

PHASE I ARCHEOLOGICAL SURVEY OF THE  
PROPOSED EXTENSION OF THE  
JUNCTION AND BREAKWATER TRAIL  
LEWES, SUSSEX COUNTY, DELAWARE

*prepared for*  
DELAWARE DEPARTMENT OF TRANSPORTATION  
DOVER, DELAWARE

*by*  
JOHN MILNER ASSOCIATES, INC.  
WEST CHESTER, PENNSYLVANIA

DRAFT  
MARCH 2013

**PHASE I ARCHEOLOGICAL SURVEY**

**OF THE**

**PROPOSED EXTENSION OF**  
**THE JUNCTION AND BREAKWATER TRAIL,**  
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prepared for

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## ABSTRACT

JMA (John Milner Associates, Inc.) conducted a Phase I archeological survey in conjunction with the proposed extension of the Junction and Breakwater Trail located in Lewes, Sussex County, Delaware. This work was completed for the Delaware Department of Transportation (the Department). The purpose of the survey was to identify the presence or absence of potentially significant archeological remains that would be affected by the construction project in compliance with Section 106 of the National Historic Preservation Act, as amended. Background research into the history of the properties intersected by the project area and a series of shovel test unit (STU) excavations were undertaken along the centerline of the proposed trail. A total of one hundred twenty-two (122) STUs were excavated within four distinct areas: the development berm, the agricultural field, the wooded area, and the highway ROW. A 1x1-m unit was also excavated to examine a possible prehistoric feature identified during shovel testing. The STUs along the berm behind the Breakwater Development were mostly negative for cultural resources, and the artifacts recovered from the STUs excavated along the Freeman Highway ROW were found in disturbed contexts.

The majority of artifacts recovered were from the agricultural field and the wooded area associated with nearby farm complexes. Based on the sparseness and condition of the historic cultural material, the absence on historical maps of any structures other than outbuildings in the vicinity, the lack of any documented cultural features from surface or subsurface contexts, and the degree of previous disturbance that has occurred in several areas along the trail APE, JMA is of the opinion that the historical artifacts recovered across the project area do not represent a potentially significant historic archeological site. Accordingly, no further archeological consideration for the historic cultural resources within the Proposed Extension of the Junction and Breakwater Trail is recommended.

Prehistoric artifacts including Coulbourne Ware, unidentified prehistoric ceramics, and lithic debitage were recovered from STUs within the wooded area and the northern section of the agricultural field. A prehistoric pipe bowl and several unidentified prehistoric wares were recovered from a possible "D" shaped pit feature which was isolated from the rest of the prehistoric site to the northwest. Within the agricultural field, prehistoric artifacts came from the Ap Horizon, but were recovered from undisturbed contexts within the wooded area, where prehistoric artifacts were recovered from buried intact surfaces. The stratigraphy in this area suggests that this was once a low area, possibly a wetland that has been gradually filled in colluvially. Prehistoric artifacts were recovered from lower levels of this colluvium as well.

Based on the on the 29 STUs that were positive for prehistoric artifacts along the northwestern edge of the agricultural field and within the wooded area, JMA has defined a tentative site boundary for the Smith Farm site (site number pending), with the knowledge that the true boundary has not been delineated due to the APE boundary that constrained the field testing. The date for the occupation of this site during the Woodland I period is based on the recovered Coulbourne Ware. Delaware has a high concentration of known Woodland I sites, so much data has already been gathered on this type of site; however, the potential significance for this site is in the unplowed, undisturbed surface within the wooded area. JMA recommends either avoidance of this area or a Phase II survey in order to better delineate the extent and significance of this site.

Feature 1, located in STU 50 and EU 1, is a prehistoric feature isolated from the Smith Farm site to the northwest. Prehistoric pipe bowl fragments and several unidentified/burnt prehistoric wares were recovered from the feature. All radials, however, were negative. It is possible that this

feature is part of a site that is outside the APE for this project, but currently it will remain enigmatic. JMA is not seeking a site designation for this feature, but does recommend avoidance if possible.

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## **1.0 INTRODUCTION**

### **1.1 PURPOSE AND GOALS OF THE INVESTIGATION**

This report presents the purpose, goals, methods, and results of a Phase I archeological survey of the proposed extension of the Junction and Breakwater Trail located in Lewes, Sussex County, Delaware. This investigation was undertaken for the Delaware Department of Transportation (the Department). The construction of the new section of trail would connect the current trail head at Gills Neck Road to the Theodore C. Freeman Highway (Road 23), from which it would run northeast along the highway to Monroe Avenue. The proposed trail continues to follow the highway, ending at Gills Neck Road; however, this last portion of the trail was not part of the archeological survey. The purpose of the survey was to identify the presence or absence of potentially significant archeological remains that would be affected by the construction project in compliance with Section 106 of the National Historic Preservation Act, as amended. Funding for the project was provided the Department under Agreement #1536, Task Order 4.

### **1.2 DESCRIPTION OF THE PROJECT AREA**

The project area is located within Lewes, Sussex County, Delaware. The linear survey was approximately 0.96 miles (1.55 km) in length. (Figures 1 and 2). The right-of-way (ROW) of the proposed trail varied from 35 feet (10.67 m) to 50 feet (15.24 m) in width. The center line of the bike trail runs from Gills Neck Road along a manmade berm the runs between Breakwater Development and a tree line that demarcates an agricultural field (Plate 1). The centerline then crosses the tree line at the end of the development, into an agricultural field. It follows the boundary of the field along the edge of the Bay Breeze Community Development (Plate 2) until it comes to the Theodore C. Freeman Memorial Highway. The trail crosses through what is now an overgrown wooded area (Plate 3) onto the highway ROW. It parallels a gas line within this ROW until it reaches Monroe Ave (Plate 4).

