APPENDIX B-1

Archaeological Survey and Testing at the Lowesville Tract, Lincoln County, North Carolina

Archaeological Survey And Testing At the Lowesville Tract, Lincoln County, North Carolina

Brockington And Associates
Atlanta, Georgia
1990

ARCHAEOLOGICAL SURVEY AND TESTING AT THE LOWESVILLE TRACT, LINCOLN COUNTY, NORTH CAROLINA

Prepared for

Duke Power Company,
Charlotte, North Carolina

Prepared by

Jeffrey W. Gardner
Project Director and Principal Author

Christopher T. Espenshade
Principal Investigator and Co-Author

Ruthanne L. Mitchell
Bobby L. Southerlin
Marian D. Roberts
Co-Authors

Brockington and Associates, Inc.
Atlanta, Georgia
September, 1990

ABSTRACT

Two stages of cultural resource investigations were conducted at the Lowesville Tract (Lincoln County, North Carolina) for Duke Power Company. The first stage (conducted during November and December 1988) involved Historical American Building Survey level documentation (photography, measured drawings, and verbal descriptions) of the J. Graham Morrison House and associated outbuildings, and archaeological testing in the immediate house area. This stage also included preliminary historical research, focusing on determining the age of the structures and general property history. The second stage was conducted during September 1989, and consisted of archaeological survey of the surrounding 712 acre tract, evaluation of recorded sites, and historical (i.e., archival and oral history) research.

Stage one resulted in the complete documentation of the J. Graham Morrison House (built ca. 1911) and associated extant outbuildings, and recovery of a sample of historic period artifacts. Stage two resulted in the location and evaluation of 34 archaeological sites and 23 isolated finds of prehistoric and historic artifacts. All but one of the recorded sites are considered to lack significant research potential and are recommended ineligible for the National Register of Historic Places; no additional work is required at these sites. Based on integrity and clarity of archaeological and architectural remains, site 31LN78 & 78** is considered to possess significant research potential to provide data on rural postbellum lifeways in the Piedmont of North Carolina, and is recommended eligible for the National Register of Historic Places. While preservation is recommended, data recovery should be undertaken if preservation is not feasible.

ACKNOWLEDGEMENTS

A number of individuals and groups are to be acknowledged for their contributions to the successful completion of this project. Chris Espenshade served as Principal Investigator throughout the entire project. David Anderson, Wayne Archie, and Tom Yocum of Duke Power Company provided logistical support for all phases of the project research. Michael Southern (Survey and Planning Branch, North Carolina State Historic Preservation Office) consulted with us regarding documentation procedures for the J. Graham Morrison house and associated structures. Richard Bryant conducted the photographic documentation, and Ruthanne Mitchell (with the aid of a crew consisting of Chryssie Mitchell, Chris Espenshade, John Davis, Shane Cox, and Mark Butler) drew architectural plans and directed the archaeological testing around the house. Jeff Gardner served as Project Director for the survey and evaluation stage of the project and was ably assisted by a seasoned field crew: Bobby Southerlin, John O'Donnell, Ashley Chapman, David Marsh, Matt Wilkerson, Jim Legg, Ron Schoettmer, and Ray Talley. Useful oral history was graciously provided by Margaret Guillett, Lewis and Hazel Anderson, and Jerald Rankin. The principal author would also like to thank the co-authors: Chris Espenshade, Ruthanne Mitchell, Bobby Southerlin, and Marian Roberts for their contributions to the final report.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

I. INTRODUCTION

This report documents the cultural resource investigations undertaken by Brockington and Associates, Inc., at the Lowesville Tract (Lincoln County, North Carolina) for Duke Power Company during 1988 and 1989. This research included archaeological survey, archaeological testing, Historic American Building Survey [HABS] quality photography and recording, and historical research. The work was undertaken in anticipation of tract development and was completed without federal or state mandate.

On 6 and 7 July 1988, Mr. Christopher T. Espenshade (Brockington and Associates, Inc.) met with Mr. David Anderson (Duke Power Company) to discuss areas of concern related to architectural and archaeological resources within a 712 acre tract (located approximately two miles west of Lowesville, Lincoln County, North Carolina) under consideration for purchase (Figure 1). These meetings resulted in formulation of a two-stage plan for addressing management of cultural resources (letter, Espenshade to Anderson, 8 July 1988). The first stage involved development of a plan for dealing with what was purported to be an historically significant standing structure (i.e., the Robert H. Morrison House), and its associated outbuildings. The second stage consisted of development of a plan for archaeological survey and testing of the remainder of the Lincoln County tract to locate and define archaeological sites within tract boundaries, to evaluate these sites with regard to eligibility to the National Register of Historic Places [NRHP], and to recommend management options.

On 26 August, Brockington and Associates, Inc., submitted detailed descriptions of the cultural resource management plan to Duke Power Company (Espenshade to Anderson, 26 August 1988). This plan included results of a search of the North Carolina Archaeological Site Files and NRHP listings; general description and management options for the purported R.H. Morrison House; evaluation of the cultural resources potential for the tract (based on relevant archaeological literature, historic land use, and erosion); and description of survey and testing methods.

Concerns over the construction date of the extant Morrison House (based on inconsistencies in the historical records and questions of architectural style, materials, and methods of construction) resulted in consultation with Mr. Michael T. Southern (Survey and Planning Branch, North Carolina Division of Archives and History). On 10 November 1988, Mr. Southern and Mr. Espenshade visited the house, and examined key construction details, including the foundation, interior and exterior wall

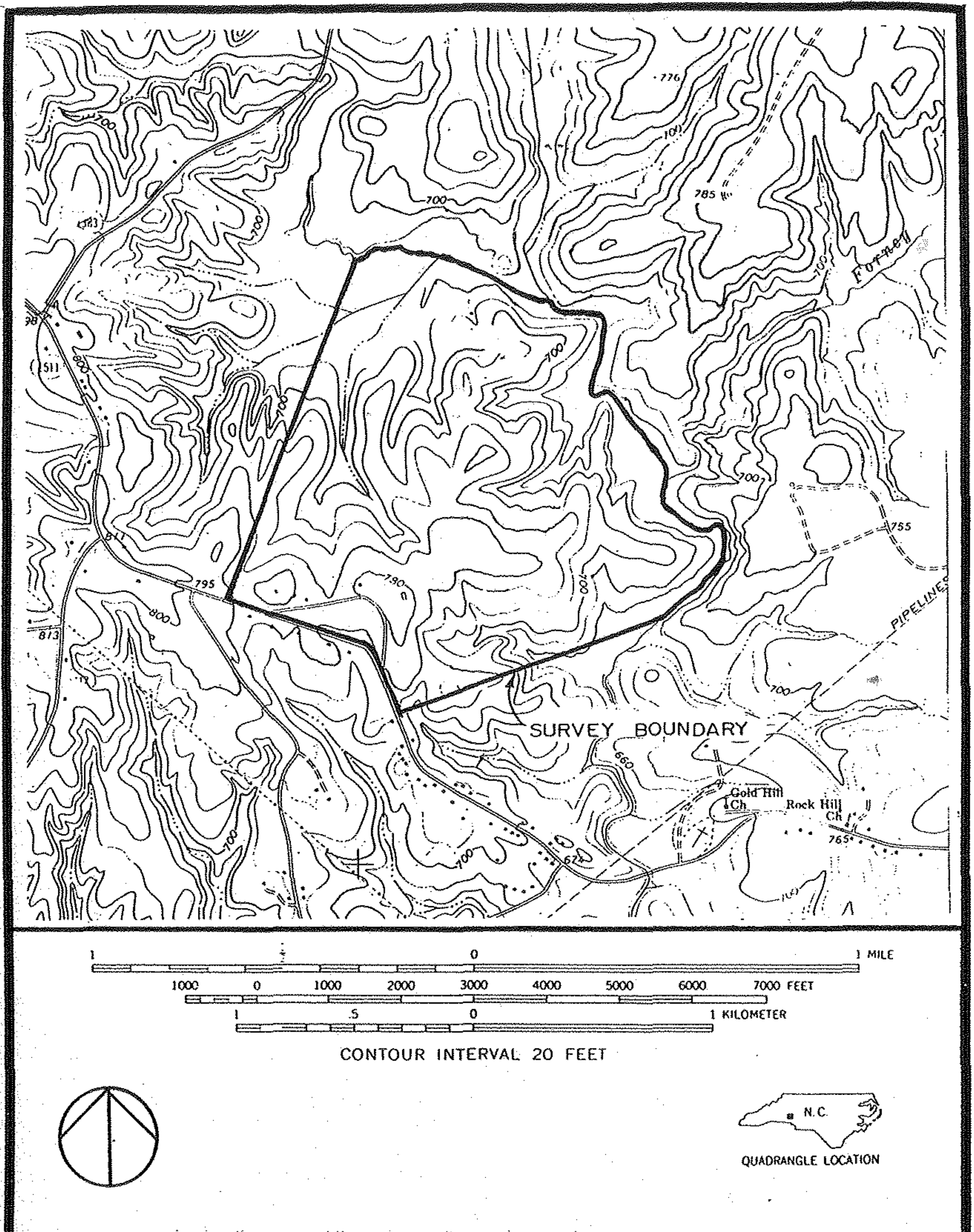


Figure 1. Project Tract Location.

construction, and roof support system. Based on these observations and the discovery of older rock foundation remnants in the house crawl space, Mr. Southern concluded that, although constructed on the site of an earlier structure (possibly the R.H. Morrison house, ca. 1840), the extant Morrison house was probably built during the period 1915-1925 [additional research verified this assessment, indicating that the extant house had been constructed ca. 1912 by R.H. Morrison's grandson, J. Graham Morrison]. Mr. Southern indicated that the house probably did not exhibit sufficient architectural or historical value to be eligible to the NRHP, and suggested appropriate documentation procedures (4 by 5 inch photos, plan drawings, and statement of history, ownership, and occupancy) to be undertaken prior to razing of the structure (letter, Southern to Espenshade, 21 November 1988). In consultation with Mr. Stephen R. Claggett (North Carolina Office of State Archaeologist), Mr. Espenshade incorporated these recommendations and a plan for archaeological testing around the extant house and outbuildings into the previously submitted cultural resource management plan (letter, Espenshade to Anderson, 14 Novenber 1988).

Cultural resource investigations within the Lowesville tract were conducted in two stages. In November, 1988, Duke Power Company was authorized to purchase the former Morrison tract. Archaeological and architectural documentation of the J. Graham Morrison House was directed by Ms. Ruthanne L. Mitchell and undertaken between 28 November and 1 December 1988; at the same time, Mr. Richard Bryant conducted the photographic documentation. Descriptions of this work are included in this report as Appendix A. The J. Graham Morrison House and existing outbuildings were razed during the period December 1988-January 1989; Duke Power Company purchased the tract in January 1989. Archaeological survey and testing of the Lowesville tract was conducted between 5 and 14 September 1989 and directed by Mr. Jeffrey W. Gardner. Additional archival and informant research was conducted by Mr. Gardner during September and October 1989.

Results of survey, testing, archival, and informant investigations of the Lowesville tract are presented in this report. Chapter II consists of a brief discussion of the environmental setting of the project area. Chapter III outlines the prehistoric and historic culture history of the area, including a property-specific discussion. Chapter IV describes methods utilized during field work, archival research, and laboratory processing and analysis. Results are discussed in Chapter V, and conclusions and recommendations are presented in Chapter VI. As noted above, Appendix A contains results of the archaeological and architectural documentation of the J. Graham Morrison house (ca. 1912-1989). Appendix B presents the artifact data from the tract survey and testing phase, and Appendix C includes the resumes of key project personnel.

II. ENVIRONMENTAL SETTING

The Lowesville project area is located in west central North Carolina, in the southwest portion of the Piedmont Province. The Piedmont is classified as a highly dissected plateau, part of the metamorphic region of the Appalachian Highlands. The Lincoln County portion is described by Burke and Brinkley (1914:559) as

> rolling to hilly, erosion and stream dissection having reached an advanced stage. The surface now presents a succession of ridges with deep intervening valleys.

Elevations within the county vary from 650 feet above mean sea level [AMSL] (on the Catawba River at the Gaston County line) to 1,500 feet AMSL (at Buffalo Knob, in northwestern Lincoln County). Within the project area, elevations range from approximately 650 feet AMSL on the flood plain near the confluence of Forney and Killian Creeks, to approximately 780 feet AMSL on the ridge top near the former location of the Morrison House.

Although the general drainage pattern of Lincoln County is to the south and southeast (toward the Catawba River), the survey tract consists generally of ridge top, slope, and flood plain lands draining north and east into Anderson and Killian Creeks (Figure 1). Drainage patterns are distinctively dendritic; Ward (1983:54) suggests that these patterns "would have encouraged the north-south movements of people while inhibiting east-west travel."

The Piedmont is underlain by a range of parent materials, including igneous, sedimentary, and metamorphic bedrock. Ward (1983:54) suggests that breccia, ash, tuff, and slate derived from surface or near-surface deposits from the Carolina Slate Belt would have "provided the prehistoric inhabitants of the Piedmont with an abundant supply of raw materials from which to make their tools and implements."

Upland Piedmont soils originate primarily from the weathering of a number of rock formations. Burke and Brinkley (1914:569) indicate that fine textured rock contributes to the formation of heavier soils (e.g., clay and clay loams) while coarse grained rock forms the basis for coarser textured soils (e.g., sand and silt loams). Lincoln County soils are derived from granites and gneisses (including quartz, feldspar, mica, and horneblende), with schists, crystalline slates, and diorites represented as minority types (Burke and Brinkley 1914:569).

Depths of surface soils vary dramatically based on degree of erosion and redeposition; in many cases, particularly on ridge tops and slopes in areas undergoing intensive agricultural use, ground surfaces are exposed to underlying red clay subsoil. Colluvial redeposition of sandy upland soils is apparent on terrace and upland surfaces (Burke and Brinkley 1914:569).

The primary upland (ridge top and upper slopes) soils found in the Lowesville tract are defined as Cecil sandy loams and Cecil clay loams (Burke and Brinkley 1914:571-577). The former is described as well-drained, gray loamy sand with scattered quartz throughout. This soil is found on ridge tops (varying with color from 6 to 15 inches) and slopes, and is highly susceptible to erosion. The latter (often found mixed with or underlying Cecil sandy loam) is a brown or red, shallow, compact clay loam, and is found primarily along gentle to steep slopes above watercourses at depths of 5 to 8 inches. Burke and Brinkley (1914:575) state that "more damage is done on this soil by wash than on any other in the county, with the exception of Cecil clay. Some fields have been abandoned on account of wash."

It should be noted that while a recent soil survey of Lincoln County (1988 copy provided by the District Conservationist of the USDA Soil Conservation Service), poses different names for soil types occurring in this area (for example, Cecil clay loam and Cecil sandy loam are subsumed under the Gaston sandy clay loam type), few differences were noted in current woodland types, drainage, and productivity. For the purposes of this study, the soil typology utilized during the 1914 soil survey (Burke and Brinkley 1914) will be followed.

Cecil sandy and clay loams vary somewhat in supporting vegetation, productivity, and drainage. Cecil sandy loams are easily cultivated but lack organic matter; cultivated lands produce cotton, corn, a variety of other grains and grasses, and fruit trees. Forested areas support white, red, and post oak, some hickory, and small amounts of pine and cedar. Cecil clay loams are less well drained but are also primarily cultivated, producing cotton, corn, wheat, oats, hay, and small quantities of truck and fruit crops. Pine is most common on rugged uncultivated lands, but is accompanied by varieties of oak, hickory and cedar (Burke and Brinkley 1914).

Current fair to poor condition of ridge top soils is generally attributable to poor agricultural practices during the last 150 years. These practices, which in many cases have led to severe erosion of upland soils, include shallow plowing, lack of winter cover crops, overgrazing, limited crop rotation, and omission of fertilization (Burke and Brinkley 1914:566).

Minor drainages and upper terraces exhibit Cecil clay loam (hilly phase) and Louisa clay soils. The hilly phase is similar to Cecil clay loam in composition but is generally found on hillsides or slopes adjacent to stream bottoms. These soils are not often cultivated, but have been found to be good grazing land. Red micaceous Louisa clay is found on a range of surfaces, varying from level or undulating to steep and broken, and exhibits severe washing and noticeable gullying; fertility is moderate (Burke and Brinkley 1914:576-77; 582-83).

Iredell clay loam and Congaree silt loam are the major soil types found on flood plains of Anderson and Killian Creeks (Burke and Brinkley 1914:584-586). Brown/grey Iredell clay loams vary in depth from 2 to 10 inches and occur primarily on stream slopes. Red/brown micaceous Congaree silt loams are derived from colluvial deposits and are generally poorly drained, occurring on flood plains and first terraces at depths of 6 to 10 inches.

The Lowesville project tract is located within a temperate climatic band experiencing damp (misty rains; some light snows) moderately cold winters (mean winter temperature is 43 degrees F) and dry warm summers (mean summer temperature is 77 degrees F) (Burke and Brinkley 1914:561). The mean annual precipitation for this area is approximately 49 inches (combined snow and rain averages) distributed evenly throughout the year. The last killing frost occurs at the end of March with the earliest frost reported in early November; the average growing season of 210 days (Burke and Brinkley 1914:562).

During the last 10,000 years, a modern somewhat xeric forest probably covered much of the Piedmont (Braun 1950; Kuchler 1964; Wharton 1978). As warming continued, increased moisture augmented the northward advance of the oak-hickory forest (H. Delcourt 1979). In a study by Sheehan, Whitehead, and Jackson (n.d.), for the Richard B. Russell multiple use area in Piedmont Georgia and South Carolina, palynological evidence suggests that spruce, fir, pine, and hemlock rapidly decreased in importance between 9,000 to 4,000 years before present [BP]. By the mid-Holocene, the oak-hickory forest was gradually being replaced by a pine dominated woodland (Sheehan _et al_. n.d.:3).

From 4,000 yrs BP to the present, the upland vegetation of the Piedmont is characterized by "fluctuations in population sites of pine, oak, and chestnut" (Sheehan _et al_. n.d.). Hickory and gum are generally less important, with alder and ragweed increasing in representation in the palynological record (H. Delcourt 1979; Sheehan _et al_. n.d.). This suggests a thinning of arboreal vegetation, possibly resulting from human intervention. Similarly, the importance and overall increase of pine species in the forest at this time would have depended on several factors, including soil, fire, and human land clearing efforts (Sheldon 1983; Sheehan _et al_. n.d.).

Utilizing this example from Georgia, upland hardwood communities across the Piedmont would seem to have exhibited the most change since Afro-European settlement (Trimble 1969:15-23). Prior to this time, river and stream channels were distinctly defined, usually rocky and exhibiting minimal overflow. Trimble (1969:22-23) indicates that "bottomland along valley floors was reasonably dry and tillable, ... with infrequent wet places, and well developed soil horizons." This cultivable bottomland was of great agricultural and timbering importance to the early settlers, however their activities often resulted in severe alteration of flood plains and terraces along major river and creek drainages.

Currently the Lowesville project area is dominated by an oak-hickory-pine forest characteristic of the central Piedmont (Braun 1950:213). Upland vegetational communities typically include such species as white, post, and red oak, hickory, dogwood, pine, and cedar. Large sections of the formerly cultivated uplands have been planted in loblolly(?) pine. Flood plain flora are elm, ash, oak, poplar, sycamore, willow, and semiaquatic undergrowth (Burke and Brinkley 1914).

Modern stream and flood plain fauna of the Piedmont have been summarized by Shelford (1963) and include most species of eastern fishes, mammals, birds, amphibians, and reptiles. Mammals exploiting riverine resources directly are otter, mink, raccoon, shrews, deer, and rabbit.

III. CULTURAL BACKGROUND

A. PREHISTORIC OVERVIEW

Paleo-Indian and Transitional Periods (12,000 to 7,500 BC)

The Paleo-Indian Period has classically been interpreted as a time in which small, highly mobile bands made their living through the hunting of now extinct megafauna (Griffin 1967). While the distinctive tool kit of the period -- fluted projectile points and a well developed blade technology -- has been found in association with the remains of megafauna commonly in the West and occasionally in the East (see Webb et al. 1984), current interpretations suggest that a more generalized subsistence program was in effect. Ward (1983:64-65) argues:

> The seasonal round of resource utilization within a tightly scheduled procurement system cannot be substantiated and neither can the exploitation of late Pleistocene megafauna. Although it is difficult to tell what was hunted by the shape of the projectile point, the general typological continuity between the Hardaway, Palmer, and Kirk horizons appears to suggest less specialized activity than the exploitation of megafauna.

The material culture of the Paleo-Indian period is dominated by fluted or semi-fluted projectile points, most commonly produced on high quality crytocrystalline material. Although some fluted points have been found in surface contexts across the North Carolina Piedmont, the Paleo-Indian (i.e., Clovis) period is poorly represented (Ward 1983).

Artifacts and sites of the Transitional period (10,000 to 8,000 BC) are much more common in the region. It should be noted that there is some disagreement regarding the placement of the Hardaway and Palmer phases, with the Palmer phase sometimes placed in the Early Archaic period and the Hardaway phase sometimes placed in the Paleo-Indian period (e.g., Ward 1983; Purrington 1983; Claggett and Cable 1982). The interpretations of Ward (1983) are followed in this report.

The Hardaway complex includes semi-fluted/side-notched projectile points and a wide variety of formal scrapers (Coe 1964). It is best known from the Hardaway (type) site in Stanley County (Coe 1964), but other excavations have also yielded Hardaway and Hardaway-Dalton material (e.g., Claggett and Cable 1982). The following Palmer phase retains many of the same formal tool types, while the Palmer projectile point is a side-notched variety generally lacking basal thinning or fluting (Coe 1964).

In terms of settlement, there appears to have been a dramatic increase in site frequency from Clovis to Hardaway phases, and again from Hardaway to Palmer phases. The later sites (Hardaway and Palmer) appear to have been present in a wide variety of environmental zones. If O'Steen's (1983) model of Transitional Period settlement in the Georgia Piedmont can be applied to the North Carolina Piedmont, then major sites would be expected near large rivers, particularly around areas of shoals or narrows.

No Paleo-Indian or Transitional period sites were previously recorded for the project tract. It was anticipated that the only evidence of this period would be small upland sites on the clay ridges, and possibly deeply buried deposits in the flood plains of Anderson or Killian Creeks.

Early Archaic Period (7,500 to 6,000 BC)

The Early Archaic was a time of response to the end of the glacial climate and the extinction of numerous large animals. Material culture of this period includes Kirk (Coe 1964) and possibly bifurcate projectile points (Ward 1983, Oliver 1985). During the Kirk phase, there may have been an emphasis on white-tailed deer and nuts (Ward 1983), and a collector strategy has been suggested by regional researchers (Chapman 1975; O'Steen 1983; Claggett and Cable 1982; Anderson and Hanson 1985).

Middle Archaic Period (6,000 to 3,000 BC)

This period is divided into the Stanly, Morrow Mountain, and Guilford phases, as defined by Coe (1964). Oliver (1985) views the Stanly projectile point type as technologically transitional between the earlier Kirk points and the Savannah River points of the Late Archaic. The Morrow Mountain and Guilford technologies are seen as possibly intrusive developments (Oliver 1985). Regardless of origin and relationships, all the traditions of the Middle Archaic were marked by a high site frequency and a dramatic increase in the use of locally available lithic resources (Claggett and Cable 1982; Blanton 1983). Ward (1983) observes:

> An increase in population occurred from the Early to Late Archiac period, and more and more diverse and specialized ecological niches were exploited as adaptive efficiency increased through time. This "forest efficiency" is generally believed to have been

enhanced by scheduling resource procurement in a tightly structured seasonal round (Caldwell 1958).

The North Carolina Piedmont has a very high density of medium to small lithic scatters dating to the Middle Archiac period. While some larger sites are occasionally encountered, it was anticipated that the Middle Archaic presence on the Lowesville tract would be limited to small scatters of quartz debitage and diagnostic projectile points.

Late Archaic Period (3,000 to 500 BC)

The Late Archaic witnessed still increasing localization and specialization, augmented by incipient horticulture (Ward 1983). The most prevalent diagnostic tool of the Late Archaic is the broad, square-stemmed Savannah River projectile point and its derivatives (Coe 1964; Oliver 1985). While the coastal zone saw a dramatic increase in site size and complexity in the Late Archaic, the Piedmont witnessed a basic continuation of Middle Archaic adaptations. The Late Archaic did begin to see a breakdown in the localization of the Middle Archaic, as steatite and lithic resources were traded interregionally.

Early Woodland Period (500 BC to AD 800)

The Woodland Period is marked by the first production of pottery in the North Carolina Piedmont, and by the first use of small triangular projectile points, assumed to indicate the presence of the bow and arrow. The Early Woodland sequence defined by Coe (1964) has been only minimally revised in the past 26 years, and is represented by the Badin and Yadkin complexes. The earlier Badin complex is characterized by fabric impressed or cord marked pottery, decorative modes of apparently northern origin (Caldwell 1958). In the subsequent Yadkin complex, check stamping (a southern tradition) is added to the decorative modes (Caldwell 1958). While horticulture was probably practiced in the Early Woodland, it apparently was not emphasized. The Early Woodland is interpreted as a time of increased cultural dynamics as populations and ideas moved spread through the greater Southeast.

Middle Woodland Period (AD 800 to 1200)

During the Middle Woodland Period in the Piedmont of North Carolina, the Uwharrie ceramic series is prevalent. Uwharrie pottery includes net-impressed decorations, and is produced on a coarse tempered body (Coe 1952). Sites apparently became larger, and dense middens, refuse/storage pits, permanent structures, and shellfish debris become more common. Villages of this period seems to have been focused on major river floodplains, but the importance of maize horticulture is uncertain. Ward (1983:73) reports:

> To summarize, maize agriculture was not important during the Early and Middle Woodland periods in the North Carolina Piedmont. In fact, corn does not appear to have had much importance before A.D. 1000 (Coe 1964:51). Although people were growing corn by Late Woodland times, they were still relying heavily on hunting and gathering.

Late Woodland (AD 1200 to Contact)

As the above quotation indicates, the people of the Late Woodland of the North Carolina Piedmont apparently did not emphasize maize horticulture, in contrast to the Mississippian cultures of surrounding areas. The project area was apparently an interface between the Dan River/Caraway manifestations to the north (a continuation of Middle Woodland adaptations) and Southern Appalachian traditions to the south (Coe 1964; Reid 1967; Ferguson 1971).

B. HISTORICAL OVERVIEW OF LINCOLN COUNTY

The following overview of the history of Lincoln County is taken primarily from <u>Our Enduring Past: A Survey of 235 Years of Life and Architecture in Lincoln County, North Carolina</u>, by Brown and York (1986). The goal of this overview is to place the development of the Lowesville house site against a background of early and contemporary settlement and economic patterns within the county.

Lincoln County is located in the southwestern North Carolina Piedmont, east of the Catawba River. The earliest known inhabitants of the area, the Catawba Indians, were living there when the first Europeans explored the interior of North Carolina. Hernando de Soto and Juan Pardo led expeditions which traveled through the Piedmont between 1528 and 1568, and Pardo recorded Indian villages in the Lincoln County area. Diseases introduced by these explorers brought about dramatic changes in the population and culture of the Native Americans, causing entire villages to disappear before 1700.

In 1669 and 1670, an expedition under the leadership of John Lederer traveled through the Appalachian Mountains, and down the Occaneechi trail through what is now western North Carolina.

According to Swanton (1979), Lederer may have gone as far as the Catawba country. Several years later, in 1701, John Lawson explored the Piedmont. His party visited the Catawba "King's" house where they found a Scottish trader, John Stewart, waiting for them to arrive. The Indians had told him almost three weeks previously that Lawson was coming that way. Stewart wanted to travel along with them for safety because the Senecas were on the warpath in the Piedmont. Stewart had brought seven pack horses loaded with English trade goods into the Catawba territory, which he presumably exchanged for pelts (Lawson 1967).

By the 1740s and 1750s, white settlers had begun moving into the Piedmont. Many of these settlers came down the Great Wagon Road, from the Mid-Atlantic states (Pennsylvania, Maryland, New Jersey, and Virginia). Land in these areas had become infertile and expensive, and population densities were increasing. The primarily Scots-Irish and German emigrants were seeking rich, inexpensive farmland in sparsely settled areas where land would be available for their sons when they came of age. Many of the Scots-Irish settlers followed John Beattie, settling along the west side of the Catawba River near Beattie's Ford; prominent family names among this group include Alexander, Bell, Kincaid, and McCorkle. The Germans settled mainly in the valley of the south fork of the Catawba River, avoiding close contact with the Scots-Irish. Killian Creek was named for one of the early German families. Others settlers came from England and coastal North and South Carolina, also looking for farmland in sparsely settled areas.

The Catawba Indians were still living in the area when the settlers began moving in. These early settlers were harassed by the Catawba and Cherokee Indians, until the army defeated the Cherokees in 1761, driving them further west into the Blue Ridge Mountains. The Catawbas finally made peace with the British in 1763.

Lincoln County was created in 1779 and named for General Benjamin Lincoln who had just taken command of a section of the Continental Army. It was originally a fairly large county, consisting of more than 1800 square miles (Figure 2). Large counties were soon divided into smaller units as the population of the Piedmont increased, and Lincoln County lost much of its territory; by 1850, it had decreased to only 305 square miles (Figure 3).

In 1790 there were few large slaveowners in the county, as most of the farms were small. The residents of the new county were mainly subsistence farmers who raised corn, potatoes, beans, and peas for their own use. They usually also owned a few horses, cows, cattle, hogs, and chickens. Wheat became important economically late in the eighteenth century, and flour and

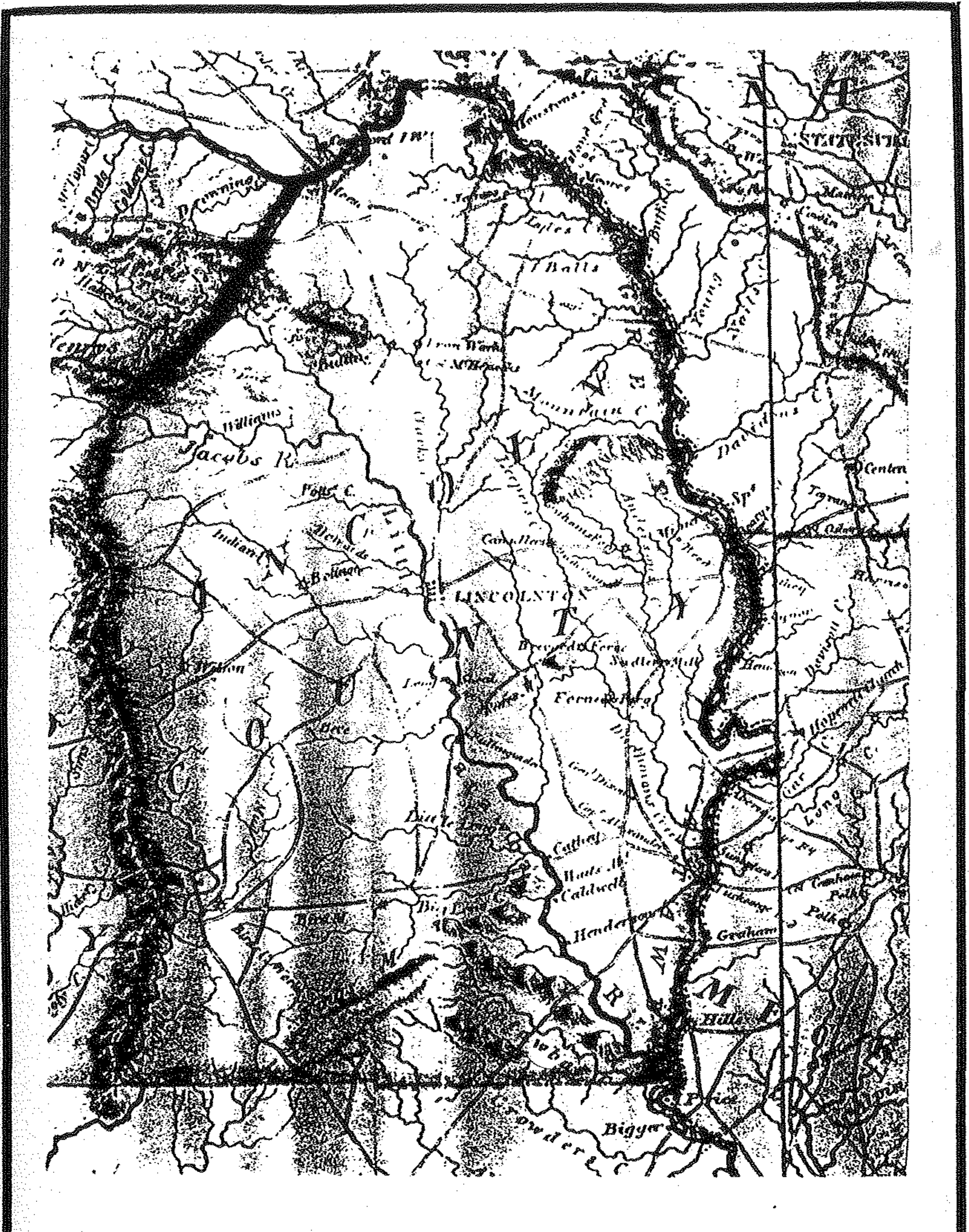
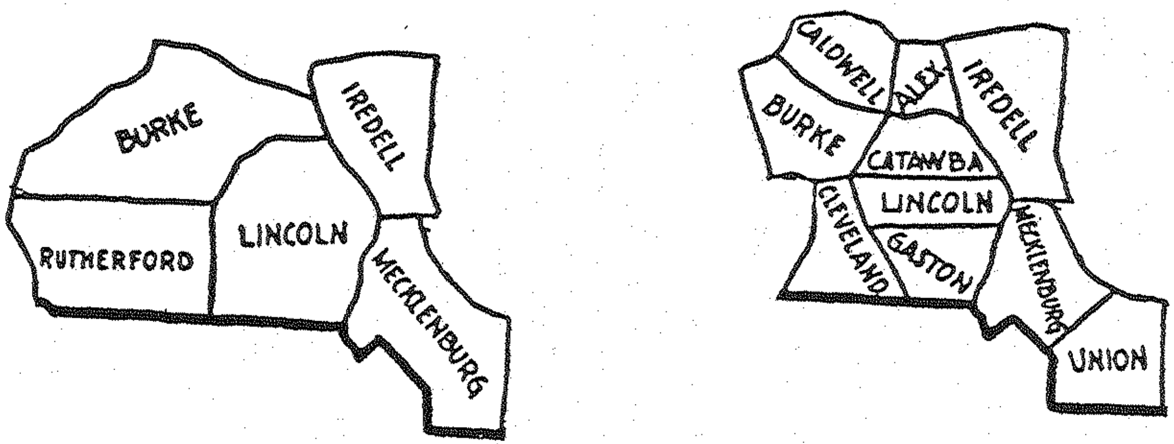


Figure 2. Segment of 1805 Map of North Carolina, Showing Lincoln County (reproduced in Brown and York 1986:245).



Lincoln County
At the Beginning of 1840

Lincoln County
At the Beginning of 1850

Figure. 3. Sketch Maps Showing Size Decrease of Lincoln County Between 1840 and 1850 (from Brown and York 1986:254).

cornmeal were shipped from Lincoln County down the Catawba and Little Catawba Rivers to South Carolina. Before the Revolutionary War, shipment of produce out of the county was very difficult due to the lack of good roads or easily navigable waterways.

At the time of the American Revolution, the residents of Lincoln County were divided in their loyalties. Some supported the rebel Americans, and others, the British. The German settlers in Lincoln County supported the English, feeling gratitude toward the Crown for allowing them to emigrate to the colonies. The Scots-Irish, many of whom had taken loyalty oaths to the Crown following the Regulator uprising, also supported England. British forces came into the county in 1780 and were joined by many of the Tories in a fight against the Whig militia at Ramsour's Mill. The combatants, who were neighbors and even relatives of each other, engaged in a fierce battle for more than an hour, resulting in at least 200 casualties about evenly divided between the two factions. The rebel Whigs finally prevailed, and the Lincoln County Tories were never a threat after that time. At the Battle of Kings Mountain a force of Tory Loyalists, led by British Captain Patrick Ferguson, was defeated by rebel militia units including a force from Lincoln County, commanded by Frederick Hambright.

After the Revolutionary War, many improvements were made in transportation, leading to increased wealth as cash crops for shipment to other areas, along with manufactured items, became important economically. New roads were built connecting Lincoln County to markets in nearby counties, Charlotte and the northern Piedmont, and cities in South Carolina. The MacRae-Brazier map of 1833 (Figure 4) shows the major roads in the county at that time. In the early nineteenth century, cotton production increased in the county, and the number of slaves increased dramatically, from 935 in 1790 to 5,502 by 1840. The number of slaveowners, however, remained nearly the same. The new roads also made travel easier. In 1831 passengers and mail were taken by stagecoach once a week from Lincolnton to Asheville. Passengers could leave Lincolnton at four o'clock Saturday morning and be in Asheville by Sunday night, a distance of 110 miles. The two-horse stagecoaches could carry eight passengers inside, and a few others could ride on top (Blackmun 1977:225).

In 1851, a plank road was built from Lincolnton to the Catawba River on the eastern edge of the county, and by 1856 the North Carolina Railroad between Goldsboro and Charlotte could be more easily reached. This enabled small farmers to produce more cash crops since they could more easily get them to a market.

With the new roads, goods could be taken to Charleston by wagon. Cotton, skins, cattle, hams, and butter were taken to

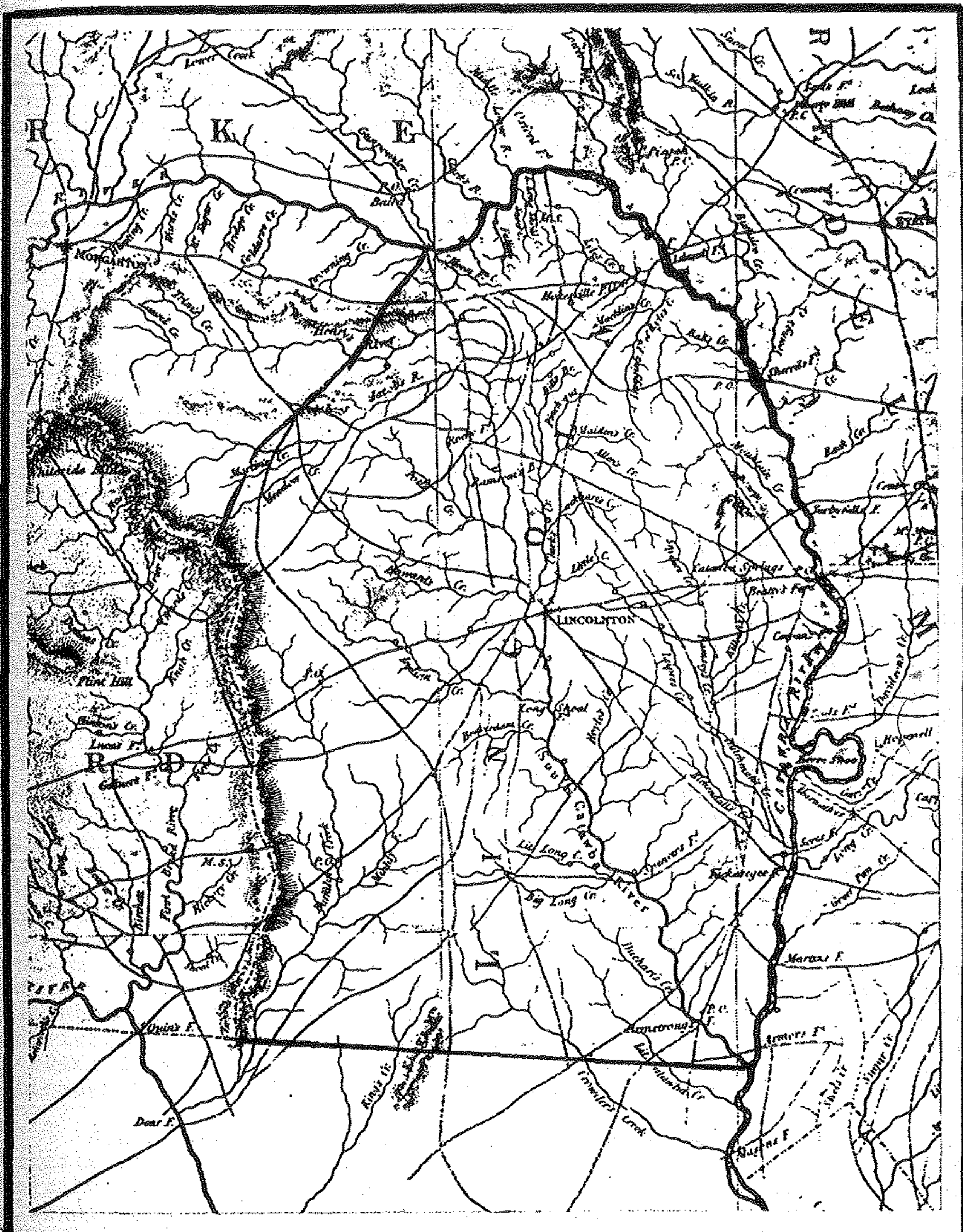


Figure 4. Segment of MacRae-Brazier (1833) Map, Showing Major Roads in Lincoln County.

market and the wagons returned laden with goods which could not be produced on family farms, such as coffee, tea, salt, sugar, cloth, and manufactured items. Charleston became the main market for produce from Lincoln County because there were still no good roads from Lincoln County leading into eastern North Carolina.

Most of the industries in Lincoln County in the late eighteenth and early nineteenth centuries were small, such as grist mills, flour mills, sawmills, potteries, and tanneries. In 1820 there were 71 grist mills, 39 sawmills, and 26 tanneries. By 1840 the number of grist mills had increased to 90, and there were 56 flour mills, 75 sawmills and 20 tanneries. Cloth was woven at home on most of the farms, and any excess was probably sold locally, but it wasn't long before cotton mills made their appearance. The first cotton mill south of the Potomac River was built in Lincoln County in 1813 (Powell 1989:4), and more were built in the next forty to fifty years. For a time, gold was mined in large amounts, but deposits were depleted before the middle of the nineteenth century.

Beginning around 1770, iron manufacturing became an important industry in Lincoln County. As an incentive to perspective founders, the state offered 3,000 acres of free land considered unfit for cultivation to any person who produced 5,000 pounds of iron within three years. In 1789, Peter Forney and others acquired the "Big Ore Bank," a large iron-ore rich tract, constructed furnaces, and produced tools and implements, pots, pans, skillets, hinges, lock, and nails, and bars of iron to be sold to blacksmiths. In the early 1790s, Major John Davidson and his sons-in-law, Joseph Graham and Alexander Brevard, began purchasing large tracts and constructing forges along Leeper's and and Anderson Creeks. Many other men constructed furnaces, and many fortunes were made before the Civil War. Before 1800 most of the county's residents lived in log houses, but the wealthy iron merchants were able to build large brick houses, and contribute funds to upgrade the older log churches, and build new schools. The new iron industry created jobs and increased trade out of and into the area. The major markets for goods produced in the ironworks were the North Carolina towns of Salisbury, Hillsborough, Greensboro, Wadesboro, Camden, and Cheraw; and Charleston, downriver in coastal South Carolina. Merchants and traders from the west brought cloth, leather and food to the furnaces to trade for iron products and iron bars.

Slaves were the labor force for the furnaces, which were usually fired during the winter when the slaves were not busy raising crops. The integration of iron manufacturing into the already productive agricultural economic base, was actually beneficial to the slaveowners, as their slaves were kept busy year round. Once the furnaces and molds for the molten iron were paid for, there was little additional expense incurred in producing goods, and profits were high.

In 1840, the Lincoln County ironworks were leading the industry in North Carolina; however, just before the Civil War, the industry declined, as no improvements had been made in production and transportation methods, and wood for fuel was growing scarce. For a time, Lincoln County's ironworks were no longer competitive, but the Civil War increased the demand for iron products and food, since the Confederate government had to purchase everything locally. One new iron furnace was built in the county, and a Confederate facility for manufacturing drugs was built near Lincolnton. During the final weeks of the war there was an influx of refugees from South Carolina, who had been displaced by Sherman's march through the state. These refugees brought some money into the county as they had to pay for food and a place to stay in most instances. There was some profiteering at the expense of those people, causing understandable bitterness among them.

After the Civil War, the size of individual farms decreased as the slave system gave way to tenancy. There was a period of recession following the war, but by 1880 prosperity had returned to the area and major cash crops such as cotton, oats, corn, and tobacco were being grown in large amounts. Major industries in the area were textile mills and tobacco and furniture factories, and there was an increase in the number of grist and flour mills. Transportation improvements included the development of the railroads, and better roads within the county. The first railroad built through Lincoln County was the Chester and Lenoir narrow gauge track, built in 1881. This railroad ran north from Chester, South Carolina, and through Lincoln County to Lenoir in Caldwell County, North Carolina. By 1896, other tracks connected Lincolnton with Shelby in adjacent Cleveland County, and with Charlotte, in Mecklenburg County (Figure 5).

For many years, Lincoln County had a reputation as a resort center. The Catawba Springs resort attracted patrons as early as the 1790s, when wealthy planters and their families from the Carolina coast stayed there during the summer to escape the hot weather and the debilitating diseases common in the coastal area at that time. In 1887, a new enterprise, the Lincoln Lithia Water Company, was organized to bottle and ship mineral water, and two years later the company built a hotel near Lincolnton. It soon developed into a popular resort, serving patrons from throughout the Carolinas.

The iron industry, which had played such a large part in the economy of the region, declined again after the Civil War. However, the advent of the railroads offset the general economic decline to some degree, and by the early twentieth century,

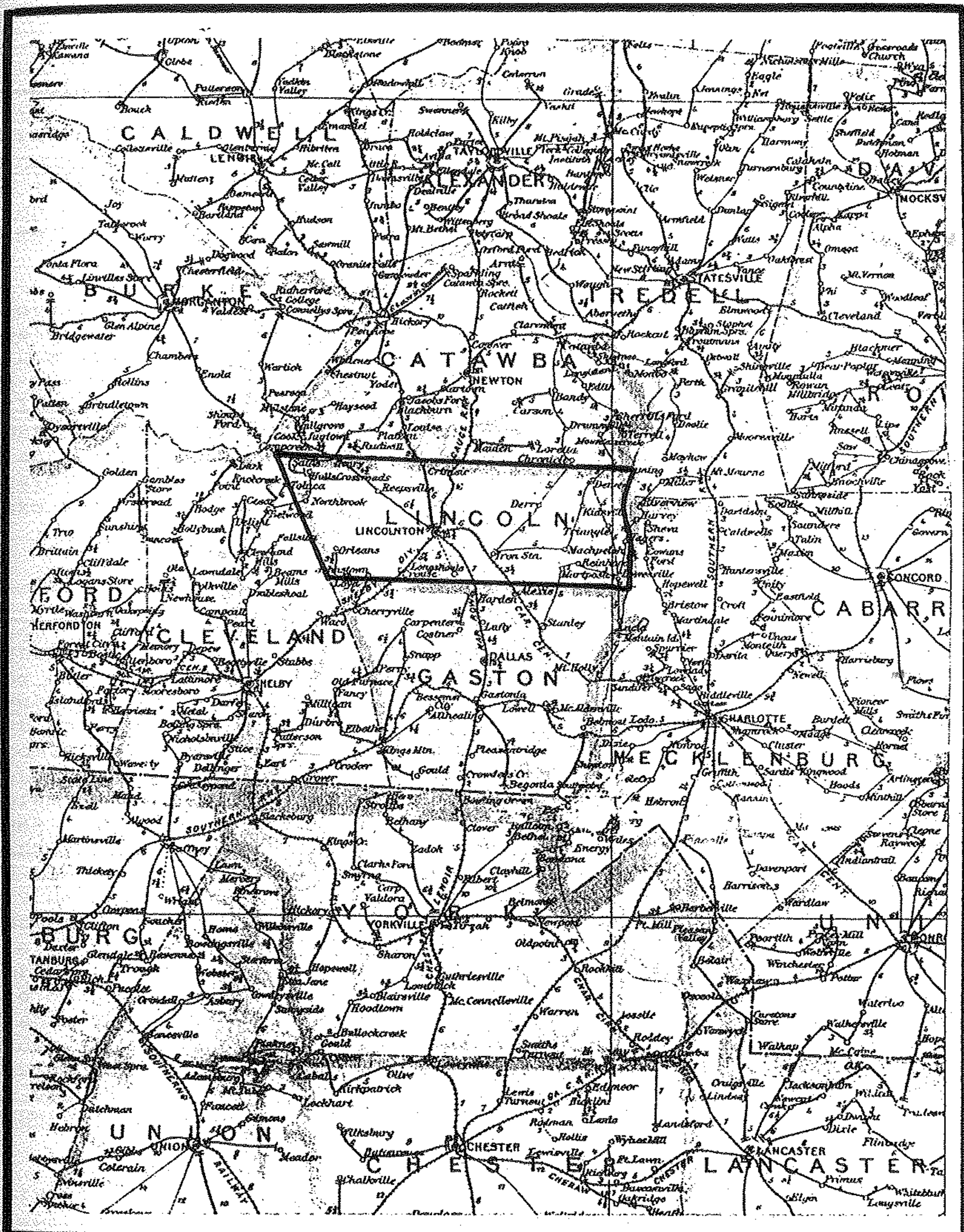


Figure 5. Segment of the 1896 Post Route Map of North and South Carolina, Showing the Railroads Which Passed Through Lincoln County (reproduced in Brown and York 1986:245).

Lincoln County was prosperous again. Textile factories were established in the 1880s, providing more jobs, and many former farm laborers became factory workers by 1900. Although accounting for only about one-third of the county's economic base by 1920, agriculture was still important; cotton was the major crop prior to 1920, and tobacco was the main cash crop after that time.

Industry became much more diversified in the twentieth century. New industries in the county included brick dealerships, a casket factory and other woodworking plants, and tin mining. Falling cotton prices after 1930 caused a reduction in the planted acreage of that crop, and a number of the textile mills were closed. After World War II, the textile industry continued to decline, but new furniture and food processing plants were built which offset the loss of jobs somewhat. Many residents now commute to nearby cities to work, but continue to make their homes in Lincoln County.

C. Tract Specific History

According to Lincoln County historical records, initial settlement in the project area appears to have been related to the rapid growth of the iron industry during the late eighteenth century. In 1788, the North Carolina state assembly passed "An Act to Encourage the Building of Iron Works in this State," promising 3,000 acres of non-agricultural land to anyone establishing an ironworks. In 1789, Peter and Abram Forney, Abram Earhardt, and Turner Abernathy purchased the "Big Ore Bank," a large deposit of iron ore to the northeast of Lincolnton, from the State of North Carolina (Graham 1904:136); by the early 1790s, Peter Forney was operating an iron furnace at Mt. Welcome. In 1791, Major John Davidson and his sons-in-law, Joseph Graham and Alexander Brevard, purchased an interest in the ore bank and furnace from Peter Forney, and by 1795 the partnership had acquired nearly 3,000 acres along Leeper's Creek, and constructed Mount Tirzah Forge. That same year, Davidson, Graham, and Brevard purchased an interest in a tract along Anderson Creek from Forney and constructed Vesuvius Furnace (Brown and York 1986:258). Soon thereafter Graham built a house at Vesuvius Furnace and moved his family there from Mecklenberg County (Graham 1904:137).

Graham had settled in nearby Mecklenberg County after service in the Revolutionary War, but had begun purchasing property in adjoining Lincoln County, in partnership with Davidson and Brevard, as early as 1791 (Lincoln County Deed Books [LCDB] 17-21). The specific record of his purchase of the Lowesville study tract could not be determined. A survey of deed records suggests that if purchased prior to 1804 (Davidson sold his share of the iron business, including nearly 9,000 acres and two furnaces, to his sons-in-law, October 14, 1804; LCDB 21:323-324), property records would probably reflect purchase by Davidson, Brevard, and Graham as "Joseph Graham & Company." After 1804, the company was known as "Alexander Brevard & Company.

The earliest property reference attributable to the Lowesville study tract is Joseph Graham's sale of a portion of the current tract (listed as 400 acres on Killian Creek) to his son-in-law, R. H. Morrison (LCDB 36:102-103; Table 1). While tradition holds that this tract was a gift from Graham to his daughter, Mary (Graham) Morrison, the deed records a selling price of $3,000.

Robert Hall Morrison was born in the Rocky River section of Cabarrus County, North Carolina in 1798. He entered the University of North Carolina in 1816, graduating with honors in 1818 before ordination into the ministry (Concord Presbytery) in 1820. In 1824, while serving as pastor of the First Presbyterian Church in Fayetteville, he met and married Mary Graham, daughter of General Joseph Graham, at her home at Vesuvius Furnace. After participating in the establishment of Davidson College, Morrison was elected its first president, serving in this position from 1837 to 1840. Retiring from this post due to poor health which kept him from teaching, Morrison and his family (including by this time seven children) moved to their farm in Lincoln County, (Lore, Lore, and Morrison 1950:281). No specific records could be found concerning construction of the house on this property (called "Cottage Home"), but it is suggested that it was built sometime between Morrison's purchase of the tract (1834) and his retirement (1840). An unknown writer indicates that the house was small at first, but was enlarged as the family grew in size (Cottage Home n.d.)

By 1842, Morrison had recovered sufficiently to begin preaching again; after first accepting the pastorate of Unity Church, he then organized two additional congregations, Castanea (Gaston County) and Machpelah, where it was said that "he so thrilled his audiences everywhere he spoke that he became one of the most popular ministers in the State" (Lore _et al_. 1950:282).

During the middle nineteenth century, Cottage Home was described as "a popular and hospitable place, the scene of many romances and prominent marriages" (Cottage Home n.d.). The house was the location of the marriages of all six daughters of Dr. Morrison to Confederate officers. Their eldest daughter, Mary Anna Morrison, married then-Captain Thomas "Stonewall" Jackson at Cottage Home in 1857 (Lore _et al_. 1950:281).

TABLE 1. Lowesville Tract Chain of Title.

Date of Record	Grantor	Grantee	Acreage	* D/W Ref.
11/23/1834	Joseph Graham	R.H. Morrison	400 A	D36:102
5/18/1889	R.H. Morrison	J.G. Morrison and R.H. Morrison heirs	400 A	W4:399
4/26/1906	J.G. Morrison[Jr.]	Heirs of J.G. Morrison	635 A	W5:347
7/3/1911	Mary M. and C.E. Rynall, Anna M. and R.B. Wilson, Jennie D. Morrison, and R.H. Morrison	J.Graham Morrison	636 A	D109:364
8/5/1968	Joseph G. and Pearl Morrison	J.G. Morrison Jr., Junius D. Morrison, Margaret Guillett, John N. Morrison, and Anna M. Whiddon	12 tracts 778.4 A	D463:349
9/10/1974	Joseph G. Morrison heirs	William T. Griffin	712.82 A	D510:920
7/17/1987	W.T. and Pearl Griffin	Hash Howard Sherrill & Associates	712.82 A	D671:510
?	?	Graham Mullen	712.82 A	not found
?/?/1989	Graham Mullen	Duke Power Company	712.82 A	not found

* D/W = Lincoln County Deed or Will Book

As a prominent citizen, plantation owner, and land holder, R.H. Morrison was able to amass a comfortable estate for himself and his family. In 1850, Morrison's real estate was valued at $6,000 (1850 Lincoln County Population Census); by 1860, his combined real and personal estate was valued at over $70,000, including 28 slaves (1860 Lincoln County Population Census). Wartime depredation and devaluation of currency after the Civil war took a heavy toll on Morrison's estate. By his accounts, he "lost by the War which ended in 1865 from Thirty-five to Forty thousand Dollars." (R.H. Morrison Family Book n.d.).

Robert Hall Morrison died on May 13, 1889, and was buried at the Machpelah cemetery. The Cottage Home tract (containing 400 acres) was left to his eldest living son, Joseph Graham Morrison (Lincoln County Will Book [LCWB] 4:399-401). J.G. Morrison was born at Cottage Home in 1842, where he lived until his acceptance to Virginia Military Institute. He served during the Civil War as an aide-de-Camp to his brother-in-law, General Thomas Jackson, and rose to the rank of Captain. After the war, J.G. Morrison returned to Cottage Home where he raised a large family, served in the state legislature (1881) and became one of the largest cotton manufacturers in the county, owning a number of mills, including Mariposa Mill on Leeper's Creek (Lore et al. 1950:309). J.G. Morrison was the only member of his family to remain in Lincoln County; he died in 1906 and is buried at Machpelah Cemetery (Cottage Home n.d.).

J.G. Morrison's Will (dated 1904) originally stated that much of his property holdings, including his "homeplace" (Cottage Home; now said to contain 635 acres), were to be transferred to his son, J.G. Morrison, Jr. (LCDB 5:347-353); however, a codicil added in 1905, divided interest in the Mariposa Cotton Mill and the homeplace equally among his children. Five years later (1911), his surviving children sold all their interest in the Cottage Home tract to J.G. Morrison, Jr. (LCDB 109:364-365).

An exact date for the burning of Cottage Home has not been established, but it appears to have occurred between 1908 and 1910. An unnamed writer suggests that the house burned in 1908 and was replaced by the recently razed J.G. Morrison house in 1912 (Cottage Home n.d.). Mrs. Margaret Guillett, a Morrison descendant residing in Charlotte, was born in the "new" house and recalls stories of men on horseback riding to the Mariposa Mill to inform her grandfather (J.G. Morrison, Sr.) that his house was on fire. The suggested cause of the blaze which totally destroyed the house was a yard clearing fire set too near the chimney by Morrison's daughters, anxious to tidy the yard after a winter trip to Charlotte (Margaret Guillett personal communication 1989). Mrs. Guillett indicated that this incident took place prior to her parent's marriage in 1910.

For some time after the fire, the Morrisons lived in one of the mill houses at Mariposa. According to Mrs. Guillett, her mother's aunt in Shelby donated architectural plans from her recently completed house for a new house. Mrs. Guillett recalls that this large wood-sided house was constructed between the births of her brothers (1911 and 1912). Brick veneer was added to the exterior after a tornado damaged the house in 1938 (Margaret Guillett personal communication 1989). It appears that economy ruled the construction and decoration of the new house. Mr. Morrison is said to have sawn the ash for the panelling himself, and the wainscotting and floors were never finished. Mrs. Guillett stated that her mother had to be taken away from the house for a period of time so that the original wood exterior could be painted.

J.G. Morrison, Jr. was born in 1885 at Cottage Home. After graduating from North Carolina State College with a degree in agriculture, he returned to Lincoln County, where he later became County Agent and Agricultural Demonstrator. After construction of the new house, the Morrisons moved back to the property, remaining there through the late 1960s.

In 1968, J.G. and Pearl Morrison transferred 12 tracts (totalling nearly 780 acres) including the study tract, to their five children (LCDB 463:349), but continued to live on the property. According to Mrs. Guillett, by 1970 her parents (J.G. and Pearl) were unable to run the house and farm themselves. In that year they moved out; six months later, her father died. In 1974, their heirs sold the property (now listed as 712.82 acres) to William T. Griffin (LCDB 510:920). Griffin planted pines in the old cotton fields and sold timber from the tract, but lived in the house for a only a short time. In 1987, Griffin and his wife sold the tract to the firm of Hash Howard Sherrill & Associates (LCDB 671:510). Subsequent transactions are unclear, but by 1988 the property belonged to Graham Mullen. The J. Graham Morrison House, apparently unoccupied for several years, was razed during December 1988 and January 1989, prior to purchase by Duke Power Company (Tom Yocum, Duke Power Company, personal communication 1990).

IV. METHODS OF INVESTIGATION

Archival Research

Archival research concerning the Lowesville tract was directed toward three specific goals: documentation of previously recorded sites or National Register of Historic Places [NRHP] properties within the study area; development of appropriate prehistoric and historic overviews; and determination of property history. Examination of the North Carolina state site files (Raleigh) indicated that no archaeological sites had been previously recorded within the tract boundaries. It was also determined that no properties in or around the Lowesville tract are included in listings of sites either on the National Register or eligible for inclusion.

A general review of relevant local and regional archaeological literature was conducted to provide background data for development of a prehistoric overview. This review included examination of archaeological reports, papers, and manuscripts concerning previous investigations in this area; discussions with knowledgeable professionals; and review of regional prehistoric syntheses.

Archival research was undertaken at a number of local and state facilities to develop an historic context for these investigations. Books, maps, unpublished pamphlets and manuscripts, and personal paper collections were examined for both general and specific references. Collected family histories and property records also provided specific references, and interviews with informants aided in clarifying written records.

As noted above, selected property records were utilized in developing an historic overview for this study. Property records (e.g., deeds, bills of sale, rental agreements) related specifically to the Lowesville tract were also examined to provide a basis for documenting tract ownership, family history, and socioeconomic trends through time.

Field Methods

Initial survey methodology involved pedestrian traverse and intensive shovel testing of the entire tract at a 30 meter interval. In most cases, parallel transects (30 meters apart) were begun along defined linear landmarks (i.e., paved and dirt roadways, tree lines, power line right-of-ways, previously defined transects). Shovel test locations were established through compass orientation and paced distances. Slopes greater than 20 degrees were not shovel tested; however, all eroded slope ground surfaces (and other areas of surface visibility) were examined for artifacts. Shovel tests measured approximately 30 by 30 cm and were excavated into sterile subsoil. All fill was screened through 0.25 inch hardware cloth and any cultural materials present were collected. Distinct transect/shovel test numbers were assigned to each shovel test; surface artifacts were designated by nearest shovel test or other defineable feature. The content and context (i.e., soils data) of each shovel test containing cultural material (positive test) were recorded in field notebooks, and all positive tests were flagged and labeled for relocation.

Conditions encountered and survey methods utilized in specific sections within the project tract require further discussion. In general, narrow side drainages separating ridge segments were not investigated due to perceived degree of slope and the presence of nearly impenetrable second growth vegetation. Pedestrian traverse of animal trails through some of these areas suggest that these landforms represent areas of low probability for the presence of prehistoric or historic sites.

The potential for the presence of deeply buried sites on creek flood plains was investigated through excavation of deep (80 to 110 cm) shovel tests across these landforms. Particular attention was placed on slight rises noted in the generally flat flood zone. Despite difficulty in access to these areas posed by nearly impassable vegetation, all such areas, whether noted on topographic maps or observed in the field, were examined.

In general, site boundaries were determined through a combination of short interval shovel testing, surface collection, and landform definition. Short interval (15 meter) shovel tests were placed around each positive initial (30 meter) test (or group of positive tests), oriented with either the original transect or in the cardinal directions. Exposed ground surfaces around positive tests were also examined for cultural material. These additional shovel tests and surface collections served to determine whether initial positive tests represented isolated finds of cultural material or more extensive archaeological sites. Sites were defined as occurrences of four or more relatively contemporaneous artifacts within a given area. Peripheral shovel tests lacking cultural material and discontinuation of surface finds served to define site boundaries. Field sketch maps of sites were drawn during shovel testing to illustrate initial transect locations, positive and negative shovel tests, perceived surface and subsurface concentrations, and feature/structure locations. Black and white photographs were taken of each site, field site numbers were assigned, and site locations were plotted on project plan maps.

On a majority of the sites encountered on the Lowesville tract, shovel test and surface collection data were sufficient to determine low artifact density and poor context. Shovel tests and surface examination at many of these sites revealed severe erosion of plowzone soils, exposing sterile subsoil at the surface. In these areas, no further work was conducted.

In order to evaluate the research potential of recorded archaeological sites and to determine eligibility of these sites for the NRHP, several evaluation methods were utilized. Field site testing and evaluation consisted of the excavation of 50 by 50 cm, and 1 by 1 meter formal units in areas of high artifact concentration or potential for intact structural remains. All formal units were excavated in natural levels (when possible), fill was screened through 0.25 inch hardware cloth, and all cultural materials encountered were collected and labeled by vertical and horizontal provenience. Measured drawings were made and photographs taken of unit floors, features, and significant profiles. All units were backfilled upon completion of the field phase.

In several cases, additional site-specific documentary research was conducted to supplement archaeological evaluation data. Historical documents (land records, maps, accounts) were reexamined for information concerning historic sites. Informants with long-term knowledge of the tract were interviewed in an effort to determine use/occupation type and temporal range.

Laboratory Analysis

All recovered materials were washed and accessioned according to their unique site number and surface collection, transect/shovel test, or formal unit/level number. Analysis of artifacts focused on determining the cultural/temporal affiliation of the sites and their various components. Non-diagnostic artifacts were described by raw (or manufactured) material and morphology. Diagnostic prehistoric (i.e., lithics and ceramics) and historic artifacts were compared with published type descriptions (e.g., Coe 1964; Chapman 1977; Justice 1987; Noel Hume 1969; South 1977). Delineation of historic artifacts into defined artifact groups (for pattern definition; see South 1977), and calculations of Terminus Post and Ante Quem, and Mean Ceramic Date were attempted for historic artifacts when possible.

Artifact Curation

All project artifacts have been stored in plastic bags and are currently curated at the offices of Brockington and Associates, Inc., 2853 Henderson Mill Road, Atlanta, Georgia, 30341. After final approval of project reports, the artifacts will be transferred to the storage facility at the North Carolina Office of State Archaeology, Raleigh.

V. RESULTS

The Lowesville survey resulted in the location of 34 archaeological sites within and adjacent to Duke Power Company's 712 acre Killian Creek tract (Figure 6). Fourteen of these sites represent primarily prehistoric land use, while nineteen (designated by "**" appended to the site number) contain both historic and prehistoric components. In addition, 23 isolated finds of prehistoric and historic artifacts were recorded (Table 2). While these results indicate widespread prehistoric and historic use of much of the tract, the majority of the archaeological deposits have been severely disturbed by erosion. Discovered cultural remains are described in this chapter. Only one of the sites encountered (31LN78 & 78**) has research potential beyond the present project, and is recommended as eligible for the National Register of Historic Places (NRHP). The remaining sites are recommended ineligible for the NRHP.

31LN78 & 78** (ridge end; 730 ft AMSL)

Site 31LN78 & 78** is located near the east end of a ridge overlooking the confluence of Anderson and Killian creeks, approximately 40 m east-northeast of 31LN89 (Figure 6). This site was first recognized during the survey by a light scatter of historic ceramics and prehistoric lithics in a heavily eroded roadway passing along the south side of the ridge crest. Shovel tests placed along the south side of the road encountered a single tuff flake in highly disturbed (i.e., graded and eroded) soils; however, further investigation upslope from the road encountered other surface indications of historic occupation, including periwinkle grass and the ruins of a stone chimney (Figure 7). A single initial shovel test in this area recovered prehistoric artifacts (a translucent quartz stemmed PP/K [nondiagnostic], and rhyolite flakes), a sherd of whiteware, a fragment of olive green bottle glass, and an indeterminate historic sherd, indicating the need for a more detailed examination of the historic component of this site.

The site was evaluated through the excavation of 14 shovel tests, a 50 by 50 cm unit, and one 1 by 1 m unit. In addition, the chimney (made of large, cut stones in broken courses; base measuring approximately 2 meters square) and other remains, including a possible field stone foundation remnant, were sketch mapped. Five of the fourteen shovel tests yielded cultural material, indicating a well defined site measuring approximately 25m by 35 m (Figure 7). Test Unit 1 (1 by 1 m) was placed between Shovel Tests 2 and 3, approximately one meter southwest of the chimney base. Test Unit 2 (50 by 50 cm) was excavated near Shovel Test 5 to examine an area of apparent yard midden.

