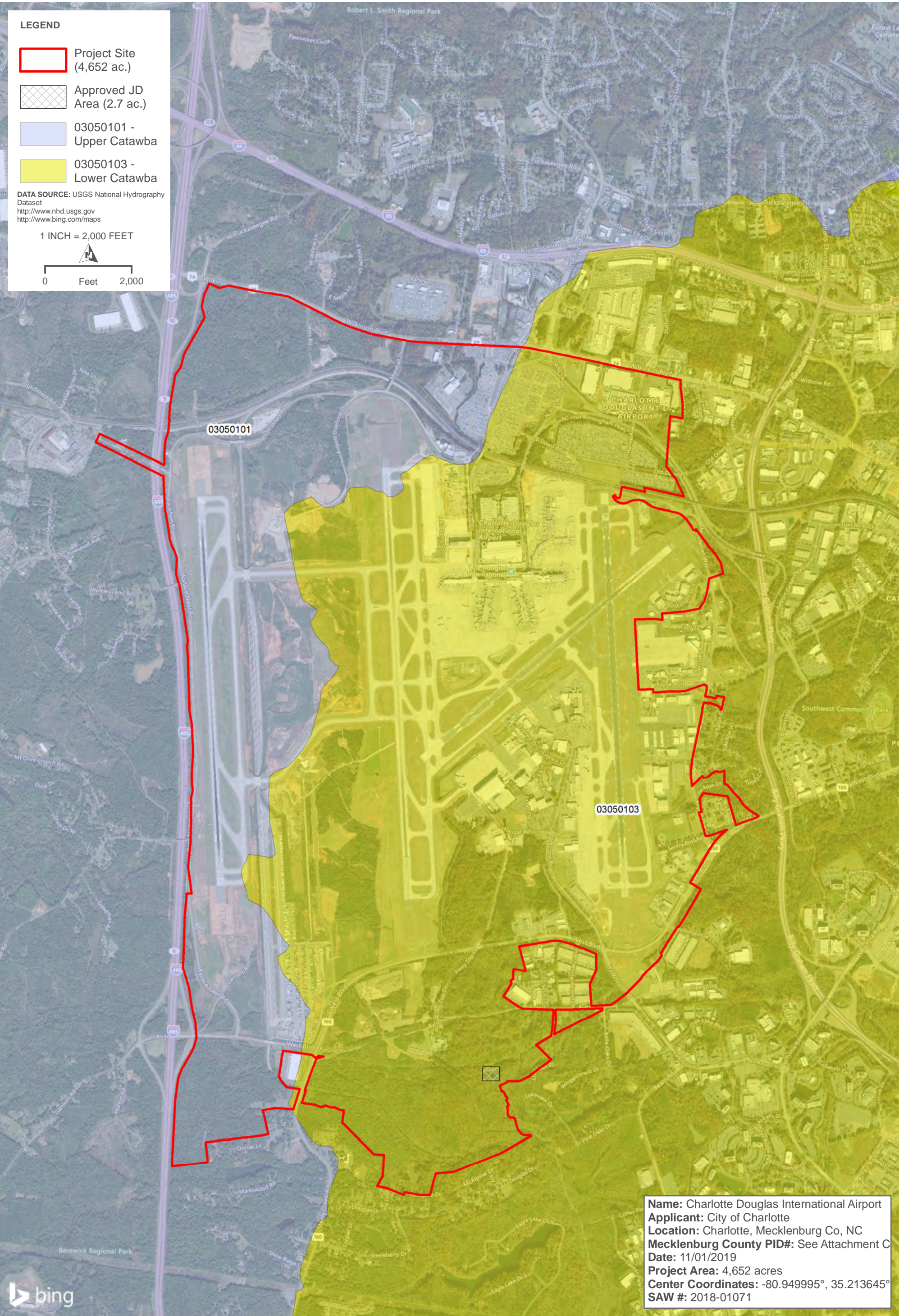
Figures













Name: Charlotte Douglas International Airport
Applicant: City of Charlotte
Location: Charlotte, Mecklenburg Co, NC
Mecklenburg County PID#: See Attachment C
Date: 11/01/2019
Project Area: 4,652 acres
Center Coordinates: -80.949995°, 35.213645°
SAW #: 2018-01071

LEGEND

Project Site
(4,652 ac.)