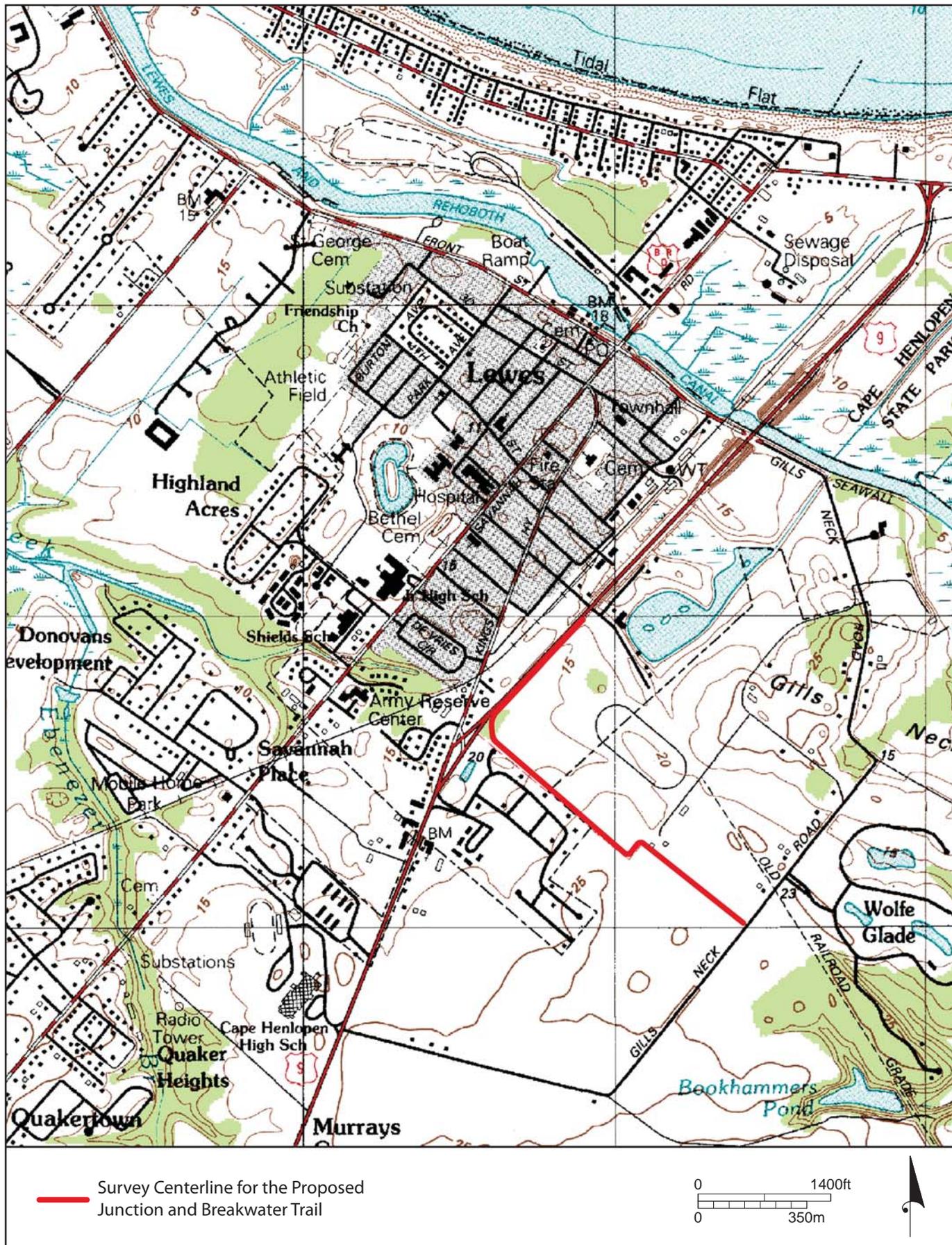


Figure 1. Project location (detail, Lewes, DE 7.5 Minute Quadrangle, USGS 1984 (photorevised 1991)).



Plate 1. View of the trail centerline along the top of the berm between the Breakwater Development and the tree line demarcating the neighboring agricultural field. View to the northwest.



Plate 2. View of the trail centerline along the edge of the agricultural field behind the Bay Breeze Community Development. View to the southeast.



Plate 3. View of the overgrown wooded area in between the agricultural field and the Freeman Highway right-of-way. View to the northwest.



Plate 4. View of the trail centerline above the drainage ditch within the Freeman Highway right-of-way. View to the southwest.

## 2.0 ENVIRONMENTAL AND CULTURAL CONTEXT

### 2.1 ENVIRONMENTAL SETTING

The project area lies in the Coastal Plain physiographic province, a relatively flat expanse of Pleistocene/Holocene-age terraces dissected by small rivers (Jordan 1964). The province is underlain by a sand sheet of Quaternary-aged (1.65 million years to present) sediments overlying earlier marine deposits of greater thickness. The Quaternary-aged Columbia formation was deposited by the ancestral Delaware River probably as discharge from continental glaciations sometime in the past (Jordan 1964). The surface of the Columbia formation was modified by at least one sea-level stand approximately 6 m (20 ft.) above the present level circa 125,000 years ago (Toscano and York 1992:321, 325). Streams were incised into the surficial deposits during earlier and subsequent times of lowered sea level. Extensive marshes have developed behind barrier beaches oriented toward Delaware Bay and the Atlantic Ocean as sea level has risen to its present position following the most recent continental glaciation (Kraft et al. 1976; Fletcher et al. 1990; Knebel et al. 1988).

The project area is nearly flat, with elevations ranging between about 12 (3.7 m) and 22 ft. (6.7 m) above sea level on a broad plain that rises moving southeast from the Theodore C. Freeman Highway to Gills Neck Road. The regional slope is generally to the east and south. Local waterways are incised into the landscape and graded to lowered sea levels. Stream banks can be relatively high and steep. Higher ground is slightly, almost imperceptibly rolling. Surficial sediments in the region are derived from Pleistocene shallow marine environments including sandy shoals and spits, back barrier environments, and beach ridges (Colquhoun et al. 1991:635–636).

Waterways located near the project area include Broadkill River, the Lewes and Rehoboth Canal (historically Lewes Creek), Ditch Creek, Old Mill Creek, Canary Creek, and Wolfe Glade (historically Wolfe Creek). Broadkill River historically (into at least the first quarter of the twentieth century) flowed directly into Delaware Bay a considerable distance northwest of the project area, while Lewes Creek, roughly paralleling the edge of Delaware Bay and flowing northwestward, emptied into Broadkill River near its mouth. The entire length of Lewes Creek between Broadkill River and Rehoboth was channelized as the Lewes & Rehoboth Canal in the early twentieth century, authorized by the U. S. River and Harbor Act of 1912 and constructed by the U. S. Army Corps of Engineers, which completed work in 1927 (Burris 2008). The natural mouth of Broadkill River was intentionally cut off from the bay and rerouted into Lewes Creek as the extended Broadkill River during the same period. The Lewes & Rehoboth Canal is still known as such east of Roosevelt Inlet, with the channel west of the inlet identified as Broadkill River on the current USGS topographic quadrangle. Ditch Creek, which currently originates in the Great Marsh to the west and flows westward, empties into Old Mill Creek farther west; historical maps indicate that this stream also entered Broadkill River on its eastern end. Canary Creek (formerly called Pagan Creek) is about 6.4 km (4 mi.) in length, draining approximately one-quarter of the Great Marsh, and now empties into Delaware Bay via Roosevelt Inlet (Elliott 1972:42–43). Wolfe Glade drains an area to the southeast of the project area and flows into the Lewes & Rehoboth Canal.

Other bodies of water of note in the area are Block House Pond, White's Pond, Bookhammer's Pond, as well as the Atlantic Ocean. Block House Pond and White's Pond are both named on the 1944 USGS topographic map, but are depicted on the earliest available detailed map from 1848 (USCS). Block House Pond is located to the northwest of the project area, close to historic downtown Lewes. White's Pond is located just to the northeast of the project area, on the other side of Monroe Ave. Early maps depict this as a marshy area with a small central pond, but it appears today to have been mechanically expanded and the area is no longer marshy. Bookhammer's Pond, to the southeast, was

created when the railroad was built in 1878 (Hancock 2976: 84), showing up on the 1901 Coastal Survey Map (USC&GS). The Atlantic Ocean is presently located a little over a mile to the north from the project area. Much of the prosperity of the region historically is due to proximity with the Atlantic through trade, shipping, and fishing, as well as more recently through an expansion of the tourism industry. Determining the shoreline for prehistoric cultures is more complicated, as this shoreline is now underwater. Utilizing a recently updated Holocene sea-level curve for the Delaware coast (Nikitina et al. 2000), we can determine how much lower sea-level was in relation to the current mean seal-level (MSL). In 2,000 BP, sea level in Delaware was 2-4 meters lower than the MSL. This translates to roughly 1.5-2.5 miles from our project area. The earlier Archaic and Paleoindian shorelines were much lower, and thus many of these sites are now underwater.

