

INTRODUCTION

The purpose of this report is to describe the archaeological investigations of three project areas within the Chesapeake and Delaware Canal Section of the State Route 1 Corridor, New Castle County, Delaware (Figure 1). Archaeological testing of the Scott's Run project area, the Route 72/13 Intersection Improvements project area and associated Eastern Shore Natural Gas (ESNG) Transmission Pipeline corridor, and the Woodville Grave Site project area was conducted by the University of Delaware Center for Archaeological Research (UDCAR) for the Delaware Department of Transportation (DelDOT) and the Federal Highway Administration (FHWA) under Section 106 of the National Historic Preservation Act of 1966 and Section 138 of the Federal Highway Administration. Data analysis and report preparation for the three project areas took place between January 1995 and June 1995.

The first project area to be described in this report is the Scott's Run project area located approximately one mile south of the St. Georges Bridge. The project area lies on the west side of the present Route 13 and on the south side bank of the head of Scott's Run Creek (Figure 2). Archaeological survey of the Scott's Run project area was intended to locate and identify archaeological sites which would be affected by the proposed State Route 1 Corridor. Phase I and II archaeological testing of the Scott's Run project area was undertaken between July 1991 and May 1992 and identified four prehistoric and three historical sites. The four prehistoric sites are small and are located on slight terraces above Scott's Run. The three historical sites identified were the G. W. Townsend Site (7NC-G-112) - a mid-nineteenth to mid-twentieth century agricultural complex, an associated tenant house - the G. W. Townsend Tenant House Site (7NC-G-112A), and the Bennett-Thomas Mill Site (7NC-G-111) - a late eighteenth to mid-nineteenth century mill.

The second project area to be discussed in this report is the Route 72/13 Intersection Improvements project area located at the northwest and northeast corners of the intersection of Route 72 and Route 13, New Castle County, Delaware (Figure 3). Archaeological survey consisted of Phase I and II testing of the proposed turn lane along the west side of the south bound lanes of Route 13, the widening of the shoulder along the north side of Route 72, the proposed detour road on the northeast corner of the Route 72/13 intersection, and the 1400-foot Eastern Shore Natural Gas Transmission Pipeline corridor that is contained within the DelDOT right-of-way on the northwest and northeast corners of the Route 72/13 intersection (Figure 3). The survey work was intended to evaluate the effects of proposed improvements to the intersection and associated pipeline construction on significant, or potentially significant, cultural resources as defined by the National Register of Historic Places (36CFR60). The field work took place from February to October 1993 and identified three archaeological sites. Components of the Thomas Williams Site (7NC-E-104) include an eighteenth century farm site and a small prehistoric site. The Jones House Site (7NC-E-103) is a nineteenth and twentieth century dwelling site that also included a nineteenth century blacksmith shop.

The Woodville Grave Site (7NC-E-98A) is the third project to be discussed in this report. The site is located on a small bluff just northeast of the intersection of Route 13 and Route 406 (Figure 3). This unmarked cemetery was first discovered in the summer of 1993 by construction crews of the State Route 1 Corridor. After discovery of human remains and notification of the State Historic Preservation Officer, the University of Delaware Center for Archaeological Research conducted full excavation of the unmarked cemetery between June 1993 and October 1993. Because of the unavoidable destruction of the cemetery, the goals of these excavations were not only to define the limits of the Woodville Grave Site but also to fully recover all skeletal materials and any relevant data present at the site.

The current status of the sites located within the three project areas is summarized in Table 1. In the following pages, the three project areas will be discussed in terms of their environmental setting, their relationship to prehistoric and historical settlement patterns and site specific archaeological research questions. Field and laboratory methods and the research design governing the Phase I and II investigations will then be presented, followed by a discussion of the results of feature excavations and artifact analyses for each project area. Conclusions discussing all three project areas from local and regional perspectives will then be presented.

Environmental Setting

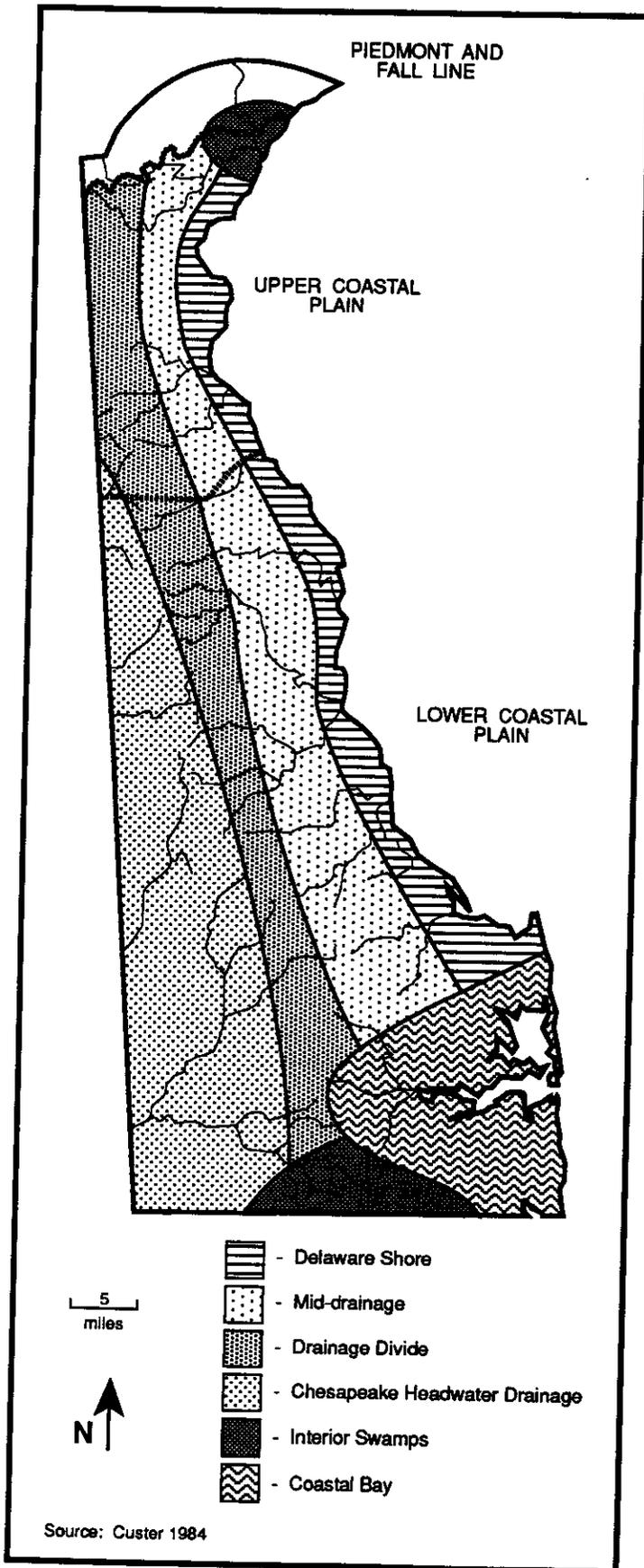
All three study areas are located in the central portion of New Castle County (Figure 4) within the Upper Coastal Plain physiographic zone, which extends from the Piedmont Fall Line to the Smyrna River (Custer 1984; Custer and Bachman 1986). Sediments of the Coastal Plain in northern Delaware are composed of two major formations: the Potomac and the Columbia. The former consists of fluvial silts and clays deposited during the Early Cretaceous Period. These sediments were later subject to major erosional forces, resulting in the unconformity separating them from the overlying sediments of the Columbia Formation. Watercourses from the north and northeast deposited the sediments of this formation sometime in the Quaternary Period. Sands, which form the primary component of these sediments, consist mostly of quartz and feldspar, while gravels are dominated by sandstone, vein quartz, and chert (Jordan 1964). These sediments derived from episodes of glacial outwash in which streams under conditions of high discharge emerged from the Piedmont to drop their bed loads of glacially-derived materials. Decrease of particle size and increase of sorting of these sediments is noted moving southward on the Delmarva Peninsula.