Approved JD
Area (2.7 ac.)

Permitted Not
Impacted
Stream

Permitted And
Impacted
Stream

Permitted Not
Impacted
Wetland

Permitted And
Impacted Open
Water

Permitted And
Impacted
Wetland

Not Permitted
Jurisdictional
Streams

Not Permitted
Jurisdictional
Open Water

Not Permitted
Jurisdictional
Wetlands

DATA SOURCE: AID: 2006-32521
http://www.bing.com/maps

1 INCH = 2,000 FEET

0 Feet 2,000

Runway Expansion (includes West Blvd.)					
Action ID	2006-32521				
Verified	8/7/2009				
Expires	12/31/2024				
Summary of Permit Actions and Impacts Complete vs Incomplete					
Feature	Original Permit Impacts (3/21/07)	Permit Modification Impact Addition (8/7/09)	Permit Total ^a	Completed Impacts	Impacts Remaining Under Valid Permit
Streams (lf)	16,312	5,247	21,559	16,752	4,809
Wetlands (ac.)	0.432	0.716	1.148	0.728	0.42
Open Waters (ac.)	4.631	2.733	7.364	7.364	0

^a Public notice (dated May 20, 2009) and subsequent approval (dated August 7, 2009) indicate a discrepancy of total impact amounts for stream and open water impacts. Listed above are the impact numbers actual totaled.

Name: Charlotte International Airport
Applicant: City of Charlotte
Location: Charlotte, Mecklenburg Co, NC
Mecklenburg County PID#: See Attachment C
Date: 11/01/2019
Project Area: 4,652 acres
Center Coordinates: -80.949995°, 35.213645°
SAW #: 2018-01071

PREVIOUS ON-SITE ACTION: RUNWAY EXPANSION: 2006-32521
CHARLOTTE DOUGLAS INTERNATIONAL AIRPORT
FIGURE 7A

JURISDICTIONAL DETERMINATION VERIFICATION

LEGEND

Project Site
(4,652 ac.)

Approved JD
Area (2.7 ac.)

Permitted Not
Impacted
Stream

Permitted And
Impacted
Stream

Permitted Not
Impacted
Wetland

Permitted And
Impacted Open
Water

Permitted And
Impacted
Wetland

Not Permitted
Jurisdictional
Streams

Not Permitted
Jurisdictional
Open Water

Not Permitted
Jurisdictional
Wetlands

DATA SOURCE: AID: 2008-03090
http://www.bing.com/maps

1 INCH = 2,000 FEET

0 Feet 2,000

Parking Deck	
Action ID	2008-03090
Verified	6/11/2012
Expired	12/31/2017
Impacts	
Streams (Linear Feet)	3,161
Wetland (Acres)	3.035
Open Water (Acres)	0

Name: Charlotte International Airport
Applicant: City of Charlotte
Location: Charlotte, Mecklenburg Co, NC
Mecklenburg County PID#: See Attachment C
Date: 11/01/2019
Project Area: 4,652 acres
Center Coordinates: -80.949995°, 35.213645°
SAW #: 2018-01071

PREVIOUS ON-SITE ACTION: PARKING DECK MODIFICATION 2008-03090
CHARLOTTE DOUGLAS INTERNATIONAL AIRPORT
FIGURE 7B

JURISDICTIONAL DETERMINATION VERIFICATION

LEGEND

Project Site
(4,652 ac.)

Approved JD
Area (2.7 ac.)