Test Unit 1 was excavated to eight cm below surface [bs], where an intact brick surface was encountered over most of the

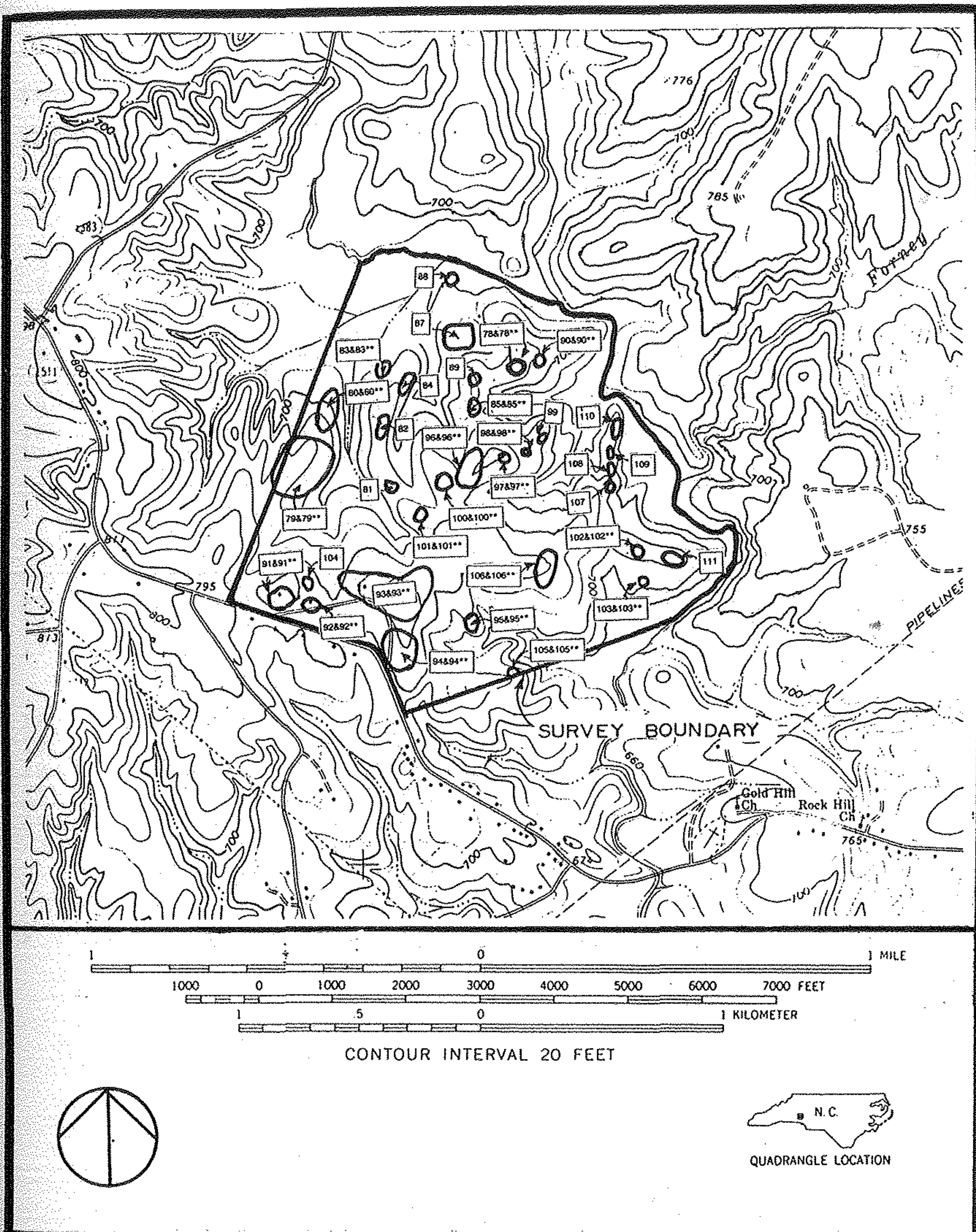


Figure 6. Project Area Map Showing Site Locations.

TABLE 2. ISOLATED FINDS (IF) - LOWESVILLE SURVEY.

IF#	Description	Location
1	1 translucent quartz scraper	TR 1; ST 11
2	1 translucent quartz flake	TR 28; ST 2
3	1 tuff flake	TR 32; ST 1
4	2 translucent quartz flakes	TR 33; ST 5
5	1 translucent quartz flake	TR 33; ST 8
6	1 plain whiteware sherd	TR 40; ST 14
7	1 plain whiteware sherd	TR 41; ST 8
8	1 translucent quartz flake	TR 49; ST 2
9	1 alkaline stoneware sherd	TR 52 (surface)
10	1 plain ironstone sherd (surface)	TR 61; ST 7
11	1 translu. quartz core (surface)	TR 94; ST 7
12	1 chert Morrow Mtn.PP/K (surface)	TR 156; ST 12
13	1 alkaline stoneware 1 plain whiteware frag. 1 translucent quartz flake	TR 156; ST 13
14	1 translucent quartz flake	TR 157; ST 7
15	2 translucent quartz flakes	TR 157; ST 10
16	1 translucent quartz shatter	TR 158; ST 10
17	1 plain ironstone sherd 2 rhyolite tertiary flakes 1 chert flake (surface)	TR 163; ST 3 & 4
18	1 chert flake (surface)	TR 163; TR end
19	1 tuff flake (surface)	TR 166; TR east
20	1 rhyolite flake (surface)	TR 175; TR beg.
21	2 crystal quartz flakes	TR 175; ST 10
22	1 util. rhyolite flake (surface)	TR 176; ST 10*
23	3 translucent quartz flakes 1 util. rhyolite flake (surface)	TR 178

* = artifact found 15 meters east of shovel test

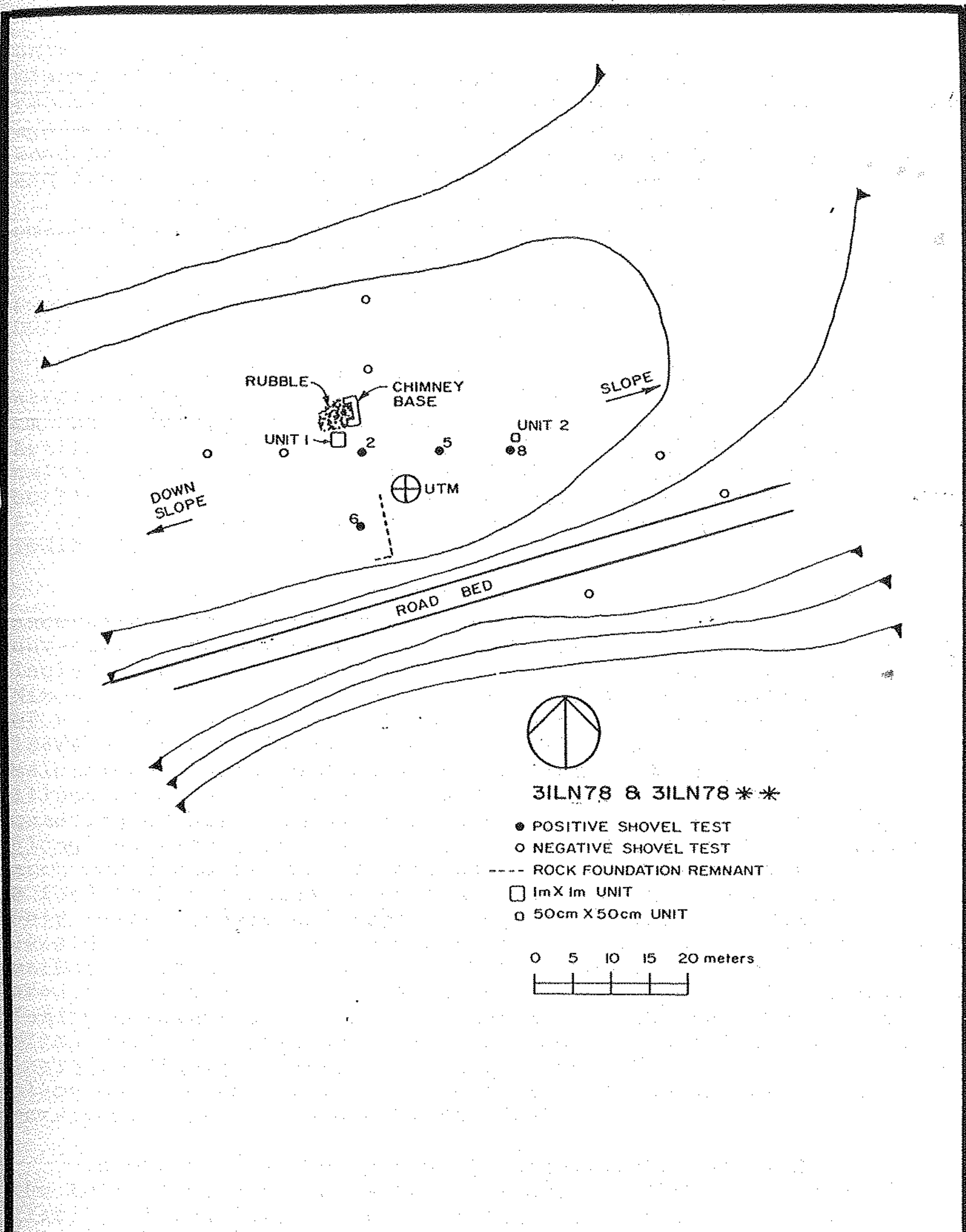


Figure 7. Plan Map of 31LN78 & 78**.

unit floor (Figure 8). At least two courses of brick were in place, with minimal mortar between bricks. The assemblage recovered above the brick surface was dominated by nails (n=80) and melted glass (283.9 grams); the condition of these artifacts suggests that a structure fire may have occurred. Good floral and faunal preservation was indicated by the presence of a peach pit, walnuts, and bone. The artifacts suggest a general postbellum occupation span. The orientation of the brick surface to the chimney (and to the overall structure) could not be determined, although it may have functioned as a hearth base. A possible post feature was also noted (but not excavated) in the northwestern corner of Test Unit 1.

Test Unit 2 was excavated in two 10 cm levels. The stratigraphy was characterized by reddish brown clay loam to 18 cm bs, overlying red clay (culturally sterile) subsoil. Artifacts from Test Unit 2 included: square (n=10) and wire (n=2) nails; undecorated whiteware; alkaline glazed stoneware; clear bottle glass; punched leather; and miscellaneous metal fragments. A late nineteenth/early twentieth century occupation is indicated.

Archival research and informant interviews were conducted to ascertain the occupation span of 31LN78 & 78**. While unverified, deed records appear to indicate that this site was included in a 100 acre tract sold by R.H. Morrison to Bartlett Nixon in 1873 (Warranty Deed Book 49:143). No additional records of transfer involving this property were found during the late 1800s or early 1900s, suggesting that Nixon and his heir(s) maintained ownership during this period. A single structure is illustrated at 31LN78 & 78** on the 1914 USGS 15 minute quadrangle sheet, along with several other structures dispersed along the ridges of the area (see Sites 1, 14, and 19). Longtime area residents recall travelling the road passing by the site (to a ford across Killian Creek) as early as the 1920s, and seeing only ruins (Lewis Anderson, Margaret [Morrison] Guillett, and Jerald Rankin personal communication 1989). Rankin described the structure as the ruins of a "sharecropper house in a snakey area." Site 31LN78 & 78** did not become a part of the Morrison family holdings again until after 1947. In that year, Kemp B. Nixon sold 35 acres on the west side of Killian Creek (which included 31LN78 & 78**), retaining the 140 acre Bart Nixon home place on the east side of the creek (Kemp B. Nixon to J.G. Morrison, Warranty Deed Book 251:528).

In evaluating the potential significance of 31LN78 & 78**, the following attributes from Glassow (1977) were considered: clarity; integrity; artifact frequency; and artifact diversity. Site 31LN78 & 78** has high clarity. The site was occupied for a relatively short span in the postbellum period, and repeated occupation (and mixing of refuse) does not appear to have occurred.

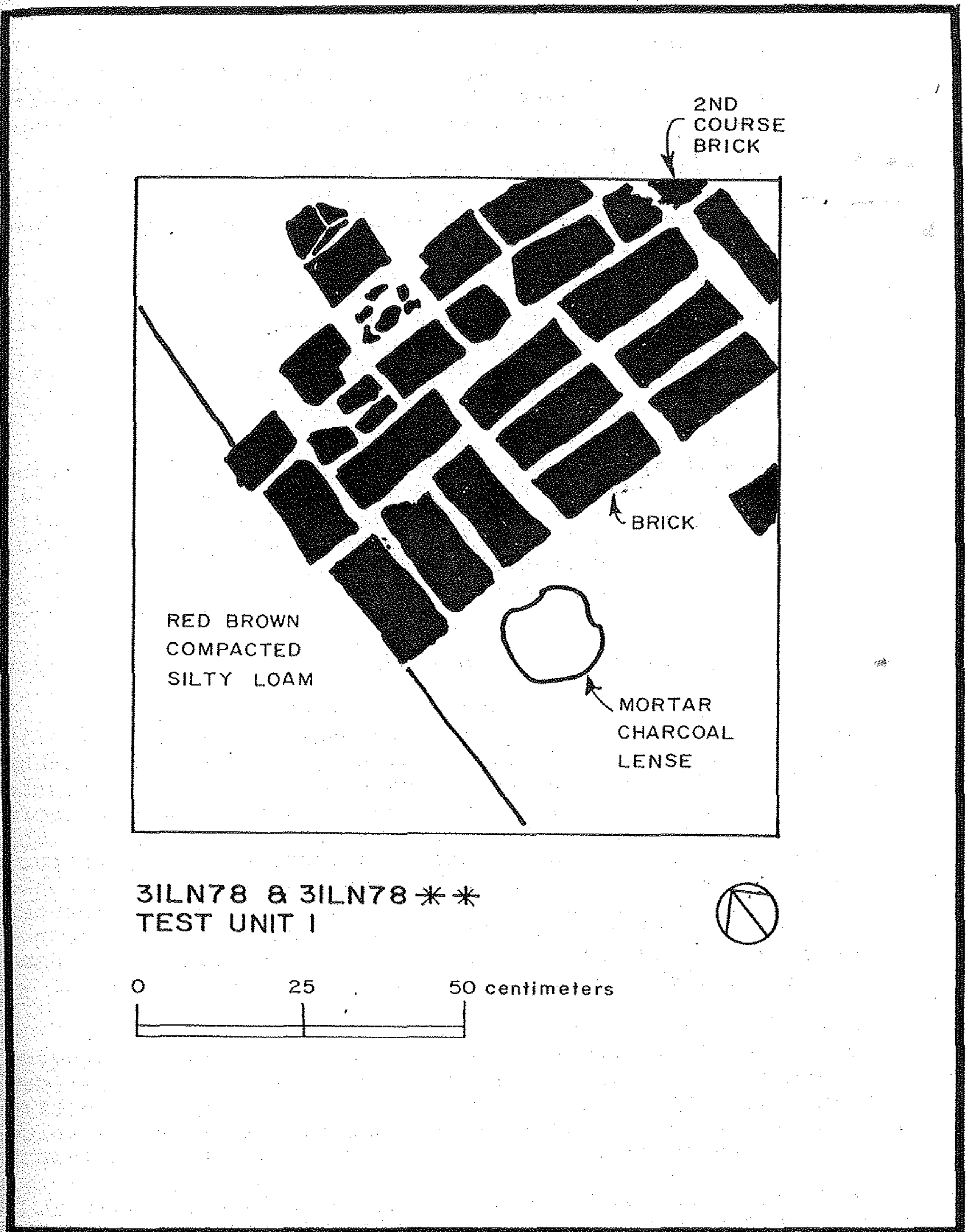


Figure 8. Plan Map, Test Unit 1, 31LN78 & 78**, Showing Laid Brick Feature.

Site integrity is considered good. The site has intact architectural features, as well as preserved bone and ethnobotanical remains in its midden. The refuse from the household has not been displaced by erosion or plowing.

The artifact frequency and variability are both high. In contrast to the expectations of current models of tenant site archaeology, 31LN78 & 78** has a moderately dense artifact midden; Level 1 of Unit 1 (1 by 1 m) yielded 134 items, in addition to brick, bone, and melted glass. The suspected house fire may be responsible for the primary deposition of a significant assemblage, and the lack of post-occupation plowing or clearing favors the preservation of the house midden. The artifact diversity is as high as can be expected within a postbellum home site.

Based on this assessment, 31LN78 & 78** is considered to possess good potential to provide significant data on postbellum lifeways in the Piedmont of North Carolina. It is recommended as eligible for the National Register of Historic Places at the local level of significance. Planned development may not affect this site; preservation is recommended, but data recovery should be undertaken if preservation is not feasible.

31LN79 & 79** (ridge top and slope; 750 ft AMSL)

Site 31LN79 & 79** is a large light density surface scatter of prehistoric and historic artifacts above a small tributary of Anderson Creek. The site was initially encountered as a surface scatter in the dirt field road running along a low ridge top and slope at the western boundary of the tract (Figure 6). Additional artifacts were recovered on the surface (visibility ranging from 75 - 100%) near shovel tests excavated among planted pines downslope (southeast) from this road. No artifacts were recovered from shovel tests, due apparently to the heavily eroded condition of the site area. Red clay subsoil is exposed across much of the site area. The site measures approximately 400 m NS by 180 m EW as defined by surface artifacts (Figure 9).

Prehistoric artifacts recovered include: banded and porphyritic rhyolite, tuff, quartz, argillite, and metavolcanic debitage; a possible ground granitic cobble; quartz and felcite biface fragments (nondiagnostic); a triangular tuff projectile point/knife [PP/K] fragment (undifferentiated Woodland); and a translucent quartz Savannah River PP/K (Late Archaic).

Historic artifacts appear to date from the late nineteenth through the middle twentieth centuries and were clustered near the site's center, at the top of the slope and approximately 45 meters southeast from the dirt road. Glass container fragments are the predominant artifact type represented, and include canning jars and lid liners; medicinal (panel) bottles; aqua

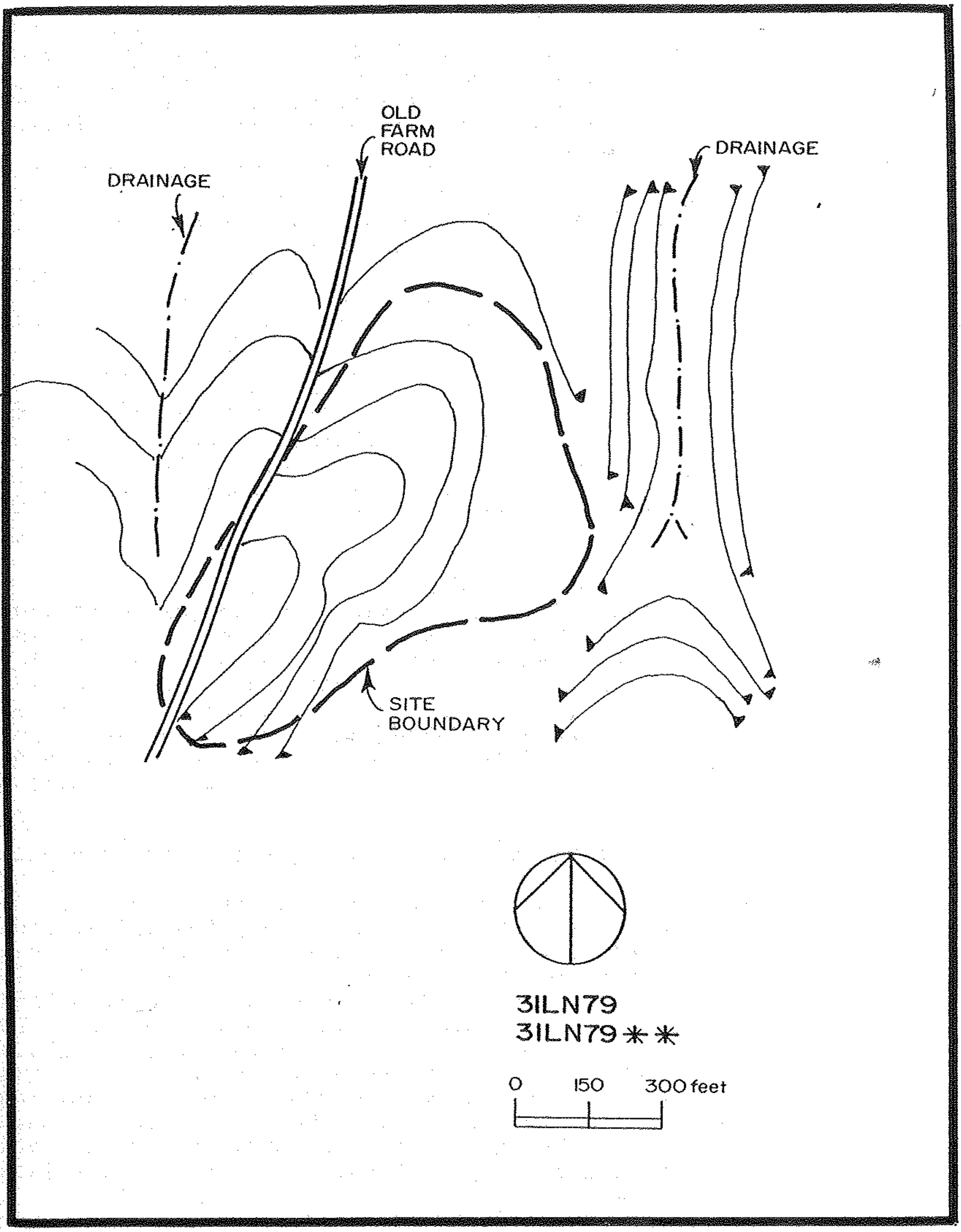


Figure 9. Plan Map of 31LN79 & 79**.

(soda) and amber (beer) bottles. A small amount of ceramics were also collected, consisting of unglazed red earthenware; undecorated, green transfer print and red glazed whiteware; plain porcelain; and alkaline glazed stoneware.

The historic artifact cluster (31LN79**) may be associated with a structure shown in this vicinity on the 1914 Lincoln County soil survey map (USDA 1914). This building appears to have been located upslope (northwest) from the cluster and on the opposite side of the dirt road. As the building site appears to be located outside the present project boundary, no attempt was made to locate structural remains.

Artifacts recovered suggest both prehistoric and historic occupation/utilization of this site area. Identifiable prehistoric components include Late Archaic and undifferentiated Woodland, and historic artifacts indicate a late nineteenth-middle twentieth century deposition date range. The historic artifact cluster may represent a former structure location or a dump site associated with the structure noted above.

Contexts in the site area have been destroyed by erosion of surface soils, exposing artifacts at the subsoil level. Due to this disturbance, artifacts exhibit widespread dispersion; it is unlikely that subsurface features have survived. The location of this site and its relevance to local prehistoric and historic settlement patterns are the most significant research contribution. Based on these assessments, 31LN79 & 79** is recommended ineligible for the NRHP, and no further work is deemed necessary.

31LN80 & 80** (ridge terrace; 715 ft AMSL)

Site 31LN80 & 80** is a moderate density surface lithic scatter located northeast of 31LN79 & 79** on a gently sloping ridge terrace overlooking a tributary of Anderson Creek (Figure 6). The site was initially encountered in the surface of a dirt road along the west edge of the project tract, and was defined by surface finds near shovel tests excavated southeast from the road; no artifacts were recovered from subsurface contexts. The site area is generally heavily eroded (to red clay subsoil), and portions are covered in planted pines and secondary undergrowth. Based on surface finds, 31LN80 & 80** (measuring approximately 270 m NS by 60 m EW) appears to be a more concentrated, linear artifact cluster than 31LN79 & 79** (Figure 10).

As was the case at 31LN79 & 79**, prehistoric artifacts recovered from 31LN80 & 80** represent a wide variety of lithic resources. Lithic debitage consists of translucent and milky quartz, banded rhyolite, chert, and weathered tuff. Potentially diagnostic tools include two hafted endscrapers; two small quartz Savannah River-like PP/Ks (Late Archaic); one quartz Otarre or

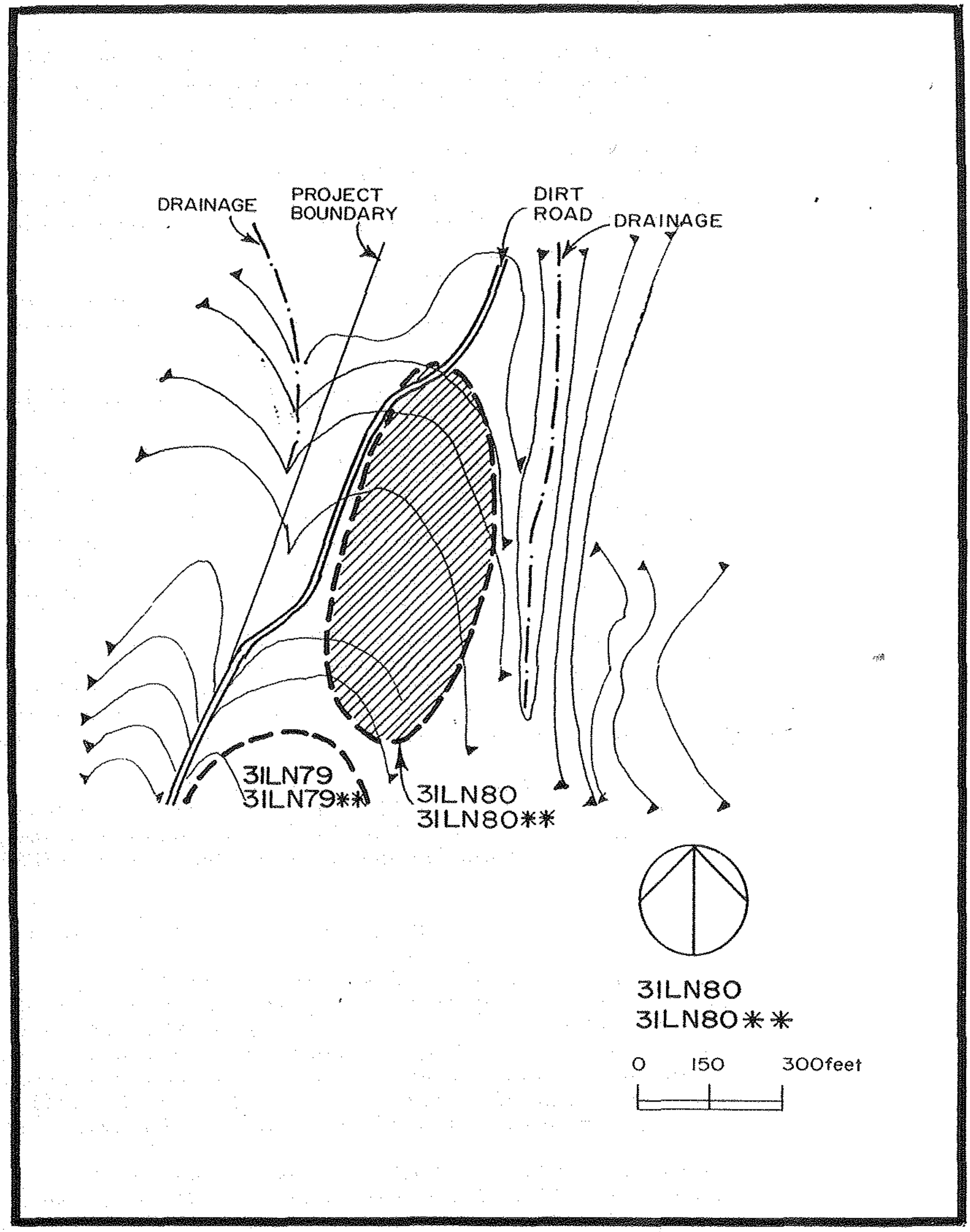


Figure 10. Plan Map of 31LN80 & 80**.

Gary-like PP/K (Late Archaic/Early Woodland), and a small chert triangular PP/K (Woodland/Mississippian). The site also included one isolated historic (sponge decorated whiteware) artifact.

Site 31LN80 & 80** represents a poorly preserved prehistoric multicomponent (possible Late Archaic-Mississippian, noninclusive) occupation locus. An historic component is represented by a single ceramic sherd. Disturbance to context due to heavy sheet erosion severely limits the research potential of this site to site location and its relevance to local settlement patterning. Site 31LN80 & 80** is recommended ineligible for the NRHP, and no further work is recommended.

31LN81 (ridge top; 730 ft AMSL)

Site 31LN81 is a very light density surface lithic scatter located on a narrow ridge between two intermittent tributaries (Figure 6). All artifacts were recovered from the surface of a dirt road following the crest of the ridge; subsequent shovel tests along the road edges encountered totally eroded soils and no additional artifacts. As defined by the road scatter, 31LN81 measures approximately 60 m NS by 20 m EW (Figure 11).

As noted, artifacts recovered from 31LN81 consist wholly of a variety of lithic debitage and tools. These consist of translucent quartz (predominate), crystal quartz, rhyolite, tuff, and chert flakes; three quartz biface fragments (nondiagnostic); and a quartzite Savannah River PP/K stem (Late Archaic).

Based on the low artifact density and the heavily eroded nature of this site area, 31LN81 is considered to have extremely poor research potential and is recommended ineligible for the NRHP; no further work is recommended.

31LN82 (ridge top; 730 ft AMSL)

Site 31LN82 is a very light density surface lithic scatter, located on a narrow ridge between two intermittent tributaries north of 31LN81 (Figure 6). As at 31LN81, all artifacts were recovered from the ridge top dirt road surface. Shovel tests along the road edges were negative and encountered totally eroded soils. Site 31LN82, as defined by the road scatter, measures approximately 100 m NS by 30 m EW (Figure 12).

Artifacts recovered from Site 31LN82 are somewhat similar to those from 31LN81; however, rhyolite is the predominate lithic type. The collection also includes a rhyolite stemmed PP/K base (type indeterminate); a few translucent quartz flakes; a translucent quartz bifacial core; and a milky quartz PP/K fragment (nondiagnostic).

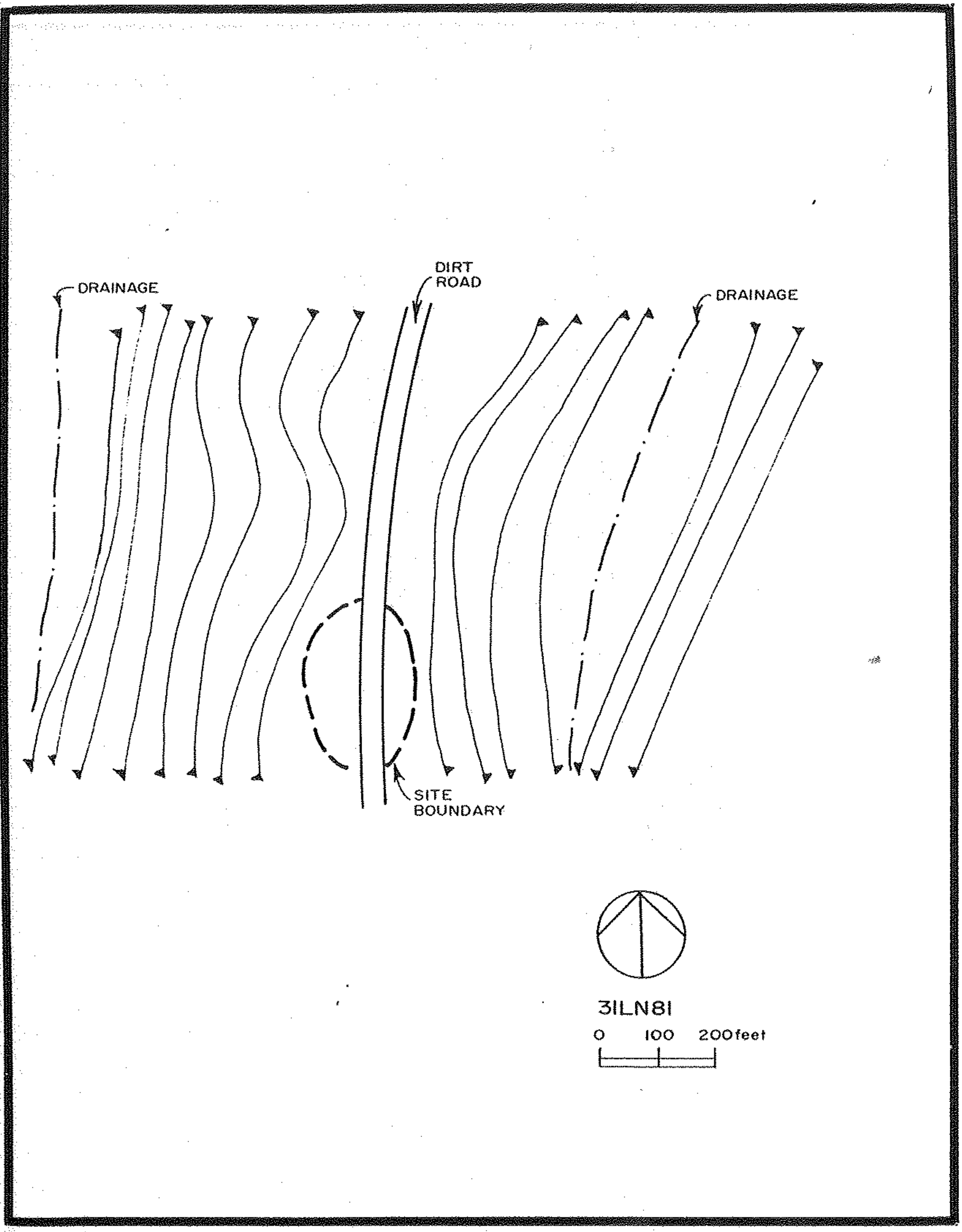


Figure 11. Plan Map of 31LN81.

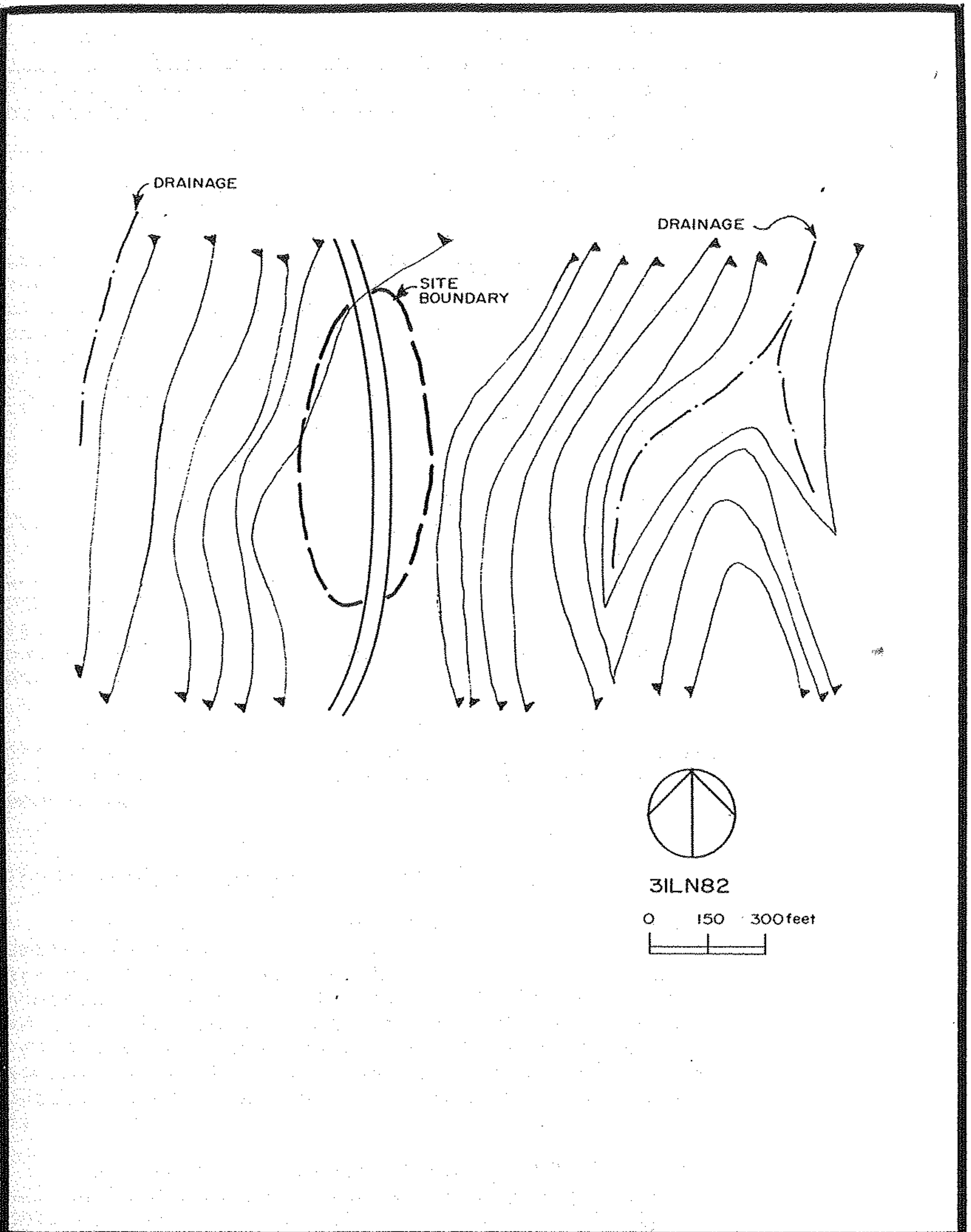


Figure 12. Plan Map of 31LN82.

Based on the low artifact density and the heavily eroded nature of this site area, Site 31LN82 is considered to have extremely poor research potential and is recommended ineligible for the NRHP; no further work is recommended.

31LN83 & 83** (ridge terrace; 685 ft AMSL)

Site 31LN83 & 83** is a very light density surface lithic scatter, and is located downslope from 31LN82, on a small cleared ridge terrace (Figure 6). All of the recovered artifacts were collected in and around a gully wash at the edge of the dirt road passing downslope through 31LN82. Some evidence of past cultivation of this area was noted. As was the case with similar sites, shovel tests excavated near the road contained no artifacts and encountered totally eroded soils. Site 31LN83 & 83**, as defined by the roadside scatter, measures approximately 30 m NS by 25 m EW (Figure 13).

Artifacts recovered from Site 31LN83 & 83** consist primarily of lithic debitage. Flakes are predominately translucent quartz, but quartzite and rhyolite flakes were also recovered. Tools are nondiagnostic and consist of rhyolite and translucent quartz biface fragments and a translucent quartz PP/K tip. Isolated historic artifacts found within the site area consist of a green bottle glass fragment and a sherd of shell edged pearlware.

Based on poor context and low artifact density, 31LN83 & 83** is considered to have extremely poor research potential and is recommended ineligible for the NRHP; no further work is recommended.

31LN84 (ridge top; 730 ft AMSL)

Site 31LN84 is a light density surface and subsurface lithic scatter located near the end of a narrow ridge, overlooking a terrace of Anderson Creek (Figure 6). The site was first encountered in a shovel test in the woods along the ridge crest and was followed in both shovel tests and surface artifacts into a clearing at the northernmost end of the land form. As determined by two positive shovel tests and two surface find spots, 31LN84 measures approximately 60 m NS by 30 m EW (Figure 14).

Artifacts recovered from 31LN84 consist of both lithic debitage and tools. Flakes are rhyolite, chert, and tuff, and tools consist of a translucent quartz PP/K tip and a translucent quartz point base (possible Savannah River- Late Archaic; no mend). Shovel test artifacts were recovered in the upper 5 cm of highly mixed, heavily eroded fill.

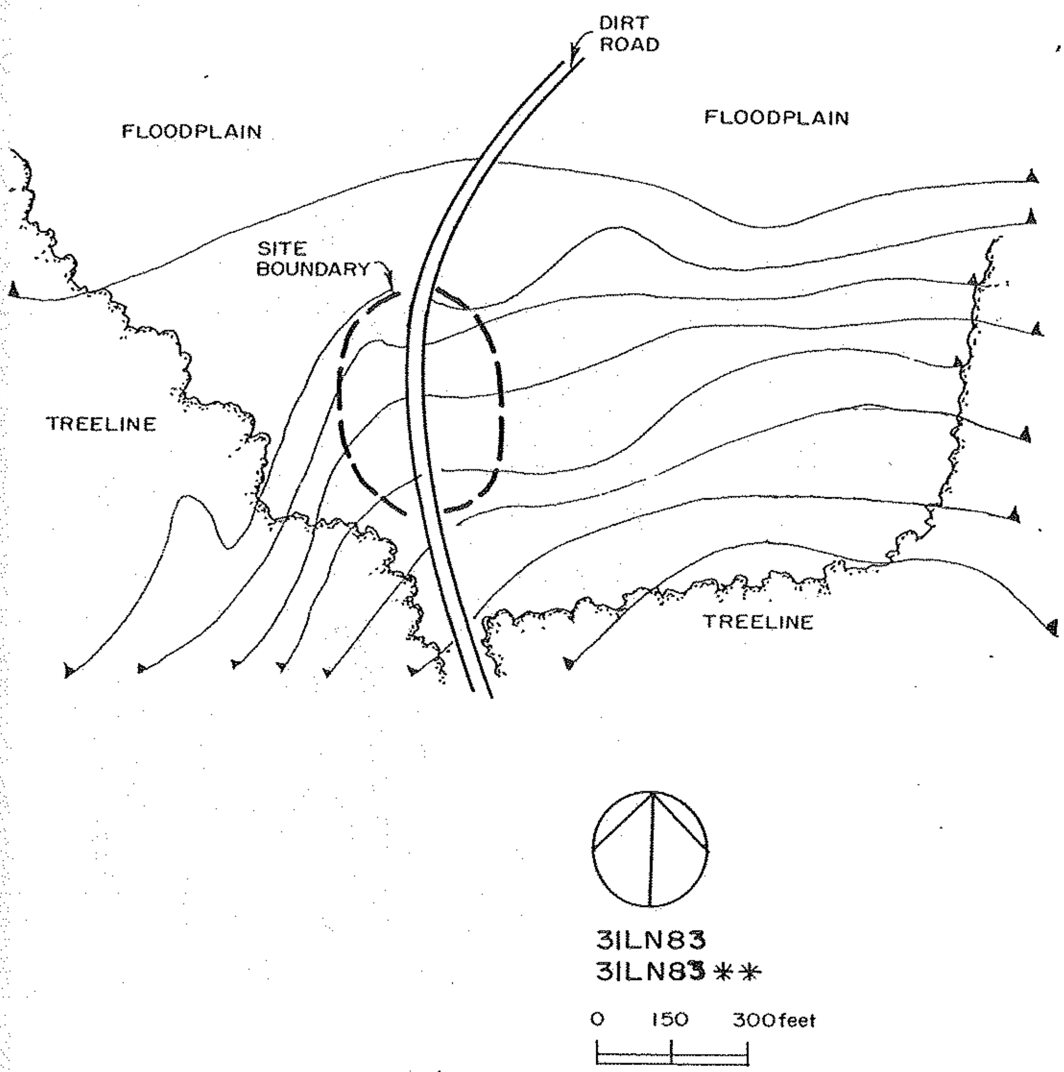


Figure 13. Plan Map of 31LN83 & 83**.

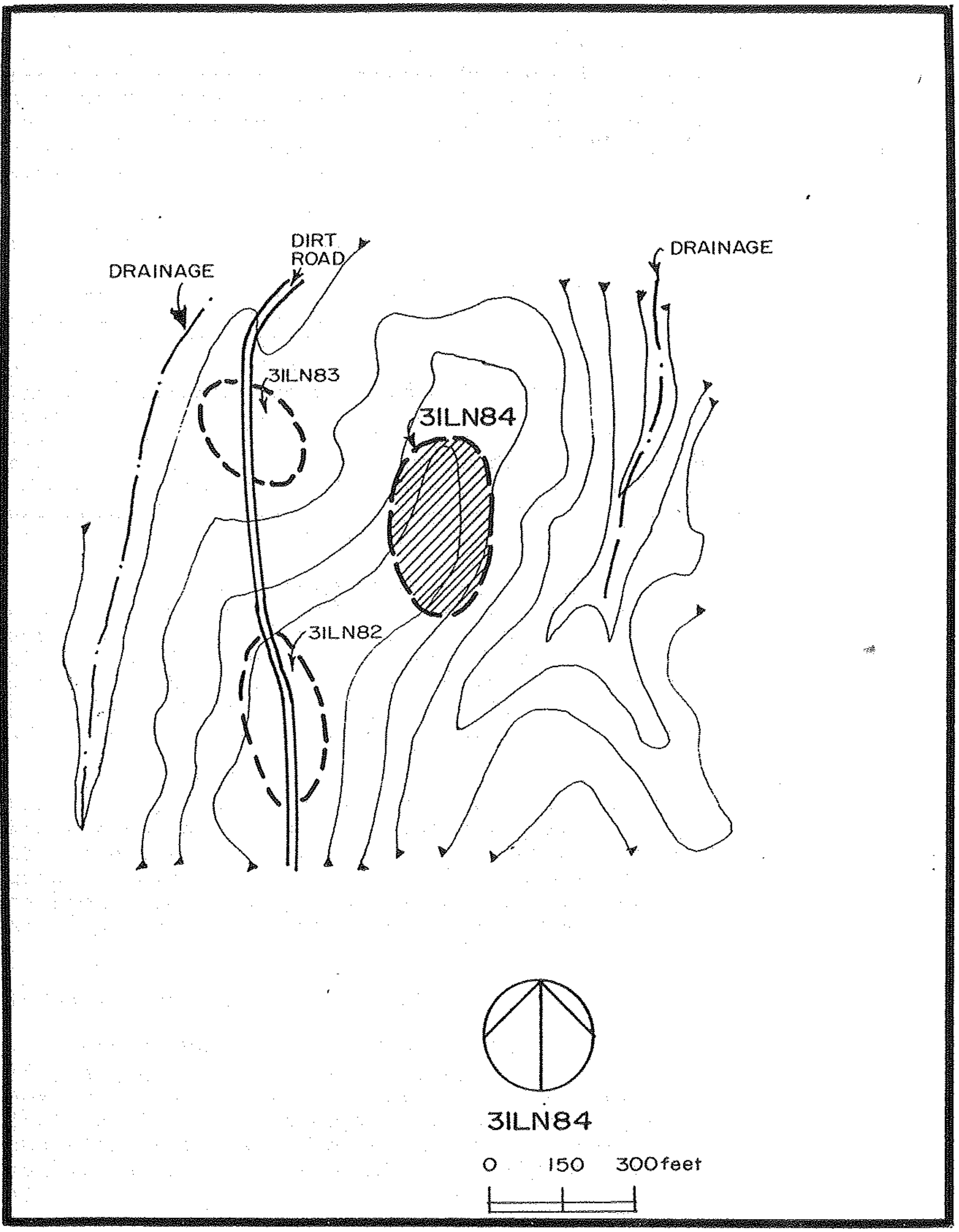


Figure 14. Plan Map of 31LN84.

Low artifact density and the heavily eroded nature of this site area limits the research potential of this site to site location and its relevance to local settlement patterning. As these criteria have been met by the present survey, 31LN84 is recommended ineligible for the NRHP, and no further work is recommended.

31LN85 & 85** (ridge top; 740 ft AMSL)

Site 31LN85 & 85** is a light density surface and subsurface lithic and ceramic scatter, located on a narrow ridge near the head of an intermittent drainage (Figure 6). This site was initially encountered at the surface of an intersection of two dirt roads, approximately 100 meters north of the large ridge top clearing. A single shallow shovel test at the road edge also yielded additional lithic and ceramic artifacts; however, visual examination of the soil matrix indicated that this material was redeposited road fill. Based on the maximum extent of the surface artifact scatter, 31LN85 & 85** measures approximately 40 m NS by 25 m EW (Figure 15).

Artifacts recovered from 31LN85 & 85** consist of prehistoric ceramics and lithics and a single historic ceramic sherd (annular whiteware; recovered from the surface). Sand tempered plain sherds (recovered from approximately 7 cm below surface in the shovel test) could not be assigned to a known type. Lithic materials (flakes only) consist of chert, rhyolite, and translucent and crystal quartz.

Site 31LN85 & 85** exhibits low artifact density and has been heavily disturbed by road grading and erosion. While some research potential exists related to site location and settlement patterning, these factors have been met through the current survey. Site 31LN85 & 85** is considered to have limited additional research potential and is recommended ineligible for the NRHP; no further work is recommended.

31LN86 (ridge top; 735 ft AMSL)

Site 31LN86 is located approximately 50 m north of 31LN85 & 85**, along the crest of the same ridge, and consists of a light density surface lithic scatter (Figure 6). Shovel tests in highly eroded soils along the road failed to encounter additional subsurface remains. Based on the extent of the road surface scatter, 31LN86 measures approximately 50 m NS by 20 m EW (Figure 16).

Artifacts recovered from 31LN86 consist of lithic flakes; unfortunately, the artifact bag was lost prior to analysis and specific lithic material types were not determined. Based on field note entries, it can be determined that artifacts numbered less than ten in an area of excellent surface visibility.

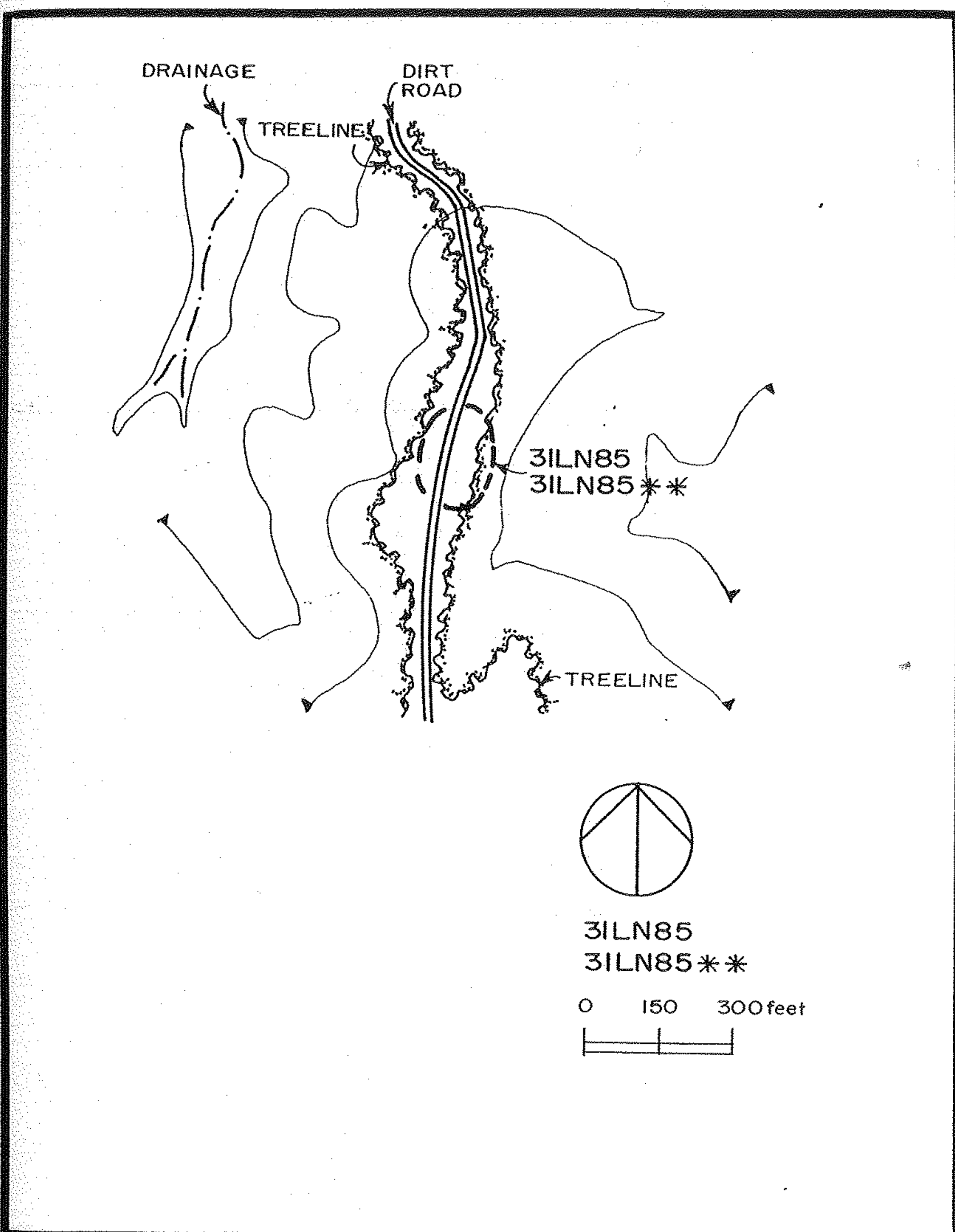


Figure 15. Plan Map of 31LN85 & 85**.

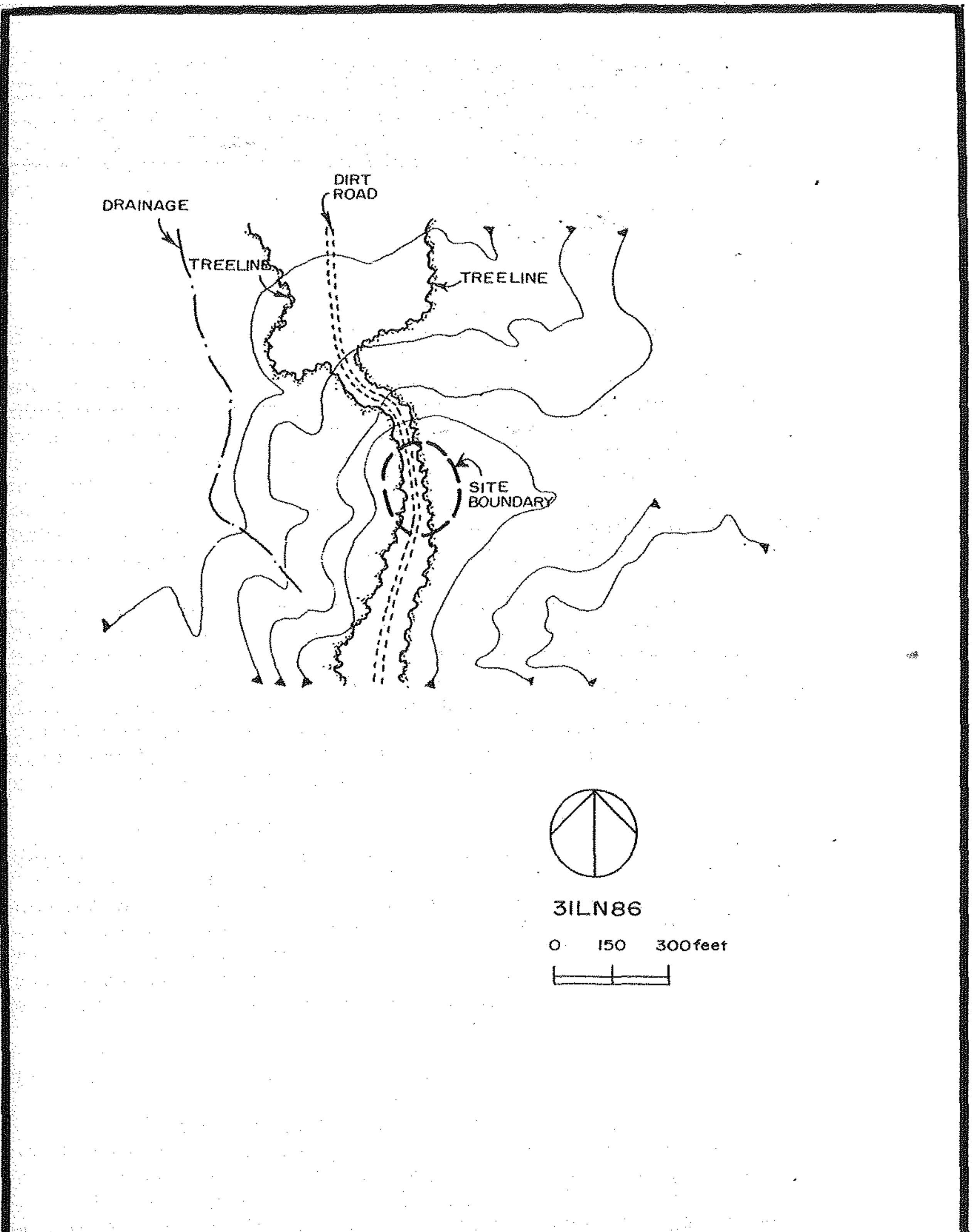


Figure 16. Plan Map of 31LN86.

As in previous sites, low artifact density and the heavily eroded nature of this site area limits the research potential of this site to site location and its relevance to local settlement patterning. As these criteria have been met by the present survey, 31LN86 is recommended ineligible for the NRHP, and no further work is recommended.

31LN87 & 87** (creek terrace; 685 ft AMSL)

Site 31LN87 & 87** is a large light density surface and subsurface ceramic and lithic scatter, located on a broad creek terrace segment of Anderson Creek (Figure 6). The site area has been cleared recently and is currently in planted pines and associated underbrush. While some artifacts were collected from eroded surfaces among the pines, most of the cultural material was recovered from shovel tests. Soils encountered were mixed sandy clay loams, appearing primarily as recent colluvium (i.e., slopewash). Based on the maximum extent of surface and subsurface artifacts, and following the land form, 31LN87 & 87** measures approximately 90 m NS by 160 m EW (Figure 17).

Artifacts recovered from 31LN87 & 87** are primarily prehistoric ceramics and lithics. Fine and coarse sand tempered plain sherds (recovered from 5 to 10 cm below surface in shovel tests) could not be assigned to a known type. Lithic materials (flakes only) consist of chert, rhyolite, and translucent and crystal quartz. No evidence of subsurface cultural features was encountered. A single historic ceramic sherd (annular whiteware) was also recovered from the surface.

Site 31LN87 & 87** appears to represent colluvial redeposition of prehistoric cultural materials to this location. As a result of this assessment, integrity of these artifacts is considered to be poor, negating research potential related to site location and settlement patterning. Based on examination of artifacts and context, 31LN87 & 87** is considered to have no additional research potential and is recommended ineligible for the NRHP; no further work is recommended.

31LN88 & 88** (creek flood plain; 655 ft AMSL)

Site 31LN88 & 88** is a very small surface and subsurface lithic and ceramic scatter, located on an eroded levee segment on the Anderson Creek flood plain (Figure 6). The site was initially encountered as a relatively concentrated surface scatter in an eroded dirt road, approximately 25 meters south of an old creek ford. Thirty meter interval shovel tests along and away from the road (in portions of fallow field and thick roadside vegetation) failed to recover additional subsurface cultural materials; however, a subsequent test unit (1 m by 1 m) placed near the center of the surface scatter encountered artifacts in plowzone extending to 20 cm below present ground

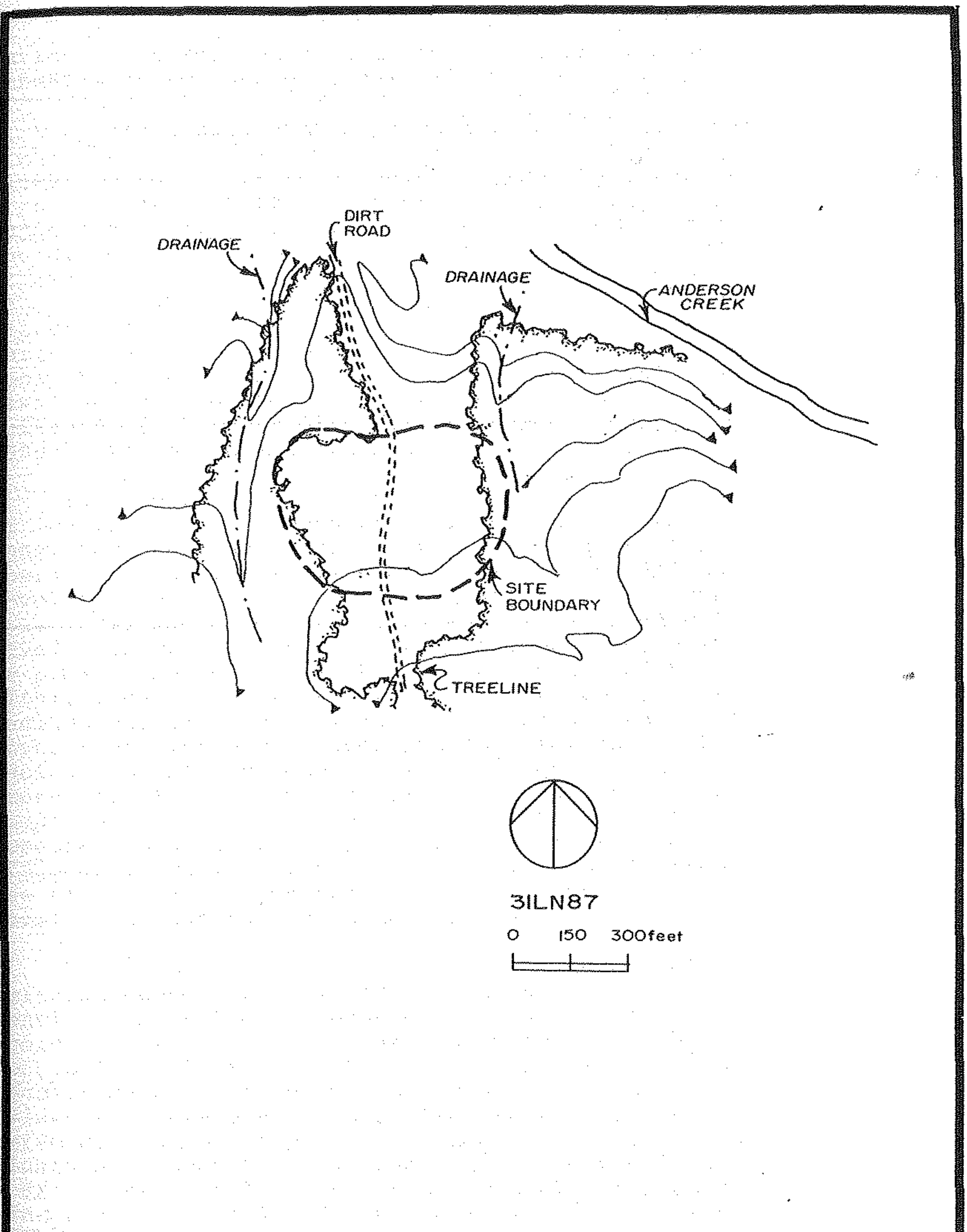


Figure 17. Plan Map of 31LN87 & 87**.

surface. Based on the maximum extent of surface artifacts, 31LN88 measures approximately 15 m NS by 10 m EW (Figure 18).

Surface artifacts recovered from 31LN88 & 88** consist of prehistoric lithics and ceramics, and historic ceramics and glass. Lithic artifact types include rhyolite, translucent and crystal quartz, tuff, and chert flakes; a rhyolite PP/K (Kirk or MacCorkle-like; Early Archaic) and PP/K fragments (nondiagnostic); quartz biface fragments; and a quartzite cobble fragment. A single fine sand tempered plain prehistoric sherd found on the surface appears to be burnished (exterior). Historic artifacts recovered suggest a middle nineteenth through early twentieth century period of deposition. Artifact types (only Kitchen Group artifacts were found; South 1977) consist of alkaline glazed and albany slipped stoneware; undecorated whiteware (one sherd with East Liverpool, Ohio maker's mark dated 1890-1900); and olive green and clear bottle glass.

Test Unit 1 at 31LN88 & 88** was excavated in arbitrary 10 cm levels. Level 1 consisted of compacted fine sandy loam (plow zone) and contained several grit (e.g., quartz) and sand tempered sherds, a number of lithic flakes (primarily chert, but also rhyolite, quartz, tuff and quartzite), a quartzite cobble (pestle?), and a chert triangular PP/K (Middle/Late Woodland). Level 2 (same soil type, but more compacted; also considered to be plow zone) contains higher densities of both ceramics and lithics; ceramics vary from fine to coarse sand temper and include examples of plain, cordmarked, and fabric impressed decorations (probable Woodland association). Lithic artifacts include primarily chert flakes (quartz and rhyolite also represented), and two rhyolite triangular PP/Ks (Middle/Late Woodland). Level 3 began at the base of the plow zone and appeared as hard packed red clay with scattered weathered bedrock fragments. While several very small, heavily eroded sherds and a few flakes were recovered near the Level 2/Level 3 transition, Level 3 was considered to be sterile.

Site 31LN88 & 88** contains evidence of at least three cultural components. The PP/K found on the surface indicates a possible Early Archaic presence. Prehistoric ceramics and lithic tools appear to represent a Middle and/or Late Woodland occupation of this site. All prehistoric artifacts were recovered in surface and plowzone contexts, and there was no evidence of preserved subsurface features. As noted, historic ceramics and glass collected from the surface imply a middle nineteenth through early twentieth century utilization of 31LN88 & 88**, but the lack of architectural artifacts (i.e., nails, window glass etc.) and the entirely surficial context suggest that the site area was not permanently occupied. It is suggested that these artifacts may have been redeposited through natural (e.g., erosional slopewash) or cultural (e.g., part of road fill) means, or represent evidence of intermittent visitation to this area.

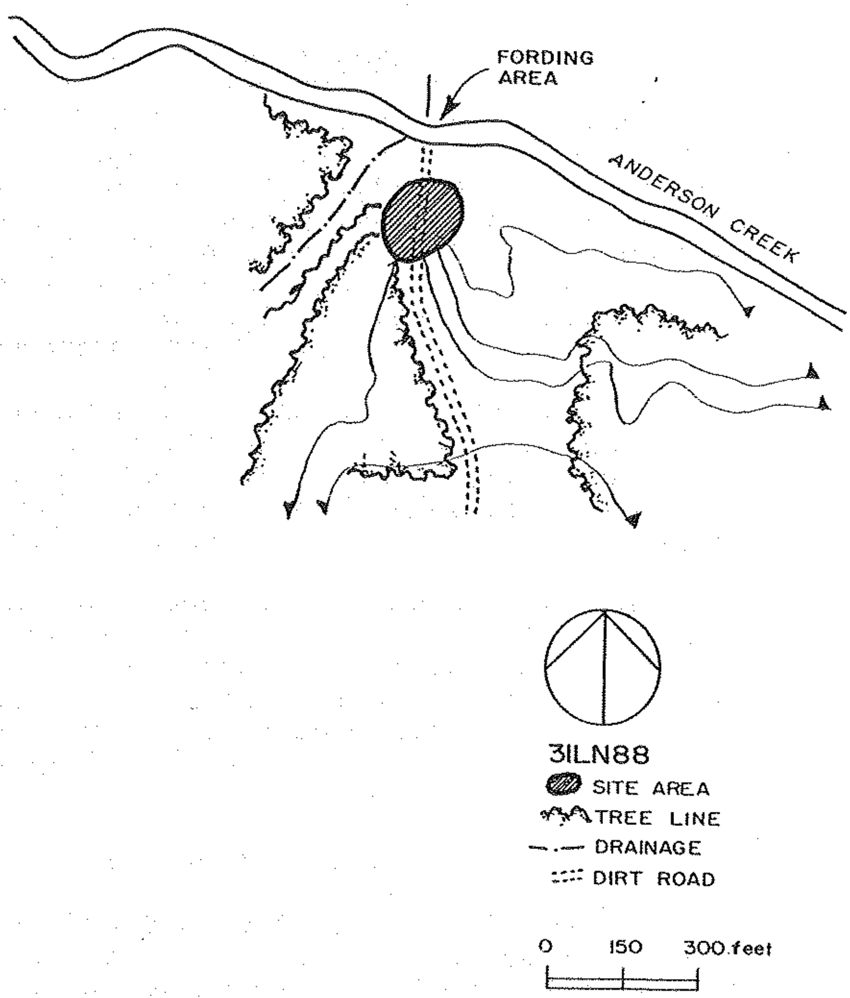


Figure 18. Plan Map of 31LN88 & 88**.

Research potential of 31LN88 & 88** is considered limited due to the general surface/plow zone nature of deposits and the mixing of Archaic, Woodland, and late Historic contexts. While recovered artifacts indicate broad temporal utilization of this portion of the Anderson Creek flood plain, recording of site location (supporting its relevance to local settlement patterning) as accomplished during this survey adequately addresses the overall research potential of 31LN88 & 88**. Based on examination of artifacts and context, 31LN88 & 88** is considered to have no additional research potential and is recommended ineligible for the NRHP; no further work is recommended.

31LN89 (ridge top; 730 ft AMSL)

Site 31LN89 is located on a narrow trail running at the crest of a ridge, approximately 45 m east of 31LN86 (Figure 6), and consists of a very light density surface lithic scatter. Surface visibility along the eroded ridge top was excellent. Shovel tests placed along the trail encountered highly eroded soils and no additional subsurface remains. 31LN89 (based on the extent of the road surface scatter) measures approximately 10 m NS by 40 m EW (Figure 19).

Artifacts collected at 31LN89 consist entirely of a small number of lithic flakes. Translucent quartz is the predominant lithic type, but tuff and crystal quartz flakes are also represented. No significant spatial or temporal patterning could be discerned from this small sample of artifacts.

As in previous sites, low artifact density and the heavily eroded nature of this site area limits the research potential of this site to site location and its relevance to local settlement patterning. As these criteria have been met by the present survey, 31LN89 is recommended ineligible for the NRHP, and no further work is recommended.

31LN90 & 90** (ridge end; 720 ft AMSL)

Site 31LN90 & 90** is a small very light density historic surface scatter. The site is located in a heavily eroded former log landing approximately 40 meters east of 31LN78 & 78**, and is defined within a small clearing (Figure 6). While a clear glass bottle fragment was recovered from a single shovel test, the context appeared to be severely disturbed. Based on the extent of surface artifacts, 31LN90 & 90** measures approximately 10 m NS by 30 m EW (Figure 20).