TABLE 1
Summary of Cultural Resources within the Project Areas

Site Number	CRS Number	Site Name	Site Type	Project Area	Work Completed
7NC-G-111	N-12769	Bennett-Thomas Mill Site	Late 18th - 19th century Mill complex and prehistoric procurement site	Scott's Run	Phase I/II
7NC-G-112	N-12770	G. W. Townsend Farm Site	19th- 20th century Agricultural complex	Scott's Run	Phase I/II
7NC-G-112A	N-12770	G. W. Townsend Tenancy Site	Rural Tenant Site	Scott's Run	Phase I/II
7NC-G-113	N-12786	Scott's Run Borrow Pit Loci F	Prehistoric procurement site	Scott's Run	Phase I/II
7NC-G-114	N-12787	Scott's Run Borrow Pit Loci A	Prehistoric procurement site	Scott's Run	Phase I/II
7NC-G-115	N-12788	Scott's Run Borrow Pit Loci D	Prehistoric procurement site	Scott's Run	Phase I/II
7NC-E-103	N-12718	Jones House Site	19th century blacksmith and dwelling and 20th century dwelling	Route 72/13	Phase I/II
7NC-E-104	N-12719	Thomas Williams Site	18th century Agricultural complex and prehistoric procurement/lithic scatter site	Route 72/13	Phase I/II
7NC-E-98A	N-5053	Woodville Grave Site	19th century cemetery		Phase III

FIGURE 4

Physiographic Zones of Delaware



As described by Custer (1984), the Upper Coastal Plain is characterized by very coarse gravel deposits of the Columbia Formation. These gravels resisted erosion creating a low rolling topography with differences in elevation of up to 50 feet (16 meters) between the headlands bordering larger streams and the adjacent floodplain marshes. Although these elevation differences are less extreme than in the Piedmont, there is slope contrast in the seasonal differences in plant communities (Braun 1967:246-247). Water courses are deeply incised and are tidally influenced for substantial distances inland. The topographic and aquatic conditions allow for a wide range of resources.

The Upper Coastal Plain can be divided into several zones running parallel to the Delaware Bay (Figure 4). The study areas straddle the border between the Delaware Shore and the Mid-drainage subdivisions (Hodny, Bachman, and Custer 1989:7-9). The Delaware Shore zone includes terrace remnants of the Delaware River and tidal marshes that fringe the Delaware River and Delaware Bay. Marshes dominate the area and often extend well inland from the river and bay shore. Soils in the area are generally poorly drained; however, pockets of well-drained soils may be found on higher elevations. The study area includes only the western extensions of this zone. Portions of the study area fall in the Mid-Drainage Zone located between the Delaware Shore and Mid-Peninsular Drainage Divide zones. The modern tidal limit marks the center of the zone. The major drainages and their tributaries are fresh throughout the inland portion of the zone. Some tidal marshes and poorly-drained floodplains occur along the major drainages. Well-drained soils have developed on upper terraces of the drainages and on isolated headlands between the major drainages and their tributaries. Access to both brackish and freshwater resources makes this zone one of the richest in Delaware for hunters and gatherers.

Drainages. The southern boundary of the project areas is marked by Scott Run which drains northeast into the Chesapeake and Delaware Canal. The Scott's Run project area is located along the south bank of the head of Scott Run. The Route 72/13 Intersection Improvements project area is located near a small, unnamed tributary and an ephemeral drainage of Dragon Run. The northern boundary is Red Lion Creek which drains into Delaware Bay. The Woodville Grave Site project area is located between Doll Run and an unnamed tributary that both drain into Red Lion Creek. Swampy and poorly-drained areas are found adjacent to the major streams.

Soils. Soils in the project areas fall within the Matapeake-Sassafras association (Matthews and Lavoie 1970). South of the Chesapeake and Delaware Canal Matapeake silt loams dominate, while to the north Sassafras sandy loams and Matapeake silt loams are evenly dispersed. Most of these soils are well drained, but badly eroded due to agricultural practices. Along the stream poorly-drained soils are more common.

Modern Setting. Land use in the project areas has been primarily agricultural since European colonization of the region. Most of the land surrounding the project areas is still under cultivation. All three project areas are located within an area of the state subject to the greatest impact pressures from public and private development (De Cunzo and Catts 1990:182-183). Recently, the area has been drastically altered at an increasingly rapid rate through commercial and residential development. This development has adversely affected the cultural resources surrounding the project area. Portions of the project area lie within two major transportation corridors, the State Route 1 Corridor and the Route 301 Corridor which, in anticipation of future development of the area, will alleviate traffic congestion but may also affect cultural resources within the corridor.