Permitted Not
Impacted
Stream

Permitted And
Impacted
Stream

Permitted Not
Impacted
Wetland

Permitted And
Impacted Open
Water

Permitted And
Impacted
Wetland

Not Permitted
Jurisdictional
Streams

Not Permitted
Jurisdictional
Open Water

Not Permitted
Jurisdictional
Wetlands

DATA SOURCE: AID: 2010-00837
http://www.bing.com/maps

1 INCH = 2,000 FEET

0 Feet 2,000

Taxiway D	
Action ID	2010-00837
Verified	7/6/2010
Expired	7/10/2015
Impacts	
Streams (Linear Feet)	149
Wetland (Acres)	0
Open Water (Acres)	0

Name: Charlotte International Airport
Applicant: City of Charlotte
Location: Charlotte, Mecklenburg Co, NC
Mecklenburg County PID#: See Attachment C
Date: 11/01/2019
Project Area: 4,652 acres
Center Coordinates: -80.949995°, 35.213645°
SAW #: 2018-01071

HDR

CLT

CHARLOTTE DOUGLAS
INTERNATIONAL AIRPORT

PREVIOUS ON-SITE ACTION: TAXIWAY D 2010-00837

CHARLOTTE DOUGLAS INTERNATIONAL AIRPORT

FIGURE 7C

JURISDICTIONAL DETERMINATION VERIFICATION

LEGEND

Project Site
(4,652 ac.)

Approved JD
Area (2.7 ac.)

Permitted Not
Impacted
Stream

Permitted And
Impacted
Stream

Permitted Not
Impacted
Wetland

Permitted And
Impacted Open
Water

Permitted And
Impacted
Wetland

Not Permitted
Jurisdictional
Streams

Not Permitted
Jurisdictional
Open Water

Not Permitted
Jurisdictional
Wetlands

DATA SOURCE: AID: 2013-00433
http://www.bing.com/maps

1 INCH = 2,000 FEET

0 Feet 2,000

Impacts occurred under
AID 2006-32521

Norfolk Southern (After-the-Fact Permit)	
Action ID	2013-00433
Verified	unknown
Expired	12/31/2018
Impacts	
Streams (Linear Feet)	1,807
Wetland (Acres)	0
Open Water (Acres)	0

Name: Charlotte International Airport
Applicant: City of Charlotte
Location: Charlotte, Mecklenburg Co, NC
Mecklenburg County PID#: See Attachment C
Date: 11/01/2019
Project Area: 4,652 acres
Center Coordinates: -80.949995°, 35.213645°
SAW #: 2018-01071

HDR

CLT

CHARLOTTE DOUGLAS
INTERNATIONAL AIRPORT

PREVIOUS ON-SITE ACTION: NORFOLK SOUTHERN IMF 2013-00433

CHARLOTTE DOUGLAS INTERNATIONAL AIRPORT

FIGURE 7D

JURISDICTIONAL DETERMINATION VERIFICATION

LEGEND

Project Site
(4,652 ac.)

Approved JD
Area (2.7 ac.)

Permitted Not
Impacted
Stream

Permitted And
Impacted
Stream

Permitted Not
Impacted
Wetland

Permitted And
Impacted Open
Water

Permitted And
Impacted
Wetland

Not Permitted
Jurisdictional
Streams

Not Permitted
Jurisdictional
Open Water

Not Permitted
Jurisdictional
Wetlands

DATA SOURCE: AID: 2006-32521
http://www.bing.com/maps

1 INCH = 2,000 FEET

0 Feet 2,000

Airport Traffic Control Tower (ATCT)	
Action ID	2014-0038
Verified	unknown
Expired	unknown
Impacts	
Streams (Linear Feet)	709
Wetland (Acres)	0
Open Water (Acres)	0

Name: Charlotte International Airport
Applicant: City of Charlotte
Location: Charlotte, Mecklenburg Co, NC
Mecklenburg County PID#: See Attachment C
Date: 11/01/2019
Project Area: 4,652 acres
Center Coordinates: -80.949995°, 35.213645°
SAW #: 2018-01071

PREVIOUS ON-SITE ACTION: AIR TRAFFIC CONTROL CENTER 2014-00838
CHARLOTTE DOUGLAS INTERNATIONAL AIRPORT

FIGURE 7E

JURISDICTIONAL DETERMINATION VERIFICATION

LEGEND

Project Site
(4,652 ac.)

Approved JD
Area (2.7 ac.)