The manufacture/use date range of historic artifacts recovered at 31LN90 & 90** spans the late nineteenth and early twentieth centuries. Ceramics include alkaline glazed stoneware, and blue shell-edged and plain whiteware. As noted above, a

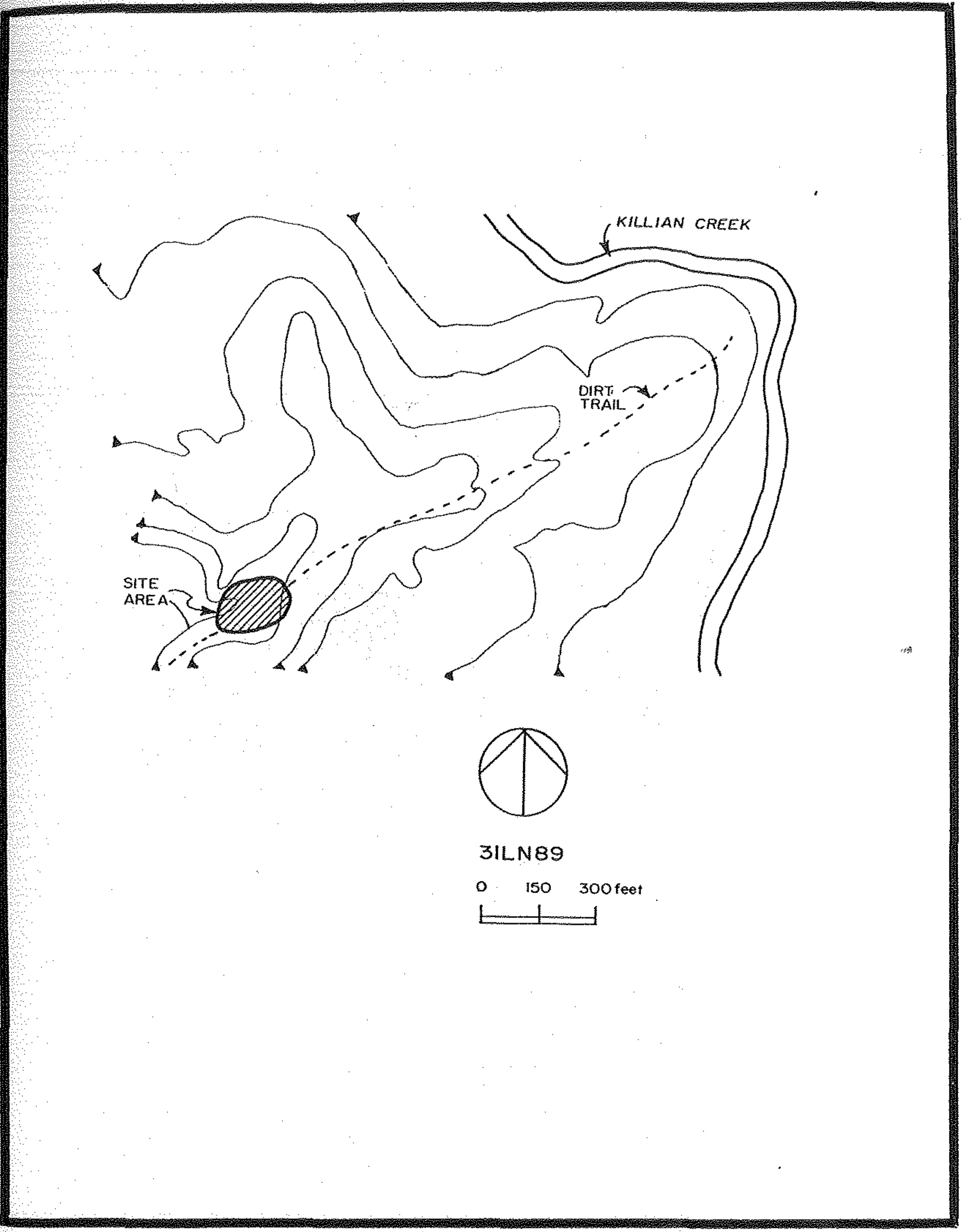


Figure 19. Plan Map of 31LN89.

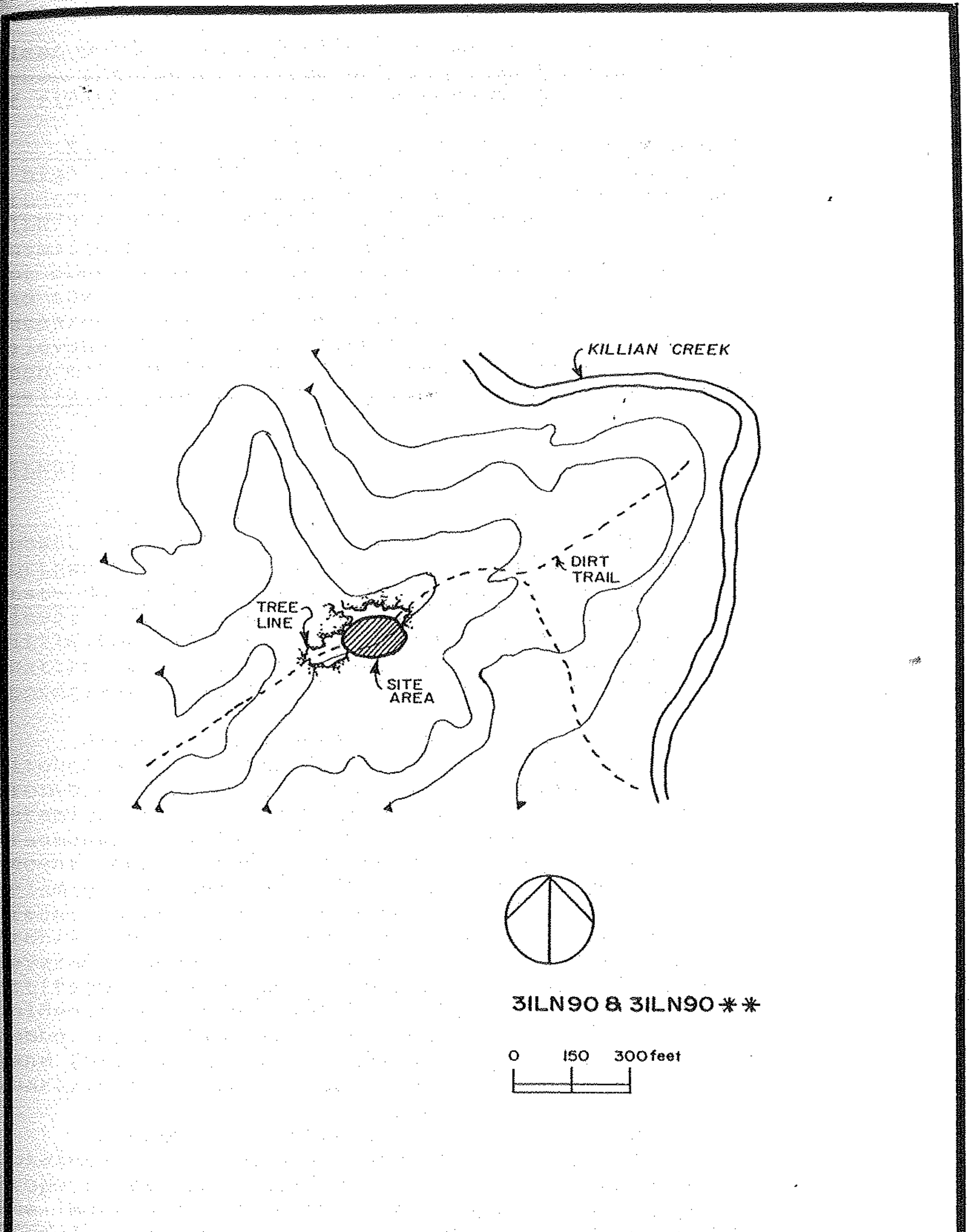


Figure 20. Plan Map of 31LN90 & 90**.

clear molded glass bottle base was recovered from a shovel test. Other artifacts include an impacted bullet fragment, a fragment of fire brick, and a metal button back.

Site 31LN90 & 90** is a small locus of historic artifacts in a highly disturbed context. Based on proximity and comparable projected occupation date ranges, 31LN90 & 90** may be related to 31LN78 & 78**, either as the location of another house, an outbuilding of the same time period, or as a dump site. As noted for other sites encountered on this tract, low artifact density and the heavily eroded nature of this site area limits the research potential of this site to site location and its relevance to local settlement patterning. As these criteria have been met by the present survey, 31LN90 & 90** is recommended ineligible for the NRHP, and no further work is recommended.

31LN91 & 91** (knoll top; 785 ft AMSL)

Site 31LN91 & 91** is a moderate density surface and subsurface scatter of historic artifacts located on the top and northwest slope of a knoll, approximately 100 meters north of State Route 1511 (Figure 6). The site area is planted in small pines, affording poor to fair surface visibility; however, very little topsoil remains. Based on the extent of the surface scatter and positive shovel tests, 31LN91 & 91** measures approximately 170m NS by 120 m EW (Figure 21).

Historic artifacts from this site are primarily from the Kitchen and Architecture Groups (South 1977), and indicate a probable late nineteenth-middle twentieth century occupation. Ceramics are predominantly undecorated whiteware, with several fragments of late porcelain and alkaline glazed stoneware; more recent food serving vessels are represented by Bakelite and Melamine. Container glass is primarily clear, although light green, amber, blue, and milkglass fragments were also collected. Architectural artifacts are represented by a few wire nails and several fragments of window glass. Additional historic period artifacts collected include various iron machine parts, unidentified sheet metal (roofing?), coal and slag. A small number of prehistoric artifacts were also scattered across this land form, including flakes of translucent and crystal quartz, a quartz biface, and a quartz core.

Historical references to occupation of this site were obtained from informant interviews and examination of area maps. Property records indicate that the site area has been a part of the Morrison property since its original purchase (1834). According to a lifetime resident, an "old two story house" stood at this location as early as sixty years ago (Lewis Anderson personal communication 1989). A structure is shown at this location on the 1914 soil survey map (USDA 1914). Anderson recalls that this building was torn down "around 1968" after housing a succession of tenants; the presence of a structure at

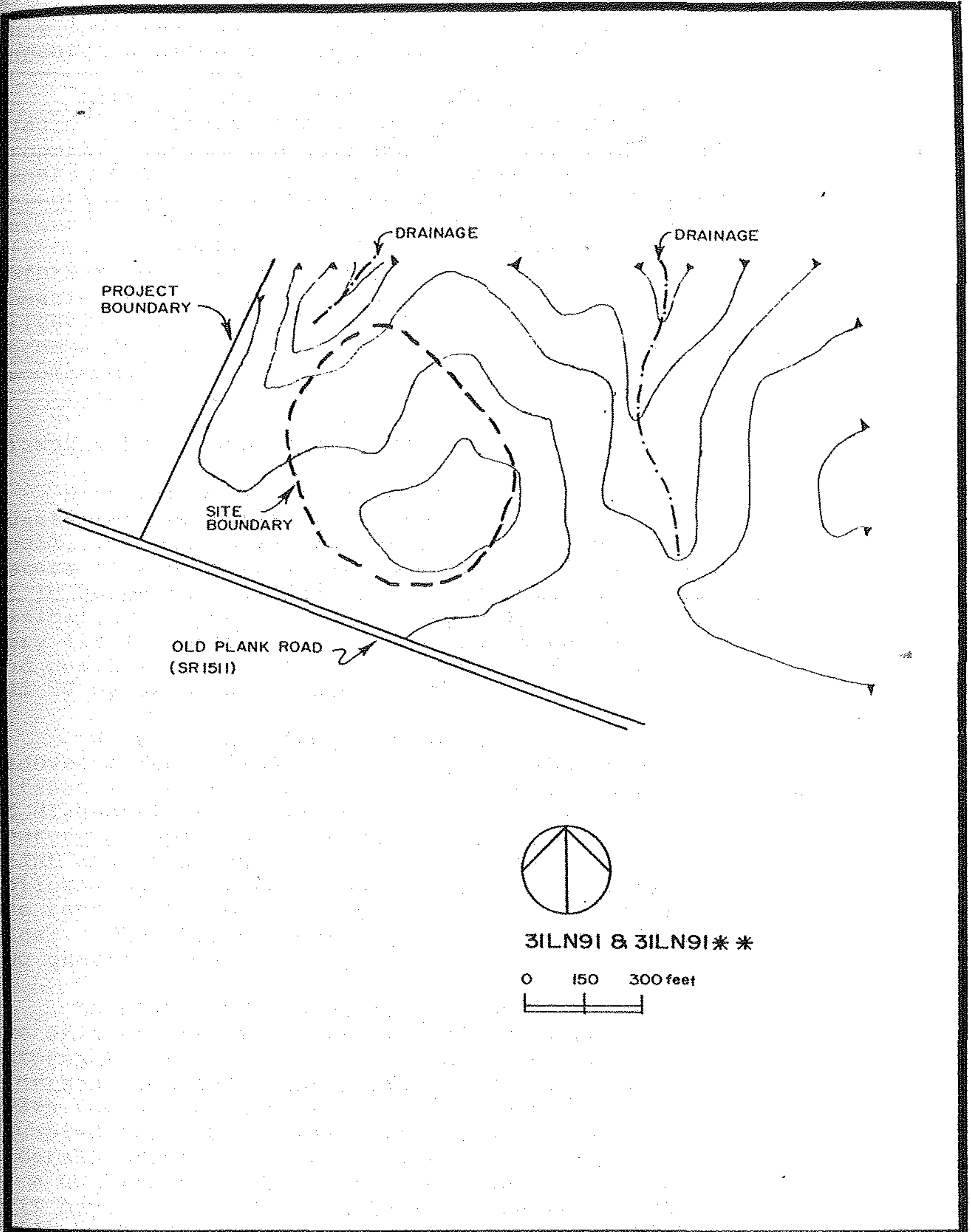


Figure 21. Plan Map of 31LN91 & 91**.

this location on the 1970 Lowesville quad sheet (USGS 1970) supports a slightly later date of removal.

Site 31LN91 & 91** represents a late nineteenth through middle twentieth century tenant occupation on the Morrison property. Archaeological survey provided dateable artifacts and general definition of site boundaries, but found poor site integrity (i.e., plowed and eroded surfaces; poor potential for intact features). Informant and map data provided a general historic occupation and site abandonment profile. Based on this information, research potential of this site is limited to site location and relevance to local settlement patterning. As these criteria have been met by the present survey, 31LN91 & 91** is recommended ineligible for the NRHP, and no further work is recommended.

31LN92 & 92** (knoll top; 770 ft AMSL)

Site 31LN92 & 92** is a light density surface and subsurface scatter of historic artifacts located on the top of a small knoll, approximately 100 meters north of State Route 1511 and 60 meters east of Site 14 (Figure 6). As in Site 14, the site area is in an overgrown field and is planted in small pines; surface visibility is poor to fair overall. Shovel tests encountered very little topsoil. Based on the extent of the surface scatter and positive shovel tests, 31LN92 & 92** measures approximately 50m NS by 60 m EW (Figure 22).

Historic artifacts from this site are similar to those recovered from 31LN91 & 91**, attributable primarily to the Kitchen and Architecture artifact groups (South 1977). Analysis of diagnostic types indicates a probable early-middle twentieth century occupation. Ceramics consist of undecorated and transfer print and ironstone. Container glass is primarily light green, followed by clear and amber fragments. Architectural artifacts are represented by a wire nail and several fragments of window glass. The site collection also includes a fragment of wire, and two quartz flakes.

As with 31LN91 & 91**, inclusion of this site area within the original Morrison tract limited historical data sources to informant interviews and examination of area maps. Lewis Anderson recalled construction of a small house here in the late 1920s for a Morrison tenant, Lee Jones. Several other tenants occupied the house until its razing in the middle 1970s (Lewis Anderson personal communication 1989). Anderson's recollection of a construction date for the house is supported by the 1914 soil map, where no structure is shown at this location (USDA 1914). The presence of a structure at this location on the current Lowesville quad sheet (USGS 1970) supports a post-1970 removal.

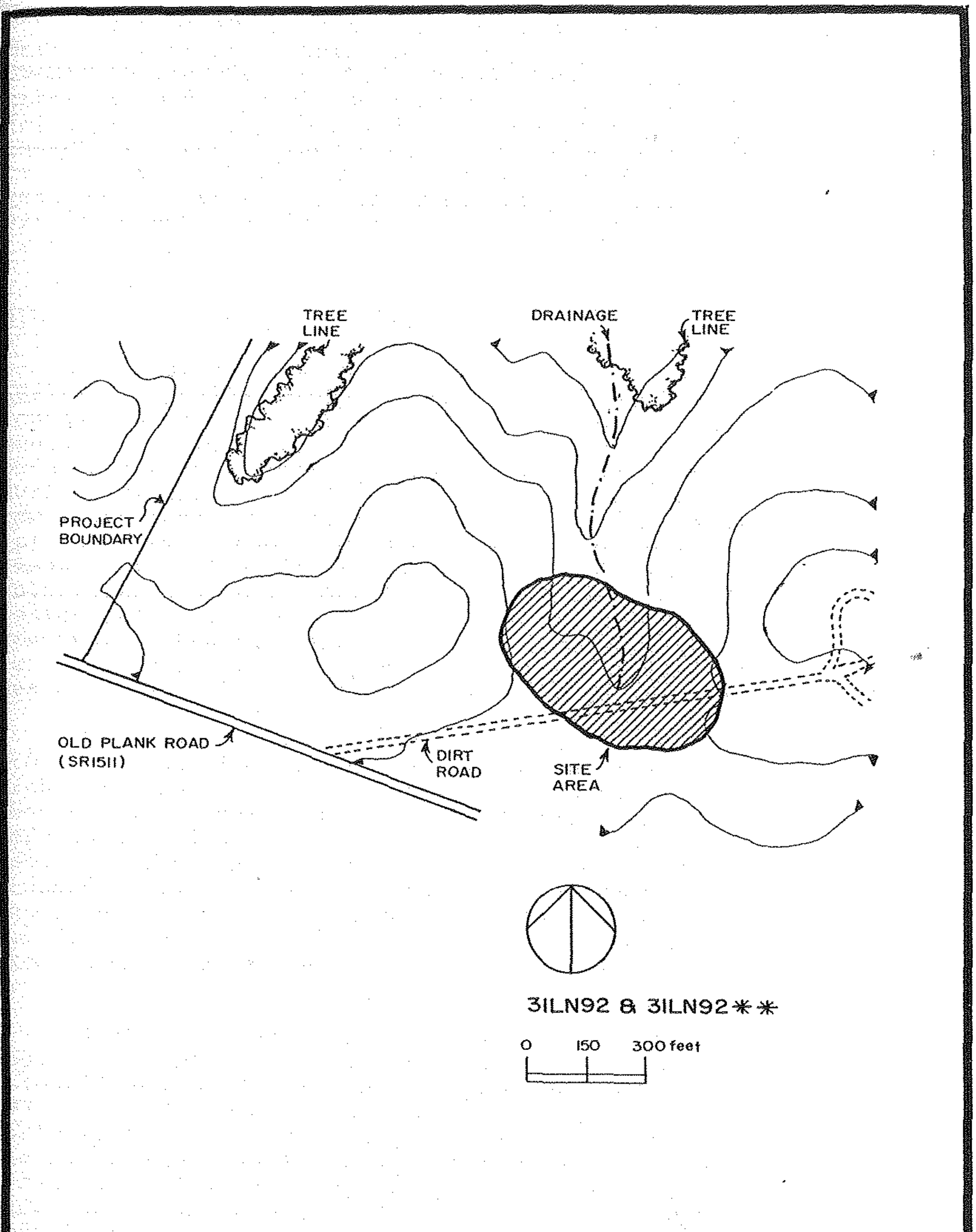


Figure 22. Plan Map of 31LN92 & 92**.

Site 31LN92 & 92** represents a tenant occupation on the Morrison property, this one dating to the early to middle twentieth century. While archaeological survey provided dateable artifacts and general definition of site boundaries, poor site integrity (i.e., plowed and eroded surfaces; poor potential for intact features) affects the ability of this site to provide research potential beyond the site's general relevance to local settlement patterning. Based on this information, Site 31LN92 & 92** is considered ineligible for the NRHP, and no further work is recommended.

31LN93 & 93** (ridge top; 785 ft AMSL)

Site 31LN93 & 93** is an extensive surface and subsurface scatter of predominately historic artifacts located on a ridge top and adjacent slopes, approximately 300 meters north of State Route 1511 (Figure 6). The site encompasses the area formerly occupied by the Morrison House and associated outbuildings. Surface visibility varied from poor (thick grass and trees in the immediate area of the razed house and outbuildings) to fair (planted pines and low undergrowth; eroded fields and dirt roadways). Topsoil is sparse to nonexistent in formerly cultivated fields and developed but variably disturbed around the former structure locations. Based on informant and map data concerning structure and building placement, the extent of the surface scatter, and positive shovel tests, 31LN93 & 93** measures approximately 150m NS by 360 m EW (Figure 23).

The central portion of this site (i.e., specified areas around the Morrison house and surrounding outbuildings) underwent archaeological testing in November 1988, during graphic and photographic documentation of the Morrison house. These studies were completed prior to the razing of the house and outbuildings. Documents pertaining to this work, including recommendations for documentation from the North Carolina Department of Cultural Resources; a management summary describing this work; photographs and floor plans of the house; a site map and discussions of excavation results; and an artifact list are included in Appendix 1.

Historic artifacts recovered from 31LN93 & 93** resemble those recovered from 31LN91 and 91**, and are attributable primarily to the Kitchen and Architecture artifact groups (South 1977). Analysis of diagnostic types indicates a probable early-middle twentieth century occupation. Ceramics consist of plain, transfer print, and sponge decorated whiteware; plain, green, and blue glazed ironstone whiteware; alkaline glazed stoneware; and plain, blue glazed, and underglaze decorated porcelain. Container glass is primarily clear bottle and tableware fragments; however, light green, dark green, amber, and red fragments were also recovered. Enamelled cookware was also observed. Architectural artifacts are represented by a quantity of brick (sampled), an iron spike, and a few fragments of window

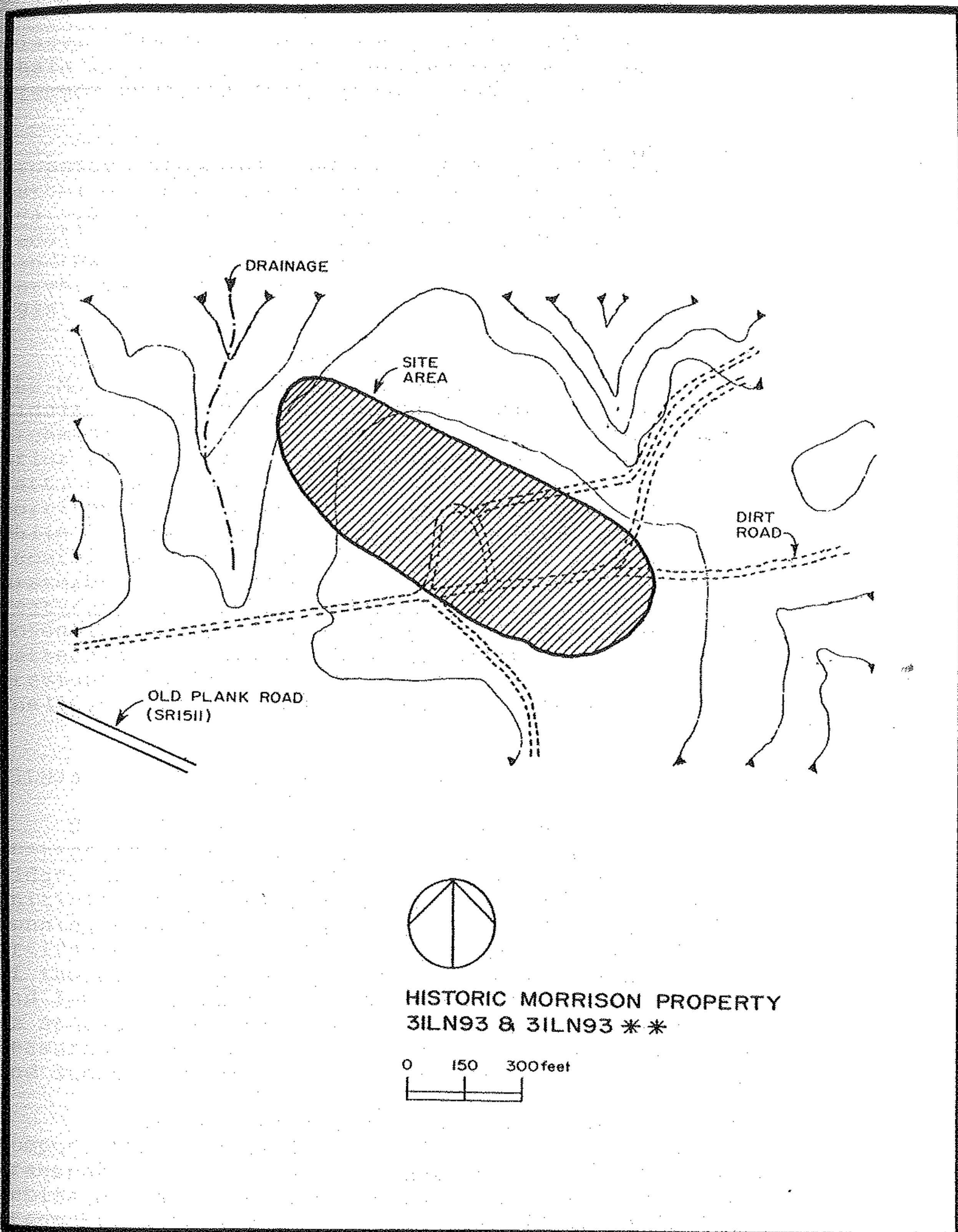


Figure 23. Plan Map of 31LN93 & 93**.

glass. The site collection also includes a battery core, a metal chain link, a plastic button, several quartz flakes, and two stemmed rhyolite PP/Ks (nondiagnostic).

According to property history, this portion of the Morrison property probably included the manor house and associated outbuildings from the time of original construction on this tract (ca. 1840). In addition to the main house, Lewis Anderson recalls the presence of a second two story house in this area (southwest of the barn). This house appears on the 1914 soil survey map and is said to have been destroyed by a tornado in 1938.

Site 31LN93 & 93** represents the manor house occupation on the Morrison property, dating (from historical records) to the middle nineteenth through middle twentieth century. Archaeological survey failed to recover evidence of occupation prior to the early twentieth century; this may be attributed, in part, to debris clearing activities undertaken after the original Morrison house burned and before the new house was constructed. While archaeological survey provided dateable artifacts and general definition of site boundaries, poor site integrity (i.e., disturbed and eroded surfaces; poor potential for intact features) affects the ability of this site to provide research potential beyond the site's general relevance to local settlement patterning. Based on this information, and in concurrence with previous testing in this area, 31LN93 & 93** is considered ineligible for the NRHP, and no further work is recommended.

31LN94 & 94** (ridge top; 775 ft AMSL)

Site 31LN94 & 94** is a light density surface and subsurface scatter of prehistoric and historic artifacts on a gently sloping ridge top adjacent to Highway 1511 (Figure 6). The site was initially encountered as a surface scatter in the dirt exit road running between the highway and the Morrison house. Additional artifacts were collected in systematic shovel tests east and west of the road. Surface conditions varied from fair (planted pines and low undergrowth) to good (eroded dirt road surface). Topsoil is sparse to nonexistent in formerly cultivated fields. The site measures approximately 135 m NS by 105 m EW as defined by surface and subsurface artifacts (Figure 24).

Lithic artifacts represent the minority prehistoric components at 31LN94 & 94**. Recovered artifacts include: transparent, translucent, and milky quartz flakes; rhyolite debitage; a quartzite cobble; a transparent quartz biface fragment; a transparent quartz PP/K (Palmer; Early Archaic); and a rhyolite PP/K (Morrow Mountain; Middle Archaic).

Historic artifacts from 31LN94 & 94** date from the late nineteenth through the middle twentieth centuries and are primarily attributable to the Kitchen and Architecture artifact

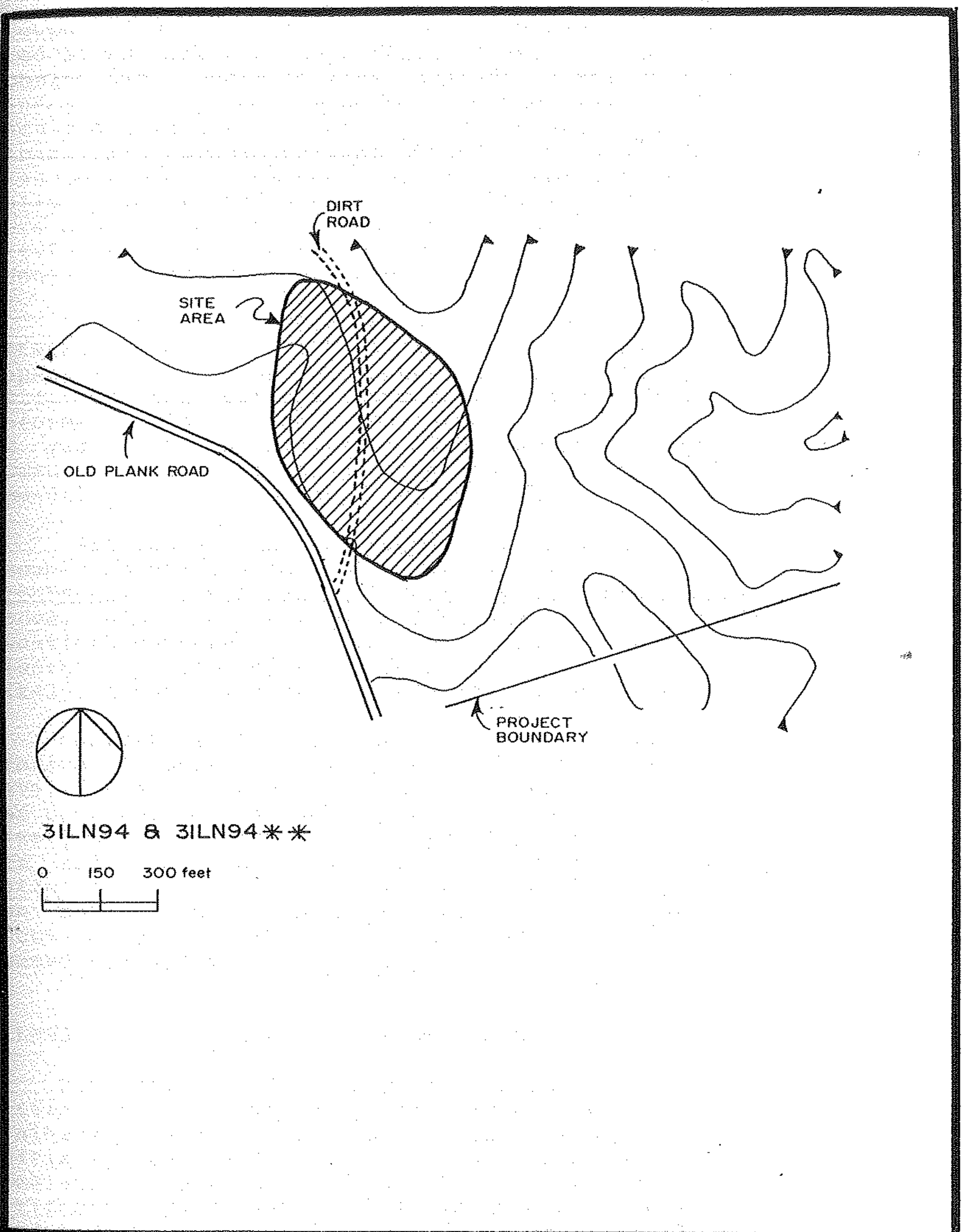


Figure 24. Plan Map of 31LN94 & 94**.

groups (South 1977). Glass container fragments are the predominant artifact type represented, and include clear, green, cobalt, and amber bottles; canning jars; and milk glass lid liners. Collected ceramics include plain, blue glazed, and decalled whiteware; ironstone whiteware; alkaline glazed and albany slip stonewares; and plain porcelain. Pale green window glass was the predominate architectural artifact type; however, nails (unidentified and wire), tacks, linoleum, and a lock plate were also recovered. Additional Personal and Activity Group artifacts include metal buttons, a pocket watch stem, a 1925 penny, a skeet fragment, and a piece of auto tire.

Archival research was unable to provide historical references for the 31LN94 & 94** artifact cluster. No structures appear in this area on either the 1914 soil survey map (USDA 1914) or the current Lowesville quad sheet (USGS 1970). Informants did not recall buildings in this area during the past 60 years (Lewis Anderson and Margaret Guillett, personal communication 1989), suggesting possible secondary deposition of domestic debris from one or more of the other nearby house sites.

Artifacts recovered suggest both prehistoric and historic occupation/utilization of 31LN94 & 94**. Identifiable prehistoric components include Early and Late Archaic. As noted above, historic artifacts indicate a late nineteenth-middle twentieth century deposition date range. The historic artifact cluster may represent a former structure location or, more likely, a dump site associated with another domestic site.

Contexts in the site area have been destroyed by plowing and erosion of surface soils, exposing artifacts to the subsoil level. Due to this disturbance, widespread artifact dispersion has occurred and any subsurface features previously present have likely not survived. The mapped location of 31LN94 & 94** and its relevance to local prehistoric and historic settlement patterns are the most significant research contributions the site can make. Based on these assessments, 31LN94 & 94** is recommended ineligible for the NRHP, and no further work is deemed necessary.

31LN95 & 95** (ridge end; 740 ft AMSL)

Site 31LN95 & 95** is a light density surface and subsurface artifact scatter on a small ridge end overlooking a minor drainage feeding into Forney Creek (Figure 6). The site was initially recorded as a surface scatter of historic and prehistoric artifacts. Six shovel tests recovered subsurface artifacts. Surface visibility in an overgrown field was fair to good and the surrounding area was planted in pines with moderate underbrush. Site dimensions are approximately 60 m NS by 30m EW (Figure 25).

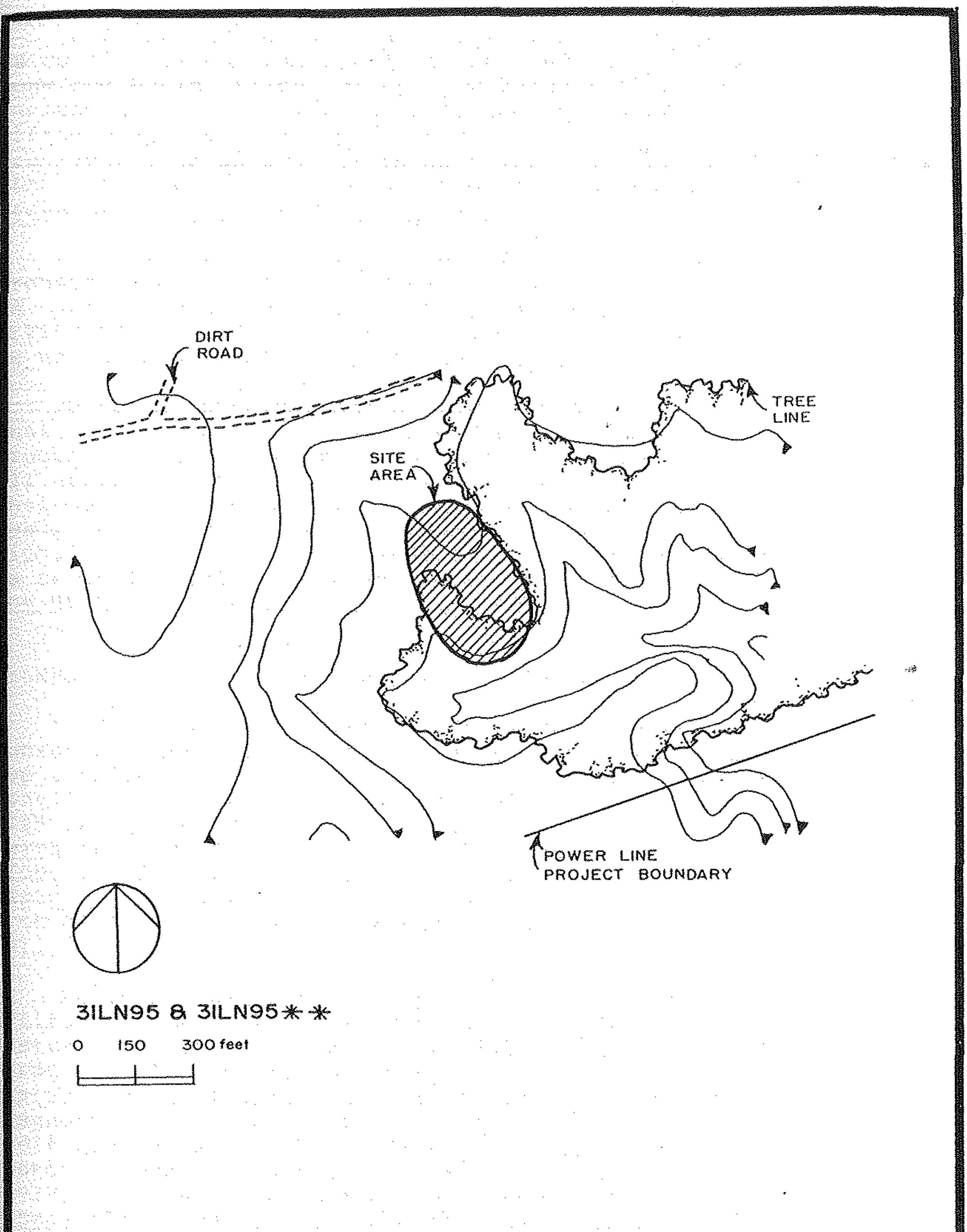


Figure 25. Plan Map of 31LN95 & 95**.

All non-surface artifacts were recovered from the upper 5 to 10 cm of a mixed (apparently eroded and redeposited) brown silty loam/red brown silty clay. Prehistoric artifacts recovered include schist, rhyolite, tuff, and transparent quartz flakes, biface fragments, and associated shatter. Four stemmed bifaces are identified as two Savannah River and one Little Bear Creek (Late Archaic) PP/Ks, and one MacCorkle/LeCroy bifurcated (Early Archaic) PP/K.

Historic artifacts include undecorated whiteware and ironstone, milk glass, and clear and light green bottle glass. An early to mid-twentieth century component is suggested by these artifacts. Based on artifact context, this component appears to be non-occupational, i.e., a dump site.

On-site observations of landform and surface area indicate that 31LN95 & 95** has been subject to severe erosional processes, making artifact context questionable. As noted above, all artifacts were recovered from exposed surface areas or from shallow disturbed deposits. Based on these site conditions, the description and mapped location of 31LN95 & 95** is its most significant research contribution. Additional research potential is severely limited and the site is recommended ineligible for the NRHP. No further work is recommended at 31LN95 & 95**.

31LN96 & 96** (ridge top and slope: 755 ft AMSL)

Site 31LN96 & 96** is a moderate density surface and subsurface artifact scatter located along both sides of a ridge top farm road (Figure 6). A major portion of the site is in a heavily overgrown field; peripheral areas are in planted pines with thick underbrush. Surface visibility was generally poor (with the exception of the dirt road surface and eroded side slopes) and artifacts are restricted to the top 15 cm (PZ). Based on artifact presence in shovel tests and at the surface, site dimensions are approximately 180 m NS by 70 m EW (Figure 26).

While a small amount of prehistoric material was recovered, artifacts from 31LN96 & 96** are primarily from the recent historic period, dating generally from the late nineteenth through early twentieth century. Prehistoric lithics include quartz, metavolcanic, and tuff flakes; despite a lack of diagnostic artifacts, this site appears to represent an undifferentiated Archaic lithic workshop area. A typical historic domestic assemblage is represented, including South's (1977) Kitchen group (whiteware, ironstone, alkaline glazed and Albany slip stonewares, and porcelain; clear, amethyst, cobalt, green, amber, and aqua container glass), Architecture group (brick, mortar, and wire nails), and Clothing group (buttons, shoe parts). Other artifacts indicating special activities include machine parts and fence staples, and faunal/botanical

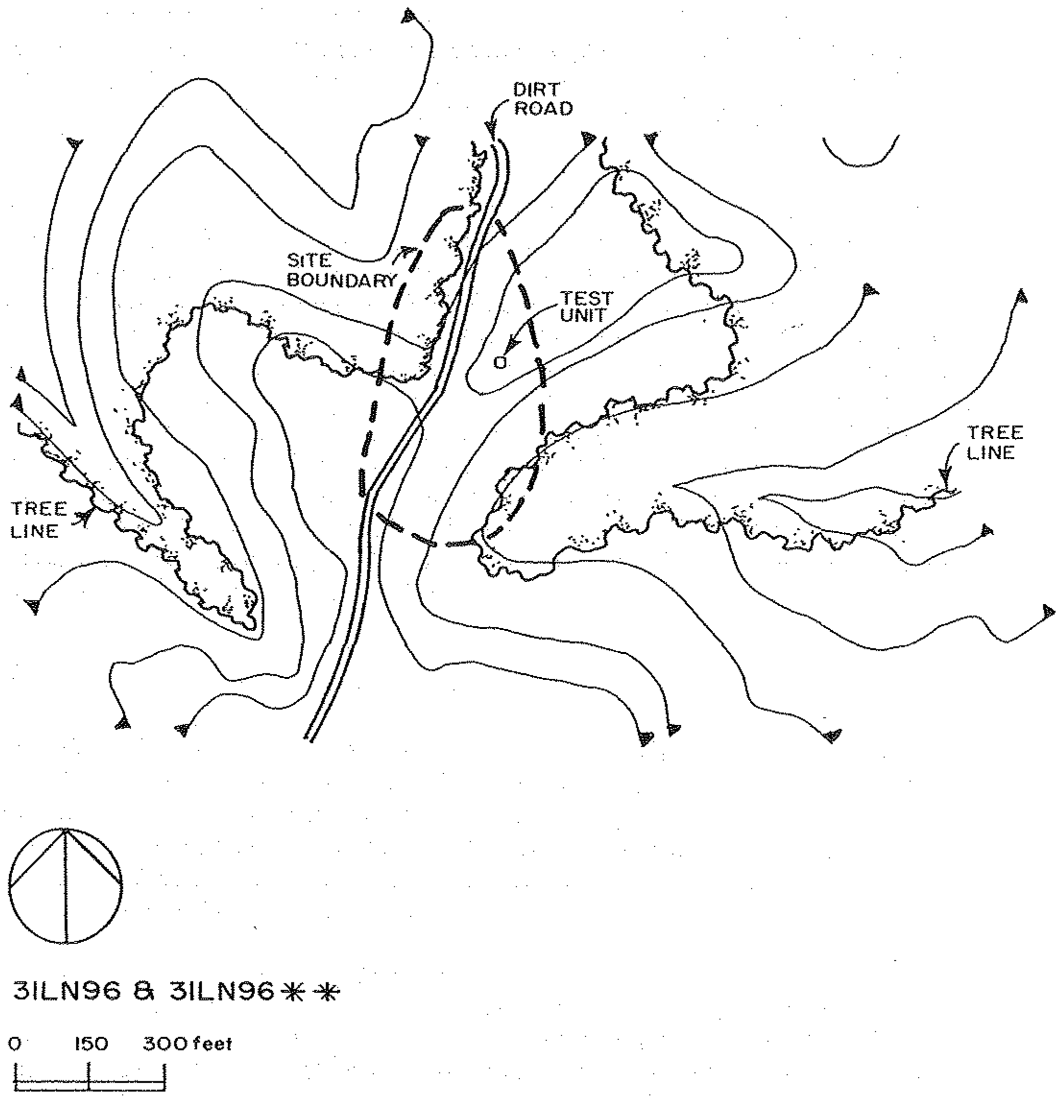


Figure 26. Plan Map of 31LN96 & 96**.

remains (mammal bones, whelk fragment, peach pits, nut fragments).

In addition to shovel tests and surface collections at 31LN96 & 96**, a single 1 m by 1 m formal test unit was excavated in an area of high artifact density. Test Unit 1 encountered a moderate density of historic artifacts in plowzone soils (to 18 cm below surface); these artifacts date generally to the turn of the century. The site has been severely impacted by erosion; plow scars were apparent across the floor of the formal unit, and there was no indication of features.

The historic artifact cluster within 31LN96 & 96** appears to be associated with a structure shown in this vicinity on the 1914 Lincoln County soil survey map (USDA 1914). The structure is located on the eastern portion of the site and is remembered by Lewis Anderson as a four room house. Results of a 1 m by 1 m formal test unit excavation suggest that artifact context is questionable, and the potential for features is doubtful. Based on these assessments, the mapped location of 31LN96 & 96** and its relevance to local prehistoric and historic settlement patterns are its most significant research contributions. Additional research potential is severely limited and this site is recommended ineligible for the NRHP. No further work is recommended at 31LN96 & 96**.

31LN97 & 97** (ridge top: 755 ft AMSL)

Site 31LN97 & 97** is a very light density surface lithic scatter located along a small trail running along the ridge top (Figure 6). Ground surface visibility is fair to good, but the surface is severely eroded. Shovel tests recovered no additional artifacts. Site dimensions based on the surface scatter are 10 m NS by 10 m EW (Figure 27).

Artifacts from 31LN97 & 97** are predominately prehistoric in origin. Nine prehistoric artifacts were recovered from the surface, including chert, tuff, and rhyolite flakes. While no diagnostic artifacts were recovered, it is suggested that this site probably represents the remains of an Archaic period lithic workshop. A single clear glass fragment was recovered, but is not considered related to occupation of the area. It is more probable that the glass fragment represents a product of erosional processes moving artifacts away from 31LN96 & 96**.

Site 31LN97 & 97** is another small, disturbed upland lithic scatter. As noted previously, archaeological research potential for these sites is very low. As a result, this site is recommended ineligible for the NRHP and no further work is recommended here.

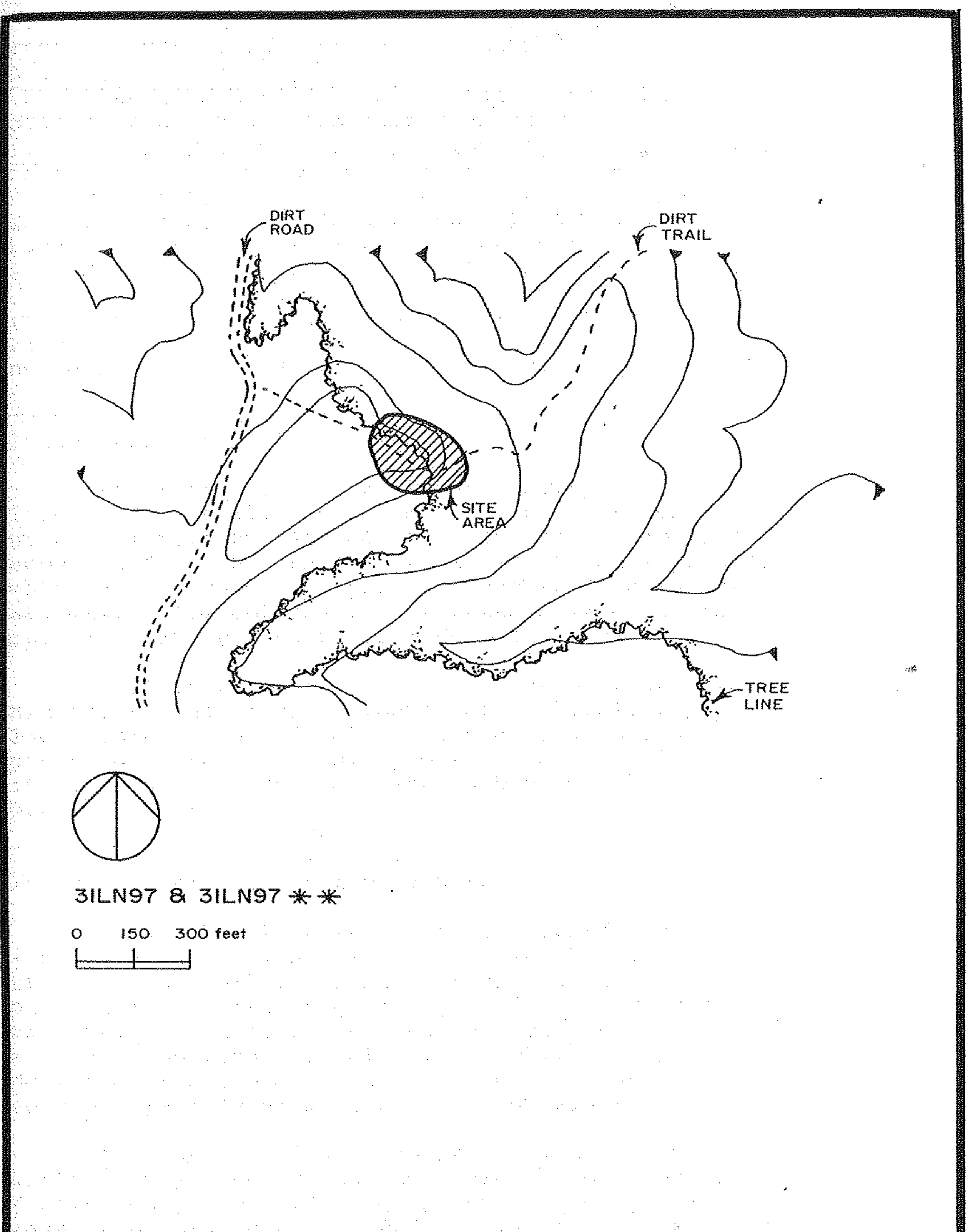


Figure 27. Plan Map of 31LN97 & 97**.

31LN98 & 98** (ridge top; 755 ft AMSL)

Site 31LN98 & 98** is another very light density artifact scatter found in a farm road running along a ridge top (Figure 6). Site dimensions are approximately 10 m by 10 m (Figure 28).

Of the total of three artifacts recovered from this site, two are recent (twentieth century) whiteware sherds, and the third is a prehistoric (translucent quartz) flake. All artifacts were found on the surface; shovel tests in the vicinity recovered no additional artifacts. Surface conditions indicate that this site represents secondary deposition of artifacts rather than primary occupational debris. Site 31LN98 & 98** is recommended ineligible for the NRHP and no further work is required.

31LN99 (ridge top; 735 ft AMSL)

Site 31LN99 is a very light density surface lithic scatter along a dirt trail near the end of a ridge top (Figure 6). Surface visibility was poor to fair, with a total of three flakes recovered from the trail surface and a small push pile. Shovel tests in the immediate vicinity recovered no additional cultural material. Size of the site, based on the surface scatter, is approximately 10 m NS by 15 m EW (Figure 29).

The context of this site is extremely questionable. While this may represent the remnants of a lithic work station, it is also possible that 31LN99 represents a secondary depositional episode due to erosional processes or machinery displacement. Site 31LN99 is recommended ineligible for the NRHP and no further work is required.

31LN100 & 100** (ridge top; 750 ft AMSL)

Site 31LN100 & 100** is a moderate density prehistoric lithic scatter. The site is primarily a surface scatter of artifacts initially encountered during walkover of an old farm road running along the ridge landform (Figure 6). Extreme erosional processes and the exposed road surface provided good to excellent surface visibility. Only a single artifact was recovered from shovel tests in the site area. Site dimensions are approximately 60 m NS by 60 m EW (Figure 30).

Prehistoric artifacts recovered include rhyolite, tuff, and quartz flakes, two PP/Ks, and two biface fragments. An Early Archaic occupation is suggested by the presence of a single diagnostic side-notched PP/K (Taylor). A minor historic component is represented by plain whiteware and ironstone and a fragment of green bottle glass. These artifacts probably represent dispersion from 31LN96 & 96**, a turn of the century tenant occupation.

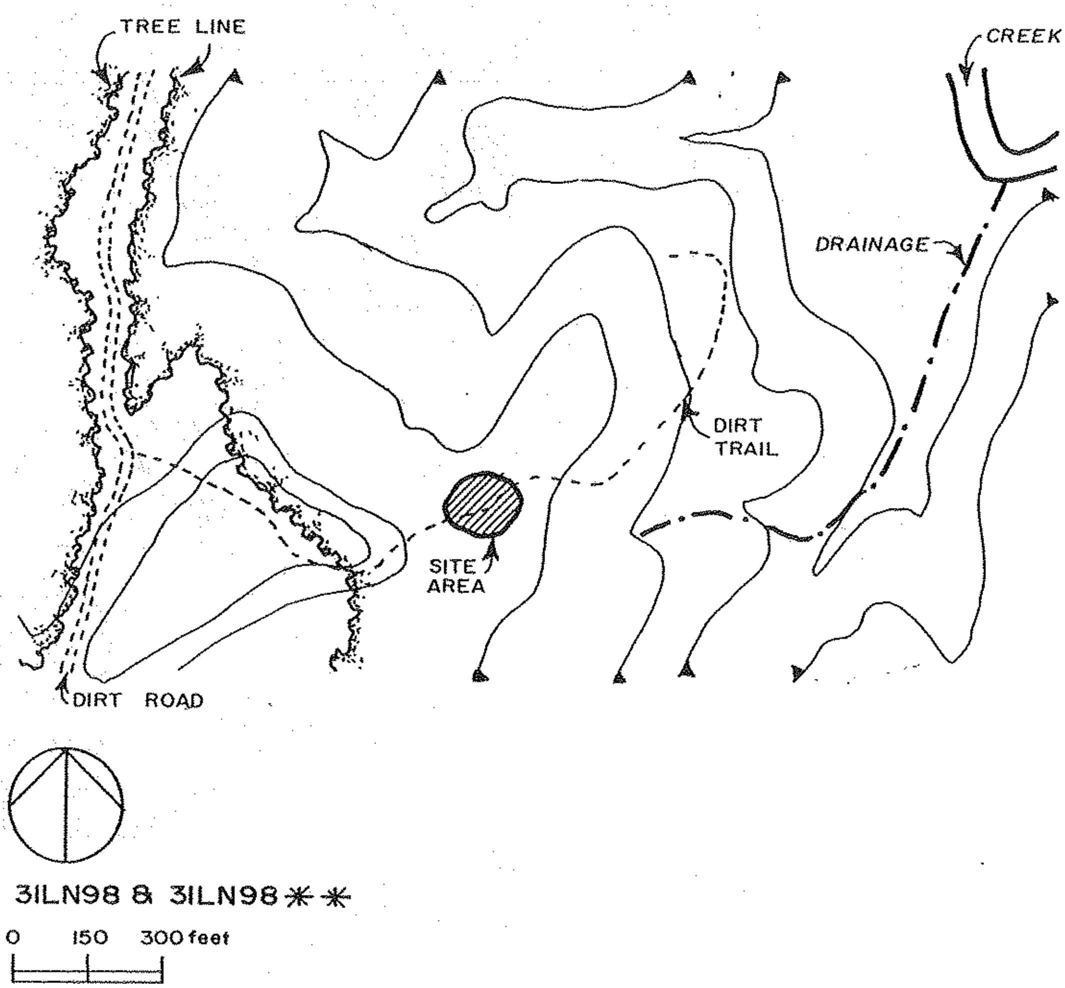


Figure 28. Plan Map of 31LN98 & 98**.

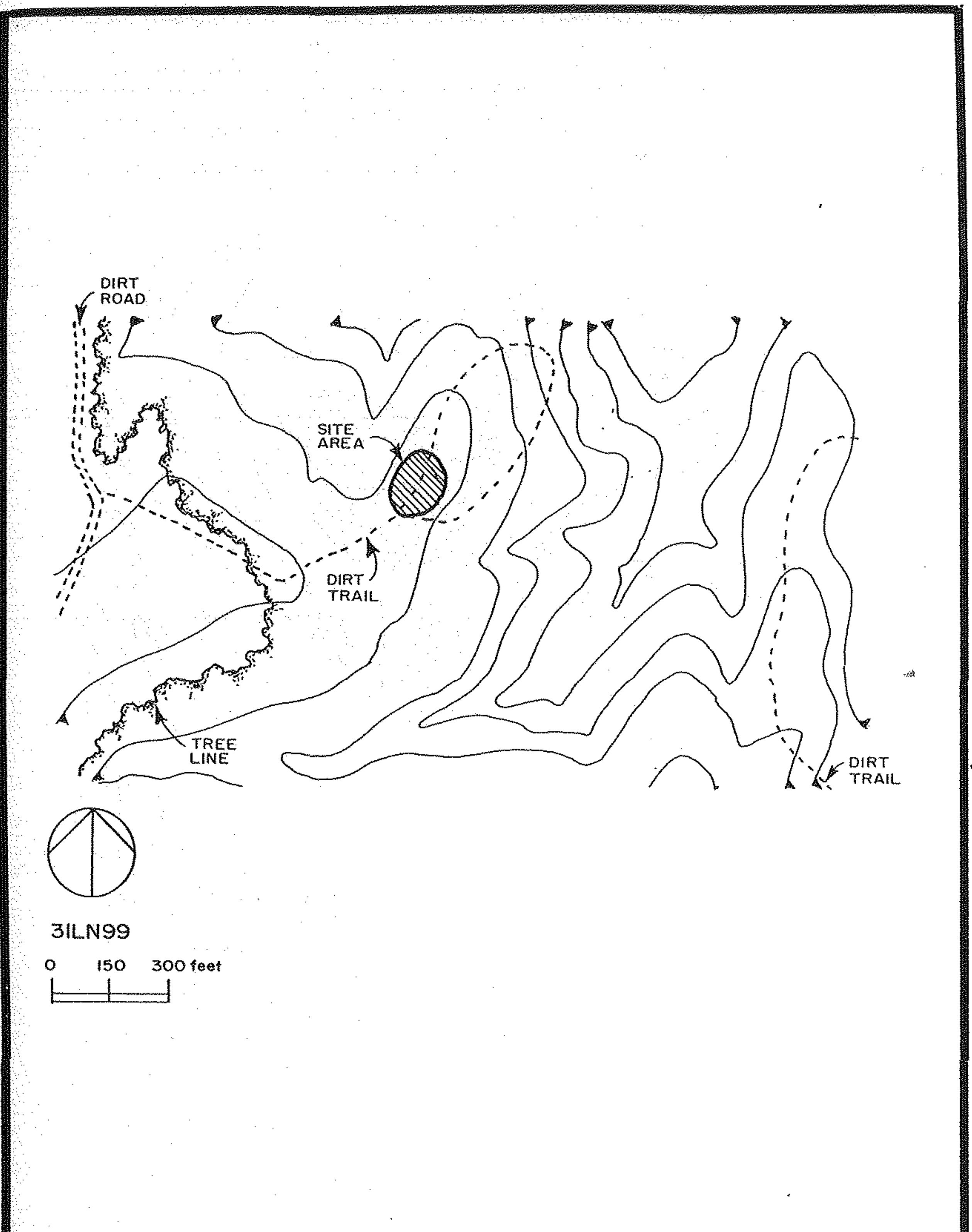


Figure 29. Plan Map of 31LN99.

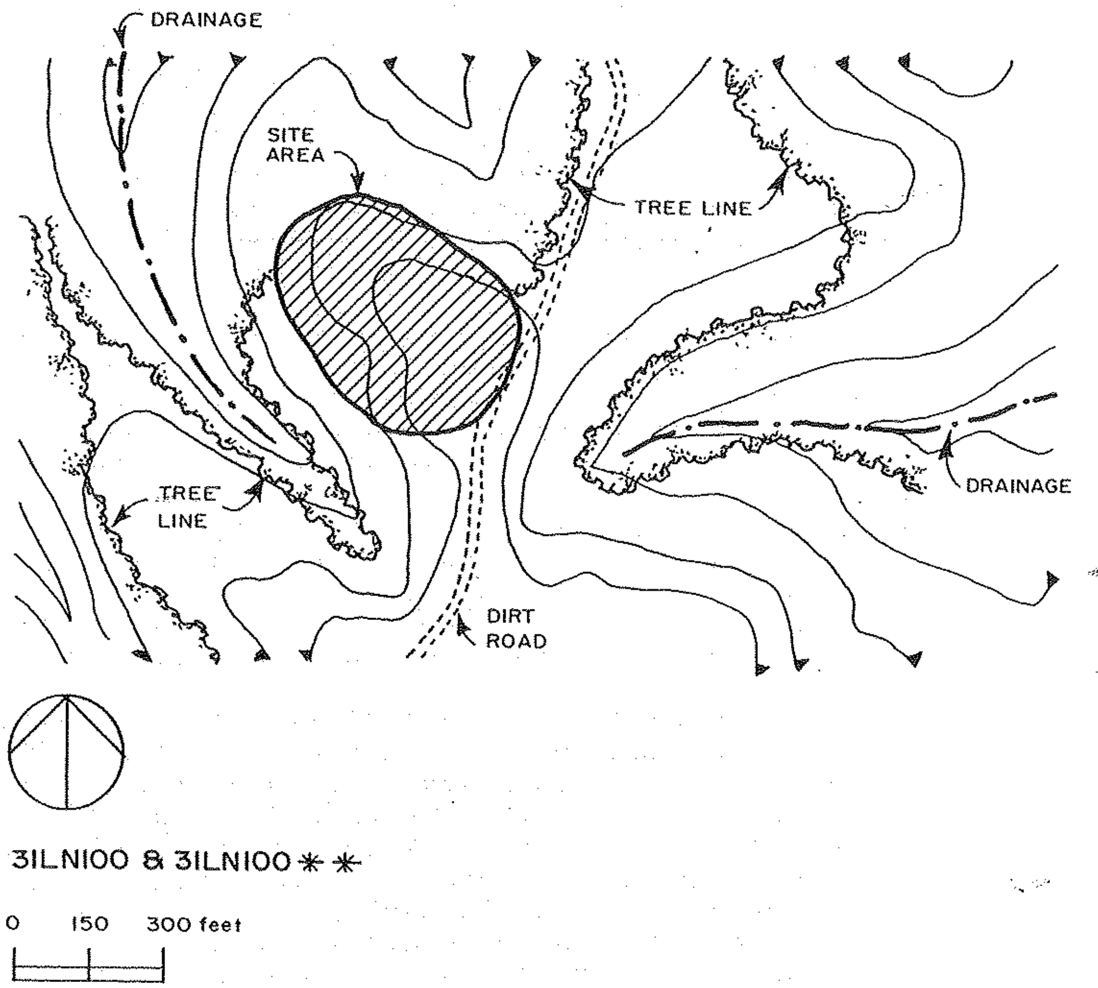


Figure 30. Plan Map of 31LN100 & 100**.

Due to extreme erosion in the site area, the presence of features and other intact deposits is doubtful. It is also probable that the extensive site area of 31LN100 & 100** is a result of displacement of artifacts from a more concentrated zone. Site 31LN100 & 100** is recommended ineligible for the NRHP; no further work is required.

31LN101 & 101** (ridge top; 755 ft AMSL)

Site 31LN101 & 101** is a very light density surface and subsurface scatter of late nineteenth through middle twentieth century artifacts. The site is located near the head of a small drainage (Figure 6). Most of the artifacts were found on the ground surface, with only a single stoneware sherd from shovel tests in the site area. The site boundaries are approximately 20 m NS by 30 m EW (Figure 31).

Historic artifacts recovered consist primarily of clear, brown, light green, and cobalt glass fragments. Ceramics collected are alkaline glazed and salt glazed (ginger beer bottle) stonewares, and plain whiteware sherds. Other artifacts include metal and bone fragments.

A single prehistoric artifact, a tuff flake, was also collected from the surface area. This represents an isolated find of questionable nature, and probably does not represent an occupational episode. Erosional processes and/or cultivation practices could easily account for its presence.

Site 31LN101 & 101** may be the remains of a structure shown on a 1914 Lincoln County soil survey map (USDA 1914), on the west side of a farm road just north of 31LN93 & 93** (the Morrison House). While no structural remains were noted, Lewis Anderson recalls that this was the location of a small house built around 1900 and occupied by a succession of Morrison tenants. Among these tenants was Mr. Anderson's brother, Russell, who was burned to death in a kerosene explosion at this house. Several years later (1965), the house itself burned down (Lewis Anderson personal communication 1989). This site appears to exhibit no additional research potential and is recommended ineligible for the NRHP; no further work is required.

31LN102 & 102** (ridge top; 710 ft AMSL)

Site 31LN102 & 102** is a light scatter of prehistoric artifacts located along a farm road running along a ridge top (Figure 6). Artifacts were recovered primarily from shallow shovel tests in the roadway. No diagnostic lithic material was present, but a single prehistoric sherd suggests a Late Woodland/Protohistoric association. Site dimensions are approximately 5 m NS by 30 m EW (Figure 32).

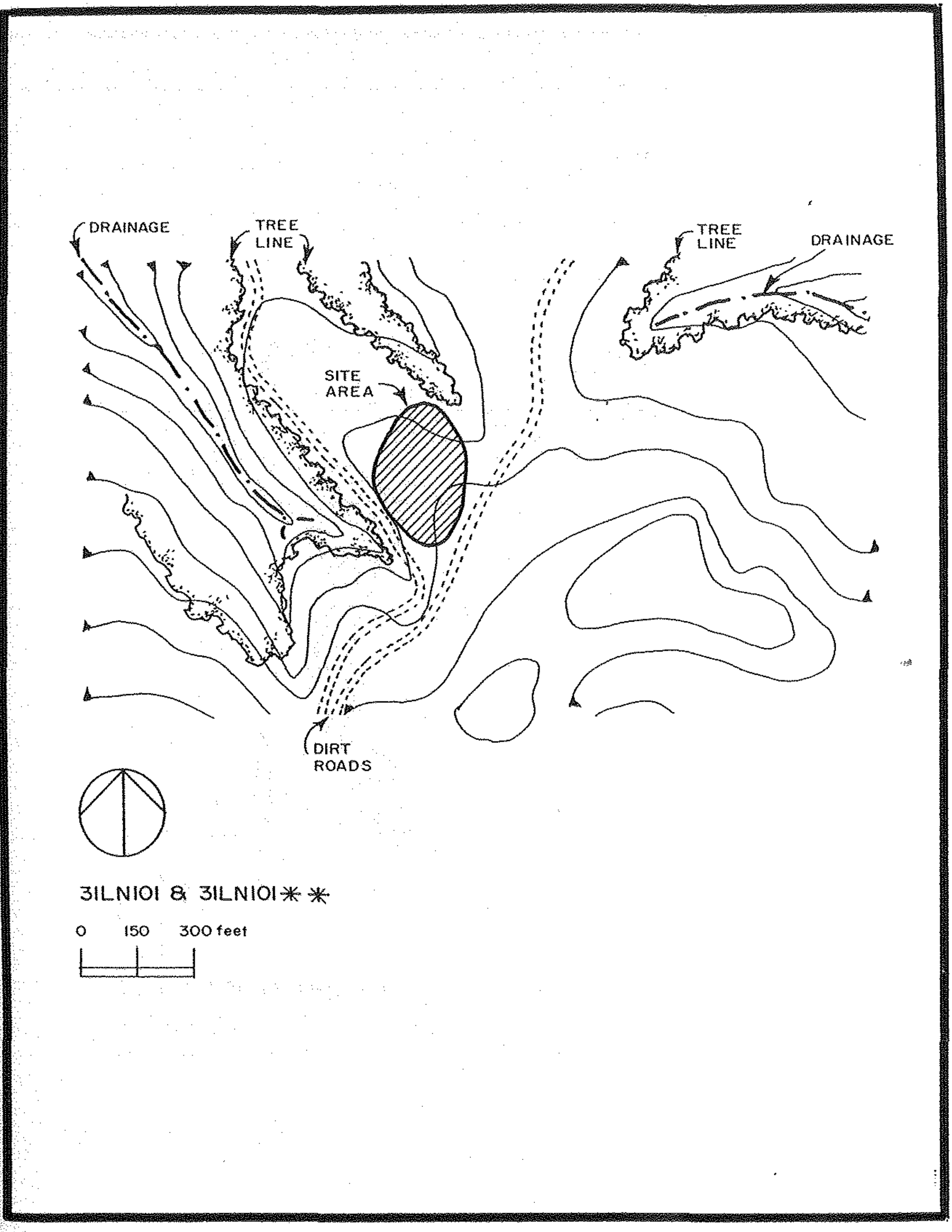


Figure 31. Plan Map of 31LN101 & 101**.