Soils of the study area are mapped as Downer sandy loam (DoA) in the southern area of the project area which includes all of the shovel tests along the development berm, and one area of the agricultural field. The majority of the soil that comprises the rest of the field is Greenwich loam with a 0-2 percent slope (GrA). The area within the wooded area is also a Greenwich loam, but with a 2-5 percent slope (GrB).

Downer sandy loam is part of the Downer Series found across the Northern Atlantic Coastal Plain, formed on a parent material of loamy fluviomarine deposits. This soil type is very deep, well drained, and ideal for agricultural use. This soil type is classified taxonomically as a Typic Hapludult, denoting a moderately deep, well drained soil profile that contains an argillic (Bt) horizon. A typical soil profile has Ap-BA-Bt-C horization (NRCS 2012) i.e. a surface plowzone over a transitional horizon with characteristics of both the upper organic horizon and the subsoil, one argillic subhorizon (subsoil), and a deep fluviomarine parent material.

Greenwich loam is part of the Greenwich Series that is also found across a small portion of the Northern Atlantic Coastal Plain, formed on a parent material of loamy Eolian and alluvial deposits high in silt underlain by loamy and sandy alluvial sediments. This soil type is very deep, well drained, and ideal for agricultural use; however, large areas of this soil type have been developed for urban and residential use. This soil type is classified taxonomically also as a Typic Hapludult, denoting a moderately deep, well drained soil profile that contains an argillic (Bt) horizon. A typical soil profile has AP-Bt1-Bt2-2Bt3-2Bt4-2CB-2C1-2C2-2C3 (NRCS 2006) i.e. a surface plowzone over one or more argillic subhorizons that may include a discontinuity caused by a soil development into two different parent materials. The CB horizon is a transitional horizon containing characteristics of both the subsoil and the parent material which may be a series of different sediment types that shift from loamy Eolian and alluvial deposits into sandy alluvial sediments.

## 2.2 PREHISTORIC CONTEXT

The following brief, general discussion provides an outline of the prehistoric cultural record of the lower Delmarva Peninsula as it is currently understood (e.g., Custer 1984a, 1986a, 1987, 1989; Custer et al. 1983; Thomas et al. 1975). The prehistoric archeological record of the Delmarva Peninsula can be divided into five major periods:

- Paleoindian period (ca. 14,000–8500 years BP);
- Archaic period (8500–5000 years BP);
- Woodland I period (5000–1000 years BP);
- Woodland II period (1000–400 years BP), and;
- Contact period (ca. AD 1600–present).

### 2.2.1 PALEOINDIAN PERIOD

Based on archeological data, Native Americans first inhabited Delaware sometime after 14,000 years BP (Custer 1989:81–86). It is thought that small family groups of Paleoindians lived a wandering existence, hunting animals that roamed a mosaic of subarctic-temperate woodland and grassland environments. Game animals may have included musk ox, caribou, moose, and the extinct mastodon; however, modern game animals, such as white-tailed deer, were also present in the region (Custer 1989:95–98). Extinct megafauna (mastodon, mammoth) and large northern mammals (e.g., moose, caribou) roamed the continental shelves at the time (Emory 1966; Emory and Edwards 1966; Edwards and Merrill 1977). The Paleoindian stone tool kit was designed chiefly for hunting and processing animals. Wild plant foods supplemented the diet. Distinctive “fluted” points, characteristic of the early Paleoindian period, show a preference for high-quality stone (Custer 1984b). Use of coastal resources during the Paleoindian period is not known primarily because sea-level rise has drowned the contemporaneous shore (Fletcher 1988; Kellogg 1988; Solecki 1961). Knowledge of the Paleoindian period is, therefore, limited and skewed to the interior of the North American continent. On the eastern shore of Chesapeake Bay, several Paleoindian sites have been identified. The sites suggest a preference for interior drainage-divide locations near fresh water sources and wetlands (Lowery and Phillips 1994). A single-component Paleoindian site has yet to be discovered in Delaware.

### 2.2.2 ARCHAIC PERIOD

The beginning of the Archaic period in Delaware is marked by major changes in human adaptations (Custer 1989:122). By 9000 years BP, northern species of plants and animals had migrated out of the Mid-Atlantic region. Temperate plant and animal species were more common, and climatic patterns had become more like those of the present. Few Archaic sites have been excavated in Delaware, however, so what is known must be extrapolated from other areas (Custer 1989:127–129).

Subsistence activities became more generalized during the Archaic period, and people depended increasingly on edible wild plants, as well as animal food sources. Archaic tool kits were less specialized than the earlier Paleoindian tool kits and included plant-processing tools, such as grinding stones, mortars, and pestles. A seasonal, mobile lifestyle exploiting a wide range of resources and settings was probably common. Custer (1986b) found that Archaic-period sites occur in a wider variety of settings than Paleoindian-period sites. Archaic sites appear to have been occupied for longer periods of time, perhaps on a seasonal basis by flexible kinship-based groups (Custer 1989:129). Exchange of stone for tools tied people together across large areas of the eastern United States, enabling more-elaborate exchange networks later in time (Custer 1989:140).

Relatively recent excavations at two sites have added to our knowledge of Archaic occupations of peninsular Delaware. The Blueberry Hill site (7K-C-107), in Kent County near Dover, was occupied during the late Paleoindian and early in the Archaic period (Heite and Blume 1995). Evidence of site occupation was sealed and separated by sediments moved by winds during a period of drier climate. The site was situated on a low knoll overlooking a stream confluence and was infrequently occupied for short periods of time, probably as a hunting and gathering camp. The Two Guys site (7S-F-68) was probably first visited intermittently during Paleoindian times, but was not visited frequently until the early Archaic period. Evidence for mid-Archaic occupation of the site is sparse, but it was revisited more frequently during the later Archaic period (LeeDecker et al. 1996). The site is situated on a sandy ridge in an area of extensive, upland wetlands.

### 2.2.3 WOODLAND I PERIOD

The Woodland period in Delaware has been subdivided into the Woodland I (or Early Woodland) and the Woodland II (or Late Woodland) (Custer 1984a:28; 1989:33–38). The Woodland I period, ca. 5000 to 1000 years BP, is the first period that is well represented on the Delmarva Peninsula. The period is characterized by a certain degree of sedentism, increased population densities, and a greater degree of contact and exchange between native groups. Woodland I period occupations in Delaware focused on the mid-drainage zone, which in eastern Sussex County is now closer to the coast due to the sea-level transgression (Custer and Mellin 1987:66).

