



DESKTOP WETLAND ASSESSMENT

Churchill Apartments

1117 June Lane
Florence, South Carolina 29506

Report Date

August 21, 2024

Partner Project No.

24-458664.2

Prepared for:

The Paces Foundation, Inc.
Smryna, Georgia 30080



Building
Science



Environmental
Consulting



Construction &
Development



Energy &
Sustainability



August 21, 2024

Mr. Steven Bauhan
The Paces Foundation, Inc.
2730 Cumberland SE
Smryna, Georgia 30080

Subject: Desktop Wetland Assessment
Churchill Apartments
1117 June Lane
Florence, South Carolina 29506
Partner Project No. 24-458664.2

Dear Mr. Bauhan:

Partner Engineering and Science, Inc. is pleased to provide the results of the Desktop Wetland Assessment (DWA) performed on the above-referenced property. This assessment is intended to be used as a limited screening tool to indicate the likely presence or absence of wetland conditions on the subject property. The assessment is based on readily available information presented by regulatory agencies and, if possible, site conditions described in previous reports prepared for the subject property.

We appreciate the opportunity to provide these assessment services. If you have any questions concerning this report, or if we can assist you in any other matter, please contact Misty Ponce at (818) 337-1203 or mponce@partneresi.com.

Sincerely,

Partner Engineering and Science, Inc.

Katie L. Morgan, PWS, EP
Director of Natural and Cultural Resources
Professional Wetland Scientist (#3100)

Misty Ponce
National Client Manager

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FIGURES

- Figure 1:** Site Location Map
Figure 2: Site Plan
Figure 3: Topographic Map

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- Appendix A:** Supporting Documentation

1.0 WETLAND DESKTOP ASSESSMENT

Partner has performed a DWA for the subject property. Wetlands are areas that must meet three criteria: hydric soils, wetland vegetation, and wetland hydrology. The legal definition of a wetland is:

Those 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. (33 CFR §328.3(b)).

A qualified environmental professional reviewed readily available information presented by regulatory agencies and, if possible, site conditions described in previous reports prepared to preliminarily identify areas of interest on the subject property.

1.1 Property Description

The subject property is located at 1117 June Lane, in Florence, South Carolina, to the northeast of the intersection of South Church Street and June Lane and to the south of State Road S-21-612 and June Lane within a mixed residential, commercial, and industrial area of Florence County. The subject property is identified as Assessor's Parcel Numbers (APNs) 0014901006 and 0014901007. The subject property is currently occupied by Churchill Apartments, consisting of 166 residential units, and the Housing Authority of Florence. Churchill Apartments consist of 43 two-story residential structures and two one-story buildings consisting of a leasing office and an office occupied by the Housing Authority of Florence. The structures were built in circa 1975 and total approximately 300,000-square feet on a 29.81-acre lot. The lot is a reverse 'L' shape with June Lane traversing through the northern vertical portion and the central horizontal portion. The subject property is accessed at the western boundary via South Church Street, at the northern boundary by State Road South 21-612. The southern portion across June Lane consists of undeveloped woodland. Jefferies Creek is located south of the southern subject property boundary line.

The immediately surrounding properties consist of vacant commercial and industrial properties to the north; vacant, wooded land and wetlands to the south across Jefferies Creek; vacant wooded land and wetlands to the east; and vacant commercial and commercial properties to the west.

1.2 Historical Information

Partner obtained available aerial photographs of the subject property and surrounding area from Environmental Risk Information Services (ERIS). The reviewed materials are included in **Appendix A**.

According to available historical sources, the subject property was formerly undeveloped land as early as 1940. In the 1941 aerial photograph, the northern vertical portion appears to be saturated, while the southern portion appears to be a part of a wooded forest area. The vertical saturation is not visible in the 1949 aerial. From 1957 to approximately 1964, the subject property appears agricultural and residential in nature, with the exception of the southern wooded forest area. In the 2017 and 2020 topographic maps, wetlands are depicted in the southern portion of the subject property. Jefferies Creek is visible to the south of the southern subject property boundary line in the topographic maps between 1940 and 2021.

Historical topographic maps and aerial photographs are included in **Appendix A**.

1.3 Current Freshwater Environments

Based on a review of online imagery and/or the Phase I Environmental Site Assessment (ESA) performed on the subject property, forested wetlands are visible on the south undeveloped portion of the subject property at this time.

Based on a review of the United States Fish and Wildlife (USFW), National Wetland Inventory (NWI) online wetland map:

- The southern undeveloped portion of the subject property consists of a portion of a 236.70-acre Freshwater Forested/Shrub Wetland and is classified as PFO1/2F. This classification code means that the land is a Palustrine System (P), which includes all nontidal wetlands dominated by trees, shrubs, persistent emergent, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 ppt. The land is forested (FO), meaning it is characterized by woody vegetation that is six meters or taller. The wetland is Broad-Leaved Deciduous wetland (1), which contains woody angiosperms (trees or shrubs) with relatively wide, flat leaves that are shed during the cold or dry season, and Needle-Leaved Deciduous (2) wetland, which consists of wetlands where trees or shrubs are predominately deciduous and needle-leaved and is represented by young or stunted trees. The water regime for this wetland is Semipermanently Flooded (F), meaning that surface water is persistent throughout the growing season in most years. When surface water is absent, the water table is usually at or very near the land surface.

The State of South Carolina does not maintain an additional Interactive Wetland map, and the South Carolina Department of Natural Resources (DNR) references the USFWS NWI

A copy of the supporting soil information along with the USFW NWI wetland map is included in **Appendix A**.

1.4 Vegetation

According to the 1987 USACE Wetland Delineation Manual, hydrophytic vegetation is defined as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present.

According to the U.S. Army Corps of Engineers 2020 National Wetland Plant List, version 3.5 and the National Wetland Plant List Indicator Rating Definition document, wetland indicator status ratings and their rating categories, as described in the National List of Plant Species that Occur in Wetlands (Reed 1988) are provided in the table below.

WETLAND PLANT INDICATOR STATUS

| Indicator status (abbreviation) | % Occurrence in wetlands |
|---|--------------------------|
| Obligate (OBL). Occur almost always under natural conditions in wetlands. | 99 |

WETLAND PLANT INDICATOR STATUS

| Indicator status (abbreviation) | % Occurrence in wetlands |
|---|--------------------------|
| Facultative Wetland (FACW). Usually occur in wetlands but occasionally found in non-wetlands. | 67–99 |
| Facultative (FAC). Equally likely to occur in wetlands and non-wetlands. | 34–66 |
| Facultative Upland (FACU). Usually occur in non-wetlands but occasionally found in wetlands. | 1–33 |

Review of online imagery indicates the subject property consists of 43 two-story residential structures and two one-story buildings consisting of a leasing office and an office occupied by the Housing Authority of Florence. The southern portion of the subject property consists of undeveloped woodlands.

The subject property is located within the Southeastern Plains Level III Ecoregion (65) and Atlantic Southern Loam Plains Level IV Ecoregion (65I). The Southeastern Plains (65) encompasses much of the coastal plains of the southeastern US. The climate is humid and subtropical, with hot, humid summers and relatively mild winters. Precipitation is high year-round, with relatively little seasonality. This region is subject to hurricanes and tropical storms. The terrain is gently dissected, mostly with rolling plains, and is lower in elevation. Much of the area has pine forests, with longleaf pine (*Pinus palustris* [FAC]) and loblolly pine (*Pinus taeda* [FAC]) as the most dominant plants. There are also some mixed oak-hickory-pine forests throughout the region and the southern part of this region had some southeastern mixed forests, with a mixture of broadleaf evergreens, deciduous evergreens, and pines. Floodplains mostly supported deciduous forests, and there were some cypress swamps. This area is utilized for agriculture and forestry.

The Atlantic Southern Loam Plains Ecoregion (65I) has finer soils and is a major agricultural zone, with deep, well-drained soils and cropland. Flora is varied due to the variety of edaphic conditions. The region has a high concentration of Carolina Bays, which are shallow, elliptical depressions, often swampy or wet in the middle with dry sandy rims. Carolina bays not drained for agriculture often contain rare or endangered plant and animal species. Within South Carolina, the northern portion of the region in the Florence and Pee Dee River area tends to be flatter with more areas of wet soils. Vegetation structure and composition are influenced by salt spray, extreme disturbance events, and the distinctive climate of the immediate coast. Most typical stands are dominated by oaks, primarily southern live oak (*Quercus virginiana* [FACU]) and/or sand live oak (*Quercus germinata* [FAC]). Vegetation may also include different woodland communities often dominated by southern pine species. Other vegetation includes pond pine (*Pinus serotina* [FACW]) and slash pine (*Pinus elliottii* var. *elliottii* [FACW]). These habitats have densely shrubby subcanopies and understories with species such as southern live oak, sand live oak, Darlington's oak (*Quercus hemisphaerica* [FACU]), Chapman's oak (*Quercus chapmanii* [FAC]) myrtle oak (*Quercus myrtifolia* [FAC]) and southern magnolia (*Magnolia grandiflora* [FAC]). Unlike maritime vegetation to the north, this system may be more heavily influenced by natural fire regimes that may help to explain the predominance of the fire-tolerant pine species.

According to information outlined within the online Natural Resources Conservation Service (NRCS) *Soil Survey for Florence County*, and the *USACE National Wetland Plant List for the Atlantic and Gulf Coastal Plain Region*, the southern portion of the subject property is conducive to hydrophytic wetland-type vegetation.

1.5 Hydrology

According to the 1987 USACE Wetland Delineation Manual, wetland hydrology is defined as an area that is inundated either permanently or periodically at mean water depths are less than or equal to 6.6 feet, or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation. According to the USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0), wetland hydrology is present when 14 or more consecutive days of flooding or ponding, or a water table 12 inches or less below the soil surface is present, during the growing season at a minimum frequency of 5 out of 10 years unless an alternative standard has been established for a particular region or wetland type.

According to the contour lines on the United States Geological Survey (USGS), *Florence West, South Carolina* Quadrangle, dated 2024, the subject property is located at approximately 105 feet above mean sea level (MSL). The contour lines in the area of the subject property indicate the area is sloping toward the south (**Figure 3**).

Partner performed a review of the Flood Insurance Rate Map (FIRM), published by the Federal Emergency Management Agency (FEMA). According to Community Panel Numbers 45041C0142E, dated December 16, 2014, the area of the subject property that contains the residential buildings and leasing/office buildings are located within Flood Zone X (Unshaded), an area located outside of the 100-year and 500-year flood plains, which is also referred to as an area of minimal flood hazards. However, the southern portion is located within Flood Zone AE, defined as areas subject to inundation by the 1-percent annual-chance flood event determined by detailed methods.

According to FEMA, flood hazard areas identified on the FIRM are identified as a Special Flood Hazard Area (SFHA). SFHA are defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood. SFHAs are labeled as Zone A, Zone AO, Zone AH, Zones A1-A30, Zone AE, Zone A99, Zone AR, Zone AR/AE, Zone AR/AO, Zone AR/A1-A30, Zone AR/A, Zone V, Zone VE, and Zones V1-V30. Moderate flood hazard areas, labeled Zone B or Zone X (shaded) are also shown on the FIRM, and are the areas between the limits of the base flood and the 0.2-percent-annual-chance (or 500-year) flood. The areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance flood, are labeled Zone C or Zone X (unshaded).

A copy of the FIRM is included in the **Appendix A**.

1.6 Geology / Soils

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that form under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation. Hydric soil field indicators and a hydric soil technical standard have been developed to determine whether a soil meets the criteria for hydric soils. Evaluation of hydric soils was

completed based on criteria defined in NRCS (2010) and as outlined in the 1987 Manual and the Regional Supplement. Soils observed in wetland areas within the proposed survey area typically developed under anaerobic (i.e., inundated/saturated edaphic conditions) or alternating aerobic-anaerobic conditions (i.e., wet/dry hydroperiod).

The NCHS hydric soil definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006). However, not all areas within a mapping unit or polygon identified as having hydric soils may be hydric. Conversely, inclusions of hydric soils may be found within soil mapping units where no hydric soils have been identified. The Hydric Soils List should be used as a tool, indicating that hydric soil will likely be found within a given area, but should not be used as a substitute for onsite investigation and field indicators of hydric soils.

The subject property is situated within the Coastal Plain physiographic province of the State of South Carolina. The uppermost geologic formation underlying the soils at the subject property is the Pliocene Age Bear Bluff Formation. The Bear Bluff Formation underlying soils at the subject property is of the Pliocene Age and is one of the older coastal terrace sequences in the Carolinas. The primary rock type is composed of fluvial sand deposits with secondary rock type consisting of limestone.

According to the online web soil survey, the soil type located at the subject property consist of Norfolk loamy sand, 0 to 2 percent slopes (NoA), Norfolk loamy sand, 2 to 6 percent slopes (NoB), Osier loamy sand (Os), Wagram sand, 0 to 6 percent slopes (WgB), and Wehadkee and Johnston soils, frequently flooded (Wn). According to the web soil survey hydric rating by map unit online map, the Osier loamy sand and Wehadkee and Johnson soil map units are rated as hydric soils based on the National Soil Information System (NASIS) NRCS hydric soil criteria.

- The Norfolk series is comprised of very deep and well drained soils that formed in marine deposits or fluviomarine deposits on uplands or marine terraces. Slopes range from 0 to 10 percent. Mean annual temperature is about 62 degrees Fahrenheit and mean annual precipitation is about 49 inches. The A or Ap horizon is comprised of loamy sand, sandy loam, fine sandy loam, or loamy fine sand with hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 to 4. Some pedons are fine sand or sand. The E horizon is comprised of loamy sand, sandy loam, fine sandy loam, or loamy fine sand with hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 2 to 6. Some pedons are fine sand or sand. The BE horizon, where present, is comprised of sandy loam or fine sandy loam with a hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 8. The Bt horizon is comprised of sandy loam, fine sandy loam, sandy clay loam, or clay loam with hue of 7.5YR to 2.5Y, value of 5 to 8, and

chroma of 3 to 8. Redoximorphic depletions may be present. The 2Bt horizon, where present, has the same color as the Bt horizon; texture is sandy clay loam. The BC or BCt horizon, where present, is comprised of sandy loam, fine sandy loam, sandy clay loam, clay loam, sandy clay, or clay with a hue of 5YR to 2.5Y, value of 5 to 8, and chroma of 3 to 8. Redoximorphic features may be present. The C horizon is comprised of loamy coarse sand, loamy sand, loamy fine sand, coarse sandy loam, sandy loam, fine sandy loam, sandy clay loam, clay loam, or sandy clay with a hue of 2.5YR to 5Y, value of 4 to 8, and chroma of 3 to 8. Redoximorphic features may be present. Some pedons have layers of coarser or finer textured materials.

- The Osier series consists of very deep, poorly drained soils that formed in alluvium. These soils are on floodplains. The mean annual precipitation is 44 to 60 inches, and the mean annual air temperature is 59 to 64 degrees F. The A horizon has a hue of 10YR or 2.5Y, a value of 2 to 5, and a chroma of 1 or 2. The texture of the A horizon is fine sandy loam, loamy fine sand, loamy sand, fine sand, or sand. An Ab horizon may be present with a hue of 10YR to 5Y, a value of 2 or 3, and a chroma of 1 or 2. The Ab horizon would have a texture of fine sand, loamy fine sand, or loamy sand. The C horizon has a hue of 7.5YR to 5GY, a value of 3 to 8, and a chroma of 1 or 2. This horizon may also be neutral with a value of 5 to 7. Redoximorphic features may be present in shades of brown, yellow, and/or gray. The texture of the C horizon is loamy fine sand, loamy sand, fine sand, and sand. The lower Cg horizons may also be coarse sand.
- The Wagram series consists of very deep, well drained, somewhat excessively drained, moderately permeable soils that formed from fluvio-marine deposits and marine deposits. The mean annual air temperature is about 62 degrees F and the mean annual precipitation is about 49 inches. The Ap or A horizon (where present) has hue of 10YR or 2.5Y, value of 3 to 6, chroma of 1 to 4, or is neutral with value of 3 to 6. The texture is sand, fine sand, loamy sand, or loamy fine sand. The E horizon has hue of 10YR or 2.5Y, value of 5 to 7, chroma of 2 to 4, or is neutral with value of 4 to 8. The texture is sand, fine sand, loamy sand, or loamy fine sand. The Bt horizon has hue of 7.5YR to 2.5Y, value of 5 or 6, and chroma of 4 to 8. The texture is sandy loam or sandy clay loam. Redoximorphic features (where present) are masses of oxidized iron in shades of red, brown, or yellow and iron depletions in shades of brown, yellow, olive, or gray. Depletions with chroma of 2 or less are below a depth of 60 inches. The BC horizon or BCt horizon (where present) has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 3 to 8, or is variegated in shades of these colors. The texture is sandy loam, loam, sandy clay loam, or clay loam. Redoximorphic features (where present) are masses of oxidized iron in shades of red, brown, or yellow and iron depletions in shades of brown, yellow, olive, or gray. Depletions with chroma of 2 or less are below a depth of 60 inches. The horizon has is 0 to 8 inches and is grayish brown in color (10 YR 5/2) with loamy sand. The second layer (E) is 8 to 24 inches, pale brown (10YR 6/3) loamy sand and is single grain, loose, nonsticky, and nonplastic. The third through sixth layer (Bt1 through Bt4) is yellowish brown in color (10YR 5/6 and 5/8) and is sandy clay loam. The last layer (BC) is yellowish brown (10YR 5/6) and is sandy loam, massive, friable, nonsticky, nonplastic, and has iron depletions.
- The Wehadkee series consists of very deep, poorly drained and very poorly drained soils on flood plains along streams that drain from the mountains and piedmont. They are formed in loamy sediments. Slopes range from 0 to 2 percent. The Ap or A horizon has hue of 10YR or 2.5Y or is neutral, value of 3 to 6, and chroma of 0 to 4. Some pedons have soft masses of iron accumulation

in shades of brown or red. Texture is fine sandy loam, very fine sandy loam, loam, silty clay loam, sandy loam, or silt loam. Some pedons have recent layers of overwash as much as 20 inches thick that are loamy and variable in color. Many pedons have an Ab horizon that has the same color and texture range as the A horizon. The Bg horizon has hue of 10YR to 5Y or is neutral, value of 4 to 6, and chroma of 0 to 2. Soft masses of iron accumulation are in shades of red, yellow, and brown. Texture is sandy clay loam, silt loam, loam, clay loam, or silty clay loam. The Cg horizon has hue of 10YR to 5Y or is neutral, value of 4 to 7, and chroma of 0 to 2. Soft masses of iron accumulation are in shades of brown, red, and yellow. Texture is commonly sandy loam, loam, or silt loam, but in some pedons the Cg horizon contains stratified layers of sandy clay loam, clay loam, silty clay loam, loamy sand, sand, and gravel. Sandy textures are restricted to depths below 40 inches.

- The Johnston series consists of very deep, very poorly drained, moderately rapid permeable soils that formed in alluvium. These soils are found on floodplains and swamps. The mean annual air temperature is about 63 Fahrenheit, and the mean annual precipitation is about 46 inches. Slopes range from 0 to 2 percent. The Oa horizon, where present, has hue of 10YR, 2.5Y, or is neutral, value of 2 or 3, and chroma of 1 or 2. The texture is muck. The A horizon has hue of 10YR, 2.5Y, 5Y, or neutral, value of 2 to 3, and chroma of 1 or 2. The texture is coarse sandy loam, sandy loam, fine sandy loam, or loam and may include the mucky texture modifier. Redoximorphic features, where present, are masses of oxidized iron in shades of red, yellow, or brown and iron depletions in shades of gray. The Cg horizon has hue of 10YR to 5Y, value of 4 to 8, and chroma of 1 or 2, or is neutral with value of 4 to 7. The texture is coarse sand, sand, fine sand, loamy coarse sand, loamy sand, loamy fine sand, coarse sandy loam, sandy loam, fine sandy loam, or loam. Some pedons have thin strata of sandy clay loam. Redoximorphic features, where present, are masses of oxidized iron in shades of red, yellow, or brown and iron depletions in shades of gray.

1.7 Summary of Potentially Jurisdictional Waters

Descriptions of the suspect wetlands and waterbodies identified on the subject property are provided in the table below.

SUMMARY OF SUSPECT WETLANDS AND WATERBODIES IDENTIFIED WITHIN THE SURVEY AREA

| Field Identification | Classification | Approximate Size | Potential Jurisdiction | Applicable Buffer |
|---|----------------|------------------|------------------------|-------------------|
| Wetland A (undeveloped south portion) | Forested | 8.5 acres | Likely Jurisdictional | None |

1.7.1 Federal Definition of Jurisdictional Waters of the United States

In accordance with the revised WOTUS rule promulgated on January 18, 2023 ("revised rule") (88 Fed. Reg. 3004),¹ potentially jurisdictional WOTUS include: The territorial seas and traditional navigable waters; perennial and intermittent tributaries that contribute surface water flow to such waters; certain lakes, ponds, and impoundments of jurisdictional waters; and wetlands adjacent to other jurisdictional waters. See 33 CFR 328.3 and 40 CFR 120.2, revised as of January 18, 2023. Paragraph (a) of the revised rule identifies four categories of waters that are "waters of the United States." These waters are referred to as "jurisdictional" in this notice and in the regulatory text. Paragraph (b) of the revised rule identifies those waters and features that are excluded from the definition of "waters of the United States." These waters are referred to as "non-jurisdictional" or "excluded" in this notice and as "non-jurisdictional" in the regulatory text. Paragraph (c) of the revised rule defines applicable terms.

As a baseline concept, this revised rule recognizes that waters of the United States are waters within the ordinary meaning of the term, such as oceans, rivers, streams, lakes, ponds, and wetlands, and that not all waters are waters of the United States. The revised rule includes the agencies' longstanding category of the territorial seas and traditional navigable waters. A "tributary" is defined in the revised rule as a river, stream, or similar naturally occurring surface water channel that contributes surface water flow to a territorial sea or traditional navigable water in a typical year either directly or indirectly through other tributaries, jurisdictional lakes, ponds, or impoundments, or adjacent wetlands. A tributary must be perennial or intermittent in a typical year. The alteration or relocation of a tributary does not modify its jurisdictional status as long as it continues to be perennial or intermittent and contributes surface water flow to a traditional navigable water or territorial sea in a typical year. A tributary does not lose its jurisdictional status if it contributes surface water flow to a downstream jurisdictional water in a typical year through a channelized non-jurisdictional surface water feature, through a subterranean river, through a culvert, dam, tunnel, or other similar artificial feature, or through a debris pile, boulder field, or similar natural feature. The term "tributary" includes a ditch that either relocates a tributary, is constructed in a tributary, or is constructed in an adjacent wetland as long as the ditch is perennial or intermittent and contributes surface water flow to a traditional navigable water or territorial sea in a typical year.