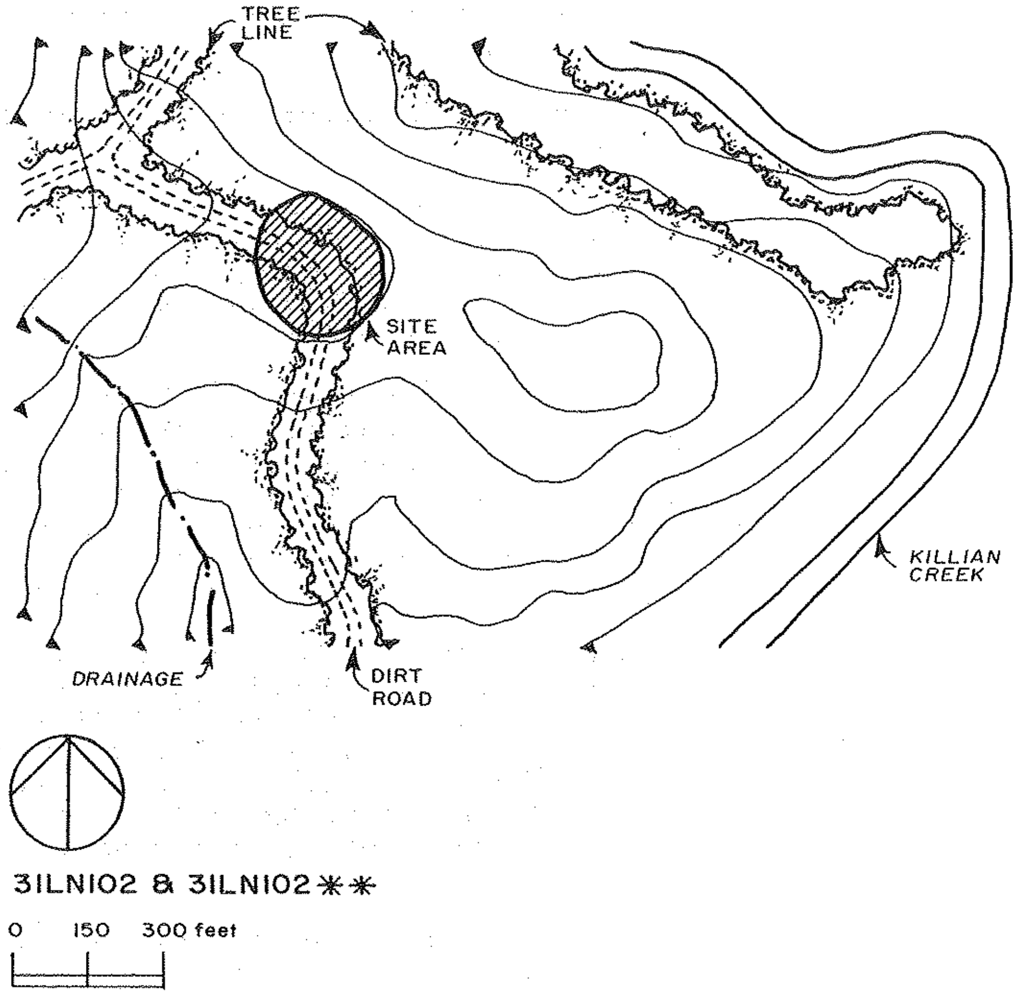


Figure 32. Plan Map of 31LN102 & 102**.

Prehistoric artifacts recovered include quartz and meta-volcanic flakes and a single fine incised sand tempered sherd. A single clear glass fragment represents an isolated occurrence of questionable context. Its presence is believed to be due to erosional processes or cultivation practices rather than an historic occupation.

This site represents one of the few prehistoric sites with ceramic components; unfortunately, the roadbed location and disturbed nature of the site suggest that research potential for the site is extremely limited. Based on these observations, 31LN102 & 102** is recommended ineligible for the NRHP and no additional work is required at this site.

31LN103 & 103** (ridge slope; 685 ft AMSL).

Site 31LN103 & 103** is a light density prehistoric lithic scatter located in a farm road running along a ridge slope (Figure 6). All artifacts were collected from the ground surface along the farm road. Shovel tests in the site area provided no indication of sub-surface deposits. Surface finds define the site boundary as approximately 10 m NS by 10 m EW (Figure 33).

The prehistoric component is indicated by the presence of quartz and rhyolite flakes. No diagnostic materials were recovered. Specific component and site function could not be determined from this limited artifact sample, but an Archaic occupation/use is suspected. A single historic whiteware sherd was also collected from the ground surface, but this represents an isolated occurrence rather than an occupational episode.

Previous farming practices and subsequent erosional processes affecting 31LN103 & 103** limit the amount of useful information that is available from this site. While located on a broad, relatively level ridge slope, disturbance of surface deposits in this site area is extensive. The resulting low research potential supports an assessment of ineligibility to the NRHP. No further work is recommended.

31LN104 (ridge slope; 750 ft AMSL)

Site 31LN104 is a light density lithic scatter located on an eroded slope among planted pines (Figure 6). The site was initially recorded as surface finds while covering pedestrian transects. No additional subsurface artifacts were recovered from shovel tests in the site area. Surface finds define site boundaries as approximately 30 m NS by 60 m EW (Figure 34).

Prehistoric artifacts are limited to quartz, quartzite, and rhyolite flakes; no diagnostic artifacts were recovered. Contexts in the site area have been destroyed by erosion of surface soils, exposing artifacts at the subsoil level. Due to

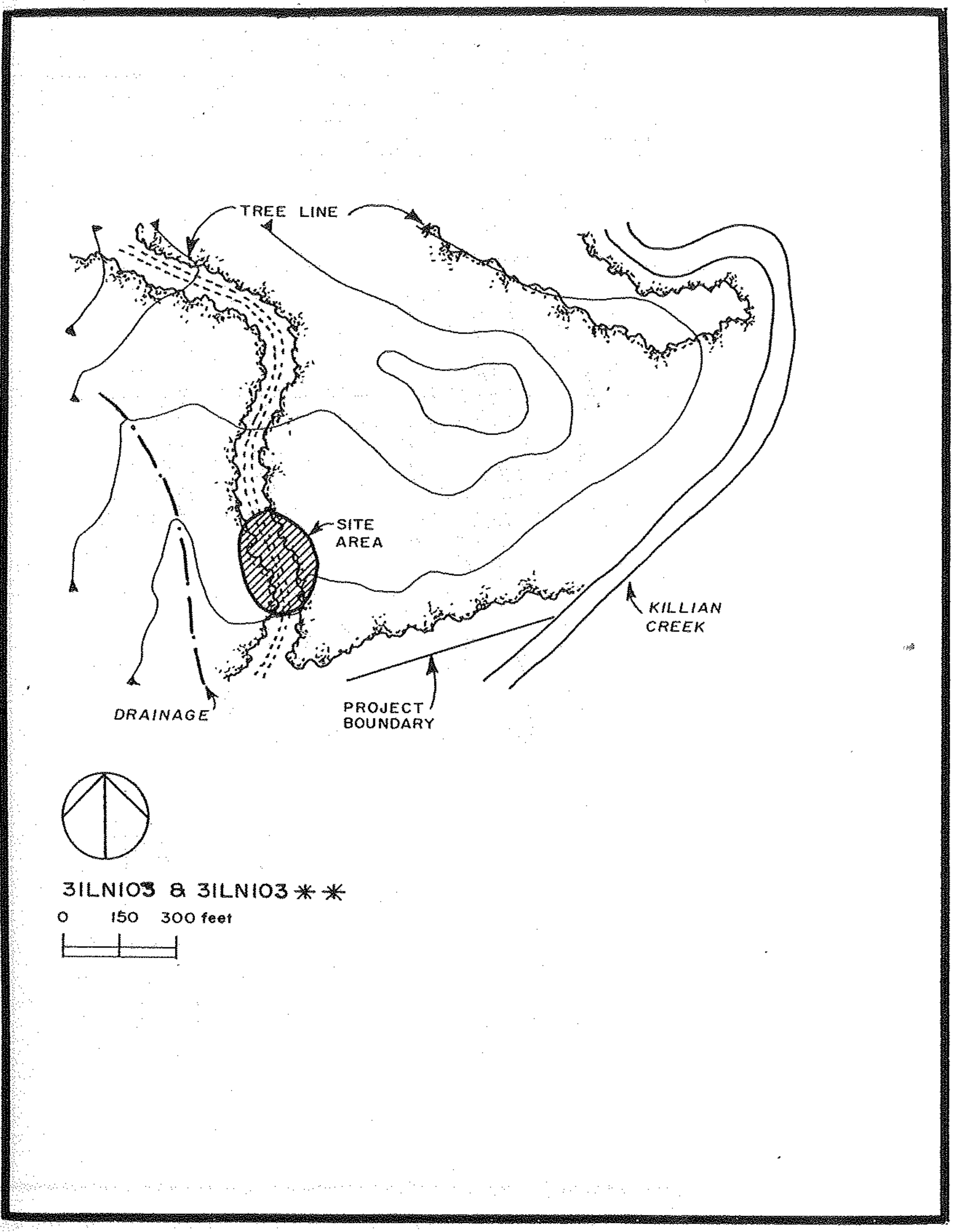


Figure 33. Plan Map of 31LN1Ø3 & 1Ø3**.

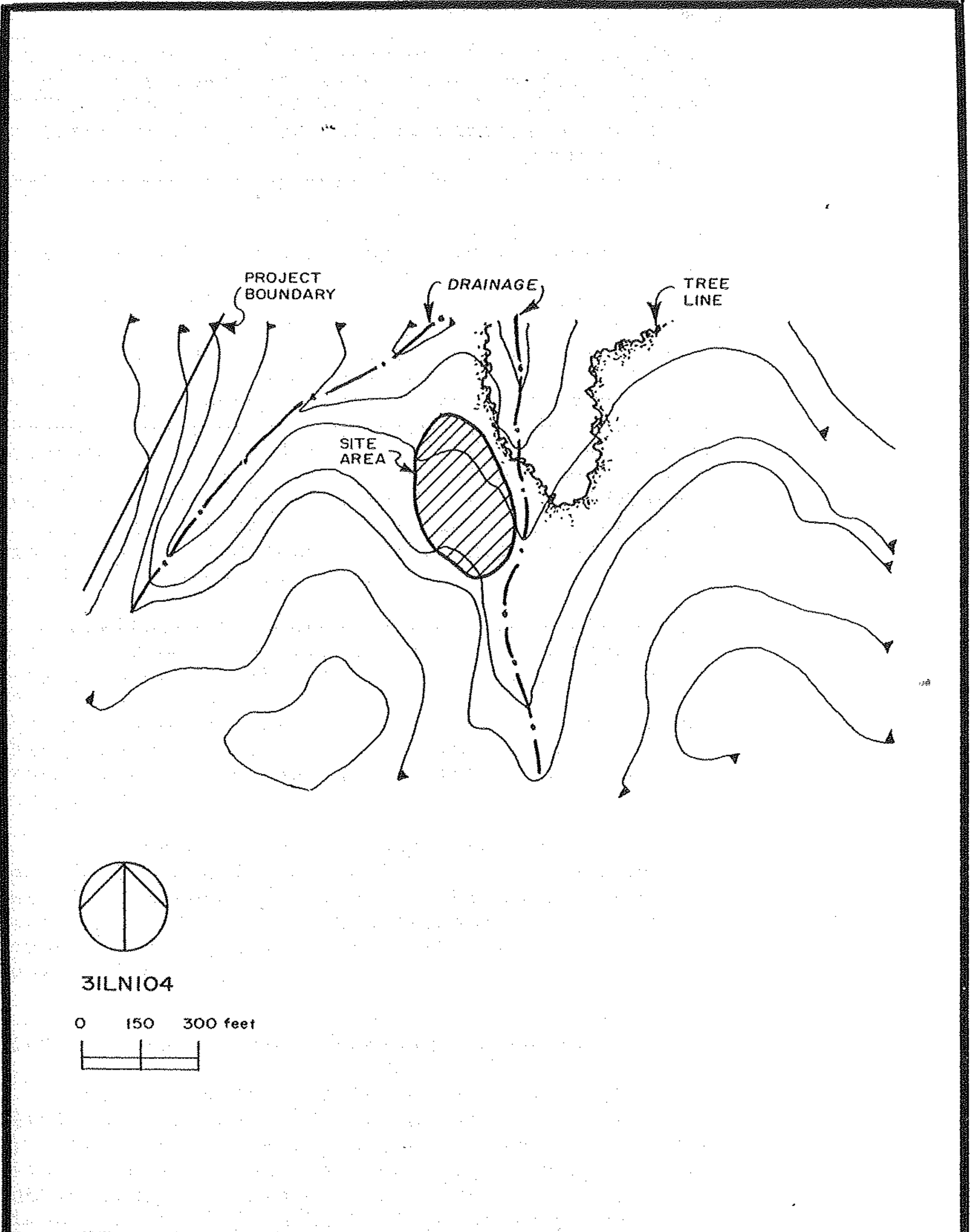


Figure 34. Plan Map of 31LN104.

this disturbance, artifacts exhibit widespread dispersion and it is unlikely that subsurface features have survived. The location of this site and its relevance to local prehistoric settlement patterns are its most significant research contribution. Based on these assessments, 31LN104 is recommended ineligible for the NRHP, and no further work is deemed necessary.

31LN105 & 105** (ridge slope; 740 ft AMSL)

Site 31LN105 & 105** is another light density lithic scatter located along the transmission line forming the southeastern boundary of the project area (Figure 6). The site is located near a small drainage head which feeds into Killian Creek, but all artifacts were recovered from a graded area at the base of a transmission tower. Vegetation in the area is planted pine and moderately dense undergrowth. Surface visibility was generally poor except in the area disturbed by tower construction. Shovel tests in the site area recovered no additional artifacts and suggest the absence of intact sub-surface deposits. Site dimensions as indicated by the surface scatter are approximately 5 m NS by 5 m EW (Figure 35).

Artifacts recovered include two early stage biface fragments and quartz and rhyolite flakes. No diagnostic lithic artifacts were recovered. This lithic scatter probably represents a small lithic workshop area, possibly in the vicinity of a quarry (suggested by the presence of early stage biface fragments). Two whiteware sherds (plain and blue sponged) were also recovered, probably representing an isolated occurrence rather than an occupational episode.

Site 31LN105 & 105** does not appear to exhibit any additional research potential beyond the location of this site and its relevance to local prehistoric and historic settlement patterns. Based on this assessments, 31LN105 & and 105** is recommended ineligible for the NRHP, and no further work is deemed necessary.

31LN106 & 106** (ridge top and slope; 755 ft AMSL)

Site 31LN106 & 106** is a large light density prehistoric lithic scatter on a ridgetop and adjacent (east) slope (Figure 6). Surface visibility during survey varied from fair to good, with several erosional gullies present. Both surface and sub-surface (plowzone) contexts yielded artifacts. Site dimensions are 180 m NS by 60 m EW (Figure 36).

Prehistoric artifacts recovered include both metavolcanic and quartz artifacts. A quartz biface and metavolcanic and quartz biface fragments were recovered, but no diagnostic artifacts were encountered; an Archaic affiliation is suspected. Other prehistoric artifacts collected are flakes, a core

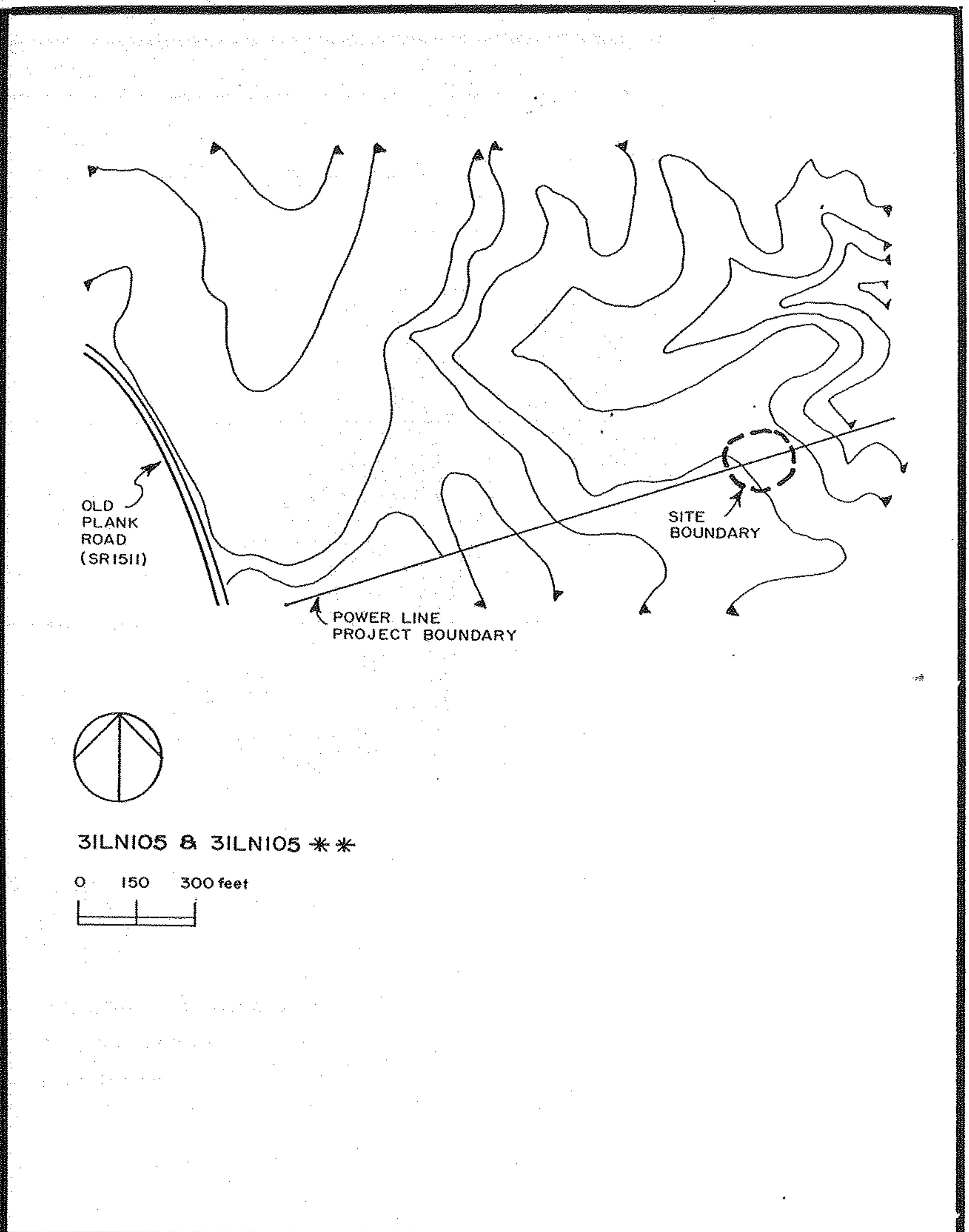


Figure 35. Plan Map of 31LN105 & 105**.

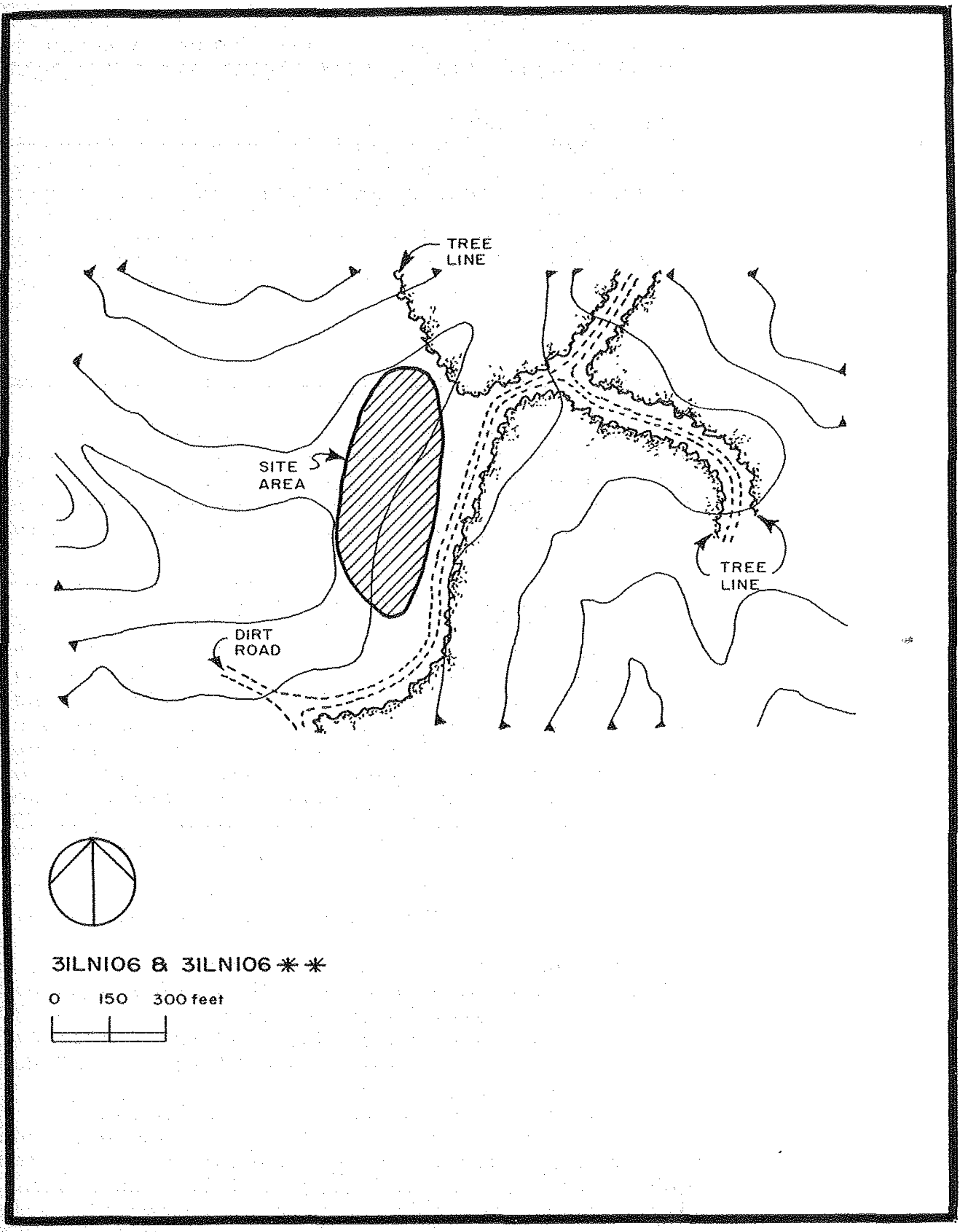


Figure 36. Plan Map of 31LN106 &106**.

fragment, and shatter. Three plain whiteware sherds and one spongeware sherd were collected, but no evidence remains suggesting preservation of architectural features.

Site contexts have been severely impacted by soil erosion, exposing artifacts at the subsoil level. It is likely that artifact distribution exhibits significant dispersal associated with cultivation practices, erosional processes, and machinery traffic. The location of this site and its relevance to local prehistoric and historic settlement patterns are the primary contributions to research. Based on these assessments, 31LN106 & 106** is recommended ineligible for the NRHP and no additional work is suggested.

Site 31LN107 (ridge end and slope; 695 ft AMSL)

Site 31LN107 is a light density surface lithic scatter on a ridgetop and adjacent southeastern slope (Figure 6). An old eroded farm road provides an area of good surface visibility. No diagnostic artifacts were recovered, and site boundaries, as determined by the surface scatter, are 20 m NS by 60 m EW (Figure 37).

Seven translucent quartz flakes were the only artifacts collected. Shovel tests in the site area yielded no positive results; however, contexts have been severely impacted by soil erosion, exposing artifacts at the subsoil level. It is likely that artifact distribution exhibits significant dispersal associated with cultivation practices, erosional processes, and machinery traffic. The location of this site and its relevance to local prehistoric settlement patterns are the primary contributions to research. Based on these assessments, Site 31LN107 is recommended ineligible for the NRHP and no additional work is suggested.

31LN108 (ridge top; 690 ft AMSL)

Site 31LN108 is a light density surface lithic scatter on a ridgetop (Figure 6). An old eroded road provides the only area of moderate ground surface visibility. Diagnostic artifacts indicate an Early Archaic cultural component. Site dimensions are 30 m NS by 10 m EW (Figure 38).

Artifacts recovered include a metavolcanic Early Archaic corner-notched PP/K (Kirk). The only other artifacts are two metavolcanic flakes, and a single quartz flake, suggesting a limited use lithic workshop area. Site contexts have been severely impacted by soil erosion, exposing artifacts at the subsoil level. It is likely that artifact distribution exhibits significant dispersal associated with cultivation practices, erosional processes, and machinery traffic. The location of this site and its relevance to local prehistoric settlement patterns

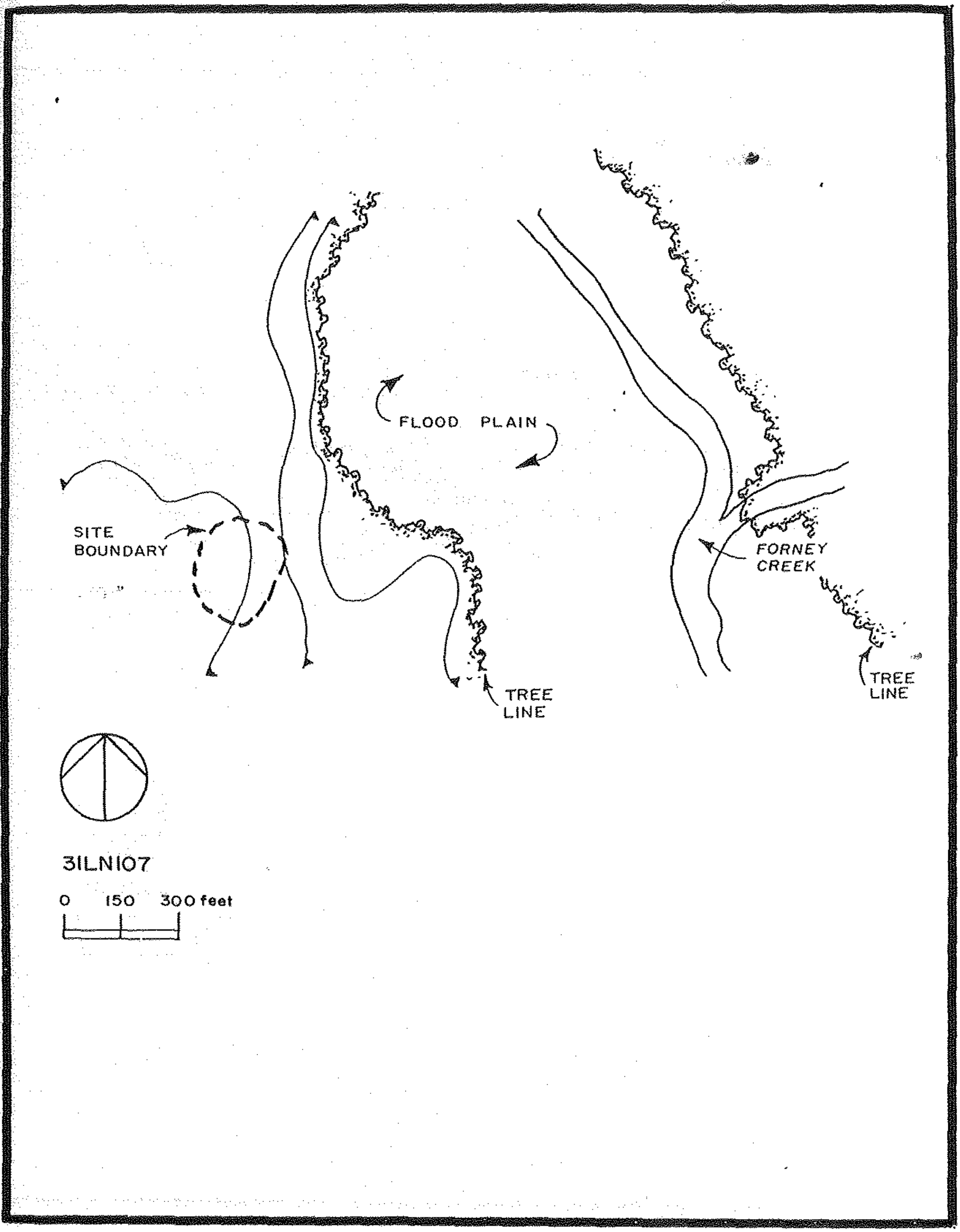


Figure 37. Plan Map of 31LN107.

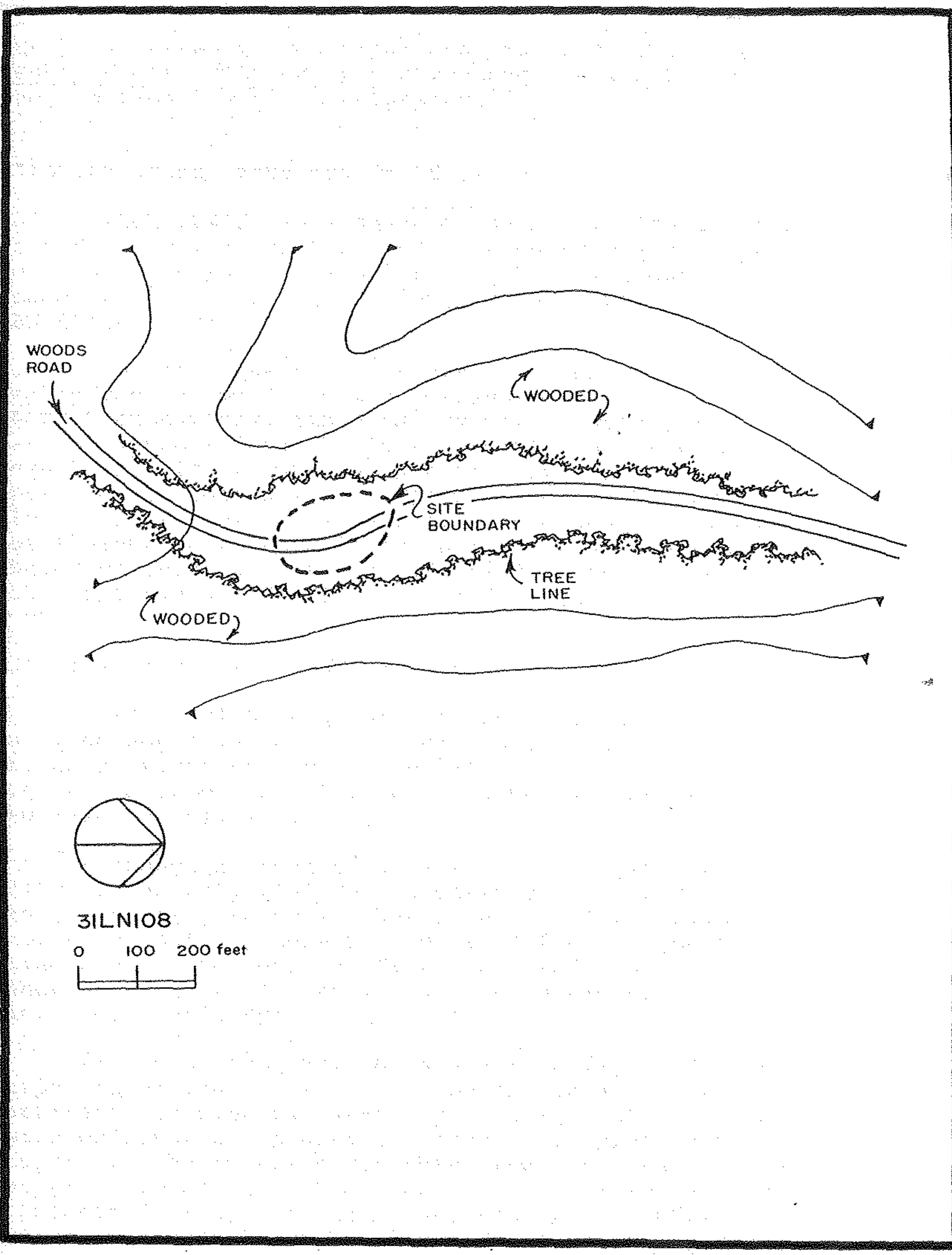


Figure 38. Plan Map of 31LN108.

are the primary contributions to research. Based on these assessments, 31LN108 is recommended ineligible for the NRHP and no additional work is suggested.

31LN109 (ridge top; 685 ft AMSL)

Site 31LN109 is a moderate density surface lithic scatter on a ridge top (Figure 6). An old eroded farm road provides an area of good surface visibility. No diagnostic artifacts were recovered, and site dimensions are approximately 20 m NS by 10 m EW (Figure 39).

One each quartz, quartzite, and possibly chert flakes were collected, as well as six metavolcanic flakes. Site contexts have been severely impacted by soil erosion, exposing artifacts at the subsoil level. It is likely that artifact distribution exhibits significant dispersal associated with cultivation practices, erosional processes, and machinery traffic. The location of this site and its relevance to local prehistoric settlement patterns are the primary contributions to research. Based on these assessments, 31LN109 is recommended ineligible for the NRHP and no additional work is suggested.

31LN110 (ridge top; 630 ft AMSL)

Site 31LN110 is a moderate density surface lithic scatter on a ridge top (Figure 6). An old farm road provides areas of fair to good ground surface visibility. No diagnostic artifacts were collected from the site. Site boundaries measure 90 m NS by 15 m EW (Figure 40).

Although a total of 51 lithic artifacts were recovered from 31LN110, no potentially diagnostic artifacts were collected. It is interesting to note that with the large number of artifacts collected not a single biface or biface fragment is present. A single utilized quartz flake is the only tool form noted. Another 16 quartz flakes, and 34 metavolcanic flakes complete the artifact inventory.

Site contexts have been severely impacted by soil erosion, exposing artifacts at the subsoil level. It is likely that artifact distribution exhibits significant dispersal associated with cultivation practices, erosional processes, and machinery traffic. The location of this site and its relevance to local prehistoric settlement patterns are the primary contributions to research. Based on these assessments, 31LN110 is recommended ineligible for the NRHP and no additional work is suggested.

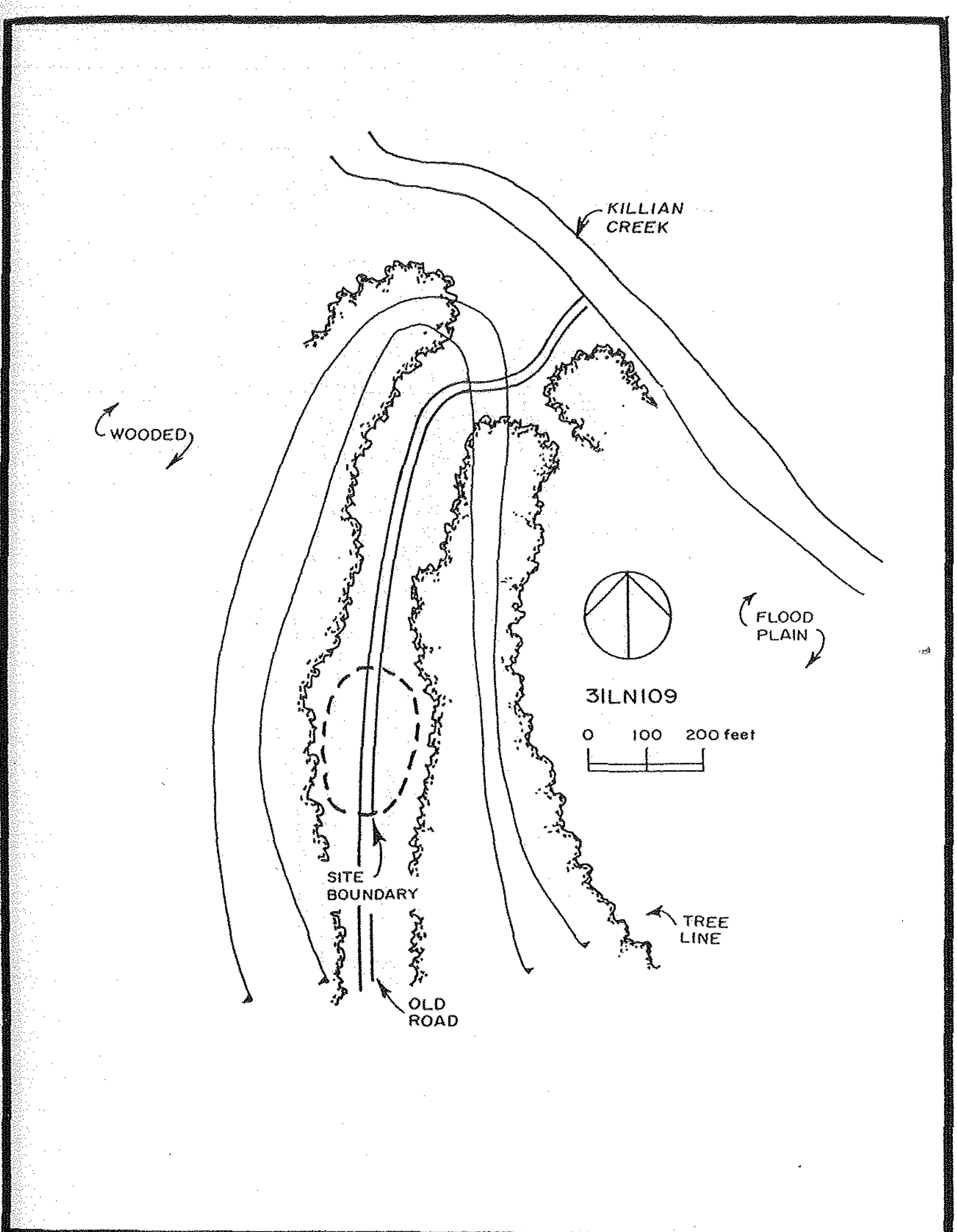


Figure 39. Plan Map of 31LN109.

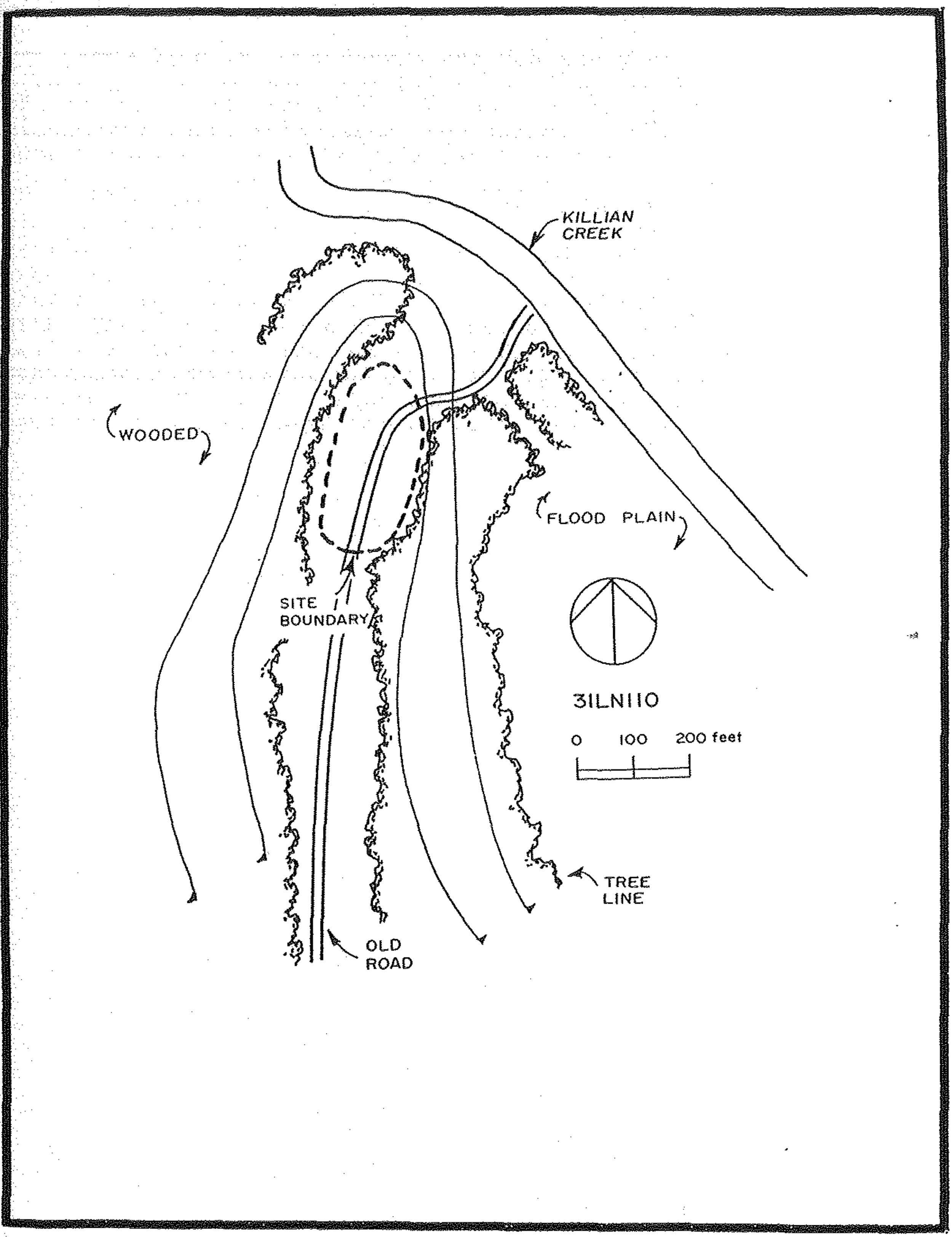


Figure 40. Plan Map of 31LN110.

31LN111 (ridge top; 710 ft AMSL)

Site 31LN111 is a very light density surface and subsurface lithic scatter on a narrow ridge top (Figure 6). This is an area of severe soil erosion and poor surface visibility. No diagnostic artifacts were recovered. Site dimensions are approximately 15 m NS by 30 m EW (Figure 41).

Five metavolcanic flakes were recovered from 31LN111. A single flake was recovered from a shovel test in the plowzone. Site contexts have been severely impacted by soil erosion, exposing artifacts at the subsoil level. It is likely that artifact distribution exhibits significant dispersal associated with cultivation practices, erosional processes, and machinery traffic. The location of this site and its relevance to local prehistoric settlement patterns are the primary contributions to research. Based on these assessments, 31LN111 is recommended ineligible for the NRHP and no additional work is suggested.

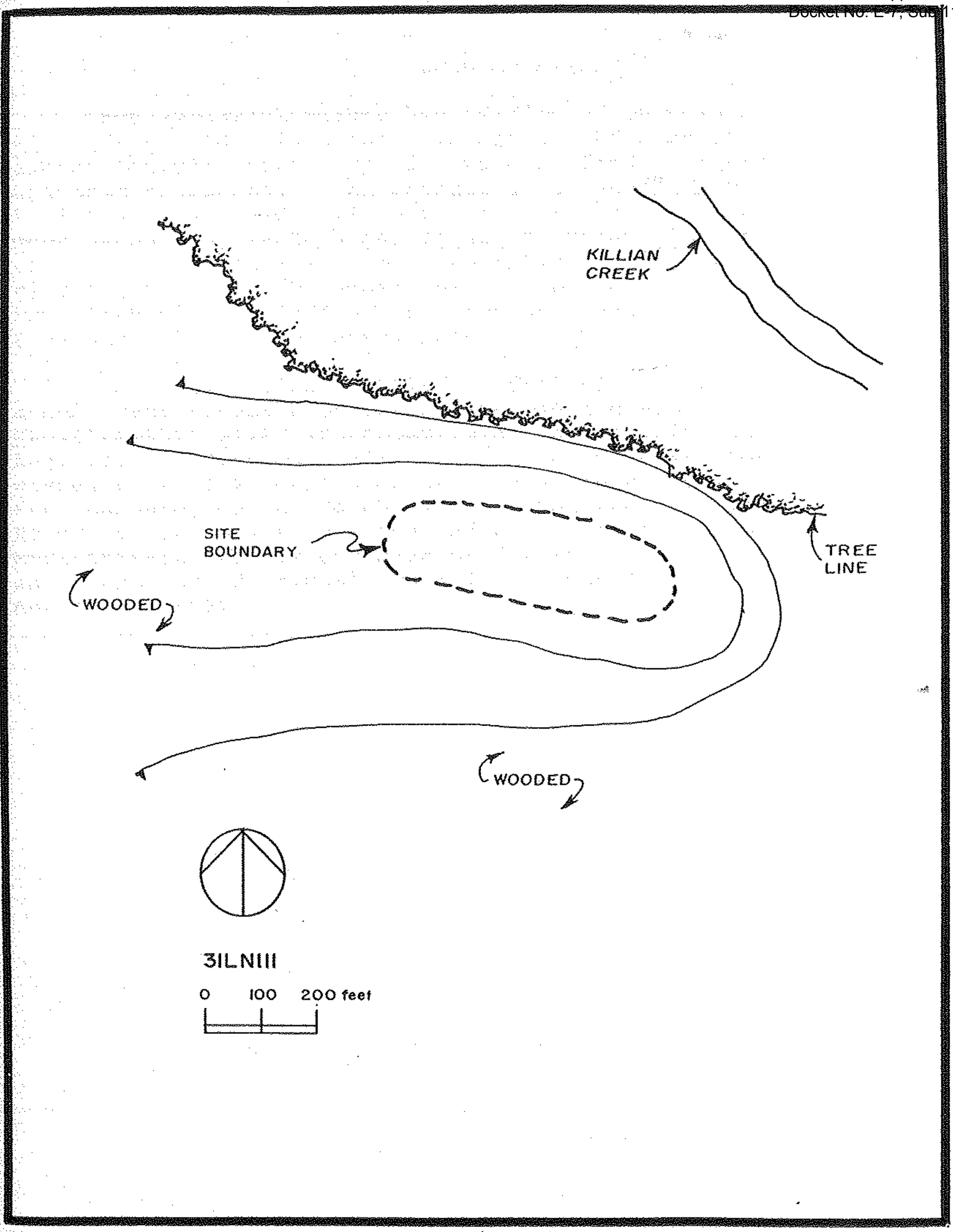


Figure 41. Plan Map of 31LN111.

VI. RECOMMENDATIONS

Archaeological survey and testing of the 712 acre Lowesville tract resulted in the location and evaluation of 34 archaeological sites and 23 isolated finds of prehistoric and historic artifacts. As indicated in Chapter V, all of the isolated finds and all but one of the recorded sites are considered to lack significant research potential and are recommended ineligible for the National Register of Historic Places (Table 3). No additional archaeological investigations or recording procedures are required at these sites and the site areas are cleared for development.

A single site (31LN78 & 78**) is considered to exhibit significant research potential beyond the scope of the present project; this site is recommended as eligible to the National Register of Historic Places. Based on Duke Power Company's wishes to follow compliance procedures regardless of the lack of FERC mandate, on 23 March 1990, a Management Summary and Data Recovery plan was formulated and submitted to the North Carolina Environmental Review Coordinator for review. The site assessment and plan for additional work (as necessary) were approved on April 18, 1990.

Table 3. Lowesville Tract Archaeological Survey: Site Descriptions and NRHP Recommendations.

Site Number	Site Type	NRHP Recommendation*
31LN78/78**	hist. house site/prehist. scatter	E
31LN79/79**	prehist./hist artifact scatter	I
31LN80/80**	prehist./hist artifact scatter	I
31LN81	prehistoric lithic scatter	I
31LN82	prehistoric lithic scatter	I
31LN83/83**	prehist./hist. artifact scatter	I
31LN84	prehistoric lithic scatter	I
31LN85/85**	prehist./hist. artifact scatter	I
31LN86	prehistoric lithic scatter	I
31LN87/87**	prehist./hist.artifact scatter	I
31LN88/88**	prehist./hist.artifact scatter	I
31LN89	prehistoric lithic scatter	I
31LN90/90**	historic artifact scatter	I
31LN91/91**	hist. house site/artifact scatter	I
31LN92/92**	hist. house site/artifact scatter	I
31LN93/93**	Morrison House artifact scatter	I
31LN94/94**	prehist./historic artifact scatter	I
31LN95/95**	prehist./historic artifact scatter	I
31LN96/96**	hist. house site/artifact scatter	I
31LN97/97**	prehist./hist. artifact scatter	I
31LN98/98**	prehist./hist. artifact scatter	I
31LN99	prehistoric lithic scatter	I
31LN100/100**	prehistoric lithic scatter	I
31LN101/101**	hist. house site/artifact scatter	I
31LN102/102**	prehist./hist. artifact scatter	I
31LN103/103**	prehist./hist. artifact scatter	I
31LN104	prehistoric lithic scatter	I
31LN105/105**	prehist./hist.artifact scatter	I
31LN106/106**	prehist./hist. artifact scatter	I
31LN107	prehistoric lithic scatter	I
31LN108	prehistoric lithic scatter	I
31LN109	prehistoric lithic scatter	I
31LN110	prehistoric lithic scatter	I
31LN111	prehistoric lithic scatter	I

* I = Ineligible; no further work recommended
E = Eligible; preserve in place

REFERENCES CITED

Anderson, David G. and Glen T. Hanson
1985 The Early Archaic Occupation of the Savannah River Basin. Paper presented at the 42nd Annual Meeting of the Southeastern Archaeological Conference, Birmingham.

Blackmun, Ora
1977 Western North Carolina: Its Mountains and Its People to 1880. Appalachian Consortium Press, Boone.

Blanton, Dennis B.
1983 Lithic Raw Material Procurement and Use During the Morrow Mountain Phase in South Carolina. Master's thesis, Department of Anthropology, University of Georgia, Athens.

Braun, Lucy E.
1950 Deciduous Forests of Eastern North America. Hafner Publishing Company, New York.

Brown, Marvin A. and Maurice C. York
1986 Our Enduring Past:A Survey of 235 Years of Life and Architecture in Lincoln County, North Carolina. Sterrett, Smith and Spangler, Charlotte.

Burke, R.T. Avon, and L.L. Brinkley
1914 Soil Survey of Lincoln County, North Carolina. Field Operations of the Bureau of Soils, 1914, U.S. Department of Agriculture, Washington.

Caldwell, Joseph R.
1957 Trend and Tradition in the Prehistory of the Eastern United States. American Anthropological Association, Memoir 88.

Chapman, Jefferson
1975 The Rose Island Site and the Bifurcate Point Tradition. University of Tennessee, Department of Anthropology, Report of Investigations 14.

1977 Archaic Period Research in the Little Tennessee River Valley. University of Tennessee, Department of Anthropology, Report of Investigations 18.

Claggett, Stephen R. and John S. Cable, assemblers
1982 The Haw River Sites: Archaeological Investigations at Two Stratified Sites in the North Carolina Piedmont. Commonwealth Associates, Inc., Jackson, Mississippi.

Coe, Joffre L.
1952 The Cultural Sequence of the Carolina Piedmont. In Archaeology of the Eastern United States, edited by James B. Griffin, pp. 301-311. University of Chicago Press, Chicago.

1964 The Formative Cultures of the Carolina Piedmont. Transactions of the American Philosophical Society, n.s., 54(5).

Cottage Home
n.d. Cottage Home. Ms on file at the Lincoln County Library, Lincolnton.

Delcourt, Hazel R.
1979 Late Quarternary Vegetation History of the Eastern Highland Rim and Adjacent Cumberland Plateau of Tennessee. Ecological Monographs 49:255-280.

Ferguson, Leland G.
1971 South Appalachian Mississippian. PhD dissertation, Department of Anthropology, University of North Carolina, Chapel Hill.

Graham, William A.
1904 General Joseph Graham And His Papers On North Carolina Revolutionary History. Edwards and Broughton, Raleigh.

Griffin, James B.
1967 Eastern North American Archaeology: A Summary. Science 156:175-191.

Justice, Noel D.
1987 Stone Age Spear and Arrow Points of the Midcontinental and Eastern United States. Indiana University Press, Bloomington.

Kuchler, A.W.
1964 Potential Natural Vegetation of the Coterminous United States, Vol. 36. American Geographical Society Special Publications.

Lawson, John
1967 A New Voyage to Carolina. Edited by Hugh Talmage Lefler, University of North Carolina press, Chapel Hill.

Lincoln County, North Carolina
various Lincoln County Deed Books [LCDB]

various Lincoln County Will Books [LCWB]

1850 Lincoln County Population Census

1860 Lincoln County Population Census

Lore, Adelaide, Eugenia Lore and Lt. Col. Robert Hall Morrison
1950 The Morrison Family of the Rocky River Settlement of North Carolina: History and Genealogy. Observer Printing House, Charlotte.

Morrison, R.H.
n.d. Family Book. Unpublished Ms. in possession of Mrs. Margaret Gardner Morrison Guillett.

Noel Hume, Ivor
1969 A Guide to Artifacts of Colonial America. Alfred A. Knopf, New York.

O'Steen, Lisa
1983 Early Archaic Settlement Patterns in the Wallace Reservoir: An Inner Piedmont Perspective. Master's thesis, Department of Anthropology, University of Georgia, Athens.

Oliver, Billy L.
1985 Tradition and Typology: Basic Elements of the Carolina Projectile Point Sequence. In Structure and Process in Southeastern Archaeology, edited by Roy S. Dickens Jr., and H. Trawick Ward, pp.195-211. University of Alabama Press, University.

Purrington, Burton L.
1983 Ancient Mountaineers: An Overview of the Prehsitoric Archaeology of North Carolina's Western Mountain Region. In The Prehistory of North Carolina: An Archaeological Symposium, edited by Mark A. Mathis and Jeffrey J. Crow, pp. 83-160. North Carolina Division of Archives and History, Raleigh.

Reid, J. Jefferson
1967 Pee Dee Pottery From the Mound at Town Creek. Master's thesis, Department of Anthropology, University of North Carolina, Chapel Hill.

Sheehan, Mark C., Donald R. Whitehead, and Stephen T. Jackson
n.d. Late-Quarternary Environmental History of the Richard B. Russell Multiple Resource Area. Ms on file, Department of Biology, Indiana University, Bloomington.

Sheldon, Elisabeth S.
1983 Vegetational History of the Wallace Reservoir. Early Georgia 11(1-2):19-31.

Shelford, V.E.
1963 The Ecology of North America. University of Illinois, Urbana.

South, Stanley
1977 Method and Theory in Historical Archaeology. Academic Press, New York.

Swanton, John R.
1979 The Indians of the Southeastern United States. Reprint of Smithsonian Institution, Bureau of American Ethnology Bulletin 137, Smithsonian Institution Press, Washington, D. C.

Trimble, Stanley W.
1969 Culturally Accelerated Sedimentation on the Middle Georgia Piedmont. Master's thesis, University of Georgia, Athens.

Ward, H. Trawick
1983 A Review of Archaeology in the North Carolina Piedmont: A Study of Change. In The Prehistory of North Carolina: An Archaeological Symposium, edited by Mark A. Mathis and Jeffrey J. Crow, pp. 53-81. North Carolina Division of Archives and History, Raleigh.

Wharton, Charles H.
1978 The Natural Environments of Georgia. Georgia Department of Natural Resources, Atlanta.

Webb, S. David, Jerald T. Milanich, Roger Alexon, and James S. Dunbar
1985 A Bison Antiquus Kill Site, Wacissa River, Jefferson County, Florida. American Antiquity 49(2):384-392.

APPENDIX A.

ARCHAEOLOGICAL AND ARCHITECTURAL DOCUMENTATION OF THE J. GRAHAM MORRISON HOUSE AND ENVIRONS.

North Carolina Department of Cultural Resources

James G. Martin, Governor
Patric Dorsey, Secretary

Division of Archives and History
William S. Price, Jr., Director

November 21, 1988

Chris Espenshade
Brockington and Associates
3781 Presidential Parkway, Suite 104
Atlanta, Georgia 30340

Re: House on SR 1400, Lincoln County, N.C.

Dear Chris:

At your request, I am submitting recommendations for the documentation of the brick house on SR 1400 in Lincoln County. A good documentation package would consist of the following:

1. Large format black and white photographs (4 X 5 negatives) of the following views:

   a. A distant view of the house in its setting.
   b. Straight-on exterior views of all four elevations (vegetation allowing).
   c. Oblique views from the southeast and northeast.
   d. Interior views of the front parlor, stair hall, and one or two representative interior rooms showing mantels and woodwork.
   e. An oblique view, from whatever angle is most appropriate, of each of the outbuildings.

2. Measured floor plans of the first and second floors. Complete measured drawings of the whole house are not necessary.

3. A brief statement of its history, ownership, and occupancy. As we discussed, I did not see anything about the house that appeared to date before the early twentieth century. It is possible that the house sits on the site of the earlier Morrison House, and it is possible that it was intended to replicate the general form and "spirit" of the older house. To my eye, it has an unfinished quality that makes me think it was never used as originally intended.

If I can be of further assistance, please let me know.

Sincerely,

Michael

Michael T. Southern, Head
Survey and Planning Branch
State Historic Preservation office

MTS/lmm

BROCKINGTON AND ASSOCIATES
ARCHEOLOGICAL AND HISTORICAL CONSULTING
3781 PRESIDENTIAL PARKWAY, SUITE 104
ATLANTA, GEORGIA 30340
(404) 457-6323
(404) 458-2835

December 2, 1988

PAUL E. BROCKINGTON, JR., PH.D.
LAWRENCE E. ABBOTT, JR., M.A.
CHRISTOPHER T. ESPENSHADE, M.A.
JEFFREY W. GARDNER, M.A.
JOELLE A. GARDNER, B.A.
RUTHANNE L. MITCHELL, M.A.
CAROL J. POPLIN, B.A.
ERIC C. POPLIN, PH.D.
MARIAN D. ROBERTS, M.S.S.
BOBBY G. SOUTHERLIN, B.A.

Mr. David Anderson
Duke Power Company
422 South Church Street
Charleston, North Carolina 28242

Dear Mr. Anderson:

Brockington and Associates has completed the field documentation of the standing structure area of the Lincoln County Tract. Please consider this letter a Management Summary of our archaeological, photographic, and cartographic efforts. As a result of the field work, the standing structures (large house and five outbuildings) have been documented, and the area to be impacted by structure removal has been archaeologically investigated. The recording procedures recommended by the State have been followed, and Brockington and Associates now recommends clearance to remove the standing structures from the site.

The field methods included archival photography of the structures and their setting; detailed mapping of the structures and yard vegetation; and archaeological investigation of a 60 ft wide strip around the main house and a 20 ft strip around the other structures. Due to time limitations, the site specific archival research -- as requested by the State -- has not yet been undertaken. The archival research will best be pursued in conjunction with the planned survey of the remainder of the 700 acre tract.

The photography was done by Mr. Richard Bryant, utilizing a 4 X 5 inch negative camera with bellows and lenses to minimize distortion. Three exposures were made of each image, as well as a polaroid 4 X 5 to check composition and lighting. The following views were photographed:

1. the south facade of the house;
2. the eastern facade of the house;
3. the northern facade of the house;
4. an oblique view of the northwestern corner of the house;
5. an oblique view of the northeastern corner of the house;
6. a view of the front porch of the house;

7. an oblique view of the southeastern corner of the house;
8. a view of the top of the interior staircase and landing;
9. a view of the first floor landing of the staircase;
10. a view of the main mantel in the living room;
11. a view of a corner/angled mantel in the first floor, northwestern interior room;
12. a view out the second story, north-central window showing rear tower and backyard;
13. a view of the house kitchen;
14. detail of molding and baseboard in southwestern, upstairs bedroom;
15. detail of sliding door construction, eastern front hall of house;
16. the front (eastern) facade of the backyard shed;
17. a distant view, facing northeast, of the general setting of the standing structures;
18. a view of the original Morrison House foundation in the cellar of the present house;
19. the front (southern) facade of the two-car garage;
20. the front (southern) facade of the four pen pole barn;
21. the front (southern) facade of the hay barn;
22. the front (eastern) facade of the well house/smoke house;

The negatives of all views are being developed on 2 and 3 December 1988, to assure that professional documentation has been completed before removal of the structures.

A site plan was produced for the study area. The plan records the location and dimensions of the house and other standing buildings. In addition, significant yard trees, the hedgerow, and the bamboo patch were plotted. The site plan was utilized to record the location of the archaeological shovel tests and formal units.

A measured exterior floor plan of the main house was also produced. The location of exterior walls, chimneys, doors, porch, steps, and carport were recorded. In addition, the position of the original foundation (discovered in the basement) was recorded relative to the present structure.

A measured floor plan of the interior of the structure was also produced. The interior dimensions of each room were recorded, as well as the location of doors, windows, halls, and stairways. The floor plan, site plan, and photographs will be elements of the North Carolina Historic Structure Data Sheet to be completed.

The archaeological investigations were designed to assure that significant cultural deposits were not disturbed during the removal of the standing structures. The study area was limited to a 60 ft wide strip around the main house, and strips encompassing 20 ft on all sides of the outbuildings. The entire study area was examined through screened (0.25 inch mesh) shovel testing on a 15 ft interval (a field version of the site plan showing shovel test and unit location is enclosed; a final version will be drafted for you next week). Approximately 130 shovel tests were excavated. The artifact content and soil stratigraphy were recorded for each shovel test.

The areas which shovel testing revealed to have possibly valuable deposits were investigated through the excavation of formal units. The units were excavated in 6 inch arbitrary levels, and all fill was screened. At least one profile of each completed unit was photographed and drawn to scale. A total of seven formal units was excavated, as follows:

UNIT SIZE	COUNT
3 by 3 ft	5
5 by 3 ft	1
2 by 2 ft	1

The shovel testing and formal units recovered numerous historic artifacts, but almost all dated to the occupation of the presently standing structure (1910 and later). The only evidence of the earlier structure was the bottom two courses of the probable rock foundation, encountered in a unit east/northeast of the standing house. Two historic, square post stains were encountered west/northwest of the standing structure, but these apparently date to the twentieth century. No intact midden deposits were encountered, and the evidence suggests that the remains of the original house (which burned circa 1890) were scraped away from the house site prior to construction of the present structure.

It should be noted that the well house/smoke house outbuilding did contain a stone lined well. This may represent the original, nineteenth century well, but its archaeological value is limited. Because the well was used through the twentieth century occupation of the house, it is likely that very few or no earlier artifacts are present in the well.

Overall, the standing structures and the areas to be impacted through their removal have been thoroughly documented. Minimal historic, archaeological, or architectural research value remains, and it is recommended that the removal of the standing structures be permitted. Please note that a full reporting of the documentation effort will be included in the survey report for the entire 700 acre tract. If the survey is not undertaken as anticipated, it will be necessary to complete archival research and analysis, and produce a report for the present project. The recommendations of the State have been fulfilled by the field work, with the exception of archival research to be conducted at a later date. The architectural and archaeological remains present in the standing structures area do not warrant further work prior to the removal of the structures.

Brockington and Associates was pleased to conduct this documentation study, and we look forward to the upcoming survey. Please do not hesitate to call if you have any questions regarding this Management Summary.

Sincerely,

Christopher T. Espenshade

Christopher T. Espenshade
Principal Investigator

Ruthanne L. Mitchell
Field Director

Enclosure: Field Copy of Site Plan

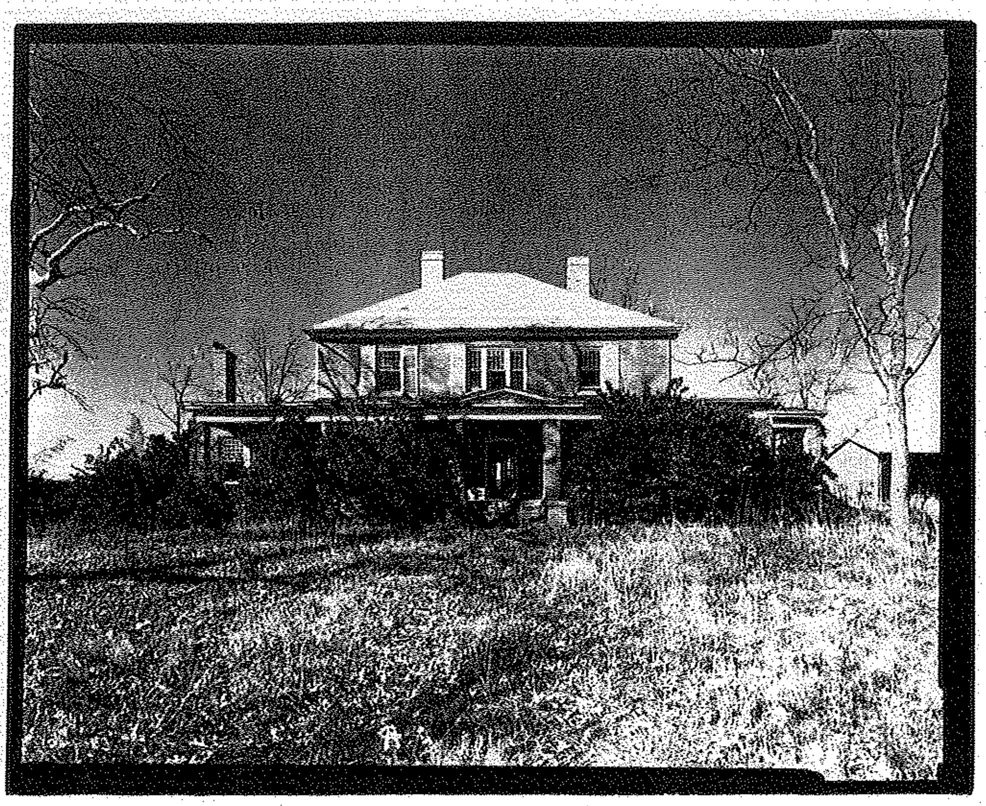


Photo 1. South Facade of Morrison House.

Photo 2. East Facade of Morrison House.

Photo 3. North Facade of Morrison House.

Photo 4. Oblique View, Northwest Corner of Morrison House.

Photo 5. Oblique View, Northeast Corner of Morrison House.

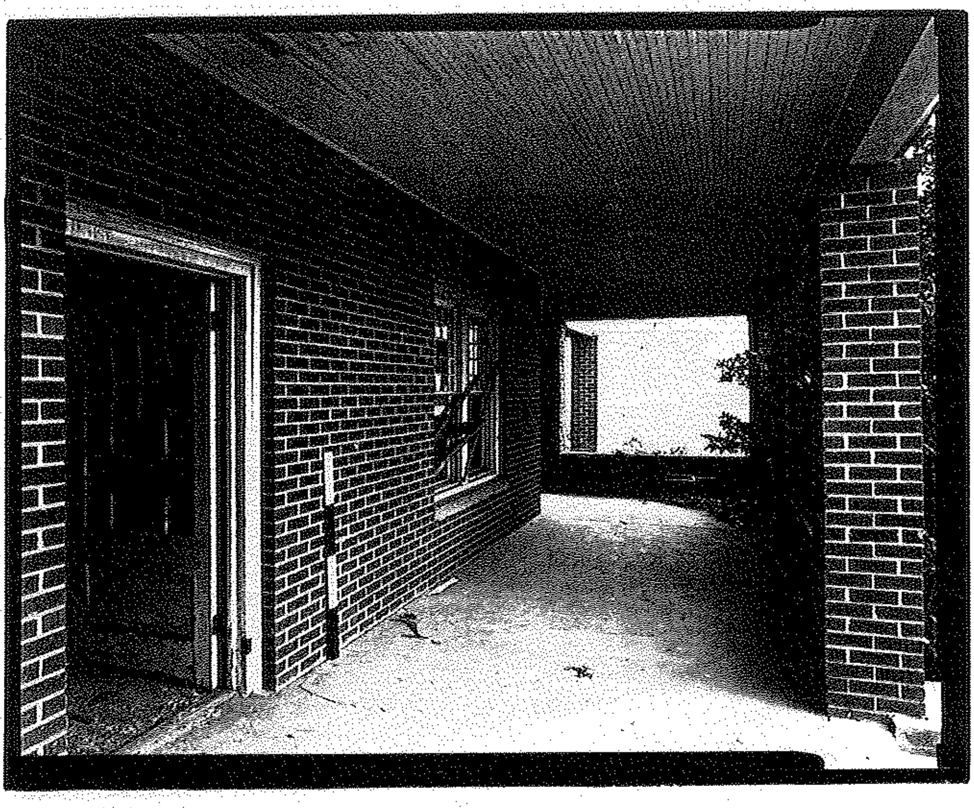


Photo 6. View of Front Porch, Morrison House.

Photo 7. Oblique View, Southeast Corner of Morrison House.