Permitted Not
Impacted
Stream

Permitted And
Impacted
Stream

Permitted Not
Impacted
Wetland

Permitted And
Impacted Open
Water

Permitted And
Impacted
Wetland

Not Permitted
Jurisdictional
Streams

Not Permitted
Jurisdictional
Open Water

Not Permitted
Jurisdictional
Wetlands

DATA SOURCE: AID: 2014-00838
http://www.bing.com/maps

1 INCH = 2,000 FEET

0

Feet

2,000

Rental Parking Expansion (JD Only)	
Action ID	2014-00838
Verified	7/15/2014
Expired	7/15/2019
Streams (Linear Feet)	0
Wetland (Acres)	0
Open Water (Acres)	0

Name: Charlotte International Airport
Applicant: City of Charlotte
Location: Charlotte, Mecklenburg Co, NC
Mecklenburg County PID#: See Attachment C
Date: 11/01/2019
Project Area: 4,652 acres
Center Coordinates: -80.949995°, 35.213645°
SAW #: 2018-01071

HDR

CLT

CHARLOTTE DOUGLAS
INTERNATIONAL AIRPORT

PREVIOUS ON-SITE ACTION: RENTAL CAR PARKING EXPANSION 2014-00838

CHARLOTTE DOUGLAS INTERNATIONAL AIRPORT

FIGURE 7F

JURISDICTIONAL DETERMINATION VERIFICATION

LEGEND

Project Site
(4,652 ac.)

Approved JD
Area (2.7 ac.)

Permitted Not
Impacted
Stream

Permitted And
Impacted
Stream

Permitted Not
Impacted
Wetland

Permitted And
Impacted Open
Water

Permitted And
Impacted
Wetland

Not Permitted
Jurisdictional
Streams

Not Permitted
Jurisdictional
Open Water

Not Permitted
Jurisdictional
Wetlands

DATA SOURCE: AID: 2006-32521
http://www.bing.com/maps

1 INCH = 2,000 FEET

0 Feet 2,000

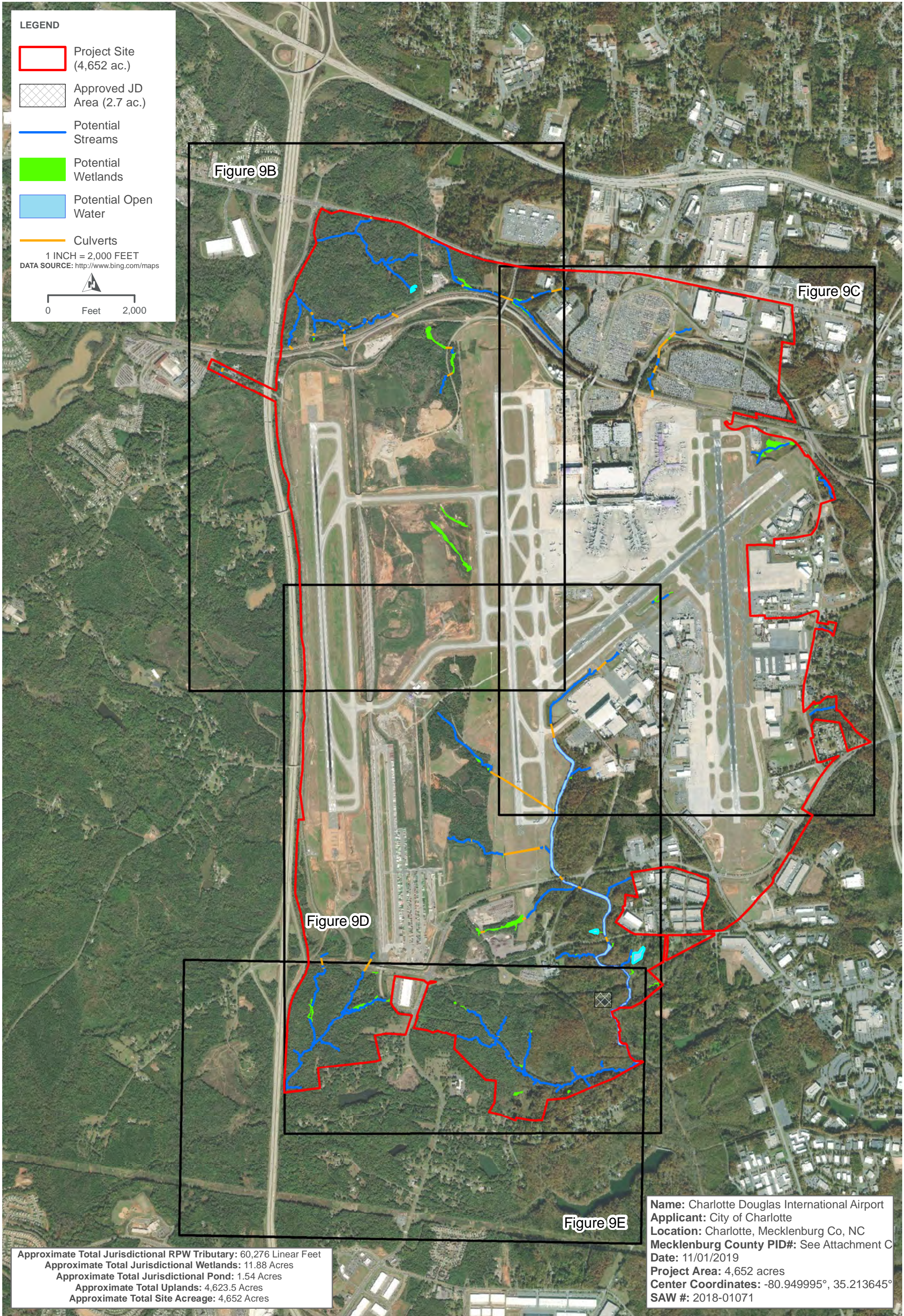
2015 Improvement Areas (JD Only)	
Action ID	2014-00838
Verified	1/19/2016
Expires	1/29/2021
Streams (Linear Feet)	7,007
Wetland (Acres)	1.05
Open Water (Acres)	0