The revised rule defines "lakes and ponds, and impoundments of jurisdictional waters" as standing bodies of open water that contribute surface water flow in a typical year to a territorial sea or traditional navigable water either directly or through a tributary, another jurisdictional lake, pond, or impoundment, or an adjacent wetland. The agencies note that to be jurisdictional, an "impoundment of a jurisdictional water" must be an impoundment of a territorial sea or traditional navigable water, tributary, jurisdictional lake or pond, or an adjacent wetland, and must meet the conditions in paragraph (c)(6) of the revised rule. A lake, pond, or impoundment of a jurisdictional water does not lose its jurisdictional status if it contributes surface water flow to a downstream jurisdictional water in a typical year through a channelized non-jurisdictional surface water feature, through a culvert, dike, spillway, or similar artificial feature, or through a debris pile, boulder field, or similar natural feature. A lake, pond, or impoundment of a jurisdictional water is also

¹ This revised rule was challenged in three federal district courts which, together, blocked implementation of the rule in 27 states. South Carolina is one of the 27 states and, therefore, the agencies continued to apply the revised rule in South Carolina.

jurisdictional if, in a typical year, it is inundated by flooding from a territorial sea or traditional navigable water, or tributary, or from another jurisdictional lake, pond, or impoundment.

The revised rule defines “adjacent wetlands” as wetlands that abut a territorial sea or traditional navigable water, a tributary, or a lake, pond, or impoundment of a jurisdictional water; are inundated by flooding from a territorial sea or traditional navigable water, a tributary, or a lake, pond, or impoundment of a jurisdictional water in a typical year; are physically separated from a territorial sea or traditional navigable water, a tributary, or a lake, pond, or impoundment of a jurisdictional water only by a natural berm, bank, dune, or similar natural feature; or are physically separated from a territorial sea or traditional navigable water, a tributary, or a lake, pond, or impoundment of a jurisdictional water only by an artificial dike, barrier, or similar artificial structure so long as that structure allows for a direct hydrological surface connection to the territorial sea or traditional navigable water, tributary, or lake, pond, or impoundment of a jurisdictional water in a typical year, such as through a culvert, flood or tide gate, pump, or similar artificial feature. “Abut” means when a wetland touches a territorial sea, traditional navigable water, tributary, or lake, pond, or impoundment of a jurisdictional water at least at one point or side. An adjacent wetland is jurisdictional in its entirety when a road or similar artificial structure divides the wetland, as long as the structure allows for a direct hydrologic surface connection through or over that structure in a typical year.

Consistent with the U.S. District Court for the District of Arizona’s August 30, 2021, order vacating and remanding the Navigable Waters Protection Rule, promulgated April 21, 2020 (85 Fed. Reg. 22250), effective June 22, 2020, the EPA and USACE halted implementation of the Navigable Waters Protection Rule and began interpreting “waters of the United States” consistent with the pre-2015 regulatory regime, as further defined in the revised rule discussed above. An approved jurisdictional determination (AJD) is a document provided by the Corps stating the presence or absence of “waters of the United States” on a parcel or a written statement and map identifying the limits of “waters of the United States” on a parcel. See 33 CFR 331.2. Under existing Corps’ policy, AJDs are generally valid for five years unless new information warrants revision prior to the expiration date. See U.S. Army Corps of Engineers, Regulatory Guidance Letter No. 05–02, § 1(a), p. 1 (June 2005) (Regulatory Guidance Letter (RGL) 05–02). As a general matter, the agencies’ actions are governed by the rule in effect at the time the Corps completes an AJD, not by the date of the request for an AJD. Therefore, AJDs that were pending on, or received after the court’s decision will be completed consistent with the pre-2015 regulatory regime. AJDs completed prior to the court’s decision remain valid until the expiration date unless one of the criteria for revision is met under RGL 05-02, or the recipient of such an AJD requests that a new AJD be provided pursuant to the pre-2015 regulatory regime.

On August 29, 2023, the EPA and the USACE issued a new final rule further limiting the scope of WOTUS consistent with the U.S. Supreme Court’s May 25, 2023 decision in the case of *Sackett v. EPA* (as of the date of this report, not yet published in the Federal Register). The agencies are revising the 2023 Rule to remove the significant nexus standard and to amend its definition of “adjacent” as these provisions are invalid under the Supreme Court’s interpretation of the Clean Water Act in *Sackett*. See section II of this preamble for the specific amendments. Under the decision in *Sackett*, waters are not jurisdictional under the Clean Water Act based on the significant nexus standard. In addition, under the decision in *Sackett*, wetlands are not defined as “adjacent” or jurisdictional under the Clean Water Act solely because they are “bordering, contiguous, or neighboring . . . [or] separated from other ‘waters of the United States’ by man-made dikes or barriers, natural river berms, beach dunes and the like.” Therefore, under this conforming rule, waters cannot be found to be jurisdictional because they meet the significant nexus standard; nor can wetlands be found to

be jurisdictional based on the definition of “adjacent” codified in the 2023 Rule. Furthermore, as a result of the decision in Sackett invalidating the significant nexus standard, the provision for assessment of streams and wetlands under the additional waters provision of paragraph (a)(5) is no longer valid as any jurisdictional streams and wetlands are covered by paragraphs (a)(1) through (4) of the 2023 Rule.² Finally, the agencies are removing “interstate wetlands” from the 2023 Rule to conform with the decision in Sackett. The Supreme Court in Sackett examined the Clean Water Act and its statutory history and found the predecessor statute to the Clean Water Act covered and defined “interstate waters” as “all rivers, lakes, and other waters that flow across or form a part of State boundaries.” Sackett at 1337 (citing 33 U.S.C. 1160(a), 1173(e) (1970 ed.) (emphasis in original)). The Court concluded that the use of the term “waters” refers to such “open waters” and not wetlands. Id. As a result, under Sackett, the provision authorizing wetlands to be jurisdictional simply because they are interstate is invalid. The agencies will continue to interpret the remainder of the definition of “waters of the United States” in the 2023 Rule consistent with the Sackett decision. And it is both reasonable and appropriate for the agencies to promulgate this rule in response to a significant decision of the Supreme Court and, to provide administrative guidance to address other issues that may arise outside this limited rule.

Partner’s professional opinion of jurisdictional status of identified features (if any) on the subject property, is consistent with the interpretation used by EPA and USACE.

1.7.2 State Wetlands and Surface Waters Regulations

It should be noted that, the state of South Carolina has additional wetland and surface water regulations as discussed below.

Regulatory activities pertaining to wetlands are administered by South Carolina's Department of Health and Environmental Control (SCDHEC). SCDHEC's Office of Environmental Quality Control (OEQC), Bureau of Water regulates waters of the state, including wetlands, and issues §401 certifications under the Clean Water Act (CWA). Statewide, 401 Water Quality Certification is applied where a 404 permit is required by federal regulations and follow the same exemptions as those applied under the Section 404 programs by the Corps.

The state's regulation of coastal wetlands is extensive and represents a major component of wetland work in South Carolina. This additional layer of state-level regulation is coordinated by SCDHEC's Office of Ocean and Coastal Resource Management (OCRM)'s Regulatory Division. The Division regulates tideland critical areas through a direct permitting program under the state's Coastal Zone Management Act (CZMA). This program provides two-tiers of regulation. Tier One regulates tideland Critical Areas. Tier Two areas include brackish water wetlands outside the Critical Areas but within the coastal zone.

1.7.3 Local Wetlands and Surface Waters Regulations

The subject property is located within the municipal limits of the City of Florence. As such, ordinances associated with the City of Florence will apply to development at the subject property.

The City of Florence relies on the Florence Unified Development Ordinance (FUDO) to impose land use restrictions on certain lands within the City of Florence. Codes applicable to the proposed development are outlined within Part 4, Articles 12, 16, and 21, including the following:

Part 4, Article 12, Divisions 2 and 4, Sections 1 and 8 General Information and Submittal Requirements

If the area proposed for development is to impact waters of the state (WOTUS) or jurisdictional wetlands, a United States Army Corps of Engineers (USACE) determination may be required. Prior to site development, a site-specific Stormwater Pollution Prevention Plan (SWPPP) must be developed. The SWPPP must identify and delineate all WOTUS, including wetlands, within the disturbed area and/or the total area associated with the construction site.

During construction activities, there is an established forty-five-foot, undisturbed buffer required where the surface waters are classified as Level I and II Water Bodies by the City. This extended natural buffer should be located between the surface waters and the outermost sediment and erosion controls at the construction site.

Part 4, Article 16, Division 4-16.1, Sec. 12 Use Standards

Wetlands are delineated and defined specifically as wetlands according to the methodology accepted by the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency.

Part 4, Article 21, Division 6, Section 1 Submittal Requirements

All environmental areas must be delineated on site plans. General statements regarding the preservation of wetlands are required.

2.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the limited information available to complete this assessment, the south undeveloped wooded portion of the subject property appears to satisfy the three wetland criteria and wetland areas are likely to exist in this area of the subject property. The remaining portions of the subject property consist of residential development and do not appear to satisfy the three wetland criteria and wetland areas are unlikely to exist on these remaining portions of the subject property. According to the client, no ground disturbance is anticipated; therefore, additional investigation is not recommended.

It should be noted the USACE has the ultimate authority for wetlands and Waters of the United States (WOTUS) determinations. The Environmental Protection Agency (EPA) has the ultimate authority for official jurisdictional determinations; however, authority has been delegated to the USACE to give a jurisdictional determination (JD) on potential Waters of the United States.

3.0 LIMITATIONS

All conclusions expressed or implied in this report are limited by the contractual Scope of Work and standard commercial methods used to perform these services. This desktop review has been performed in general accordance with applicable guidelines that have been set forth by the USACE, EPA, and industry standards.

In preparing this report, Partner has relied solely on information that has been provided and/or derived from secondary sources and compiled data. Partner cannot and does not warrant or guarantee that the information provided by these other sources is accurate or complete. The conclusions and findings set forth in this report are strictly limited in time and scope to the date of the evaluation. No other warranties are implied or expressed. The methodologies of this records review are not intended to identify all environmental concerns which may be identified in other Environmental Site Assessments. Site reconnaissance by Partner personnel was not conducted as part of this investigation.

Acceptance and use of this report infers acknowledgment that the condition of the property may have changed after the publication of the reviewed materials and that Partner, its officers, employees, vendors, successors or assigns, are not liable for changes in the condition of the property and damages that may occur as a result of the changes.

4.0 USER RELIANCE

All reports, both verbal and written, are for the sole use and benefit of the entities identified on the cover page. This report has no other purpose and may not be relied upon by any other person or entity without the written consent of Partner.

This report has been completed under specific Terms and Conditions relating to scope, relying parties, limitations of liability, indemnification, dispute resolution, and other factors relevant to any reliance on this report. Any parties relying on this report do so having accepted the Terms and Conditions for which this report was completed. A copy of Partner's standard Terms and Conditions can be found at <http://www.partneresi.com/terms-and-conditions.php>.

5.0 SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

Partner has performed a Desktop Wetland Assessment of the property located at 1117 June Lane in the City of Florence, Florence County, South Carolina in conformance with the scope and limitations of the protocol and the limitations stated earlier in this report. Exceptions to or deletions from this protocol are discussed earlier in this report.

By signing below, Partner declares that, to the best of our professional knowledge and belief, we meet the definition of *Environmental Professional* as defined in §312.10 of 40 CFR §312. Partner has the specific qualifications based on education, training, and experience to assess a *property* of the nature, history, and setting of the subject *property*.

Prepared By:



Katie Scherr
Environmental Scientist

Reviewed By:



Amy Parker, PG, WPIT
Project Manager – Natural Resources



Katie L. Morgan, PWS, EP
Director of Natural and Cultural Resources
Professional Wetland Scientist (#3100)

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FIGURES

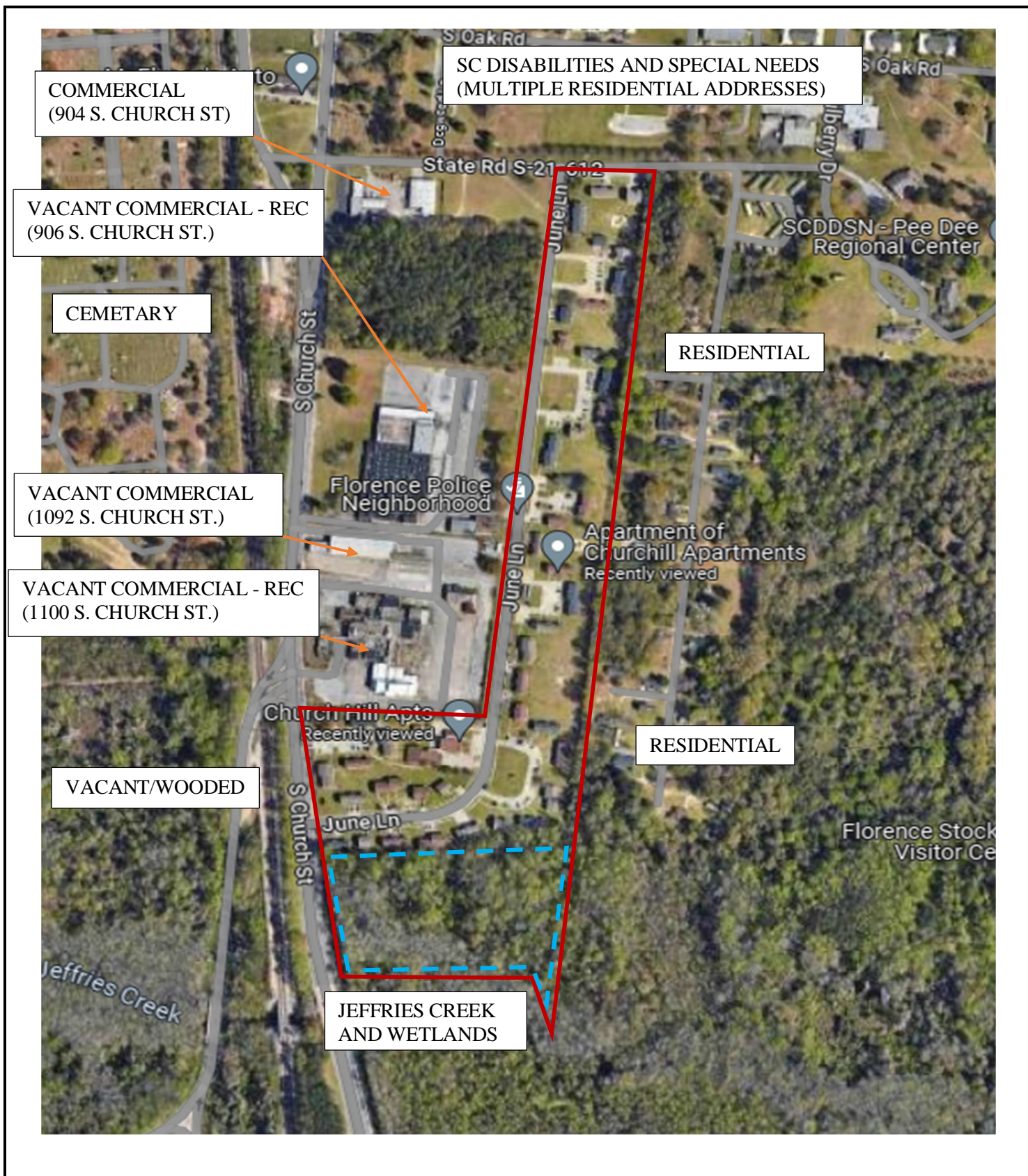
- 1. SITE LOCATION MAP**
- 2. SITE PLAN**
- 3. TOPOGRAPHIC MAP**



Drawing Not To Scale

KEY:
Subject Property 

FIGURE 1: SITE LOCATION MAP
Project No. 24-458664.2



KEY:

Subject Property

Suspect Wetlands

FIGURE 2: SITE PLAN
Project No. 24-458664.2

APPENDIX A: SUPPORTING DOCUMENTATION

EXHIBIT W

Identification of Wetlands

Company: _____

Development: _____

Development Location: _____

County: _____ Acres: _____

_____ I certify that the development listed above **does not** contain jurisdictional and non-jurisdictional wetlands.

_____ I certify that the development listed above **does** contain jurisdictional and/or non-jurisdictional wetlands and the proposed development will not disturb the wetlands. The wetlands are _____ (acres) in size, rendering the buildable percentage at _____%.

I have provided the following:

1. National Wetlands Inventory (NWI) map
2. My credentials that qualify me to make this determination.

Financial Interest: Neither I nor the company I work for have any financial interest in the proposed LIHTC application other than in the practice of our profession.



Signature and Certification of Wetlands Professional

Date



Name of Wetland Professional

Signature and Certification of Development Owner

Date

Name of Developer

Florence County, SC

Parcel Information

| | |
|-------------------|---|
| Parcel Number | 00149-01-006 |
| Location Address | 1117 JUNE LN |
| Legal Description | OFF CHURCH ST |
| | (Note: Not to be used on legal documents) |
| Deeded Acres | 0.00 |
| Property Use | CI COMMERCIAL IMPROVED |
| Tax District | 110 CITY OF FLORENCE |
| Homestead | N |

[View Map](#)

Owner

[HOUSING AUTHORITY OF FLORENCE](#)
PO DRAWER 969
FLORENCE SC 29503

Certified 2023 Tax Year Value Information

| | | |
|---|-----------------------|----------|
| + | Land Value | \$50,000 |
| + | Improvement Value | \$0 |
| + | Miscellaneous Value | \$0 |
| = | Total Appraised Value | \$50,000 |

Tax Collector

Tax Collector

No data available for the following modules: Residential Buildings, Miscellaneous Improvements, Sales.

Florence County makes every effort to produce the most accurate information possible. No warranties, expressed or implied, are provided for the data herein, its use or interpretation. The assessment information is from the last certified taxroll. All data is subject to change before the next certified taxroll.
| [User Privacy Policy](#) | [GDPR Privacy Notice](#)
[Last Data Upload: 8/6/2024, 8:39:26 PM](#)

[Contact Us](#)

Developed by
 Schneider
GEOSPATIAL

Florence County, SC

Parcel Information

| | |
|-------------------|---|
| Parcel Number | 00149-01-007 |
| Location Address | 60000 |
| Legal Description | CHURCH HILL |
| | (Note: Not to be used on legal documents) |
| Deeded Acres | 0.00 |
| Property Use | CI COMMERCIAL IMPROVED |
| Tax District | 110 CITY OF FLORENCE |
| Homestead | N |

[View Map](#)

Owner

[HOUSING AUTHORITY OF FLORENCE](#)
PO DRAWER 969
FLORENCE SC 29503

Certified 2023 Tax Year Value Information

| | |
|-------------------------|-----------|
| + Land Value | \$350,000 |
| + Improvement Value | \$0 |
| + Miscellaneous Value | \$0 |
| = Total Appraised Value | \$350,000 |

Tax Collector

Tax Collector

No data available for the following modules: Residential Buildings, Miscellaneous Improvements, Sales.

Florence County makes every effort to produce the most accurate information possible. No warranties, expressed or implied, are provided for the data herein, its use or interpretation. The assessment information is from the last certified taxroll. All data is subject to change before the next certified taxroll.
[User Privacy Policy](#) | [GDPR Privacy Notice](#)
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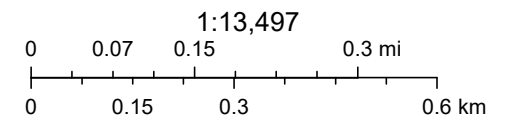
[Contact Us](#)



Untitled map



8/6/2024



500
Feet

**Subject
Property**



Year: 1941
Source: ASCS
Scale: 1" = 500'
Comment:

Address: 1117 June Lane, FLORENCE, SC
Approx Center: -79.76056085,34.17569651

Order No: 24073001051

PARTNER



**Subject
Property**

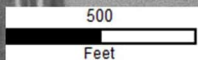


Year: 1949
Source: ASCS
Scale: 1" = 500'
Comment:

Address: 1117 June Lane, FLORENCE, SC
Approx Center: -79.76056085,34.17569651

Order No: 24073001051

PARTNER



**Subject
Property**



Year: 1957
Source: USGS
Scale: 1" = 500'
Comment:

Address: 1117 June Lane, FLORENCE, SC
Approx Center: -79.76056085,34.17569651

Order No: 24073001051

PARTNER

500
Feet

**Subject
Property**



Year: 1964
Source: USAF
Scale: 1" = 500'
Comment:

Address: 1117 June Lane, FLORENCE, SC
Approx Center: -79.76056085,34.17569651

Order No: 24073001051

PARTNER

500
Feet

**Subject
Property**



Year: 1975
Source: USGS
Scale: 1" = 500'
Comment: Best Copy Available

Address: 1117 June Lane, FLORENCE, SC
Approx Center: -79.76056085,34.17569651

Order No: 24073001051

PARTNER

500
Feet

**Subject
Property**



Year: 1983
Source: USGS
Scale: 1" = 500'
Comment:

Address: 1117 June Lane, FLORENCE, SC
Approx Center: -79.76056085,34.17569651

Order No: 24073001051

PARTNER

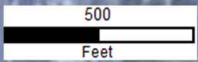


Year: 1994
Source: USGS
Scale: 1" = 500'
Comment:

Address: 1117 June Lane, FLORENCE, SC
Approx Center: -79.76056085,34.17569651

Order No: 24073001051

PARTNER



**Subject
Property**



Year: 2003
Source: USDA
Scale: 1" = 500'
Comment:

Address: 1117 June Lane, FLORENCE, SC
Approx Center: -79.76056085,34.17569651

Order No: 24073001051

PARTNER



Year: 2006
Source: USDA
Scale: 1" = 500'
Comment:

Address: 1117 June Lane, FLORENCE, SC
Approx Center: -79.76056085,34.17569651

Order No: 24073001051

PARTNER

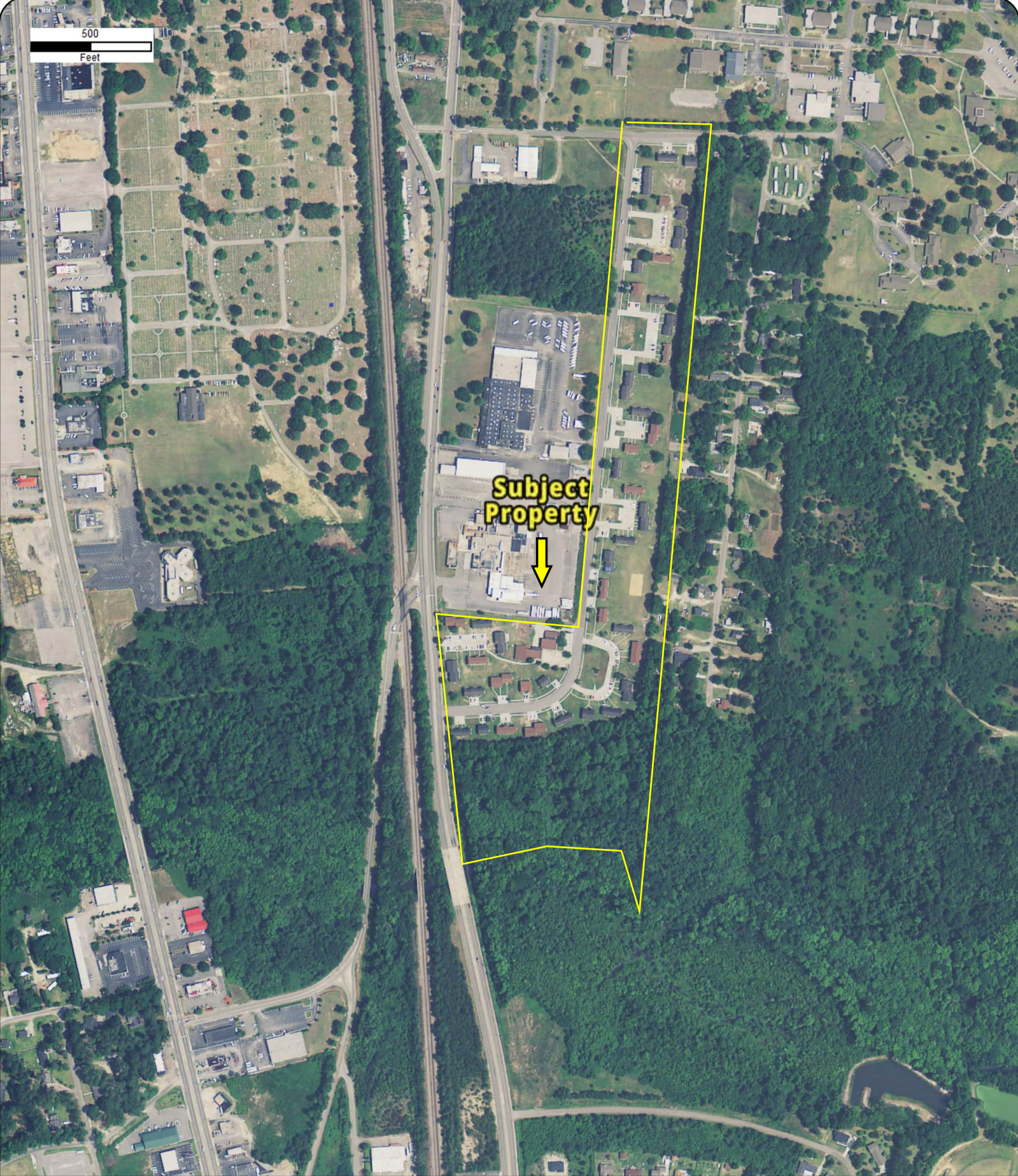


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Order No: 24073001051



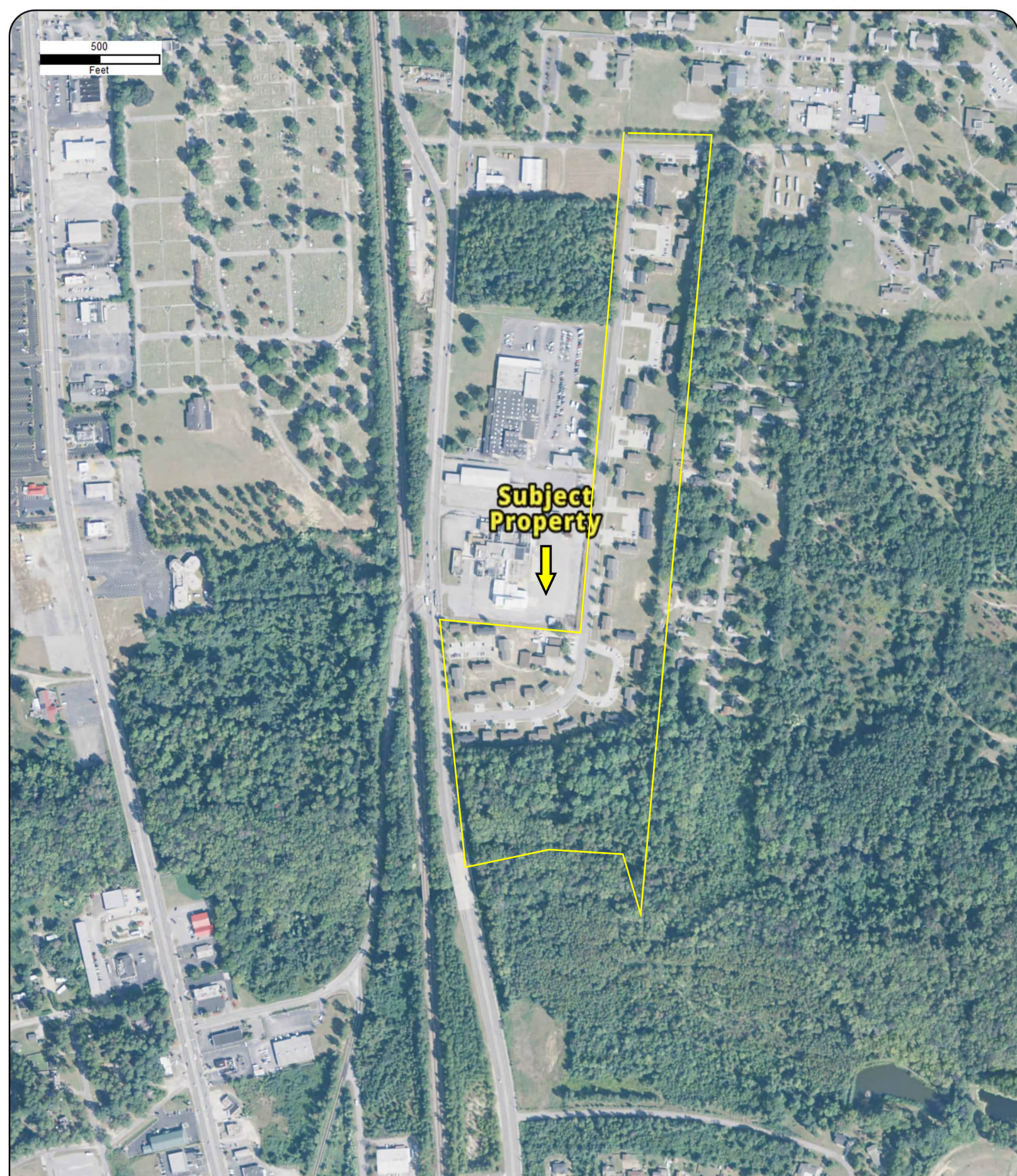


Year: 2011
Source: USDA
Scale: 1" = 500'
Comment:

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Order No: 24073001051

PARTNER

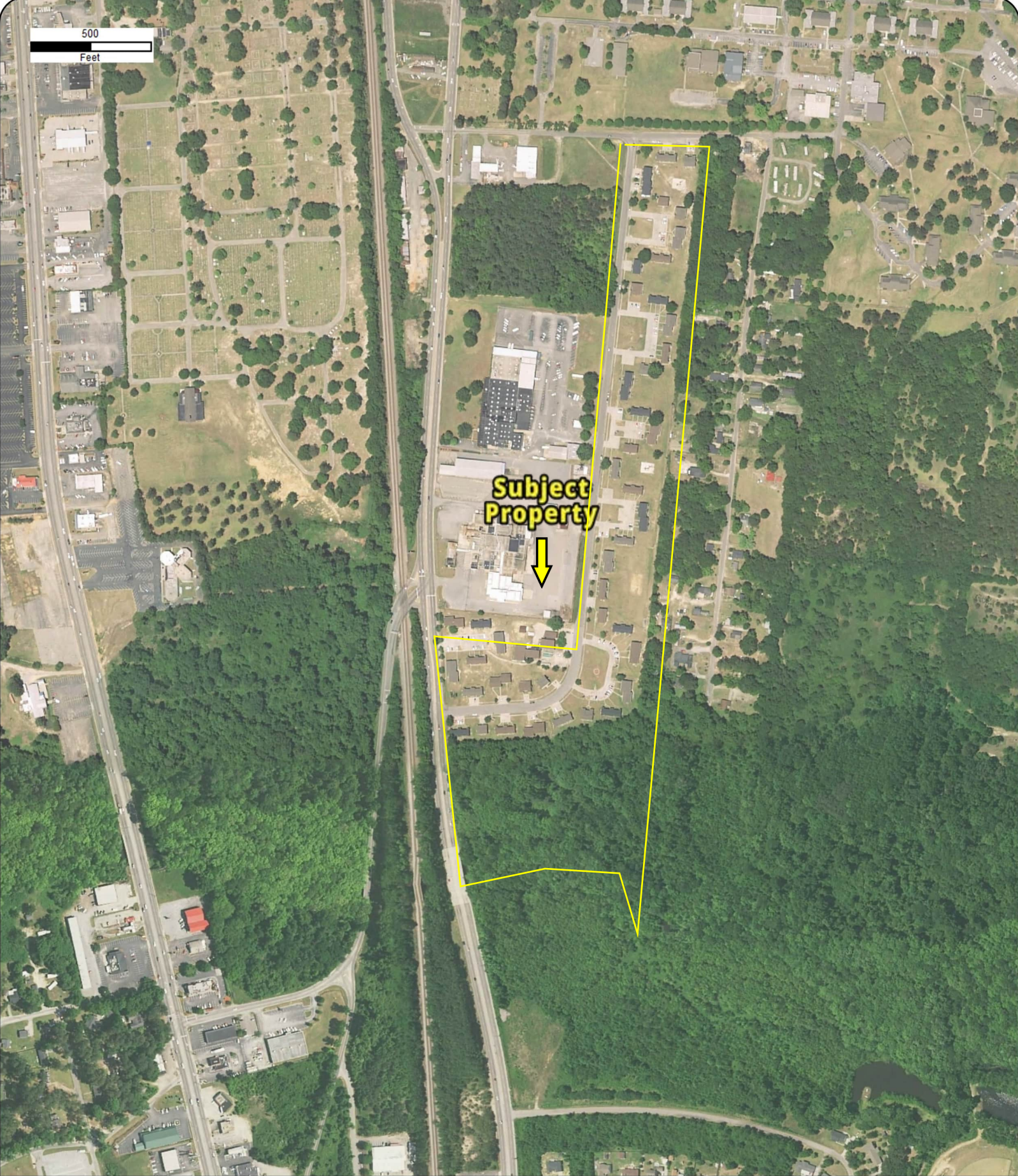


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PARTNER

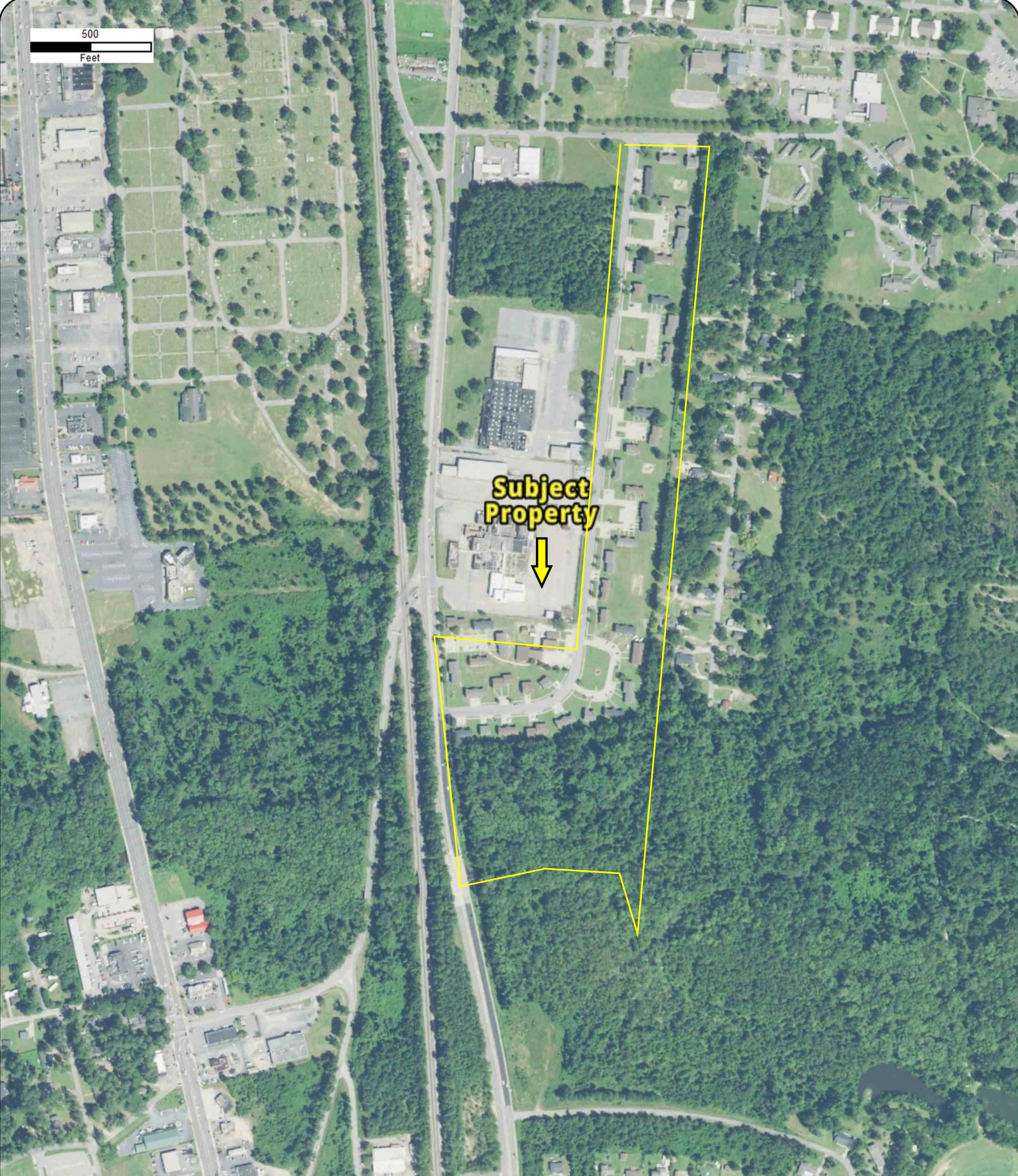


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Order No: 24073001051

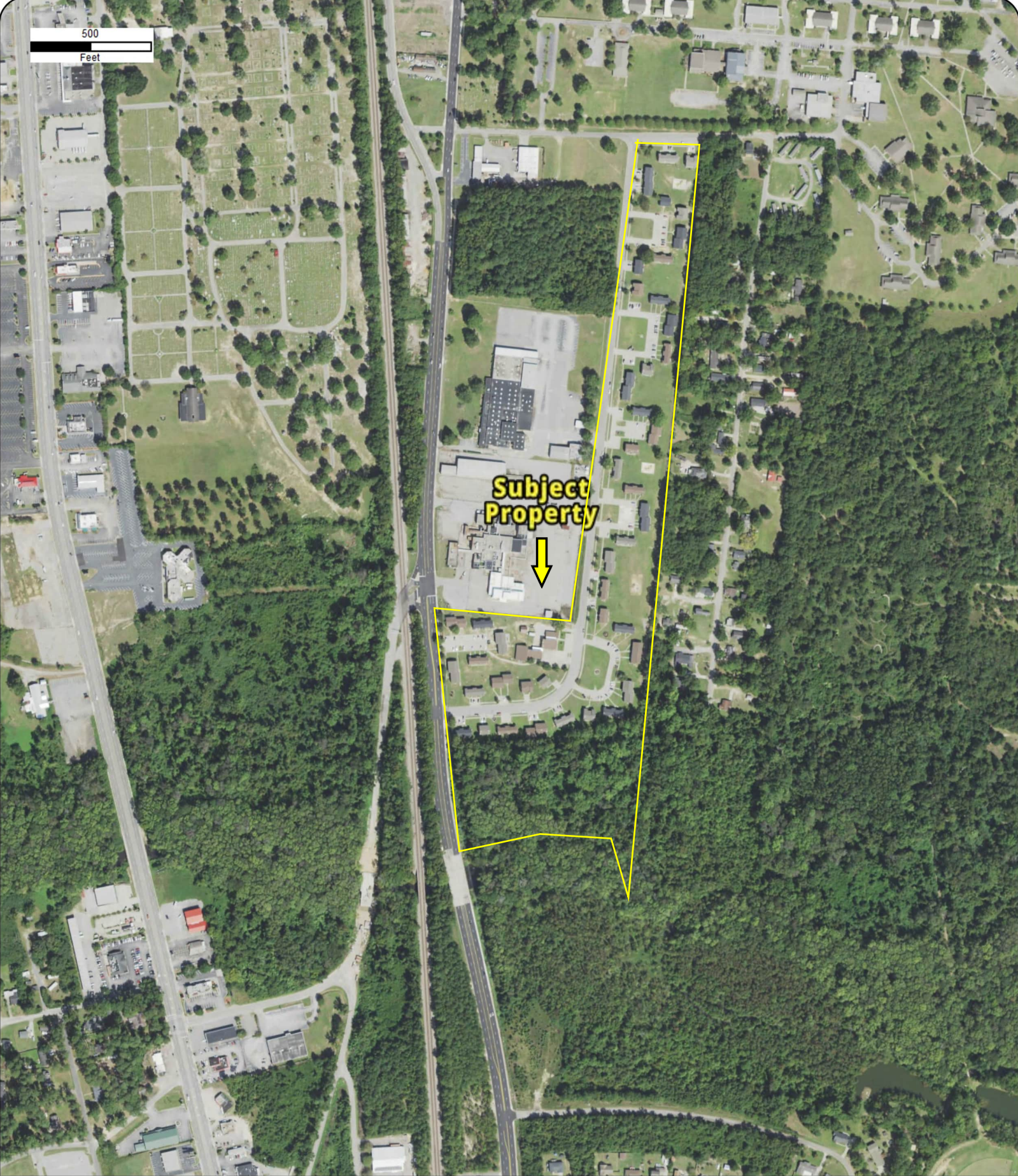




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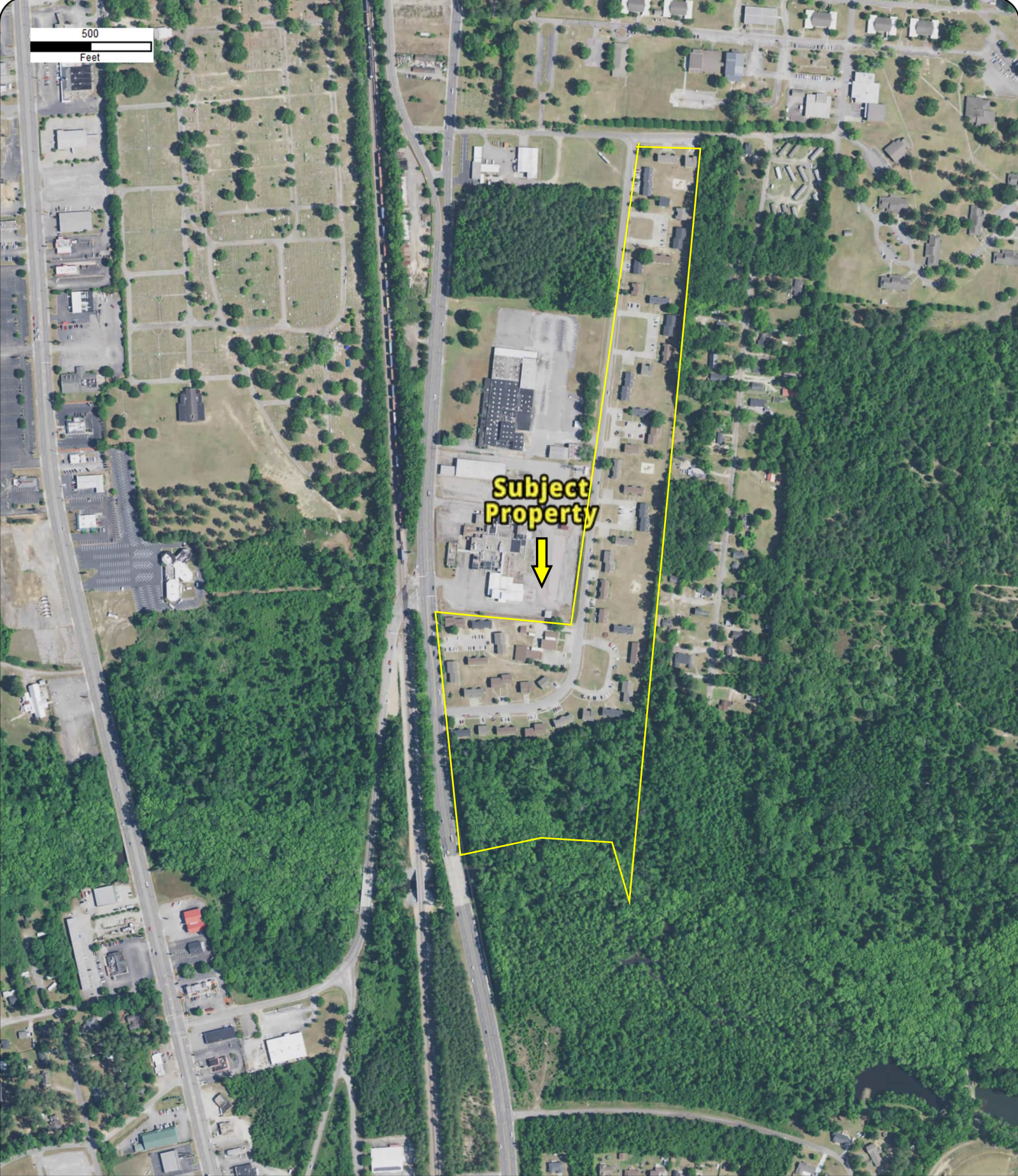


Year: 2019
Source: USDA
Scale: 1" = 500'
Comment:

Address: 1117 June Lane, FLORENCE, SC
Approx Center: -79.76056085,34.17569651

Order No: 24073001051





Year: 2021
Source: USDA
Scale: 1" = 500'
Comment:

Address: 1117 June Lane, FLORENCE, SC
Approx Center: -79.76056085,34.17569651

Order No: 24073001051



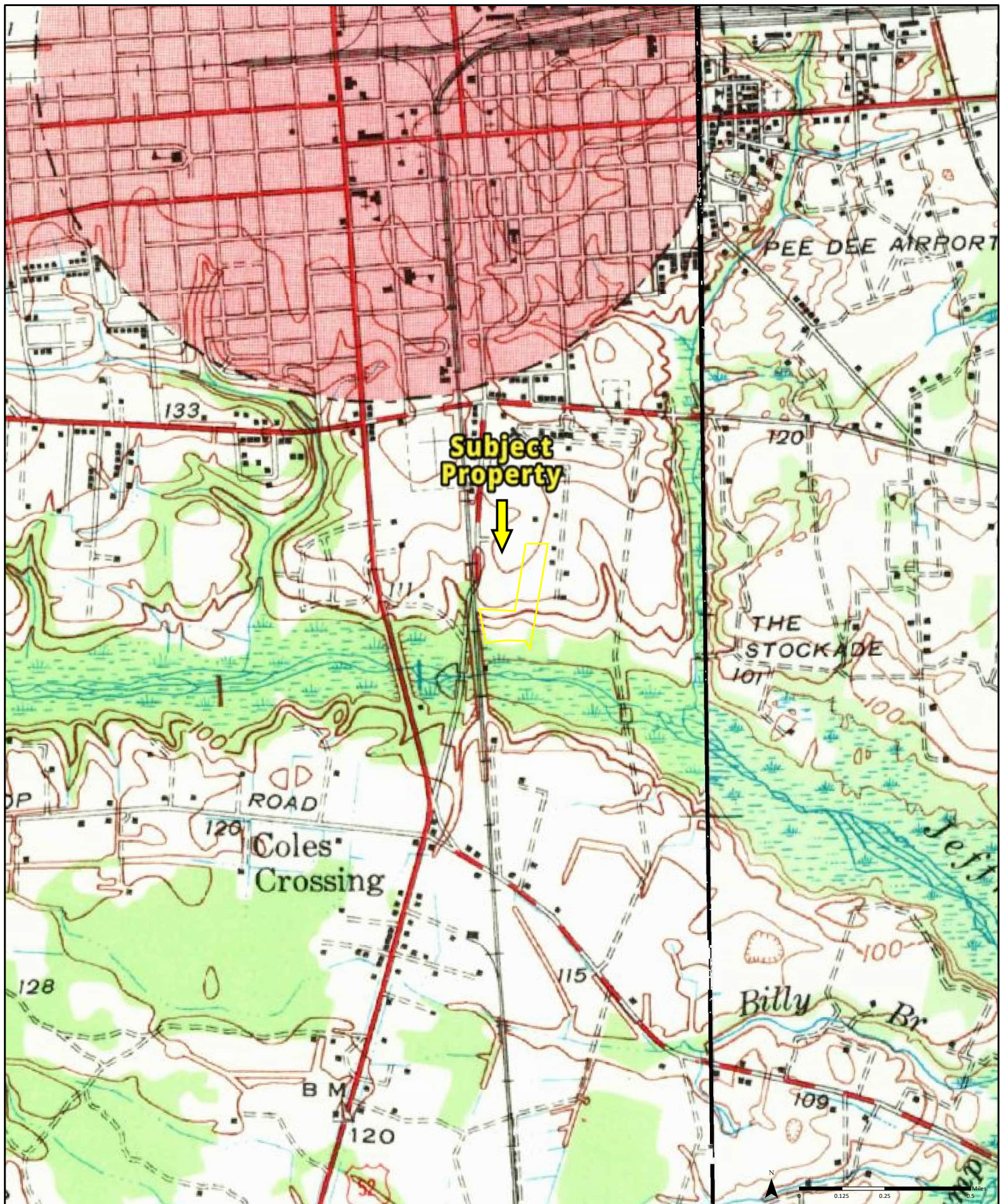


Year: 2023
Source: MAXAR
Scale: 1" = 500'
Comment:

Address: 1117 June Lane, FLORENCE, SC
Approx Center: -79.76056085,34.17569651

Order No: 24073001051





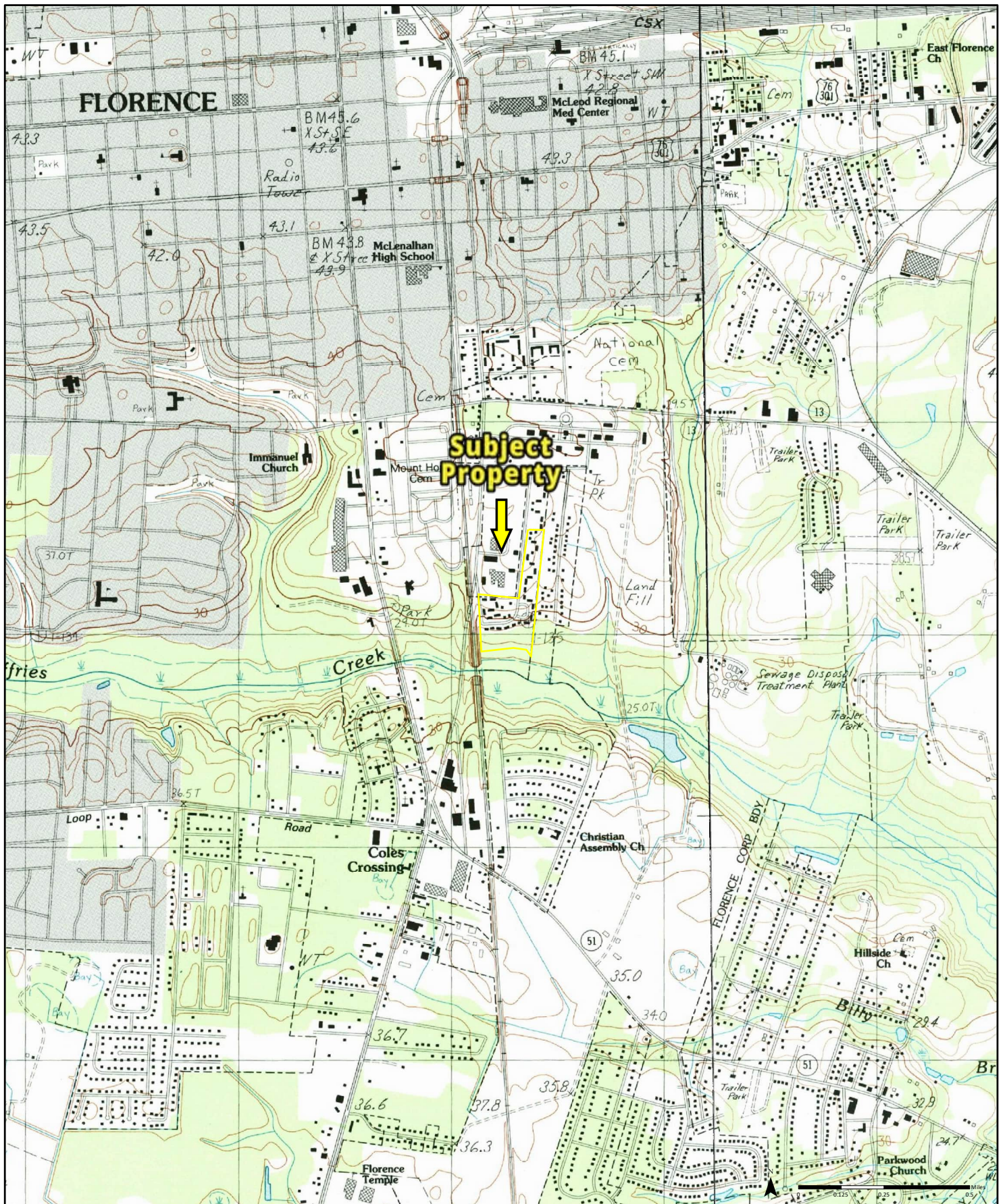
1940

Quadrangle(s): Florence West, SC
Florence East, SC

Order No. 24073001051

Source: USGS 15 Minute Topographic Map

PARTNER



1986

(1-1986)

Aerial Photo Year: 1977

(2-1986)

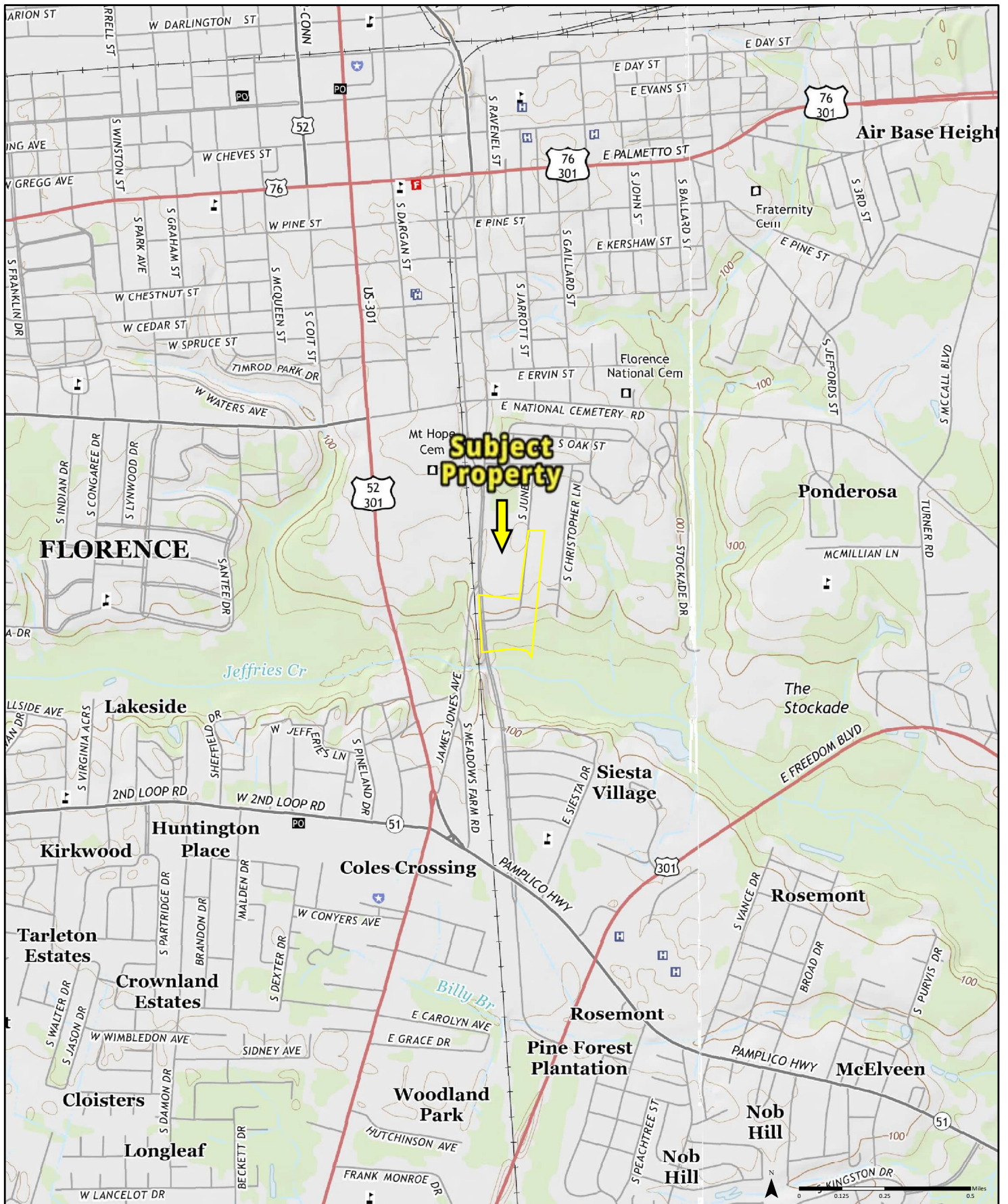
Aerial Photo Year: 1977

Quadrangle(s): Florence West, SC(2-1986)
Florence East, SC(1-1986)

Order No. 24073001051

Source: USGS 7.5 Minute Topographic Map

PARTNER



2014

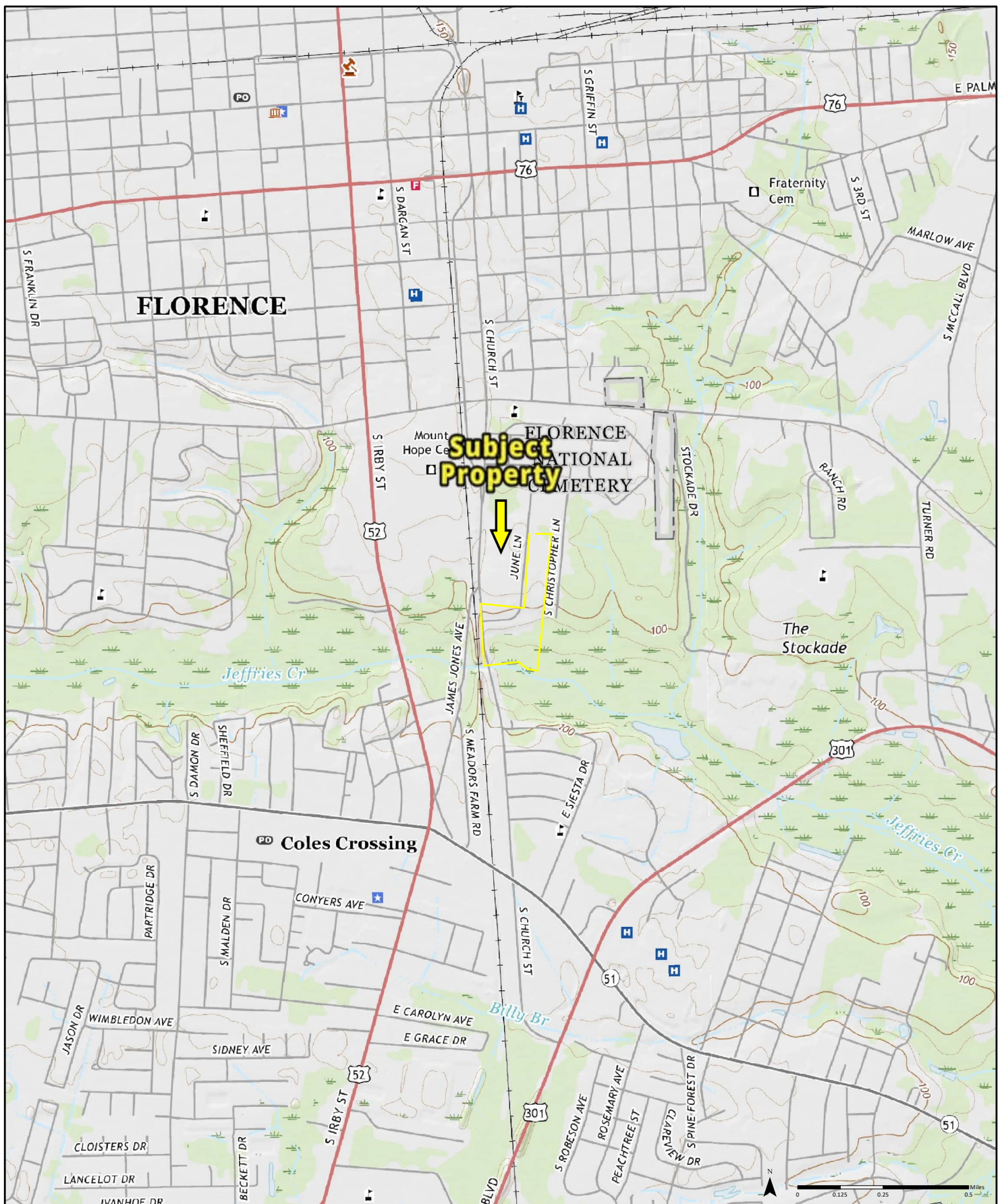
Quadrangle(s): Florence West, SC
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Order No. 24073001051

Source: USGS 7.5 Minute Topographic Map

PARTNER

PARTNER



2020

**Quadrangle(s): Florence West, SC
Florence East, SC**

Order No. 24073001051

Source: USGS 7.5 Minute Topographic Map

PARTNER

Summary Table: Characteristics of the Ecoregions of North Carolina and South Carolina

| 45. PIEDMONT | | | | | | | | | | | | |
|------------------------------|---------------------|--|--|---|--|--|---|--------------------------------------|------------------------------------|------------------------------|---|--|
| Level IV Ecoregion | Physiography | | Geology | | Soil | | Climate | | | Potential Natural Vegetation | Land Use and Land Cover | |
| | Area (square miles) | | Elevation/Local Relief (feet) | Surficial Material and Bedrock | Order (Great Group) | Common Soil Series | Temperature/Regime (Moisture) | Precipitation (Mean annual (inches)) | Frost Free (Mean annual (days)) | | | Mean Temperature (January min/max; July max/min (°F)) |
| 45a. Southern Inner Piedmont | 1320 | Dissected irregular plains, some low to high hills, ridges, and isolated monadnocks; low to moderate gradient streams with mostly cobble, gravel, and sandy substrates. | 730-1912 / 100-400 | Quaternary to Tertiary clayey, micaceous clay, quartz-rich, and sandy clay saprolite; Precambrian, Cambrian, and Ordovician gneiss, schist, granite, and amphibolite. | Utsilts (Kanhabladus, Hapludals); on floodplains Inceptisols (Dysdrudepts) and Entisols (Udalfvents, Fluvaquents) | Cecil, Picolet, Madison, Rion, Grover, Catala, Hawessee; on floodplains Chowchilla, Caney, Pocah, Enoree. | Thermic / Udic | 52-65 | 185-230 | 29-49; 65-87 | Mixed oak forest, oak-hickory-pine forest. Mostly white oak, southern red oak, black oak, mockernut and pignut hickories, some Virginia pine and shortleaf pine; on more mesic sites beech, northern red oak, tulip poplar, red maple, some hemlock. | Deciduous forest, mixed forest, pasture, some cattle and hay production, apple orchards. |
| 45b. Southern Outer Piedmont | 1278 | Dissected irregular plains, some low rounded hills and ridges; low to moderate gradient streams with mostly cobble, gravel, and sandy substrates. | 180-1510 / 100-300 | Quaternary to Tertiary clay, micaceous clay, sandy clay and sandy saprolite, with rock outcrops and joint-block boulders; Precambrian to Paleozoic schist, gneiss, granite, metavolcanic rock, amphibolite, metagabbro, metadiorite, phyllite, and quartzite. | Utsilts (Kanhabladus, Hapludals, Kandindals), Alfisols (Hapludals) on floodplains (Inceptisols) and Entisols (Udalfvents, Fluvaquents) | Cecil, Apppling, Madison, Paolot; on more mafic rocks Wilkes, Metekong, and Udic; on floodplains Inceptisols (Dysdrudepts) and Entisols (Udalfvents, Fluvaquents) | Thermic / Udic | 44-56 | 190-230 | 29-50; 67-89 | Mixed oak forest, oak-hickory-pine forest. Mostly white oak, southern red oak, black oak, mockernut and pignut hickories, some Virginia pine and shortleaf pine; on more mesic sites beech, northern red oak, tulip poplar, red maple. | Mixed forest, deciduous forest, pine plantations, pasture, urban; hay, cattle, dairy, and poultry production; some barley, oats, and wheat. |
| 45c. Carolina Slate Belt | 6454 | Dissected irregular plains, some hills, linear ridges, and isolated monadnocks; low to moderate gradient streams with mostly boulder and cobble substrates. | 165-1188 / mostly 100-300, some areas to 500 | Quaternary to Tertiary silt to clayey saprolite; Precambrian to Cambrian felsic to mafic metavolcanic rock, metamudstone, meta-argillite, phyllite, schist, some Paleozoic gabbro, diorite, and granite. | Utsilts (Kanhabladus, Hapludals), Inceptisols (Dysdrudepts) | Georgville, Herndon, Union, Badin, Goldston, Miesheimer, Clin. | Thermic / Udic | 44-49 | 185-210 in north, 200-230 in south | 29-51; 67-89 | Mixed oak forest, oak-hickory-pine forest. Mostly white oak, southern red oak, black oak, southern shagbark hickory, mockernut and pignut hickories, some Virginia pine and shortleaf pine; on monadnocks (Uwharrie) chestnut oak; near coastal plain boundary some longleaf-pine-shortleaf-pine-loblolly pine-hardwoods forest. | Mixed forest, deciduous forest, pine plantations, pasture; cattle, hay, and poultry production, some public land (Uwharrie and Sumner National Forests). |
| 45e. Northern Inner Piedmont | 4266 | Dissected irregular plains, low to high hills, ridges, and isolated monadnocks; low to moderate gradient streams with mostly cobble, gravel, and sandy substrates. | 360-2035 / 150-700 | Quaternary to Tertiary sandy clay saprolite and micaceous clay to silty clay saprolite; Cambrian gneiss, schist, and amphibolite, some Ordovician and Precambrian gneiss and granite. | Utsilts (Kanhabladus, Hapludals), Inceptisols (Dysdrudepts) | Clifford, Fairview, Halifax, Taut, Bannertown, Siler, Knob, Rhodhes, Westfield, Woolwine | Mesic / Udic | 45-55 | 170-200 | 25-08; 65-87 | Mixed oak forest, oak-hickory-pine forest. Mostly white oak, southern red oak, black oak, mockernut and pignut hickories, some Virginia pine and shortleaf pine; on monadnocks chestnut oak; on more mesic sites beech, northern red oak, tulip poplar, red maple, hemlock. | Mixed forest, deciduous forest, pasture; hay, cattle, poultry, and tobacco production. |
| 45f. Northern Outer Piedmont | 2705 | Dissected irregular plains, some low rounded hills and ridges; low to moderate gradient streams with mostly cobble, gravel, and sandy substrates. | 130-600 / 100-250 | Quaternary to Tertiary sandy clay and sandy saprolite with rock outcrops and joint-block boulders; Cambrian gneiss, schist, and amphibolite, some Pennsylvanian to Permian granite. | Utsilts (Kanhabladus, Hapludals); on floodplains Inceptisols (Dysdrudepts) | Cecil, Picolet, Madison, Wedlowe, Rion, some Georgville and Nason in Eastern State Belt area; on floodplains Wehachee, Chowchilla; some coastal plain soils on uplands near 65m. | Thermic / Udic | 44-46 | 185-210 | 28-49; 67-89 | Mixed oak forest, oak-hickory-pine forest. Mostly white oak, southern red oak, black oak, mockernut and pignut hickories, some shortleaf pine and loblolly pine; near coastal plain boundary some longleaf-pine-shortleaf-pine-loblolly pine-hardwoods forest. | Mixed forest, deciduous forest, pine plantations, pasture; tobacco, cattle, hay, and poultry production; urban. |
| 45g. Triassic Basins | 1418 | Dissected irregular plains, some low rounded hills and ridges; low to moderate gradient streams with mostly sand and clay substrates; relatively wider floodplains than other Piedmont ecoregions. | 190-1000 / 100-300 | Quaternary to Tertiary red sandy loam to silty clay decomposition residue; on floodplains (Inceptisols) and Entisols (Endoaqupts, Udalfvents); some minor coal, Jurassic diabase dikes and sills. | Utsilts (Hapludals), Alfisols (Hapludals) on floodplains (Inceptisols) and Entisols (Udalfvents) | Maydon, Creedmore, White Store, Plakton, Plotter, Stone, Chowchilla, and Dan River Basin Clarks, Lackland, Wadsworth, Wolftrap, Dan River. | Thermic (Mesic in Dan River Basin) / Udic | 44-48 | 180-220 | 27-49; 66-88 | Mixed oak forest, oak-hickory-pine forest. Mostly white oak, southern red oak, black oak, mockernut and pignut hickories, some Virginia pine and shortleaf pine; on more mesic sites beech, northern red oak, tulip poplar, red maple; some bottomland hardwood forest (bottomland oaks, red maple, sweetgum, green ash, American elm). | Mixed forest, deciduous forest, pine plantations, pasture, urban. |
| 45i. Kings Mountain | 289 | Hills and linear ridges, some irregular plains; moderate gradient streams with bedrock, boulder, cobble, gravel, and sand substrates. | 400-1600 / 200-500 | Quaternary to Tertiary micaceous saprolite, quartz-rich saprolite; Precambrian quartz-sericite schist, metavolcanic rock, quartz-pebble metaconglomerate, quartzite, Cambrian sericite schist, phyllite, quartzite, marble, amphibolite. | Utsilts (Hapludals, Kanhabladus), Inceptisols (Dysdrudepts) | Tatum, Georgville, Herndon, Badin, Goldston, Mantro | Thermic / Udic | 47-49 | 190-220 | 28-50; 66-88 | Mixed oak forest and oak-hickory-pine forest; Piedmont monadnock forest (chestnut oak, white oak, scarlet oak, post oak, mockernut and pignut hickories, Virginia pine, shortleaf pine); some Virginia pine-dominated woodlands on high ridges. | Mixed forest, deciduous forest, some pine plantations and pasture. |