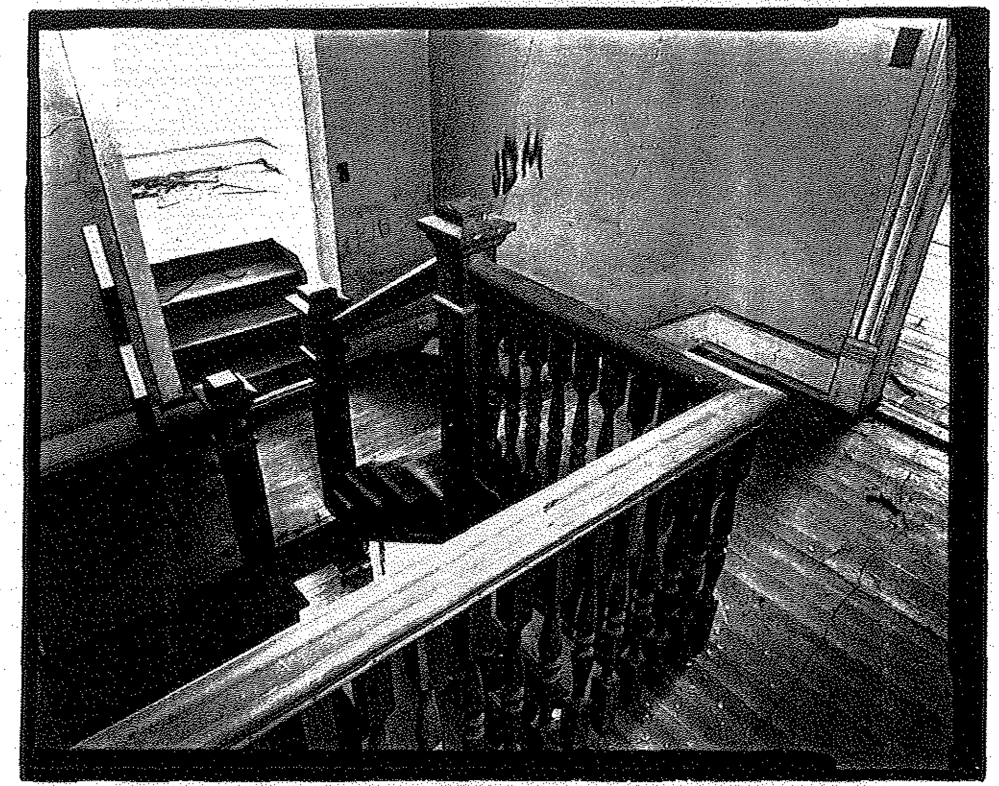


Photo 8. View of Top of Interior Staircase and Landing, Morrison House.

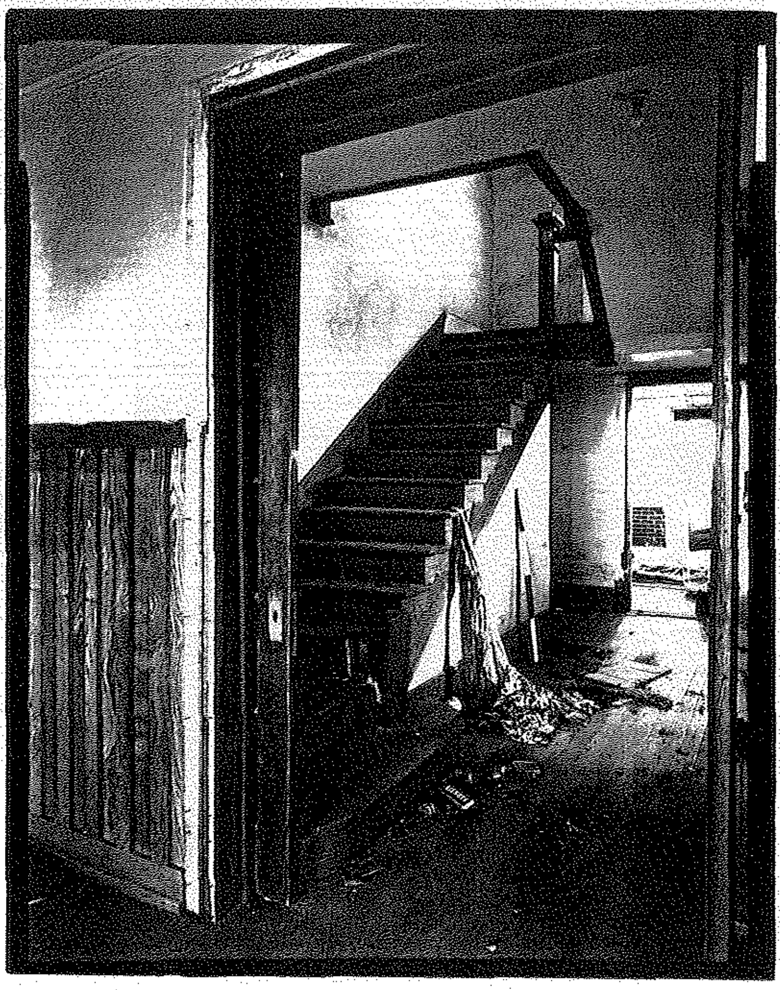


Photo 9. View of First Floor Landing of the Staircase, Morrison House.

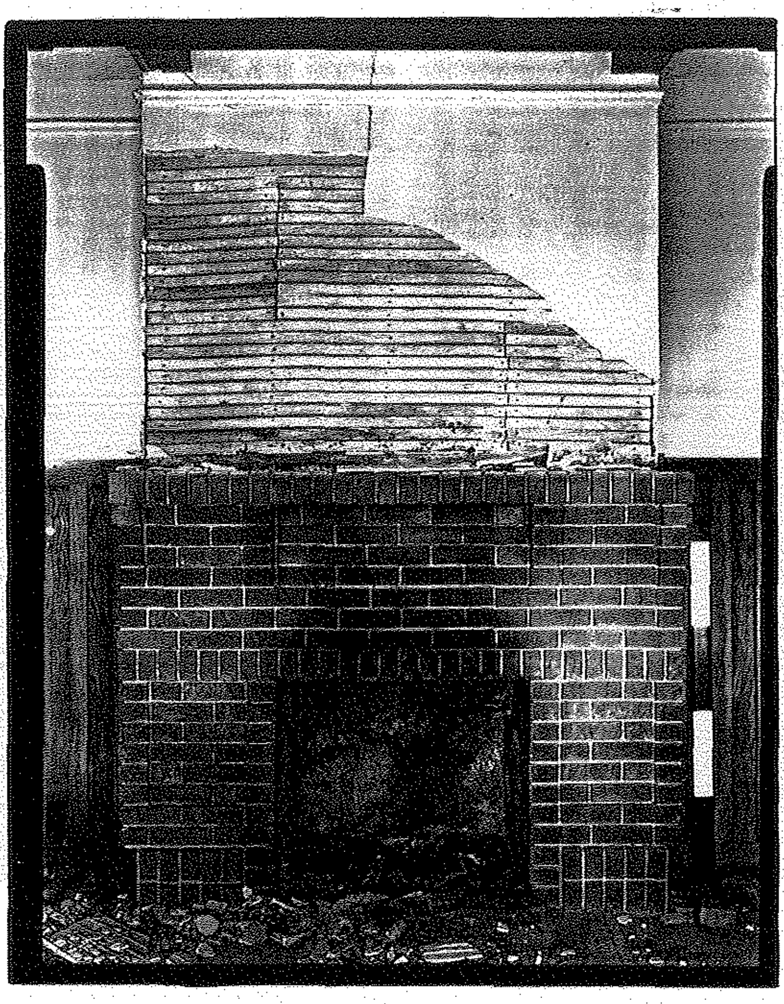


Photo 10. View of the Main Mantle in the Living Room, Morrison House.

Photo 11. View of a Corner/Angled Mantle in the First Floor Northwestern Interior Room, Morrison House.

Photo 12. View out the Second Story, North-Central Window Showing Rear Tower and Backyard, Morrison House.

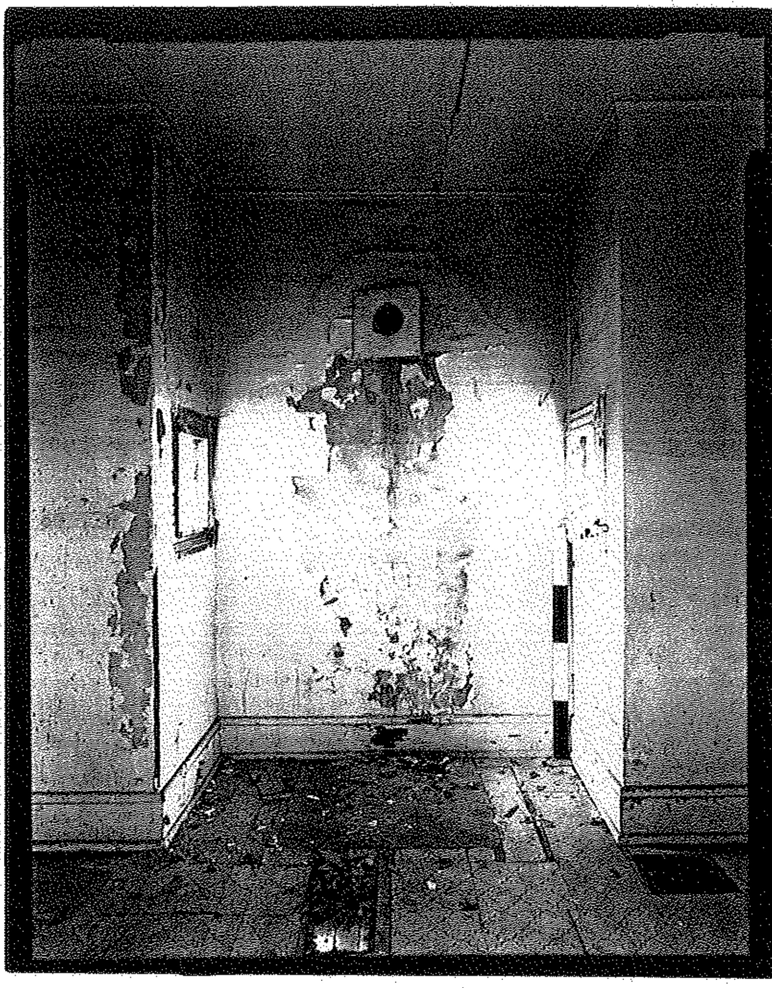


Photo 13. View of the House Kitchen, Morrison House.

Photo 14. Detail of Molding and Baseboard in Southwestern Upstairs Bedroom, Morrison House.

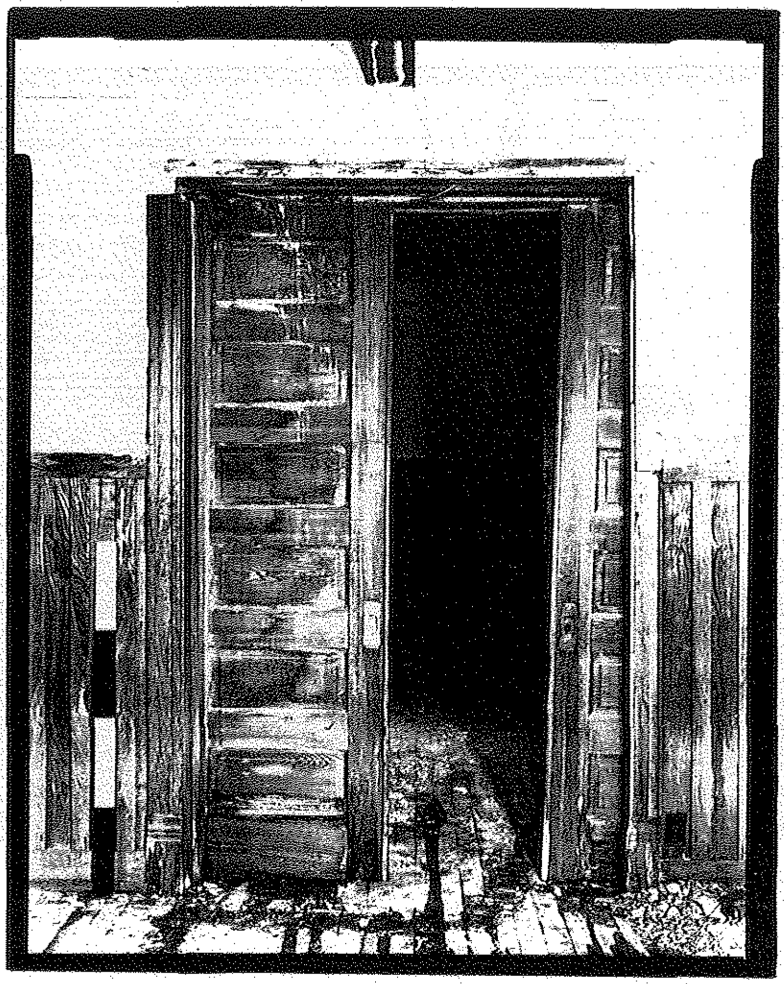


Photo 15. Detail of Sliding Door Construction, Eastern Front Hall of House, Morrison House.

Photo 16. Front (Eastern) Facade of Backyard Shed, Morrison House.

Photo 17. Distant View, Facing Northeast, of the General Setting of the Standing Structures, Morrison House.

Photo 18. View of the Original Morrison House Foundation in the Cellar of the Present House, Morrison House.

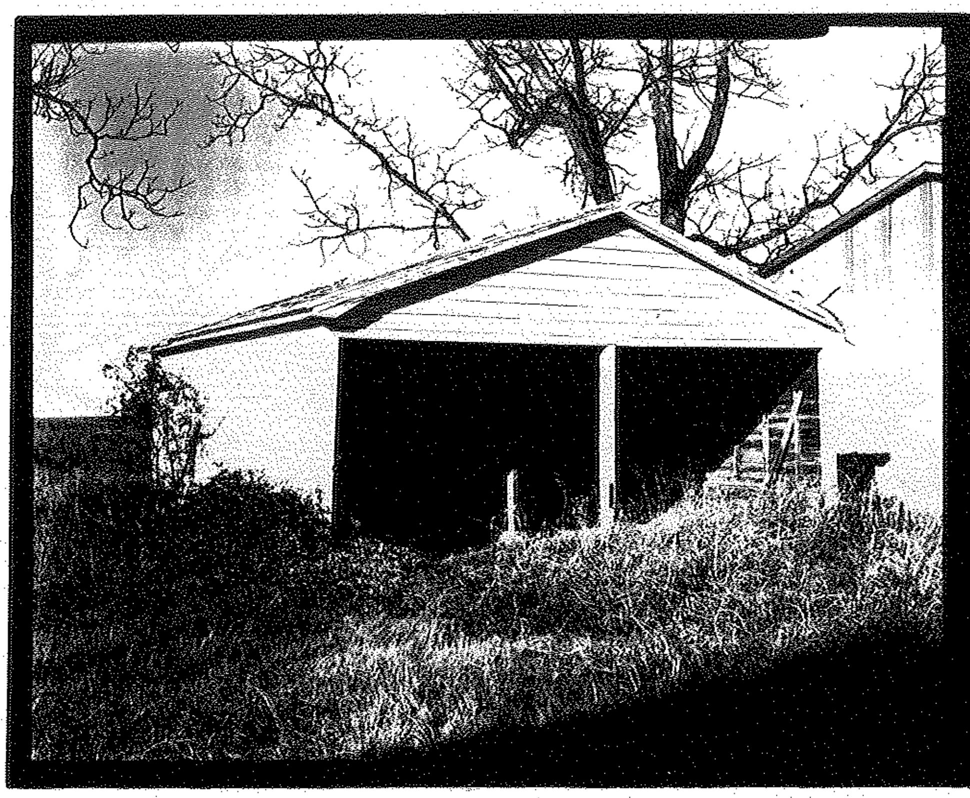


Photo 19. Front (Southern) Facade of Two-Car Garage, Morrison House.

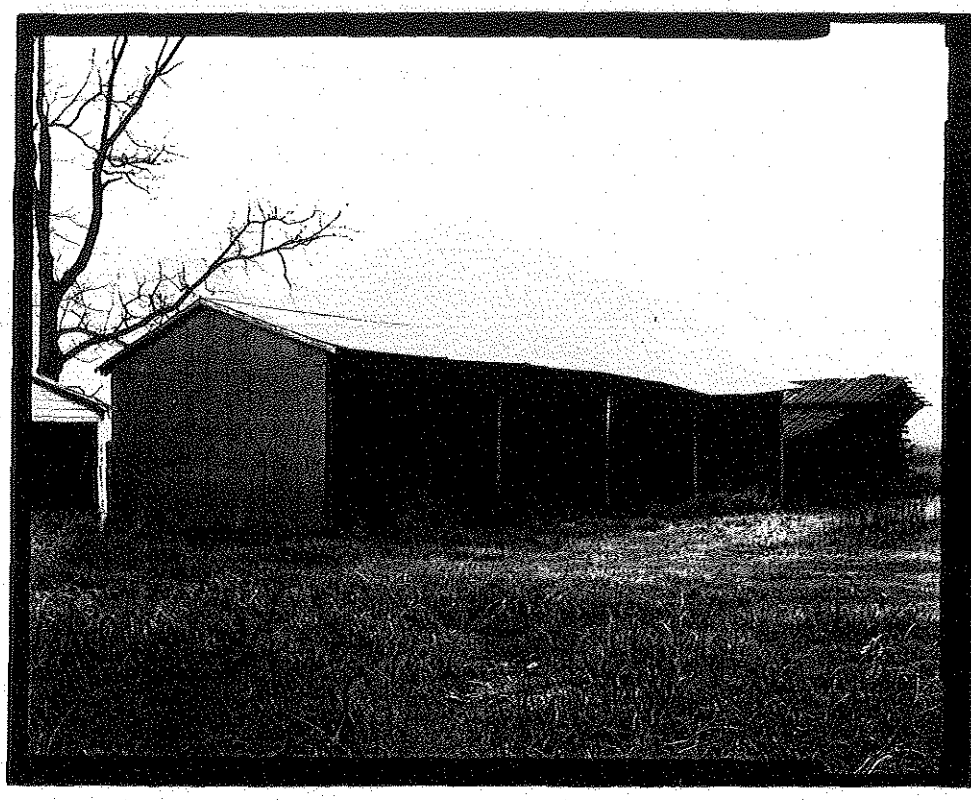


Photo 20. Front (Southern) Facade of Four Pen Pole Barn, Morrison House.

Photo 21. Front (Southern) Facade of Hay Barn, Morrison House.

Photo 22. Front (Eastern) Facade of Well House/Smoke House, Morrison House.

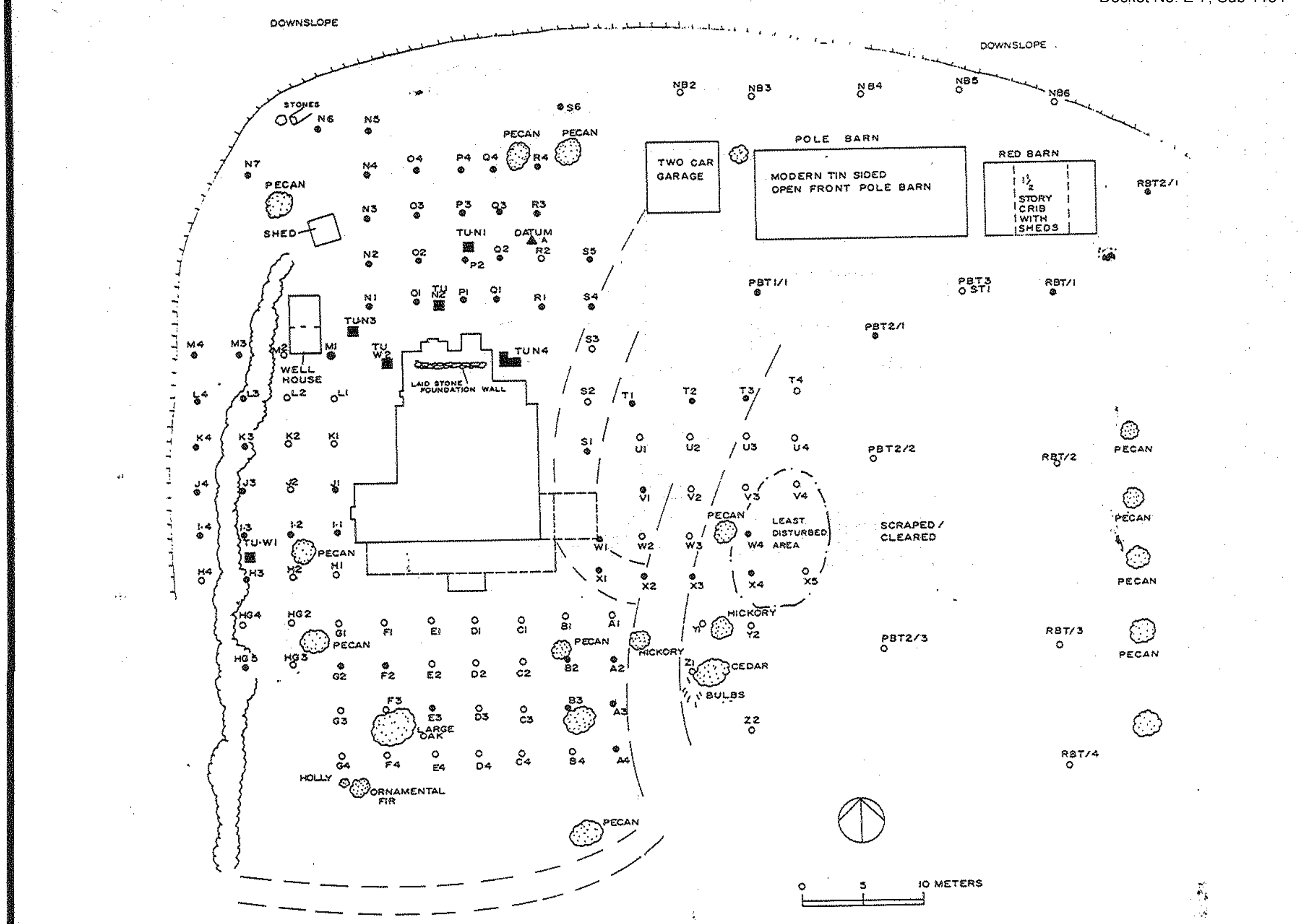


Figure 1. Morrison House Site and Exterior Floor Plan.

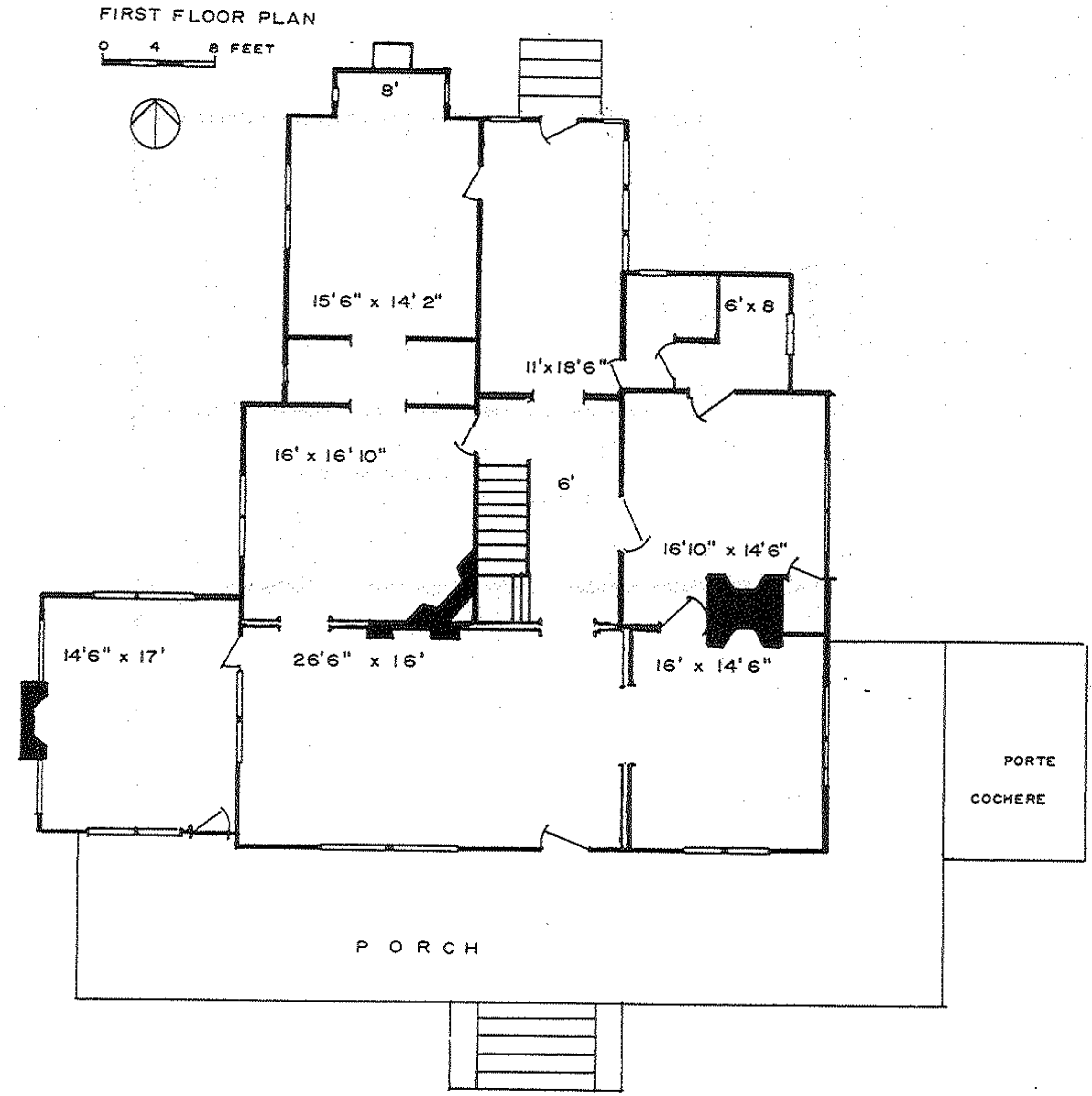


Figure 2. Morrison House, First Floor Plan.

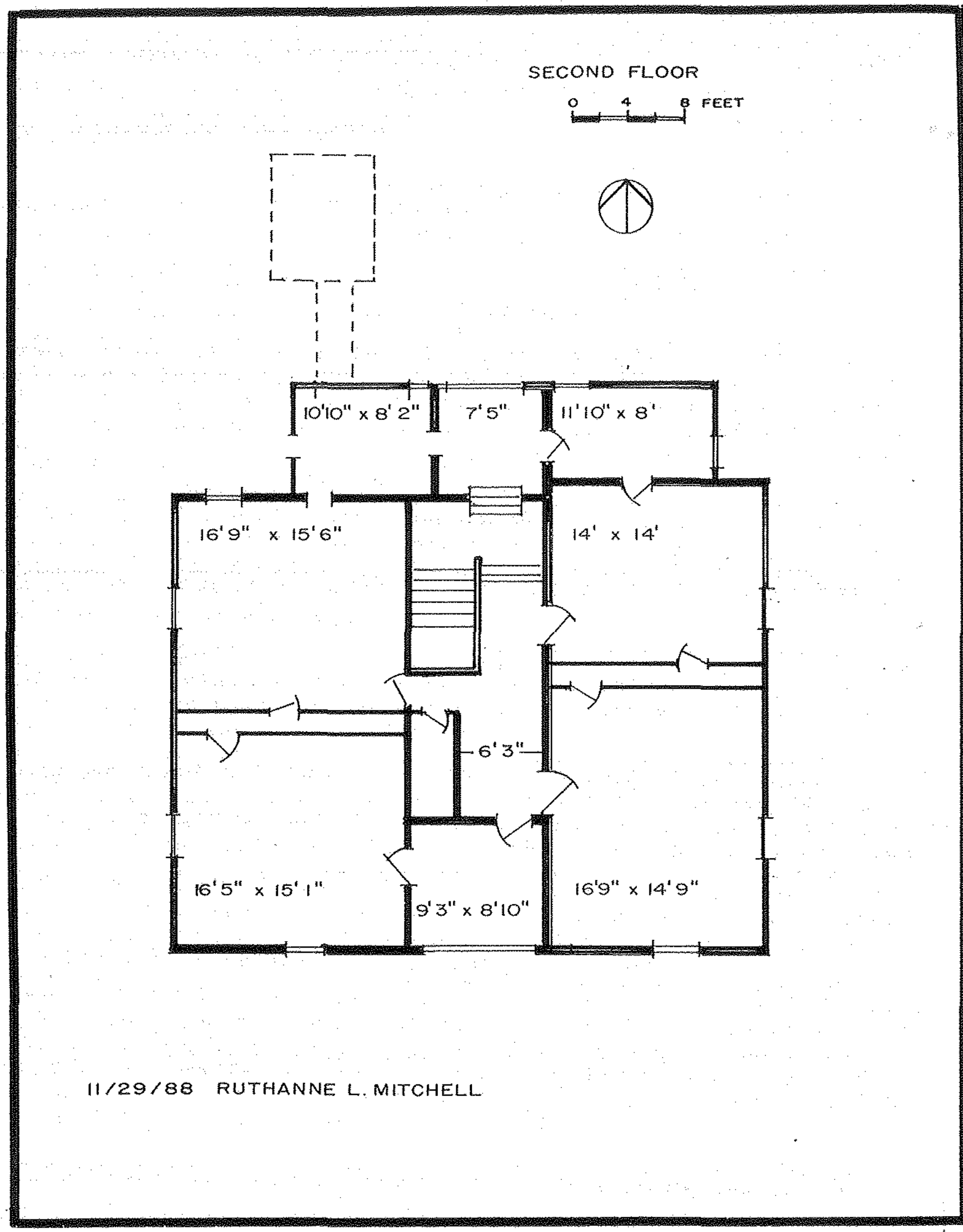


Figure 3. Morrison House, Second Floor Plan.

ARCHITECTURAL DATA FORM

Landseidel Exhibit 2, Appendix B-1
Docket No. E-7, Sub 1134

ATE	COUNTY	TOWN OR VICINITY
orth Carolina	Lincoln	Lowesville

STORIC NAME OF STRUCTURE *(INCLUDE SOURCE FOR NAME)*	HABS NO.
. Graham Morrison House (Margaret Morrison Guillett)	

CONDARY OR COMMON NAMES OF STRUCTURE
orrison House

MPLETE ADDRESS *(DESCRIBE LOCATION FOR RURAL SITES)*
orth Side of County Road 1511, Between Machpelah and Lowesville

TE OF CONSTRUCTION *(INCLUDE SOURCE)*	ARCHITECT(S) *(INCLUDE SOURCE)*
. 1912 (Maragret Morrison Guilett)	unknown

GNIFICANCE *(ARCHITECTURAL AND HISTORICAL, INCLUDE ORIGINAL USE OF STRUCTURE)* –After his ather's house burned c. 1909, J.G. Morrison built the present structure . 1912 on the site of the c. 1840 Georgian plan house (Cottage Home). he newer house bears strong resemblance to the original 4 over 4 structure.

YLE *(IF APPROPRIATE)*
Colonial Revival

TERIAL OF CONSTRUCTION *(INCLUDE STRUCTURAL SYSTEMS)* balloon frame construction on rick piers; brick facade over weather board; wood joist and floors; replace-ent asphalt shingles over original stamped metal shingle roof.

APE AND DIMENSIONS OF STRUCTURE *(SKETCHED FLOOR PLANS ON SEPARATE PAGES ARE ACCEPTABLE)*
see photo-copies of drawings)

TERIOR FEATURES OF NOTE –Red brick common bond exterior walls (later addition), 0/1 double-hung windows; replacement asphalt shingle roof; east end porte ochere; two story tower at north end rear extention. Original metal shingle oof is visible on north extention.

TERIOR FEATURES OF NOTE *(DESCRIBE FLOOR PLANS, IF NOT SKETCHED)* –Pocket doors located at st floor staircase, and between SW (26' 6"x 16') room and NW (16'x 16' 10") oom. Tongue & groove wood floors; unfinished wainscoting on bottom half 1st loor walls. Upper half 1st floor and other interior walls are plaster.

JOR ALTERATIONS AND ADDITIONS WITH DATES – Structure was extensively damaged by a ornado in 1938. Exterior was bricked to discourage further damage the same ear. Original tearne-plated, stamped metal shingle roof was replaced with sphalt shingles at an undetermined date (c. 1970?).

ESENT CONDITION AND USE – Structure was domestic residence until its sale in 1970 fter that time, the new owner maintained residence there occasionally until . 1975, after which it was abandoned. Structure was demolished in 1989.

HER INFORMATION AS APPROPRIATE – The property was demolished because it was afety hazard. Duke Power purchased the property and sponsored HABS drawings id arcaheological investigations of the site.

JRCES OF INFORMATION *(INCLUDING LISTING ON NATIONAL REGISTER, STATE REGISTERS, ETC.)*
iterview with Margaret Morrison Guillett, October 11, 1989.
ttage Home. Article located in vertical files, Lincoln Co. Public Library.

MPILER, AFFILIATION	DATE
ffrey W. Gardner, Brockington and Associates	September 10, 1990

J. Graham Morrison House
(c. 1912)

Lincoln County, North Carolina

Chain of Title

Date	Grantor	Grantee	Acreage	Ref.
11-23-1834	Joseph Graham	Robert H. Morrison	400 acres	db 36/102-3
05-18-1884	R.H. Morrison	Joseph G. Morrison	400 acres	wb 4/399-4
04-26-1906	J.G. Morrison	heirs of J.G.	635 acres	wb 5/347-5
07-03-1911	Mary M. & C.B. Roynall, Annie M. & R.B. Wilson, Jeannie D. & R.H. Morrison	J. Graham Morrison	636 acres	db 104/364-5
8-5-1968	J. Graham Morrison Pearl G. Morrison	J.G. Morrison Jr. Junius Morrison Margaret Guillett John N. Morrison Anna M. Whidden	12 Tracts 778.4 ac.	db 463/349
9-10-1974	J.G. Morrison Jr. Martha M. Wallace John N. Morrison Anna M. Whidden Margaret M. Guillet	William T. Griffin	712.82 ac.	db 510/920
7-17-1987	W.T. Griffin Pearl T. Griffin	Hash Howard Sherrill & Assoc.	712.82 ac.	db 671/510
?	Howard Gastonia?	Graham Mullen	?	?
1-1989	Graham Mullen	Duke Power	711.28	?

drawn
will probate date

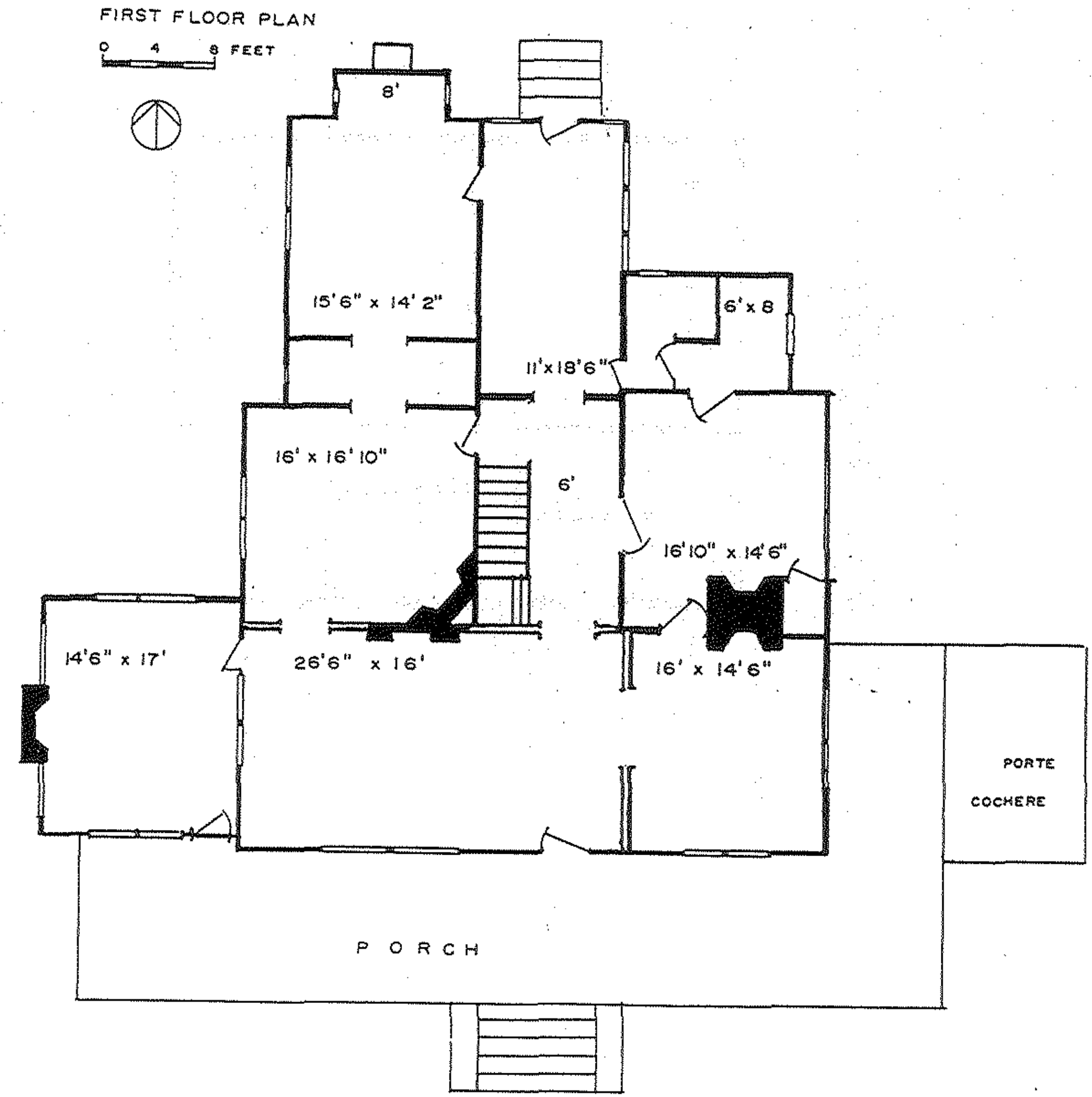


Figure 2. Morrison House, First Floor Plan.

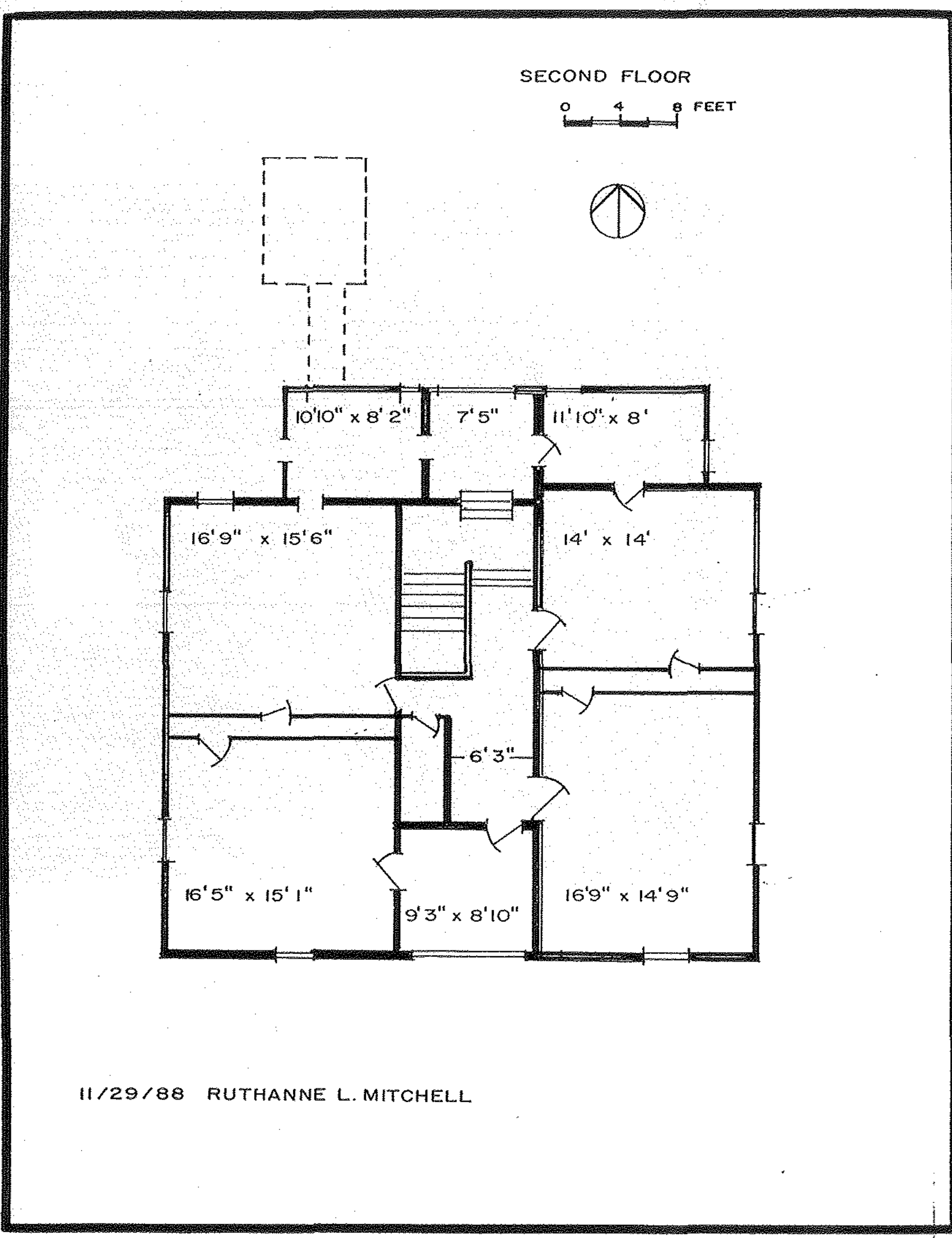


Figure 3. Morrison House, Second Floor Plan.

COTTAGE HOME
(original c. 1840 structure that burned c. 1909)

Lincoln County, North Carolina

Site No.:31LN93/93**

Provenience: 1 - General Surface; west orchard

Catalog	Quan.	Description
1	2	mason jar lid liner, milk glass
2	1	leathr shoe heel

Provenience: 2 - General Surface; road to silo

Catalog	Quan.	Description
1	1	half of horse shoe
2	1	light green bottle glass
3	2	annular underglazed porcelain
4	3	undecorated porcelain
5	1	alkaline glazed earthenware
6	1	undecorated whiteware
7	1	white slipped stoneware; Albany slipped interior
8	1	crystal quartz biface

Provenience: 3 - Sample West; stone wall foundation

Catalog	Quan.	Description
1	1	light green bottle glass
2	1	patinated flat glass
3	6	wire nail fragment
4	4.6g	brick and mortar

Provenience: 4 - Sample East; stone wall foundation

Catalog	Quan.	Description
1	113.4g	brick and mortae
2	21	wire nails
3	Ø.6g	charcoal
4	1	undecorated porcelain
5	1	flat metal fragment
6	1	rock

Provenience: 5 - Transect A, shovel test 2

Catalog	Quan.	Description
1	127.6g	mortar
2	1	brown bottle glass base
3	1	clear bottle glass

rovenience: 6 - General Surface, transect A, shovel test 3

atalog	Quan.	Description
	38.9g	brick
	3	green glass
	1	undecorated whiteware
	1	clear bottle glass
	1	quartz flake
	2	undecorated pearlware
	1	green slate

rovenience: 7 - Transect A, shovel test 3

atalog	Quan.	Description
	6	clear glass

rovenience: 8 - Transect A, shovel test 4

atalog	Quan.	Description
	2	clear glass
	1	green bottle glass
	1	wire nail
	2	unidentifiable square nails
	6.5g	wood
	1	copper tubing
	1	nut shell
	0.8g	charcoal

ovenience: 9 - Transect B, shovel test 2

talog	Quan.	Description
	1	unidentifiable square nail

ovenience: 10 - Transect B, shovel test 3

talog	Quan.	Description
	1	square cut nail
	1	burnt whiteware

Provenience: 11 - Transect E, shovel test 3

Catalog	Quan.	Description
1	1	sheet of plastic
2	1	rubber gasket

Provenience: 12 - Transect F, shovel test 2

Catalog	Quan.	Description
1	2	wire nails
2	1	unidentifiable metal fragment

Provenience: 13 - Transect G, shovel test 2

Catalog	Quan.	Description
1	1	wire nail
2	1	square cut nail

Provenience: 14 - Transect HG, shovel test 5

Catalog	Quan.	Description
1	2	wire nails

Provenience: 15 - Transect H, shovel test 3

Catalog	Quan.	Description
1	1	clear flat glass
2	2	light green flat glass
3	1	biface/knife

Provenience: 16 - Transect I, shovel test 1

Catalog	Quan.	Description
1	1	undecorated whiteware
2	1	rock

Provenience: 17 - Transect I, shovel test 2

Catalog	Quan.	Description
1	no artifacts	

Provenience: 18 - Transect I, shovel test 3

Catalog	Quan.	Description
1	1	unidentifiable metal fragment
2	1	shale fragment

Provenience: 19 - Transect I, shovel test 4

Catalog	Quan.	Description
1	1	flat clear glass
2	1	flat very light green glass
3	1	undecorated porcelain
4	1	unidentifiable square nail
5	1	unidentifiable metal
6	1	whiteware

Provenience: 2Ø - Transect J, shovel test 1

Catalog	Quan.	Description
1	1	clear flat glass
2	2	light green glass
3	2	unidentifiable square nails
4	1	square cut nail

Provenience: 21 - Transect J, shovel test 3

Catalog	Quan.	Description
1	1	undecorated porcelain
2	1	decaled whiteware
3	1	ironstone fragment
4	1	burnt whiteware
5	1	unidentifiable square nail fragment
6	2	square cut nails
7	2.2g	shell

Provenience: 22 - Transect J, shovel test 4

Catalog	Quan.	Description
1	1	square cut nail
2	4	clear bottle glass
3	1	clear flat glass
4	1	milk glass scre type bottle fragment
5	1	light blue bottle top fragment
6	Ø.8g	charcoal

Provenience: 23 - Transect K, shovel test 3

Catalog	Quan.	Description
1	2	brown bottle glass
2	2	green bottle glass
3	1	light blue bottle glass
4	6	clear flat glass
5	2	clear bottle glass
6	1	square cut nail
7	1	flat metal piece
8	1	undecorated whiteware

Provenience: 24 - Transect K, shovel test 4

Catalog	Quan.	Description
1	1	square cut nail
2	3	clear bottle glass
3	6	green bottle glass
4	3	ironstone
5	1	unglazed stoneware
6	146.5g	brick

Provenience: 25 - Transect L, shovel test 3

Catalog	Quan.	Description
1	1	clear flat glass
2	1	green bottle glass
3	1	sponged whiteware
4	1	ironstone

Provenience: 26 - Transect L, shovel test 4

Catalog	Quan.	Description
1	1	clear flat glass
2	1	green bottle glass

Provenience: 27 - Transect M, shovel test 1

Catalog	Quan.	Description
1	3	unidentifiable square nails
2	1	unidentifiable metal fragment

Provenience: 28 - Transect M, shovel test 3

Catalog	Quan.	Description
1	1	clear bottle glass
2	1	decaled whiteware
3	1	alkaline glazed stoneware

Provenience: 29 - Transect M, shovel test 4

Catalog	Quan.	Description
1	1	green bottle glass

Provenience: 30 - Transect N, shovel test 1

Catalog	Quan.	Description
1	1	flat clear glass
2	2	sqaure cut nails
3	2	unidentifiable square nails

Provenience: 31 - Transect N, shovel test 2

Catalog	Quan.	Description
1	1	wire nail
2	3	unidentifiable square nails
3	1	square cut nail
4	2.2g	bone

Provenience: 32 - Transect N, shovel test 3

Catalog	Quan.	Description
1	1	wire nail
2	1	square cut nail
3	1	clear flat glass
4	1	unglazed redware
5	16.7g	brick

Provenience: 33 - Transect N, shovel test 4

Catalog	Quan.	Description
1	1	clear bottle glass
2	1	green bottle glass
3	1	light blue bottle glass
4	4	unidentifiable square nails
5	1	square cut nail

Provenience: 34 - Transect N, shovel test 5

Catalog	Quan.	Description
1	1	clear flat glass
2	1	clear bottle glass
3	1	square cut nail
4	2	white porcelain

Provenience: 35 - General Surface, transect N shovel test 6

Catalog	Quan.	Description
1	3	undecorated porcelain

Provenience: 36 - Transect N, shovel test 6

Catalog	Quan.	Description
1	1	clear bottle glass
2	1	light green bottle glass
3	1	milk glass mason jar liner marked "ON"
4	1	Albany slipped stoneware

Provenience: 37 - General Surface; transect N, shovel test 7

Catalog	Quan.	Description
1	1	alkaline glazed stoneware
2	1	decaled whiteware

Provenience: 38 - Transect N, shovel test 7

Catalog	Quan.	Description
1	1	peach pit
2	2	wire nails
3	2	unidentifiable nails
4	1	undecorated whiteware
5	1	hand painted ironstone
6	1	alkaline glazed stoneware

Provenience: 39 - Transect O, shovel test 1

Catalog	Quan.	Description
1	2	wire nails
2	1	unidentifiable square nail
3	1	unidentifiable metal fragment

Provenience: 40 - Transect O, shovel test 2

Catalog	Quan.	Description
1	6	wire nails
2	38.4g	coal

Provenience: 41 - Transect O, shovel test 3

Catalog	Quan.	Description
1	2	clear bottle glass
2	1	light green bottle glass
3	1	metal ring/washer
4	1	rubber wheel

Provenience: 42 - Transect O, shovel test 4

Catalog	Quan.	Description
1	1	wire nail
2	1	clear bottle glass
3	1	ironstone
4	1	unglazed redware
5	4.5g	coal

Provenience: 43 - Transect P, shovel test 1

Catalog	Quan.	Description
1	2	clear bottle glass
2	1	green bottle glass
3	0.9g	bone
4	1	gun shell casing
5	15	wire nails
6	1	large wire spike
7	6	unidentifiable square nails
8	1	tar fragment

Provenience: 44 - Transect P, shovel test 2

Catalog	Quan.	Description
1	1	green bottle glass
2	1	light brown bottle glass
3	1	light blue bottle glass
4	2	molten clear glass
5	6	clear bottle glass
6	2	patinated clear glass
7	1	metal name plate "Hydrator"
8	2	unidentifiable flat metal
9	7	wire nails
10	2	ironstone
11	1	nut shell fragment

Provenience: 45 - Transect P, shovel test 3

Catalog	Quan.	Description
1	7	wire nails
2	2	unidentifiable square nails
3	1	flat metal triangle
4	2	clear chinmey glass
5	17.5g	brick
6	6.3g	coal
8	3	brown bottle glass
9	1	alkaline glazed stoneware
10	10	clear bottle glass
11	1	hand painted overglazed porcelain
12	1	undecorated whiteware
13	1	clear bottle glass marked "N"

Provenience: 46 - Transect P, shovel test 4

Catalog	Quan.	Description
1	2	clear flat glass
2	1	wrought nail
3	1	wire nail
4	1	flat metal
5	2	undecorated whiteware

Provenience: 47 - Transect Q, shovel test 1

Catalog	Quan.	Description
1	1	patinated flat glass
2	4	wire nails
3	2	unidentifiable nail fragments
4	1	alkaline glazed stoneware
5	1	green outdoor carpet

Provenience: 48 - Transect Q, shovel test 2

Catalog	Quan.	Description
1	2	wire nails
2	2	clear bottle glass
3	1	brown bottle glass
4	2.7g	mortar
5	1	molded hand painted overglazed porcelain
6	1	rock

Provenience: 49 - Transect Q, shovel test 3

Catalog	Quan.	Description
1	Ø.8g	mortar
2	3	clear bottle glass
3	1	nut shell fragment

Provenience: 5Ø - Transect Q, shovel test 4

Catalog	Quan.	Description
1	1	uniedntifiable metal
2	1	bakelite fragment

Provenience: 51 - Transect R, shovel test 1

Catalog	Quan.	Description
1	1	clear bottle glass
2	1	alkaline glazed stoneware
3	2.6g	mortar

Provenience: 52 - Transect R, shovel test 2

Catalog	Quan.	Description
1	1	light green bottle glass
2	1	clear bottle glass
3	1	mirror glass
4	1	burnt whiteware

Provenience: 53 - Transect R, shovel test 3

Catalog	Quan.	Description
1	2	clear bottle glass
2	1	brown bottle glass

Provenience: 54 - Transect R, shovel test 4

Catalog	Quan.	Description
1	1	brown bottle glass base
2	2	light green glass
3	1	clear bottle glass
4	1	clear bottle glass
5	1	green bottle glass
6	1	undecorated whiteware

Provenience: 55 - Transect 5, shovel test 4

Catalog	Quan.	Description
1	1	wire nail

Provenience: 56 - Transect S, shovel test 5

Catalog	Quan.	Description
1	3	clear glass
2	3	clear glass
3	1	green "oatmeal" pressed glass
4	1	alkaline glazed stoneware
5	1	wire nail
6	1	nut shell

Provenience: 57 - Transect S, shovel test 6

Catalog	Quan.	Description
1	1	light green flat glass
2	2	clear flat glass
3	1	unidentifiable nail
4	1	undecorated pearlware

Provenience: 58 - Transect General Surface

Catalog	Quan.	Description
1	1	square cut nail
2	1	green bottle glass
3	1	light green bottle glass
4	2	clear window glass
5	2	clear bottle glass
6	1	quartz flake

Provenience: 59 - Transect T, shovel test 1

Catalog	Quan.	Description
1	1	clear bottle glass

Provenience: 60 - Transect T, shovel test 2

Catalog	Quan.	Description
1	1	brown bottle glass

Provenience: 61 - Transect T, shovel test 3

Catalog	Quan.	Description
1	1	square cut nail

Provenience: 62 - Transect U, shovel test 1

Catalog	Quan.	Description
1	1	wire nail
2	1	square cut nail

Provenience: 63 - Transect V, shovel test 1

Catalog	Quan.	Description
1	20	clear bottle glass
2	1	metal bolt tap

Provenience: 64 - Transect V, shovel test 3

Catalog	Quan.	Description
1	1	clear bottle glass

Provenience: 65 - Transect W, shovel test 1

Catalog	Quan.	Description
1	18	clear bottle glass

Provenience: 66 - Transect W, shovel test 4

Catalog	Quan.	Description
1	1	moulded green bottle glass
2	1	pressed light blue bottle glass marked "BY"

Provenience: 67 - Transect X, shovel test 1

Catalog	Quan.	Description
1	1	brown bottle glass
2	28.4g	asphalt

Provenience: 68 - Transect X, shovel test 2

Catalog	Quan.	Description
1	36.7g	asphalt

Provenience: 69 - Transect X, shovel test 3

Catalog	Quan.	Description
1	4	undecorated whiteware

Provenience: 70 - Transect X, shovel test 4

Catalog	Quan.	Description
1	2	hard plastic
2	1	alkaline glazed stoneware

Provenience: 71 - General surface; pole barn transect

Catalog	Quan.	Description
1	1	undecorated whiteware
2	1	unglazed stoneware

Provenience: 72 - Pole barn transect, shovel test 1

Catalog	Quan.	Description
1	1	undecorated whiteware
2	1	unidentifiable metal piece

Provenience: 73 - Red barn transect, general surface

Catalog	Quan.	Description
1	1	salt glazed stoneware
2	1	ironstone
3	5	undecorated whiteware
4	1	clear flat glass
5	1	moulded clear glass
6	1	clear glass
7	1	lithic flake

Provenience: 74 - Red barn transect, shovel test 1

Catalog	Quan.	Description
1	1	undecorated whiteware

Provenience: 75 - Test Unit North 1, level 1

Catalog	Quan.	Description
1	11.5g	mortar
2	1	wrought nail
3	2	square cut nails
4	5	wire nails
5	3	unidentifiable square nails
6	2	unidentifiable metal piece
7	1	screw on Coke cap
8	2.4g	coal
9	1	shell cap marked "US"
10	1	green bottle glass, screw type
11	4	light green flat glas
12	30	clear bottle glass
13	3	moulded clear glass
14	2	brown bottle glass
15	1	heavily patinated glass
16	1	stippled glass
17	1	milk glass Mason jar liner "MASON JA"
18	12	whiteware
19	4	ironstone
20	1	unidentified bottle glass, heavily patinated
21	2	quartz flakes

Provenience: 76 - Test Unit North 1, level 2

Catalog	Quan.	Description
1	1	large bolt
2	1	metal washer
3	2	wire nails
4	5	square cut nails
5	6	unidenitifiable square nails
6	5	unidentifiable nails
7	3	unidentifiable metal fragments
8	1	aluminum foil scrap
9	1	roofing slate
10	3.2g	coal slag
11	69	clear bottle glass
12	1	stippled glass base
13	3	patinated flat glass
14	1	clear bottle glass; decaled "lott"
15	2	blue bottle glass
16	2	light green bottle glass
17	1	black glass
18	7	brown bottle glass
19	1	moulded clear glass
20	3	melted glass
21	1	clear glass rim
22	5	alkaline glazed stoneware
23	2	undecorated pearlware

24	7	uknown overglazed design whiteware
25	1	burnt white-bodied ceramic
26	2	undecorated porcelain
27	1	bone handle, etched "armac"
28	2.7g	mortar
29	1	quartz rock

Provenience: 77 - Test Unit North 2, level 1

Catalog	Quan.	Description
1	136	wire nails
2	46	unidentifiable square nails
3	10	square cut nails
4	29	unidentifiable nail fragments
5	4	unidentifiable flat metal
6	2	unidentifiable metal fragments
7	1	metal buckle
8	1	metal bolt
9	1	metal hook
10	1	metal fencing wire
11	1	aluminum foil
12	2	shell casings "WRA Co. 45-79" "U"
13	2	clear bottle glass
14	1	light green flat glass
15	2	light green glass
16	2	light green bottle glass
17	1	brown bottle glass
18	2	Jackfield-like redware
19	2	annular whiteware
20	1	unglazed redware
21	1	burnt whiteware
22	5	decaled whiteware
23	3	porcelain
24	1	alkaline glazed stoneware
25	1	clay marble
26	6	pink melmac cup fragments
27	1	melted orange plastic
28	1	plastic comb tooth
29	1	linoleum
30	235.2g	mortar and brick
31	34.8g	bone
32	7	rocks
33	0.1g	charcoal

Provenience: 78 - Test Unit North 2, level 2

Catalog	Quan.	Description
1	1	wire nail
2	4	square cut nails
3	5	unidentifiable square nails
4	1	unidentifiable nails
5	3	clear bottle glass
6	1	green bottle glass
7	1	badly worn whiteware

Provenience: 79 - Test Unit North 3, level 1

Catalog	Quan.	Description
1	8	wire nails
2	2	unidentifiable square nails
3	1	unidentifiable nail
4	2	vinyl coated wire
5	1	metal wire
6	3	unidentifiable flat metal
7	1	unidentifiable metal cap
8	5	very light green flat glass
9	1	clear flat glass
10	1	green bottle glass
11	1	brown bottle glass
12	23.8g	brick and mortar
13	1	linoleum fragment
14	1	burnt wood
15	3.1g	coal

Provenience: 80 - Test Unit North 3, level 2

Catalog	Quan.	Description
1	1	unidentified metal machine part
2	4	wire nails
3	1	tack
4	5	unidentifiable square nails
5	1	whiteware
6	1	clear glass
7	1	quartz rock
8	0.5g	shell
9	2	alkaline glazed stoneware

11	1	amethyst bottle glass
12	6	porcelain
13	1	ironstone
14	1	annular whiteware
15	1	alkaline glazed stoneware
16	3	unedcorated whiteware
17	1	transfer printed whiteware
18	5	rocks
19	2	flakes

Provenience: 84 - Test Unit West 1, level 2

Catalog	Quan.	Description
1	1	clear bottle glass

Provenience: 85 - Test Unit West 2, 3X3 extension

Catalog	Quan.	Description
1	16	wire fragments
2	1	wire nail and attached metal
3	7	wire nails
4	6	unidentifiable metal
5	1	large metal coupler
6	1	screw
7	1	spark plug
8	1	wrought nail
9	4	square cut nails
10	3	unidentifiable square nails
11	1	unidentifiable nail
12	9	very light green flat glass
13	2	light green bottle glass
14	2	green bottle glass
15	1	aqua flat glass
16	1	burnt clear bottle glass
17	21	clear bottle glass
18	1	clear flat glass
19	2	burnt white-bodied ceramic
20	1	undecorated whiteware
21	1	ironstone
22	2	plastic fragments

APPENDIX B.