Several distinct cultural complexes can be distinguished within the Woodland I period based on artifact styles, site locations, and inferred behaviors (Custer 1987:33–43; 1989:141–297; 1994:18–45). In addition, stone, and later, ceramic containers were included in the repertoire of technologies in use. The Clyde Farm complex exhibits some continuity in stone artifacts with the late Archaic but includes soapstone (steatite) bowls, Marcey Creek–type ceramics, and experimental pottery wares. Heavy woodworking tools, such as axes, adzes, celts, and gouges, were also more common. Between 2500 and 2000 years BP there were two contemporaneous cultural complexes in Delaware: Wolfe Neck and Delmarva Adena (Custer 1987:249). The Wolfe Neck complex is characterized by grit-tempered, cord- and net-marked pottery. The Delmarva Adena, a local manifestation of the “Adena Interaction Sphere,” is slightly younger than the Wolfe Neck Complex and is distinguished by mortuary ceremonialism, artifacts made of materials from outside the region (e.g., Ohio), and more-complex social systems (Custer et al. 1990; Thomas 1987; Thomas and Warren 1970). The mechanisms by which the Adena Interaction Sphere spread its influence across the majority of the eastern United States is not clearly understood, but its impact on the Middle Atlantic is well represented at several burial sites (Custer 1989:258–275; Thomas 1970, 1976, 1987). Delmarva Adena peoples produced pottery that included crushed ceramic sherds or burned clay in the temper, although the timing of this association has been questioned (Hoffman 1997).

The Carey complex is identified by Mockley shell-tempered ceramics and stemmed Rossville-like stone points, among others (Custer 1987:276–289). The earliest date for shell-tempered pottery on the Delmarva Peninsula is approximately 1700 years BP (Custer 1989:276). Mortuary ceremonialism is not pronounced during the Carey complex (Custer 1989:277). Homogeneity in the Carey complex on the Delmarva Peninsula apparently broke down by ca. 1400 years BP, and regionally distinct cultures developed, especially in northern Delaware. In southern Delaware, the Carey complex continued and developed into the Woodland II Slaughter Creek complex (Custer 1989:289).

Although the subsistence/settlement systems for the Woodland I period are thought to be generally similar to those postulated for the Archaic period, there appears to be a greater degree of complexity due to changes in social organization. An additional factor is the development of modern coastal environments and greater diversity in environments. Numerous Woodland-period sites have been investigated in the region, as discussed below.

The Wolfe Neck site (7S-D-10), also known as the Moore Shell Midden site (Weslager 1939), is a stratified, multicomponent Woodland I site that provided data on which the prehistoric ceramic typology for the region was refined (Griffith and Artusy 1977). The lower levels of the site are representative of the Wolfe Neck complex. Coulbourn clay-tempered ceramics were found in overlying deposits, while shell-tempered Mockley ceramics were found in the uppermost strata of the shell midden (Griffith and Artusy 1977). Coulbourn ceramics have been associated with the Delmarva Adena complex (Custer 1989:173), but new radiocarbon dates from another archeological site on Wolfe Neck (7S-D-61A) may require reevaluation of this association (Hoffman 1997:III-4–

III-7). Mockley ceramics are considered a technological precursor of the Woodland II Townsend ceramic series (Custer 1989:173–174).

The Wilgus site (7S-K-21), on Cedar Neck, is a “micro-band base camp” occupied by Delmarva Adena and Carey people. The Adena occupation is represented by an Adena-type bifacial stone tool and debitage of Ohio Flint Ridge chalcedony, a gorget, and Coulbourn ceramics. Artifacts were recovered from the plowzone in the living area of the site on a low knoll. Just off the knoll on the slope was a series of Delmarva Adena middens, each approximately 8 m in diameter, in some cases buried by slopewash and unplowed. Some of the middens contained oystershell and clamshell, while others were identified as a dark rich soil with artifacts. Food remains represented in the middens included freshwater fish, deer, snake, turtles, and birds. Seasonality indicators suggest fall, winter, and early spring occupation of the site. Numerous *Amaranth* and *Chenopodium* seeds were recovered by flotation (Artusy 1976, 1978; Custer 1989:256–257). A new ceramic type identified at, and named for, the Wilgus site is tempered with both shell and clay. Wilgus ware fills a gap in the ceramic sequence between clay-tempered Coulbourn wares and later shell-tempered Mockley wares, suggesting continuity in regional occupation. Occupation of the Wilgus site by the Carey complex is indicated by Mockley ceramics (Custer 1989:278).

#### 2.2.4 WOODLAND II PERIOD

The Woodland II period, ca. 1000 years BP to AD 1600, is characterized by increasing sedentism (Custer and Mellin 1987) and a breakdown of the exchange systems that existed in Woodland I times. The reasons are not well understood, but it has been suggested that population pressures may have played some role (Custer 1989:300). Although sedentism is often associated with the introduction of agriculture, which provides a steady and reliable subsistence base, there is only meager evidence suggesting that agriculture provided a significant portion of the diet for people living in southern Delaware. However, previous investigations in the Sussex County coastal region have discovered the remains of probable cultivated plants (e.g., corn, amaranth seeds), and recent excavations at the Two Guys site in Sussex County recovered evidence of a cultivated variety of sumpweed (LeeDecker et al. 1996:136–138). In addition, and perhaps of more importance, marine resources were a primary source of food during the Woodland II period. The Woodland II period is relatively well known in southern Delaware because of extensive early work by the Sussex Society for Archaeology and History (SSAH).

#### 2.2.5 CONTACT PERIOD

The archeology of the Contact period, ca. AD 1600 to present, is very poorly understood because no clear-cut Contact-period sites have been identified and thoroughly investigated in Delaware (Custer 1989:340; Grumet 1990:193, 202, 204). Intermittent contact between Native Americans and Spanish and other explorers is poorly documented, but oral traditions imply contacts prior to attempts at colonization (Grumet 1990:192–193). Seventeenth-century and later historical documents contain many references to interactions between Native Americans and Europeans (e.g., Davidson 1982; de Valinger 1950; Mayre 1936a, 1936b, 1937, 1938, 1939, 1940).

The earliest European settlements on the eastern shore of Delaware were those of the Dutch, whose presence in Delaware Bay was well established by the middle of the seventeenth century (Grumet 1990:199–201). Fort Swanendael and a Dutch West Indies Company outpost near Lewes were established in 1631. The first settlement was destroyed and the buildings burned after a misunderstanding between the Dutch and the local inhabitants (Weslager 1969). A number of seventeenth-century European settlements were situated on, or very near, late Woodland II Slaughter Creek-complex sites in the Lewes/Rehoboth area. Early historic cultural material was also found in close association with Native American material, or in separate features, on several sites excavated

by the SSAH (e.g., Bonine 1956:31). It is likely that European settlers moved onto the clearings associated with Native American sites. Weslager (1942) quotes Lindstrom in associating the name “Sironesack” (variously spelled, see below) with a large village at Lewes occupied by “natives rich in corn fields.” The place is also referred to as “Chenonnessex,” “Checonesseck,” “Sikonesses,” or “Sickpnesyns” (Weslager 1942, 1943a). Land was “purchased” from the Indians by the Dutch in 1629. The names of Quesquakous and Ensanques, inhabitants of “Sickonesyns,” appear on a recording of the deed made in Manhattan the following year (Weslager 1949).