| 63. MIDDLE ATLANTIC COASTAL PLAIN | | | | | | | | | | | | |
|---|---------------------|--|--------------------------------|---|---|---|-------------------------------|--------------------------------------|--|------------------------------|---|---|
| Level IV Ecoregion | Physiography | | Geology | | Soil | | Climate | | | Potential Natural Vegetation | Land Use and Land Cover | |
| | Area (square miles) | | Elevation/ Local Relief (feet) | Surficial Material and Bedrock | Order (Great Group) | Common Soil Series | Temperature/ Moisture Regimes | Precipitation (Mean annual (inches)) | Frost Free (Mean annual (days)) | | | Mean Temperature (January minimum; July maximum (°F)) |
| 63b. Chesapeake-Pamlico Lowlands and Tidal Marshes | 2226 | Low, flat plains and peninsulas; poorly drained with swamps, some low gradient streams with sandy and silty substrates, a few large lakes, estuaries and sounds. | 0-25 / 5-20 | Late Pleistocene marine sand, silt, and clay. | Utsilts (Endoaqupts, Umbrinops), Inceptisols (Humagappts), Alfisols (Endoaqupts), Histosols (Haplospists) | Tomoley, Roanoke, Perquimans, Pasquotank, Hyde, Delos, Portsmouth, Cape Fear, Wards, Roper, Annapolis, Yomges, Arden, Doran, Currituck | Thermic / Aquic | 48-55 | 210-230 | 32-52; 69-88 | Wet hardwood forest (bottomland oaks, tulip poplar, sweetgum, maple, swamp tupelo); mesic mixed hardwood forest (beech, tulip poplar, maple, oaks, sweetgum); some pond pine woodlands and longleaf pine; tidal and nonriverine cypress-swamp. | Cropland with wheat, corn, soybeans, potatoes, cotton, and peanuts; evergreen forest, mixed forest, forested wetlands, pine plantations, pasture, marsh. |
| 63c. Nonriverine Swamps and Peatlands | 1692 | Low, broad flats and interstream divides, poorly drained, a few lakes, low stream density; channelized drainage is common. | 5-50 / 5-25 | Holocene peat and silty to clayey swamp deposits; Pleistocene marine sand, silt, and clay. | Histosols (Haplospists), Inceptisols (Humagappts) | Pungs, Dene, Berhaven, Potzer, Doran, Wards, Scuppernon, Roper, Thornburg, Croatan | Thermic / Aquic | 50-56 | 210-235 | 32-54; 69-89 | Pocosins (litter-rich, t-t, jackberry, pond pine); pond pine woodland; Atlantic white cedar forest; nonriverine swamp forest (bald cypress, pond cypress, swamp tupelo, loblolly pine, red maple) | Forested wetlands, evergreen forest, mixed forest, some cropland and pine plantations. |
| 63d. Virginian Barrier Islands and Coastal Marshes | 63 | Barrier islands, dunes, beaches, lagoons, estuaries, tidal marshes. | 0-30, some dunes to 60 / 5-30 | Holocene beach and dune sand, saline marsh deposits of sand, silt, clay, and peat. | Entisols (Salfaqupts, Psammagappts, Quartzisols), Histosols (Haplospists) | Bobicket, Currier, Currituck in tidal marshes; Corolla, Newland, Duckston on beach dunes and flats. | Thermic / Aquic | 48 | 220-230 | 33-52; 69-87 | Salt and brackish marshes (cordgrass, saltgrass, rushes); tidal freshwater marsh (corydalis, sawgrass, cattail, wild rice); maritime shrub (oak myrtle, yampou); maritime dry grassland (saltmeadow cordgrass); maritime evergreen forest (live oak, sand laurel oak, loblolly pine); dune grass (beach grass, sea oats). | Marsh, forested wetland, evergreen forest, urban, wildlife habitat, beaches, recreation, fish and shellfish production. |
| 63e. Mid-Atlantic Flatwoods | 2755 | Flat plains on lightly dissected marine terraces; swamps, low gradient streams with sandy and silty substrates. | 2-100 / 5-75 | Pleistocene and Pliocene marine sand, silt, and clay. | Utsilts (Palaqupts, Paleudals, Albiqupts, Hapludals) | Rains, Lynnhburg, Goldsboro, Leaf, Craven, Lenoir, Noboco, Pantego | Thermic / Aquic, Udic | 46-50 | 200-230 | 30-52; 68-89 | Mesic pine flatwoods (longleaf pine, loblolly pine, oaks, hickories, bluestem); wet pine flatwoods (longleaf pine with loblolly or pond pine); pine savanna (longleaf pine, pond pine, bluestem); pond pine woodland; some oak-hickory and mixed forest. | Pine plantations, cropland with peanuts, cotton, corn, soybeans, tobacco, wheat, chickens, and hogs; pasture, mixed and deciduous forest. |
| 63f. Carolinian Barrier Islands and Coastal Marshes | 557 | Barrier islands, dunes, beaches, lagoons, estuaries, tidal marshes. | 0-30, some dunes to 100 / 5-30 | Holocene beach and dune sand, saline marsh deposits of sand, silt, clay, and peat. | Entisols (Salfaqupts, Psammagappts, Hydraqqupts, Quartzisols/pansments) | Bobicket, Currier, Hoboken in tidal marshes; Corolla, Newland, Duckston, Frapp on beach dunes and grass. | Thermic / Aquic | 50-56 | 240-260 | 35-53; 72-86 | Salt and brackish marshes (cordgrass, saltgrass, rushes); maritime shrub (oak myrtle, yampou); maritime dry grassland (saltmeadow cordgrass); maritime evergreen forest (live oak, sand laurel oak, loblolly pine); dune grass (sea oats, bitter panic grass, cordgrass, beach grass). | Marsh, forested wetland, evergreen forest, urban, wildlife habitat, beaches, tourism, recreation, fish and shellfish production. |
| 63h. Carolina Flatwoods | 11510 | Flat plains on lightly dissected marine terraces; swamps, low gradient streams with sandy and silty substrates; Carolina bays. | 2-195 / 5-75 | Pleistocene and Pliocene marine sand, silt, and clay; Tertiary sand, silt, clay, and limestone, some Cretaceous sand, silt, and clay. | Utsilts (Palaqupts, Paleudals, Endoaqupts), Albiqupts (Alaquods), Spodosols (Alaquods), Entisols (Quartzisols/pansments), Histosols (Haplospists) | Goldsboro, Lynchburg, Rains, Coxville, Wake, Blades, Ainger, Cosaw, Noboco, (Endoaqupts), Woodington, Leon, Kureb, Yanhank, Yemassee, Ogeechee, Croatan | Thermic / Aquic, Udic | 46-53 | 210-240 in the north, 230-250 in the south | 33-55; 70-90 | Longleaf-pine-wiregrass; xeric sandhill scrub (longleaf-pine-turkey oak-wiregrass); pond pine forest and woodland; some oak-hickory and mixed forest. | Pine plantations, mixed forest, forested wetlands, cropland of cotton, corn, soybeans, wheat, peanuts, tobacco, blueberries; production of hogs, broilers, and turkeys; some public land, wildlife habitat. |
| 63i. Mid-Atlantic Floodplains and Low Terraces | 2193 | Major river floodplains and associated low terraces; low gradient streams with sandy and silty substrates, oxbow lakes, ponds, swamps. | 2-130 / 5-25 | Holocene alluvial silt, clay, and gravelly sand; local swamp deposits and organic muck; some late Pleistocene alluvial and estuarine sand and silt. | Inceptisols (Endoaqupts, Dysdrudepts, Humagappts), Entisols (Udalfvents), Utsilts (Hapludals), Umbrinops (Endoaqupts), Alfisols (Albaqupts) | Johnson, Muckalee, Hoston, Doran, Dorwan, Chastain, Johns, Kenaville, Roanoke, Lumbie, Paxville, Meggett, Tawcow, Chewacha, Hecow (Albaqupts) | Thermic / Aquic, some Udic | 46-54 | 210-240 in the north, 230-250 in the south | 32-54; 69-90 | Southern floodplain forest. Includes cypress-gum swamp (water tupelo, swamp tupelo, bald cypress, pond cypress) and bottomland hardwood forest (bottomland oaks, red maple, sweetgum, green ash, bitternut hickory). | Forested wetlands, deciduous forest, some cropland on larger terraces. |

| 65. SOUTHEASTERN PLAINS | | | | | | | | | | | |
|--|---------------------|-------------------------------|---|--|---|-----------------------------|--------------------------------------|------------------------------------|---|--|---|
| Level IV Ecoregion | Physiography | | Geology | | Soil | | Climate | | | Potential Natural Vegetation | Land Use and Land Cover |
| | Area (square miles) | Elevation/Local Relief (feet) | Surficial Material and Bedrock | Order (Great Group) | Common Soil Series | Temperature/Moisture Regime | Precipitation (Mean annual (inches)) | Frost Free (Mean annual (days)) | Mean Temperature (January, minimum; July, maximum (°F)) | | |
| 65c. Sand Hills | 5147 | 100-720 / 100-300 | Quaternary medium to coarse sand decomposition residue, loamy sand, sandy loam and sandy clay decomposition residue; Cretaceous sand, sandstone, and limestone; Tertiary sand and clayey sand. | Utsilts (Palaqupts, Hapludals, Kanhabladus, Kandulids), Entisols (Quartzisols) | Blaney, Candor, Lakeland, Gilead, Vaulcuse, Ayley, Dothan, Puckney, Wagman, Pelton, Alpin, Troy, Lucy | Thermic / Udic | 44-48 | 200-220 in north, 215-240 in south | 30/52; 68/90 | Pine-scrub oak sandhill (longleaf pine, turkey oak, blackjack oak, bluestack oak, wiregrass); xeric sandhill scrub (longleaf pine, turkey oak, wiregrass); streambank pocosins (pond pine, red maple, tulip poplar, evergreen shrub). | Pine plantations, mixed forest, pasture, recreation, some cropland and peach orchards. |
| 65d. Atlantic Southern Loam Plains | 6459 | 50-660 / 100-200 | Quaternary sand and clay decomposition residue, marine sand, silt, and clay; Tertiary and Cretaceous sand, clay, and gravel. | Utsilts (Kandulids, Palaqupts, Paleaqupts) | Norfolk, Lynchburg, Goldsboro, Rain, Wagman, Aquia, Coville, and Orangeburg, Dothan, Fugate, Varnia, Fairview, Noboco, Troy, Marlboro, Barlow | Thermic / Udic, some Aquic | 44-49 | 200-240 | 31/55; 68/90 | Mesic pine flatwoods (longleaf pine, loblolly pine, oaks, hickories, wiregrass); pine-scrub oak sandhill (longleaf pine, turkey oak, blackjack oak, bluestack oak, wiregrass); oak-hickory forest (southern red oak, post oak, hickories, pines); some mesic mixed hardwood forest (beech, tulip poplar, maple, white oak, red oak, sweetgum). | Cropland and pasture with soybeans, corn, wheat, cotton, tobacco, hogs, and hay; in SC, peach orchards on the Ridge (Edgewater & Saluda counties); some pine plantations, mixed forest, forested wetlands, and urban. |
| 65e. Rolling Coastal Plain | 5182 | 30-460 / 100-200 | Quaternary sand and clay decomposition residue, middle and early Pleistocene marine sand, silt, and clay; Pliocene clay and sand; sporadic and some Piedmont rock outcrops on side slopes near 45°. | Utsilts (Kandulids, Palaqupts, Hapludals, Paleaqupts); some Kanhabladus on Appling on side slopes near 45° | Norfolk, Goldsboro, Rain, Wagman, Emporia, Coville, Lynchburg, Ayrville, and Orangeburg | Thermic / Udic, some Aquic | 44-51 | 200-220 | 29/51; 68/89 | Mesic pine flatwoods (longleaf pine, loblolly pine, oaks, hickories, wiregrass); oak-hickory forest (southern red oak, post oak, hickories, pines); some mesic mixed hardwood forest (beech, tulip poplar, maple, white oak, red oak, sweetgum). | Cropland and pasture with cotton, soybeans, corn, wheat, sweetpotatoes, peanuts, tobacco, hogs, and chickens; some pine plantations, mixed forest, and forested wetlands. |
| 65f. Southeastern Floodplains and Low Terraces | 2458 | 15-200 / 5-35 | Quaternary alluvial gravelly sand, sandy gravel, silt, and clay. | Inceptisols (Endoaqupts, Dystrudepts), Histosols (Haploglossis), Entisols (Udalfvents), Utsilts (Hapludals, Umbrinops, Endoaqupts) | Johnston, Bibb, Clinton, Dyer, Milledgeville, Chastain, Riverogue, Congaree, Roanoke, Wickham, Alveston, State, Cape Fear, Waiber, Tawara, Rutledge | Thermic / Aquic, some Udic | 45-50 | 200-240 | 31/54; 68/89 | Southern floodplain forest. Includes bottomland hardwood forest and cypress-gum swamp (water tupelo, swamp tupelo, bald cypress, pond cypress). | Forested wetlands, deciduous forest; cropland and pasture where drained and protected from flooding. |

| 66. BLUE RIDGE | | | | | | | | | | | |
|--|---------------------|-------------------------------|--|---|--|--|--------------------------------------|---------------------------------|---|---|---|
| Level IV Ecoregion | Physiography | | Geology | | Soil | | Climate | | | Potential Natural Vegetation | Land Use and Land Cover |
| | Area (square miles) | Elevation/Local Relief (feet) | Surficial Material and Bedrock | Order (Great Group) | Common Soil Series | Temperature/Moisture Regimes | Precipitation (Mean annual (inches)) | Frost Free (Mean annual (days)) | Mean Temperature (January, minimum; July, maximum (°F)) | | |
| 66c. New River Plateau | 443 | 2350-4175 / 500-1200 | Quaternary to Tertiary sandy to clayey saprolite, some mafic-boulder loamy colluvium; Precambrian gneiss, schist, and amphibolite. | Inceptisols (Dysdrudepts), Humagappts, Utsilts (Hapludals), Kanhapludals, Entisols (Udalfments) | Evard, Ashe, Hayessville, Clifton, Chandler, Watanga on uplands; Colford, Towsay on floodplains. | Mesic / Udic | 45-55 | 150-170 | 21/42; 58/80 | Appalachian oak forest. Includes northern red oak, white oak, and chestnut oak forests; montane oak-hickory forest; cove forests (tulip poplar, basswood, beeches, yellow birch, beech, hemlock, northern red oak). | Deciduous forest, mixed forest, pasture and cropland with hay, cattle, tobacco, and Christmas trees. |
| 66d. Southern Crystalline Ridges and Mountains | 4432 | 850-5500 / 1000-3500 | Quaternary to Tertiary granitic bedrock; colluvium; loamy colluvium, sandy to clayey saprolite; Precambrian granite, gneiss, schist, quartzite, metagraywacke, metavolcanic rock, and amphibolite, some Paleozoic gneiss and quartz diorite. | Inceptisols (Dysdrudepts), Humagappts, Utsilts (Hapludals), Kanhapludals | Ashe, Evard, Cosm, Hayessville, Clifton, Fanning, Watanga, Pilot, Edneyville, Chestnut, Edneytown, Porters, Hayessville, Castles, Shalala, Talsade, Wadhwa on uplands; Tate, Tusquegee, Cullasaga on colluvium; Debbwood, Midway on floodplains. | Mesic / Udic, some Aquic in narrow floodplains | 45-50 in north, 50-100 in south | 145-190 | 19-26/38-48; 55-62/75-84 | Appalachian oak forest. Includes northern red oak, white oak, and chestnut oak forests; montane oak-hickory forest, pine-oak-hickory woodlands (Virginia pine, table-mountain pine, pitch pine, scarlet oak); cove forests (tulip poplar, basswood, beeches, yellow birch, beech, hemlock, northern red oak). At high elevations, northern hardwoods forest (beech, yellow birch, yellow poplar, maples). | Deciduous and mixed forest; large areas of public land (Pisgah, Nantahala, and Smoky National Forests) for some private land, small clearings for pasture or orchards on less steep land; tourism, recreation, hunting, and forestry. |
| 66e. Southern Sedimentary Ridges | 37 | 1280-5085 / 1500-3600 | Quaternary to Tertiary sandy clay colluvium and colluvium with boulders or huge blocks; Cambrian sandstone, siltstone, shale, dolomite, and conglomerate. | Inceptisols (Dysdrudepts), Utsilts (Hapludals) | Disney, Utsilo, Catsaka, Junalsika, Spivey, Tsali | Mesic / Udic | 45-50 | 150-170 | 20-26/43-47; 56-62/76-82 | Appalachian oak forest. Includes northern red oak, white oak, and chestnut oak forests; montane oak-hickory forest; cove forests (tulip poplar, basswood, beeches, yellow birch, beech, hemlock, northern red oak). At high elevations, northern hardwoods forest (beech, yellow birch, yellow poplar, maples). | Deciduous and mixed forest, mostly public land (Pisgah National Forest); tourism, recreation, hunting, and forestry. |
| 66f. Southern Metasedimentary Mountains | 1677 | 1200-5400 / 2000-3500 | Quaternary to Tertiary arkosic metasedimentary bedrock colluvium; Pre-Cambrian metagraywacke, metasilicite, metacarbonate, slate, schist and sulfidic schist, meta-arkose, and phyllite, some Cambrian sulfidic schists. | Inceptisols (Dysdrudepts), Hapludisols, Utsilts (Hapludals) | Brastown, Junalsika, Soco, Stecoah, Cheach, Syko on colluvium; Spivey, Whiteoak on floodplains. | Mesic / Udic | 55-80 | 150-190 | 20-27/41-48; 55-63/76-85 | Appalachian oak forest. Includes northern red oak, white oak, and chestnut oak forests; montane oak-hickory forest; pine-oak-hickory woodlands (Virginia pine, table-mountain pine, pitch pine, scarlet oak); cove forests (tulip poplar, basswood, beeches, yellow birch, beech, hemlock, northern red oak). At high elevations, northern hardwoods forest (beech, yellow birch, yellow poplar, maples). | Deciduous and mixed forest; large areas of public land (Nantahala and Pisgah National Forests, Great Smoky Mountains National Park); tourism, recreation, hunting, and forestry. |
| 66g. High Mountains | 316 | 4500-6684 / 1500-2100 | Quaternary to Tertiary granitic or metasedimentary bedrock colluvium; Precambrian metagraywacke, schist, and amphibolite, some quartzite, and gneiss. | Inceptisols (Hapludrepts) | Wayah, Oconalufte, Burton, Crogan, Clingman, Tanton, Balsam | Frigid / Udic | 75-100+ | 130-140 | 18/36; 54/69 | Southeastern spruce-fir forest (Fraser fir, red spruce, yellow birch, rhododendron); northern hardwoods forest (beech, yellow birch, yellow poplar, maples); grass bald (montane oak) and heath balds (rhododendron). | Evergreen forest, deciduous forest, mostly public land (Nantahala and Pisgah National Forests, Great Smoky Mountains National Park); tourism, recreation, hunting, and forestry. |
| 66h. Broad Basins | 986 | 1575-3280 / 250-700 | Intermontain basins with low mountains, rolling foothills, and moderately broad mountain valleys. Moderate gradient streams with cobble and boulders, low to moderate gradient rivers with sand and bedrock substrates. | Quaternary to Tertiary sandy, silty, and clayey saprolite with some rock outcrops and joint-block boulders; quartz-rich saprolite; Precambrian gneiss, schist, amphibolite, and quartzite in southwest; metasediment, metasilicite, schist, metaconglomerate, quartzite, slate. | Utsilts (Hapludals), Kanhapludals, Entisols (Udalfments), Inceptisols (Dysdrudepts, Humagappts) | Mesic / Udic, some Aquic in narrow floodplains | 40-55 | 155-190 | 21/47; 64/84 | Appalachian oak forest. Mostly dry-mesic oak-hickory forest (white oak, southern red oak, black oak, hickories, pines), some chestnut oak forest (chestnut oak, scarlet oak, northern red oak, hickories, hemlock, red maple, pine-oak-hickory woodlands (Virginia pine, shortleaf pine, pitch pine, scarlet oak)). | Pasture and cropland with hay, cattle, corn for silage, apples, and tobacco; urban and suburban, deciduous forest, mixed forest. |
| 66i. Amphibolite Mountains | 130 | 2950-5400 / 1000-2000 | Quaternary to Tertiary mafic boulder loamy colluvium, granitic bedrock colluvium; Precambrian amphibolite, gneiss, and schist. | Inceptisols (Dysdrudepts), Utsilts (Hapludals) | Porters, Fanning, Evard, Edneyville, Ashe, Tusquegee, Thunder, Spivey | Mesic / Udic | 52-65 | 150-160 | 21/42; 58/79 | Appalachian oak forest. Includes northern red oak, white oak, and chestnut oak forests; montane oak-hickory forest; cove forests (tulip poplar, basswood, beeches, yellow birch, beech, hemlock, northern red oak). At high elevations, northern hardwoods forest (beech, yellow birch, yellow poplar, maples). | Deciduous forest, mixed forest, recreation, hunting, wildlife habitat. |
| 66j. Eastern Blue Ridge Foothills | 652 | 980-2890 / 800-1300 | Quaternary to Tertiary silty to sandy clay saprolite; Cambrian gneiss, schist, quartzite, amphibolite, and Ordovician granite. | Utsilts (Hapludals), Kanhapludals, Entisols (Udalfments), Inceptisols (Dysdrudepts) | Evard, Cosm, Fanning, Clifford, Hayessville, Saluda on uplands; Greenlee, Tate, on colluvium; Chewala on small floodplains. | Mesic / Udic | 50-60 | 170-195 | 25-48; 65/80 | Appalachian oak forest. Mostly chestnut oak forest (chestnut white oak, scarlet oak, hickories, pines); pine-oak-hickory forest (Virginia pine, table-mountain pine, pitch pine, scarlet oak); cove forests (beech, yellow birch, basswood, tulip poplar, hemlock). Some dry-mesic oak-hickory forest (white oak, northern and southern red oak, black oak, hickories, pines, tulip poplar). | Deciduous forest, mixed forest, recreation, hunting, pasture with cattle, hay, and corn; public land (South Mountains State Park). |
| 66k. Smoky Mountains | 25 | 1000-2595 / 1000-1400 | Quaternary to Tertiary quartz-rich saprolite; Cambrian gneiss, schist, mica, muscovite schist, and biotite gneiss. | Utsilts (Hapludals), Kanhapludals, Entisols (Udalfments), Inceptisols (Dysdrudepts) | Pilot Mountain, Sawtooth, Hayessville, Cosm, Ashe, Brevard, Greenlee | Mesic / Udic | 48-50 | 165-185 | 24/46; 64/80 | Appalachian oak forest. Mostly pine-oak-hickory woodlands (Virginia pine, table-mountain pine, pitch pine, scarlet oak); chestnut oak forest (chestnut oak, scarlet oak, northern red oak, hickories, hemlock, red maple, pines). | Deciduous forest, mixed forest, public land (Great Smoky Mountains National Park), recreation (Hanging Rock and Pilot Mountain State Parks). |