Name: Charlotte International Airport
Applicant: City of Charlotte
Location: Charlotte, Mecklenburg Co, NC
Mecklenburg County PID#: See Attachment C
Date: 11/01/2019
Project Area: 4,652 acres
Center Coordinates: -80.949995°, 35.213645°
SAW #: 2018-01071

PREVIOUS ON-SITE ACTION: 2015 IMPROVEMENT AREAS 2014-00838
CHARLOTTE DOUGLAS INTERNATIONAL AIRPORT
FIGURE 7G

JURISDICTIONAL DETERMINATION VERIFICATION





LEGEND

- Project Site (4,652 ac.)
- Approved JD Area (2.7 ac.)
- Potential Streams
- Potential Wetlands
- Potential Open Water
- Culverts

1 INCH = 2,000 FEET
DATA SOURCE: <http://www.bing.com/maps>



Figure 9B

Figure 9C

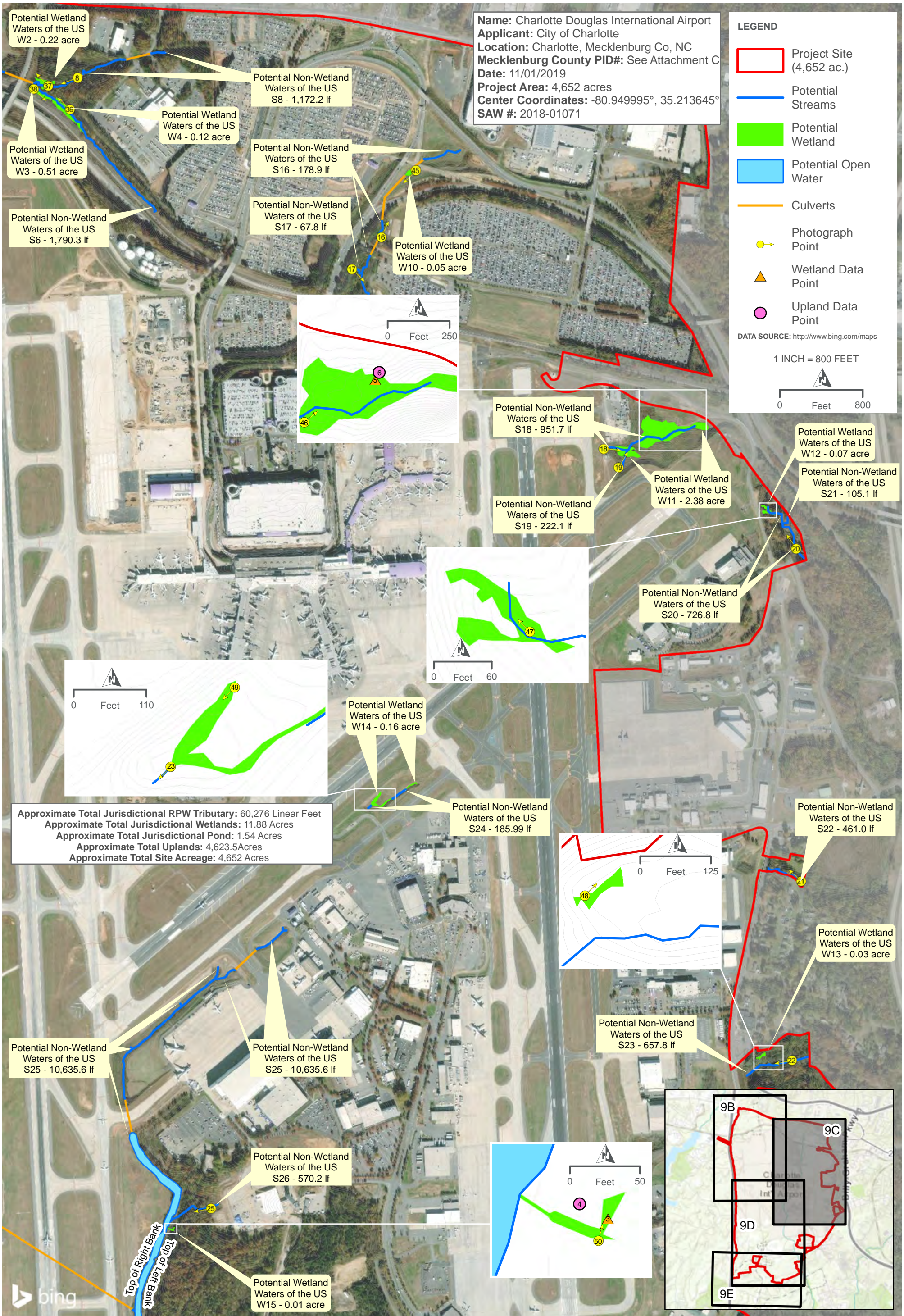
Figure 9D

Figure 9E

Approximate Total Jurisdictional RPW Tributary: 60,276 Linear Feet
Approximate Total Jurisdictional Wetlands: 11.88 Acres
Approximate Total Jurisdictional Pond: 1.54 Acres
Approximate Total Uplands: 4,623.5 Acres
Approximate Total Site Acreage: 4,652 Acres