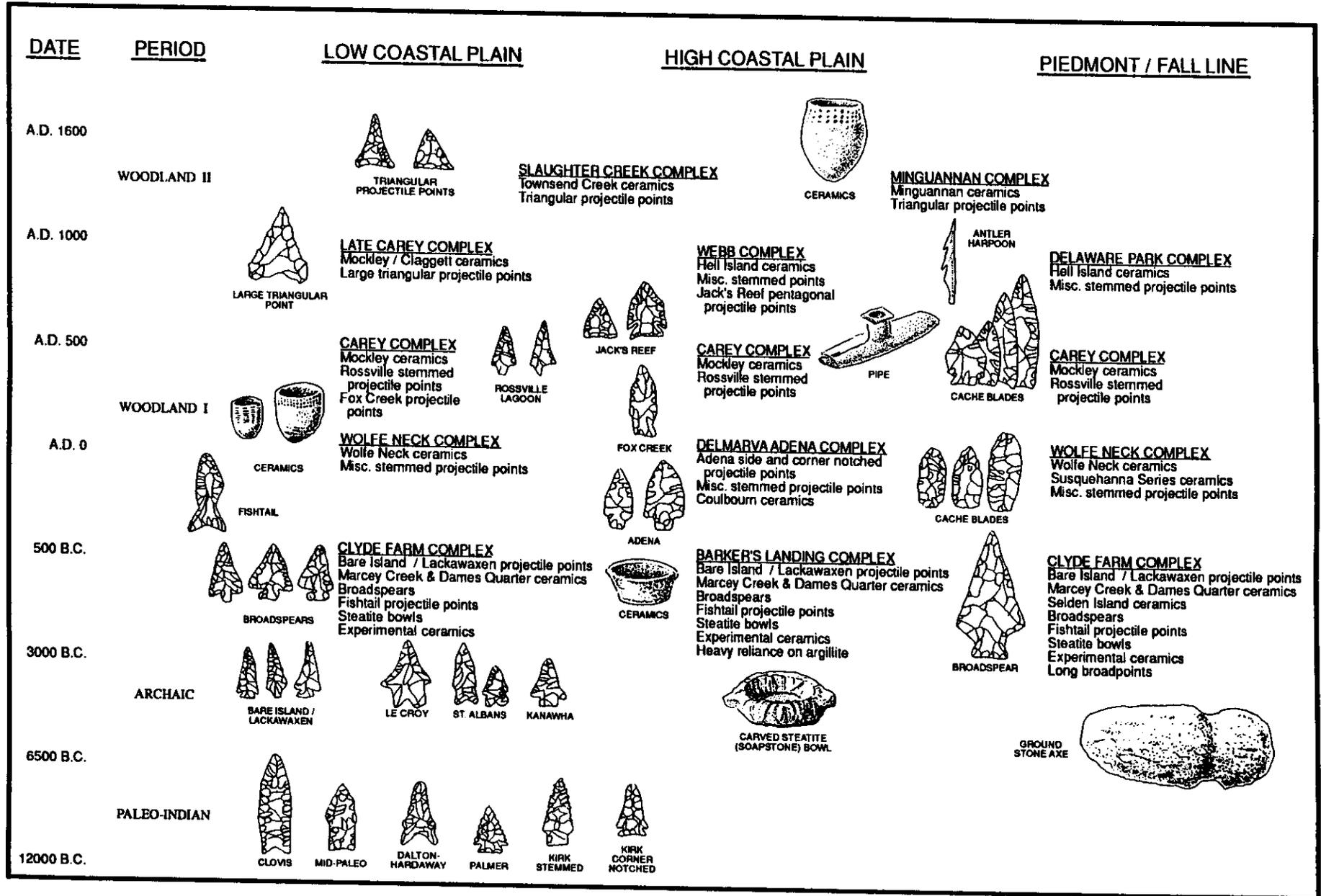
Regional Prehistory

The following summary of regional prehistory was abstracted from the work of Custer (1984, 1986, 1989). The prehistory of the Delaware Coastal Plain is divided into four periods: the Paleo-Indian Period (12,000 B.C. - 6500 B.C.), the Archaic Period (6500 B.C. - 3000 B.C.), the Woodland I Period (3000 B.C. - A.D. 1000), and the Woodland II Period (A.D. 1000 - A.D. 1650). A fifth time period, the Contact Period, from A.D. 1650 to A.D. 1750, marks the final phase of occupation by Native American groups in Delaware in anything resembling their Pre-European Contact form (Figure 5).

Paleo-Indian Period (ca. 12,000 B.C.- 6500 B.C.). The Paleo-Indian Period encompasses both the final retreat of Pleistocene glacial conditions from eastern North America and the subsequent establishment of more modern Holocene environments. The distinctive feature of the Paleo-Indian Period is an adaptation to climatic changes; from the cold climate of the end of the Pleistocene to the alternatively wet and dry climate marking the beginning of the Holocene. Paleo-Indians practiced a hunting and gathering subsistence in which animal food resources comprised a major portion of their diet. Hunted animals may have included now extinct megafauna and moose. A mosaic of deciduous, boreal, and grassland environments in central Delaware would have provided numerous productive habitats for such animals. Watering areas would have been particularly good hunting settings.

Tool kits of Paleo-Indian groups were oriented toward the procurement and processing of hunted animal resources. Preferences for high quality lithic materials are apparent in flaked stone tool kits. Careful resharpening and maintenance of tools was common. Mobile groups of single and multiple family bands are hypothesized to have focused on game attractive environments for settlement.

FIGURE 5 Delaware Prehistoric Chronology Chart



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Numerous Paleo-Indian finds are noted in Central Delaware and are usually located on well-drained knolls adjacent to poorly-drained areas. Unfortunately, all finds were found on the surface and shed little light on Paleo-Indian lifeways on the Delmarva Peninsula.

Archaic Period (6500 B.C. - 3000 B.C.). The Archaic Period is characterized by the complete emergence of the Holocene environment in central Delaware. Mesic forests of oak and hemlock predominated in the Holocene climate while grasslands diminished. Consequently, many of the grazing animals, hunted during Paleo-Indian times, became extinct while browsing species such as deer flourished.

The beginning of the Holocene in central Delaware is also associated with a rise in sea level. This rise resulted in a rise in the water table, creating numerous large interior swamps. Adaptations shifted from the hunting focus of the Paleo-Indian Period to a generalized foraging pattern in which plant food resources played a more prominent role. Swamp settings, such as Churchman's Marsh in northern Delaware, supported base camps, as indicated by archaeological excavations at the Clyde Farm Site. Numerous small procurement sites in favorable hunting and gathering locales are recorded in central and southern Delaware.

Differences between the adaptive subsistence patterns of the Archaic Period and the Paleo-Indian Period are also reflected in the tool kits. In addition to the introduction of plant processing tools such as grinding stones, mortars, and pestles, Archaic tool kits were more generalized than those of their Paleo-Indian precursors. A mobile lifestyle continued, with a wide range of resources and environmental settings utilized on a seasonal basis.

Woodland I Period (3000 B.C. - A.D. 1000). The Woodland I Period coincides with dramatic local climatic and environmental shifts. The emergence of pronounced warm and dry conditions caused the mesic forests to be replaced by xeric forests of oak and hickory and once again grasslands became common. The continued rise in sea level, although at a reduced rate, created many large brackish marshes around the Delaware River and Bay Shore. These changes in environment and resource distributions brought about a radical shift in adaptations for prehistoric groups. Important areas for settlements included the major river floodplains and estuarine swamp/marsh areas. Large base camp sites are evident in central Delaware at sites such as Barker's Landing, Coverdale, Hell Island, and Robbins Farm sites. Overall, the Woodland I Period tended toward a more sedentary lifestyle compared to the former periods. Social organization probably became more complex as population density increased (Custer 1982).