| 75. SOUTHERN COASTAL PLAIN | | | | | | | | | | | | |
|-----------------------------------|---------------------|--|-------------------------------|---|--|---|------------------------------|--------------------------------------|---------------------------------|---|---|--|
| Level IV Ecoregion | Physiography | | Geology | | Soil | | Climate | | | Potential Natural Vegetation | Land Use and Land Cover | |
| | Area (square miles) | | Elevation/Local Relief (feet) | Surficial Material and Bedrock | Order (Great Group) | Common Soil Series | Temperature/Moisture Regimes | Precipitation (Mean annual (inches)) | Frost Free (Mean annual (days)) | Mean Temperature (January minimum; July maximum (°F)) | | |
| 75i. Floodplains and Low Terraces | 146 | Major river floodplains and associated low terraces; low gradient streams with sandy and silty substrates, oxbow lakes, ponds, swamps. | 2-80 5-25 | Holocene alluvial silt and clay. | Inceptisols (Endoaqupts, Dystrudepts) | Chastain, Tawcan, Chewala | Thermic / Aquic | 48-50 | 240-260 | 35-58; 69/91 | Southern floodplain forest. Includes cypress-gum swamp (water tupelo, swamp tupelo, bald cypress, pond cypress) and bottomland hardwood forest (bottomland oaks, red maple, sweetgum, green ash, bitternut hickory). | Forested wetlands, deciduous forest. |
| 75j. Sea Islands / Coastal Marsh | 1987 | Barrier islands, dunes, beaches, lagoons, estuaries, tidal marshes. | 0-30 5-20 | Holocene saline marsh deposits of silt, sand, peat, and clay; Holocene beach and dune sand; Pleistocene beach and near-shore marine sand. | Entisols (Quartzisols), Vertisols, Udipalmisols, Sulfapalmisols, Hydromisols, Spodosols (Alloquods, Alorthods) | Seabrook, Wando, Cainhoy, Fripp, Edistoand, Bantley, Leno; in tidal marshes Bokibet and Capers. | Thermic / Aquic | 48-53 | 260-280 | 37/58; 72/89 | Salt and brackish marshes (cordgrass, saltgrass, rushes); maritime swamp forest (upland, red maple, sweetgum, bald cypress); maritime evergreen forest (live oak, sand laurel oak, slash pine, loblolly pine); dune grass (sea oats, bitter panic grass, cordgrass, beach grass). | Marsh, forested wetlands, evergreen forest, urban, wildlife habitat, beaches, recreation, fish and shellfish production. |

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NWI Map



August 12, 2024

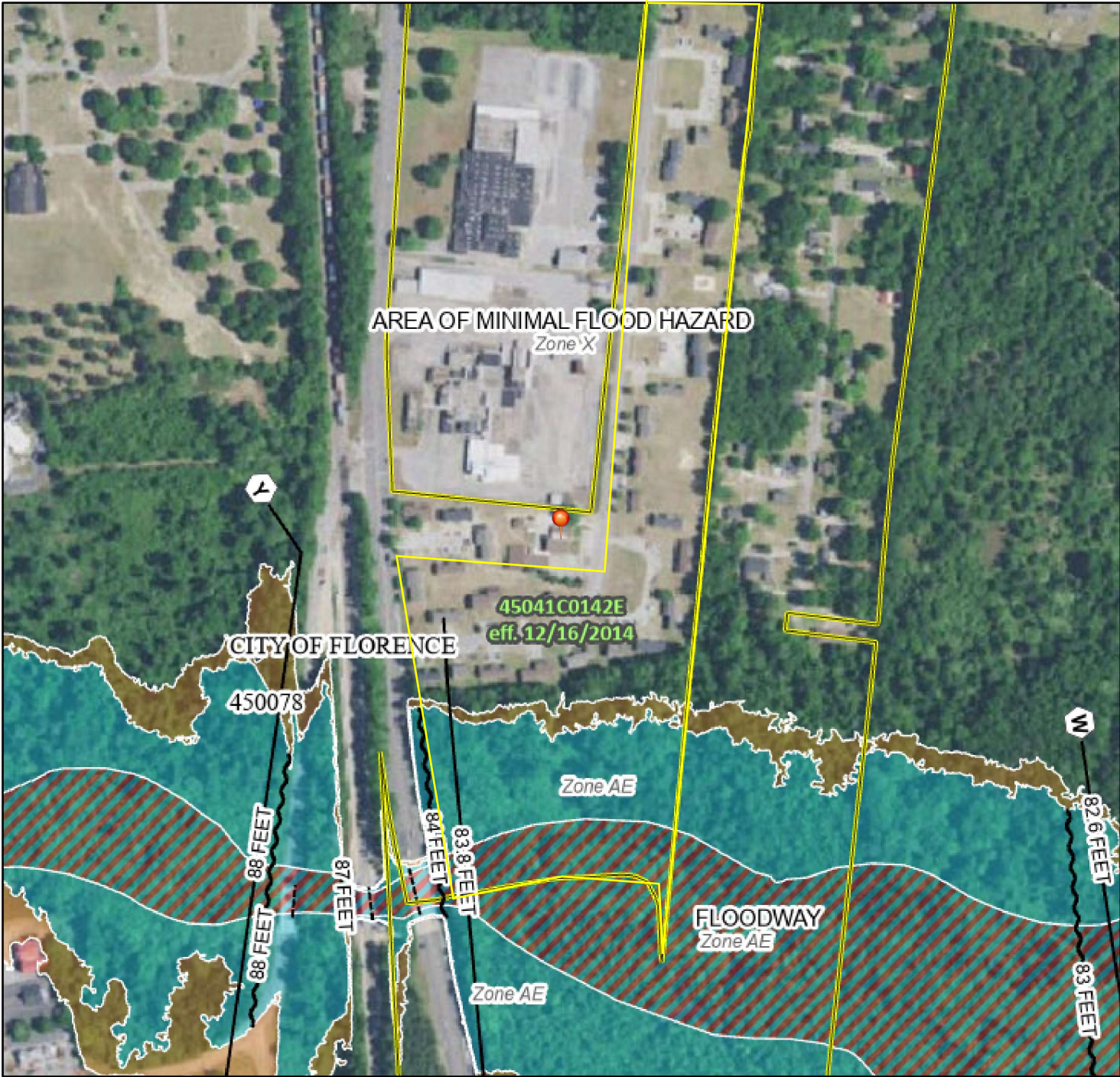
Wetlands

- Wetlands**
- | | | | | | |
|---|--------------------------------|---|-----------------------------------|--|----------|
|  | Estuarine and Marine Deepwater |  | Freshwater Emergent Wetland |  | Lake |
|  | Estuarine and Marine Wetland |  | Freshwater Forested/Shrub Wetland |  | Other |
| | |  | Freshwater Pond |  | Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Flood Hazard Layer FIRMMette

79°45'54"W 34°10'48"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

| | | |
|-----------------------------|--|---|
| SPECIAL FLOOD HAZARD AREAS | | Without Base Flood Elevation (BFE) Zone A, V, A99 |
| | | With BFE or Depth Zone AE, AO, AH, VE, AR |
| | | Regulatory Floodway |
| OTHER AREAS OF FLOOD HAZARD | | 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X |
| | | Future Conditions 1% Annual Chance Flood Hazard Zone X |
| | | Area with Reduced Flood Risk due to Levee. See Notes. Zone X |
| | | Area with Flood Risk due to Levee Zone D |
| OTHER AREAS | | NO SCREEN Area of Minimal Flood Hazard Zone X |
| | | Effective LOMRs |
| GENERAL STRUCTURES | | Area of Undetermined Flood Hazard Zone D |
| | | Channel, Culvert, or Storm Sewer |
| OTHER FEATURES | | Levee, Dike, or Floodwall |
| | | Cross Sections with 1% Annual Chance Water Surface Elevation |
| MAP PANELS | | Coastal Transect |
| | | Base Flood Elevation Line (BFE) |
| OTHER FEATURES | | Limit of Study |
| | | Jurisdiction Boundary |
| OTHER FEATURES | | Coastal Transect Baseline |
| | | Profile Baseline |
| OTHER FEATURES | | Hydrographic Feature |
| | | Digital Data Available |
| MAP PANELS | | No Digital Data Available |
| | | Unmapped |



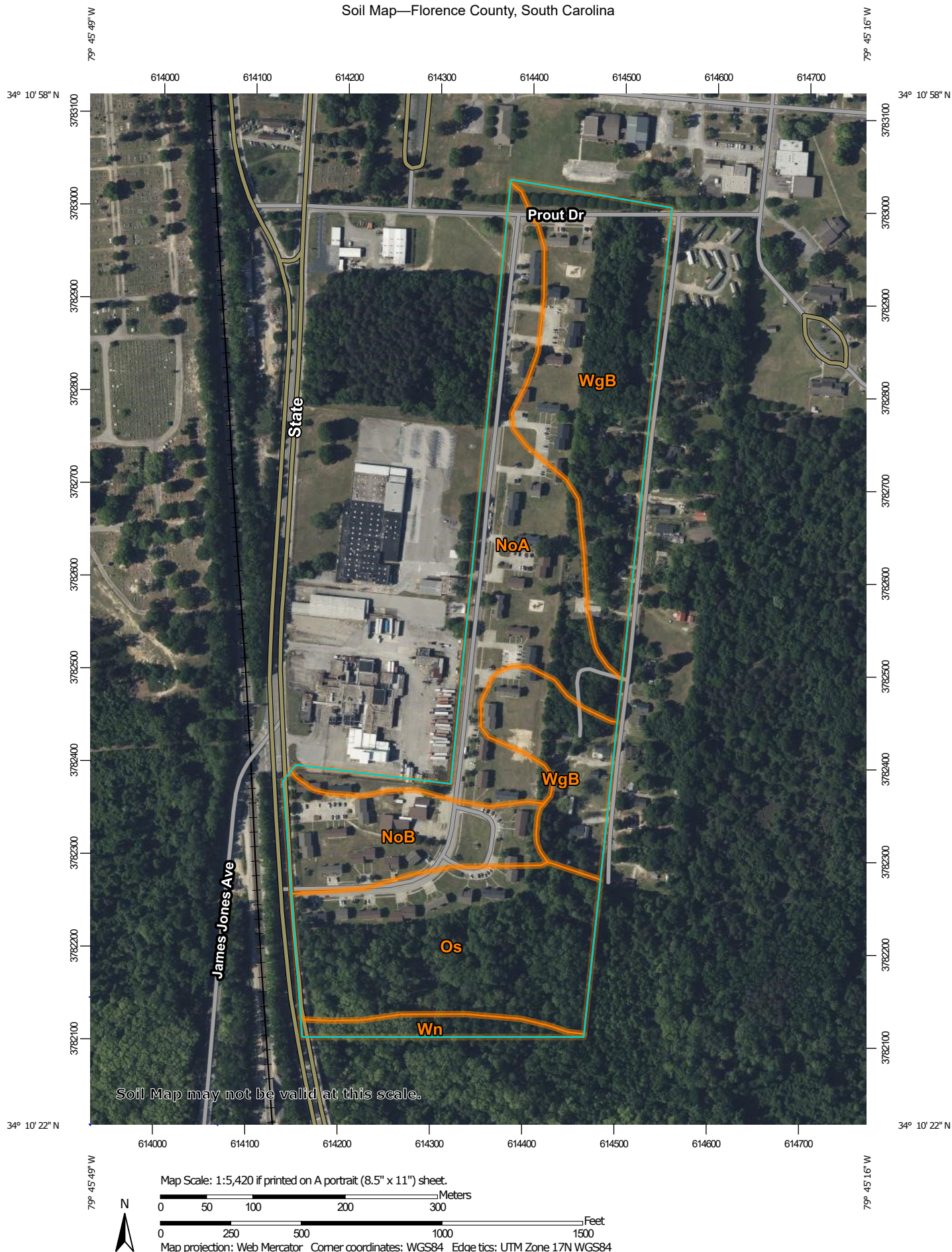
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/19/2024 at 1:59 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Soil Map—Florence County, South Carolina



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Florence County, South Carolina

Survey Area Data: Version 27, Aug 29, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 17, 2022—May 20, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|------------------------------------|---|--------------|----------------|
| NoA | Norfolk loamy sand, 0 to 2 percent slopes | 13.3 | 26.3% |
| NoB | Norfolk loamy sand, 2 to 6 percent slopes | 6.0 | 11.9% |
| Os | Osier loamy sand | 12.4 | 24.5% |
| WgB | Wagram sand, 0 to 6 percent slopes | 17.4 | 34.5% |
| Wn | Wehadkee and Johnston soils, frequently flooded | 1.5 | 2.9% |
| Totals for Area of Interest | | 50.5 | 100.0% |

Soil Survey Area - Soil Data Access (SDA) - Hydric Soils Rating by Map Unit

An SDA-populated select list is used to pick a state and SSA which enables creation of a "Hydric Soils Report" based upon those selections. The data is not static; it hits Soil Data Access Live. To reset the table change the state dropdown. Once a state is selected and table appears, if a new state is selected it will refresh the table. The report uses a count instead of component percent to determine the hydric rating by map unit. [For more information about the table,](#)

South Carolina ▼

selected stateId = SC

Florence County, South Carolina ▼

selected SSA areasympbol = SC041

| areasympbol | musym | muname | mukey | hydric_rating |
|-------------|-------|--|--------|------------------------|
| SC041 | Ba | Barth loamy sand | 129941 | Predominantly Nonydric |
| SC041 | Br | Brogdon sand | 129942 | Nonhydric |
| SC041 | CaA | Cahaba loamy fine sand, 0 to 3 percent slopes | 129943 | Nonhydric |
| SC041 | Cb | Cahaba-Leaf complex | 129944 | Partially Hydric |
| SC041 | Ce | Cape Fear loam | 129945 | Hydric |
| SC041 | Ch | Chastain-Chewacla-Congaree association, frequently flooded | 129946 | Partially Hydric |
| SC041 | Cn | Chipleay loamy sand, dark surface | 129947 | Predominantly Nonydric |
| SC041 | Cv | Coxville fine sandy loam | 129948 | Hydric |
| SC041 | Dp | Duplin fine sandy loam | 129949 | Nonhydric |
| SC041 | DuA | Duplin and Exum soils, 0 to 2 percent slopes | 129950 | Nonhydric |
| SC041 | DuB | Duplin and Exum soils, 2 to 6 percent slopes | 129951 | Nonhydric |
| SC041 | Ex | Exum sandy loam | 129952 | Predominantly Nonydric |
| SC041 | FaA | Faceville loamy sand, 0 to 2 percent slopes | 129953 | Predominantly Nonydric |
| SC041 | FaB | Faceville loamy sand, 2 to 6 percent slopes | 129954 | Predominantly Nonydric |
| SC041 | FaD | Faceville loamy sand, 6 to 15 percent slopes | 129955 | Nonhydric |
| SC041 | FuB | Fuquay sand, 0 to 4 percent slopes | 129956 | Predominantly Nonydric |
| SC041 | Go | Goldsboro loamy sand | 129957 | Predominantly Nonydric |
| SC041 | Hy | Hyde loam | 129958 | Hydric |
| SC041 | Jo | Johns fine sandy loam | 129959 | Nonhydric |

| | | | | |
|-------|-----|--|---------|-----------------------|
| SC041 | Ka | Kalmia loamy sand | 129960 | Nonhydic |
| SC041 | KeB | Kenansville sand, 0 to 4 percent slopes | 129961 | Nonhydic |
| SC041 | Ls | Leaf fine sandy loam | 129964 | Hydic |
| SC041 | LuB | Lucy sand, 0 to 6 percent slopes | 129965 | Nonhydic |
| SC041 | LuC | Lucy sand, 6 to 10 percent slopes | 129966 | Nonhydic |
| SC041 | Lz | Lynn Haven sand | 129968 | Hydic |
| SC041 | Mp | Mine pits and dumps | 129969 | Nonhydic |
| SC041 | NoA | Norfolk loamy sand, 0 to 2 percent slopes | 129970 | Predominantly Nonydic |
| SC041 | NoB | Norfolk loamy sand, 2 to 6 percent slopes | 129971 | Predominantly Nonydic |
| SC041 | On | Olanta loamy sand | 129972 | Nonhydic |
| SC041 | OrA | Orangeburg loamy sand, 0 to 2 percent slopes | 129973 | Nonhydic |
| SC041 | OrB | Orangeburg loamy sand, 2 to 6 percent slopes | 129974 | Nonhydic |
| SC041 | OrC | Orangeburg loamy sand, 6 to 10 percent slopes | 129975 | Nonhydic |
| SC041 | Os | Osier loamy sand | 129976 | Hydic |
| SC041 | Pa | Pantego loam | 129977 | Hydic |
| SC041 | PIB | Pocalla sand, 0 to 4 percent slopes | 129978 | Nonhydic |
| SC041 | Ra | Rains sandy loam | 129979 | Hydic |
| SC041 | Rs | Rimini sand | 129980 | Nonhydic |
| SC041 | Ru | Rutlege loamy sand | 129981 | Hydic |
| SC041 | SuC | Sunsweet loamy fine sand, 6 to 10 percent slopes | 129982 | Nonhydic |
| SC041 | SuE | Sunsweet loamy fine sand, 10 to 25 percent slopes | 129983 | Nonhydic |
| SC041 | Ub | Urban land-Coxville-Norfolk association | 129984 | Partially Hydic |
| SC041 | VaA | Varina loamy fine sand, 0 to 2 percent slopes | 129985 | Predominantly Nonydic |
| SC041 | VaB | Varina loamy fine sand, 2 to 6 percent slopes | 129986 | Nonhydic |
| SC041 | W | Water | 129987 | Nonhydic |
| SC041 | WgC | Wagram sand, 6 to 10 percent slopes | 129989 | Nonhydic |
| SC041 | WgD | Wagram sand, 10 to 15 percent slopes | 129990 | Nonhydic |
| SC041 | Wh | Wahee fine sandy loam | 129991 | Predominantly Nonydic |
| SC041 | Wk | Wehadkee-Chastain association, frequently flooded | 129992 | Hydic |
| SC041 | Wn | Wehadkee and Johnston soils, frequently flooded | 129993 | Hydic |
| SC041 | Ly | Lynchburg sandy loam, 0 to 2 percent slopes | 129967 | Predominantly Nonydic |
| SC041 | LaB | Lakeland sand, 0 to 6 percent slopes, Southern Coastal Plain | 129962 | Nonhydic |
| SC041 | LkB | Lakeland sand, 0 to 6 percent slopes, Atlantic Coast Flatwoods | 2893521 | Nonhydic |
| SC041 | WgB | Wagram sand, 0 to 6 percent slopes | 129988 | Nonhydic |
| SC041 | LaD | Lakeland sand, 6 to 15 percent slopes | 129963 | Nonhydic |

| | | | | |
|-------|-----|---|---------|----------------------|
| SC041 | RnA | Rains sandy loam, 0 to 2 percent slopes, Atlantic Coast Flatwoods | 3260154 | Predominantly Hydric |
|-------|-----|---|---------|----------------------|

Report Metadata: [Back to top](#)

- **areasympol:** A symbol that uniquely identifies a single occurrence of a particular type of area (e.g. Dane Co., Wisconsin is WI025).
- **musym:** The symbol used to uniquely identify the soil mapunit in the soil survey.
- **Mapunit_Name:** Correlated name of the mapunit (recommended name or field name for surveys in progress).
- **mukey:** A non-connotative string of characters used to uniquely identify a record in the Mapunit table.
- **hydric_rating:** This Hydric Soil Category rating indicates the components of map units that meet the criteria for hydric soils.

Hydric Soil Categories :

This Hydric Soil Category rating indicates the components of map units that meet the criteria for hydric soils. Map units are composed of one or more major soil components or soil types that generally make up 20 percent or more of the map unit and are listed in the map unit name, and they may also have one or more minor contrasting soil components that generally make up less than 20 percent of the map unit. Each major and minor map unit component that meets the hydric criteria is rated hydric. The map unit class ratings based on the hydric components present are: Hydric, Predominantly Hydric, Partially Hydric, Predominantly Nonhydric, and Nonhydric. The report also shows the total representative percentage of each map unit that the hydric components comprise.

- **"Hydric"** means that all major and minor components listed for a given map unit are rated as being hydric.
- **"Predominantly Hydric"** means that all major components listed for a given map unit are rated as hydric, and at least one contrasting minor component is not rated hydric.
- **"Partially Hydric"** means that at least one major component listed for a given map unit is rated as hydric, and at least one other major component is not rated hydric.
- **"Predominantly Nonhydric"** means that no major component listed for a given map unit is rated as hydric, and at least one contrasting minor component is rated hydric.
- **"Nonhydric"** means no major or minor components for the map unit are rated hydric. The assumption is that the map unit is nonhydric even if none of the components within the map unit have been rated.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

If soils are wet enough for a long enough period of time to be considered hydric, they typically exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Vasilas, Hurt, and Noble, 2010).