Native American society was shattered by European colonization. People were forced off their traditional lands and populations were decimated by disease (e.g., Grumet 1993:2). Migrations and political alliances between neighboring groups led to cultural amalgamations that make it difficult to reconstruct precontact cultural systems. Nonetheless, some Native Americans were able to maintain their identities and communities. In 1711, the Maryland assembly set aside 1000 acres for an Indian reservation in what is now southern Delaware; however, most of the land was apparently sold off in the 1740s (Mayre 1940; Porter 1979:327–329). Many Native Americans left the area at the time to join other groups to the north (Porter 1979:329–330, 1987:46–48). Those who remained in their homeland withdrew into the hinterlands and were able to survive in relative isolation (Porter 1979:331–334). The archeological record for this period is unknown in Delaware; however, the Burr/Haines site in Burlington County, New Jersey (Zebooker and Thomas 1993), may provide a model for the type of archeological site that may be representative of a protohistoric Native American occupation.

Racial tensions and segregationist law led to a classification of many Native Americans as “Negro” or “mulatto” (Porter 1987; Weslager 1943b). The matter was tested in court in 1855 when Levin Sockum, a storekeeper in Sussex County, sold shot to another “Moor.” Lydia Clark, an 87-year-old woman who was purportedly the last fluent speaker of the Nanticoke language (Babcock 1899:280), testified that the “Moors” were descendants of an Irish woman and her African slave. Thus, Levin Sockum was considered a “mulatto” and convicted of a crime (Porter 1979:340–341, 1987; Weslager 1943b). Racial tensions continued to affect Native American populations in Delaware. In 1875, the Delaware legislature passed a tax measure to support segregated schools (Porter 1979:39–342, 1987; Weslager 1943b). The Nanticoke were considered nonwhite and so were subject to the new law. The Nanticoke protested and resisted the tax, resulting in a new law, passed in 1881, recognizing the “Incorporated Body,” which allowed the Nanticoke to establish their own schools. The 1881 law did not specify the cultural identity of the Incorporated Body, so the Nanticoke appealed to the Delaware Assembly for explicit recognition of their Native American heritage in 1903. Nonetheless, the assimilation of the Nanticoke into western society continued, and the Incorporated Body languished somewhat (Porter 1987:72–72).

Near the turn of the century, the relatively new discipline of anthropology recognized the existence of remnant Native American populations in the eastern United States (e.g., Babcock 1899). Frank Speck, an anthropologist at the University of Pennsylvania, began a long association with the Nanticoke in 1911 (Porter 1987; Weslager 1943b). With Speck’s help the Nanticoke sought stronger legal status, and a charter incorporating the Nanticoke Indian Association was acquired. The Nanticoke continue the struggle to maintain their cultural identity (Clark 1987; Porter 1979, 1987:79–84). Other communities of Native American descent are also seeking recognition in Delaware. For example, many individuals of the “Moor” community in Kent County trace their ancestry to Native Americans (Babcock 1899; Heite and Blume 1999; Weslager 1943b). Despite the difficulties in recognizing Native American archeological sites after European colonization (Custer 1989:340–341; Porter 1979:333), there has been a continuous Native American presence in Delaware from prehistoric into historic and modern times.

## 2.3 REGIONAL HISTORICAL CONTEXT

Delaware's recent past, comprising approximately three centuries has been compartmentalized into five temporal study units, as defined by the *Delaware Comprehensive Historic Preservation Plan* (Ames et al. 1987), and these units form the basis for an appropriate chronological framework for the investigation of the state's historic resources:

- Exploration and Frontier Settlement (1630–1730)
- Intensified and Durable Occupation (1730–1770)
- Transformation from Colony to State (1770–1830)
- Industrialization and Capitalization (1830–1880)
- Urbanization and Suburbanization (1880–1940)

In an effort to coordinate the study of aboveground and archeological cultural resources, these temporal study units were adopted unaltered in the *Management Plan for Delaware's Historical Archaeological Resources* (De Cunzo and Catts 1990:119).

The following regional historical summary is presented to provide a brief background on important local and regional historical events that shaped and affected the inhabitants of Sussex County. The historical periodization is obtained from the State Historical Plan (Ames et al. 1987; De Cunzo and Catts 1990; Herman and Siders 1986), and descriptions of regional historical events are based on the works of Munroe (1978, 1984), Hoffecker (1977), Hancock (1976), and Scharf (1888).

### 1630 to 1730: Exploration and Frontier Settlement

The first permanent settlement in the vicinity of Lewes was made in 1630 and was known as Swanendael (“valley of swans”). About a decade earlier the Dutch West India Company had established a trading post on the west side of Delaware Bay (then called Godins Bay after Samuel Godyn, a company supporter) (Weslager 1969). The new colony of Swanendael was located near the Dutch West India trading station at Whorekil. It was sponsored by the patroons of the Dutch West India Company, under the direction of Samuel Godyn and Samuel Bloomaert. Swanendael was created for the purpose of whaling and raising grain and tobacco. This venture was privately financed, but it ended when the all-male population was wiped out in a massacre by the local Indians, the Sickoneysincks, in 1632. After the destruction of the settlement, the Dutch abandoned any attempts to settle the lower Delaware valley and focused instead on their holdings in New Amsterdam (modern New York) (Zebooker et al. 1996).

Farther north a group of Swedes in the employ of the New Sweden Company built Fort Christina in 1638 in what is now part of the City of Wilmington. Fort Christina thus became the first permanent European settlement in Delaware. The Swedish government supported the venture, and Fort Christina, located at the confluence of the Brandywine and Christina creeks, became the nucleus of a scattered settlement of Swedish and Finnish farmers and traders known as New Sweden (Weslager 1987).

The Dutch claimed the identical land—from the Schuylkill River south—by right of prior discovery, and in 1651 the West India Company retaliated by building Fort Casimir at the present site of New Castle, in an attempt to block Swedish efforts to control commerce on the Delaware River. The Swedes responded by capturing this fort in 1654 and renaming it Fort Trinity. Rivalry between the Swedes and the Dutch continued, and the Dutch returned to the

Delaware Valley in 1655 with a large military force and recaptured Fort Trinity and also seized Fort Christina. As a result, New Sweden ceased to exist as a political entity due to a lack of support from the homeland. Nonetheless, Swedish and Finnish families continued to observe their own customs and religion.