SURVEY AND TESTING ARTIFACT DATA

Site No.: 31LN78 & 78**

Provenience: 1 - Shovel test 2

Catalog	Quan.	Description
1	2	wire nails
2	4	wire fragments
3	14	molten glass fragments
4	65.0g	brick

Provenience: 2 - Shovel test 5

Catalog	Quan.	Description
1	1	alkaline glazed stoneware
2	1	translucent quartz tertiary flake

Provenience: 3 - Shovel test 6

Catalog	Quan.	Description
1	1	undecorated whiteware
2	1	undecorated porcelain

Provenience: 4 - Shovel test 8

Catalog	Quan.	Description
1	1	undecorated whiteware

Provenience: 5 - Transect 106, shovel test 10

Catalog	Quan.	Description
1	1	translucent quartz stemmed point
2	2	rhyolite tertiary flakes
3	1	undecorated whiteware
4	1	unidentifiable historic ceramic
5	1	olive green bottle glass

Provenience: 6 - Shovel test 11

Catalog	Quan.	Description
1	1	tuff thinning flake
2	1	undecorated whiteware

Provenience: 7 - Test unit 1, level 1

Catalog	Quan.	Description
1	41	unidentifiable square nails
2	37	square nails
3	7	wire nails
4	5	unidentifiable nails
5	1	screw
6	7	unidentifiable metal machine parts
7	12	unidentifiable metal fragments
8	8	flat metal fragments
9	3	metal staples
10	1	scissors fragment
11	1	metal cake knife
12	3	green bottle glass fragment
13	5	clear bottle glass
14	283.9g	molten glass
15	2	grey salt glazed stoneware
16	1	glass 4 holes button
17	2327.7g	brick
18	15.3g	bone

Provenience: 8 - Test unit 2 near shovel test 5, level 1

Catalog	Quan.	Description
1	10	unidentifiable square nails
2	2	wire nails
3	10	alkaline glazed stoneware
4	2	undecorated whiteware
5	1	glass button
6	1	rhyolite tertiary flake
7	4	translucent quartz tertiary flake
8	17.1g	brick

Provenience: 9 - Test unit 2, level 2

Catalog	Quan.	Description
1	9	unidentifiable square nails
2	9	unidentifiable flat metal fragments
3	3	clear bottle glass
4	2	clesr melted glass
5	1	undecorated whiteware
6	2	overglazed hand painted porcelain handle fragment
7	6	alkaline glazed stoneware
8	1	small punched leather fragment
9	4	heavily rusted unidentifiable metal fragment
10	1	tuff tertiary flake
11	3	translucent quartz tertiary flakes

12	2	translucent quartz thinning flakes
13	1	crystal quartz tertiary flake

Site No.: 31LN79 & 79**

Provenience: 1 - Transect 59/60/61/62, shovel test 1, surface

Catalog	Quan.	Description
1	17	banded rhyolite tertiary flakes
2	3	banded rhyolite thinning flakes
3	1	porphyritic rhyolite tertiary flake
4	2	tuff tertiary flakes
5	3	translucent quartz tertiary flakes
6	1	banded rhyolite lanceolate biface
7	1	felcite biface fragment

Provenience: 2 - Transect 60 surface between shovel test 1 & 2

Catalog	Quan.	Description
1	1	banded rhyolite tertiary flake

Provenience: 3 - Transect 61, shovel test 3 surface

Catalog	Quan.	Description
1	1	translucent quartz projectile point; Savannah River

Provenience: 4 - Transect 61, shovel test 1, surface

Catalog	Quan.	Description
1	1	possible ground granitic rock

Provenience: 5 - Transect 64, shovel test 3 surface

Catalog	Quan.	Description
1	1	fine grained tuff projectile point fragment
2	1	banded rhyolite secondary flake

Provenience: 6 - Transect 64, shovel test 5 surface

Catalog	Quan.	Description
1	7	banded rhyolite tertiary flakes
2	2	unidentifiable meta-volcanic flakes
3	1	banded rhyolotee utilized flake
4	1	porphyritic rhyolite tertiary flake
5	2	banded rhyolite thinning flakes

Provenience: 7 - Transect 65, shovel test 6 surface

Catalog	Quan.	Description
1	13	banded rhyolite tertiary flakes
2	2	unidentifiable meta-volcanic tertiary flakes
3	1	argillite tertiary flake

Provenience: 8 - Transect 66, shovel test 6 surface

Catalog	Quan.	Description
1	1	banded rhyolite core fragment
2	2	unidentifiable weathered meta-volcanic tertiary flakes
3	1	banded rhyolite tertiary flake

Provenience: 9 - Transect 67, shovel test 3 surface

Catalog	Quan.	Description
1	1	banded rhyolite tertiary flake

Provenience: 10 - Transect 167, shovel test 3 @ 16 meters

Catalog	Quan.	Description
1	13	clear bottle glass fragments
2	3	clear bottle neck fragments
3	1	clear panel glass fragment
4	1	clear moulded conatiner glass fragment
5	1	clear glass bottle base (Owens Illinois)
6	1	clear glass bottle base fragment, embossed
7	2	clear glass bottle base fragment
8	2	amber bottle glass
9	1	Aqua blue glass container neck
10	1	aqua blue glass container lid fragment
11	1	aqua blue glass conatiner fragment
12	2	light green bottle glass
13	1	light green flat glass

14	1	dark green patinated bottle glass
15	1	milk glass bottle base fragment
16	1	milk glass bottle fragment
17	1	plain porcelain
18	1	unglazed red earthenware
19	1	red glazed whiteware
20	6	undecorated whiteware
21	3	alkaline glazed stoneware
22	1	green transfer printed whiteware
23	1	rubber shoe sole

Provenience: 11 - Transect 67, shovel test 6-7 surface

Catalog	Quan.	Description
1	3	banded rhyolite tertiary flakes
2	1	translucent quartz projectile point fragment
3	1	translucent quartz biface fragment
4	1	white plastic button

Provenience: 12 - Transect 68, shovel test 2, surface

Catalog	Quan.	Description
1	1	chert tertiary flake

Provenience: 13 - Transect 69, shovel test 3 surface

Catalog	Quan.	Description
1	1	rhyolite tertiary flake
2	2	translucent quartz tertiary flake

Provenience: 14 - Transect 70, shovel test 6, surface

Catalog	Quan.	Description
1	4	translucent quartz tertiary flakes
2	1	milky quartz tertiary flake
3	1	banded rhyolite tertiary flake

Provenience: 15 - Transect 71, shovel test 2, surface

Catalog	Quan.	Description
1	1	milky quartz projectile point tip

Site No.: 31LN80 & 80**

Provenience: 1 - Transect 74, surface near shovel test 3

Catalog	Quan.	Description
1	1	hydrated chert thinning flake

Provenience: 2 - Transect 75, shovel test 3 surface

Catalog	Quan.	Description
1	1	translucent quartz hafted end scraper

Provenience: 3 - Transect 76, shovel test 3 surface

Catalog	Quan.	Description
1	1	translucent quartz unifacial end scraper
2	1	residual sherd
3	1	translucent quartz utilized flake
4	4	translucent quartz tertiary flakes
5	1	milky quartz tertiary flake
6	1	rhyolite bifacial tool

Provenience: 4 - Transect 77, shovel test 3 surface

Catalog	Quan.	Description
1	1	hand painted whiteware fragment
2	1	rhyolite thinning flake
3	1	translucent quartz stemmed projectile point
4	1	translucent quartz bifacial tool
5	1	translucent quartz tertiary flake
6	1	banded rhyolite tertiary flake

Provenience: 5 - Surface near transect 78, shovel test 2

Catalog	Quan.	Description
1	2	translucent quartz biface fragment
2	3	translucent quartz tertiary flakes
3	2	weathered rhyolite tertiary flakes
4	1	rhyolite biface

Provenience: 6 - Transect 79, shovel test 1-2 surface

Catalog	Quan.	Description
1	2	translucent quartz tertiary flakes
2	1	weathered tuff tertiary flake
3	1	rhyolite thinning flake
4	3	banded rhyolite tertiary flakes
5	1	banded rhyolite secondary flake

Provenience: 7 - Transect 8Ø, shovel test 2 surface

Catalog	Quan.	Description
1	1	translucent quartz tertiary flake
2	1	sponge decorated whiteware

Provenience: 8 - Transect 8Ø, shovel test 3 surface

Catalog	Quan.	Description
1	1	chert triangular projectile point
2	1	rhyolite stemmed biface
3	1	unifacial tuff tool fragment
4	1	milky quartz projectile point
5	3	translucent quartz tertiary flakes

Provenience: 9 - Transect 81, shovel test 2 surface

Catalog	Quan.	Description
1	1	translucent quartz biface fragment
2	1	translucent quartz biface
3	1	translucent quartz tertiary flake
4	1	rhyolite tertiary flake

Provenience: 1Ø - Transect 82, shovel test 2 surface

Catalog	Quan.	Description
1	1	rhyolite tertiary flake

Site No.: 31LN81

Provenience: 1 - Surface between transect 85/86, shovel test 2-5

Catalog	Quan.	Description
1	3	translucent quartz tertiary flakes
2	1	translucent quartz thinning flake
3	1	translucent quartz rectangular bifacial tool
4	1	translucent quartz biface fragment
5	1	translucent quartz utilized flake
6	1	translucent quartz point stem
7	1	crystal quartz tertiary flake
8	1	quartzite Savannah River point stem
9	13	rhyolite tertiary flakes
10	2	rhyolite thinning flakes
11	5	tuff tertiary flakes
12	1	grey chert tertiary flake

Site No.: 31LN82

Provenience: 1 - Surface between transect 85/86, shovel test 12-15

Catalog	Quan.	Description
1	1	translucent quartz bifacial core fragment
2	2	translucent quartz tertiary flakes
3	1	translucent quartz retouched flake
4	1	milky quartz projectile point
5	23	rhyolite tertiary flakes
6	1	rhyolite thinning flake
7	1	rhyolite stemmed point fragment
8	1	rhyolite point fragment
9	1	weathered unknown lithic

Site No.: 31LN83 & 83**

Provenience: 1 - Transect 92, shovel test 1, surface

Catalog	Quan.	Description
1	17	translucent quartz tertiary flakes
2	1	rhyolite biface fragment
3	1	translucent quartz biface fragment
4	1	translcuent quartz projectile point tip
5	1	translucent quartz biface
6	2	quartzite tertiary flakes
7	1	green bottle glass fragment
8	1	shell-edged pearlware fragment
9	2	rhyolite tertiary flakes

Site No.:31LN84

Provenience: 1 - Transect 87, shovel test 4

Catalog	Quan.	Description
1	1	tuff tertiary flake

Provenience: 2 - Transect 88, shovel test 5

Catalog	Quan.	Description
1	1	grey chert thinning flake

Provenience: 3 - Transect 89, shovel test 1, surface

Catalog	Quan.	Description
1	1	rhyolite tertiary flake
2	1	translucent quartz point tip

Provenience: 4 - Transect 59, shovel test 5, surface

Catalog	Quan.	Description
1	1	translucent quartz point stem

Site No.: 31LN85 & 85

Provenience: 1 - Transect 97, shovel test 1, surface

Catalog	Quan.	Description
1	3	translucent quartz tertiary flakes
2	1	crystal quartz thinning flake
3	2	quartzite tertiary flakes
4	1	grey chert secondary flake
5	2	grey chert tertiary flakes
6	1	rhyolite primary flake
7	1	rhyolite tertiary flake
8	1	annular whiteware

Provenience: 2 - Transect 97, shovel test 1

Catalog	Quan.	Description
1	1	plain body sherd, fine sand temper
2	10	residual sherds
3	1	grey chert flake fragment
4	1	unknown lithic flake

Site No.: 31LN87

Provenience: 1 - Transect 100, shovel test 3, surface

Catalog	Quan.	Description
1	1	plain body sherd, fine sand temper
2	1	unidentifiable surface body sherd, sand temper
3	1	rhyolite tertiary flake
4	1	rhyolite biface mid-section

Provenience: 2 - Transect 100, shovel test 3

Catalog	Quan.	Description
1	1	translucent quartz tertiary flakes

Provenience: 3 - Transect 100, shovel test 4

Catalog	Quan.	Description
1	1	rhyolite tertiary flake

Provenience: 4 - Transect 101, shovel test 1

Catalog	Quan.	Description
1	1	plain body sherd, coarse sand temper

Provenience: 5 - Transect 101, shovel test 2

Catalog	Quan.	Description
1	1	residual sherd

Provenience: 6 - Transect 101, shovel test 4

Catalog	Quan.	Description
1	2	plain body sherd, coarse sand temper

Provenience: 7 - Transect 101, shovel test 7

Catalog	Quan.	Description
1	1	plain body sherd, fine sand temper

Provenience: 8 - Transect 101, shovel test 1, surface

Catalog	Quan.	Description
1	2	plain body sherd, fine sand temper

Provenience: 9 - Transect 102, shovel test 4

Catalog	Quan.	Description
1	4	residual sherds

Provenience: 10 - Transect 103, shovel test 4

Catalog	Quan.	Description
1	1	translucent quartz triangular point

Provenience: 11 - Transect 103, shovel test 5, surface

Catalog	Quan.	Description
1	2	plain body sherds, fine sand temper
2	1	translucent quartz tertiary flake
3	1	quartzite tertiary flake

Provenience: 12 - Transect 103, shovel test 5

Catalog	Quan.	Description
1	1	plain body sherd, fine sand temper

Site No.: 31LN88

Provenience: 1 - Transect 97, shovel test 23-25, surface

Catalog	Quan.	Description
1	8	translucent quartz tertiary flakes
2	1	translucent quartz point stem
3	1	crystal quartz thinning flake
4	5	tuff tertiary flakes
5	2	grey chert tertiary flake
6	2	porphyritic rhyolite tertiary flake
7	10	rhyolite tertiary flake
8	1	banded rhyolite retouched flake
9	1	rhyolite point stem
10	1	rhyolite point fragment
11	1	quartzite cobble fragment
12	1	undecorated whiteware
13	1	alkaline glazed stoneware

Provenience: 2 - Transect 97, shovel test 26-27, surface

Catalog	Quan.	Description
1	6	translucent quartz tertiary flakes
2	2	translucent quartz biface fragment
3	1	translucent quartz point fragment
4	6	tuff tertiary flakes
5	1	tuff primary flake
6	6	rhyolite tertiary flakes
7	1	rhyolite Mc Corkle point
8	4	undecorated whiteware
9	1	undecorated whiteware, maker's mark; Potter's Coop
10	1	olive green bottle glass
11	1	clear flat glass

Provenience: 11 - Transect 103, shovel test 5, surface

Catalog	Quan.	Description
1	2	plain body sherds, fine sand temper
2	1	translucent quartz tertiary flake
3	1	quartzite tertiary flake

Provenience: 12 - Transect 103, shovel test 5

Catalog	Quan.	Description
1	1	plain body sherd, fine sand temper

Site No.: 31LN88

Provenience: 1 - Transect 97, shovel test 23-25, surface

Catalog	Quan.	Description
1	8	translucent quartz tertiary flakes
2	1	translucent quartz point stem
3	1	crystal quartz thinning flake
4	5	tuff tertiary flakes
5	2	grey chert tertiary flake
6	2	porphyritic rhyolite tertiary flake
7	10	rhyolite tertiary flake
8	1	banded rhyolite retouched flake
9	1	rhyolite point stem
10	1	rhyolite point fragment
11	1	quartzite cobble fragment
12	1	undecorated whiteware
13	1	alkaline glazed stoneware

Provenience: 2 - Transect 97, shovel test 26-27, surface

Catalog	Quan.	Description
1	6	translucent quartz tertiary flakes
2	2	translucent quartz biface fragment
3	1	translucent quartz point fragment
4	6	tuff tertiary flakes
5	1	tuff primary flake
6	6	rhyolite tertiary flakes
7	1	rhyolite Mc Corkle point
8	4	undecorated whiteware
9	1	undecorated whiteware, maker's mark; Potter's Coop
10	1	olive green bottle glass
11	1	clear flat glass

12	1	clear bottle glass
13	1	albany slipped stoneware
14	1	plain burnished body sherd, fine sand temper

Provenience: 3 - Test unit 1, level 1

Catalog	Quan.	Description
1	1	plain rim sherd, grit temper
2	1	plain rim sherd, grit temper
3	1	plain body sherd, sand temper
4	2	residual sherds
5	1	translucent quartz tertiary flake
6	1	quartzite primary flake
7	1	chert primary flake
8	1	chert seondary flake
9	3	chert tertiary flakes
10	1	rhyolite thinning flake
11	1	tuff thinning flake
12	1	chert triangular point fragment
13	1	quartzite cobble pestle

Provenience: 4 - Test unit 1, level 2

Catalog	Quan.	Description
1	1	cord marked body sherd, fine sand temper
2	1	fabric impressed body sherd, grit temper
3	4	eroded body and rim sherds, coarse sand temper
4	1	plain rim sherd, fine sand temper
5	1	plain body sherd, coarse sand temper
6	13	residual sherds
7	2	translucent quartz tertiary flakes
8	1	crystal quartz shatter
9	2	rhyolite tertiary flakes
10	2	green chert tertiary flakes
11	1	grey chert thinning flake
12	1	black chert thinning flake
13	1	rhyolite triangular point
14	1	rhyolite triangular point fragment

Provenience: 5 - Test unit 1, level 3

Catalog	Quan.	Description
1	1	quartzite thinning flake
2	2	rhyolite tertiary flakes
3	10	badly eroded residual sherds

Site No.: 31LN89

Provenience: 1 - Transect 106, shovel test 6/7 surface

Catalog	Quan.	Description
1	6	translucent quartz tertiary core reduction flakes
2	1	crystal quartz tertiary flakes
3	2	tuff tertiary flakes

Site No.: 31LN78 & 78**

Provenience: 1 - Shovel test 2

Catalog	Quan.	Description
1	2	wire nails
2	4	wire fragments
3	14	molten glass fragments
4	65.0g	brick

Provenience: 2 - Shovel test 5

Catalog	Quan.	Description
1	1	alkaline glazed stoneware
2	1	translucent quartz tertiary flake

Provenience: 3 - Shovel test 6

Catalog	Quan.	Description
1	1	undecorated whiteware
2	1	undecorated porcelain

Provenience: 4 - Shovel test 8

Catalog	Quan.	Description
1	1	undecorated whiteware

Provenience: 5 - Transect 106, shovel test 10

Catalog	Quan.	Description
1	1	translucent quartz stemmed point
2	2	rhyolite tertiary flakes
3	1	undecorated whiteware
4	1	unidentifiable historic ceramic
5	1	olive green bottle glass

Provenience: 6 - Shovel test 11

Catalog	Quan.	Description
1	1	tuff thinning flake
2	1	undecorated whiteware

Provenience: 7 - Test unit 1, level 1

Catalog	Quan.	Description
1	41	unidentifiable square nails
2	37	square nails
3	7	wire nails
4	5	unidentifiable nails
5	1	screw
6	7	unidentifiable metal machine parts
7	12	unidentifiable metal fragments
8	8	flat metal fragments
9	3	metal staples
10	1	scissors fragment
11	1	metal cake knife
12	3	green bottle glass fragment
13	5	clear bottle glass
14	283.9g	molten glass
15	2	grey salt glazed stoneware
16	1	glass 4 holes button
17	2327.7g	brick
18	15.3g	bone

Provenience: 8 - Test unit 2 near shovel test 5, level 1

Catalog	Quan.	Description
1	10	unidentifiable square nails
2	2	wire nails
3	10	alkaline glazed stoneware
4	2	undecorated whiteware
5	1	glass button
6	1	rhyolite tertiary flake
7	4	translucent quartz tertiary flake
8	17.1g	brick

Provenience: 9 - Test unit 2, level 2

Catalog	Quan.	Description
1	9	unidentifiable square nails
2	9	unidentifiable flat metal fragments
3	3	clear bottle glass
4	2	clesr melted glass
5	1	undecorated whiteware
6	2	overglazed hand painted porcelain handle fragment
7	6	alkaline glazed stoneware
8	1	small punched leather fragment
9	4	heavily rusted unidentifiable metal fragment
10	1	tuff tertiary flake
11	3	translucent quartz tertiary flakes
12	2	translucent quartz thinning flakes
13	1	crystal quartz tertiary flake

Site No.: 31LN90 & 90**

Provenience: 1 - Shovel test 2

Catalog	Quan.	Description
1	1	molded clear glass bottle base

Provenience: 2 - Transect 106, shovel test 12-13

Catalog	Quan.	Description
1	1	eroded stoneware fragment
2	1	alkaline glazed stoneware fragment
3	1	blue shell-edged white-bodied ceramic
4	1	impacted lead bullet
5	1	brick
6	1	metal button back
7	1	undecorated whiteware

Site No.: 31LN91 & 91**

Provenience: 1 - Transect 4, shovel test 3

Catalog	Quan.	Description
1	1	crystal quartz shatter

Provenience: 2 - Transect 4, shovel test 6

Catalog	Quan.	Description
1	1	alkaline glazed stoneware
2	1	unidentifiable metal fragment

Provenience: 3 - Transect 4, shovel test 7 surface

Catalog	Quan.	Description
1	1	whiteware fragment

Provenience: 4 - Transect 5, shovel test 5

Catalog	Quan.	Description
1	1	unidentifiable metal/nail fragment
2	2	clear bottle glass
3	2	clear flat glass
4	1	translucent quartz tertiary flake
5	1	metal wire fragment
6	1	green bottle glass
7	1	quartzite tertiary flake

Provenience: 5 - Transect 5, shovel test 6, surface

Catalog	Quan.	Description
1	1	decal decorated whiteware

Provenience: 6 - Transect 6, shovel test 3

Catalog	Quan.	Description
1	3	whiteware

Provenience: 7 - Transect 6, surface between shovel test 3-4

Catalog	Quan.	Description
1	1	light green bottle glass fragment

Provenience: 8 - Transect 6, shovel test 4

Catalog	Quan.	Description
1	1	milk glass fragment
2	1	molded light green container glass
3	1	metal cog wheel
4	1	whiteware fragment
5	2	clear flat glass
6	1	clear bottle glass
7	1	coal slag fragment
8	2	unidentifiable flat metal fragment
9	1	translucent quartz tertiary flake

Provenience: 9 - Transect 6, shovel test 5

Catalog	Quan.	Description
1	1	blue bottle glass fragment
2	1	light blue bottle glass fragment
3	1	amber bottle glass
4	2	clear flat glass fragment

Provenience: 10 - Transect 7, shovel test 2 and 7 surface

Catalog	Quan.	Description
1	1	translucent quartz core fragment
2	1	translucent quartz biface fragment
3	1	annular porcelain fragment
4	1	procelain fragment

Provenience: 11 - Transect 3, shovel test 3

Catalog	Quan.	Description
1	1	light blue bottle glass
2	1	undecorated whiteware
3	1	milk glass canning jar lid

Provenience: 12 - Transect 7, surface between St 3 & 4

Catalog	Quan.	Description
1	1	translucent quartz tertiary flake
2	1	clear stippled flat glass
3	1	light blue glass bottle base
4	1	coal fragment
5	1	slag fragment
6	1	clear bottle glass fragment
7	1	clear flat glass fragment
8	2	undecorated whiteware

Provenience: 13 - Transect 7, shovel test 4

Catalog	Quan.	Description
1	1	cobalt bottle glass
2	1	light green flat glass
3	1	melmac fragment
4	2	unidentifiable clear glass fragments
5	1	blue decorated whiteware
6	1	undecorated whiteware
7	1	unidentifiable square nail
8	1	wire nail

Provenience: 14 - Transect 5, shovel test 7

Catalog	Quan.	Description
1	1	alkaline glazed stoneware
2	1	bakelite
3	1	light blue bottle glass
4	1	clear flat glass

Provenience: 15 - Transect 7, shovel test 6

Catalog	Quan.	Description
1	1	clear bottle glass

Provenience: 16 - Transect 8, shovel test 3

Catalog	Quan.	Description
1	2	clear bottle glass
2	1	molded clear bottle glass lid
3	1	clear flat glass
4	1	clear glass bottle base
5	1	blue bottle glass
6	1	unidentifiable flat metal
7	1	translucent quartz primary flake
8	1	banded rhyolite primary flake

Site No.: 31LN92 & 92**

Provenience: 1 - Transect 12, shovel test 4

Catalog	Quan.	Description
1	1	wire nail
2	1.3g	charcoal

Provenience: 2 - Transect 13, shovel test 5

Catalog	Quan.	Description
1	1	brown bottle glass
2	1	light green bottle glass
3	1	translucent quartz thinning flake

Provenience: 3 - Transect 15, shovel test 5

Catalog	Quan.	Description
1	1	undecorated whiteware

Provenience: 4 - Transect 16, shovel test 4

Catalog	Quan.	Description
1	1	hand painted transfer printed whiteware

Provenience: 5 - Transect 16, shovel test 6

Catalog	Quan.	Description
1	1	clear flat glass
2	1	metal wire fragment

Provenience: 6 - Transect 16, shovel test 8

Catalog	Quan.	Description
1	4	ironstone fragment
2	2	clear flat glass
3	1	clear bottle glass
4	1	light green bottle glass
5	2	light green flat glass
6	1	crystal quartz tertiary flake

Site No.: 31LN93 & 93**

Provenience: 1 - Surface

Catalog	Quan.	Description
1	1	rhyolite stemmed point

Provenience: 2 - Transect 13, shovel test 9

Catalog	Quan.	Description
1	1	unidentifiable metal fragment

Provenience: 3 - Transect 13, shovel test 10

Catalog	Quan.	Description
1	1	alkaline glazed stoneware

Provenience: 4 - Transect 14, shovel test 9

Catalog	Quan.	Description
1	1	blue glazed porcelain
2	1	unidentifiable metal fragment

Provenience: 5 - Surface near transect 14, shovel test 16

Catalog	Quan.	Description
1	1	undecorated whiteware

Provenience: 6 - Transect 15, shovel test 10

Catalog	Quan.	Description
1	1	black plastic shank type button

Provenience: 7 - Transect 17, shovel test 13, surface

Catalog	Quan.	Description
1	1	undecorated whiteware

Provenience: 8 - Transect 18, shovel test 7

Catalog	Quan.	Description
1	2	clear bottle glass

Provenience: 9 - Transect 19, shovel test 8

Catalog	Quan.	Description
1	1	clear bottle glass

Provenience: 10 - Transect 19, shovel test 10

Catalog	Quan.	Description
1	1	clear flat glass
2	1	undecorated whiteware
3	1	translucent quartz tertiary flake

Provenience: 11 - Transect 19, shovel test 14 on surface

Catalog	Quan.	Description
1	1	sponge decorated hand painted underglazed whiteware

Provenience: 12 - Transect 20, shovel test 4, surface

Catalog	Quan.	Description
1	69.0g	brick

Provenience: 13 - Transect 20, shovel test 8

Catalog	Quan.	Description
1	1	translucent quartz thinning flake

Provenience: 14 - Transect 20, shovel test 9, surface

Catalog	Quan.	Description
1	1	light green bottle glass
2	1	light green flat glass
3	1	blue flat glass
4	1	red molded bottle glass
5	1	molded whiteware
6	5	undecorated whiteware
7	3	porcelain
8	1	green glazed whiteware
9	1	carbon battery core
10	2	metal chain fragment
11	1	metal spike

Provenience: 15 - Transect 20, shovel test 9

Catalog	Quan.	Description
1	2.4	brick
2	4.5g	coal slag
3	1	light green bottle glass

Provenience: 16 - Transect 21, shovel test 4

Catalog	Quan.	Description
1	3	undecorated ironstone
2	1	clear bottle glass

Provenience: 17 - Transect 21, shovel test 5

Catalog	Quan.	Description
1	1	milk glass fragment
2	1	clear flat glass
3	1	clear bottle glass
4	1	translucent quartz tertiary flake

Provenience: 18 - Transect 21 near shovel test 8, surface

Catalog	Quan.	Description
1	1	banded rhyolite stemmed point

Provenience: 19 - Transect 22, surface near shovel test 12

Catalog	Quan.	Description
1	2	undecorated porcelain
2	8	blue glazed ironstone

Provenience: 20 - Transect 22, shovel test 13

Catalog	Quan.	Description
1	1	quartzite tertiary flake

Provenience: 21 - Transect 23, shovel test 10

Catalog	Quan.	Description
1	2	translucent quartz tertiary flake

Provenience: 22 - Transect 38, shovel test 5, surface

Catalog	Quan.	Description
1	1	molded clear coaster fragment
2	2	milk glass canning jar liner
3	2	undecorated porcelain
4	2	hand painted whiteware
5	1	undecorated whiteware
6	1	crystal quartz shatter
7	1	translucent quartz tertiary

Provenience: 23 - Transect 38, shovel test 10

Catalog	Quan.	Description
1	1	translucent quartz secondary flake

Provenience: 24 - Transect 39, shovel test 4

Catalog	Quan.	Description
1	1	light green bottle glass

Provenience: 25 - Surface in wash near transect 40, shovel test 7

Catalog	Quan.	Description
1	1	hand painted overglazed porcelain
2	2	undecorated porcelain
3	2	undecorated whiteware
4	1	hand painted underglazed porcelain
5	1	molded clear bottle glass
6	1	clear molded panel bottle marked "oline"
7	1	clear molded bottle glass
8	1	clear bottle glass base fragment
9	1	brown bottle glass
10	1	opaque green bottle glass
11	1	enameled metal fragment

Provenience: 26 - Transect 40, shovel test 9

Catalog	Quan.	Description
1	1	undecorated whiteware

Site No.: 31LN94 & 94 **

Provenience: 1 - Road surface near transect 21, shovel test 5

Catalog	Quan.	Description
1	1	metallic bar fragment
2	1	metal eyelet
3	2	tacks
4	4	unidentifiable nails
5	1	rubber tire fragment
6	1	milk glass bottle fragment
7	3	clear bottle glass
8	1	cheerwine bottle fragment
9	7	light green bottle glass
10	6	light green flat glass
11	2	blue glazed whiteware
12	1	alkaline glazed stoneware
13	1	albany slipped exterior, white glazed interior stoneware
14	20	undecorated whitewar
15	2	ironstone
16	1	white glazed stoneware

Provenience: 2 - Transect 21, shovel test 6

Catalog	Quan.	Description
1	1	ironstone
2	1	whiteware

Provenience: 3 - Transect 22, shovel test 2, surface in road cut

Catalog	Quan.	Description
1	1	metal iron bar
2	1	porcelain base
3	1	amethyst jar rim
4	1	quartzite cobble fragment
5	1	rhyolite tertiary flake

Provenience: 4 - Transect 22, shovel test 4, surface in road wash

Catalog	Quan.	Description
1	2	unidentifiable square nails
2	1	staple
3	1	lock plate
4	1	metal button
5	1	2 piece metal button
6	1	winder knob/stem of pocket watch
7	1	1925 one cent coin (wheat penny)
8	1	unidentifiable wrought metal
9	1	lead (decorative) fragment
10	1	cobalt blue glass
11	1	green tinted bottle base
12	1	aqua bottle glass
13	2	clear bottle glass
14	1	alkaline glazed stoneware
15	1	undecorated whiteware
16	1	ironstone
17	1	blue glazed late ironstone
18	1	translucent quartz biface fragment
19	1	translucent quartz Palmer point
20	1	rhyolite tertiary core reduction flake
21	1	rhyolite Morrow Mountain point
22	1	skeet fragment

Provenience: 5 - Transect 22, shovel test 7

Catalog	Quan.	Description
1	1	unidentifiable square nail
2	1	clear bottle glass
3	1	lead canning jar lid
4	1	unidentifiable vinyl
5	1	undecorated whiteware
6	1	black glazed stoneware
7	1	decaled whiteware

Provenience: 6 - Transect 23, shovel test 5

Catalog	Quan.	Description
1	1	wing nut
2	1	unidentifiable nail
3	1.2g	unidentifiable flat metal

Provenience: 7 - Transect 23, shovel test 6

Catalog	Quan.	Description
1	4	translucent quartz shatter

Provenience: 8 - Transect 25, shovel test 7

Catalog	Quan.	Description
1	1	clear bottle glass

Provenience: 9 - Transect 26, shovel test 4

Catalog	Quan.	Description
1	1	translucent quartz thinning flakes

Provenience: 10 - Transect 26, shovel test 6

Catalog	Quan.	Description
1	1	translucent quartz thinning flakes

Provenience: 11 - Transect 26, shovel test 8

Catalog	Quan.	Description
1	1	translucent quartz thinning flake

Provenience: 12 - Transect 26/27, shovel test 8/9, surface

Catalog	Quan.	Description
1	1	milky quartz biface fragment
2	1	milky quartz tertiary flake
3	1	translucent quartz biface fragment
4	1	translslcuent quartz biface
5	1	translucent quartz flake fragment
6	1	translucent quartz shatter
7	1	rhyolite tertiary flake
8	1	tertiary flake

Provenience: 13 - Transect 27, shovel test 6

Catalog	Quan.	Description
1	1	crystal quartz thinning flake

Provenience: 14 - Transect 27, shovel test 7

Catalog	Quan.	Description
		No artifacts

Site No.: 31LN95 & 95**

Provenience: 1 - Transect 36, shovel test 5, surface

Catalog	Quan.	Description
1	3	undecorated ironstone
2	1	undecorated whiteware
3	1	milk glass bottle fragment
4	3	clear bottle glass
5	1	light green bottle glass

Provenience: 2 - Transect 36, shovel test 5

Catalog	Quan.	Description
1	1	tuff stemmed projectile point
2	2	translucent quartz tertiary flakes

Provenience: 3 - Transect 36, shovel test 6, surface

Catalog	Quan.	Description
1	3	translucent quartz tertiary flakes
2	1	translucent quartz stemmed point
3	1	schist early stage biface fragment,
4	1	schist biface tip
5	1	schist tertiary flake
6	4	rhyolite tertiary flakes
7	1	rhyolite point tip
8	2	rhyolite thinning flakes
9	1	tuff stemmed point
10	1	tuff stemmed point or knife

Provenience: 4 - Transect 36, shovel test 7

Catalog	Quan.	Description
1	5	translucent quartz tertiary flakes
2	1	translucent quartz shatter
3	2	translucent quartz thinning flakes

Provenience: 5 - Transect 36, shovel test 10

Catalog	Quan.	Description
1	1	translucent quartz secondary flake
2	5	translucent quartz tertiary flakes

Provenience: 6 - Transect 37, shovel test 6

Catalog	Quan.	Description
1	1	quartzite flake fragment

Provenience: 7 - Transect 37, shovel test 7

Catalog	Quan.	Description
1	1	translucent quartz shatter

Site No.: 31LN96 & 96**

Provenience: 1 - General Surface

Catalog	Quan.	Description
1	1	2-holed plastic button

Provenience: 2 - Transect 46, shovel test 16

Catalog	Quan.	Description
1	2	clear bottle glass

Provenience: 3 - Transect 46, shovel test 16

Catalog	Quan.	Description
1	1	clear bottle glass

Provenience: 4 - Transect 47, shovel test 15

Catalog	Quan.	Description
1	1	blue tinted bottle glass
2	2	clear bottle glass
3	1	clear bottle glass base
4	1	unidentifiable nail

Provenience: 5 - Transect 47, shovel test 16

Catalog	Quan.	Description
1	1	green tinted flat glass
2	1	unidentifiable nail
3	354.1g	brick

Provenience: 6 - Surface of road North of Tr. 47, st 16

Catalog	Quan.	Description
1	6.3g	whelk shell
2	1	metal bottle cap
3	4	clear bottle glass
4	1	milk glass bottle glass
5	1	amber bottle glass
6	3	undecorated whiteware

Provenience: 7 - Transect 167, shovel test 7

Catalog	Quan.	Description
1	1	green tinted bottle glass
2	2	clear flat glass

Provenience: 8 - Transect 167, shovel test 3

Catalog	Quan.	Description
1	1	whiteware
2	19.3g	unidentifiable metal object

Provenience: 9 - Transect 167, shovel test 4

Catalog	Quan.	Description
1	1	clear bottle glass
2	1	green tinted bottle glass

Provenience: 10 - Transect 168,shovel test 3 at 21m

Catalog	Quan.	Description
1	1	rubber fragment
2	1	brown bottle glass
3	3	clear bottle glass
4	1	enameled tin fragment
5	1	translucent quartz tertiary flake
6	1	tuff tertiary flake

Provenience: 11 - Transect 168, road surface

Catalog	Quan.	Description
1	1	whiteware
2	1	albany slipped stoneware

Provenience: 12 - Test unit 1

Catalog	Quan.	Description
1	1	rubber shoe plate
2	8	large mammalian long bone fragment
3	8	clear bottle glass
4	1	clear bottle base
5	1.5g	brick
6	9	undecorated whiteware
7	1	yellow glazed whiteware

Provenience: 13 - Test Unit 1, level 1

Catalog	Quan.	Description
1	25	undecorated whiteware
2	1	transfer printed whiteware
3	1	ironstone
4	1	yellow glazed whiteware
5	3	alkaline glazed stoneware
6	1	clear glazed red-bodied ware
7	5	unidentifiable bone fragments
8	1	mammalian tooth fragment
9	1	peach pit
10	1	walnut shell
11	1	unidentifiable nut fragment
12	11	unidentifiable nails
13	2	unidentifiable square nails
14	1	fence staple
15	7.7g	metal wire
16	1	metal spring
17	1	metal clothes rivet

18	1	unidentifiable metal object
19	1	lead fragment
20	3.8g	unidentifiable flat metal
21	0.9g	rubber fragments
22	1	tuff tertiary flake
23	3	translucent quartz thinning flakes
24	1	meta-volcanic tertiary flake
25	2	skeet fragment
26	28.8g	brick and mortar
27	0.7g	unidentifiable plastic
28	16	clear flat glass
29	179	clear bottle glass
30	9	clear molded glass
31	1	clear panel bottle glass
32	3	clear bottle necks
33	2	clear burned glass
34	2	blue glass
35	14	amber bottle glass
36	2	green bottle glass
37	1	molded green glass
38	6	aqua bottle glass
39	1	manganese bottle glass
40	1	dolls hand (bisque)
41	1	porcelain doll/ornament part
42	1	unidentifiable metallic tube

Provenience: 14 - Test Unit 1, level 1

Catalog	Quan.	Description
1	22.6g	brick
2	1	skeet fragment
3	3	roofing material
4	1	rubber fragment
5	1	bullet cartridge
6	1	metal rivet
7	1	unidentifiable metal strip
8	1	metal machine part
9	1	unidentifiable nail
10	< 0.1g	foil wrapper
11	5.4g	unidentifiable flat metal
12	0.1g	unidentifiable bone fragment
13	1	butchered mammalian long bone fragment
14	3	walnut shell
15	1	ironstone mug/cup
16	2	ironstone fragments
17	15	whiteware
18	1	decal decorated whiteware
19	1	purple decorated whiteware
20	2	clear glazed red-bodied ware
21	1	alkaline glazed stoneware
22	1	green stippled bottle glass
23	6	amber bottle glass

24	2	blue bottle glass
25	1	aqua bottle glass
26	2	light green flat glass
27	2	milk glass canning jar liners
28	11	clear flat glass
29	105	clear bottle glass
30	7	clear molded glass

Provenience: 15 - Test Unit 1, level 1

Catalog	Quan.	Description
1	4	undecorated whiteware
2	2	unglazed red-bodied ware
3	2	walnut fragments
4	0.3g	charcoal
5	1	green bottle glass
6	1	amber bottle glass
7	1	blue bottle glass
8	2	light green flat glass
9	2	clear flat glass
10	59	clear bottle glass
11	1	plough part
12	2	unidentifiable nails
13	1	metal stud
14	1	piece of slate
15	0.2g	blob of blue paint
16	2	rhyolite tertiary flakes
17	1	translucent quartz shatter

Site No.: 31LN97 & 97**

Provenience: 1 - Surface near 20m E of transect 172 shovel test 2

Catalog	Quan.	Description
1	1	clear bottle glass
2	1	rhyolite tertiary flake
3	1	tuff tertiary flake
4	1	grey chert thinning flake

Site No.: 31LN98 & 98**

Provenience: 1 - Transect 173, surface

Catalog	Quan.	Description
1	2	undecorated whiteware
2	1	translucent quartz tertiary flake

Site No.: 31LN99

Provenience: 1 - Surface south of transect 173, shovel test 3

Catalog	Quan.	Description
1	2	translucent quartz tertiary flakes
2	1	quartzite tertiary flake

Site No.: 31LN100 & 100**

Provenience: 1 - Surface along transect 43, shovel test 16

Catalog	Quan.	Description
1	1	stemmed tuff point
2	1	translucent quartz tertiary flake
3	1	green bottle glass
4	1	undecorated whiteware

Provenience: 2 - Surface @ end of transect 43 beyond shovel test 17

Catalog	Quan.	Description
1	1	rhyolite biface fragment

Provenience: 3 - Surface near transect 44, shovel test 14

Catalog	Quan.	Description
1	1	translucent quartz tertiary flake
2	1	rhyolite tertiary flake

Provenience: 4 - Transect 44, shovel test 14

Catalog	Quan.	Description
1	1	rhyolite tertiary flake

Provenience: 5 - General surface near transect 44

Catalog	Quan.	Description
1	1	rhyolite secondary flake

Provenience: 6 - Surface find near transect 45, shovel test 14

Catalog	Quan.	Description
1	1	tuff point tip

Provenience: 7 - Surface 10-20m N @ transect 45, shovel test 14

Catalog	Quan.	Description
1	1	undecorated ironstone
2	1	rhyolite tertiary flake
3	2	translucent quartz tertiary flake

Provenience: 8 - Surface find on transect 45, shovel test 15

Catalog	Quan.	Description
	1	tuff tertiary flake
	2	tuff side notched point

Site No.: 31LN1Ø1 & 1Ø1**

Provenience: 1 - Transect 41, shovel test 1Ø

Catalog	Quan.	Description
1	1	alkaline glazed stoneware

Provenience: 2 - Surface @ transect 42, shovel test 1Ø & 11

Catalog	Quan.	Description
1	1	molded clear glass
2	7	undecorated whiteware
3	1	mustard glazed stoneware
4	1	brown bottle glass
5	1	light green bottle glass
6	1	blue bottle glass
7	1	unidentifiable metal fragment
8	1	tuff tertiary flake
9	2.2g	unidentifiable bone

Site No.: 31LN1Ø2 & 1Ø2**

Provenience: 1 - General Surface

Catalog	Quan.	Description
1	1	rhyolite tertiary flake

Provenience: 2 - Transect 175, shovel test 5

Catalog	Quan.	Description
1	1	tuff tertiary flake
2	1	milky quartz tertiary flake
3	1	milky quartz thinning flake

Provenience: 3 - Transect 175, shovel test 6

Catalog	Quan.	Description
1	1	incised body sherd, sand temper
2	1	tuff tertiary flake
3	1	rhyolite tertiary flake

rovenience: 4 - Transect 176, shovel test 1

atalog	Quan.	Description
	2	clear glass
	1	translucent quartz thinning flakes
	1	rhyolite tertiary flake

ite No.: 31LN1Ø3 & 1Ø3**

rovenience: 1 -

atalog	Quan.	Description
	1	translucent quartz biface fragment
	1	whiteware
	4	rhyolite tertiary flakes

rovenience: 2 - Surface near shovel test 13

atalog	Quan.	Description
	3	rhyolite tertiary flake
	1	translucent quartz tertiary flake

ite No.: 31LN1Ø4

rovenience: 1 - Surface between transects 7&8, shovel test 14

atalog	Quan.	Description
	1	translucent quartz tertiary flake
	1	quartzite tertiary flake
	1	oolitic quartzite tertiary flake
	4	banded rhyolite tertiary flakes

Site No.: 31LN1Ø5 & 1Ø5**

Provenience: 1 - Surface at 2nd power line tower

Catalog	Quan.	Description
	2	translucent quartz biface fragment
	4	translucent quartz tertiary flakes
	2	translucent quartz shatter
	1	rhyolite thinning flake
	1	undecorated whiteware

Site No.: 31LN1Ø6 & 1Ø6**

Provenience: 1 - Transect 115, shovel test 1

Catalog	Quan.	Description
	1	tuff flake fragment

Provenience: 2 - Transect 162, shovel test 1Ø

Catalog	Quan.	Description
	1	translucent quartz core fragment
	1	milky quartz biface fragment
	1	crystal quartz biface

Provenience: 3 - Transect 162, shovel test 13

Catalog	Quan.	Description
	1	whiteware

Provenience: 4 - Transect 163, shovel test 5

Catalog	Quan.	Description
	1	rhyolite point tip
	18	rhyolite tertiary flakes
	2	tuff tertiary flakes
	1	tuff shatter
	1	translucent quartz thinning flake

Provenience: 5 - Transect 164, surface between St 4 & 5

Catalog	Quan.	Description
1	6	rhyolite tertiary flake
2	4	tuff tertiary flakes
3	2	tuff thinning flakes
4	1	tuff point base
5	4	welded tuff tertiary flakes
6	1	blue sponged whiteware
7	2	undecorated whiteware

Site No.: 31LN1Ø7

Provenience: 1 - Transect 178, shovel test 1

Catalog	Quan.	Description
1	7	translucent quartz third core reduction flake

Site No.: 31LN1Ø8

Provenience: 1 - Transect 178, locus 2, surface

Catalog	Quan.	Description
1	1	rhyolite Kirk corner notched point
2	1	rhyolite retouched flake
3	1	rhyolite tertiary flake
4	2	translucent quartz tertiary flakes

Site No.: 31LN1Ø9

Provenience: 1 - Transect 178, locus 3, surface

Catalog	Quan.	Description
1	1	translucent quartz tertiary flake
2	1	welded tuff tertiary flake
3	1	quartzite tertiary flake
4	1	chert tertiary flake
5	5	rhyolite tertiary flakes

Site No.: 31LN110

Provenience: 1 - Locus 4, surface

Catalog	Quan.	Description
1	5	milky quartz tertiary flakes
2	3	translucent quartz thinning flakes
3	8	translucent quartz tertiary flakes
4	1	translucent quartz utilized flake
5	1	tuff tertiary flake
6	8	rhyolite thinning flakes
7	25	rhyolite tertiary flakes

Site No.: 31LN111

Provenience: 1 - Translucent quartz 176, shovel test 5

Catalog	Quan.	Description
1	1	rhyolite thinning flake

Isolates

Provenience: Isolate 1, transect 1, shovel test 11

Catalog	Quan.	Description
1	1	translucent quartz uniface tool/scraper

Provenience: Isolate 2, transect 28, shovel test 2

Catalog	Quan.	Description
1	1	translucent quartz tertiary flake

Provenience: Isolate 3, transect 32, shovel test 1

Catalog	Quan.	Description
1	1	tuff tertiary flake

Provenience: Isolate 4, transect 33, shovel test 5

Catalog	Quan.	Description
1	1	translucent quartz tertiary flake
2	1	translucent quartz utilized flake

Provenience: Isolate 5, transect 33, shovel test 8

Catalog	Quan.	Description
1	1	translucent quartz tertiary flake

Provenience: Isolate 6, transect 40, shovel test 14

Catalog	Quan.	Description
1	1	undecorated whiteware

Provenience: Isolate 7, transect 41, shovel test 8

Catalog	Quan.	Description
1	1	undecorated whiteware

Provenience: Isolate 8, transect 49, shovel test 2

Catalog	Quan.	Description
1	1	translucent quartz thinning flake

Provenience: Isolate 9, transect 52, surface

Catalog	Quan.	Description
1	1	alkaline glazed stoneware

Provenience: Isolate 10, Surface near transect 61, shovel test 7

Catalog	Quan.	Description
1	1	ironstone fragment

Provenience: Isolate 11, transect 94, shovel test 7, surface

Catalog	Quan.	Description
1	1	translucent quartz core fragment

Provenience: Isolate 12, transect 156 near shovel test 12

Catalog	Quan.	Description
1	1	chert point fragment, Morrow Mountain

Provenience: Isolate 13, transect 156 near shovel test 13

Catalog	Quan.	Description
1	1	alkaline glazed stoneware
2	1	undecorated whiteware
3	1	translucent quartz tertiary flake

Provenience: Isolate 14, transect 157, shovel test 7

Catalog	Quan.	Description
1	1	translucent quartz thinning flake

Provenience: Isolate 15, transect 157, shovel test 10

Catalog	Quan.	Description
1	2	translucent quartz tertiary flakes

Provenience: Isolate 16, transect 158, shovel test 10

Catalog	Quan.	Description
1	1	translucent quartz shatter

Provenience: Isolate 17, transect 163, shovel test 3&4

Catalog	Quan.	Description
1	1	ironstone fragment
2	2	rhyolite tertiary flakes
3	1	chert secondary flake

Provenience: Isolate 18, surface at end of transect 163

Catalog	Quan.	Description
1	1	chert tertiary flake

Provenience: Isolate 19, surface east of transect 166

Catalog	Quan.	Description
1	1	tuff tertiary flake

Provenience: Isolate 20, transect 175, beginning of road surface

Catalog	Quan.	Description
1	1	rhyolite tertiary flake

Provenience: Isolate 21, transect 176, shovel test 10

Catalog	Quan.	Description
1	2	crystal quartz thinning flake

Provenience: Isolate 22, transect 176, 15m east of shovel test 10

Catalog	Quan.	Description
1	1	rhyolite utilized flake

Provenience: Isolate 23, transect 178, surface at road

Catalog	Quan.	Description
1	3	translucent quartz tertiary flake
2	1	rhyolite utilized flake

APPENDIX C.

RESUMES OF KEY PROJECT PERSONNEL

CHRISTOPHER T. ESPENSHADE

Brockington and Associates, Inc.
2853 Henderson Mill Road
Atlanta, Georgia 30341
(404) 491-7171

EDUCATION

B.A. in Anthropology, Wake Forest University, May 21, 1979.
M.A. in Anthropology, University of Florida, December 17, 1983.

FIELD SCHOOL

Wake Forest University Field School at the Pettit Site, a Pueblo-III ruin, Ramah, New Mexico; July 6 to August 16, 1976; under Dr. J. Ned Woodall.

AREAS OF SPECIALIZATION

Ceramic Technology, Southeastern Prehistory.

PROFESSIONAL SOCIETIES

Member, Society for American Archaeology
Member, Southeastern Archaeological Conference
Certified, Society of Professional Archeologists

EMPLOYMENT HISTORY: ARCHAEOLOGICAL SURVEY

December 1989; Principal Investigator; Archaeological Survey and HABS Documentation, Oak Island NC Coast Guard Station, B and A.

November 1989; Principal Investigator, Oconee-McGuire to Jocassee Transmission Corridors Survey, Pickens County, SC, with B and A.

August 1989; Principal Investigator, Oak Grove Survey, Charleston County, SC, with B and A.

August 1989; Principal Investigator, Terrapin Island Survey, Charleston County, SC, with B and A.

April-May 1989; Principal Investigator, 770 acre Palmetto Headlands Survey and Testing, Hilton Head, SC, B and A.

April 1989; Principal Investigator, 517 acre Brickyard Plantation Survey, Charleston County, SC, B and A.

February 1989; Principal Investigator, Resource Inventory II, SCS/DOE Experiment Project, Plant Yates, Coweta County, GA.

August 1988; Principal Investigator, Baker Creek State Park Road Survey, McCormick County, SC, B and A.

March 1988; Project Archaeologist, survey of the Jocassee-Tuckaseegee Corridor, NC-SC Mountains, for Duke Power Company, B and A.

January-February 1988; Principal Investigator, survey of A-1 Recreation Area, for Georgia Power Company, B and A.

October 1987; Principal Investigator, survey of C-5 Recreation Area, for Georgia Power Company, B and A.

September 1987; Principal Investigator, survey of Dewees Island, South Carolina, for Newkirk Environmental Consultants, B and A.

August, November 1987; Project Archaeologist, survey and testing of the proposed Little River Neck Golf Course, SC. B and A.

August 1987; Principal Investigator, survey of the proposed Prestwicke Development, Myrtle Beach, SC. B and A.

June-July 1987; Project Archaeologist, survey of proposed Coley Creek Facility, NC/SC Mountains, for Duke Power Company, B and A.

June 1987; Principal Investigator, survey of 302 acre proposed reservoir, Henry County, Georgia, for Clayton County, B and A.

May 1987; Principal Investigator, survey of 160 acre Palmetto Fort Tract, Coastal South Carolina, for Newkirk Environmental Consultants, B and A.

April 1987; Project Archaeologist, survey of 2,000 acre Arcadia Tract, Coastal South Carolina, for North Inlet Corp., B and A.

July-August 1985; Project Archaeologist, survey of the Vogtle - South Carolina Transimission Line, for Georgia Power Company, with Garrow & Associates, Inc. (G & A).

December 1984; Principal Investigator, survey of the Canton Cherokee County Business and Industrial Park (Georgia), G & A.

October 1984; survey work on the Laona-Goodman (Wisconsin) Pipeline Project for American Natural Resources, G & A.

June-August 1980; survey chief on surface survey for the U.S.A.F. M.X. Missile Project (Nevada), with Gilbert-Commonwealth Associates, Inc. and Basin Research Associates.

May 1979; survey work for the Greater Alamance Creek (N.C.) Project, with Wake Forest.

May-August 1978; survey and excavation for the Shenandoah National Park Cultural Resource Survey, with the University of Virginia.

May-June 1977; survey work on the Varina Farms (Va.) Project, for Virginia Commonwealth University.

EMPLOYMENT HISTORY: TESTING AND DATA RECOVERY EXCAVATION

March 1990; Principal Investigator, Evaluation of Three Sites in the Witherbee District, Francis Marion Forest, for the Forest Service, B and A.

February 1990; Principal Investigator, Testing of Two Lots in the New Bern NC Historic District, for Peterson Architects, B and A.

November-December 1989; Prinicpal Investigator; Archaeological Evaluation of 12 Sites, MCB Camp Lejeune NC, for the USCOE-Wilmington, B and A.

October-November 1989 and January 1990; Principal Investigator, Data Recovery Excavations at Camp Baird, Mitchelville, and 38BU967, Hilton Head, SC, B and A.

July 1989; Principal Investigator, Testing of Four Sites in Francis Marion National Forest, SC, for the USFS, B and A.

June 1989; Principal Investigator, Archaeological Testing of the Dorn Mill NRHP Site, for the McCormick Business League, B and A.

October 1988-June 1989; Principal Investigator, Documentation of Young's Mill, Troup Co,. GA., for USCOE-Mobile, B and A.

August 1988; Principal Investigator, Site Specific Survey and Evaluation of Four Sites at MCB Camp Lejeune, NC, for the USCOE-Wilmington District, B and A.

April-May 1988; Project Archaeologist, Data Recovery at Minim Island, SC, for the USCOE-Charleston District, B and A.

February-March 1987; Field Director on the data recovery controlled stripping of two sites, for ANR Pipeline, Inc., Northeastern Louisiana, B and A.

January 1987; Field Director on the testing of seven prehistoric sites, for ANR Pipeline, Inc., Northeastern Louisiana, B and A.

December 1986; Principal Investigator on the controlled stripping of Area II, 8Da411, Dade County Florida, for Capeletti Bros., Inc., G & A.

August-September 1986; Field Director on the data recovery excavations of an early Ostionoid village site, Cerrillos River, Puerto Rico, for the USCOE, G & A.

June-July 1986; Principal Investigator on the archaeological survey of six sites in the Voice of America Radio Relay Station Tract, Cabo Rojo, Puerto Rico, for the USCOE, G & A.

September 1985; project archaeologist for preliminary survey and testing at the Oxon Hill Site, Maryland, for the PortAmerica Development, G & A.

April 1985; project archaeologist on the survey and testing of the Honey Hill Archaeological Zone, Dade County, Florida, for the Miami Dolphins, G & A.

January 1985; field director on the testing of Ri 4 and Ri 3, Richmond County, Georgia, for the Vogtle-Goshen Transmission Line (Georgia Power), G & A.

November 1984; field director on the testing of GP-LI-Ø1, Liberty County, Georgia, for the Thalman-Liberty-Bryant Transmission Line (Georgia Power), G & A.

August-December 1979; excavation on a stratified terrace site, for the B. Everett Jordan Reservoir (N.C.) Project, with Gilbert-Commonwealth Associates, Inc..

July-August 1979; field assistant and osteologist on the excavation of a Miller III burial site, for the Tennessee-Tombigbee Waterway Project, with the University of Southern Mississippi.

December 1977; phase II survey work for the Greensboro (N.C.) Airport Project, with Wake Forest University.

July-August 1977; survey and salvage excavation for the Illinois Department of Transportation, with Western Illinois University.

EMPLOYMENT HISTORY: LABORATORY

June-December 1988; ceramicist for the Minim Island (S.C.) Data Recovery for the USCOE Charleston District, B and A.

January-February 1986; ceramicist for the Sumter (S.C.) Project, for the S.C. Dept. of Highways and Public Trans., G & A.

December 1982 to July 1983; ceramicist for the Jacksonville (Fla.) Electrical Authority Mitigation Project, with the University of West Florida.

June 1981 to September 1982; ceramicist for the Kings Bay Naval Support Base (Ga.) Mitigation Project, with the University of Florida.

January-March 1980; lab analysis of the lithics and ceramics from the B. Everett Jordan Reservoir Project, with Gilbert-Commonwealth Associates, Inc., Jackson, Michigan.

PUBLICATIONS AND PAPERS

1989 Christopher T. Espenshade
Archaeological Survey of the Oconee-McGuire to Jocassee Transmission Corridors, Pickens County, SC. B and A.

1989 Christopher T. Espenshade
Archaeological Survey of Terrapin Island, Charleston County, South Carolina. B and A.

1989 Christopher T. Espenshade
Archaeological Survey of the Oak Grove Tract, Charleston County, South Carolina. B and A.

1989 Christopher T. Espenshade
Archaeological Evaluation of 38CH146, 38CH426, 38CH1047, and 38CH1048, Francis Marion Forest, Charleston County, South Carolina. B and A.

1989 Christopher T. Espenshade
Archaeological Evaluation of the Dorn Mill National Register Site, McCormick, South Carolina. B and A.

1989 Christopher T. Espenshade and Ramona Grunden
Archaeological Survey and Testing of the Palmetto Headlands Tract, Hilton Head Island, South Carolina. B and A.

1989 Christopher T. Espenshade and Ramona Grunden
Archaeological Survey of the Brickyard Plantation Tract, Charleston County, South Carolina. B and A.

1989 Christopher T. Espenshade and Jeffrey W. Gardner
The Meal Tastes Sweeter: Documentation of Young's Grist and Saw Mills, West Point Lake, Troup County, Georgia. B and A.

1989 Christopher T. Espenshade, Jeffrey Gardner, and Marian Roberts
CRM: Resource Inventory II: SCS/DOE Experiment Project, Plant Yates, Coweta County, Georgia. B and A.

1989 Christopher T. Espenshade and Paul E. Brockington, Jr. (compilers)
An Archaeological Study of the Minim Island Site: Early Woodland Dynamics in Coastal South Carolina. B and A.

1988 Christopher T. Espenshade
An Archaeological Survey of the Proposed 329/43 Connector, McCormick County, South Carolina. B and A.

1988 Christopher T. Espenshade
Site Specific Survey of 31ON308, 31ON309, 31ON386, and 31ON391, Camp LeJeune, North Carolina. B and A.

1988 Christopher T. Espenshade, B. G. Southerlin, and Ruthanne Mitchell
Archaeological Survey of the North Carolina Portion of the Jocasee to Tuckaseegee Transmission Corridor, Transylvania and Jackson Counties, North Carolina. B and A.

1988 B. G. Southerlin and Christopher T. Espenshade
Archaeological Survey of Parker Island, Charleston County, South Carolina. B and A.

1988 James B. Legg, Christopher T. Espenshade, and Paul E. Brockington, Jr.
Historical Background for Georgia Pacific's Wando Tract, Charleston County, South Carolina. B and A.

1988 Christopher T. Espenshade and B. G. Southerlin
Limited Data Recovery Excavations at 16MO103 and 16MO60, Morehouse Parish, Louisiana. B and A.

1988 Christopher T. Espenshade, B. G. Southerlin, and Ruthanne Mitchell
Archaeological Survey of the South Carolina Portion of the Jocassee to Tuckaseegee Transmission Corridor, Pickens and Oconee Counties, South Carolina. B and A.

1988 Christopher T. Espenshade and Ruthanne L. Mitchell
CRM Wallace Dam Project, Greene County, Georgia: Recreation Area -1, Resource Inventory II: Final Report. B and A.

1988 Christopher T. Espenshade, Ruthanne L. Mitchell, and Bobby G. Southerlin
Archaeological Survey and Testing, Coley Creek Project, Oconee County, South Carolina and Transylvania County, North Carolina. B and A.

1987 Christopher T. Espenshade and Ruthanne L. Mitchell
CRM Wallace Dam Project, Greene County, Georgia: Recreation Area C-5, Resource Inventory II: Final Report. B and A.

1987 Christopher T. Espenshade, Paul E. Brockington, Jr., Joseph L. Tippett, and B. G. Southerlin
Archaeological Survey of Dewees Island, Charleston County, South Carolina. B and A.

1987 Christopher T. Espenshade and Ruthanne Mitchell
Archaeological Survey of the Proposed Prestwicke Development, Horry County, South Carolina. B and A.

1987 Paul E. Brockington, Bobby G. Southerlin, and Christopher T. Espenshade
Archaeological Reconnaissance of Proposed Borrow Areas in Horry County, South Carolina. B and A.

1987 Paul E. Brockington, Christopher T. Espenshade, Linda F. Stine, and Roy S. Stine
Archaeological Survey of the Morgan's Pointe Tract, Charleston County, South Carolina. B and A.

1987 Christopher T. Espenshade and Ruthanne L. Mitchell
Archaeological Survey of a Proposed Reservoir, Henry County, Georgia. B and A.

1987 Christopher T. Espenshade
Archaeological Survey of the Palmetto Fort Tract, Charleston County, South Carolina. B and A.

1987 Christopher T. Espenshade and Paul Brockington
Archaeological Survey of the Arcadia Tract, Georgetown County, South Carolina. B and A.

1987 Christopher T. Espenshade and Paul Brockington
Archaeological Survey and Testing of the Proposed ANR Pipeline: Ouachita, Morehouse, and Richland Parishes, Louisiana. B and A.

1987 Blanton, Dennis, Chris Espenshade, and Mary Beth Reed
Archaeological and Historical Investigations of Sligh Pottery: Stoneware Production in a Rural Industrial Complex. 20th Annual Meeting, Society for Historical Archaeology, Savannah, Georgia.

1986 Chrsitopher T. Espenshade
Archaeologically Controlled Stripping of Area II, 8Da411, Honey Hill Archaeological Zone, Dade County, Florida. Garrow & Associates, Inc (G & A).

1986 Christopher Espenshade
Data Recovery Excavations at Site PO-21, Cerrillos River Valley, Puerto Rico. G & A.

1986 Dennis B. Blanton and Christopher T. Espenshade
CRM: Vogtle-Effingham-Thalmann 500 KV Electric Transmission Line, GP-SN-05 Data Recovery. G & A.

1986 Christopher Espenshade, Dennis Blanton, David Lorne McWatters, and J.W. Joseph
Site-Specific Archaeological Survey and Additional Reconnaissance of Selected Portions of the Proposed Voice of America Relay Station, Cabo Rojo, Puerto Rico. G & A.

1986 Christopher Espenshade
Climbing on the Macro Band Wagon. Twelfth Annual Conference on South Carolina Archaeology, Columbia.

1986 Christopher Espenshade
CRM: Vogtle-Effingham-Thalmann 500 KV Electric Transmission Line, GP-SN-13 Data Recovery. G & A.

1986 Christopher T. Espenshade
Chapter 5: The Late Formative Stage, and Chapter 10: Ceramic Analysis; Typology and Classification. In Aboriginal Subsistence and Settlement Archaeology of the Kings Bay Locale, edited by William H. Adams. University of Florida.

1986 Dennis B. Blanton, Chris Espenshade, and Paul E. Brockington
An Archaeological Study of 38SU83: A Yadkin Phase Site in the Upper Coastal Plain of South Carolina. G & A.

1985 Christopher T. Espenshade
Archaeological Survey of a Portion of the Oxon Hill Site, Oxon Hill, Maryland. G & A.

1985 Christopher T. Espenshade
Test Excavations at the Mausoleum, Oxon Hill Manor Site, Oxon Hill, Maryland. G & A.

1985 Christopher T. Espenshade
Cultural Resource Management: Resource Inventory I and II: Vogtle - South Carolina Transmission Line, Burke County, Georgia. G & A.

1985 Christopher T. Espenshade
Preliminary Investigations at the Site of the Addison Family Cemetery, Oxon Hill, Maryland. G & A.

1985 Lisa O'Steen and Christopher Espenshade
Archaeological Testing of Two Cultural Properties, GP-SN-Ø3 and GP-SN-Ø5, Screven County, Georgia, within the Proposed Vogtle - Effingham - Thalmann Electric Transmission Line. G & A.

1985 Christopher T. Espenshade
Archaeological Survey and Testing in the Honey Hill Archaeological Zone, Dade County, Florida. G & A.

1985 Christopher T. Espenshade
Archaeological Survey of the Proposed Canton Cherokee County Business and Industrial Park, Etowah River, Georgia. G & A.

1985 Christopher Espenshade and Ruthanne Mitchell
Archaeological Testing of Three Cultural Properties, (T) 9 Ri C.P.#3, (T) 9 Ri C.P.#4, and (T) 9 Bur C.P.#29, in Richmond and Burke Counties, Georgia, within the Proposed Vogtle to Goshen Electric Transmission Line. G & A.

1984 Christopher T. Espenshade and Daniel T. Elliott
Archaeological Survey of the Proposed Laona-Goodman Lateral Pipeline in Forest and Marinette Counties, Wisconsin. G & A.

1984 Christopher T. Espenshade and Paul E. Brockington, Jr.
Archaeological Testing of GP-LI-Ø1, Liberty County, GA. G & A.

1984 Christopher T. Espenshade
Aboriginal Household Pottery Production at the Gauthier Site, Florida. 41st Annual Meeting of the Southeastern Archaeological Conference, Pensacola.

1984 Chung Ho Lee, Christopher Espenshade, Irvy Quitmyer, and Robert Johnson
Estuarine Adaptations During the Late Prehistoric Period: Archaeology of Two Shell Midden Sites on the St. Johns River. The University of West Florida.

1983 Christopher T. Espenshade
Savannah Problems and Alachuan Interpretations: Ceramic Evidence from the Northeast Florida Coast. 4Øth Annual Meeting of the Southeastern Archaeological Conference, Columbia.

1983 Christopher T. Espenshade
Ceramic Ecology and Aboriginal Household Pottery Production at the Gauthier Site, Florida. Unpublished Masters Thesis, University of Florida.

1983 Christopher T. Espenshade
Book Review: Archaeological Ceramics. The Florida Journal of Anthropology 8(1): 54-58.

1982 Teresia R. Lamb, Christopher T. Espenshade, and Robert C. Wilson
Ceramic Technology and the Typing of Undecorated Pottery from Southern Louisiana. 39th Annual Meeting of the Southeastern Archaeological Conference, Memphis.

1981 Christopher Espenshade
The Lack of a Wilmington/Savannah Distinction at Kings Bay, Georgia. Early Georgia 9:25-32.

1977 Charles Troup, Christopher Espenshade, Christopher Hays, and Marcie Bergman
An Evaluation of the Cultural Resources of Tracts I, II, and III, Madison and Green Counties, Shenandoah National Park, Virginia. University of Virginia.

JEFFREY W. GARDNER

Brockington and Associates, Inc.
2853 Henderson Mill Road
Atlanta, Georgia 30341
404 491-7171

EDUCATION

M.A. in Anthropology. University of Tennessee, Knoxville, 1987. Areas of Concentration - Historic Period Settlement, Primary Historical Records Research.

B.A. in Anthropology. Ohio State University, 1978.

PROFESSIONAL POSITIONS AND EXPERIENCE

November 1987-Present
Archaeologist, Brockington and Associates, Inc., Atlanta, Georgia.

July-November 1987
Archaeologist, Ladies Hermitage Association, Hermitage, Tennessee.

May-June 1987
Archaeologist, BARCON Inc., Environmental Services, LaVergne, Tennessee.

February-April 1987
Archaeologist, Brockington and Associates, Inc., Atlanta, Georgia.

April-September 1986
Archaeologist I, Tennessee Division of Archaeology, Department of Conservation.

March 1985-March 1986
Planning Technician I, Tennessee Historic Commission and Knoxville/Knox County Metropolitan Planning Commission.

September-December 1984
Archaeologist I, Tennessee Division of Archaeology, Department of Conservation.

ctober 1981-June 1984
ield Supervisor/Historic Sites Supervisor, Anthropology epartment, University of Tennessee, Knoxville.

ctober 1981
roject Director, Anthropology Department, University of ennessee.

ovember 1979-September 1981
rchaeological Field and Lab Technician, Anthropology Department, niversity of Tennessee.

arch-August 1979
ield Assistant, Ohio Historical Center, Columbus, Ohio.

une-September 1978
rchaeological Field Technician, Western Illinois University, acomb, Illinois.

pril-June 1978
rchaeological Field Technician, Ohio Historical Center, olumbus.

eptember 1977
rchaeological Field Technician, University of Mississippi,

une-August 1977
ield School, Ohio State University, Columbus, Ohio.

ROJECTS DIRECTED

989/90; Resource Inventory I/II: North Georgia Hydroelectric roject, Georgia, for Georgia Power Company. Brockington and ssociates, Inc.

989; Resource Inventory II: Lloyd Shoals Hydroelectric Project, eorgia, for Georgia Power Company. Brockington and Associates, nc.

988; Resource Inventory I: Lloyd Shoals Hydroelectric Project, eorgia, for Georgia Power Company. Brockington and Associates, nc.

988; Jocassee to Bad Creek to Coley Creek Transmission Corridor urvey, for Duke Power Company. Brockington and Associates, Inc.

988; Resource Inventory II: Riverview and Langdale Hydroelectric rojects, Georgia and Alabama, for Georgia Power Company. rockington and Associates, Inc.

1987; Resource Inventory I: Riverview and Langdale Hydroelectric Projects, Georgia and Alabama, for Georgia Power Company. Brockington and Associates, Inc.

1987; Hunter's Hill Survey and Testing Project, for the Ladies Hermitage Association. Hermitage, Tennessee.

1987; Proffitt House Site (40Bt46) Testing Project, for The City of Alcoa, Tennessee. BARCON Inc., Environmental Services.

1983-1984; Bandy Creek Testing/Mitigation Project, Scott County, Tennessee, for the U.S. Army Corps of Engineers, Nashville District. The University of Tennessee.

1981; James White Second Home Site Testing, Knoxville, Tennessee, for the Tennessee Department of Transportation. The University of Tennessee.

OTHER PROFESSIONAL EXPERIENCE

1989; Project Co-Director, Architectural and Historical Documentation of Young's Mill. West Point Lake, Troup County, Georgia. Brockington and Associates, Inc.

1987; Field Assistant, Data Recovery at an Early Mississippian Village in Northeast Louisiana. Brockington and Associates, Inc.

1987; Field Assistant, Cultural Resource Surveys in Horry, Georgetown, and Charleston Counties, South Carolina. Brockington and Associates, Inc.

1985-1986; Architectural Surveyor, Identification and Recording of Historic Buildings, Structures, and Sites in Rural and Urban Areas. Tennessee Historic Commission and Knoxville/Knox County Metropolitan Planning Commission.

1984; Crew Chief, Testing and Excavation at Federal Period Fort Southwest Point (1797-1807), Kingston, Tennessee. Division of Archaeology, Tennessee Department of Conservation.

1980; Field Assistant, Weaver Pottery Site Project: Testing of Late Nineteenth Century Stoneware Manufacturing Site. The University of Tennessee.

1980; Field Assistant, Cumberland Plateau Archaeological Research Project: Survey of Uplands Areas. Tennessee Historical Commission and The University of Tennessee.

1980; Field Assistant, Tellico Reservoir Project; Testing and Final Systematic Surface Collection Prior to Inundation. The University of Tennessee.

1979; Field Assistant, Archival Research, Survey, Testing, and Report Preparation, Highway Construction Projects. The Ohio Historical Center and the Ohio Department of Transportation.

1978; Field Assistant, FAI 270 Salvage Project: Survey and Testing of Historic and Prehistoric Sites in Outerbelt I-270 Right-of-Way. Western Illinois University and the Illinois Department of Transportation.

1978; Field Assistant, Great Bend Project: Archaeological Survey of Ohio River Terrace and Upland Slope Areas. Ohio Historical Center and the Southern Ohio Electric Company.

1977; Field Assistant, Testing of Archaic Quarry and Tool Manufacturing Sites, Tishimingo County, Mississippi.

1977; Student, Ohio State University Field School. Excavation of Middle Woodland Structure within Hopewell Ceremonial Earthwork, Seip Mound State Memorial, Ross County, Ohio.

REPORTS, PAPERS, AND PUBLICATIONS

1982 (with T.A. Ferguson and R.A. Pace)
An Archaeological Survey and Testing of Proposed Construction Areas and Road Right-of-Way in the Bandy Creek Development Site of the Big South Fork National River and Recreation Area. Report submitted to the Nashville District U.S. Army Corps of Engineers.

1983 (with T.A. Ferguson)
Archaeological Survey and Testing of the Proposed Construction Areas and Road Right-of-Way of the National Park Service Firing Range. Report Submitted to the Nashville District U.S. Army Corps of Engineers.

1984 (with T.A. Ferguson and R.A. Pace)
An Archaeological Reconnaissance and Testing of Proposed Construction Areas and Road Rights-of-Way in the Blue Heron, Devil's Jump, and Leatherwood Ford Overlooks of the Big South Fork National River and Recreation Area. Report submitted to the Nashville District U.S. Army Corps of Engineers.

985 (with R.A. Pace)
xploring Dimensions of Illegal Liquor Manufacture: Moonshining s a Cottage Industry in the Southern Appalachians. Paper resented at the Annual Meeting of the Society for Historical rchaeology, Williamsburg, Virginia.

985 (with R.A. Pace)
xploring Dimensions of Illegal Liquor Manufacture: Moonshining s a Cottage Industry in the Southern Appalachians. Tennessee nthropologist X(1): 1-26.

986 (with T.A. Ferguson, R.A. Pace, and R.W. Hoffman)
n Archaeological Reconnaissance and Testing of Indirect Impact reas Within Selected Development Sites of the Big South Fork ational River and Recreation Area. Report submitted to the ashville District U.S. Army Corps of Engineers.

986
he Effects of Kinship on Land Transfer: A Study of Settlement on he Cumberland Plateau of Kentucky and Tennessee. M.A. Thesis, epartment of Anthropology, University of Tennessee.

987
hase II Investigations at the Proffitt House Site (40Bt46), lcoa, Tennessee. Report submitted to the City of Alcoa and the ashville District U.S. Army Corps of Engineers.

987
he Hunter's Hill Project: Historical and Archaeological Research t the Shute-Turner Farm, Davidson County, Tennessee. Report ubmitted to the Ladies Hermitage Association.

987
he Effects of Kinship on Land Transfer: A Study of Settlement on he Cumberland Plateau of Kentucky and Tennessee. Paper resented at the Annual Meeting of the Southeastern rchaeological Conference, Charleston, South Carolina.

988 (with Ruthanne L. Mitchell and Paul E. Brockington)
ocumentation: Langdale and Riverview Hydroelectric Generating rojects, Chambers County, Alabama and Harris County, Georgia: ultural Resource Management, Resource Inventory I. Document ubmitted to Georgia Power Company by Brockington and Associates, nc., Atlanta.

988
ocumentation: Langdale and Riverview Hydroelectric Generating rojects, Chambers County, Alabama and Harris County, Georgia: ultural Resource Management, Resource Inventory II. Document ubmitted to Georgia Power Company by Brockington and Associates, nc., Atlanta.

1988 (with B.G. Southerlin, Ruthanne Mitchell, and Christopher T. Espenshade)
Archaeological Survey of the Jocassee to Bad Creek to Coley Creek Transmission Corridors, Oconee County, South Carolina. Report submitted to Duke Power Company by Brockington and Associates, Inc.

1988 (with JoLee A. Gardner)
Documentation: Lloyd Shoals Hydroelectric Generating Project, Butts, Henry, Jasper, and Newton Counties, Georgia: Cultural Resource Management, Resource Inventory I. Document submitted to Georgia Power Company by Brockington and Associates, Inc., Atlanta.

1989
Documentation: Lloyd Shoals Hydroelectric Generating Project, Butts, Henry, Jasper, and Newton Counties, Georgia: Cultural Resource Management, Resource Inventory II. Document submitted to Georgia Power Company by Brockington and Associates, Inc., Atlanta.

1989 (with Christopher T. Espenshade)
The Meal Tastes Sweeter: Documentation of Young's Mill, West Point Lake, Troup County, Georgia. Report submitted to the Mobile District US Army Corps of Engineers by Brockington and Associates, Inc.