The NTCHS has developed criteria to identify those soil properties unique to hydric soils (Federal Register, 2012). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria use selected soil properties that are described in "Field Indicators of

Hydric Soils in the United States" (Vasilas, Hurt, and Noble, 2010), "Soil Taxonomy" (Soil Survey Staff, 1999), "Keys to Soil Taxonomy" (Soil Survey Staff, 2010), and the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

The criteria for hydric soils are represented by codes, for example, 2 or 3. Definitions for the codes are as follows:

1. All Histels except for Folistels, and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
 1. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
 2. Show evidence that the soil meets the definition of a hydric soil;
3. Soils that are frequently ponded for long or very long duration during the growing season.
 1. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
 2. Show evidence that the soil meets the definition of a hydric soil;
4. Map unit components that are frequently flooded for long duration or very long duration during the growing season that:
 1. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
 2. Show evidence that the soil meets the definition of a hydric soil;

Hydric Condition: Food Security Act information regarding the ability to grow a commodity crop without removing woody vegetation or manipulating hydrology.

References:

- Federal Register. July 13, 1994. Changes in hydric soils of the United States.
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- Vasilas, L.M., G.W. Hurt, and C.V. Noble, editors. Version 7.0, 2010. Field indicators of hydric soils in the United States.

LOCATION NORFOLK

NC+AL AR FL GA SC VA

Established Series

CMO/Rev. JAK

11/2005

NORFOLK SERIES

MLRA(s): 133A-Southern Coastal Plain, 153A-Atlantic Coast Flatwoods, 153B-Tidewater Area

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Raleigh, North Carolina

Depth Class: Very deep

Drainage Class (Agricultural): Well drained

Internal Free Water Occurrence: Deep, transitory or very deep

Index Surface Runoff: Negligible to medium

Permeability: Moderate (Saturated Hydraulic Conductivity: Moderately high)

Landscape: Lower, middle, or upper coastal plain

Landform: Uplands or marine terraces

Geomorphic Component: Interfluvial, side slopes

Hillslope Profile Position: Summits, shoulders, backslopes

Parent Material: Marine deposits or fluviomarine deposits

Slope: 0 to 10 percent

Elevation (type location): Unknown

Mean Annual Air Temperature (type location): 62 degrees F.

Mean Annual Precipitation (type location): 49 inches

TAXONOMIC CLASS: Fine-loamy, kaolinitic, thermic Typic Kandiodults

TYPICAL PEDON: Norfolk loamy sand--cultivated. (Colors are for moist soil unless otherwise indicated.)

Ap--0 to 9 inches; grayish brown (10YR 5/2) loamy sand; weak fine and medium granular structure; very friable; nonsticky, nonplastic; few fine and medium roots; darker-colored material in old root channels; strongly acid; clear smooth boundary. (3 to 10 inches thick)

E--9 to 14 inches; light yellowish brown (10YR 6/4) loamy sand; weak medium granular structure; very friable; nonsticky, nonplastic; few fine and medium roots; darker-colored material in old root channels; strongly acid; clear smooth boundary. (0 to 10 inches thick)

Bt1--14 to 17 inches; yellowish brown (10YR 5/6) sandy loam; weak medium subangular blocky structure; friable; slightly sticky, slightly plastic; few fine and medium roots; few faint clay films on faces of peds; strongly acid; clear wavy boundary.

Bt2--17 to 38 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; slightly sticky, slightly plastic; many fine and medium pores; few faint clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt3--38 to 58 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; slightly sticky, slightly plastic; few faint clay films on faces of peds; few fine faint strong brown (7.5YR 4/6) and few prominent yellowish red (5YR 5/8) masses of oxidized iron and few fine distinct pale brown (10YR 6/3) iron depletions; strongly acid; gradual wavy boundary.

Bt4--58 to 70 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; slightly sticky, slightly plastic; few faint clay films on faces of peds; common medium distinct yellowish

red (5YR 5/8) masses of oxidized iron and pale brown (10YR 6/3) and light brownish gray (10YR 6/2) iron depletions; 1 percent, firm yellowish red plinthite nodules; strongly acid; gradual wavy boundary. (Combined thickness of Bt horizon is 40 to more than 60 inches.)

BC--70 to 82 inches; variegated brownish yellow (10YR 6/6), strong brown (7.5YR 5/6), and yellowish red (5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; slightly sticky, slightly plastic; 5 percent firm, brittle plinthite nodules; strongly acid; gradual wavy boundary. (0 to more than 15 inches thick)

C--82 to 100 inches; variegated red (2.5YR 4/8), strong brown (7.5YR 5/8), brownish yellow (10YR 6/8) and gray (10YR 5/1) sandy clay loam; massive; friable; slightly sticky, slightly plastic; strongly acid.

TYPE LOCATION: Robeson County, North Carolina; 1.25 miles south of Parkton; 300 feet west of State Road 1724 and 60 feet south of farm road.

RANGE IN CHARACTERISTICS:

Thickness of the sandy surface and subsurface layers: 3 to 19 inches

Depth to top of the Argillic horizon: 3 to 19 inches

Depth to the base of the Argillic horizon: 60 to more than 80 inches

Depth to top of the Kandic horizon: 3 to 19 inches

Depth to bedrock: Greater than 80 inches

Depth to Seasonal High Water Table: 40 to 72 inches, January to March

Soil Reaction: Extremely acid to strongly acid, throughout except where limed

Rock Fragment Content: 0 to 5 percent, by volume throughout; mostly quartz pebbles or ironstone nodules

Plinthite Content: 0 to 4 percent to a depth of 60 inches and 0 to 10 percent or more below 60 inches

RANGE OF INDIVIDUAL HORIZONS:

Ap horizon or A horizon (where present):

Color--hue of 10YR or 2.5Y, value of 4 to 7, chroma of 1 to 4

Texture--loamy sand, sandy loam, fine sandy loam, or loamy fine sand. Some pedons are fine sand or sand.

E horizon:

Color--hue of 10YR or 2.5Y, value of 4 to 7, chroma of 2 to 6

Texture--loamy sand, sandy loam, fine sandy loam, or loamy fine sand. Some pedons are fine sand or sand.

BE horizon (where present):

Color--hue of 10YR or 2.5Y, value of 4 to 6, chroma of 3 to 8

Texture--sandy loam or fine sandy loam

Bt horizon (upper):

Color--hue of 7.5YR to 2.5Y, value of 5 to 8, chroma of 3 to 8

Texture--sandy loam, fine sandy loam, sandy clay loam, or clay loam

Redoximorphic features (where present)--masses of oxidized iron in shades of red, yellow, or brown and iron depletions in shades of brown, yellow, or olive

Bt horizon (lower):

Color--hue of 7.5YR to 2.5Y, value of 5 to 8, chroma of 3 to 8

Texture--sandy loam, fine sandy loam, sandy clay loam, clay loam, sandy clay, or clay

Redoximorphic features--masses of oxidized iron in shades of red, yellow, or brown and iron depletions in shades of brown, yellow, olive, or gray

BC horizon or BCt horizon (where present):

Color--hue of 5YR to 2.5Y, value of 4 to 7, chroma of 3 to 8, or variegated in shades of these colors

Texture--sandy loam, fine sandy loam, sandy clay loam, clay loam, sandy clay, or clay

Redoximorphic features--masses of oxidized iron in shades of red, yellow, or brown and iron depletions in shades of brown, yellow, olive, or gray

C horizon:

Color--hue of 2.5YR to 5Y, value of 4 to 8, chroma of 3 to 8, or is variegated in shades of these colors

Texture--loamy coarse sand, loamy sand, loamy fine sand, coarse sandy loam, sandy loam, fine sandy loam, sandy clay loam, clay loam, or sandy clay. Some pedons have layers of coarser or finer textured materials.

Redoximorphic features--masses of oxidized in shades of red, yellow, or brown and iron depletions in shades of brown, yellow, olive, or gray

COMPETING SERIES:

[Orangeburg](#) soils--have hue of 5YR or redder throughout the Bt horizon

[Thursa](#) soils--have hue of 5YR or redder below the upper 10 inches of the Bt horizon

GEOGRAPHIC SETTING:

Landscape: Lower, middle, or upper coastal plain

Landform: Uplands or marine terraces

Geomorphic Component: Interfluve, side slopes

Hillslope Profile Position: Summits, shoulders, backslopes

Parent Material: Marine deposits or fluviomarine deposits

Elevation: 30 to 450 feet

Mean Annual Air Temperature: 57 to 70 degrees F.

Mean Annual Precipitation: 35 to 55 inches

Frost Free Period: 190 to 245 days

GEOGRAPHICALLY ASSOCIATED SOILS:

[Aycock](#) soils--are in a fine-silty family

[Bonneau](#) soils--have an arenic soil surface

[Butters](#) soils--are in a coarse-loamy family

[Caroline](#) soils--are in a fine family

[Craven](#) soils--are in a fine family

[Duplin](#) soils--are in a fine family

[Exum](#) soils--are in a fine-silty family

[Faceville](#) soils--are in a fine family

[Foreston](#) soils--are in a coarse-loamy family

[Goldsboro](#) soils--are moderately well drained

[Marlboro](#) soils--are in a fine family

[Noboco](#) soils--have siliceous mineralogy

[Lakeland](#) soils--are sandy throughout

[Lynchburg](#) soils--are somewhat poorly drained

[Rains](#) soils--are poorly drained soils

[Orangeburg](#) soils--have hue of 5YR or redder throughout the Bt horizon

[Pantego](#) soils--are very poorly drained soils

[Thursa](#) soils--have hue of 5YR or redder below the upper 10 inches of the Bt horizon

[Wagram](#) soils--have an arenic soil surface

DRAINAGE AND PERMEABILITY:

Depth Class: Very deep

Drainage Class (Agricultural): Well drained

Internal Free Water Occurrence: Deep, transitory or very deep

Index Surface Runoff: Negligible to medium

Permeability: Moderate (Saturated Hydraulic Conductivity: Moderately high)

USE AND VEGETATION:

Major Uses: Mostly cleared and used for general farm crops.

Dominant Vegetation: Where cultivated--corn, cotton, peanuts, tobacco, and soybeans. Where wooded--pines and mixed hardwoods.

DISTRIBUTION AND EXTENT:

Distribution: Alabama, Arkansas, Florida, Georgia, North Carolina, South Carolina, and Virginia

Extent: Large

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Raleigh, North Carolina

SERIES ESTABLISHED: Cecil County, Maryland; 1900.

REMARKS: The June, 1988 revision recognized the low activity clay properties of this soil as defined in the low activity clay amendment of Soil Taxonomy, August 1986. 10/2004, changed water table from 4.0-6.0 ft to 3.3-6.0 ft to cover depth that would be included in the typic subgroup versus associated soils in the Oxyaquic subgroup. Diagnostic horizons and features recognized in this pedon are:

Ochric epipedon--the zone from the surface to a depth of 14 inches (A and E horizons)

Kandic horizon--the zone between 14 and 70 inches (Bt horizon)

Argillic horizon--the zone between depths of 14 and 70 inches (Bt horizon)

ADDITIONAL DATA: (1) U.S. Department of Agriculture, Soil Survey Laboratory Data and Descriptions for Some Soils of Georgia, North and South Carolina. Soil Survey Investigations Report No. 16; SCS, in cooperation with Georgia, North Carolina, and South Carolina Agricultural Experiment Stations; Pages 65, 67, 69. (2) U.S. Department of Agriculture, Certain Properties of Selected Southeastern United States Soils and Mineralogical Procedures for Their Study, Southern Cooperative Series Bulletin 61 (S-14); Soil Conservation Service, Agricultural Research Service and cooperating Experiment Stations; tables 64, 67, 68. (3) U.S. Department of Agriculture, Selected Coastal Plain Soil Properties, Southern Cooperative Service and cooperating Experiment Stations; pages 40, 42, 44, 46.

TABULAR SERIES DATA:

| SOI-5 | Soil Name | Slope | Airtemp | FrFr/Seas | Precip | Elevation |
|--------|-----------|-------|---------|-----------|--------|-----------|
| NC0037 | NORFOLK | 0-10 | 57-70 | 190-245 | 35-55 | 30-450 |

| SOI-5 | FloodL | FloodH | Watertable | Kind | Months | Bedrock | Hardness |
|--------|--------|--------|------------|----------|---------|---------|----------|
| NC0037 | NONE | | 3.3-6.0 | APPARENT | JAN-MAR | >80 | - |

| SOI-5 | Depth | Texture | 3-Inch | No-10 | Clay% | -CEC- |
|--------|--------|-----------|--------|--------|-------|-------|
| NC0037 | 0-14 | SL FSL | 0-0 | 95-100 | 5-18 | 1-4 |
| NC0037 | 0-14 | LS LFS | 0-0 | 92-100 | 2-8 | 1-3 |
| NC0037 | 14-38 | SL SCL CL | 0-0 | 91-100 | 18-35 | 2-4 |
| NC0037 | 38-70 | SCL CL SC | 0-0 | 98-100 | 20-43 | 2-5 |
| NC0037 | 70-100 | VAR | - | - | - | - |

| SOI-5 | Depth | -pH- | 0.M . | Salin | Permeab | Shnk-Swll |
|--------|--------|---------|---------|-------|---------|-----------|
| NC0037 | 0-14 | 3.5-5.5 | 0.5-2.0 | 0-0 | 2.0-6.0 | LOW |
| NC0037 | 0-14 | 3.5-5.5 | 0.5-2.0 | 0-0 | 6.0-20 | LOW |
| NC0037 | 14-38 | 3.5-5.5 | 0.0-0.5 | 0-0 | 0.6-2.0 | LOW |
| NC0037 | 38-70 | 3.5-5.5 | 0.0-0.5 | 0-0 | 0.6-2.0 | LOW |
| NC0037 | 70-100 | - | - | - | - | - |

National Cooperative Soil Survey
U.S.A.

Established Series
Rev. GRB
08/2005

OSIER SERIES

The Osier series consists of very deep, poorly drained, rapidly permeable soils on flood plains or low stream terraces. They formed in sandy alluvium. Near the type location, the mean annual temperature is about 67 degrees F, and the mean annual precipitation is about 46 inches. Slopes range from 0 to 2 percent.

TAXONOMIC CLASS: Siliceous, thermic Typic Psammaquents

TYPICAL PEDON: Osier loamy fine sand - forested. (Colors are for moist soil stated.)

A1--0 to 3 inches; very dark grayish brown (10YR 3/2) loamy fine sand; moderate fine granular structure; very friable; many fine and coarse roots; very strongly acid; abrupt wavy boundary.

A2--3 to 8 inches; mixed dark gray (10YR 4/1) and grayish brown (2.5Y 5/2) loamy sand; weak medium granular structure; very friable; common fine and coarse roots; thin strata of sand; very strongly acid; clear wavy boundary. (Combined thickness of the A horizons range from 2 to 20 inches.)

Cg1--8 to 16 inches; dark gray (10YR 4/1) loamy sand; weak fine granular structure; very friable; common fine roots; thin strata of gray (10YR 6/1) sand; very strongly acid; gradual wavy boundary.

Cg2--16 to 36 inches; gray (10YR 6/1) sand; single grained; loose; few fine roots; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Cg3--36 to 48 inches; light brownish gray (2.5Y 6/2) sand; single grained; loose; few fine roots; common coarse distinct brownish yellow (10YR 6/6) masses of iron accumulation; very strongly acid; gradual wavy boundary.

Cg4--48 to 60 inches; light gray (2.5Y 7/2) coarse sand; single grained; loose; few fine distinct yellowish brown (10YR 5/6) masses of iron accumulation; common medium faint light brownish gray (2.5Y 6/2) areas of iron depletions; very strongly acid; gradual wavy boundary.

Cg5--60 to 75 inches; dark gray (10YR 4/1) coarse sand; single grained; loose; many coarse faint light brownish gray (10YR 6/2) areas of iron depletions; very strongly acid.

TYPE LOCATION: Irwin County, Georgia. Approximately 4 miles south of Ocilla, Georgia, along U.S. Highway 129, about 2.3 miles southwest along county road, and about 250 feet east of road in wooded bottom area.

RANGE IN CHARACTERISTICS: Thickness of the sand is 80 inches, or more. Reaction ranges from extremely acid to moderately acid throughout the profile. The silt plus clay content of the 10 to 40 inch zone is 5 to 15 percent.

The A horizon has hue of 10YR or 2.5Y, value of 2 to 5, and chroma of 1 or 2. Where the value is 2 or 3, it is less than 10 inches thick. Texture is fine sandy loam, loamy fine sand, loamy sand, fine sand or sand.

The C horizon has hue of 7.5YR to 5GY, value of 3 to 8, and chroma of 1 or 2; or it is neutral with value of 5 to 7. Redoximorphic features in shades of brown, yellow, and gray range from none to common. Texture is loamy

fine sand, loamy sand, fine sand, sand; and in the lower Cg horizons, can include coarse sand. Most pedons have thin strata of material ranging from sand to sandy loam.

In some pedons, the C horizon is underlain or interrupted by an Ab horizon. It has hue of 10YR to 5Y, value of 2 or 3, and chroma of 1 or 2. Texture is fine sand, loamy fine sand, or loamy sand.

COMPETING SERIES: These include the [Duckston](#), [Solite](#), and [Totness](#) in the same family. Duckston and Solite soils have less than 5 percent silt plus clay in the control section. In addition, Solite soils formed in reworked homogenous sandy spoil. Totness soils have thick strata of loamy material in the profile.

GEOGRAPHIC SETTING: Osier soils are on flood plains, depressions, or rarely on stream terraces of the Coastal Plain. They formed in recent sandy alluvium. The climate is warm and humid. Slopes range from 0 to 2 percent. The average annual temperature ranges from 65 to 69 degrees F, and the average annual precipitation ranges from 43 to 49 inches.

GEOGRAPHICALLY ASSOCIATED SOILS: These include the [Albany](#), [Bibb](#), [Blanton](#), [Chipley](#), [Echaw](#), [Johnston](#), [Kershaw](#), [Lakeland](#), [Lynchburg](#), [Ochlockonee](#), [Ocilla](#), [Pactolus](#), [Paxville](#), [Pelham](#), [Pickney](#), [Plummer](#), [Rains](#), and [Rutlege](#) series. Albany, Blanton, Lynchburg, Ocilla, Paxville, Pelham, and Rains soils have argillic horizons. Bibb and Ochlockonee soils have more than 15 percent silt plus clay in the 10 to 40 inch control section. In addition, Ochlockonee soils are well drained. The somewhat poorly to moderately well drained Chipley soils are on higher adjacent uplands. The moderately well drained Echaw soils are on higher adjacent positions. The excessively drained Kershaw and Lakeland soils are on higher adjacent uplands. The very poorly drained Johnston, Pickney, and Rutlege soils are on lower positions and have umbric epipedons.

DRAINAGE AND PERMEABILITY: Poorly drained; rapid permeability.

USE AND VEGETATION: Most areas of Osier soil is in forest. The vegetation consists primarily of sweetgum, blackgum, water oak, red maple, swamp holly, bay, slash pine, and longleaf pine. The understory vegetation is mostly briars, vine, canes, myrtle, and gallberry.

DISTRIBUTION AND EXTENT: The Coastal Plain of Alabama, Delaware, Georgia, northern Florida, North Carolina, South Carolina, and Texas. The series is of moderate extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Auburn, Alabama.

SERIES ESTABLISHED: Pitt County, North Carolina, 1969.

REMARKS: Diagnostic horizon recognized in this pedon:

Ochric epipedon - the zone from the surface to approximately 8 inches (A1 and A2 horizons).

The water table is within 12 inches of the surface for 3 to 6 months in most years. Osier soils are frequently flooded for brief periods.

Established Series
CMO/Rev. JAK
10/2007

WAGRAM SERIES

MLRA(s): 133A-Southern Coastal Plain

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Raleigh, North Carolina

Depth Class: Very deep

Drainage Class (Agricultural): Somewhat excessively drained

Internal Free Water Occurrence: Very deep

Index Surface Runoff: Negligible to medium

Permeability: Moderate

Landscape: Upper and middle coastal plain

Landform: Uplands

Geomorphic Component: Interfluves, side slopes

Hillslope Profile Position: Summit, shoulder, backslope

Parent Material: Fluviomarine deposits and marine deposits

Slope: 0 to 15 percent

Elevation (type location): Unknown

Mean Annual Air Temperature (type location): 62 degrees F.

Mean Annual Precipitation (type location): 49 inches

TAXONOMIC CLASS: Loamy, kaolinitic, thermic Arenic Kandiudults

TYPICAL PEDON: Wagram loamy sand--in a cultivated field. (Colors are for moist soils, unless otherwise stated.)

Ap--0 to 8 inches; grayish brown (10YR 5/2) loamy sand, light brownish gray (10YR 6/2) dry; single grain; loose, nonsticky, nonplastic; moderately acid; abrupt smooth boundary. (1 to 10 inches thick)

E--8 to 24 inches; pale brown (10YR 6/3) loamy sand; single grain; loose, nonsticky, nonplastic; few lenses of sandy loam; strongly acid; gradual wavy boundary. (10 to 35 inches thick)

Bt1--24 to 27 inches; yellowish brown (10YR 5/6) sandy loam; few fine distinct grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; friable, nonsticky, nonplastic; few penetrations of loamy sand E material in old root channels; few areas are brittle; strongly acid; clear wavy boundary. (0 to 6 inches thick)

Bt2--27 to 38 inches; yellowish brown (10YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; few faint clay films in pores and on faces of peds; strongly acid; gradual wavy boundary.

Bt3--38 to 52 inches; yellowish brown (10YR 5/8) sandy clay loam; common medium distinct yellowish red (5YR 5/8) mottles; weak medium and coarse subangular blocky structure; friable, slightly sticky, slightly plastic; few faint clay films on faces of peds; common clean grains of coarse sand; strongly acid; gradual wavy boundary.

Bt4--52 to 75 inches; yellowish brown (10YR 5/6) sandy clay loam; few medium distinct yellowish red (5YR 5/8) masses of oxidized iron and few medium faint pale brown (10YR 6/3) iron depletions; weak medium and

coarse subangular blocky structure; friable slightly sticky, slightly plastic; strongly acid; gradual irregular boundary. (Combined thickness of the Bt horizon is 21 to 60 inches or more.)

BC--75 to 82 inches; yellowish brown (10YR 5/6) sandy loam; massive; friable, nonsticky, nonplastic; few lenses or pockets of sandy clay loam; many medium and coarse prominent gray (10YR 6/1) iron depletions; some gray areas contain very coarse sand grains; very strongly acid.

TYPE LOCATION: Scotland County, North Carolina; 4.2 miles north of Laurinburg on U.S. 501, 0.2 mile north of Five-Points and 75 feet west of highway.