In 1657, as a result of peaceful negotiations, the City of Amsterdam acquired Fort Casimir from the West India Company and founded the town in the environs of the fort called New Amstel. This was a unique situation in American colonial history—a European city became responsible for the governance of an American colony. The Dutch erected a small fort at Lewes, called the Whorekil (also spelled Hoerenkil, Horekill, Horekill, and Hoorekill), near the mouth of the Delaware Bay in 1659 for the purpose of blocking English incursions, particularly settlers from the Chesapeake Bay and Virginia, since Lord Baltimore considered the lands on the eastern shore of the Chesapeake Bay and extending to the western shore of the Delaware as part of his proprietorship. At the Whorekil (Lewes) several Dutch families built homes, including Dutch Mennonites under the leadership of Cornelius Plockhoy, who established a semisocialistic community there in July 1663. They too were under the supervision of local officials appointed by the burgomasters of Amsterdam.

English hegemony of the Delaware River and Bay area began in 1664, when Sir Robert Carr attacked the Dutch settlement at New Amstel on behalf of James Stuart, Duke of York, brother of Charles the II. This was an important move on the part of England to secure her economic position in the New World. The settlement at the Whorekil was also seized and pillaged by the English.

A transfer of political authority from the Dutch to the English then followed, and the Dutch settlers who swore allegiance to the English were allowed to retain their lands and personal properties with all the rights of Englishmen. Former Dutch magistrates continued in office under the Duke of York's authority, and the Swedes, Finns, and Dutch alike peacefully accepted the rule of the Duke of York through his appointed governors. In 1670 the first local court was established at the Whorekil by Governor Lovelace. By 1671 the population of the Whorekil consisted of 47 individuals, both Dutch and English (Gehring 1977:100). It was reported at that time that the Marylanders were unlawfully settling within the boundaries of the Duke of York's lands, specifically about 20 miles from the Whorekil in the vicinity of Assawoman Inlet. Indeed, in 1670 Lord Baltimore had created a new county, called Durham, which encompassed all of the lands currently occupied by much of the State of Delaware (Papenfuse and Coale 1982:11). Between 1670 and 1682, when William Penn became the proprietor of the lands from the Whorekil to New Castle, Baltimore issued at least 45 warrants for lands on the west side of the Delaware Bay, along "Duke Creek" (probably Duck Creek), Slaughter Creek, Prime Hook, Indian River, and Whorekil Creek (Skirven 1930). In 1673, during the third Anglo-Dutch war, the Dutch recaptured New Netherlands, including New Amstel and the Whorekil. The Dutch retained possession of the region only briefly, returning the lands to the English in 1674 in exchange for the captured Dutch colony of Surinam. The short war had an effect on the settlers at the head of Delaware Bay, however, because in December 1673, the Maryland government sent an expeditionary force of 40 men to the Whorekil, which was burned and pillaged for a second time in less than a decade (deValinger 1950). Following the peace treaty, the English again regained control of the region.

In 1682, the granting of proprietary rights to William Penn and his representatives by the Duke of York essentially gave political and economic control of the Delaware region to Philadelphia, the new seat of government in Penn's colony of Pennsylvania (Munroe 1978). Two years earlier, in 1680, Governor Edmund Andros had established the County of Deale, which included the

settlements at the Whorekil northward to Cedar Creek. The settlement of the Whorekil region, particularly around the town of Whorekil, and the area 10 miles south at Indian River and Assawoman Inlet, was encouraged by Governor Andros. Between 1676 and 1678, 47 land patents were issued by the Duke of York's government for lands in the area, all fronting on the coast or on navigable streams and rivers (Hancock 1976:17).

With Penn's arrival in 1682, the name of Deale County was again changed, this time to Sussex County, and the name of the town of Whorekil was changed to Lewes, the county seat of the English county of Sussex. In 1682 the first surveyors of highways and bridges were appointed for the county. Sussex County at this time was heavily forested and swampy, and settlement in the county for much of this period was confined to an area within about 10 to 12 miles of the coastline, extending inland along a line running roughly from modern Milford-Milton-Harbeson-Millsboro-Dagsboro. Gristmills were established on Broadkiln Creek (Milton) by 1695 and on Bundick's Branch soon thereafter; an earlier gristmill had existed in Lewes by 1676. Lewes was the only town of any size in the county, and it became a political, maritime, and commercial center for the region.

Yards for shipbuilding were present in Lewes by the early 1680s (Hancock 1976:21). The population of Sussex County has been estimated to have been less than 1000 persons by 1700, and the majority of these inhabitants were farmers, raising crops of tobacco (the primary medium of exchange), corn, wheat, and rye. Hogs and cattle were also raised. The exporting of cattle, by driving them overland from Lewes to New Castle, appears from the records to have been a significant source of income for the settlers of Sussex (Munroe 1978:198).

Political relations between the Three Lower Counties and Pennsylvania deteriorated, and by 1704 representatives from Sussex County began to meet with legislators from New Castle and Kent Counties in a separate assembly at the town of New Castle, but the governor continued to be appointed by Pennsylvania. Economic and social ties, however, continued to link the Lower Counties with Philadelphia throughout the seventeenth and eighteenth centuries (Munroe 1954).

### **1730 to 1770: Intensified and Durable Occupation**

Settlement in Sussex County by the start of this period had penetrated the interior portions of the region, reaching the area of the mid-peninsular divide (just to the west of present-day Georgetown). Patents for land west of the headwaters of the Broadkiln and Indian rivers, and along Gravelly Branch and its tributaries, were being issued from the Pennsylvania government by the second decade of the eighteenth century (Scharf 1888:1237, 1293). According to one contemporary observer:

The Inhabitants here live scattering generally at 1/2 a mile or miles distance from each other, except in Lewes where 58 families are settled together. The business or Employment of the Country Planters, is almost the same with that of an English Farmer, they commonly raise Wheat, Rye, Indian Corn, and Tobacco, and have Store of Horses, Cows, and Hoggs. The produce they raise is commonly sent to Philadelphia ... The people here have generally the Reputation of being more Industrious than they of some of the Neighboring counties .... (Hancock 1962:139).

On the opposite side of the peninsula, in the area that would become Northwest Fork, Nanticoke, and Seaford hundreds, the Maryland government was issuing patents and warrants as early as the 1680s for lands on the Marshyhope Creek, Clear Brook Branch, and other tributaries of the northwest fork of the Nanticoke River. In 1682 John Nutter of Maryland took up the tract of land

between Clear Brook Branch and Bridge Branch that would eventually contain the town of Bridgeville (Hancock 1987:13). Other prominent family names from the western part of Sussex County, such as Cannon, Polk, Richards, and Adams, appeared in the area during this period under Maryland land patents. Until the settling of the dispute over the boundary line between Maryland and Pennsylvania (including the Three Lower Counties) in 1765 by the establishment of the Mason-Dixon Line, the traditional western boundary between Sussex County and Worcester County was the Nanticoke River and its tributaries, particularly Tussocky Branch and Gravelly Branch. Those settlers on the west side of the Nanticoke resided in the Province of Maryland, and those on the east side lived in Sussex County. Needless to say, this rather arbitrary boundary caused considerable confusion and dissension among the “Border People” on the peninsula, and numerous annoying disturbances occurred along the borders of New Castle, Kent, and Sussex counties throughout the period.