Woodland I tool kits also reflected the practice of a more sedentary lifestyle. Chipped stone tool assemblages changed little from the preceding Archaic Period, although more broad-blade, knife-like processing tools became prevalent. Plant processing tools became more common suggesting intensive harvesting of wild plant foods. First stone, and then ceramic vessels appeared during the Woodland I Period and allowed more efficient cooking and food storage. Storage pits and house features from the Woodland I Period have also been identified in Northern Delaware at sites such as Clyde Farm and Delaware Park.

Woodland II (A.D. 1000 -A.D. 1650). In many areas of the Middle Atlantic, the Woodland II Period is characterized by the appearance of agricultural food production systems. However, this shift in subsistence strategy is not apparent in the Coastal Plain of Delaware (Custer and Cunningham

1986:24). Occupation of many Woodland I settlements, especially the large base camps, continued throughout the Woodland II Period, with few changes in basic lifestyles (Stewart, Hummer, and Custer 1986). Intensive plant utilization and hunting remained the basic subsistence activities up to European Contact. Similarly, no major changes are evident in social organization during this period in central Delaware. Changes in ceramic technology and projectile styles identify Woodland II Period archaeological sites.

Contact Period (A.D. 1650 - A.D. 1750). The arrival of the first substantial number of Europeans marks the beginning of the Contact Period. Due to the paucity of known archaeological sites clearly dating from this time, this period remains enigmatic for Delaware. Site 7NC-E-42 in northern New Castle County and the Dragon Run Site (7NC-G-104) are the only sites with Contact components yet investigated in Delaware (Custer and Watson 1985; Kellogg et al. 1994). These sites' small size, impoverished assemblage of European goods, and persistence of aboriginal lithic technologies contrast with the larger Contact sites of neighboring southeastern Pennsylvania and elsewhere. Native American groups of Delaware apparently did not interact much with Europeans and were probably under the virtual domination of the Susquehannock Indians of southern Lancaster County, Pennsylvania. The Contact Period ended with the virtual extinction of Native American lifeways in the Middle Atlantic area with the exception of a few remnant groups.

Regional History

The following summary of the regional history provides a background of important local and regional events and trends that shaped the development of New Castle County and its inhabitants. The summary is arranged according to historical periods that are defined in the State Historical Plan (De Cunzo and Catts 1990). Summaries and descriptions of the regional history are based on the works of Kellogg (1993a), Catts, Hodny, and Custer (1989a, 1989b), De Cunzo and Catts (1990), (Mellin and Baumgardt 1990), Hoffecker (1977), Munroe (1978, 1984), Scharf (1888), and Weslager (1987, 1988).

The first period of Delaware history as defined by the State Plan is 1630 to 1730: Exploration and Frontier Settlement (De Cunzo and Catts 1990). Colonization of the region began when the New Sweden Company built Fort Christina in 1638 near the modern city of Wilmington and is considered the first permanent European settlement in Delaware (Weslager 1987). The Dutch gained political control of the region in 1655, resulting in construction of Fort Casimir near New Castle. In 1664, political balance again shifted when the English extended their control over Dutch colonies in the New World. The granting of proprietary rights to William Penn in 1682 by the Duke of York provided the basis for the formal granting of land tracts to the European settlers of northern Delaware (Monroe 1978).

The early settlers were farmers growing tobacco, rye and barley, but soon shifted from subsistence to market-oriented agriculture by growing more marketable grain crops such as wheat. Mills were among the earliest manufacturing complexes in the region (Pursell 1958). During the seventeenth century, large amounts of iron ore present in and around Iron Hill, Chestnut Hill, Sandy Brae, and Gray's Hill drew a group of Welsh miner/settlers to the area and in 1684 Penn issued a grant for the "Welsh Tract" (Scharf 1888:950).

The landscape during the seventeenth century was heavily wooded in a mixture of oaks, walnut, hickory, chestnut, and maple. Water travel was the easiest, safest, and most effective means of transport. Overland travel was extremely difficult, because roads were few and very poor. The route of "Herman's Cart Road" between Appoquinimink (present Odessa) and Bohemia Manor in Maryland was in use by 1660 (Scharf 1888:991). Other early roads ran from New Castle to Appoquinimink and Christiana, and from near Oglethorpe to New Castle (Scharf 1888:413). The settlers of the "Welsh Tract" at Pencader petitioned for a road to Head of Elk in Maryland in 1723.

Small hamlets were almost always situated on a navigable river or stream and consisted of a few dwellings and services, such as blacksmith shops, taverns, and stores. The villages of Christiana and Cantwell's Bridge (or Appoquinimink, now Odessa) in the Upper Peninsula were the only hamlets of any size in the area by 1700. Plantations and dwellings were generally constructed on well-drained soils with small clearings for house sites and fields. Tobacco was the major agricultural crop for most of this period, but later, grain and livestock were important. It is likely that large portions of the property were kept in woodland or marsh for cattle forage. Wise (1980:4) suggested that historical sites dating from this time period would be located within 300 feet of a drainage.

Structures present at agricultural complexes dating to this period included small dwellings generally built of wood (frame or log), or rarely, brick with earthen foundations that were generally impermanent (Carson et al. 1981; Kelso 1984; Herman 1987:84). A variety of outbuildings such as kitchens, tobacco and grain sheds, milk houses, barns, smokehouses, and meat houses would have been present on the farmsteads (Herman 1987:61-72).

One of the archaeological sites identified within the project area, the Thomas Williams Site, was first occupied during a period of Delaware history defined by De Cunzio and Catts (1990) as Intensified and Durable Occupation, 1730-1770. It was during this period in time when population increases and commercial expansion stimulated the growth of towns and the development of transportation and industry in the region. The population of New Castle County in 1740 has been estimated at about 10,800, not including black slaves, who probably accounted for from one-third to one-fifth of the population (Kellogg 1993a). Good, productive land was settled first, but as the population grew, marginal property was also occupied and colonists began to move inland away from the navigable rivers and streams.

Towns in the Upper Peninsula, such as Christiana, Newport, Cuckoldstown (modern-day Stanton), Newark, and Cantwell's Bridge (modern-day Odessa) were either founded or began to prosper. These towns were situated at prominent crossroads or navigation locations, and served as focal points for the local economy and society (Heite and Heite 1986). The town usually consisted of a tavern, a bridge or fording place, a grist mill and/or saw mill, wharves (if on a navigable river), perhaps a store, and domestic houses. None of the towns in northern Delaware were very large. Wilmington was a receiving and distribution center for local and regional farm produce, brought by water from these small villages of the Upper Peninsula.