RANGE IN CHARACTERISTICS:

Depth to bedrock: Greater than 80 inches

Thickness of the sandy surface and subsurface layers: 20 to 39 inches

Depth to top of the argillic horizon: 20 to 39 inches

Depth to the base of the Argillic horizon: 60 to 80 inches

Depth to top of the Kandic horizon: 20 to 39 inches

Depth to seasonal high water table: Greater than 60 inches

Rock Fragment content: 0 to 5 percent, by volume; mostly quartz pebbles or ironstone fragments

Other features--0 to less than 5 percent plinthite, by volume, in the lower part of the Bt horizon, and below 60 inches 0 to 15 percent

Soil Reaction: Extremely acid to strongly acid, unless limed

RANGE OF INDIVIDUAL HORIZONS:

Ap or A horizon (where present):

Color--hue of 10YR or 2.5Y, value of 3 to 6, chroma of 1 to 4, or is neutral with value of 3 to 6

Texture--sand, fine sand, loamy sand, or loamy fine sand

E horizon:

Color--hue of 10YR or 2.5Y, value of 5 to 7, chroma of 2 to 4, or is neutral with value of 4 to 8

Texture--sand, fine sand, loamy sand, or loamy fine sand

Bt horizon:

Color--hue of 7.5YR to 2.5Y, value of 5 or 6, chroma of 4 to 8

Texture--sandy loam or sandy clay loam

Mottles (where present)--shades of red, brown, or yellow

Redoximorphic features (where present)--masses of oxidized iron in shades of red, brown, or yellow and iron depletions in shades of brown, yellow, olive, or gray. Depletions with chroma of 2 or less are below a depth of 60 inches.

BC horizon or BCt horizon (where present):

Color--hue of 7.5YR to 2.5Y, value of 5 to 7, chroma of 3 to 8, or is variegated in shades of these colors

Texture--sandy loam, loam, sandy clay loam, or clay loam

Redoximorphic features (where present)--masses of oxidized iron in shades of red, brown, or yellow and iron depletions in shades of brown, yellow, olive, or gray. Depletions with chroma of 2 or less are below a depth of 60 inches.

COMPETING SERIES:

[Lucy](#) soils--have Bt horizons with hue of 5YR or redder

GEOGRAPHIC SETTING:

Landscape: Upper and middle coastal plain

Landform: Uplands

Geomorphic Component: Interfluves, side slopes

Hillslope Profile Position: Summit, shoulder, backslope

Parent Material: Fluvio-marine deposits and marine deposits

Slope: 0 to 15 percent
Elevation: 30 to 300 feet
Mean Annual Air Temperature: 57 to 70 degrees
Mean Annual Precipitation: 35 to 55 inches
Frost Free Period: 195 to 245 days

GEOGRAPHICALLY ASSOCIATED SOILS:

[Blanton](#) soils--have sandy A horizons more than 40 inches thick
[Bonneau](#) soils--have seasonal high water table at a depth of 40 to 60 inches
[Goldsboro](#) soils--have thinner A horizons and are more poorly drained
[Lucy](#) soils--have Bt horizons with hue of 5YR or redder
[Lynchburg](#) soils--have thinner A horizons and are more poorly drained
[Norfolk](#) soils--have sandy surface layers less than 20 inches thick
[Ocilla](#) soils--are somewhat poorly drained
[Pocalla](#) soils--have a bisequal profile
[Rains](#) soils--have thinner A horizons and are more poorly drained
[Troup](#) soils--have sandy A horizons more than 40 inches thick

DRAINAGE AND PERMEABILITY:

Depth Class: Very deep
Drainage Class (Agricultural): Somewhat excessively drained
Internal Free Water Occurrence: Very deep
Index Surface Runoff: Negligible to medium
Permeability: Moderate

USE AND VEGETATION:

Major Uses: Cropland
Dominant Vegetation: Where cultivated--tobacco, cotton, corn, and small grains. Where wooded--loblolly and longleaf pine, white oak, red oak, turkey oak, and post oak; hickory, holly, and dogwood.

DISTRIBUTION AND EXTENT:

Distribution: North Carolina, South Carolina, Georgia, Florida, Alabama
Extent: Large

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Raleigh, North Carolina

SERIES ESTABLISHED: Scotland County, North Carolina; 1965

REMARKS: This revision recognizes the low activity clay properties of this soil as defined in the Low Activity Clay Amendment to Soil Taxonomy, August 1986. This series includes soils previously classified as thick surface phases of the Norfolk series and some previously classified as moderately shallow phases of the Lakeland series. Diagnostic horizons and soil characteristics recognized in this pedon:
Ochric epipedon--the zone from the surface to a depth of 24 inches (A, E horizons)
Arenic features--the zone from the surface to a depth of 24 inches (A, E horizons)
Argillic horizon--the zone between 24 and 75 inches (Bt horizons)
Kandic horizon--the zone between 24 and 75 inches has low activity clay in more than 50 percent of the upper 40 inches of the horizon (Bt horizon)

ADDITIONAL DATA:

Characterization samples were analyzed and are available from NRCS-Soil Survey Laboratory, Lincoln, NE; pedon numbers--S81NC101003, S00NC101001, S99GA103039

TABULAR SERIES DATA:

| | | | | | | |
|--------|-----------|-------|---------|-----------|--------|-----------|
| SOI-5 | Soil Name | Slope | Airtemp | FrFr/Seas | Precip | Elevation |
| NC0042 | WAGRAM | 0-15 | 57-70 | 195-245 | 35-55 | 30-300 |

| | | | | | | | |
|--------|--------|--------|------------|------|--------|---------|----------|
| SOI-5 | FloodL | FloodH | Watertable | Kind | Months | Bedrock | Hardness |
| NC0042 | NONE | | >5.0 | - | - | >80 | - |

| | | | | | | |
|--------|-------|---------|--------|--------|-------|-------|
| SOI-5 | Depth | Texture | 3-Inch | No-10 | Clay% | -CEC- |
| NC0042 | 0-24 | LS LFS | 0-0 | 98-100 | 2-10 | 1-3 |
| NC0042 | 0-24 | FS S | 0-0 | 90-100 | 1-7 | 1-3 |
| NC0042 | 24-75 | SCL SL | 0-0 | 98-100 | 10-35 | 1-4 |

| | | | | | | |
|--------|-------|----------|---------|-------|---------|-----------|
| SOI-5 | Depth | -pH- | O.M. | Salin | Permeab | Shnk-Swll |
| NC0042 | 0-24 | 3.5- 5.5 | 0.5-2.0 | 0-0 | 6.0-20 | LOW |
| NC0042 | 0-24 | 3.5- 5.5 | 0.5-2.0 | 0-0 | 6.0-20 | LOW |
| NC0042 | 24-75 | 3.5- 5.5 | 0.0-0.5 | 0-0 | 0.6-2.0 | LOW |

National Cooperative Soil Survey
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Established Series
Rev. RM:AG
07/2007

WEHADKEE SERIES

The Wehadkee series consists of very deep, poorly drained and very poorly drained soils on flood plains along streams that drain from the mountains and piedmont. They are formed in loamy sediments. Slopes range from 0 to 2 percent. Near the type location, mean annual precipitation is about 48 inches, and mean annual temperature is about 60 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, active, nonacid, thermic Fluvaquentic Endoaquepts

TYPICAL PEDON: Wehadkee fine sandy loam -- cultivated (Colors are for moist soil unless otherwise stated.)

Ap--0 to 8 inches; grayish brown (10YR 5/2) fine sandy loam; weak medium granular structure; very friable; few flakes of mica; moderately acid; abrupt smooth boundary. (6 to 14 inches thick)

Bg1--8 to 17 inches; dark gray (10YR 4/1) loam; common medium prominent strong brown (7.5YR 5/6) soft masses of iron accumulation; weak fine and medium subangular blocky structure; friable; few flakes of mica; moderately acid; clear smooth boundary. (8 to 20 inches thick)

Bg2--17 to 40 inches; gray (10YR 6/1) sandy clay loam; common medium prominent strong brown (7.5YR 5/6) soft masses of iron accumulation; weak medium subangular blocky structure; friable; common flakes of mica; moderately acid; clear smooth boundary. (0 to 30 inches thick)

Cg--40 to 50 inches; gray (10YR 6/1) sandy loam; common medium faint grayish brown (10YR 5/2) iron depletions and prominent strong brown (7.5YR 5/6) soft masses of iron accumulation; massive; friable; common flakes of mica; moderately acid.

TYPE LOCATION: Catawba County, North Carolina; 1/2 mile south of Witherspoon Crossroads on SR 1801, 3/4 mile east on SR 1807, and 650 feet north of bridge on Hogan Creek.

RANGE IN CHARACTERISTICS: Solum thickness ranges from about 20 to more than 60 inches. The content of mica flakes ranges from few to many. The soil ranges from very strongly acid through neutral, but some part of the 10 to 40 inch control section is moderately acid through neutral. Content of rock fragments ranges from 0 to 5 percent by volume in the A and B horizons, and from 0 to 20 percent by volume in the C horizons. Fragments are dominantly pebbles in size.

The Ap or A horizon has hue of 10YR or 2.5Y or is neutral, value of 3 to 6, and chroma of 0 to 4. Some pedons have soft masses of iron accumulation in shades of brown or red. Texture is fine sandy loam, very fine sandy loam, loam, silty clay loam, sandy loam, or silt loam. Some pedons have recent layers of overwash as much as 20 inches thick that are loamy and variable in color. Many pedons have an Ab horizon that has the same color and texture range as the A horizon.

The Bg horizon has hue of 10YR to 5Y or is neutral, value of 4 to 6, and chroma of 0 to 2. Soft masses of iron accumulation are in shades of red, yellow, and brown. Texture is sandy clay loam, silt loam, loam, clay loam, or silty clay loam.

The Cg horizon has hue of 10YR to 5Y or is neutral, value of 4 to 7, and chroma of 0 to 2. Soft masses of iron accumulation are in shades of brown, red, and yellow. Texture is commonly sandy loam, loam, or silt loam, but

in some pedons the Cg horizon contains stratified layers of sandy clay loam, clay loam, silty clay loam, loamy sand, sand, and gravel. Sandy textures are restricted to depths below 40 inches.

COMPETING SERIES: There are no other known series in this family. Series in closely related families are [Bibb](#), [Chastain](#), [Chewacla](#), [Chowan](#), Englehard, [Hatboro](#), [Kinston](#), [Lee](#), [Mantachie](#), [Mhoon](#), [Muckalee](#), [Rosebloom](#), and [Una](#) series. Bibb and Muckalee soils are coarse-loamy with siliceous mineralogy. Bibb soils have reaction of strongly acid or more acid throughout the control section. Chastain and Una soils are clayey and reaction is strongly acid or more acid throughout the control section. Chewacla soils have dominant chroma of more than 2 in the upper 20 inches of the soil. Chewacla soils are Fluvaquentic Dystrochrepts. Chowan, Mhoon, and Rosebloom soils are fine-silty. The subgroup for Chowan is Thapto-Histic. Englehard soils are coarse-silty and their subgroup is Humaqueptic. Hatboro soils are mesic. Kinston and Lee soils have siliceous mineralogy and reaction is strongly acid or more acid throughout the control section. Mantachie soils have siliceous mineralogy and reaction is strongly acid or more acid throughout the control section.

GEOGRAPHIC SETTING: Wehadkee soils occur on flood plains, along streams that drain from the mountains and piedmont. Slopes are generally less than 2 percent. Wehadkee soils formed in loamy sediments washed from soils that formed from schist, gneiss, granite, phyllite, and other metamorphic and igneous rocks. Mean annual precipitation is about 48 inches near the type location and mean annual temperature is about 60 degrees F. Mean annual precipitation ranges from 37 to 69 inches, and mean annual air temperature ranges from 58 to 68 degrees F.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the competing [Chewacla](#) series and [Altavista](#), [Augusta](#), [Buncombe](#), [Congaree](#), [Riverview](#), [Roanoke](#), [State](#), and [Wickham](#) series. Altavista, Augusta, Roanoke, State, and Wickham soils are on terraces and have argillic horizons. Buncombe soils are on flood plains typically beside stream channels and are sandy and excessively drained. Chewacla soils are on flood plain positions that are higher or nearer to stream channels and are somewhat poorly drained. Congaree and Riverview soils are on flood plains adjacent or near stream channels and are better drained.

DRAINAGE AND PERMEABILITY: Poorly drained and very poorly drained. Runoff is very slow and internal drainage is very slow. Permeability is moderate. Most areas are frequently flooded.

USE AND VEGETATION: Most of the area is in forest; chiefly water tolerant hardwoods such as sweetgum, blackgum, water oak, willow, oak, poplar, hickories, beech, and elm. Drained areas are used for pasture, corn, and hay.

DISTRIBUTION AND EXTENT: Alabama, Arkansas, Florida, Georgia, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia. The soil is of moderate extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Raleigh, North Carolina

SERIES ESTABLISHED: Johnston County, North Carolina; 1911.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Ochric epipedon - The zone from 0 to 8 inches (Ap horizon)

Irregular decrease in organic carbon with depth

Aquic conditions - redoximorphic features associated with wetness in the zone from 8 to 50 inches (Bg1, Bg2, and Cg horizons)

MLRA = 133A, 133B, 136, 153A, 153B

REVISED = 10/2000 KSL

ADDITIONAL DATA:

SOI-5 Soil Name Slope Airtemp FrFr/Seas Precip Elevation

NC0052 WEHADKEE 0- 2 58- 68 185-250 37- 69 5- 700

NC0233 WEHADKEE 0- 2 58- 68 185-250 37- 69 5- 700

SOI-5 FloodL FloodH Watertable Kind Months Bedrock Hardness

NC0052 COMMON 0-1.0 APPARENT NOV-MAY 60-60

NC0233 COMMON - APPARENT - 60-60

SOI-5 Depth Texture 3-Inch No-10 Clay% -CEC-

NC0052 0- 8 FSL L SL 0- 0 95-100 5-20 5- 20

NC0052 0- 8 SIL SICL 0- 0 98-100 6-40 5- 35

NC0052 8-40 SICL L SCL 0- 0 99-100 18-35 5- 25

NC0052 40-50 VAR - - - -

NC0233 0- 8 FSL L SL 0- 0 95-100 5-20 3- 9

NC0233 0- 8 SIL SICL 0- 0 95-100 6-40 3- 12

NC0233 8-40 SIL SICL VFSL 0- 0 95-100 18-35 4- 9

NC0233 40-50 VAR - - - -

SOI-5 Depth -pH- O.M. Salin Permeab Shnk-Swll

NC0052 0- 8 4.5- 6.5 2.-5. 0- 0 2.0- 6.0 LOW

NC0052 0- 8 4.5- 6.5 2.-5. 0- 0 0.6- 2.0 LOW

NC0052 8-40 4.5- 6.5 0.-2. 0- 0 0.6- 2.0 LOW

NC0052 40-50 - - - -

NC0233 0- 8 4.5- 6.5 2.-5. 0- 0 2.0- 6.0 LOW

NC0233 0- 8 4.5- 6.5 2.-5. 0- 0 0.6- 2.0 LOW

NC0233 8-40 4.5- 6.5 0.-2. 0- 0 0.6- 2.0 LOW

NC0233 40-50 - - - -

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Established Series
CMO/Rev. JAK
10/2008

JOHNSTON SERIES

MLRA(s): 133A-Southern Coastal Plain, 153A-Atlantic Coast Flatwoods, 153B-Tidewater Area

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Raleigh, North Carolina

Depth Class: Very deep

Drainage Class (Agricultural): Very poorly drained

Flooding Frequency and Duration: Frequent or occasional for very brief to long periods

Ponding Frequency and Duration: None

Internal Free Water Occurrence: Shallow, common

Permeability: Moderately rapid

Landscape: Lower to upper coastal plain

Landform: Flood plain, swamp

Geomorphic Component: Tread

Parent Material: Alluvium

Slope: 0 to 2 percent

Elevation (type location): Unknown

Mean Annual Air Temperature (type location): 63 degrees F.

Mean Annual Precipitation (type location): 46 inches

TAXONOMIC CLASS: Coarse-loamy, siliceous, active, acid, thermic Cumulic Humaquepts

TYPICAL PEDON: Johnston mucky loam--forested. (Colors are for moist soil unless otherwise stated.)

A--0 to 30 inches; black (10YR 2/1) mucky loam; massive; friable; very strongly acid; abrupt smooth boundary. (24 to 48 inches thick)

Cg1--30 to 34 inches; dark gray (10YR 4/1) loamy fine sand; single grained; loose; very strongly acid; abrupt smooth boundary.

Cg2--34 to 60 inches; gray (10YR 5/1) fine sandy loam; lenses and pockets of loamy sand and sand; massive; very friable; dark colored loam in old root channels; very strongly acid.

TYPE LOCATION: Scotland County, North Carolina; 3 miles south of Wagram; 50 feet west of Shoe Heel Creek; 1.5 miles north of Lee's pond; 25 feet south of a paved road.

RANGE IN CHARACTERISTICS:

Depth to Bedrock: Greater than 80 inches

Depth to Seasonal High Water Table: 0 to 12 inches, November to May

Rock fragment content: Below 40 inches, 0 to 35 percent, by volume, mostly rounded quartz gravel

Soil Reaction: Extremely acid to strongly acid

Other Features: Some pedons have a few inches of recent alluvium deposited over the dark colored A horizon or thin (less than 8 inches thick) organic layers.

RANGE OF INDIVIDUAL HORIZONS:

Oa horizon (where present):

Color--hue of 10YR, value of 2 or 3, chroma of 1 or 2, hue of 2.5Y, value of 2.5 or 3, chroma of 1 or 2, or is

neutral with value of 2.5 or 3
Texture--muck

A horizon:

Color--hue of 10YR, value of 2 or 3, chroma of 1 or 2, hue of 2.5Y or 5Y, value of 2.5 or 3, chroma of 1 or 2, or is neutral with value of 2.5 or 3

Texture (fine-earth fraction)--coarse sandy loam, sandy loam, fine sandy loam, or loam and may include the mucky texture modifier.

Redoximorphic features (where present)--masses of oxidized iron in shades of red, yellow, or brown and iron depletions in shades of gray

Other features--Organic matter content of the A horizon ranges from 3 to about 20 percent

Cg horizon:

Color--hue of 10YR to 5Y, value of 4 to 8, chroma of 1 to 2, or is neutral with value of 4 to 7

Texture (fine-earth fraction)--coarse sand, sand, fine sand, loamy coarse sand, loamy sand, loamy fine sand, coarse sandy loam, sandy loam, fine sandy loam, or loam. Some pedons have thin strata of sandy clay loam.

Redoximorphic features (where present)--masses of oxidized iron in shades of red, yellow, or brown and iron depletions in shades of gray

COMPETING SERIES:

There are no other known series in this family.

GEOGRAPHIC SETTING:

Landscape: Lower to upper coastal plain

Landform: Flood plain, swamp

Geomorphic Component: Tread

Parent Material: Alluvium

Elevation: 20 to 450 feet

Mean Annual Air Temperature: 59 to 70 degrees F.

Mean Annual Precipitation: 38 to 52 inches

Frost Free Period: 190 to 245 days

GEOGRAPHICALLY ASSOCIATED SOILS:

[Bibb](#) soils--poorly drained, on similar landforms

[Johns](#) soils--somewhat poorly drained, on adjacent stream terraces

[Kalmia](#) soils--well drained, on adjacent stream terraces

[Kenansville](#) soils--well drained, on adjacent stream terraces

[Kinston](#) soils--poorly drained, on similar landforms

[Lumbee](#) soils--poorly drained, on adjacent stream terraces

[Murville](#) soils--have spodic materials

[Osier](#) soils--poorly drained, on adjacent stream terraces

[Pamlico](#) soils--organic soils

[Paxville](#) soils--have a fine-loamy particle-size control section, on adjacent stream terraces and drainageways

[Pocomoke](#) soils--have thicker surface layers, on adjacent stream terraces and drainageways

[Rutlege](#) soils--have a sandy particle-size control section, on similar landforms

[Torhunta](#) soils--have an umbric horizon, on similar landforms

DRAINAGE AND PERMEABILITY:

Depth Class: Very deep

Drainage Class (Agricultural): Very poorly drained

Internal Free Water Occurrence: Shallow, common

Flooding Frequency and Duration: Frequent or occasional for very brief to long periods

Ponding Frequency and Duration: None

Permeability: Moderately rapid

USE AND VEGETATION:

Major Uses: Woodland

Dominant Vegetation: Where wooded--water tupelo, swamp tupelo, sweetgum, yellow poplar, green ash, water oak, and baldcypress. Also, loblolly pine grows in areas that have been drained. Understory plants include inkberry (bitter gallberry), American holly, greenbrier, switchcane, blueberry, honeysuckle, and poison ivy. Where cultivated--corn, soybeans, and pasture.

DISTRIBUTION AND EXTENT:

Distribution: South Atlantic and Gulf Coastal Plain in Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, and Virginia

Extent: Moderate

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Raleigh, North Carolina

SERIES ESTABLISHED: Johnston County, North Carolina; 1911.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Umbric epipedon--the zone from the surface to a depth of 30 inches (A horizon)

ADDITIONAL DATA:**TABULAR SERIES DATA:**

| SOI-5 | Soil Name | Slope | Airtemp | FrFr/Seas | Precip | Elevation |
|--------|-----------|-------|---------|-----------|--------|-----------|
| NC0043 | JOHNSTON | 0-2 | 57-70 | 190-245 | 38-52 | 20-450 |

| SOI-5 | FloodL | FloodH | Watertable | Kind | Months | Bedrock | Hardness |
|--------|--------|--------|------------|----------|---------|---------|----------|
| NC0043 | COMMON | | 0-1.0 | APPARENT | NOV-MAY | >80 | - |

| SOI-5 | Depth | Texture | 3-Inch | No-10 | Clay% | -CEC- |
|--------|-------|-----------|--------|---------|-------|-------|
| NC0043 | 0-30 | MK-L | 0-0 | 100-100 | 7-18 | 9-22 |
| NC0043 | 0-30 | L SL FSL | 0-0 | 100-100 | 5-18 | 4-12 |
| NC0043 | 30-34 | SR LS S | 0-0 | 100-100 | 2-12 | 1-5 |
| NC0043 | 34-60 | SR FSL SL | 0-0 | 100-100 | 5-20 | 1-6 |

| SOI-5 | Depth | -pH- | O.M. | Salin | Permeab | Shnk-Swll |
|--------|-------|----------|---------|-------|---------|-----------|
| NC0043 | 0-30 | 3.5- 5.5 | 8.0-15 | 0-0 | 2.0-6.0 | LOW |
| NC0043 | 0-30 | 3.5- 5.5 | 3.0-8.0 | 0-0 | 2.0-6.0 | LOW |
| NC0043 | 30-34 | 3.5- 5.5 | 0.5-3.0 | 0-0 | 6.0-20 | LOW |
| NC0043 | 34-60 | 3.5- 5.5 | 0.0-2.0 | 0-0 | 6.0-20 | LOW |

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