For most of the eighteenth century, the land remained heavily wooded and overland passage was difficult. The limited extent and development of the road network in the county is shown on Benjamin Eastburn’s map of the Lower Counties in 1737. Major roads included the King’s Highway, officially established by an Act of the General Assembly in 1752, which ran northward from Lewes to Cedar Creek and St. Matthews Anglican Church (built in 1707), and from there to Dover and up country to Wilmington (Laws of the State of Delaware 1797:320, 390–394). From Lewes the main road ran south through St. Georges Chapel to Warwick and the ferry crossing on the Indian River, and from Lewes southeast down the Atlantic Coast toward the Inlet. At St. Georges Chapel (built in 1719), a side road extended down Angola Neck, a site of early settlement in the county (Munroe and Dann 1985). In the western part of the county, claimed at this time by Maryland, a major overland route ran from Choptank Bridge across Gravelly Branch in the vicinity of Coverdale Crossroads. The roads were described at the beginning of this period as “very commodious for travelling, the land being level and generally sandy, so that the people usually come to Church Winter and Summer some 7 or 8 miles, and others 12 or 14 miles....” (Hancock 1962:140).

The population of Sussex County grew slowly throughout this period. In 1728, the Reverend William Beckett reported that there were a total of 1750 inhabitants in the county, consisting of 1075 Anglicans, 600 Presbyterians, and 75 Quakers. Beckett also noted that there were 241 slaves and free blacks in the county. The presence of so many Presbyterians, Beckett said, was due to the great influx of at that time of Scotch-Irish settlers “of the most bigotted sort” (Hancock 1962:138). By the 1740s, it was estimated that the population of Sussex County was between 1800 and 2000 (Pennsylvania Archives 1891), and Hancock (1976:26) estimates that by 1775 there were nearly 14,000 inhabitants. The tremendous growth of the population between 1740 and 1775 may be attributable to the strong migration of settlers from the eastern shore of Maryland to Delaware lands, as well as to overseas immigration from Great Britain (Munroe 1978:150).

Throughout the period, farming continued to be the major occupation of the settlers in Sussex. The farms and plantations in Sussex have been generally characterized as subsistence farms, operated by poorer farmers and farm laborers, particularly when compared to the farms located in New Castle County (Main 1973:26–32). Tobacco declined from its position as the prominent cash crop in Kent and Sussex counties and was replaced somewhat by corn and wheat. The lumber industry, particularly the harvesting of vast stands of cedar and pine from the Indian River area, began to grow in importance during this period, and the shellfish industry was established in the bays of Sussex. Shipbuilding remained a significant industry, especially at Lewes, on the Broadkilm, and along Indian River.

An important industry that flourished in the county during this time period was the iron industry. Several iron furnaces and plantations were established along the Nanticoke, Gravelly Branch, and Deep Creek beginning in the 1760s (Tunnell 1954; Heite 1974). These furnaces used bog iron, dug from the surrounding swamps and wetlands, for their sources of ore. The Deep Creek Furnace was established in 1763, as was Nanticoke Forge, located at Middleford. Pine Grove Furnace was located at the present site of Concord, and the Unity Forge (blast furnace), owned by Joseph and Samuel Shankland, was located at the head of the Nanticoke River in Northwest Fork Hundred. Most of these furnaces were out of production by the beginning of the American Revolution.

Lewes continued to be the major town in the region, though there was some dissension in the 1760s among the inhabitants of the southern and western portions of the county to have the county seat moved to the Crossroads on the Broadkilm (present-day Milton). Several small hamlets began to spring up during this time period, mostly located at stream and river crossing points. Besides the Crossroads, also known as Clowes, these hamlets included Bridgebranch (later Bridgeville) in Northwest Fork Hundred, established in 1730 with the erection of a bridge over the creek of the same name; Warwick in Indian River Hundred, a ferry point erected before 1750 on the upper reaches of Indian River; and St. Johnstown in Nanticoke Hundred, the location of crossroads village and Presbyterian Church in the last quarter of the eighteenth century.

While Lewes continued to function as a center of shipbuilding, vessels began to be built in the Indian River region during this period. Several sloops of 10 and 20 tons and at least one schooner of 10 tons were registered in Philadelphia between 1742 and 1746, and at least one of these was built at Warwick Ferry. Owners were generally from Philadelphia, but the masters of the vessels were local (Anonymous 1900).

### **1770 to 1830: Transformation from Colony to State**

By the start of this period, the century-long boundary dispute between Maryland and Pennsylvania had been decided, and the area west of the Nanticoke officially became part of Sussex County. The addition of such a substantial tract of land spurred the creation of five new hundreds in Sussex: Baltimore, Little Creek, Dagsborough, Nanticoke, and Broad Creek. These hundreds in “New Sussex” were joined with the five hundreds of “Old Sussex”: Lewes and Rehoboth, Indian River, Northwest Fork, Broadkill, and Cedar Creek (Hancock 1976:25). Sussex County thus became the largest of the Three Lower Counties, with a surface area of 938 square miles, nearly the size of both New Castle and Kent counties combined. By 1800 the population of the county was 19,358 inhabitants, with nearly 40 percent of the total located in the hundreds of Northwest Fork, Nanticoke, and Broadkill. Northwest Fork, Baltimore, and Dagsborough hundreds held the largest number of enslaved African Americans, with between 18 and 19 percent enslaved persons in their respective populations. Baltimore Hundred contained the fewest number of inhabitants in the county in 1800, with a total of 1395 persons, or approximately 27 persons per square mile. By 1830 the hundred’s population had grown slowly, reaching 2176.

At the start of this period, the American Revolution dominated the social and political scene in the county. Much of the effects of the war were limited to the coastal areas around Lewes, the Mispillion, Broadkill, and Indian rivers, where British blockades and shore raids disrupted trade and commerce. Inland, however, strong loyalist sentiments among the population prevailed, and in 1780 about 400 Tories took part in the Black Camp Rebellion. The headquarters of the rebellion was located in a swamp about six miles north of Georgetown and was quelled with the use of Kent County militia (Hancock 1976:43). Many of the participants in the rebellion were inhabitants of the poorer regions of the county, and complained about a lack of paper currency,

and of destitution for their families. Economic grievances of this sort would continue after the Revolution, and throughout the period.

In 1791, the Sussex County legislature voted to move the county seat from Lewes to the new town of Georgetown, located near the center of the county. As a result of this move, improvements in the transportation network, particularly in the interior parts of the county, were undertaken. Near the project area, the overland transportation network focused on gristmills, sawmills, and milldams. One early millseat in the region was erected in 1785 across the head of Assawoman Creek (Conrad 1908:727). Mills and stores, such as at Selbyville, Frankford (Long's Store), Omar (Baltimore Mills), Roxanna, Hall's Store (Ocean View), and Tunnels Store (Johnson's Corner) provided nodal points for the surrounding population, and other services, such as taverns, shops, and stores, were erected in their vicinities. The milldams often provided the easiest means of crossing low, swampy ground and of crossing the millponds, thus becoming ready-made causeways across streams and creeks in the area. The settlement pattern in the area also focused on water transportation, and the Indian River Bay and Assawoman Bay and their tributaries provided access to markets in Maryland, the eastern shore of Virginia, and up the Delaware Bay and River.