1989 (with Christopher T. Espenshade)
Archaeological Survey and Testing of a Line Change on the Bad Creek To Jocassee Transmission Corridors, Oconee County, South Carolina. Report submitted to Duke Power Company by Brockington and Associates, Inc.

1990
Documentation: North Georgia Hydroelectric Generating Project, Habersham, Rabun, and Stephens Counties, Georgia, and Oconee County, South Carolina: Cultural Resource Management, Resource Inventories I and II. Document submitted to Georgia Power Company by Brockington and Associates, Inc., Atlanta.

BOBBY G. SOUTHERLIN

Brockington and Associates
3781 Presidential Parkway, Suite 104
Atlanta, Georgia 30340
(404) 457-6323

EDUCATION

B.A. in Anthropology, University of South Carolina, 1988.
Accepted: Graduate Program, Anthropology, University of Georgia.

FIELD SCHOOL

University of South Carolina 1981 Field School, Mulberry Plantation, Kershaw County, South Carolina. Under Dr. Leland Ferguson.

AREAS OF SPECIALIZATION

Archaeology of Southeastern Coastal Plain
Archaeological Replication

EMPLOYMENT HISTORY

July 1988; Field Director, Survey of 840 acre Parker Island, Charleston County, SC, with Brockington and Associates (B and A).

April-May 1988; Field Assistant, Data Recovery at Minim Island, SC, for the USCOE-Charleston District, B and A.

March 1988; Field Assistant, survey of the Jocassee-Tuckaseegee Corridor, NC-SC Mountains, for Duke Power Company, B and A.

January-February 1988; Field Assistant, survey of A-1 Recreation Area, for Georgia Power Company, B and A.

October 1987; Field Assistant, survey of C-5 Recreation Area, for Georgia Power Company, B and A.

September 1987; Field Assistant, reconnaissance of Dewees Island, South Carolina, for Newkirk Environmental Consultants, B and A.

August, November 1987; Field Assistant, survey and testing of the proposed Little River Neck Golf Course, SC. B and A.

August 1987; Archaeologist, survey of the proposed Prestwicke Development, Myrtle Beach, SC. B and A.

June-July 1987; Field Assistant, survey of proposed Coley Creek Facility, NC/SC Mountains, for Duke Power Company, B and A.

June 1987; Field Assistant, survey of 302 acre proposed reservoir, Henry County, Georgia, for Clayton County, B and A.

May 1987; Field Assistant, survey of 160 acre Palmetto Fort Tract, Coastal SC, for Newkirk Environmental Consultants, B and A.

April 1987; Field Assistant, survey of 2,000 acre Arcadia Tract, Coastal South Carolina, for North Inlet Corp., B and A.

March 1987; Field Assistant, site specific survey of Prospect Hill Plantation, Charleston County, SC, for Tang Investments, B and A.

March 1987; Field Assistant, archaeological reconnaissance of proposed borrow areas in Horry County, SC, for the USCOE-Charleston, B and A.

February-March 1987; Field Assistant on the data recovery controlled stripping of two sites, for ANR Pipeline, Inc., Northeastern Louisiana, B and A.

February 1987; Technician, survey of the Charlotte (NC) Outer Loop, with Garrow & Associates (G & A).

January 1987; Field Assistant on the testing of seven prehistoric sites, for ANR Pipeline, Inc., Northeastern Louisiana, B and A.

December 1986; Field Assistant on the controlled stripping of Area II, 8Da411, Dade County Florida, for Capeletti Bros., Inc., G & A.

August-October 1986; Technician for the survey and testing at Robins Air Force Base, GA, for the National Park Service, G & A.

August 1986; Technician for the Data Recovery at the Soapstone Ridge Quarry, for Waste Management Inc., G & A.

June-July 1986; Field Assistant on the archaeological survey of six sites in the Voice of America Radio Relay Station Tract, Cabo Rojo, Puerto Rico, for the USCOE, G & A.

April-May 1986; Technician for the Data Recovery Excavations at GP-JO-05, for Georgia Power Company, G & A.

December 1985-January 1986; Technician for the testing of various sites, Effingham County, GA, for the Fort Howard Paper Company, G & A.

November 1985; Technician for the Dunlap Site Data Recovery, Darlington County, SC, with the SC Institute of Anthropology and Archaeology.

October-November 1985; Technician for the Skidaway Island (GA) survey, for the Landing, G & A.

ugust-October 1985; Technician for data recovery excavations, 3-SU-83, for the SCDOHPT, G & A.

ugust 1985; Technician for the testing at GP-JO-05, Jones County, A, for Georgia Power Company, G & A.

ay-July 1985; Technician for testing and data recovery on various ites, Screven County, GA, for the Georgia Power Company, G & A.

arch 1985; Technician for testing, Drayton Hall, Charleston ounty, SC, for the National Trust for Historic Preservation.

ovember 1984; Technician on the phase 2 survey, Tyroza Basin, rkansas, for the Soil Conservation Service, with Mid-Continental esearch Associates.

ay-October 1984; Technician for the Daniel Island (SC) data ecovery, for the SCDOHPT, with Carolina Archaeological Services.

JBLICATIONS AND PAPERS

988 Christopher T. Espenshade and B. G. Southerlin
imited Data Recovery Excavations at 16MO103 and 16MO60, Morehouse arish, Louisiana. Brockington and Associates (B and A).

988 Christopher T. Espenshade, B. G. Southerlin, and Ruthanne Mitchell
rchaeological Survey of the South Carolina Portion of the ocassee to Tuckaseegee Transmission Corridor, Pickens and Oconee ounties, South Carolina. B and A.

988 Christopher T. Espenshade, Ruthanne L. Mitchell, and Bobby G. Southerlin
rchaeological Survey and Testing, Coley Creek Project, Oconee ounty, South Carolina and Transylvania County, North Carolina. B nd A.

987 Christopher T. Espenshade, Paul E. Brockington, Jr., Joseph L. Tippett, and B. G. Southerlin
rchaeological Survey of Dewees Island, Charleston County, South arolina. B and A.

987 Paul E. Brockington, Bobby G. Southerlin, and Christopher T. Espenshade
rchaeological Reconnaissance of Proposed Borrow Areas in Horry ounty, South Carolina. B and A.

RUTHANNE LIVADITIS MITCHELL

Brockington and Associates
2654 Langland Court
Atlanta, Georgia 30345
404 939-2292

EDUCATION

M.A. in Geography, Georgia State University, Atlanta, 1984.
B.A. in Anthropology, Georgia State University, Atlanta, 1979.
Archeaological Field School, University of South Carolina, 1980.

SOCIETY MEMBERSHIPS

Society for Historical Archaeology
Southeastern Archeaological Conference
Vernacular Architecture Forum
Southeastern Division of the Association of American Geographers

PROFESSIONAL POSITIONS

Present
Archaeologist/Historian, Brockington and Associates, Atlanta.

1986-1987
Historical Researcher, Southeastern Archeological Services, Athens.

1984-1986
Archaeologist/Historian, Garrow and Associates, Inc., Atlanta.

1983-1984
Associate Geologist/Cartographer, Georgia Department of Natural Resources, Georgia Geologic Survey, Atlanta.

1980-1983
Cultural Resource Specialist, Wapora, Inc., Atlanta.

1980
Historic Preservation Intern, Georgia Governor's Intern Program, City of Atlanta, Bureau of Cultural Affairs, Atlanta.

1979-1980
Graduate Student Assistant Cartographer, Department of Geography, Georgia State University, Atlanta.

1976-1979
Graphic Artist, Office of Educational Media, Geogia State University, Atlanta.

1975-1976
Student Assistant, Multi-cultural Atlanta Project, Department of Anthropology, Georgia State University, Atlanta.

PROJECTS

1987
Archaeological Survey and Testing, Coley Creek Project, Oconee County, South Carolina, and Transylvania County, North Carolina. Historian. Brockington and Associates (B & A).

1987
Resource Inventory II of the C-5 Tract, Greene County, Georgia. Historian. B & A.

1987
National Register Documentation for St. Cyprians Chapel, Franklin, North Carolina. Macon County Historical Society. Historian.

1987
Archaeological Survey and Testing of the Snee Farm Tract, Mt. Pleasant, South Carolina. Laboratory analysis and historical research. B & A.

1987
Archival Study of Lake Holt, Tuscaloosa County, Alabama. Historical researcher. Southeastern Archeological Services for US Corps of Engineers Mobile District.

1987
Archaeological Reconnaissance of Proposed Borrow Areas in Horry County, South Carolina. Laboratory analysis. B & A.

1987
Archaeological Survey of the Arcadia Tract, Georgetown, South Carolina. Laboratory analysis. B & A.

1987
Archaeological Study of a Portion of Prospect Hill Plantation, Edisto Island, South Carolina. Laboratory analysis. B & A.

1987
Archaeological Survey of a Proposed Reservoir, Henry County, Georgia. Historian. B & A.

1987
Archaeological Survey and Testing of the Charleston National Golf Course Tract, Charleston County, South Carolina. Laboratory analysis. B & A.

1987
Archaeological Testing and Data Recovery, ANR Pipeline, Morehouse, Ouachita, and Richland Parishes, Louisiana. Laboratory analysis. B & A.

1987
Cultural Resource Survey of the Allatoona Lake Area, Georgia. Historical research. Southeastern Archeological Services.

1986
Oglethorpe Power Corporation Pumped Storage Hydroelectric Facility Evaluations, Prefeaibility Report: Historical/Archeological Resources, the Johnson Crook Alternative, Walker County, Georgia. Historical research. Southeastern Archeological Services.

1986
Cultural Resource Survey of the Chattahoochee River Reregulation Dam and Lake, Forsyth and Gwinnett Counties, Georgia. Historical research. Southeastern Archeological Services.

1986
The History of White Oak Plantation, Coweta County, Georgia:1837-1986. Historian/Author. Southeastern Archeological Services.

1986
Archaeological Testing of the Fort Howard Tract, Effingham County, Georgia. Historian. Garrow and Associates.

1986
Archaeological Testing of Cultural Property GP-JO-5, Jones County, Georgia. Historian. Garrow and Associates.

1985
Historic American Buildings Survey Documentation for the Atlanta Fixtures Building, Fulton County, Georgia. Historian. Garrow and Associates.

1985
Historical and Archaeological Investigations of the New Bern Motor Inn Site, New Bern, North Carolina. Historical research. Garrow and Associates.

1985
Archaeological Investigation in Underground Atlanta. Historical research. Garrow and Associates.

1985
Archaeological Testing at Site 28, Fort Howard Tract, Effingham County, Georgia. Co-author and Historian. Garrow and Associates.

1985
Archaeological Testing and Data Recovery at Cultural Property GP-LI-01, Liberty County, Georgia. Historian. Garrow and Associates.

1984
Archaeological Potential of Land Tracts in Effingham County, Georgia and Jasper County, South Carolina: A Preliminary Archives and Literature Search. Co-author and Historian. Garrow and Associates.

1983
Hydrogeologic Atlas of Georgia. Editor and Cartographer. Georgia Geologic Survey.

1983
Cherry Hill Plantation Development Report, Bryan County, Georgia. Co-author, Archaeologist, Architectural Historian. Wapora, Inc.

1982
National Register Nomination: St. John's River Power Park, Jacksonville, Florida. Author. Wapora, Inc.

1981
Draft Task Report on the Cultural Resources of the Western Kentucky Coal Fields. Author. Wapora, Inc. for U.S. Environmental Protection Agency.

1981
Phase I Cultural Resource Survey of the Savan Gut Flood Control Project Area, Charolotte Amalie, U. S. Virgin Islands. Co-author and Architectural Historian. Wapora, Inc.

PAPERS PRESENTED

1987
Elliot, Daniel T. and Ruthanne L. Mitchell
Recent Research in the Ebenezer Settlement, Effingham County, Georgia. Society for Historical Archaeology Meeting. Savannah.

1983
Mitchell, Ruthanne L.
Report on the Architectural, Historical, and Archaeological Resources of the Henry Ford Plantation, Bryan County, Georgia. Georgia Geologic Survey Seminar.

Mitchell, Ruthanne L.
1981
Vernacular Architecture Patterns in Haralson, Coweta County, Georgia. Georgia Academy of Sciences Meeting. Atlanta.

1981
Mitchell, Ruthanne L.
The Changing Role of the Piedmont Cotton Town: Haralson, Georgia. Georgia Academy of Sciences Meeting. Atlanta.

1980
Mitchell, Ruthanne L.
Preliminary Cultural Resources Survey of Broomtown and Shinbone Valleys in Chattooga County, Georgia. Graduate Seminar, Department of Geography, Georgia State University. Atlanta.

1979
Ruthanne L. Mitchell
The Trickster Symbol as a Cultural Artifact. Southern Anthropology Society Meeting. Memphis.

RELATED RESEARCH

1979
Cultural Resource Management Seminar Exhibit. Department of Anthropology, Georgia State University. Exhibit of folklife and urban archaeology.

1976
Interpretive Illustrations of the Historic Barricade at Horseshoe Bend National Military Park, Alabama. Published in Alabama Archaeological Journal.

MARIAN D. ROBERTS

Brockington and Associates, Inc.
2853 Henderson Mill Road
Atlanta, Georgia 30341
404 491-7171

DUCATION

.S.S. in Anthropology and History. Mississippi State niversity, Starkville, Mississippi.

.A. in Art Education, Louisiana Tech University, Ruston, ouisiana.

ROFESSIONAL EXPERIENCE

resent
rchaeologist, Brockington and Associates, Atlanta, Georgia.
- Survey and testing of the Lowesville Tract, Lincoln County, North Carolina. Historian.
- Survey and testing at W. Kerr Scott Lake, Wilkes County, North Carolina. Historian.
- Testing at Drayton Hall Plantation, Charleston County, South Carolina. Historian.
- Survey of the Hodnett Lake Tract, Habersham County, Georgia. Historian.
- U.S. Highway 521 reconnaissance survey, Clarendon, Williamsburg, and Georgetown Counties, South Carolina. Field Director and Historian.
- Delta Plantation survey, Jasper County, South Carolina. Historian.
- Falls Lake survey and testing, Wake and Durham Counties, North Carolina. Historian.
- Delta Plantation survey, Beaufort County, South Carolina. Historian.
- 19th century plantation site (38CH950) on Palmetto Fort tract, Charleston County, South Carolina. Historian.
- Darrell Creek Plantation (38CH1080), Charleston County, South Carolina. Historian.
- Plant Yates survey and testing (GP-CW-01) Coweta County, Georgia. Historian/Laboratory Technician.
- Charleston National data recovery (38CH940), Charleston County, South Carolina. Laboratory Technician.

Bloody Point survey, Ribaut Island, Beaufort County, South Carolina. Historian/Laboratory Technician.
Plant Daniel Barge Canal survey, Jackson County, Mississippi. Historian.
True Blue Plantation data recovery (38GE372), Georgetown County, South Carolina. Historian/Laboratory Technician.
Turkey Hill Plantation data recovery (38GE299). Laboratory Technician.
Little River data recovery, (38HR243, 38HR245, and 38HR258A), Horry County, South Carolina. Laboratory Technician.
Seaside Plantation survey, Edisto Island, Charleston County, South Carolina. Laboratory Technician.

1988
Field Technician, Coastal Carolina Research, Tarboro, North Carolina.
Roanoke Island Historical Association Performing Arts Center survey, Dare County, North Carolina. Field Assistant.

1988
Historian/consultant, R. Christopher Goodwin and Associates, New Orleans, Louisiana.
Logansport Loop Pipeline testing, Jackson, Lincoln, Ouachita, and Union Parishes, Louisiana. Historian.

1985-1988
Assistant Historian/Senior Research Assistant/Archaeological Technician, Garrow and Associates, Atlanta, Georgia.
Raleigh Parking Deck project, Raleigh, North Carolina. Assistant Historian/Field Technician/Laboratory Technician.
Dobbins Park survey, Cobb County, Georgia. Historian.
Shawnee National Forest testing, Illinois. Historian/Laboratory Technician.
Grace Memorial Bridge Replacement buildings survey, Charleston County, South Carolina. Assistant Historian.
Oxon Hill Plantation data recovery, Prince Georges County, Maryland. Crew Chief/Laboratory Technician.
Old San Juan testing, San Juan, Puerto Rico. Laboratory Technician.
Skidaway project, Savannah, Georgia. Assistant Historian.
Hopewell/Cumming Transmission Line Survey, Georgia. Assistant Historian/Field Technician.
Maryland 100 testing, Annapolis County, Maryland. Assistant Historian.
Barrow Homestead testing, Kernersville, North Carolina. Assistant Historian/Field Technician/Laboratory Technician.

Fort Polk Management Plan, Vernon and Natchitoches Parishes, Louisiana. Assistant Historian/Laboratory Technician.
Charlotte Outer Loop survey, Charlotte, North Carolina. Field technician.
Blue Jay Point survey, Wake County, North Carolina. Assistant Historian.
Cascade Springs survey, Fulton County, Georgia. Assistant Historian.
Big Lazar Creek, Georgia. Assistant Historian.
Fort Knox testing, Kentucky. Assistant Historian.
Jimmie Green Lime Kiln data recovery, Charleston County, South Carolina. Assistant Historian.
Peabody Place testing, Peabody Hotel, Memphis, Shelby County, Tennessee. Assistant Historian/Field Technician/Laboratory Technician.
Data recovery at PO-21, Cerrillos River Valley, Puerto Rico. Laboratory Technician.
Warner Robbins Air Force Base testing, Georgia. Laboratory Technician.
Fort Howard testing, Georgia. Laboratory Technician.
The Search for Suter's Tavern testing, Georgetown, Washington, D.C.
GP-JO-Ø5 data recovery, Jones County, Georgia. Field technician/Laboratory Technician.

1984
Museum Accessions Registrar, Lois Dowdle Cobb Museum of Archaeology, Mississippi State University, Starkville, Mississippi.

1982-1984
Field Technician/Laboratory Technician, Cobb Institute of Archaeology, Mississippi State University, Starkville Mississippi.
Ingomar Mounds area survey, Union County, Mississippi. Field technician.
Prehistoric quarry and associated village data recovery, Lauderdale County, Mississippi. Field technician.
Westport salvage archaeology, Lowndes County, Mississippi. Field Technician/Laboratory Technician.
Tom Hardy Site survey and testing, Lowndes County, Mississippi. Field Technician/Laboratory Technician.
Rolling Hills Subdivision burials salvage, Starkville, Mississippi. Field Technician/Laboratory Technician.
Bryan Farms burials salvage, Clay County, Mississippi. Field Technician.

TECHNICAL REPORTS

Archaeological Survey and Testing At the Lowesville Tract, Lincoln county, North Carolina. Brockington and Associates, Inc. With Jeffrey W. Gardner, Christopher T. Espenshade, Ruthanne L. Mitchell, and Bobby L. Southerlin.

Historical and Archaeological Survey for W. Kerr Scott Project Near Wilkesboro, North Carolina. Brockington and Associates, Inc. With Joel D. Gunn and Barbara A. Lucas.

An Archaeological and Historical Overview of the Drayton Hall Tract, Incorporating Data from the 1990 Survey. Brockington and Associates, Inc. With Christopher T. Espenshade.

Archaeological Survey of the Hodnett Lake Tract, Habersham County, Georgia. Brockington and Associates, Inc. With Christopher T. Espenshade and Jeffrey W. Gardner.

Cultural Resources Reconnaissance of Multilaning U.S. 521, Manning to Georgetown, in Clarendon, Williamsburg, and Georgetown Counties, S.C. Brockington and Associates, Inc. With Eric C. Poplin.

Inspection, Evaluation and Testing of Historic Sites Located at Falls Lake, Wake, Durham, and Granville Counties, North Carolina. Brockington and Associates, Inc., Atlanta, Georgia. With Lawrence E. Abbott, Jr. and Matthew T. Wilkerson.

Archaeological Survey of the Delta Plantation Development Tract, Jasper County, South Carolina. Brockington and Associates, Inc., Atlanta, Georgia. With Eric C. Poplin and Linda K. Allan.

Archaeological Data Recovery at Three Sites on the Palmetto Fort Development Tract, Charleston County, South Carolina. Brockington and Associates, Atlanta, Georgia. With Eric C. Poplin and Christopher T. Espenshade. In preparation.

Archaeological Evaluation of Site 38CH1080, Charleston County, South Carolina. Brockington and Associates, Atlanta, Georgia. With Stephen H. Savage and Christopher T. Espenshade.

CRM: Resource Inventory II, S.C.S./D.O.E. Experiment Project, Plant Yates, Coweta County, Georgia. Brockington and Associates, Atlanta, Georgia. With Christopher T. Espenshade and Jeffrey Gardner.

Archaeological Survey of the Eigleberger Tract, Daufuskie Island, Beaufort County, South Carolina. Brockington and Associates, Atlanta, Georgia. With Paul E. Brockington, Jr. and Bobby G. Southerlin.

Archaeological Survey of the Proposed Plant Daniel Coal Barge Unloading Facility, Jackson county, Mississippi. Brockington and Associates, Atlanta, Georgia. With Eric C. Poplin and Carol J. Poplin.

Archaeological Survey of the Bloody Point Tract, Daufuskie Island, Beaufort County, South Carolina. Brockington and Associates, Atlanta, Georgia. With Paul E. Brockington, Jr. and Bobby G. Southerlin.

Phase II Archaeological Testing and Evaluation of Seven Sites in the Logansport Loop Pipeline Right-of-Way, Jackson, Lincoln, Ouachita, and Union Parishes, Louisiana. R. Christopher Goodwin and Associates, New Orleans, Louisiana. With Jim Wajtala.

An Assessment of the Interpretive Potential of the Proposed Dobbins Park Site, Cobb County, Georgia. Garrow and Associates, Atlanta, Georgia. With Lisa D. O'Steen.

APPENDIX B-2

North Carolina State Historic Preservation Office Letter of Concurrence

North Carolina Department of Natural and Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Roy Cooper
Secretary Susi H. Hamilton

Office of Archives and History
Deputy Secretary Kevin Cherry

April 13, 2017

Robert Niehaus
Duke Energy Carolinas
400 South Tryon Street
Mail Code ST28U
Charlotte, NC 28202

Re: Construct Duke Energy 400 MW Simple Cycle Combustion Turbine, Old Plank Road, Stanley, Lincoln County, ER 17-0575

Thank you for your letter of March 24, 2017, concerning the above project.

We have conducted a review of the project and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the project as proposed.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579 or environmental.review@ncdcr.gov. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona M. Bartos

APPENDIX C

Lincoln County CT Addition Natural Resources Report

Lincoln County CT Addition

Natural Resources Report

Prepared for:
DUKE ENERGY CAROLINAS, LLC
Charlotte, North Carolina

Prepared by:
HDR
Charlotte, North Carolina

March 2017

TABLE OF CONTENTS

LIST OF TABLES

APPENDICES

1.0 Potential Impacts Reference Guide

Study Area					
The proposed project is located in southeast Lincoln County, North Carolina, off of Old Plank Road about 15 miles east of the city of Lincolnton. The Study Area as referenced in this report encompasses two individual sites comprising approximately 105 acres (Appendix A, Figure 1).					
Resource	**Identified Resources within the Study Area**	**Potential Impacts**	**Recommended Action**	**Implementing Agency**	**Website**
Land Cover	Primarily forested with adjacent maintained land.	Land disturbance during construction.	Develop and submit Erosion and Sediment Control Plan.	North Carolina Department of Environmental Quality's Energy, Mineral and Land Resources	https://deq.nc.gov/about/divisions/energy-mineral-land-resources/erosion-sediment-control/
Federally Protected Species	On February 22, 2017, Terra Incognita conducted an on-site inventory for federally protected plants species. No protected species were identified within the Study Area. No habitat exists for federally protected animal species within the Study Area.	No impacts are anticipated.	Written notification from the U.S. Fish and Wildlife Service concurring that the proposed project will not affect any federally protected species.	U.S. Fish and Wildlife Service's Asheville Ecological Services Field Office	https://www.fws.gov/asheville/
Federal Emergency Management Agency Floodplains	A review of the Federal Emergency Management Agency National Flood Hazard Layer found that approximate 0.4 acres of Special Flood Hazard Areas exist within the Study Area.	Land disturbance during construction within the regulated floodplain.	Coordination with the Lincoln County Floodplain Administrator if impacts to the 0.4-acre regulated floodplain are unavoidable.	Lincoln County	http://www.lincolncounty.org
Regulated Riparian Buffers	No local or state-regulated riparian buffers occur within the Study Area.	Clearing within the streamside buffer zones.	Coordination with Lincoln County for proposed impacts within 50 feet of an existing streamside buffer zone.	Lincoln County	https://deq.nc.gov/riparian-buffer-rules http://www.lincolncounty.org/DocumentCenter/Home/View/680

Study Area					
The proposed project is located in southeast Lincoln County, North Carolina, off of Old Plank Road about 15 miles east of the city of Lincolnton. The Study Area as referenced in this report encompasses two individual sites comprising approximately 105 acres (Appendix A, Figure 1).					
Resource	**Identified Resources within the Study Area**	**Potential Impacts**	**Recommended Action**	**Implementing Agency**	**Website**
Wetlands and Jurisdictional Waters of the U.S. (Section 404 and 401 of the Clean Water Act)	Two (2) jurisdictional streams (one perennial and one intermittent) and one (1) jurisdictional scrub/shrub wetland were identified within the Study Area.	The design and access routes may result in potential impacts that require the discharge of dredged or fill material into waters of the United States.	Potential impacts would require a Nationwide Permit 39 and General Certification 3890 for Commercial and Institutional Developments. A Section 404/401 Individual Permit would be required for significant impacts that exceed thresholds authorized by a Nationwide Permit.	U.S. Army Corps of Engineers Wilmington District, Asheville Regulatory Field Office North Carolina Department of Environmental Quality's Division of Water Resources	http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Permits/Nationwide-Permits/ https://deq.nc.gov/about/divisions/water-resources/water-resources-permits/wastewater-branch/401-wetlands-buffer-permits/401-general-certifications

2.0 Introduction

This report presents the findings of a natural resources assessment conducted by HDR for Duke Energy Carolinas, LLC (Duke Energy) associated with a Certificate of Public Convenience and Necessity (CPCN) application for the proposed Lincoln County Combustion Turbine (CT) Addition. The proposed project is located in southeast Lincoln County, North Carolina, off of Old Plank Road about 15 miles east of the city of Lincolnton (Appendix A, Figure 1). The Study Area as referenced in this report encompasses two individual sites: one 5-acre site and one 100-acre site, totaling approximately 105 acres.

HDR's approach to this study involved a desktop review of publicly available data and an on-site investigation that included surveys for wetlands and jurisdictional waters of the U.S., federally protected species habitat, and classification of natural/vegetation communities. The following sections provide a summary of HDR's methods and findings of the desktop analysis and on-site environmental surveys. Attached to this report are supporting figures (Appendix A), stream identification and wetland determination data forms (Appendix B), photographs (Appendix C), and the Terra Incognita Findings Report (Appendix D).

3.0 Description of Study Area

The Study Area is located on the existing Lincoln Combustion Turbine Station property owned by Duke Energy. Specifically, a 5-acre site is located east of the combustion turbine facility and south the switchyard. An additional 100-acre site is located south of the combustion turbine facility, bound by an existing maintained right-of-way to the east and south, and Old Plank Road to the west. The Study Area is mostly forested and surrounded by agricultural, maintained open areas, residential properties, and forested undeveloped lands (Appendix A, Figure 2). The site topography consists of hilly terrain typical of the southern piedmont that drains to Killian Creek (Appendix A, Figure 3).

The Study Area is situated in the Southern Outer Piedmont ecoregion of North Carolina. Generally, the Piedmont is considered a transitional area between the mostly mountainous ecoregions of the Appalachians to the northwest and the relatively flat coastal plain to the southeast. This ecoregion "has lower elevations, less relief, less precipitation, and tends to have more cropland than those Inner Piedmont regions." (Griffith et al. 2002). The landform is mostly irregular plains rather than plains with high hills.

4.0 Desktop Analysis

HDR conducted a desktop review of publicly available data from federal and state agencies prior to engaging in field reconnaissance surveys. The following sources were consulted as part of this analysis:

- Federal Emergency Management Agency (FEMA) Map Service Center (https://msc.fema.gov/portal)
- National Hydric Soils List (Natural Resources Conservation Service [NRCS]) (https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/)
- National Hydrography Dataset (NHD) (U.S. Geological Survey [USGS]) (http://nhd.usgs.gov/)
- National Land Cover Database 2011 (NLCD) (Multi-Resolution Land Characteristics Consortium [MRLC]) (http://www.mrlc.gov/nlcd11_data.php)
- National Wetlands Inventory (NWI), U.S. Fish and Wildlife Service (USFWS) (http://www.fws.gov/wetlands)
- North Carolina Floodplain Mapping Program (http://www.ncfloodmaps.com/)
- North Carolina List of Federally Protected Species for Lincoln County, USFWS (http://www.fws.gov/raleigh/species/cntylist/nc_counties.html)
- North Carolina Natural Heritage Program (NCNHP) Element Occurrence database and shapefiles (http://www.ncnhp.org/web/nhp/element-occurrences)
- Soil Surveys for Lincoln County, NRCS (http://websoilsurvey.nrcs.usda.gov/app/)
- USGS topographic map; Lowesville 24K Quadrangle

4.1 NRCS Soils

The NRCS Soil Survey of Lincoln County, North Carolina identified five different soil types within the Study Area (Appendix A, Figure 4). All soils types are classified as non-hydric. A summary of the soil types located within the Study Area is provided in Table 1.

Table 1. NRCS Soil Types Located within the Study Area

Mapping Unit Symbol	Mapping Unit Name	Drainage Class	Hydric Rating
LdB2	Lloyd sandy clay loam, 2 to 8 percent slopes, moderately eroded	Well Drained	Not Hydric
LdC2	Lloyd sandy clay loam, 8 to 15 percent slopes, moderately eroded	Well Drained	Not Hydric
PaD	Pacolet sandy loam, 15 to 25 percent slopes	Well Drained	Not Hydric
PeC2	Pacolet sandy clay loam, 8 to 15 percent slopes, moderately eroded	Well Drained	Not Hydric
WyD	Wynott-Winnsboro-Rowan complex, 15 to 25 percent slopes	Well Drained	Not Hydric

4.2 Land Cover

HDR reviewed the 2011 land cover layer of the MRLC's NLCD. The NLCD identifies existing land cover classifications within and immediately adjacent to the Study Area as a mix of developed, herbaceous, forested, scrub/shrub, and agricultural lands (Appendix A, Figure 5).

4.3 Federally Protected Species

HDR obtained and reviewed a list of federally protected species for Lincoln County from the USFWS website, which was last updated on April 2, 2015. A summary of these species is provided in Table 2.

Table 2. Federally Protected Species for Lincoln County, North Carolina

Common Name	Scientific Name	Federal Designation[1]	Record Status[2]
Vertebrate			
Northern long-eared bat	*Myotis septentrionalis*	T	Probable/ Potential
Vascular Plants			
Dwarf-flowered heartleaf	*Hexastylis naniflora*	T	Current
Michaux's sumac	*Rhus michauxii*	E	Historic

[1] E = Endangered. A taxon "in danger of extinction throughout all or a significant portion of its range."
T = Threatened. A taxon "likely to become endangered within the foreseeable future throughout all or a significant portion of its range."
[2] Current = The species has been observed in the county within the last 50 years.
Probable/Potential = The species is considered likely to occur in this county based on the proximity of know records (adjacent counties), the presence of potentially suitable habitat, or both.
Historic = The species was last observed in the county more than 50 years ago.

4.4 Regulated Riparian Buffers and FEMA Floodplains

HDR reviewed the FEMA Map Service Center National Flood Hazard Layer (NFHL) and found that Special Flood Hazard Areas (SFHA) exists adjacent to Killian Creek and approximately 0.4 acres of FEMA-regulated floodplain is present in the southeast corner of the 100-acre site (Appendix A, Figure 6). The SFHA are classified by FEMA as high flood risk (AE) zones, and are subject to inundation by the 1-percent-annual-chance flood event being equaled or exceeded in any given year (i.e., 100-year flood) (FEMA 2015).

The Legislature of the North Carolina State General Assembly has delegated the responsibility or directed local government units to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry as outlined in Chapter 153A, Article 6, Section 121 (General Ordinance Authority) and Chapter 143, Article 21 (Watershed Protection Rules). The Unified Development Ordinance (UDO) for Lincoln County provides regulatory guidance regarding impacts to streamside buffer zones. Section 7.5.2 B of the Lincoln County UDO states that no development, including land disturbance activities, shall occur within the streamside buffer zones. Buffer zone 1 is defined as a minimum of 30 feet extending outward (i.e., landward) from the top of the stream bank on each side of the stream while Buffer Zone 2 extends 20 feet landward of Buffer Zone 1. A variance request and mitigation may be required by Lincoln County if the proposed project impacts existing streamside buffer zones. No state-regulated riparian buffers occur within the Study Area.

5.0 Field Reconnaissance

5.1 Wetlands and Jurisdictional Waters of the U.S.

On December 8, 2016, HDR biologists surveyed the Study Area for wetlands and jurisdictional waters of the U.S. under Section 404 of the Clean Water Act (CWA). The Study Area was examined according to the methodology described in the U.S. Army Corps of Engineers (USACE) 1987 Wetland Delineation Manual, USACE Post-Rapanos guidance, USACE Eastern Mountains and Piedmont Regional Supplement, and NCDWR Methodology for Identification of Intermittent and Perennial Streams and Their Origins (Version 4.11). Waters of the U.S. were mapped in the field using a Trimble Geo7x GPS unit capable of sub-meter accuracy.

On-site reconnaissance activities revealed that two jurisdictional streams and one jurisdictional wetland occur within the Study Area (Appendix A, Figure 7). A summary of delineated jurisdictional waters of the U.S. is provided in Table 3.

Table 3. Summary of Delineated Waters of the U.S.

Site Number or Name	Latitude/ Longitude	Cowardin Class	Estimated Amount of Aquatic Resource in Review Area
Streams			
Stream 1 (Tributary to Killian Creek)	35.43155 -81.03258	R3UB1	595 linear feet
Stream 2 (Tributary to Killian Creek)	35.42550 -81.03444	R4SB3	655 linear feet
		TOTAL:	**1,250 linear feet**
Wetlands			
Wetland 1	35.42478 -81.03455	PSS1B	0.001 acres
		TOTAL:	**0.001 acres**

5.2 Description of Waters of the U.S.

5.2.1 Relatively Permanent Water with Perennial Flow

A tributary to Killian Creek (Stream 1) was identified as a Relatively Permanent Water (RPW) that exhibits perennial surface water flow to downstream Traditional Navigable Waters (TNWs). This features is classified as riverine, cobble-gravel, unconsolidated bottom, upper perennial (R3UB1) according to the Cowardin hierarchical structure (Cowardin et al. 1979) and generally flows northeast through the 5-acre site. Stream bank heights ranged from 1 to 3 feet with widths ranging from 2 to 4 feet. Ordinary High Water Mark (OHWM) indicators include a clear, natural line impressed on the bank; shelving; vegetation matted down, bent, or absent; leaf litter disturbed or washed away; sediment deposition; the presence of wrack line; sediment sorting; and scour.

5.2.2 Relatively Permanent Water with Seasonal Flow

A tributary to Killian Creek (Stream 2) was identified as an RPW that exhibits seasonal or intermittent surface water flow to downstream TNWs. This feature is classified as riverine, cobble-gravel, streambed, intermittent (R4SB3) according to the Cowardin hierarchical structure and generally flows southeast through the 100-acre site. Stream bank heights ranged from 1 to 3 feet with widths ranging from 1 to 4 feet. OHWM indicators include leaf litter disturbed or washed away, depositional bars, and scour.

5.2.3 Scrub/Shrub Wetland

Wetland 1 was identified as a palustrine, scrub/shrub, broad-leaved deciduous, saturated wetland (PSS1B) according to the Cowardin hierarchical structure. This headwater wetland is located along the southern edge of the 100-acre site and flows downgradient through the existing utility right-of-way to a tributary to Killian Creek (Stream 2). Shrub vegetation is dominant and consists of tag alders (*Alnus serrulata*), willow oak (*Quercus phellos*), Chinese privet (*Ligustrum sinense*), and sawtooth blackberry (*Rubus argutus*). Herbaceous vegetation included deer-tongue grass (*Dichanthelium clandestinum*), soft rush (*Juncus effusus*), panicgrass (*Panicum sp.*), woolgrass (*Scirpus cyperinus*), and various sedges (*Carex* sp.).

Primary and secondary wetland hydrology indicators include saturation, oxidized rhizospheres on living roots, crayfish burrows, and geomorphic position. Hydric soil indicators include depleted matrix and redox features within the upper 12 inches of soil.

A map depicting the USGS NHD, the USFWS NWI, and delineated waters of the U.S. is provided in Appendix A (Figure 7). USACE Wetland Determination Data Forms and NCDWR Stream Identification Forms are provided in Appendix B, and representative photographs from HDR's field survey are provided in Appendix C.

5.3 Natural Communities

Based upon the Classification of the Natural Communities of North Carolina – Fourth Approximation (Schafale 2012), one distinct natural community can be classified as Mesic Mixed Hardwood Forest (Piedmont Subtype) located in uplands along the existing drainage areas within the Study Area (Appendix A, Figure 7). The remaining forested areas are managed planted pine forests. Below is a description of plants species identified during the site visit in each forest community type.

5.3.1 Mesic Mixed Hardwood Forest (Piedmont Subtype)

This community is comprised of mature woody, herbaceous, and vine species including black oak (*Quercus velutina*), northern red oak (*Quercus rubra*), scarlet oak (*Quercus coccinea*), water oak (*Quercus nigra*), white oak (*Quercus alba*), American sycamore (*Platanus occidentalis*), American beech (*Fagus grandifolia*), American elm (*Ulmus americana*), loblolly pine (*Pinus taeda*), shortleaf pine (*Pinus echinata*), mockernut hickory (*Carya tomentosa*), sweetgum (*Liquidambar styraciflua*), tulip poplar (*Liriodendron tulipifera*), red maple (*Acer rubra*), American holly (*Ilex opaca*), black cherry (*Prunus serotina*), ironwood (*Carpinus caroliniana*), flowering dogwood (*Cornus florida*), possumhaw holly (*Ilex decidua*), redcedar (*Juniperus virginiana*), greenbrier (*Smilax rotundifolia*), Japanese honeysuckle (*Lonicera japonica*), crossvine (*Bignonia capreolata*), strawberry bush (*Euonymus americanus*), lopseed (*Phryma leptostachya*), spotted pipsissewa (*Chimaphila maculata*), Christmas fern (*Polystichum acrostichoides*), ebony spleenwort (*Asplenium platyneuron*), cutleaf grapefern (*Botrychium dissectum*), and heartleaf (*Hexastylis sp.*).

5.3.2 Planted Pines

This forested community is dominated by a loblolly pine canopy. Midstory woody species, vines, and herbs are scarce and included sweetgum, redcedar, winged elm (*Ulmus alata*), Japanese honeysuckle, and Christmas fern.

Routinely maintained open areas and utility line rights-of-way are located along the perimeter of the Study Area.

5.4 Terrestrial Wildlife

Terrestrial communities in the Study Area are primarily comprised of forested habitats that may support a diverse number of wildlife species. Representative mammal, bird, reptile, and amphibian species commonly occurring in these habitats are listed below. Note individual species and/or evidence of species observed during HDR's field survey are indicated with an asterisk (*). Information on species that typically use these habitats in the Southern Outer Piedmont ecoregion was obtained from relevant literature, mainly the *Biodiversity of the Southeastern United States, Upland Terrestrial Communities* (Martin et al. 1993).

Mammal species that commonly occur in these habitats include Eastern Cottontail (*Sylvilagus floridanus*); Gray Squirrel (*Sciurus carolinensis*)*; various vole, rat, and mice species; raccoon (*Procyon lotor*)*, Virginia opossum (*Didelphis virginiana*), Groundhog (*Marmota monax*); White-tailed Deer (*Odocoileus virginianus*)*, Gray Fox (*Urocyon cinereoargenteus*) and Red Fox (*Vulpes vulpes*). Bird species that commonly use these habitats include American Crow (*Corvus brachyrhynchos*)*, American Robin (*Turdus migratorius*), Blue Jay (*Cyanocitta cristata*)*, Carolina Chickadee (*Poecile carolinensis*)*, Carolina Wren (*Thryothorus ludovicianus*)*, Gray Catbird (*Dumetella carolinensis*), Brown Thrasher (*Toxostoma rufum*), Red-eyed Vireo (*Vireo olivaceus*), Yellow-throated Vireo (*Vireo flavifrons*), Northern Mockingbird (*Mimus polyglottos*)*, Scarlet Tanager (*Piranga olivacea*), Wood Thrush (*Hylocichla mustelina*), Pileated Woodpecker (*Dryocopus pileatus*), Northern Flicker (*Colaptes auratus*)*, Red-bellied Woodpecker (*Melanerpes carolinus*)*, Red-headed Woodpecker* (*M. erythrocephalus*), Downy Woodpecker (*Picoides pubescens*)*, and Hairy Woodpecker (*Picoides villosus*). Raptors on the site may include Red-shouldered Hawk (*Buteo lineatus*), Red-tailed Hawk (*Buteo jamaicensis*)*; owl species, and Turkey Vulture (*Cathartes aura*)*. Reptile and amphibian species that may use this terrestrial community include the Eastern Black Rat Snake (*Pantherophis alleghaniensis*), Eastern Corn Snake (*P. guttatus*), Eastern Hognose Snake (*Heterodon platirhinos*), Copperhead (*Agkistrodon contortrix*), Spotted Salamander (*Ambystoma maculatum*), Slimy Salamander (*Plethodon glutinosus*), Southern Dusky Salamander (Desmognathus auriculatus), American Toad (*Anaxyrus americanus*), Fowlers Toad (*A. fowleri*), Gray Treefrog (*Hyla versicolor*), Eastern Box Turtle (*Terrapene carolina carolina*)*, Eastern Fence Lizard (*Sceloporus undulatus*), Five-lined Skink (*Plestiodon fasciatus*), and Spring Peeper (*Pseudacris crucifer*).

5.5 Federally Protected Species

HDR's on-site survey also served to identify potential habitat and possible individuals of federally protected species listed above in Table 2 for Lincoln County. HDR consulted the NCNHP Element Occurrence database for protected species distribution and proximity to the Study Area. The NCNHP database revealed that there are no known occurrences of federally protected species within the Study Area (Appendix A, Figure 8). The following is a summary of biological conclusions for species that are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973.

5.5.1 Vertebrates

Northern long-eared bat (*Myotis septentrionalis*) [Federally Threatened]

USFWS Recommended Survey Window: May 15 – August 15 (summer); January 15 – February 15 (winter - hibernacula)

The northern long-eared bat measures approximately 3 to 3.7 inches long, but has a wingspan of 9 to 10 inches. Distinguished by its long ears, the northern long-eared bat is found across much of the eastern and north-central U.S. and all Canadian provinces from the Atlantic coast to the southern Northwest Territories and eastern British Columbia. The species' range includes 37 states. White-nose syndrome, a fungal disease known to affect bats, is currently the predominant threat to this species.

Northern long-eared bats have two distinct seasonal habitats. Winter habitats include caves and mines (hibernacula), whereas summer habitats consist of roosting singly or in colonies underneath bark, in cavities, or crevices of both live and dead trees. On rare occurrences this bat has also been found roosting in man-made structures such as barns or sheds.

Northern long-eared bats emerge at dusk to fly through the understory of forested hillsides and ridges feeding on moths, flies, leafhoppers, caddisflies, and beetles, which they catch while in flight using echolocation. The bat also feeds by gleaning motionless insects from vegetation and water surfaces.

Several mature trees (greater than 12 inches in diameter) that exhibit exfoliating bark (i.e., hickories and oaks) and dead tree snags were observed within the mixed hardwood forest portion of the Study Area and may serve as potential roosting habitat. According to the NCNHP database, no known occurrences including hibernacula and/or maternity roost trees have been documented within or within close proximity to the Study Area. It is assumed that no clearing restrictions or mitigation measures will be required. Therefore, potential incidental take of this species via project activities is exempt under the final 4(d) rule of the Endangered Species Act.

5.5.2 Vascular Plants

Dwarf-flowered heartleaf *(Hexastylis naniflora)* [Federally Threatened]

USFWS Optimal Survey Window: March-May

The dwarf-flowered heartleaf has dark green, heart-shaped, evergreen leaves and small jug-shaped flowers. The leaves are 1.6 to 2.4 inches (4 to 6 centimeters) long and supported by a long, thin stem that rises from an underground root. The flowers are jug-shaped, measuring 0.23 to 5 inches (6 to 13 millimeters) long, and the calyx tube is typically between 0.15 to 0.27 inches (4 to 7 millimeters) in diameter, ranging in color from beige to dark brown and sometimes greenish or purplish. Flowering occurs from mid-March to early June.

The dwarf-flowered heartleaf is found in the upper piedmont regions of North and South Carolina, growing in acidic, sandy loam soils along bluffs and nearby slopes, in boggy areas adjacent to creek heads and streams, and along the slopes of hillsides and ravines. Soil type is the primary habitat requirement. The species is associated with Pacolet, Madison gravelly sandy loam, or Musella fine sandy loam soils. In the appropriate soil, the plant can flourish in either dry or moderately moist habitat.

There are a few locations within the 5-acre site that have the Pacolet soil types preferred by this species, and plants belonging to the Hexastylis genus were identified during the site visit.

Duke Energy contracted Terra Incognita to perform a site inventory for the possible presence of the federally-listed dwarf-flowered heartleaf (*Hexastylis naniflora*) and other potentially occurring federally listed plant species. The site visit was conducted on February 22, 2017 and the

Hexastylis species present within the Study Area was identified as arrow-leaved heartleaf (*Hexastylis arifolia*), not dwarf-flowered heartleaf. Arrow-leaved heartleaf is common throughout the piedmont of North Carolina and the juvenile leaves sometimes resemble those of the dwarf-flowered heartleaf species. Because the federally listed species is not present in the Study Area, no impacts to dwarf-flowered heartleaf are anticipated. The results of the survey are detailed in the Terra Incognita Findings Report located in Appendix D.

Michaux's sumac *(Rhus michauxii)* [Federally Endangered]

USFWS Recommended Survey Window: May – October

Michaux's sumac is a rhizomatous, densely hairy shrub, with erect stems from 1-3 feet in height. The compound leaves contain evenly serrated, oblong to lanceolate, acuminate leaflets. Most plants are unisexual; however, more recent observations have revealed plants with both male and female flowers on one plant. The flowers are small, borne in a terminal, erect, dense cluster, and colored greenish yellow to white. The Michaux's sumac produces flowers from June to July while the fruit is produced in August to October (USFWS 2015b).

Michaux's sumac grows in sandy or rocky open woods. It prefers areas where some type of disturbance has provided an open area. Several populations in North Carolina are on highway rights-of-way, roadsides, or on the edges of artificially maintained clearings (USFWS 2015b).

According to the USFWS record status, this species has not been observed in Lincoln County for over 50 years and there are no known historical populations of Michaux's sumac within one mile of the Study Area; therefore, no impacts to species is anticipated.

6.0 Conclusion

Results from HDR's desktop analysis and on-site field reconnaissance indicate that the proposed Lincoln County CT Addition may have minimal impacts to natural resources including wetlands and jurisdictional waters of the U.S., natural communities, federally protected species, cultural resources, and FEMA floodplains.

Due to land cover disturbance in the Study Area during construction, development and submittal of an Erosion and Sediment Control Plan to the NCDEQ is required.

A Section 404 Permit and a 401 Water Quality Certification may be required for potential impacts to on-site waters of the U.S. based on the project design and construction access. The USACE Nationwide Permit 39 (Commercial and Institutional Developments) is expected be the applicable permit since the proposed project may result in minimal temporary or permanent fill impacts to waters of the U.S. The USACE ultimately decides what permit will be required to authorize project construction.

The National Park Service NRHP GIS Public Dataset and the NCHPO HPOWEB GIS Web Service revealed that no known cultural resources, historic structures, or historic districts are located within the Study Area. However, archaeological data were not provided in those datasets. Coordination with the NCHPO is recommended to determine if any sites of archaeological significance are located within the Study Area.

The FEMA Map Service Center's NFHL GIS database identified 0.4 acres of Special Flood Hazard Areas within the Study Area. Coordination with Lincoln County's Floodplain Administrator will be required if impacts to the regulated floodplain are unavoidable.

7.0 References

Cowardin, L. M., Carter, V., Golet, F. C., and LaRoe, E. T. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Fish and Wildlife Service. FWS/OBS-79/31. Washington, DC.

Federal Emergency Management Agency. 2015. Special Flood Hazard Area Definition/Description. http://www.fema.gov/special-flood-hazard-area (Accessed: August 2016).

Griffith, G. E., Omernik, J. M., Comstock, J. A., Schafale, M. P., McNab, W. H., Lenat, D. R., MacPherson, T. F., Glover, J. B., and Shelburne, V. B. 2002. Ecoregions of North Carolina – Regional (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,500,000).

Lincoln County Unified Development Ordinance. Effective Date 08/31/2009, Amended 11/21/2016 (http://www.lincolncounty.org/index.aspx?NID=465) (Accessed: December 2016).

Martin, W. H., Boyce, S. G., and Echternacht, A. C. 1993. *Biodiversity of the Southeastern United States, Upland Terrestrial Communities*. Sponsored by the Southeastern Chapter of the Ecological Society of America.

North Carolina Division of Water Resources. 2010. Methodology for Identification of Intermittent and Perennial Streams and Their Origins (Version 4.11).

North Carolina Natural Heritage Program. 2016. Geographic Information System (GIS) data. NCDENR, Raleigh, NC. (www.ncnhp.org). (Accessed: December 2016).

Radford, A. E., Ahles, H. E., and Bell, C. R. 1964. *Manual of the Vascular Flora of the Carolina*s. The University of North Carolina Press, Chapel Hill.

Schafale, M. P. 2012. Guide to the Natural Communities of North Carolina – Fourth Approximation. (http://cvs.bio.unc.edu/pubs/4thApproximationGuideFinalMarch2012.pdf)

U.S. Army Corps of Engineers. 2012. Regional Supplement of the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0). U.S. Vicksburg, Mississippi. April 2012. (http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg_supp/EMP_Piedmont_v2b.pdf)

_____. 1987. Wetland Delineation Manual. Vicksburg, MS.

U.S. Fish and Wildlife Service. 2015a. Endangered Species, Threatened Species, Federal Species of Concern, and Candidate Species, Lincoln County, North Carolina. Updated April 2, 2015. (https://www.fws.gov/raleigh/species/cntylist/lincoln.html).

______. 2015b. Endangered and Threatened Species of North Carolina. Updated August 6, 2015. (https://www.fws.gov/raleigh/species/es_michauxs_sumac.html).

______. 2015c. National Wetlands Inventory. (Accessed December 15, 2016). (https://www.fws.gov/wetlands/).

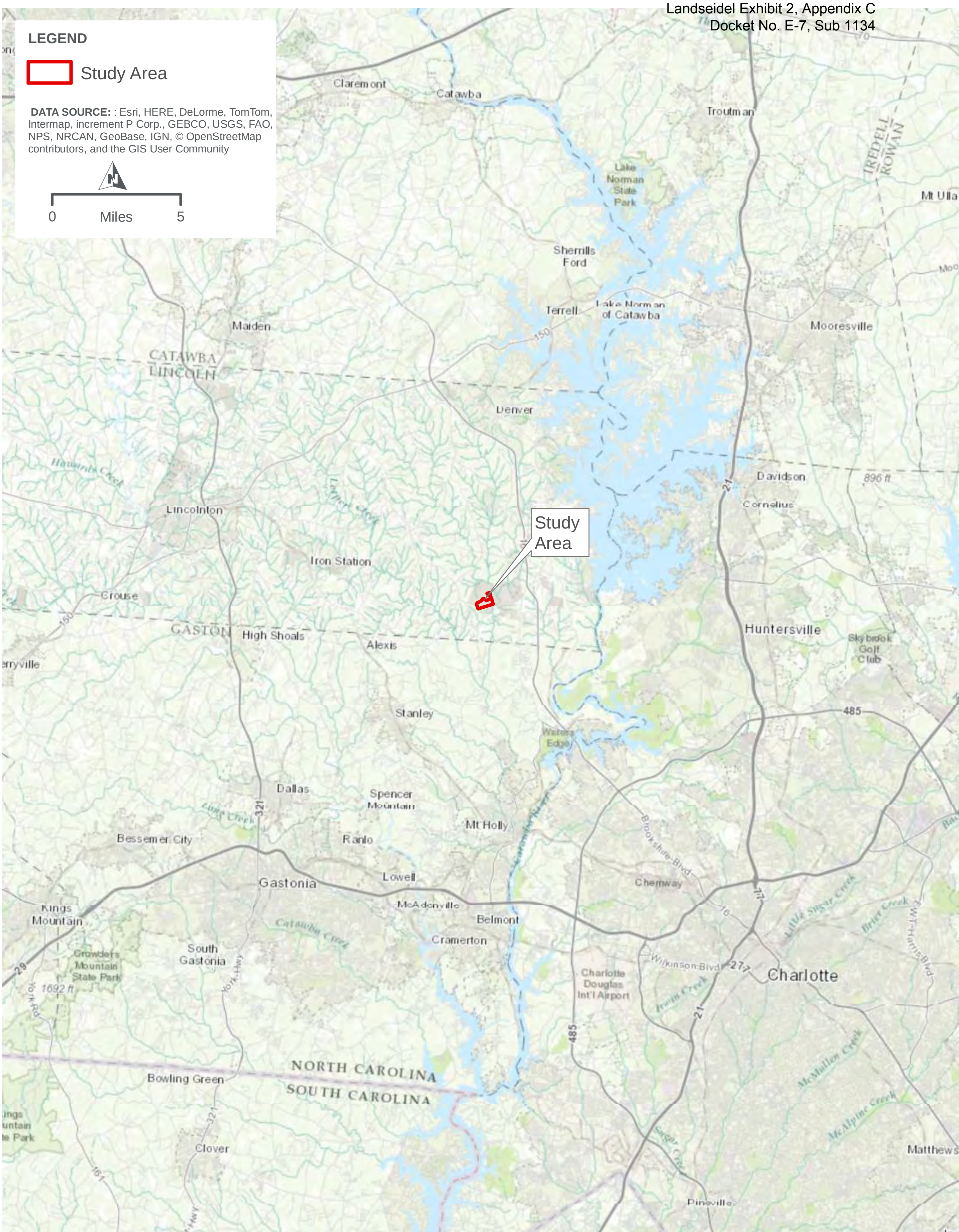
U.S. Geological Survey. 2014. National Hydrography Dataset. (Accessed December 15, 2016). (http://nhd.usgs.gov/).

Woody, W. E. 1995. Soil Survey of Lincoln County, North Carolina. USDA, NRCS. https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/north_carolina/NC109/0/lincoln.pdf

A

Appendix A

Figures



LINCOLN COUNTY CT ADDITION

PROJECT VICINITY

FIGURE 1

HDR
DUKE ENERGY. CAROLINAS

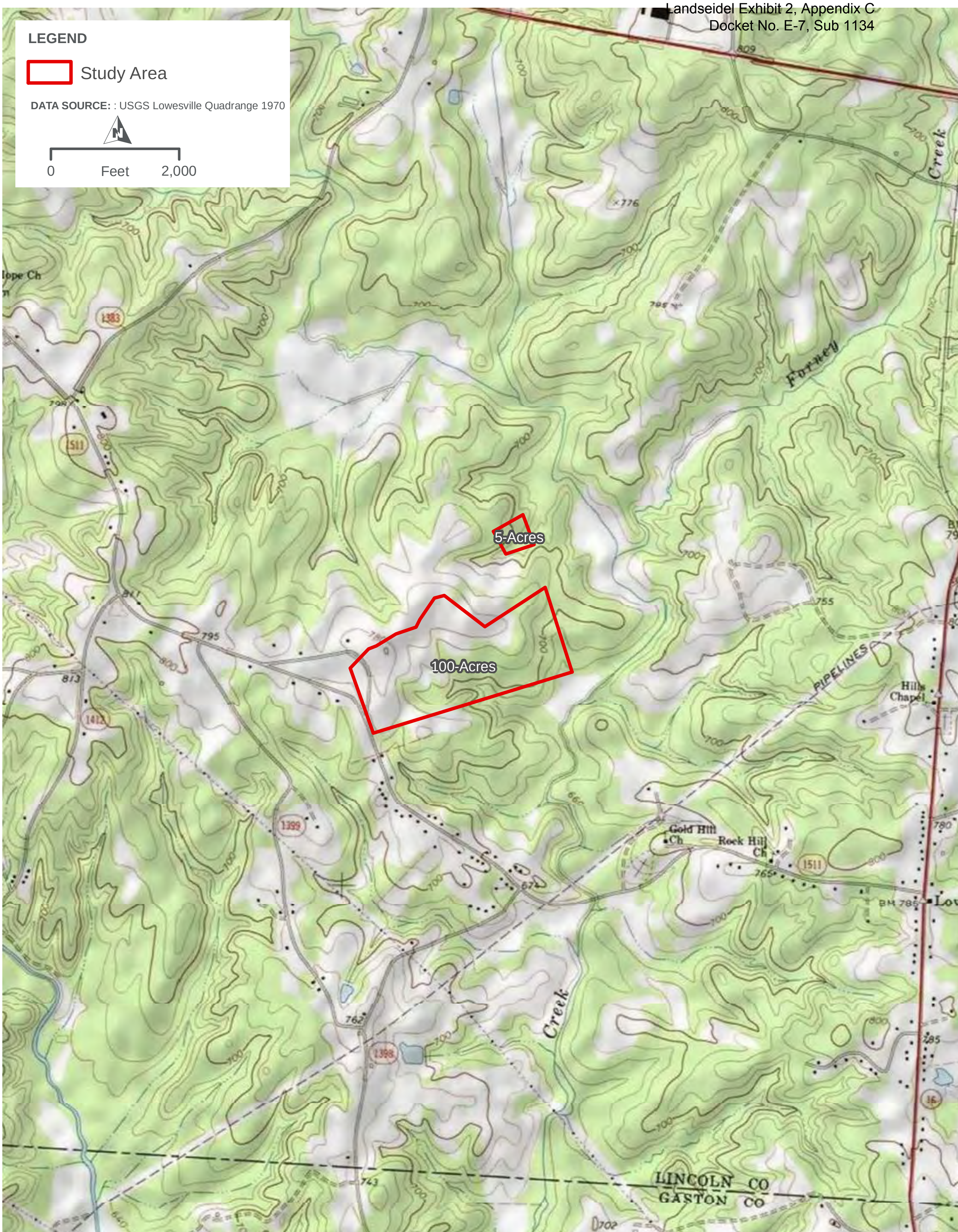
HDR DUKE ENERGY. CAROLINAS

LINCOLN COUNTY CT ADDITION

PROJECT AERIAL

FIGURE 2

Landseidel Exhibit 2, Appendix C
Docket No. E-7, Sub 1134



LINCOLN COUNTY CT ADDITION

USGS LOWESVILLE QUADRANGLE

FIGURE 3

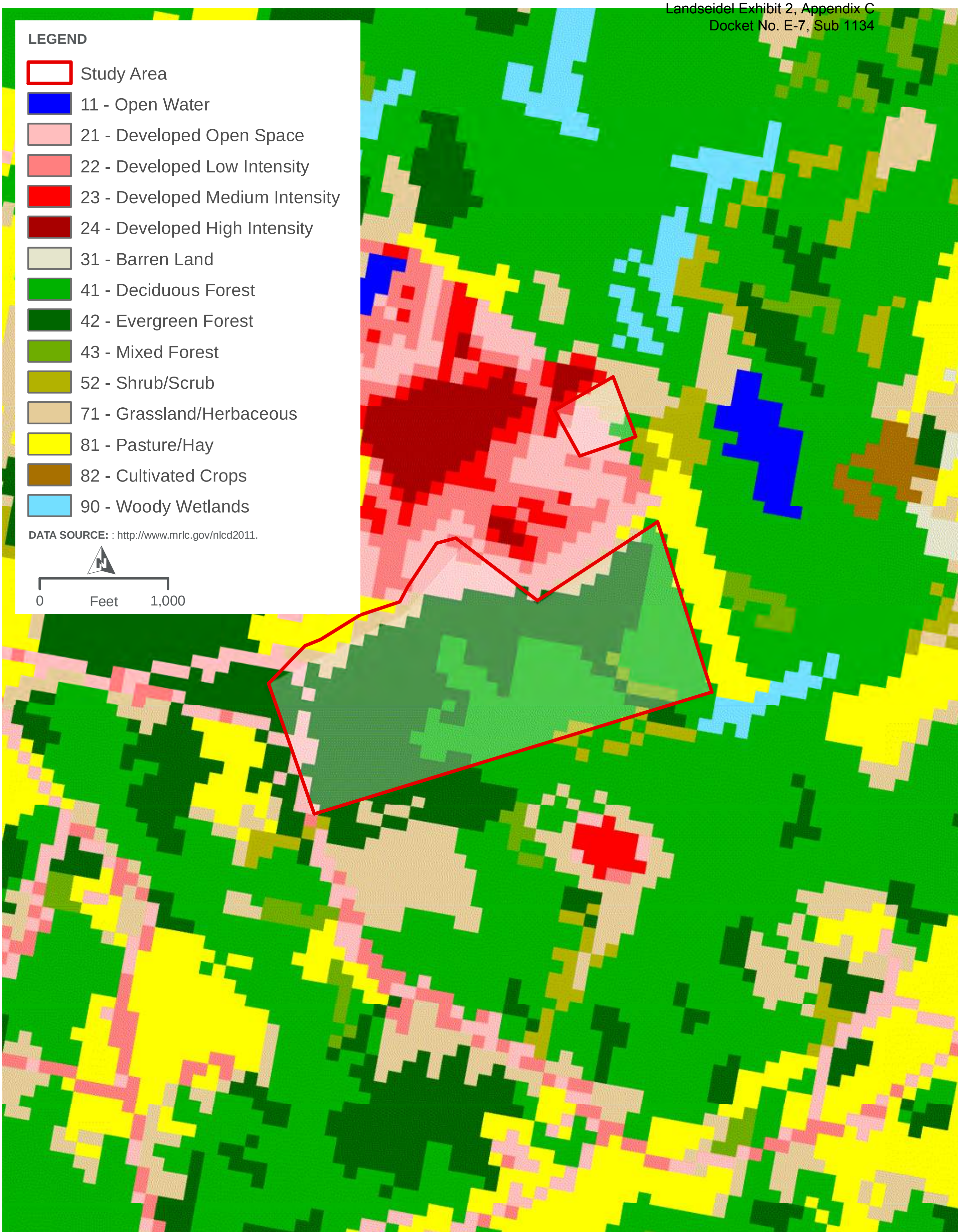
Landseidel Exhibit 2, Appendix C
Docket No. E-7, Sub 1134

FDR DUKE ENERGY. CAROLINAS

LINCOLN COUNTY CT ADDITION

NRCS SOIL SURVEY OF LINCOLN COUNTY

FIGURE 4



HDR DUKE ENERGY. CAROLINAS

LINCOLN COUNTY CT ADDITION

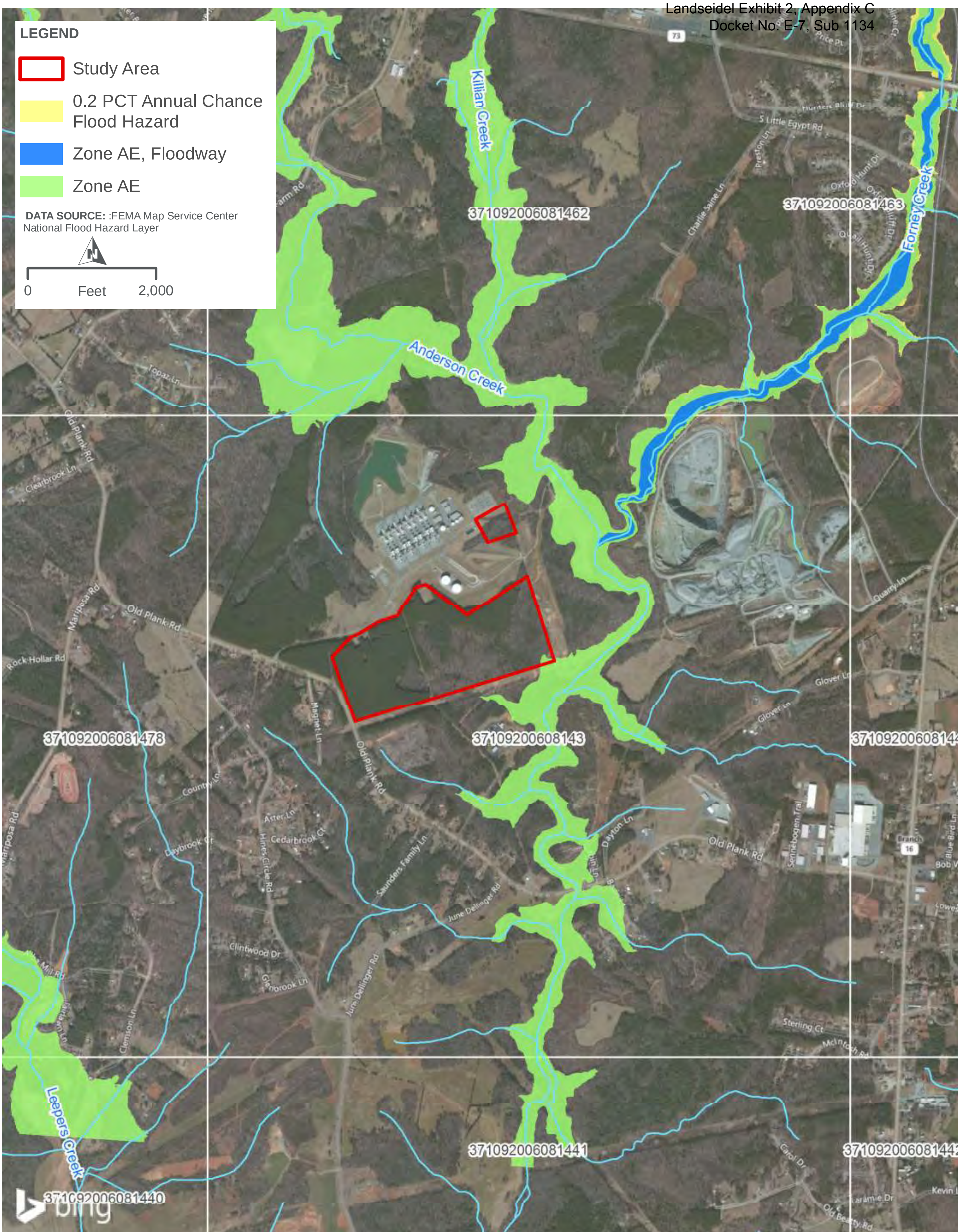
NATIONAL LAND COVER DATABASE 2011 LAND COVER

FIGURE 5

Landseidel Exhibit 2, Appendix C
Docket No. E-7, Sub 1134

OFFICIAL COPY

Jun 12 2017

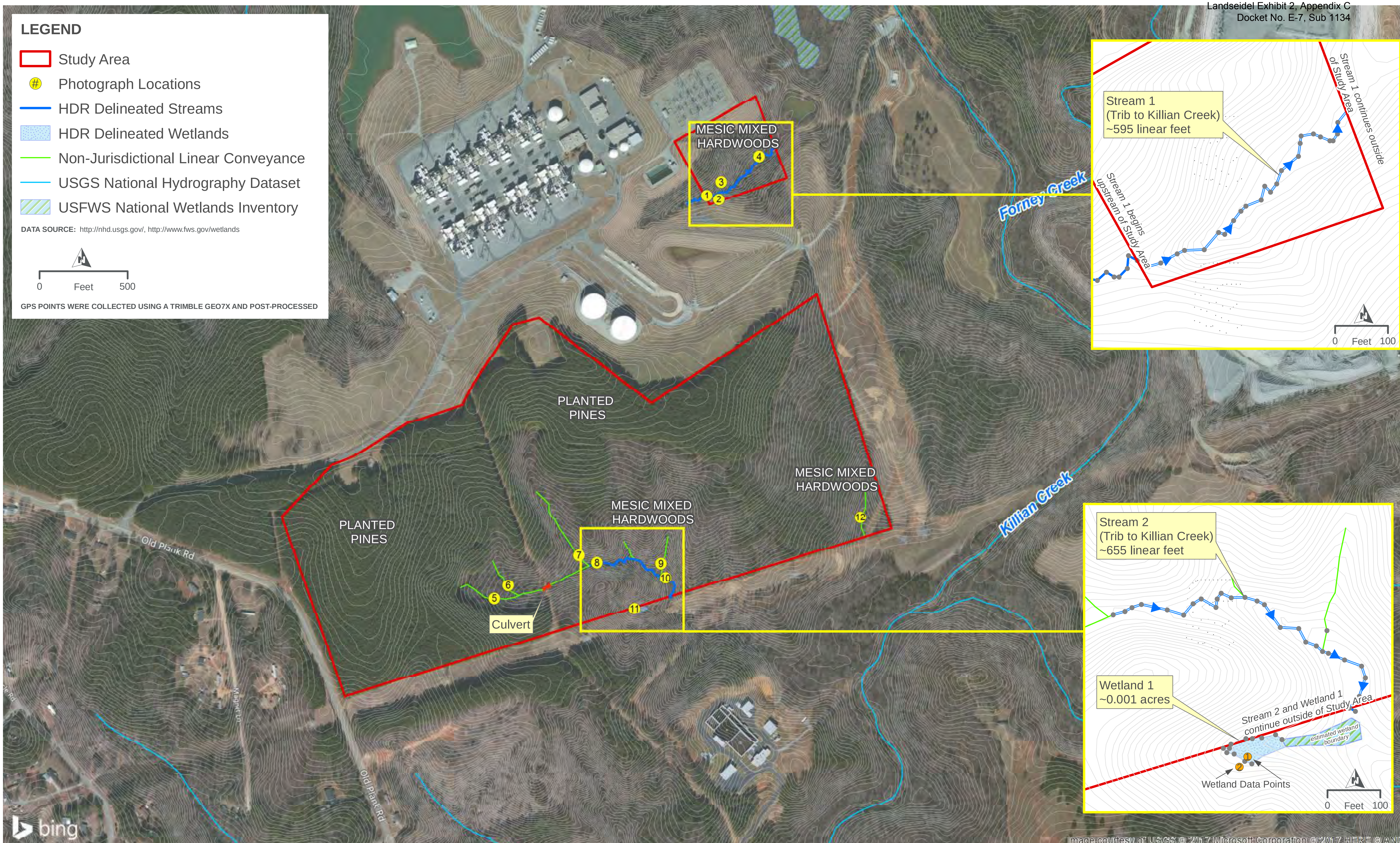


LINCOLN COUNTY CT ADDITION

FEMA SPECIAL FLOOD HAZARD AREAS

FIGURE 6

PATH: Q:\PROJECTS\UC SYNERGETIC\10050207_LINCOLNCT\MXD\CPCN\REV20170328\FLOODPLAINSREV20170328.MXD - USER: EMULARSK - DATE: 3/28/2017

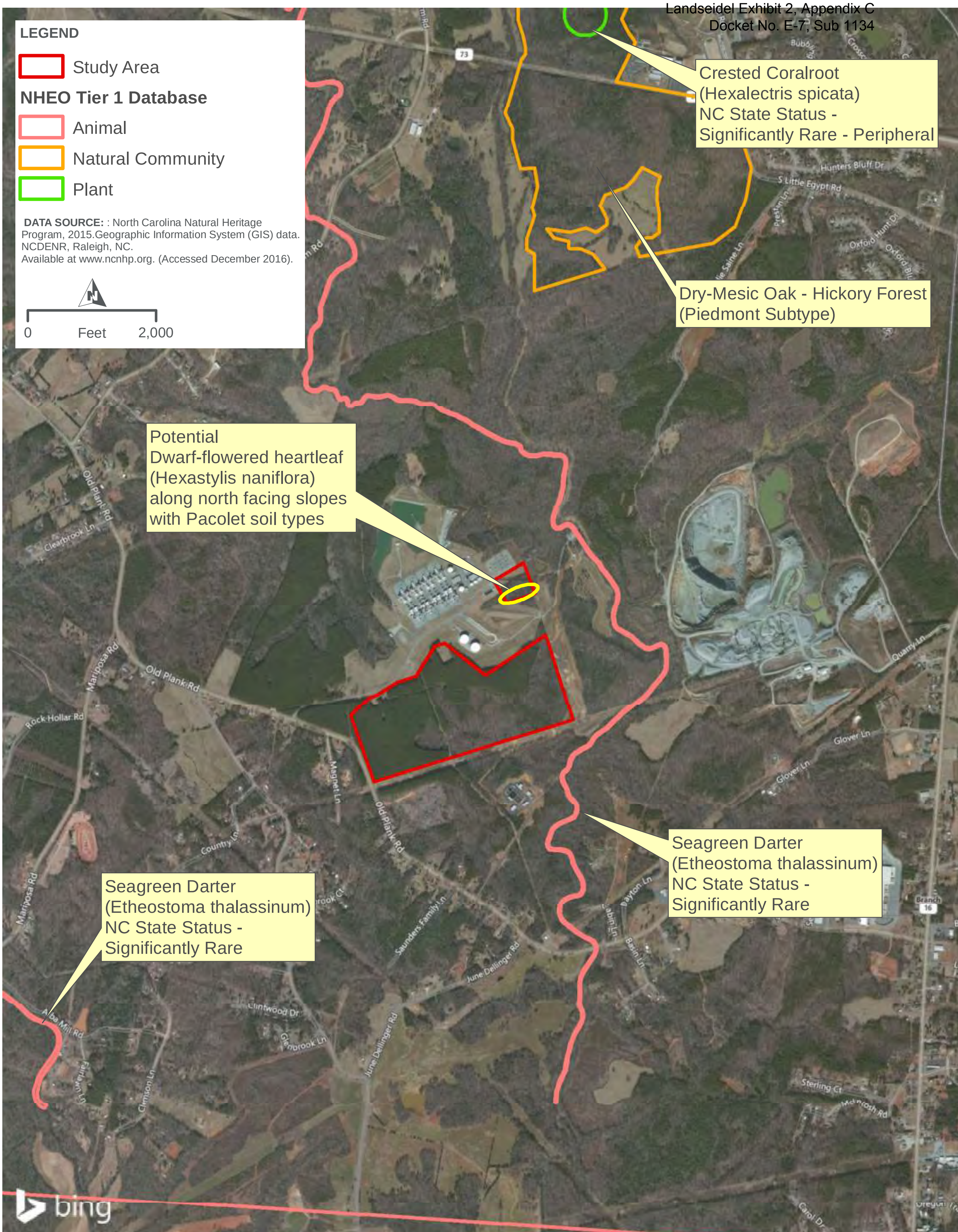


HDR DUKE ENERGY CAROLINAS

LINCOLN COUNTY CT ADDITION

DELINEATED WATERS OF THE U.S.