New areas of settlement required improvements in the transportation network. Waterways continued to be important for transportation and commerce because roads were still limited in number and in poor condition. The few existing roads led to landings on rivers and the Delaware Bay where produce and goods were shipped by cheaper, and more efficient water transport. The condition of roads in the region improved considerably over the course of the eighteenth century, but in some

locations they were poor even by contemporary standards (Munroe 1954:137; Gray 1961:309). From Wilmington and New Castle, roads radiated west, south, and north, connecting the Delaware River with the head of the Chesapeake Bay (Head of Elk), Kent and Sussex counties, and southeastern Pennsylvania. In 1762, the "Kings Highway" was established (Scharf 1888:969) which passes through the town of St. George's and the study area.

Farming remained the most important activity for between 80 and 90 percent of the early settlers (Kellogg 1993a). Wheat was the primary grain produced, followed by rye, corn, barley, oats, and garden vegetables. Livestock continued to be important for the colony's inhabitants, and home manufactures were added to the economy by the middle of the eighteenth century (Kellogg 1993a). Red Lion Hundred had more than 100 farms by 1780, producing predominately tobacco and grain (Mellin and Baumgardt 1990). Farm sizes in the Piedmont and Upper Peninsula region were slightly larger than in the previous period, averaging about 320 acres in New Castle County (De Cunzo and Catts 1990: 67-71). Cleared or cultivated lands averaged between 15 and 20 percent of the total property.

Farm placements and layout changed as more and larger fields were needed for grain agriculture. Starting in the 1740s, more permanent methods of construction and material types were used (Carson et al. 1981; Herman 1987:26,109-110). Outbuildings reflected the changes in agriculture, with a general disappearance of tobacco sheds, and the presence of more durable granaries and barns.

The American Revolution dominated the social and political scene in the county at the beginning of the third time period, 1770 to 1830: Transformation from Colony to State (De Cunzo and Catts 1990). The British blockade disrupted the maritime economy along the Delaware River and its tributaries. British warships landed raiding parties that took foodstuffs, livestock, and slaves from the inhabitants. Several military forces passed through Delaware during the Revolutionary War. In the fall of 1777, a large British and Hessian army landed in Cecil County, Maryland and marched through Newark and Hockessin towards Philadelphia. A small group of continental soldiers and militia engaged this force at Cooch's Bridge (just south of Newark); however the Americans were forced to retreat after a brief skirmish. Aiken's Tavern in Glasgow served as the headquarters for the British forces.

By 1800 the population of Delaware was 64,273 including slaves and free blacks. Nearly 40 percent of the total lived in New Castle County (De Cunzo and Catts 1990:53). In 1790 fewer than half of the blacks in the state were free, but by 1800 greater than 57 percent were free. In 1800, free blacks accounted for about 13 percent and slaves for about 9.5 percent of the total population of the state (De Cunzo and Catts 1990:53).

Delaware's economy remained agricultural throughout the early nineteenth century. Wheat was still the dominant crop in the Piedmont and Upper Peninsula, but poor farming, soil erosion, exhausted land, and declining wheat prices contributed to the economic woes of Delaware farmers. Tobacco production in Red Lion Hundred was abandoned by 1800 due to soil nutrient depletion (Mellin and Baumgardt 1990). The rapid growth of the population and the decline of agricultural productivity during the early decades of the nineteenth century forced many new farmers in Delaware to clear and farm poor quality or marginal land. Many farmers were hard-pressed to turn a profit, and there was a large outmigration during the 1820s and 1830s. Hancock (1947:374) noted that the population of Delaware remained stationary between 1810 and 1820, and only began to rise again after 1840.

As people left Delaware, a labor shortage made farming on marginal and exhausted lands even more unprofitable. Less productive farms were abandoned and incorporated into the holdings of wealthier farmers (Herman 1987). The trend towards tenant farming in the eighteenth century dramatically increased during the 1800's and by the end of the nineteenth century, roughly half of all farmers in Delaware were either tenants or sharecroppers (Shannon 1945:418).

After the Revolution, rapid industrial and urban growth took place in New Castle County. The loss of jobs in agriculture was partly offset by new sources of income and employment in urban and industrial centers (Taylor 1964:441). Thus, much of the surplus population that were previously farm laborers, tenants, or unemployed, moved into urban and industrial centers where jobs were more plentiful.

Urbanization in New Castle County during the first quarter of the nineteenth century was stimulated by the presence of a transportation network and by agricultural and industrial production. Throughout the nineteenth century, improvements in transportation were the keys to urban, agricultural, and industrial development as recognized by the national government (Gallatin 1808). During this period methods and routes of transportation underwent substantial changes in the Piedmont and Upper Peninsula, as turnpikes, canals, and railroads were introduced. The first successful turnpike in Delaware was the Newport and Gap turnpike begun in 1808. By 1815, eight more turnpikes in New Castle County were chartered.

By 1850, wheat cultivation dominated in the Piedmont and Upper Peninsula down into Red Lion. Farmsteads averaged a little over 200 acres in the Upper Peninsula. Farm layout and buildings reflected agricultural developments. In the study area diverse outbuildings and barns, necessary for grain production, could be found on the landscape. Dwellings were most commonly log or frame construction and only a few brick and stone houses were built.

The Industrial Revolution complicated regional development during the fourth time period in Delaware history, 1830-1880: Industrialization and Capitalization, when great strides in industrialization, urbanization, and transportation took place in northern Delaware (De Cunzo and Catts 1990). Philadelphia's economic influence over the region declined in the first half of this period, mainly due to Baltimore's rise and the decline in demand of foreign markets for Philadelphia's agricultural produce. Regional farmers responded by diversifying their production, aided by improvements in transportation to markets, drainage techniques, fertilizers, and machinery. As a result, Delaware's Piedmont and Upper Peninsula were among the finest agricultural regions in the United States by 1860.

During the middle decades of the nineteenth century, farmers in Delaware specialized in producing corn, dairy products, fruits and vegetables, and lumber. Wheat and livestock production decreased correspondingly (Lindstrom 1978:125). The shift from cereal farming to market gardening continued into the twentieth century. By 1860, earlier dwellings were being replaced and enlarged by two-story hall-parlor or center-passage, single pile dwellings, with barns, corn cribs, and stables as outbuildings (Herman and Siders 1986:87).

From the 1830s to the 1870s, Delaware was the center for peach production in the eastern United States. Rich soil, favorable climate and rainfall, excellent transportation facilities, and strategic location near large markets made peach production a lucrative enterprise. The first peach orchards in

Delaware were introduced in Red Lion Hundred (Scharf 1888:958). The Delaware Railroad was essential to the Peach industry after its completion in 1856 (Hayes 1880:20-25). A disease known as the "Yellows," however, devastated the peach orchards in northern Delaware by the mid-1870s.