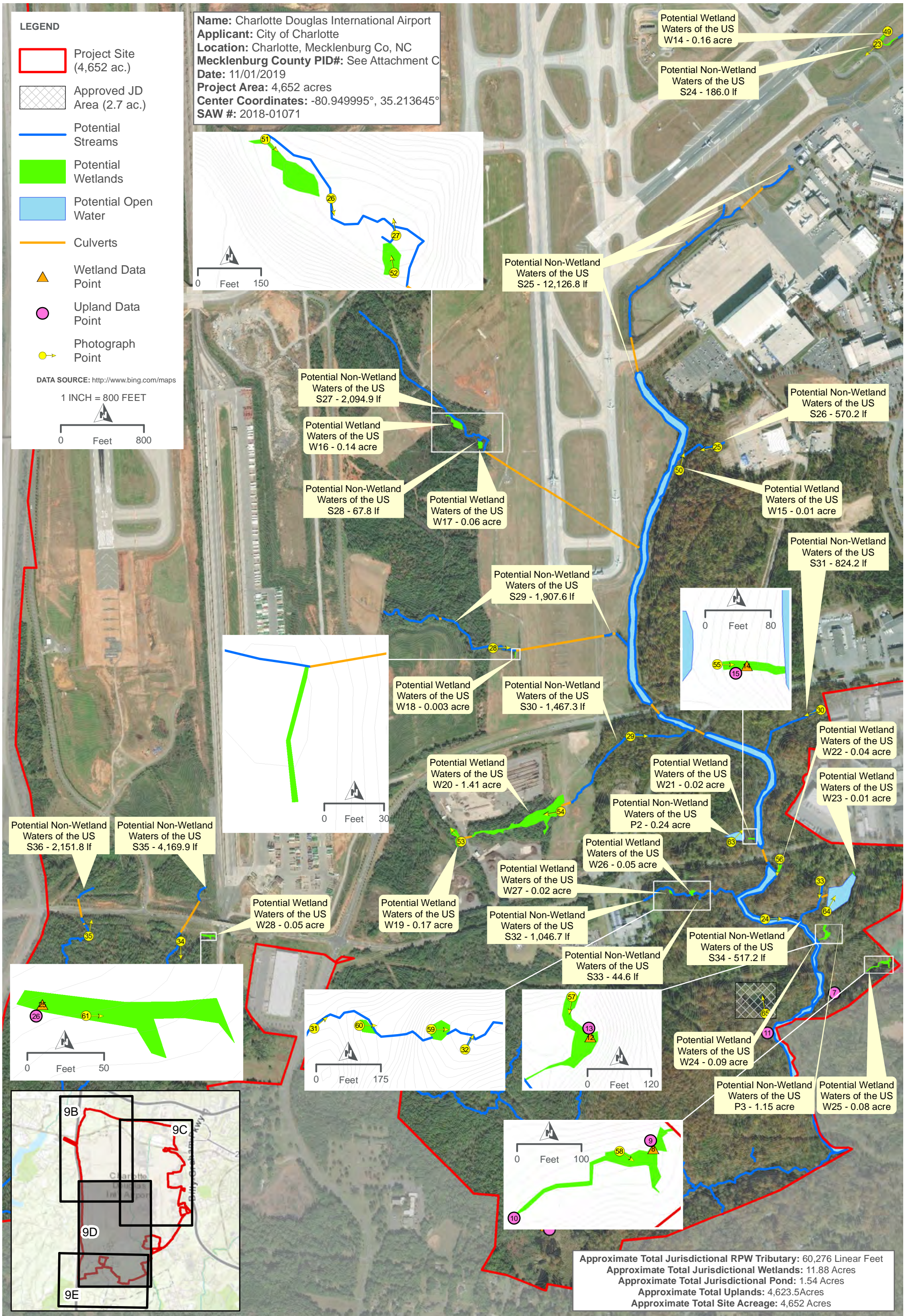
Name: Charlotte Douglas International Airport
Applicant: City of Charlotte
Location: Charlotte, Mecklenburg Co, NC
Mecklenburg County PID#: See Attachment C
Date: 11/01/2019
Project Area: 4,652 acres
Center Coordinates: -80.949995°, 35.213645°
SAW #: 2018-01071