FIGURE 7



LINCOLN COUNTY CT ADDITION

NCNHP - ELEMENT OCCURRENCE DATABASE

FIGURE 8

B

Appendix B

Data Forms

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: ______ City/County: ______ Sampling Date: ______

Applicant/Owner: ______ State: ______ Sampling Point: ______

Investigator(s): ______ Section, Township, Range: ______

Landform (hillslope, terrace, etc.): ______ Local relief (concave, convex, none): ______ Slope (%): ______

Subregion (LRR or MLRA): ______ Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: ______ NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ______ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______	No ______	**Is the Sampled Area within a Wetland?** **Yes ______ No ______**
Hydric Soil Present?	Yes ______	No ______	
Wetland Hydrology Present?	Yes ______	No ______	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ______ Depth (inches): ______

Water Table Present? Yes ______ No ______ Depth (inches): ______

Saturation Present? (includes capillary fringe) Yes ______ No ______ Depth (inches): ______

Wetland Hydrology Present? Yes ______ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point:____________

Tree Stratum (Plot size: _____________)

	Absolute % Cover	Dominant Species?	Indicator Status
1.______			
2.______			
3.______			
4.______			
5.______			
6.______			
7.______			
	_______ = Total Cover		

50% of total cover: _______ 20% of total cover:_______

Sapling/Shrub Stratum (Plot size:_____________)

	Absolute % Cover	Dominant Species?	Indicator Status
1.______			
2.______			
3.______			
4.______			
5.______			
6.______			
7.______			
8.______			
9.______			
	_______ = Total Cover		

50% of total cover: _______ 20% of total cover:_______

Herb Stratum (Plot size: _____________)

	Absolute % Cover	Dominant Species?	Indicator Status
1.______			
2.______			
3.______			
4.______			
5.______			
6.______			
7.______			
8.______			
9.______			
10.______			
11.______			
	_______ = Total Cover		

50% of total cover: _______ 20% of total cover:_______

Woody Vine Stratum (Plot size: _____________)

	Absolute % Cover	Dominant Species?	Indicator Status
1.______			
2.______			
3.______			
4.______			
5.______			
	_______ = Total Cover		

50% of total cover: _______ 20% of total cover:_______

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: __________ (A)

Total Number of Dominant Species Across All Strata: __________ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: __________ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	__________	x 1 = __________
FACW species	__________	x 2 = __________
FAC species	__________	x 3 = __________
FACU species	__________	x 4 = __________
UPL species	__________	x 5 = __________
Column Totals:	__________ (A)	__________ (B)

Prevalence Index = B/A = ____________

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: ________

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______________________________

Depth (inches): ______________________

Hydric Soil Present? Yes ______ No ______

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: ______________________________ City/County: ____________________ Sampling Date:__________

Applicant/Owner: ____ State: ______ Sampling Point:__________

Investigator(s): ______________________________ Section, Township, Range:______________________________

Landform (hillslope, terrace, etc.): ________________ Local relief (concave, convex, none): ______________ Slope (%):______

Subregion (LRR or MLRA): ____________ Lat: __________________ Long: __________________ Datum:__________

Soil Map Unit Name: ____ NWI classification: ______________

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ______ No ______ (If no, explain in Remarks.)

Are Vegetation _____, Soil ______, or Hydrology ______ significantly disturbed? Are “Normal Circumstances” present? Yes ______ No _____

Are Vegetation _____, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ______	No_______	**Is the Sampled Area within a Wetland?** **Yes ______ No _______**
Hydric Soil Present?	Yes ______	No_______	
Wetland Hydrology Present?	Yes ______	No_______	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No _____	Depth (inches):_________
Water Table Present?	Yes _____	No _____	Depth (inches):_________
Saturation Present? (includes capillary fringe)	Yes _____	No _____	Depth (inches):_________

Wetland Hydrology Present? Yes ______ No_______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point:____________

Tree Stratum (Plot size: ____________)	Absolute % Cover	Dominant Species?	Indicator Status
1.____	____	____	____
2.____	____	____	____
3.____	____	____	____
4.____	____	____	____
5.____	____	____	____
6.____	____	____	____
7.____	____	____	____
	____ = Total Cover		
50% of total cover: ____	20% of total cover: ____		
Sapling/Shrub Stratum (Plot size: ____________)			
1.____	____	____	____
2.____	____	____	____
3.____	____	____	____
4.____	____	____	____
5.____	____	____	____
6.____	____	____	____
7.____	____	____	____
8.____	____	____	____
9.____	____	____	____
	____ = Total Cover		
50% of total cover: ____	20% of total cover: ____		
Herb Stratum (Plot size: ____________)			
1.____	____	____	____
2.____	____	____	____
3.____	____	____	____
4.____	____	____	____
5.____	____	____	____
6.____	____	____	____
7.____	____	____	____
8.____	____	____	____
9.____	____	____	____
10.____	____	____	____
11.____	____	____	____
	____ = Total Cover		
50% of total cover: ____	20% of total cover: ____		
Woody Vine Stratum (Plot size: ____________)			
1.____	____	____	____
2.____	____	____	____
3.____	____	____	____
4.____	____	____	____
5.____	____	____	____
	____ = Total Cover		
50% of total cover: ____	20% of total cover: ____		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ________ (A)

Total Number of Dominant Species Across All Strata: ________ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ________ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	________	x 1 = ________
FACW species	________	x 2 = ________
FAC species	________	x 3 = ________
FACU species	________	x 4 = ________
UPL species	________	x 5 = ________
Column Totals:	________ (A)	________ (B)

Prevalence Index = B/A = ________

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: ________

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ______________________________

Depth (inches): ______________________

Hydric Soil Present? **Yes** ______ **No** ______

Remarks:

NC DWQ Stream Identification Form Version 4.11

STREAM 1 (TRIBUTARY TO KILLIAN CREEK)

Date: 12/8/16	**Project/Site:** LINCOLN NEW CT	**Latitude:** 35.43166
Evaluator: ERIC MULARSKI / KELLY THAMES	**County:** LINCOLN	**Longitude:** -81.03258
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 42.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:* LOWESVILLE

A. Geomorphology (Subtotal = 22)	Absent	Weak	Moderate	Strong
1[a.] Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

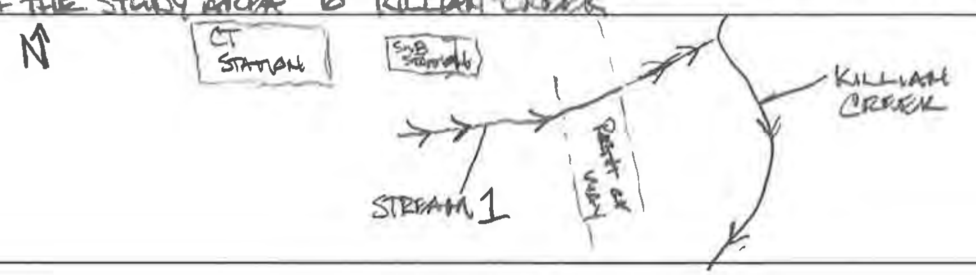
B. Hydrology (Subtotal = 11.5)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 9)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: STRONG GEOMORPHIC, HYDROLOGIC & BIOLOGY INDICATORS. FLOWS OUTSIDE OF THE STUDY AREA TO KILLIAN CREEK

Sketch:



NC DWQ Stream Identification Form Version 4.11

Stream 2 (Tributary to Killian Creek)

Date: 10/8/16	**Project/Site:** Lincoln New CT	**Latitude:** 35.42850
Evaluator: Eric Mularski / Kelly Thames	**County:** Lincoln	**Longitude:** -81.03444
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 26	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:* Lowesville

A. Geomorphology (Subtotal = 14)	Absent	Weak	Moderate	Strong
1[a] Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

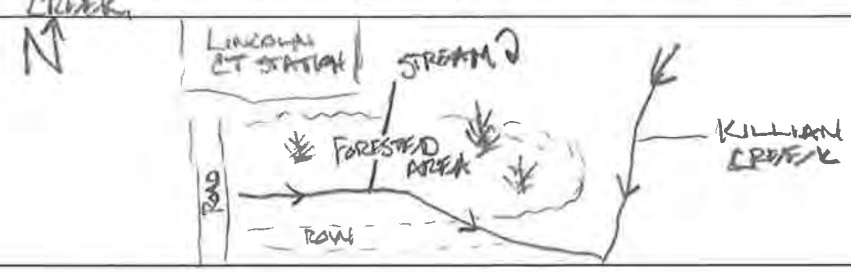
B. Hydrology (Subtotal = 4.5)	Absent	Weak	Moderate	Strong
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 7.5)	Absent	Weak	Moderate	Strong
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Strong geomorphology, low base flow. Flows southeast to Killian Creek.

Sketch:



NC DWQ Stream Identification Form Version 4.11

Non-Jurisdictional Linear Conveyance

Date: 12/8/16	**Project/Site:** Lincoln New CT	**Latitude:** 35.4266
Evaluator: Eric Mularski / Kelly Thames	**County:** Lincoln	**Longitude:** -81.0585
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** **Ephemeral Intermittent Perennial**	**Other** Lowesville *e.g. Quad Name:*

A. Geomorphology (Subtotal = ________)	Absent	Weak	Moderate	Strong
1[a.] Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = ________)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = ________)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: Point representative of several non-jurisdictional linear conveyance features to Stream 2 (tributary to Killian Creek)

Sketch:

C

Appendix C

Photographs

Photograph 1 – Tributary to Killian Creek (Stream 1) Looking Downstream

Photograph 2 – Hexastylis Species Along North Facing Slope with Pacolet Soils

Photograph 3 – Upland Hardwood Forest

Photograph 4 – Tributary to Killian Creek (Stream 1) Looking Downstream

Photograph 5 – Non-Jurisdictional Linear Conveyance

Photograph 6 – Non-Jurisdictional Linear Conveyance

Photograph 7 – Non-Jurisdictional Linear Conveyance

Photograph 8 – Tributary to Killian Creek (Stream 2) Looking Downstream

Photograph 9 – Non-Jurisdictional Linear Conveyance

Photograph 10 – Tributary to Killian Creek (Stream 2) Looking Downstream

Photograph 11 – Scrub/Shrub Wetland (Wetland 1)

Photograph 12 – Upland Hardwood Forest

D

Appendix D

Terra Incognita – Findings Report

terra incognita

125 South Edisto Avenue, Columbia, South Carolina 29205
llgaddy2@gmail.com
(803) 629-6128

L.L. Gaddy, Ph.D, President

February 28, 2017

Mr. James McRacken
Duke Energy
528 S. Church Street
Charlotte, NC 28202

re: Inventory for the possible presence of the federally-listed threatened dwarf-flowered heartleaf (*Hexastylis naniflora*) and other potentially-occurring federally-listed plant species—Lincoln County Combustion-Turbine Site—Report of Findings, Lincoln County, North Carolina

Mr. McRacken:

This is a report of findings from our February 22, 2017 inventory of the two study areas [Substation Expansion Study Area (5 acres) and 95-Acre Study Area] at Duke Energy's Lincoln County Combustion Turbine Site. Both study areas were inventoried to determine if the threatened dwarf-flowered heartleaf was present (a previous site assessment raised the possibility that the plant may occur in the study areas). Both study areas were walked and dominant plant species seen were recorded.

Substation Expansion Study Area. The Substation Expansion Study Area, which is approximately five acres in size, is found east-southeast of the existing plant in and around a north-facing ravine with a perennial stream. This study area is forested with a stand of mixed hardwoods dominated by white oak (*Quercus alba*), northern red oak (*Quercus rubra*), and hickories (*Carya* spp.). The understory has American beech (*Fagus grandifolia*), black cherry (*Prunus serotina*), and American holly (*Ilex opaca*). The herbaceous layer is dominated by Christmas fern (*Polystichum acrostichoides*), sedges (*Carex* spp.), and arrow-leaved (or common) heartleaf (*Hexastylis arifolia*). *The Hexastylis species present here, which was thought to possibly be the federally-threatened dwarf-flowered heartleaf (Hexastylis naniflora), turned out to be arrow-leaved heartleaf (Hexastylis arifolia), which is quite common in the North Carolina Piedmont.* The juvenile leaves of arrow-leaved heartleaf sometimes resemble those of dwarf-flowered heartleaf, which was not present in or near the area (see attached images).

95-Acre Study Area. The 95-Acre Study Area is located south of the existing plant and is dominated by second-growth forests. Even-aged young to middle-aged loblolly pine (*Pinus taeda*) forests dominate ridges and upslope sites here, while mixed hardwoods dominate mid- and lower slopes. Second-growth mixed oak/hickory stands were found on mid-slopes, with even-aged tulip poplar (*Liriodendron tulipifera*) stands along small creek bottoms. Several old home places with planted tree species were also present in this area. Leaves of a *Hexastylis* species were also found here, but they were those of the previously-noted common arrow-leaved heartleaf (*Hexastylis arifolia),* not those of the threatened dwarf-flowered heartleaf *(Hexastylis naniflora).*

The federally-listed threatened dwarf-flowered heartleaf (Hexastylis naniflora) or habitat for the species, therefore, was absent from both the Substation Expansion and the 95-Acre Study Areas. Finally, no other federally- or state-listed plant species or habitat for such species, was found in the Substation Expansion Study Area or the 95-Acre Study Area.

A species list of all plant species seen in the two areas and several images are attached.

Sincerely,

L. L. Gaddy, Ph. D.
President/Owner

Species List of Vascular Plant Species Seen at Substation Expansion Area and Ninety-Five Acre Study Site

Trees/Woody Plants

Carya spp. (hickories)
Diospyros virginiana (persimmon)
Fagus grandifolia (American beech)
Fraxinus americana (white ash)
Ilex opaca (American holly)
Juglans nigra (black walnut)
Juniperus virginiana (eastern red cedar)
**Ligustrum sinense* (Chinese privet)
Liquidambar styraciflua (sweet gum)
Liriodendron tulipifera (tulip poplar)
Morus rubra (red mulberry)
Pinus taeda (loblolly pine)
Pinus virginiana (Virginia pine)
Prunus serotina (black cherry)
Quercus alba (white oak)
Quercus rubra (red oak)

Non-Woody Species

Allium sp. (wild onion)
Carex albicans (whitish sedge)
Carex sp. (sedge)
Chimaphila maculata (pipsissewa)
Geum canadense (Canada avens)
Goodyera pubescens (rattlesnake plantain)
Hexastylis arifolia (common hearleaf, arrow-leaved heartleaf)
Ligusticum canadense (American lovage)
**Lonicera japonica* (Japanese honeysuckle) (non-woody here)
Mitchella repens (partridgeberry)
Polystichum acrostichoides (Christmas fern)
Tiarella sp. (foamflower)
Tipularia discolor (crane-fly orchid)
Viola sororia (common violet)

*Invasive/introduced species.

Ravine and creek at Substation Expansion Area.

APPENDIX C-1

U.S. Fish and Wildlife Service Letter of Concurrence

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Asheville Field Office
160 Zillicoa Street Suite #B
Asheville, North Carolina 28801

April 18, 2017

Mr. Robert Niehaus
Duke Energy Carolinas, LLC
400 South Tryon Street
Mail Code ST28U
Charlotte, North Carolina 28202

Subject: Listed Species Assessment, Proposed Lincoln County Combustion Turbine Addition, adjacent to Old Plank Road, in Stanley, Lincoln County, North Carolina

Dear Mr. Niehaus:
On March 27, 2017, we received a letter from you requesting our comments about the subject project. We have reviewed the information you presented and are providing the following comments in accordance with the provisions of the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e), and section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act).

According to the information that you presented, Duke Energy Carolinas, LLC is proposing to expand the existing 1,200 megawatt (MW) Lincoln Combustion Turbine Generating Station in southeastern Lincoln County. The expansion will consist of constructing a 400 MW simple-cycle combustion turbine facility and associated infrastructure within a portion of the station's 746-acre property. The proposed facility will be natural gas-fired with fuel-oil back up. The station expansion will be constructed on a portion of the property that consists of forested and open areas. An un-named perennial stream flows along the eastern boundary of the property.

Endangered Species. There appears to be suitable habitat for dwarf-flowered heartleaf (*Hexastylis naniflora*), which is currently federally listed as threatened, on the project site. Included with your letter was a copy of an inventory/survey report conducted by Dr. L.L. Gaddy of terra incognita. According to Dr. Gaddy's report, surveys for dwarf-flowered heartleaf were conducted at the site on February 22, 2017. Arrow-leaved heartleaf (*Hexastylis arifolia*) was the only plant of the genus *Hexastylis* found on the site. Dr. Gaddy determined that no federally listed plant species occur on the site. We concur with Dr. Gaddy's assessment and we believe the project will not impact any plants federally listed as threatened or endangered.

The project site also contains potential suitable habitat for northern long-eared bat (*Myotis septentrionalis*), which is currently federally listed as a threatened species. The clearing of trees for construction of the project, staging areas, easements, etc. could impact suitable maternity roost trees for northern long-eared bats. However, no known maternity roosts or hibernacula sites are within 50-miles of the project site. According to the new 4(d) rule implemented for the listing of northern long-eared bat, a cutting moratorium of June 1-July 31 should be observed within areas of habitat for this species. Because: 1) the project site is over 50-miles away from the nearest known occurrence; and 2) there is a large amount of suitable habitat in close proximity to the site and in the surrounding area, we believe the probability of "take" that could occur from this project is discountable. We recommend the cutting moratorium of June 1-July 31 be implemented into the plans if possible. Though a "not likely to adversely affect" determination would not be dependent on this action, the cutting moratorium is a measure that can be implemented to further reduce the probability of "take" of this species. Thus, we believe the requirements for northern long-eared bat under section 7 of the Act are fulfilled. However, obligations under section 7 of the Act must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered, (2) this action is subsequently modified in a manner that was not considered in this review, or (3) a new species is listed or critical habitat is determined that may be affected by the identified action.

Erosion and Sedimentation Control. Construction activities near streams, rivers, and lakes have the potential to cause water pollution and stream degradation if measures to control erosion and sediment are not properly installed and maintained. In order to effectively reduce erosion and sedimentation impacts, Best Management Practices should be designed, installed, and maintained during land-disturbing activities. A complete design manual, which provides extensive details and procedures for developing site-specific plans to control erosion and sediment and is consistent with the requirements of the North Carolina Sedimentation and Pollution Control Act and Administrative Rules, is available at: http://www.dlr.enr.state.nc.us/pages/publications.html. We strongly recommend that stringent measures to control erosion be implemented prior to any ground disturbance and that these measures be maintained throughout project construction. Any disturbed areas should be reseeded with seed mixtures that are beneficial to wildlife. Fescue-based mixtures should be avoided. Native annual small grains appropriate for the season are preferred and recommended. Biodegradable erosion-control matting should be used in conjunction with appropriate seeding on disturbed soils in steep slope and riparian areas. Matting should be secured in place with staples, stakes, or live stakes of native trees (whenever possible). The vegetation should be monitored, and subsequent plantings should be installed when needed. Fertilizers and pesticides should not be used near streams.

We are concerned about the introduction and spread of invasive exotic species in association with the proposed project. Therefore, we strongly recommend that only species native to the natural communities within the project area be used in association with all aspects of this project. Furthermore, we recommend that seeds for native plants that are beneficial to pollinators be included in any erosion control seed mixes. Pollinators, such as most bees, some birds and bats, or other insects, including moths and butterflies, play a crucial role in the reproduction of flowering plants and in the production of most fruits and vegetables. Declines in wild pollinators are a result of loss, degradation, and fragmentation of habitat and disease; while declines in honey bees has also been linked to disease. To offset the overall impacts of development and/or to increase the habitat and species diversity within the project area, we recommend the following measures be implemented into project design:

1. Throughout the site, sow native seed mixes with plant species that are beneficial to pollinators. Taller-growing pollinator plant species should be planted along the outer edge of open areas and anywhere on the site where mowing can be restricted during the

summer months. Taller plants, not mowed during the summer, would provide benefits to pollinators, habitat to ground-nesting/feeding birds, and cover for small mammals. Low-growing/groundcover native species should be planted in areas that need to be maintained. This would provide benefits to pollinators while also minimizing the amount of maintenance, such as mowing and herbicide treatment. Using a seed mix that includes milkweed species (milkweed is an important host plant for monarch butterflies) is especially beneficial. The following Web site provides a comprehensive list of native plant species that benefit pollinators:

https://mail.google.com/mail/u/0/#advanced-search/subject=pollinator&subset=all&has=anita&within=1d&sizeoperator=s_sl&sizeunit=s_smb/14f0366dba7d3bda?projector=1.

Additional information regarding plant species, seed mixes, and pollinator habitat requirements can be provided upon request. We also offer our assistance with developing seed mixes that can be used in conjunction with fast growing erosion control seed mix for overall soil stability and pollinator benefits.

2. Implement a mowing and maintenance program that restricts mowing during the summer months. Mowing at the site should be restricted to the smallest area possible to manage the edges of the site for early successional habitat. We recommend that Duke Energy Carolinas use its maintenance plan to target ecological/habitat benefits to other wildlife species, especially pollinators and birds that require early successional habitats. Aside from removing problem vegetation at the site, the primary focus should be placed on establishing compact flowering shrubs and managing for native grasses and wildflowers. The overall objective is to reach a sustainable level of grasses, forbs, and flowering shrubs (wherever feasible) throughout the project area.

We appreciate the opportunity to provide these comments. If we can be of assistance or if you have any questions, please do not hesitate to contact Mr. Bryan Tompkins of our staff at 828/258-3939, Ext. 240. In any future correspondence concerning this project, please reference our Log Number 4-2-17-306.

Sincerely,

- - *original signed* - -

Janet Mizzi
Field Supervisor

APPENDIX D

Historic Seismic Activity

Lincoln County CT Addition

Historic Seismic Activity: Appendix D

Prepared for:
DUKE ENERGY CAROLINAS, LLC
Charlotte, North Carolina

Prepared by:
HDR
Charlotte, North Carolina

January 2017

Historic Seismic Activity

The following sections present the findings of a desk-top historic seismic activity assessment conducted by HDR for Duke Energy Carolinas, LLC (Duke Energy) associated with the Certificate of Public Convenience and Necessity (CPCN) application for the proposed Lincoln County CT Addition. The existing Lincoln Combustion Turbine Generating Plant is located in Lincoln County, North Carolina, approximately twenty miles northwest of the city of Charlotte. Duke Energy has proposed the construction a new combustion turbine (CT) generating plant on surplus property at the existing site. The Study Area as referenced in this report encompasses two individual sites, one 5-acre site and one 95-acre site, with a combined area of approximately 100 acres.

Historic Earthquakes

Recorded seismicity in North Carolina is largely comprised of near surface events that typically occur within 20 miles of the ground surface. The earliest earthquake recorded in North Carolina was in 1735 near the town of Bath, in Beaufort County. Because seismographs (or the Richter scale) had not yet been invented, the earthquake was rated using the Modified Mercalli Intensity scale, which is a method of seismic measurement based on human-perceived shaking and building damage. Damage is categorized using Roman numerals, where an event of twelve (XII) is the maximum, equating to total damage, and an event of one (I) is the minimum, equating to an earthquake that is barely noticed. The 1735 Bath event was a level V event on the Modified Mercalli Intensity scale. A moderate intensity VII earthquake in 1861 near Wilkesboro, North Carolina, was felt throughout the mid-Atlantic region over an area of 300,000 square miles. In 1874, a series of at least 75 earthquakes was felt in McDowell County between February 10 and April 17; however, no damage was recorded. The 1879 Mecklenburg County, 1884 Wilmington, and 1885 Blowing Rock events disturbed residents with intensity IV – V events. The 1897 Giles County, Virginia earthquake was felt throughout much of North Carolina and was estimated as a VII – VIII event.

The largest earthquake in North Carolina occurred in 1916 near Asheville in Buncombe County, which is approximately 100 miles west of the Study Area. The event toppled chimneys, broke windowpanes, and forced inhabitants out of buildings (USGS 2015). The 1926 Mitchell County, 1928 Asheville, 1935 southwestern North Carolina, and 1957 western North Carolina earthquakes cracked walls and chimneys with intensity VI tremors. In 1958, another earthquake was felt near the location of the 1884 event in Wilmington with an intensity of V. Intensity V earthquakes were felt in 1969 in Glenville and in 1970 near Boone (USGS 2015). Well-known major earthquakes that have affected the state of North Carolina include the 1811 – 1812 New Madrid, Missouri earthquakes, which were felt in western and central North Carolina; however, the intensity VI events did not cause significant damage owing to sparse population at the time. Similarly, the 1886 Charleston earthquake was also felt in North Carolina and was estimated to be a VI near the Project Site; however, no damage was recorded.

Seismic Zones

The southeastern United States is considered a stable continental region (SCR), which is defined as an area that has not experienced rifting or major extension or transtension since the Paleogene (23 million years ago [MYA]) and has not undergone orogenic activity, deformation of orogenic forelands, or major anorogenic intrusive activity since the Early Cretaceous (Wheeler 2014).

There are three major seismic zones located within 300 miles of the Study Area. These include: (1) the East Tennessee seismic zone (ETSZ), which is a northeast-southwest trending zone in eastern Tennessee and western North Carolina where small-magnitude events frequently occur; (2) the Central Virginia seismic zone, which is located near Richmond, Virginia, and is the site of the 2011 5.8 magnitude (M) earthquake that was felt over much of the southeastern United States; and (3) the Charleston seismic zone, which is the site of the 1886 Charleston earthquake that was estimated at a magnitude of 6.7 and caused severe damage to the town of Charleston. All three of these zones are intraplate seismic zones, or areas of seismic activity that occur in the interior of a tectonic plate, and the faults in these areas are typically considered ancient (i.e., no active faults reach the surface). Intraplate earthquakes are not well understood, but may be associated with area of pre-existing weakness in tectonic plates that later become reactivated. The locations of the three major seismic zones in the southeast are shown on Figure 2.6.8-1 in Section 2.6.8. Section 2.6.8 also provides a brief explanation of the Richter scale and estimated values of peak ground acceleration in the vicinity of the Study Area.

Recent Earthquakes

There has been no recorded activity associated with the Charleston seismic zone in recent history and while activity associated with the Central Virginia seismic zone has occurred recently, the large distance that a potential seismic wave would be required to travel (>200 miles) from the epicenter to the Study Area would reduce wave propagation and hence the risk for damage. The ETSZ produces earthquakes on a fairly regular basis and these events are typically less than 4.0 M; however, there have been at least two larger events recorded in recent history (<50 years). On November 30, 1973, a 4.7 M earthquake was recorded near Alcoa, Tennessee, approximately 160 miles west of the Project Site, at a relatively shallow depth (3 kilometers [km]). On March 27, 1987, an earthquake near Vonore, Tennessee, approximately 180 miles west of the Project Area, was measured at a depth of 18 km with a magnitude of 4.3 M. The USGS estimates that earthquakes as large as magnitude 7.5 are possible in the ETSZ and events of 5.0 to 6.0 M are estimated to occur once every 200 to 300 years (Wheeler and Frankel 2000).

As part of the desktop study for the CPCN application, all seismic events within 100 miles of the Study Area within the last 50 years were identified and the respective distance, magnitude, depth below surface, and year of occurrence of each are provided in Table 1 (USGS 2015). The average magnitude of these local events is approximately 2.9 M and they have an average depth of 5 km or less. There have been no recorded events larger than 4.0 M within a 100-mile radius of the Study Area.

Table 1. Earthquakes in Previous 50 Years within 100 miles of the Study Area

Location	Distance from site (miles)	Magnitude (M)	Depth (km)	Year
Denton, NC	65	2.6	5	2015
Newton, NC	24	2.4	0	2015
Catawba, SC	46	2.0	0	2013
Cheraw, SC	97	3.7	5	2006
Davidson, NC	15	3.2	5	1998
Kershaw, SC	75	3.5	5	1998

References

U.S. Geological Survey (USGS). 2015. Earthquake Hazards Program, North Carolina Earthquake History. Accessed December 21, 2016. http://earthquake.usgs.gov/.

Wheeler, R.L. 2014. Earthquake catalog for estimation of maximum earthquake magnitude, Central and Eastern United States—Part A, Prehistoric earthquakes: U.S. Geological Survey Open-File Report 2014–1025–A, 26 p., http://dx.doi.org/10.3133/ofr20141025A.

Wheeler, R.L. and Frankel, A. 2000. Geology in the 1996 USGS seismic-hazard maps, Central and Eastern United States: Seismological Research Letters, v. 71, no. 2, p. 273–282.

NCUC DOCKET NO. E-7, SUB 1134
LINCOLN COUNTY CT ADDITION PROJECT CPCN

Confidential Exhibit 3: Cost Information

PARTIALLY CONFIDENTIAL

DUKE ENERGY®
CAROLINAS

REDACTED VERSION

3.1 CONSTRUCTION COST

The projected total project costs in 2024 dollars for the project are presented in Table 3.1 below.

[BEGIN CONFIDENTIAL]

Table 3.1: Lincoln County CT Addition Cost Summary (millions $)

Category	
On-Site Transmission Tie-in Cost	$ [redacted]
Natural Gas Tie-in Cost	$ [redacted]
Engineer, Procure, Construct (EPC) Cost including earthwork	$ [redacted]
Other Owner Costs including contingency (excluding AFUDC)	$ [redacted]
Total Project Costs (excluding AFUDC)	$ [redacted]
Project Winter Output, MW	[redacted]
Project Summer Output, MW	[redacted]
Project Cost, $/kW (Winter)	$[redacted]

[END CONFIDENTIAL]

3.2 Cash Flow

The projected cash flow for the costs presented in Table 3.1 is presented in Table 3.2.1 below.

[BEGIN CONFIDENTIAL]

Table 3.2.1: Lincoln County CT Addition Projected Cash Flow

Spend Year	Direct cost	AFUDC	Total
2017	$ [redacted]	$ [redacted]	$ [redacted]
2018	$ [redacted]	$ [redacted]	$ [redacted]
2019	$ [redacted]	$ [redacted]	$ [redacted]
2020	$ [redacted]	$ [redacted]	$ [redacted]
2021	$ [redacted]	$ [redacted]	$ [redacted]
2022	$ [redacted]	$ [redacted]	$ [redacted]
2023	$ [redacted]	$ [redacted]	$ [redacted]
2024	$ [redacted]	$ [redacted]	$ [redacted]
2025	$ [redacted]	$ [redacted]	$ [redacted]
Total	**$** [redacted]	**$** [redacted]	**$** [redacted]

[END CONFIDENTIAL]

REDACTED VERSION

3.3 Cost Estimating Methodology

The cost estimate was developed using a detailed cost estimating process based on a firm Engineering, Procurement, Construction (EPC) contract price, transmission and gas connection cost estimates and in-house historical data from other projects including data.

The EPC contract scope includes detailed plant design, major equipment supply including gas turbine, procurement of balance-of-plant items, construction and commissioning. The scope, requirements and price have been fully negotiated and incorporated into the signed EPC Agreement between Duke Energy Carolinas, LLC (DEC) and Siemens Energy.

Burns & McDonnell prepared an independent cost estimate for a competing advanced-class technology simple-cycle plant for reference at the Lincoln County site. See Appendix A. Based on the independent cost estimate, the negotiated EPC price reflects greater than a **[BEGIN CONFIDENTIAL]** [redacted] **[END CONFIDENTIAL]** % discount versus a similar project delivered with a 2024 Commercial Operation Date (COD). This translates to over **[BEGIN CONFIDENTIAL]** [redacted] **[END CONFIDENTIAL]** % savings on the total project installed capital cost versus a similar project delivered with a 2024 COD.

The project cost estimate includes future equipment and system tie-in costs for demineralized water and filtered water that are not included in the firm EPC price but are planned to be implemented by DEC prior to the COD.

The electrical transmission interconnect costs are based on preliminary results from a System Impact Study for the project as well as an external cost estimate for the physical high voltage tie-in with a new 230 kV bus line.

REDACTED VERSION

3.4 OPERATING COSTS

The annual operating cost by category are shown in Table 3.4 below.

Table 3.4: Annual Operating Cost, 2024 $
[BEGIN CONFIDENTIAL]

Category	First Year, $[1]	7 Year Average Annual $	7 Year Average Annual $/MW-hr
Fixed O&M	$[redacted]	$[redacted]	$[redacted]
Variable O&M	$[redacted]	$[redacted]	$[redacted]
Gas Pipeline	incl. in capital	incl. in capital	incl. in capital
Fuel	$[redacted]	$[redacted]	$[redacted]
Total	$[redacted]	$[redacted]	$[redacted]

[END CONFIDENTIAL]

The in-service expenses associated with the generating facilities reflect modeled costs for a seven-year period brought back to 2024 dollars. Variable O&M and fuel costs are based on projections from planning models. Assumptions relative to costs and forecasts vary and are subject to change.

3.5 UTILITY REVENUE REQUIREMENTS DURING CONSTRUCTION

The Construction Work in Progress for this project will not be included in rate base, but instead will accrue AFUDC. Therefore, there should be no impact on revenue requirements during the construction period.

3.6 CUSTOMER RATES

The 2025 North Carolina retail revenue requirement is estimated to be $19 million which would result ina an approximate average retail rate increase across all classes of 0.4%

[1] First year is assumed as 2025.

BURNS & McDONNELL

May 23, 2017

Rob Niehaus
Project Director – Project Development and Initiation
Duke Energy
400 South Tyron Street
Charlotte, NC

Re: Lincoln County 1x "Advanced J Class" SCGT Plant

Dear Mr. Niehaus:

Burns & McDonnell (BMcD) is pleased to submit this screening level capital cost estimate for a single "Advanced J Class" simple cycle gas turbine (SCGT) at the Lincoln County brownfield site (Project). The estimate, assumptions, and qualifications are included herein.

OBJECTIVES

Duke Energy Corp. (Duke) is currently evaluating the feasibility of a new "Advanced J Class" SCGT unit at the existing Lincoln County SCGT site. To support evaluation of the Project, Duke requested a screening level capital cost estimate inclusive of EPC costs. Burns & McDonnell previously prepared the "2017 Generic Unit Study" technology assessment which included an option for an "Advanced J Class" SCGT option at a generic site. Burns & McDonnell relied on recent similar project cost information and Lincoln County site information provided by Duke to develop a screening level cost estimate for the Project. For the "Advanced J Class" SCGT option, a GE 7HA.02 (nominally 372 MW output rating) was assumed for the gas turbine technology.

ANALYSIS

Burns & McDonnell prepared a "top down" screening level cost estimate for the Project by adjusting costs from similar EPC cost estimates to reflect the Project scope. Duke provided an abbreviated project scoping document identifying tie-ins at the Lincoln county site as well as known site conditions. The Project scope assumptions are included in Attachment A.

To develop the estimate, Burns & McDonnell relied on a similar firm bid EPC project cost estimate completed within the past year and adjusted the costs at a high level for the Project specific adjustments. Major scope items are listed below. Further scope definition is shown in Appendix A:

- Dual fuel scope – fuel oil firing and storage
- Evaporative inlet cooling

BURNS McDONNELL

Rob Niehaus
Duke Energy
May 23, 2017
Page 2

- Full enclosure around the gas turbine
- Selective Catalytic Reduction (SCR) and CO catalyst
- Minimal noise mitigation – typical OEM noise mitigation for GTG and SCR
- Escalation included assuming a commercial operation date of October 2024
- Labor rates to reflect non-union wages in North Carolina
- Project specific tie-in locations and site conditions
- Revised equipment and commodity pricing to reflect current market conditions

RESULTS

Using metrics from the American Association of Cost Engineering, this cost estimate is defined as an AACE Class IV estimate. Costs are adjusted based on typical design from similar projects, very little site specific engineering was performed to support the estimate. The total project costs are presented in Table 1 below.

Table 1: Capital Cost Summary

Equipment Procurement	$ [redacted]
Construction and Commodities	$ [redacted]
Escalation	$ [redacted]
Engineering, CM/CI & Startup	$ [redacted]
Warranty, Bond & Insurance	$ [redacted]
Contingency, OH & Fee	$ [redacted]
Total Project Costs	**$** [redacted]

The generic Technology Assessment costs (excluding owner's costs) totaled approximately $[redacted] million. The site specific costs are higher due to escalation to represent a project COD of October 2024 and differences in Project scope. The site specific costs include brownfield tie-ins, and a full gas turbine enclosure. The EPC fees are also increased slightly based on current projects that BMcD has bid and been awarded. Further cost estimate detail for the Lincoln County site is presented in Appendix B.

BURNS McDONNELL

Further cost differences between the generic Technology Assessment and the site specific Lincoln County estimate can also be contributed to the estimate methodology. The Technology Assessment costs are AACE Class V estimates which are less accurate than the site specific Project costs. A Class V estimate has less than 2% engineering and is generically based on average $/kW's for similar plants. The generic screening level costs utilize gross adjustments for intended scope based on BMcD's experience with other projects. The site specific Lincoln County estimate was adjusted for the requested Duke scope. While these costs are more accurate than a Class V estimate they are still screening level costs that can only be used to compare to other costs for Duke to evaluate the best option moving forward. These costs are not budgetary costs and should not be used for project approvals. Once adjusted for scope, the site specific Project costs were within 5-10% of the generic technology assessment costs which is well within the accuracy of the estimate.

CONCLUSIONS AND RECOMMENDATIONS

The information provided herein is intended for Duke to understand screening level Project costs for the "Advanced J Class" SCGT Project. The site specific Project costs and generic technology assessment costs provide a range of costs to consider for an "Advanced J Class" SCGT plant. While neither of the costs developed should be used to set the project budget, they can be used to compare to other plant options and evaluate potential cost savings.

Sincerely,

Zac Loehr

Zac Loehr, PE (Kansas)
Development Engineer

Attachments:
Appendix A – Scope Matrix
Appendix B – Cost Estimate

cc: Megan Parsons - BMcD
Patrick Burkett - Duke

APPENDIX A - SCOPE MATRIX

Duke Lincoln County
1x HA.02 SCGT
Scope Matrix

		Y/N	Number	% Capacity	Notes
GENERAL PROJECT INFORMATION					
Project Description					
	Project Location				Lincoln County North Carolina
	Site Description				Existing brownfield site. New SCGT will tie into existing facility.
	Contracting Approach				EPC with all equipment purchased by the EPC contractor. Fees included.
	Labor				Non-union Labor with Project Labor Agreement. 5x10 work week with option for 4x10 work week.
	Project Bonding /LOC				Performance bonds included.
	Project COD Dates				Escalation included to October 2024 COD
	Estimate Class				AACE Class IV cost estimate. Suitable for feasibility study, not budgetary.
MECHANICAL EQUIPMENT					
GTG (Combined Cycle)					
	General		1	100	GE HA.02
	Dual fuel	Y			Fuel oil.
	Inlet cooling	Y	1	100	Evaporative Cooling
	Inlet heating	N			
	Inlet Filter	Y			Pulse Filter
	Inlet Silencing	N			Standard GE inlet
	Heated Fuel Gas	Y			Dew Point heating in gas yard. Performance heating excluded.
SCR/CO Catalyst					
	SCR	Y			Catalyst life 5 yrs (or equivalent operating hours). 2x100% tempering air fans.
	Ammonia vaporizer	Y			Aqueous Ammonia
	CO/VOC	Y			Catalyst life 5 yrs (or equivalent operating hours).
Closed Cooling					
	CCW System	Y			Fin/Fan heat exhangers
Fuel Gas					
	General				Tie into existing gas supply pipeline
	Metering				Revenue meter in gas yard to check gas company.
	Compression	Y			Gas compression included, 400 psig supply pressure
	Pressure regulation	Y			Included, minimum one redundant train, on-site.
	Dew point heating	Y			Water bath heaters
Fuel Oil					
	Storage	Y			Tie into existing unloading station, tankage included for new SCGT.
	Pumps	Y	2	100	FO supply pumps
	Heating	Y			recirculation, heating

Duke Lincoln County
1x HA.02 SCGT
Scope Matrix

		Y/N	Number	% Capacity	Notes
Ammonia					
	Aqueous 19%	Y			
	Storage	Y	1	100	New onsite storage tank
Water Supply					
	Source Makeup				Existing brownfield plant tie in.
	Source Potable Water	Y			Existing brownfield plant tie in.
	Raw Water Treatment	N			Existing brownfield plant tie in.
	Service Water treatment	N			Existing brownfield plant tie in.
	Demin Water treatment	N			Existing brownfield plant tie in.
	Storage Service Water	Y			New onsite storage tank
	Storage Dem	Y			New onsite storage tank
Wastewater					
	All wastewater and sanitary	Y			Existing brownfield plant tie in.
Fire Protection					
	GTG FP	Y			Manufacturer's Standard - including generator
	Administration Building	Y			Detectors and fused head sprinkler system (wet pipe).
	Control Room	Y			Detection only.
	Ammonia	Y			Detection only.
CONTROLS					
Equipment Control					
	GTG	Y			Vender std control system with tie into existing Emerson Ovation DCS.
	Plant Control System (DCS)	Y			BOP systems will tie into the existing plant DCS.
Continuous Emissions Monitoring System		Y	1		1 per stack - 1 DAS per plant. NOx and CO analyzer upstream of the catalyst for feed forward control.
NERC CIP Requirements		Y			Low Impact
ELECTRICAL					
Generator Step-Up Transformers:					
	Gas Turbine	Y	1	100%	Dedicated 230kV-Wye / 22kV-Delta, sized for Generator MVA @ 65°C Rise
Auxiliary/Reserve Transformers:					
	Auxiliary	Y	1	100%	22kV-Delta / 4160V-Wye, sized for 120% of Auxiliary Power Requirements @ 65°C Rise.
Generator Buses:					
	Gas Turbine	Y	1	100%	Self-Cooled, Isolated Phase Bus, 125kV BIL Size based on capacity and then upsized to the next standard offering.
Electrical Equipment Enclosures:					PDC

Duke Lincoln County
1x HA.02 SCGT
Scope Matrix

		Y/N	Number	% Capacity	Notes
Switchgear:					
	4160 V Switchgear	Y			ABB Arc-Resistant 5kV, AMVAC circuit breakers
	480V Switchgear	Y			Arc-Resistant 480V
Motor Control Centers:					
	480 V MCCs	Y			480V, 3-Phase, 3-Wire
Black Start Capabilities:		N			No black start provisions are included.
Emergency Generator:		Y			480V, 3-Phase, tier 2
Emergency Power:					GTG 2 hour DC system with a UPS for supply to the lube oil, jacking oil, control system, and critical instrumentation
	Uninterruptible Power (UPS)	Y			One UPS with maintenance bypass, 480VAC input, 120VAC single-phase output.
	DC System	Y			Lead-acid battery, 4 hours discharge duration
TRANSMISION					
Switchyard					
	Configuration				Excluded. Scope stops at high side of GSU.
	Onsite Switchyard	N			Excluded.
	Interconnecting voltage	N			230 kV
CIVIL/STRUCTURAL					
Existing Facilities					Brownfield site.
Disposal of Spoils					Excess spoils will be disposed of offsite. No hazardous materials accounted for.
Soils Conditions / Stability					No geotech information, assumed piling is not necessary.
Subsurface Rock		N			Not Expected
Subsurface water		N			No Dewatering Required
Cut/Fill					Balanced site assuming land is basically flat. No major cut/fill.
Permanent Stormwater					Onsite stormwater pond
Roads					Main plant roads will be surfaced with asphalt topping at end of project.

Duke Lincoln County
1x HA.02 SCGT
Scope Matrix

		Y/N	Number	% Capacity	Notes
Foundation type					Spread footings, no piling.
Enclosures					
	GTG combined cycle	Y			GTG building with bridge crane
	Water Treatment	N			None
	Admin/Control Room	Y			5000 square foot pre engineered building
	Warehouse	Y			Included in Admin building
	Field Office	N			Construction trailers
OWNER COSTS / MISC.					
Permits					
	Air Permits	N			Excluded
	Environmental Assessments	N			Excluded
	SWPPP	N			Excluded
	NPDES	N			Excluded
Owner's Costs					
	Project Development	N			Excluded
	Owner's Operations Personnel	N			Excluded
	Owner's Project Management	N			Excluded
	Owner's Engineer	N			Excluded
	Owner's Legal Counsel	N			Excluded
	Political Concessions / Area Development Fees	N			Excluded
	Permitting & License Fees	N			Excluded
	Land	N			Excluded
	Water Rights Costs	N			Excluded
	Water Infrastructure and Supply to Site	N			Excluded
	Natural Gas Infrastructure and Supply to Site	N			Excluded
	Labor Camp	N			Excluded
	Permanent Plant Operating Spare Parts	N			Excluded
	Maintenance Tools & Equipment	N			Excluded
	Permanent Plant Equipment & Furnishings	N			Excluded
	Sales Tax	N			Excluded
	Escalation	Y			Included on project costs to October 2024
	Owner's Contingency	N			Typical EPC contingency included, no additional owner's contingency included.
	Financing Fees	N			Excluded
	Interest During Construction	N			Excluded
	Temporary Utilities	N			Excluded
	Startup Testing Fuels and Consumables	N			Excluded
	On-site Nurse	N			Excluded
	Operator training	N			Excluded
	Site Security	N			Excluded

APPENDIX B – COST ESTIMATE

BMcD COST ESTIMATE STRUCTURE
DUKE
Lincoln County

North Carolina

	AREA / DISCIPLINE	Direct MHRS	Labor Cost	Process Equip / Material Cost	Subcontract Cost	Construction Equipment Cost	**Total Cost**
	EQUIPMENT SUPPLY			[redacted]	[redacted]		[redacted]
	OEM EQUIPMENT INSTALLATION	[redacted]	[redacted]		[redacted]		[redacted]
	EQUIPMENT INSTALLATION	[redacted]	[redacted]	[redacted]			[redacted]
	CIVIL	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]
	PILING						
	CONCRETE	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]
	STRUCTURAL STEEL	[redacted]	[redacted]	[redacted]			[redacted]
	DUCTING						
	ARCHITECTURAL	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]
	HVAC						
	PAINTING & COATINGS				[redacted]		[redacted]
	PIPING	[redacted]	[redacted]	$ [redacted]	$ [redacted]		[redacted]
	INSULATION				[redacted]		[redacted]
	ELECTRICAL	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]
	INSTRUMENTATION & CONTROL	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]
	SWITCHYARD						
	(MISC) SCAFFOLDING				[redacted]		[redacted]
	(MISC) STARTUP CRAFT SUPPORT	[redacted]	[redacted]	[redacted]			[redacted]
	(MISC) HEAVY HAUL						
	(MISC) HEAVY CRANE RENTAL						
	(MISC) MISC SUBCONTRACTS				[redacted]		[redacted]
	(MISC) SMALL TOOLS			[redacted]			[redacted]
	Total Direct Cost	[redacted]	[redacted]	[redacted]	[redacted]	**Incl in Ind.**	[redacted]

Rev.	**Revision Date**
1	5/23/17 7:56 AM

Escalation	[redacted]
Taxes	
Engineering, CM/CI & Startup	[redacted]
Warranty, Bond & Insurance	[redacted]
Total Indirect Cost	[redacted]
Total Direct and Indirect Costs	[redacted]
Contingency, OH & Fee	[redacted]
Total Project Cost	[redacted]

BURNS McDONNELL

Opti	Description	Directs				COP	Total
1	Tie - Ins	[redacted]				[redacted]	[redacted]
							[redacted]

NCUC Docket No. E-7, Sub 1134 LINCOLN COUNTY CT ADDITION PROJECT CPCN

Exhibit 4: Construction Information

PARTIALLY CONFIDENTIAL

DUKE ENERGY CAROLINAS

4.1 Construction Schedule

The project will be initiated as a test facility to support Siemens' new entry into the advanced-class gas turbine market. Siemens plans on three gas turbine versions: A, B, and C. Versions B and C require an outage, upgrade package, and a testing and validation period. Duke Energy Carolinas, LLC (DEC) will take care, custody and control of the plant and commence Commercial Operation at the completion of Version C.

▪ File Preliminary Plans (pre-CPCN)	January 2017
▪ Award EPC Contract (including CT)	May 2017
▪ File CPCN Application	June 2017
▪ File Air Permit Application	3Q 2017
▪ Receive Final Air Permit	3Q 2018
▪ Begin Site Construction	3Q 2018
▪ Transmission Back Feed for Commissioning	4Q 2019
▪ Natural Gas Available for Commissioning	4Q 2019
▪ Version A Begin Testing	1Q 2020
▪ Version A Substantial completion	3Q 2020
▪ Version A Complete Validation Testing	2Q 2021
▪ Version B Begin Testing	3Q 2021
▪ Version B Substantial Completion	3Q 2022
▪ Version C Begin Testing	1Q 2023
▪ Version C Complete Validation Testing	2Q 2024
▪ Version C Substantial completion (COD)	4Q 2024

4.2 Plant Description

The Lincoln County CT Addition Project will be based on Siemens' new entry into the advanced-class gas turbine market in simple configuration utilizing dual fuel (natural gas and ultra-low sulfur diesel). A plant description is provided as Appendix A to this Exhibit 4.

The power block will be located south of the existing fuel oil tanks as shown in Exhibit 2.

4.3 Engineer/Procure/Construction (EPC) Scope

Siemens Energy will serve as the EPC contractor. The EPC contractor will provide all equipment, engineering, construction, commissioning, testing, and turnover services to bring the project to Commercial Operation.

4.3.1 Combustion Turbine Generators

The project will utilize a Siemens advanced-class gas turbine. The turbine is next generation **[BEGIN CONFIDENTIAL]** [redacted] **[END CONFIDENTIAL]** The SGT8000H has a 13-stage compressor section and 4-stage turbine section. The advanced-class turbine will be designed with a **[BEGIN CONFIDENTIAL]** [redacted] **[END CONFIDENTIAL]** The advanced-class design will utilize **[BEGIN CONFIDENTIAL]** [redacted] **[END CONFIDENTIAL]**

The unit will be tested in phases as shown in the construction schedule in Section 4.1. Version A will then be upgraded to Version B, which will include **[BEGIN CONFIDENTIAL]** [redacted] **[END CONFIDENTIAL]** The upgrade from Version B to Version C will include **[BEGIN CONFIDENTIAL]** [redacted] **[END CONFIDENTIAL]**

The Version C turbine will operate at a higher output and a comparable heat rate as other advanced-class turbines currently on the market. The unit's flexibility will complement the evolving DEC fleet with state-of-the-art turndown to **[BEGIN CONFIDENTIAL]** [redacted] **[END CONFIDENTIAL]** % load when burning natural gas and a **[BEGIN CONFIDENTIAL]** [redacted] **[END CONFIDENTIAL]** (MW) per minute ramp rate. This unit will provide the type of flexibility to adjust to intermittent renewable generation as the fleet evolves.

The Facility is planned to Testing & Validation of the Advanced Turbine. The Testing & Validation is comprised of three Phases: Version A, Version B and Version C; each Version having a similar planned Testing & Validation Period with a duration of approximately 12 months each.

There are two types of test requirements:

- Short-term testing will verify: **[BEGIN CONFIDENTIAL]** [redacted] **[END CONFIDENTIAL]**

- Long-term testing will validate: **[BEGIN CONFIDENTIAL]** [redacted] **[END CONFIDENTIAL]**

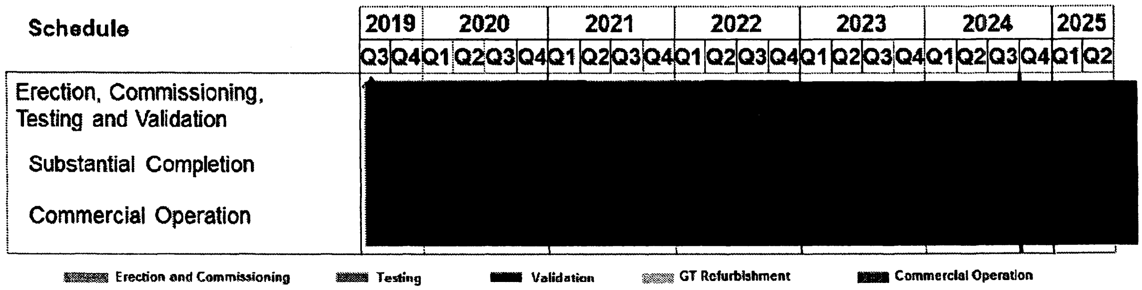
The three versions of the turbine will be tested in the approximate timeline outlined below.

Version A: An advanced frame gas turbine with a nominal power output of 369 MW (the Advanced Turbine) will be installed during the erection and building of the Facility.

Version B: after completion of Version A, including the necessary Testing & Validation, the Advanced Turbine is modified to Version B with nominal output of 382 MW.

Version C: After completion of Version B, including Testing and Validation, the Advanced Turbine will be modified to Version C with a nominal output of 402 MW. **[BEGIN CONFIDENTIAL]** [redacted] **[END CONFIDENTIAL]** After Testing & Validation of Version C, the special sensors are removed, and the Advanced Turbine is brought into the contractually stipulated condition and handed over to the Owner according the process defined in the Contract for Substantial completion and will begin commercial operation.

[BEGIN CONFIDENTIAL]



[END CONFIDENTIAL]

A long-term service agreement will economically provide comprehensive coverage to DEC and its customers. Some of the features of the agreement include:

- Warranty coverage for the entire combustion turbine, exhaust and generator.
- DEC protection from financial risk associated with deficiencies in design and durability.
- Protection from excessive escalation due to the duration of the agreement.
- **[BEGIN CONFIDENTIAL]**[redacted] **[END CONFIDENTIAL]**
- Liquidated damages for poor performance and reliability.
- Incentives for Siemens to correct problems in a timely manner.

4.3.2 Engineering

Siemens will self-perform the civil and process engineering scope and may self-perform or bid the detailed design scope to qualified engineering firms.

4.3.3 Earthwork Contractor

Siemens may directly contract for the earthwork to site to the plant elevation. Earthwork is expected to commence in 2018. The earthworks contractor will be approved by Duke Energy.

4.3.4 Construction Contractor

Siemens may contract to a general contractor or use the same engineering contractor to manage construction utilizing a multi-prime approach. All contractors will be approved by Duke Energy based on past performance, safety records, and financial strength.

4.3.5 Commissioning and Testing

Siemens will self-manage commissioning and testing of the plant as well detailed testing of the turbine.

4.4 Scope Outside of EPC Contractor

Certain scope items will be installed by Duke Energy prior to the Commercial Operation to allow for utility operation. These items include final control system tie-ins, and potential upgrades and interconnection with the existing fuel oil tanks, demineralized water and filtered water systems.

4.5 Dependable Fuel Supply

4.5.1 Natural Gas

DEC will utilize existing interstate pipeline agreements and delivered supply to manage the natural gas supply needs for the peaking Lincoln combustion turbine facility. The facility will be capable of dual fuel firing, and the site will maintain approximately three days of on-site fuel storage, including a new fuel oil storage tank to supply incremental oil back-up needs of the proposed facility. The existing Piedmont Natural Gas Company, Inc. (Piedmont) line from Transco will be modified to provide service to the Lincoln County CT Addition. The Transco tap is approximately one mile away. The proposed facility will require compression to **[BEGIN CONFIDENTIAL]** [redacted] **[END CONFIDENTIAL]** pounds per square inch gauge (psig). The current plan is for Piedmont to tap the existing line to the Lincoln regulating station. The EPC contractor will provide the gas compressors for the proposed facility as part of its scope of supply. There should be no physical limitations to supply the new and existing facilities; however, under very rare circumstances, the contractual maximum daily quantity with Piedmont could limit some existing units to operation on fuel oil. An evaluation of plant operation over the past five years revealed that this scenario would not have occurred during that time frame if the new unit was in operation during the same time period.

4.5.2 Fuel Oil

The fuel oil system which serves the existing simple-cycle units will be expanded to include an additional tank sized for 72-hour storage for the new unit. During the test period, the new tank will be dedicated to the new unit. At COD, a system will be put in place to allow transfer of oil between the existing two tanks and the new tank. With the expansion, there will be fuel oil storage for more than 72 hours of continuous operation of the new and the existing simple-cycle units.

4.6 Risk Factors

The major construction risk factors include labor availability, labor productivity, weather and new gas turbine technology performance. These risks have been transferred to the EPC Contractor. Weather risks can be at the site or at manufacturing facilities of equipment suppliers. The major testing risks are associated with unforeseen events encountered during testing which may impact schedule.

The major operating risks are equipment failure and weather. Equipment failure impact on plant operation will be mitigated by a quality assurance program during equipment fabrication and construction, EPC contract warranties and the long-term service agreement.

The lowest temperature recorded at the Charlotte Douglas International Airport's Automated Surface Observing System station was -5 degrees F, which happened twice, most recently on January 21, 1985. This temperature is incorporated into all equipment and EPC specifications as the minimum design temperature. The facility will be capable of operating at -5 degree F. A building will be provided around the turbine to provide an additional level of cold weather hardening than was employed at the existing site.

1.0 Design Criteria

The project consists of one advanced-class combustion turbine and associated balance of plant equipment. The plant will be designed based on project-specific Duke Energy operational scope requirements and discipline design criteria. Design criteria specify initial requirements, but final specific requirements will be determined during project drawing and model reviews.

The layout shall be designed to facilitate a potential future conversion to a two-on-one combined cycle configuration with bypass stacks and duct burning.

2.0 Major Equipment

Major project equipment will include those items below.

1. Combustion Turbine Generator Set
   - Water injection for NOx control (No. 2 Fuel Oil).
   - Turbine provided with SFC starting system.
   - Pulse-type multi-media inlet air filters.
   - Provisions for permanent evaporative air inlet cooling.

2. Cooling System
   - Fin-fan oil coolers.
   - Fin-fan cooler rotor-air-cooler.

3. Controls
   - CTG controls provided by OEM.
   - Controls to interface with existing Lincoln control system and be operated from the existing control room or locally at the adjacent new simple-cycle site. Controls system shall use Siemens gas turbine controls system platform. Final interface to be installed after ownership transfer. Controls shall be Emerson compatible to interface with the existing system.
   - Plant will include DCS training Simulator.
   - At commercial operation, the latest version of Smart-Gen instrumentation shall be installed.

3.0 Environmental Controls

The facility will include a dilution SCR and an oxidation catalyst. The dilution SCR uses outside air to temper the flue gas temperature to the range required for SCR operation. The SCR will utilize 19% aqueous ammonia. The plant will include NOx and CO CEMS.

4.0 Major Tanks

No. 2 Fuel Oil: A new fuel oil tank will be installed and sized for three days' oil storage. The tank will be located adjacent to the two existing tanks and utilize a common berm area. The existing fuel oil unloading station will be modified to supply the new tank. The new tank will be interconnected to the existing fuel oil tanks at commercial operation.

Demineralized Water: A single tank sized for a minimum of 24 hours storage for NOx control and evaporative cooling.

Service Water: A single tank sized for a minimum of 24 hours storage for makeup.

Ammonia Storage: An ammonia storage tank will be provided for the SCR system. The tank will be sized for 19% aqueous ammonia during detailed design to support operations for one week under the maximum expected capacity factor and the NOx ppm required by the air permit. The unloading system shall be designed to meet or exceed the requirements of the Duke Energy Natural Gas Fleet Unloading procedures.

5.0 Demineralized Water Supply

An independent system will be provided for the CT project. The system will include makeup from Lincoln CT plant service water supply and/or Lincoln County water supply for the service water system and the demineralized water system. A rental demineralized water system will be dedicated to the project and will supply the project's Demineralized Water tank.

6.0 Fire Water

The existing combustion turbine fire water loop will be expanded to include the new simple-cycle turbine.

7.0 Low Volume Waste Water

Low volume waste water streams will tie into the existing waste water system and discharge to the Lincoln County Waste Water Treatment Plant adjacent to the site via the existing Publicly Owned Treatment Works permit. Oily water separators shall be above-ground or other Duke Energy approved design. CT water wash waste water will be contained for off-site disposal. Oil-filled transformer containments shall be designed to contain the oil and the firefighting water in case of a transformer failure and/or fire.

8.0 Sanitary Waste

Sanitary waste will discharge to the Lincoln County Waste Water Treatment plant adjacent to the site.

9.0 Gas Systems

- Instrument/Service air system will include screw compressors, dryers, and mist eliminators to ensure prevention of oil carry-over.
- CO_2 System shall be designed to utilize micro-bulk storage and be capable of two times the purge capacity of the hydrogen cooled generator.
- Site shall be capable of bulk hydrogen storage and unloading in accordance with Duke Energy standards.

10.0 Electrical Equipment/Systems

- GSU for the generator 22kV/230kV.
- 22 kV / 4160 Volt medium voltage auxiliary power systems with dry-type transformer.
- Generator breaker at the CT.
- Lightning and grounding protection in accordance with Duke Energy standards.
- Security and camera systems in accordance with NERC-CIP guidelines outlined in Section 2.6 and including security cameras for viewing from the existing Lincoln CT Guard House and Control Room.

11.0 Facilities

- Gas turbine installed in a building with bridge crane access for turbine maintenance and if required for noise abatement. Additional noise abatement, including buildings in some cases, will be provided, such as stack silencers, dilution blower enclosures, etc.
- One shop/administration facility including control room, simulator room, offices, conference room, warehouse with parts issue station for inventory control, crew room and restroom facilities.
- One lube oil storage facility for inventory and waste oil.
- Plant will be designed to operate at the all-time low temperature as measured at the Charlotte Douglas airport and in accordance with Duke Energy Winterization Criteria. Water injection skid shall be located indoors to prevent freezing.

12.0 Natural Gas

The existing Piedmont Natural Gas (PNG) line from Transco will be modified to provide service to the project. The Transco tap is one to two miles away, depending on the tie-in location. The new CT will require compression to 700-750 psig. The current plan is for PNG to tap the existing line to the Lincoln M&R station on Duke-owned property. Gas compressors will be provided. Should all units including the new unit be dispatched simultaneously, some generation may be required to fire fuel oil under certain operating conditions.

13.0 Transmission

As part of the Lincoln County CT Addition, the existing 230 kV Lincoln County CT substation will be expanded and the new unit will be connected to the existing substation by a single new 230 kV transmission line of approximately 1200 feet in length and connected to an expanded 230 kV switchyard. All of the new transmission facilities will be located on existing Duke Energy Carolinas property at the Lincoln County CT site.