Much of the reemergence and success of both industry and agriculture in Delaware can be attributed to the improvement of transportation facilities that began in the 1820s with the construction of the Chesapeake and Delaware Canal that would connect the Delaware and Chesapeake bays. Construction of the canal began in 1824 and was completed in 1829 with the final excavation of the "Deep Cut" near Summit. As many as 2600 workmen labored to dig the canal living in frame shanties or privately owned houses constructed for the purpose (Kellogg 1993a). The canal limited travel between northern New Castle County and the rest of the Delmarva Peninsula because only two roads crossed the Canal at Summit Bridge and St. George's. The opening of the Canal led to the abandonment of the western two thirds of the New Castle and Frenchtown Railroad (Holmes 1961), and to the economic decline of the town of Christiana (Catts, Hodny, and Custer 1989a:39-40). The town of St. George's, located near the study area, benefited from its proximity to the canal.

The New Castle and Frenchtown Railroad Company grew out of the Turnpike Company of the same name opening a railway across the Delmarva Peninsula in 1831 in an effort to compete with the Chesapeake and Delaware Canal (Hoffecker 1977:43). The Baltimore, Wilmington, and Philadelphia Railroad linked Wilmington and its hinterland with both excellent sources of raw materials and markets for the sale of finished products. The Delaware Railroad connected to the New Castle and Frenchtown Railroad west of Red Lion and passed south into southern Delaware through Middletown in 1857 (Watkins 1896) bringing the rest of Delaware into the economic sphere of Wilmington.

The Civil War had a larger social than economic impact on the lives of Delaware's citizens. During the War, several temporary military encampments for home guard units were placed throughout the state, such as at Brandywine Springs. At the outbreak of the Civil War the population of Delaware was 112,216 with 49 percent of the people residing in New Castle County (Kellogg 1993a).

During the fifth time period, 1880-1940: Suburbanization, New Castle County had 59 percent of Delaware's population, the majority (nearly 70%) living in Wilmington. Between 1870 and 1900, the percentage of Delawareans employed in agriculture declined from 39.5 percent to 26 percent, while the percentage of persons engaged in industry and manufacturing rose from 23.5 percent to over 31 percent (Kellogg 1993a).

Beginning in the late nineteenth century and lasting into the twentieth century, farmers in Delaware focused on the production of perishable crops, and de-emphasized staple crops. A diversity of crops, including tomatoes, apples, potatoes, and truck produce were grown for the markets in New York, Philadelphia, Baltimore, and other cities. Further improvements in transportation throughout the state contributed to the importance of truck crops and dairy products in the late nineteenth century. Growth in truck farming was greatest between 1879 and 1899. In the Piedmont region farmers still grew cereal crops, but not for export or widespread consumption.

A noticeable decline in the size of farms and total farm acreage suggests that there was a period of farm abandonment and/or readaptation in the beginning of the twentieth century, coinciding with the beginnings of suburbanization in New Castle and Kent counties (Kellogg 1993a). Tenant farming, which had been common throughout all of the preceding periods, became even more prevalent during

the late nineteenth century. Large land owners increased their holdings during the hard times of the 1820s and leased their lands to tenants. By 1900 over 50 percent of all the farmers in Delaware were tenants or share croppers. Farm tenancy remained common into the twentieth century.

The Dupont Highway, which opened in 1923, linked northern and southern Delaware and helped to complete the shift in agricultural production towards non-local markets and open new areas to productive agriculture. Improved transportation in the twentieth century also brought a decline in the importance of the many small crossroad and "corner" communities, such as Bowersville, Kirkwood, and Williamsburg that had sprung up in the late eighteenth and nineteenth centuries. These have been replaced by commercial and industrial "strip" development along the major transportation routes throughout the state.

Research Designs and Methods

Background research for the Scott's Run, the Route 72/13 Intersection Improvements, and the Woodville Grave Site project areas revealed that two archaeological investigations were conducted within the project areas and several previous archaeological surveys of the nearby area are available for comparative studies. A number of cultural resource management studies (Custer and Bachman 1986; Custer, Bachman, and Grettler 1986; Custer and Cunningham 1986; Custer and De Santis 1986; Custer 1986) have provided excavation and survey data on sites in the nearby region. The Route 72/13 Intersection Improvements and the Woodville Grave Site project areas were included in a cultural resource planning study of the Route 301 corridor (Kellogg 1993a). The Delaware Cultural Resources Survey site files, which are maintained by the Delaware State Historic Preservation Office (DESHPO), the repository for records of all known prehistoric and historical sites in Delaware, also contain information about sites in the study area. It must be noted that many of the prehistoric and historical sites within the DESHPO inventory are reviewed in direct response to transportation and development. Thus, the locations of known sites tend to be clustered in areas of intense development activities and represents a distinct bias in survey and recording (De Cunzo and Catts 1990:118).

The primary goal of the Phase I survey was the simple location and identification of cultural resources within the project areas. As such, it is difficult to link the Phase I study with an explicit research design. However, the site location data can be used to test predictive models of site locations developed in earlier planning studies of the State Route 1 Corridor (Custer, Bachman, and Grettler 1987). A new study by Kellogg (1993a) has established predictive models for prehistoric and historical site locations based on those models mentioned above and include data on soils and surface water for prehistoric sites, and early roadways and navigable watercourses for historical sites. Archaeological sites located within the project areas may be used to evaluate these factors as predictors of site location.

The primary goal of the Phase II survey was the identification of site limits and the determination of potential eligibility for inclusion on the National Register of Historic Places of all the archaeological sites identified by the Phase I survey within the project areas. Significance was determined according to the archaeological integrity of the site, presence of intact subsurface features and artifacts in undisturbed contexts, and the ability of the site to provide data pertinent to current archaeological research questions (see discussion in Custer, Bachman, and Grettler 1987).

Historical archaeological investigations within the project areas followed the guidelines for research suggested by the **Management Plan for Delaware's Historical Archaeological Resources** (De Cunzo and Catts 1990). Three research domains landscape, domestic economy, social group identity and interaction guided historical archaeological research within the project areas. Specifically, cultural material remains of sites' occupants, such as ceramics, glass, architectural debris, and faunal remains, along with large archaeological features, can be analyzed to observe domestic and subsistence strategies as they change over time. In contrast to prehistoric sites, explicit predictive models have not been regularly applied to historical archaeological sites due to the general effectiveness of archival research and documentation as a predictive tool, particularly after the mid-nineteenth century. However, recent analyses show that historical site factors such as topography, surface water, soil quality and productivity, and access to transportation facilities and markets had significant influences on historic site locations (Custer, Bachman and Grettler 1986; Catts, Custer and Hoseth 1991; Custer and Grettler 1991; Kellogg 1993a, 1993b; Lukezic 1990; McGregor 1991; Sprinkle 1991).