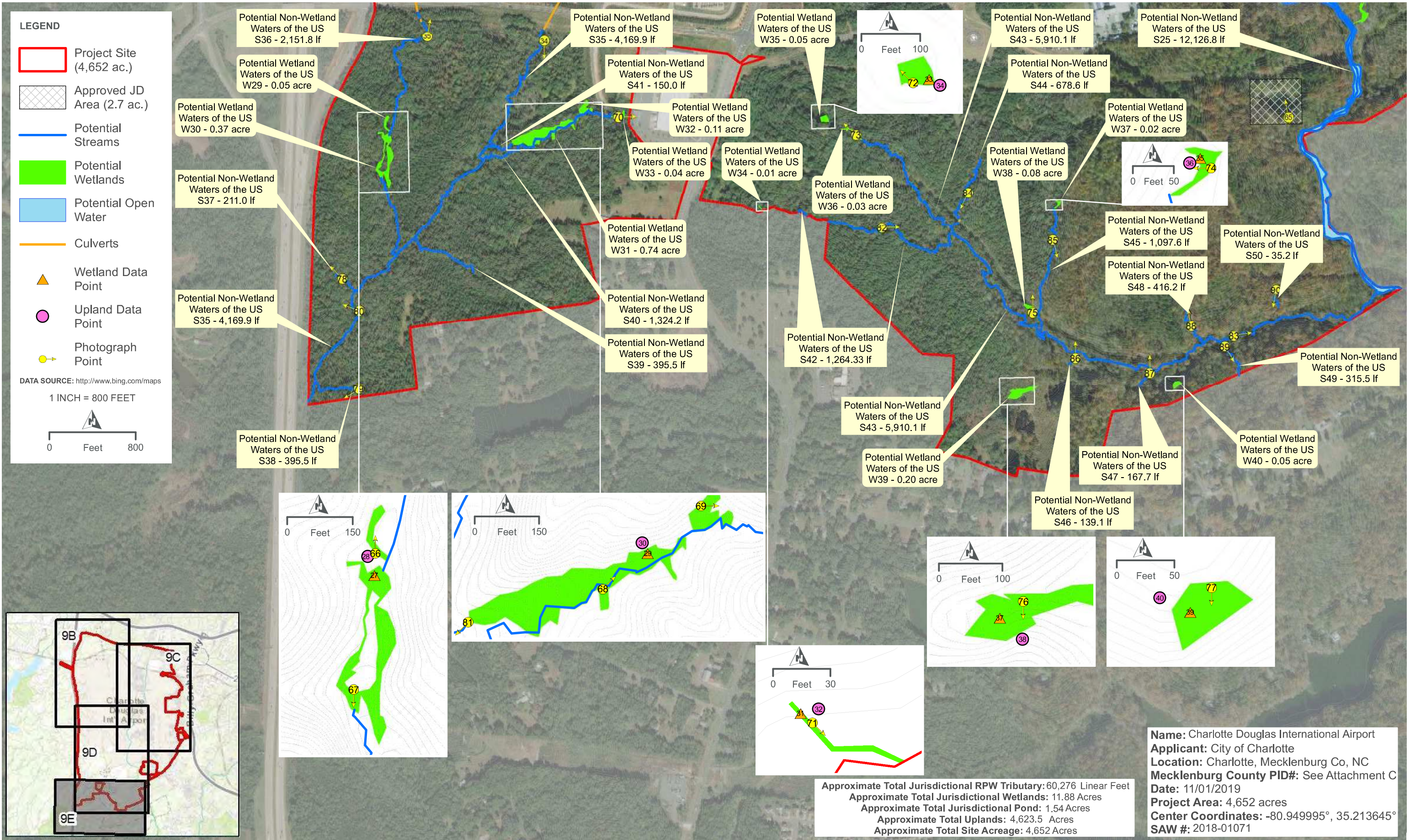





DELINEATED WATERS
CHARLOTTE DOUGLAS INTERNATIONAL AIRPORT
FIGURE 9C


JURISDICTIONAL DETERMINATION VERIFICATION







LEGEND

 Approved JD Area (2.7 ac.)


 Potential Open Water

 Upland Data Point

 Photograph Point

DATA SOURCE: <http://www.bing.com/maps>

1 INCH = 50 FEET



0 Feet 50

Name: Charlotte Douglas International Airport
Applicant: City of Charlotte
Location: Charlotte, Mecklenburg Co, NC
Mecklenburg County PID#: See Attachment C
Date: 11/01/2019
Project Area: 2.7 acres
Center Coordinates:-80.949995°, 35.213645°
SAW #: 2018-01071



Approximate Total Jurisdictional RPW Tributary: 0 Linear Feet
Approximate Total Jurisdictional Wetlands: 0 Acres
Approximate Total Jurisdictional Pond: 0 Acres
Approximate Total Uplands: 2.7 Acres
Approximate Total Site Acreage: 2.7 Acres

AJD - DELINEATED WATERS OF THE U.S.
CHARLOTTE DOUGLAS INTERNATIONAL AIRPORT
FIGURE 10