Prehistoric Research Design. Analysis of prehistoric site locations in Delaware has shown that surface water and soil moisture conditions are the most important variables to prehistoric sites outside of the coastal zone (Custer and Bachman 1986:126-131; Custer et al. 1984:172-177). Custer and Bachman (1986:126-131), for example, note that locations adjacent to streams characterize 71 percent of all sites in all time periods, and Lothrop, Custer and De Santis (1987:28-31) found that 31 of 34 sites were within 200 meters of water and 18 of the 31 sites were within 100 meters of water. Soil moisture is another important correlate to prehistoric settlement, especially the presence of "bay/basin" features where poorly-drained soils occur and standing water may be found seasonally (Custer and Bachman 1986:129, 145-149; Lothrop, Custer and De Santis 1987:33).

Based on the Route 301 survey, Kellogg (1993a:66) concluded that of five locational variables of known prehistoric archaeological sites: 1) drainage presence/absence; 2) distance to drainage; 3) poorly-drained soil presence/absence; 4) wet/dry soil ecotone presence/absence, and; 5) distance to wet/dry soil ecotone, only the distance variables were significant. The predictive model for prehistoric sites was therefore generated by taking the minimum distance to a drainage of any type or to the wet/dry soil ecotone. Based on the statistical analysis of known site location and previous study results High, Low, and Medium probability zones were established (Kellogg 1993a:66). The Route 72/13 Intersection Improvements project area is located within an area of medium probability of prehistoric activity. The Woodville Grave Site is located within a low prehistoric probability zone. The Scott's Run project area was not included within the Route 301 planning study area.

The Scott's Run project area lies within the region of low significant site potential in the Interior Zone (Custer, Bachman, and Grettler 1987:Attachment V). A possible "bay/basin" feature near Areas A and B increase the probability of prehistoric utilization of this site. The Route 72/13 Intersection Improvements project area crosses only one low-order intermittent stream that drains into Dragon Creek. Any other stream channels are located approximately 3000 feet (900 meters) from the project area. There are no identified bay/basin features in the area, and soils are generally well drained within the northwest corner of the intersection. An intermittent stream passes through the northeast corner of the intersection creating a poorly-drained swampy setting that has a high potential for prehistoric sites (Custer, Bachman, and Grettler 1987:Attachment V). Two low order ephemeral drainages are present near the Woodville Grave Site project area. Based on numerous studies of prehistoric site distributions in Delaware's High Coastal Plain (Custer 1984; Custer, Bachman, and Grettler 1987; Custer and De Santis 1986), the areas adjacent to major drainages are the focus of the most intensive and extensive

prehistoric settlement. Because there are no such settings in any of the project areas, large base camp sites are not expected. Smaller drainages and low order ephemeral drainages are present in the project areas and may be the location of small base camps, transient camps, and procurement sites.

Prehistoric site location predictions are most accurate when they are made for specific time periods because human adaptations and settlement patterns changed through time in Delaware. Management plans for prehistoric cultural resources in Delaware indicate the potential for specific archaeological resources for each time period (Custer 1986; Custer and De Santis 1986). During the Paleo-Indian Period (ca. 12,000 B.C. - 6,500 B.C.), settlement patterns were focused upon areas with either readily available cryptocrystalline outcrops or poorly-drained swamps (Custer, Cavallo, and Stewart 1983). Focus on resource-rich settings such as bay/basin features and poorly-drained swamps are expected during the Archaic Period (Custer 1986:65). Given the environmental setting of the Scott's Run project area, with its poorly-drained soils, the presence of a bay/basin feature and proximity to a low order creek but with no appreciable high quality cryptocrystalline resource, the potential for Paleo-Indian sites are low while the potential for Archaic sites are high.

The western portion of the Route 72/13 Intersection Improvements project area contains relatively well-drained soils, no bay/basin features, and cobble bed lithic sources not readily available, so it is unlikely that this area may contain Paleo-Indian and Archaic sites. The eastern portion of the project area has a higher potential of containing a Paleo-Indian or Archaic period site. No known Paleo-Indian or Archaic period sites are located near the three project areas (Kellogg 1993a:42).

Management plans for prehistoric cultural resources in Delaware (Custer 1986) indicate that the Route 72/13 Intersection Improvements and the Woodville Grave Site project areas have a moderate potential for containing Woodland I and Woodland II archaeological sites. The Scott's Run project area has a low potential for containing Woodland I and Woodland II archaeological sites. The Scott's Run project area is located on poorly-drained terraces overlooking the low order stream of Scott's Run which drains into the Delaware Bay. Major terraces of drainages or well-drained headlands adjacent to swamps/marshes would be the expected locations of base camps. During the Woodland I and II periods, procurement site locations are expected to be in swampy floodplains of major and minor drainages and on alluvial fans associated with swamps, bogs and lithic sources (Custer 1986). The Snapp Site (7NC-G-101), a Woodland I base camp and possible ceremonial site (Custer and Silber 1994), is located 0.8 miles (1.28 kilometers) north of the Scott's Run project area.

All three project areas are located in the Delaware Ethnic Area study unit (Custer 1986). Site type and site locations expectancies for the Contact Period would be very much like the Woodland I and Woodland II Period predictions; however site expectancies decrease through time after the first contacts until the mid-eighteenth century (Custer 1986). The moderate probability of Woodland I and II occupations within the project areas also allows a slight possibility for a Contact Period occupation within the project area and one Contact Period site is located mid-way between the Scott's Run and the Route 72/13 Intersection Improvements project areas (Kellogg 1993a:44).

Historic Research Design. All three project areas are located within the Upper Peninsula within a zone that De Cunzo and Catts (1990:119, 183) identify as threatened by erosion or development. As with the prehistoric period the historical period can be divided into separate recognized time periods (Custer 1986; De Cunzo and Catts 1990:119).

The earliest period of occupation, Exploration and Frontier Development, 1630 - 1730 A.D. is characterized by settlement and fortification at the mouths of major rivers such as the Horkil, St. Jones, Murderkill, and Christina along with scattered farms inland along the shores of these major drainages by the Dutch, Swedes, and English (De Cunzo and Catts 1990:29). Recent research by Kellogg (1993a:71-75) has produced predictive models for identifying potential sites for the earliest periods of historic occupation (1630-1730, 1730-1770) based on comparison of known site locations and data on navigable drainages, roadways, and soils. Although all three project areas lie outside the initial settlement areas defined by De Cunzo and Catts (1990), the relatively close proximity of navigable drainages to the project areas indicates that there is a moderate probability for historical sites dating prior to 1730 within the study areas (Kellogg 1993a). Types of sites which may be present may include, scattered farmsteads (possibly with associated slave sites) and small domestic sites along inland transportation routes, such as brickyards and service businesses (taverns, inns, grist and saw mills) (De Cunzo and Catts 1990).

The period from 1730-1770, Intensified and Durable Occupation, is characterized by the expanding of European settlements inland, away from the major rivers and creeks (De Cunzo and Catts 1990). Road building during this time period, such as the King's Highway (present-day Route 13), began to change the settlement focus from the rivers to the roads. Navigable drainages still linked the sites of the area with the economy of the larger region; however, expansion away from these drainages increased the development of overland transportation routes. Subsequently, increased commercial and economic development began in the more interior areas of Delaware (Wise 1983, De Cunzo and Catts 1990). Farming shifted from subsistence to cash crop agriculture with wheat and timber being the dominant crops in New Castle County. Large areas were still not granted or farmed. Although all three project areas fall within low to medium probability zones for historical sites dating to 1730-1770 (Kellogg 1993a), the presence of the Kings Highway increases site expectancies for this area as compared to expectancies projected for sites dated prior to 1730. Historical site types in the area may include farmsteads, possibly with associated slave and indentured servant sites; small domestic sites along overland routes to service emerging communities (such as churches, and public buildings); and sites associated with nascent industries (such as retail shops, saw and grist mills, craft-production, shipping, storage, and distribution-related activities) (De Cunzo and Catts 1990).

After 1770, rapid socio-economic changes associated with industrialization, urbanization, and suburbanization occurred in Delaware (De Cunzo and Catts 1990). The period from 1770 to 1830, Early Industrialization, is characterized by the continued reliance on cash crops with wheat being a major export from New Castle County when embargoes and high tariffs did not interfere. However the quality and productivity of the land decreased throughout Delaware. With the deteriorating agriculture, a growing number of water-powered mills of all types were built throughout the state and especially in New Castle County (De Cunzo and Catts 1990:58-60). It is during this time that the first reference of a mill and dwellings in the Scott's Run project area appear in documents from the state archives. A fulling mill and pond are recorded in a deed dated 1793. No mill complexes were previously documented in St. Georges Hundred. Alexander Bowers built a house and blacksmith shop on a one-acre parcel at the northwest corner of present-day Route 13 and Route 72. By 1832, after 20 years of development by Bowers, the intersection became know as "Bowersville."

The next period, Industrialization and Early Urbanization, 1830 - 1880 in the Upper Peninsula, is characterized by diversification of agriculture and increased dairy production. Further diversification in manufacturing was facilitated by improved water transport. Large-scale construction of transportation

routes, such as the Chesapeake and Delaware Canal in 1829 and the New Castle and Frenchtown Railroad in 1831, are reflections of emerging economic growth in the Upper Peninsula of Delaware. As apparent from various map sources (Rea and Price 1849 - Figure 6, Beers 1868 - Figure 7, and Hopkins 1881 - Figure 8) consistent settlement occurred in all three project areas throughout this time. These factors increased the number of farms and the amount of acreage farmed in Delaware (De Cunzo and Catts 1990: 64-76). A wide diversity of historic sites which date between 1830 and 1880 are expected in the project areas. Farmlands found in the area could include large estates, owner- and tenant-occupied, or free African American agricultural complexes and dwellings (De Cunzo and Catts 1990). Industrial sites may include textile, snuff or grist mills, tanneries, distilleries, or other craft-production sites. Sites related to transportation routes and their construction, such as distribution/storage sites or housing for workers of these routes, may also be present (De Cunzo and Catts 1990). The Scott's Run project area continues to be occupied through this period even though the mill ceased to operate by 1852. It is during this period that two dwellings on this parcel are recorded on Beers' Atlas of 1868 (Figure 6).

The last period, Urbanization and Suburbanization, 1880 - 1940, in the upper peninsula is characterized by the decrease in number and size of farms. The farms that continued to operate were more often run by tenant farmers specializing in dairy and truck farming. Improvements in transportation, especially macadam and other paved roads, including Route 13, increased availability of cars and trucks which caused the decline of many crossroads communities (De Cunzo and Catts 1990: 77-86). One such community, Bowersville, dwindled to a few homes and a gas station. The Bowers name all but forgotten, the intersection is presently known as Wrangle Hill. The Scott's Run project area lies adjacent to Route 13 and consisted of a small 87-acre farm. Farms of less than 100 acres become the most common type during this period. The farm continued in private hands until 1960 when it was acquired by the Department of Transportation.

Field, Laboratory, and Archival Methods. Phase I and II research conducted for the Scott's Run, the Route 72/13 Intersection Improvements, and the Woodville Grave Site project areas included a review of the site files and records maintained by the DESHPO pertaining to known prehistoric and historical cultural resources within the vicinity of the project area, a review of historical atlases and maps, and interviews with local landowners and informed persons about the project area.

Research designs governing the testing plan were created for both the prehistoric and historical cultural resources based on previous archaeological investigations in the immediate vicinity of the project area. Archival research was designed to determine the nature and extent of the information contained within extant historical documents. Archival sources included deed records, tax assessments, road papers, other court records and published sources, and the review of relevant prehistoric archaeological literature (Custer 1984, 1986). Archival research can serve to establish a base history of the construction and demolition of the structures and other landscape features of a site, land use and alteration at a site, and information about site occupants, their activities and their role in the community in which they lived.

Researchers must be aware of biases that exist in historical records and literature. For example, Catts and Custer (1990) suggest that a focus on urban and political events as well as a lack of documentary information, has resulted in virtually no studies of Delaware's rural African American population. In addition to certain ethnic biases that may be present, biases also exist regarding social class and wealth.

Extensive records and maps are often provided in genealogies, tax assessments, probate records, wills, deeds, and personal diaries often associated with wealthier, well-established landholders. Comparative studies and oral histories can be used to fill in gaps in the historical record.

Pedestrian surveys and surface collection were conducted wherever surface visibility was adequate within the project area. Shovel test pits were employed as the standard Phase I test unit because of their demonstrated effectiveness in detecting buried cultural materials, their aid in the creation of artifact distribution patterns, their ability to establish site limits, and the low intensity of effort required for their excavation when compared to larger, measured test squares (McManamon 1981; Nance and Ball 1986; Lothrop, Custer and De Santis 1987). Shovel tests were excavated generally at intervals of 40 feet, with smaller interval testing of 20 feet and 10 feet employed on known or potential site locations. Soil was passed through a 1/4-inch screen of hardware mesh, and all cultural materials were bagged and labeled according to individual shovel test pits. Field notes for each shovel test pit included the recording of thickness, color and textural characteristics of all soil horizons encountered, shovel test pit depths and dimensions, and what cultural materials were recovered.

Phase II investigations, where undertaken, were conducted to define limits, integrity and stratigraphic context of archaeological sites warranting such study so that a determination of National Register eligibility could be made. Phase II investigations consisted of the excavation of 3- x 3-foot test units in areas of high archaeological potential, as defined by the Phase I shovel test pit survey. As with the Phase I testing, soil was passed through a 1/4-inch screen of hardware mesh, and all cultural materials bagged and labeled according to stratigraphic excavation levels. Field records for the Phase II testing included measured levels of thickness, and color and textural characteristics of all soil horizons encountered. Floor plans and profiles of test units were video-taped, photographed, and drawn. Features, when encountered, were recorded in the same manner.