Corn agriculture predominated throughout this period in Sussex County, and in the southern part of the county livestock raising contributed substantially to the economy (Macintyre 1986; Michel 1985; Garrison 1988). Homesteads in Sussex were generally characterized by a frame or log 1½-story house averaging under 450 square feet of living space, a small orchard of apple and peach trees, and usually about four outbuildings, including a corn barn, smokehouse or meat house, and kitchen. Livestock on the farm might include a herd of hogs, cows, sheep, oxen, and an occasional horse. On most plantations, only 50 percent of the total acreage of the farm was under cultivation (Hancock 1987:24–25). “Out plantations” or “out fields” might be located close by the farm, and were locations of tenant houses or well-used fields. A form of extensive subsistence farming coupled with home manufacturing dominated the economy of Sussex County during this period. Tench Coxe (1814:76), in his report on the manufactures of the United States for the year 1810, indicated that over 70 percent of the looms in the state of Delaware were located in Sussex County. Over 62 percent of the total value of flaxen goods, and over 75 percent of the wool produced in Delaware came from homes in Sussex County. Coxe also reported that the five iron forges in the state were located exclusively in Sussex and produced 215 tons of iron annually. Twenty distilleries in the county produced nearly half of the annual value of all of those establishments in the state. Other categories of manufacturing, such as gristmills, fulling mills, cotton and woolen factories, and snuff mills, were located predominantly in the industrial counties of Kent and New Castle. Although the demise of the iron furnaces of western Sussex County occurred at the start of this period, they were replaced by bloomery forges, which were smaller and more economical to maintain. The forge at Collins Mill Pond and the Unity Forge near Bridgeville are examples of these types of forges (Heite 1974).

### **1830-1880: Industrialization and Capitalization**

The most significant event to occur within the county during this period was the arrival of the railroad. Prior to this time, the preferred method of long-distance travel out of the county had been by steamboat, since overland travel was generally hampered by poor roads. Constructed in the western portion of the county, the Delaware Railroad reached the town of Seaford in 1856 and exited the state at Delmar by 1859 (Hancock 1976:63). The Delaware, Maryland and Virginia Railroad ran from Harrington to Milford, and from Milford south to Georgetown in 1869 (LeeDecker et al. 1989:32). A third line, the Junction and Breakwater Railroad, was

constructed between 1859 and 1868, when it reached Lewes; a spur line eventually connected to Rehoboth in 1878 (Hancock 1976:89). The Queen Anne's Railroad, which ran between the Chesapeake and Delaware bays, was famous in the late 1890s for its excursions to Lewes but was abandoned in 1924 (Eckman 1955:407).

The arrival of the railroad in the county stimulated changes in agriculture and industry and the growth of new towns. The growing of perishable market crops, particularly fruits such as peaches, blackberries, and strawberries, became possible after the railroad. By the end of this period, Sussex County was the leading peach-producing area of Delaware, and most of this crop was shipped by rail or water to urban locations. The transportation of the fruit crops was made possible in turn by the establishment of canneries, like the Fruit Preserving Company and the Georgetown Packing Company, both constructed near the railroad depot in Georgetown by the mid-1870s (Scharf 1888:1241). Other towns, such as Milton and Bridgeville, also constructed packing companies at this time (Hancock 1976:88).

Town and village development was also spurred by the railroad, and depot towns of Lincoln, Ellendale, Selbyville, and Frankford grew and prospered as a direct result of the passage of the railroad. Smaller crossroads hamlets, such as Harbeson (started in 1869) and Bennum, sprang up at the railroad stations on the Junction and Breakwater Railroad between Georgetown and Lewes (Eckman 1955:494). Overall, however, the arrival or construction of the railroad had a more immediate effect on the communication and economy of the interior portion of the county. During this period, the eastern part of the county, by the bay and ocean, was still dominated by waterborne trade, passenger service, and communication.

The arrival of the railroad allowed the tourism industry to grow in the county during this time period. Beaches and coastal areas had always held a special allure to the region's inhabitants, and with the improved transportation methods these areas became more accessible to the urban populations of Philadelphia and Baltimore, who no longer had to rely solely on the steamboat to travel to Lewes. The Rehoboth Beach Camp Meeting was organized by the Methodists in 1873, and the Hotel Henlopen, with 75 rooms, was constructed in 1879 (Hancock 1976:90).

At the outbreak of the Civil War, Sussex County was the largest slaveholding area in Delaware, containing over half of the state's slave population. The vast majority of these bondsmen were the property of small farmers and worked as domestic servants or field laborers. Free blacks in the county generally owned little land, and like their enslaved counterparts, worked as day laborers and hired farm hands, though some were skilled artisans. As in the rest of Delaware, blacks were denied the opportunity of education, were not permitted to own firearms, and had their freedom severely circumscribed by laws (Hancock 1976:65). The end of the Civil War and the emancipation of the slaves in Sussex, though providing freedom, did little to improve their social or economic status. Several small, black communities sprang up at the end of this period, notably the villages of Belltown (started in the 1840s) and Jimtown in Lewes and Rehoboth Hundred (Eckman 1955:494).

During the Civil War, Southern sympathies and leanings were strong in the county, particularly in the southern and western hundreds. In Broad Creek Hundred the inhabitants openly celebrated Confederate victories, and the town of Seaford was notorious for its role as an illicit trade center with the south. For the most part, however, the population of the county was pro-Union, or at best neutral, and Sussex's economy did well during the war due to high grain prices and renewed construction activities at the local shipyards (Hancock 1976:89).

As in the previous historical periods described above, corn agriculture continued to dominate in Sussex County. The corn that was raised was used to feed livestock, and the small livestock herds of Sussex County were the chief source of agricultural income for the area's farmers. Home manufactures also continued to be a major source of income in Sussex. Long after New Castle or Kent County farmers ceased any home manufactures, between 50 and 85 percent of the Sussex County farmers reported it as a source of income in the 1849 Census Schedule. The majority of Sussex inhabitants have been characterized as self reliant, and often in addition to farming used smithing, carpentry, fishing, milling, tanning, hunting, and trapping as supplements to their incomes (Michel 1985:10–12; Garrison 1988).

Industrialization in the county still lagged behind that seen in New Castle and Kent counties. By 1860 there were a total of 141 manufacturers of all kinds located in the county, including 37 gristmills, 56 lumber mills, 15 blacksmith shops, and 6 shipyards in Sussex, with smaller numbers of boot and shoe manufacturers, leather works, agricultural implement shops, fisheries, and wagon and carriage shops (U.S. Census of Manufactures 1865:54). The majority of these industries were oriented toward intracounty services, though shipbuilding touched all areas of the Delaware and Chesapeake bays, with ships constructed at Seaford and Laurel as well as at Milton and Lewes, and the lumber industry was nationally known. By the end of this period shipbuilding in villages such as Milton had reached its peak (Eckman 1955:416), and the number of flourmills and gristmills, though still important in the county, had declined to 26 (Passmore et al. 1978:24).

### **1880 to 1980: Urbanization and Suburbanization**

Trends in agriculture begun in the preceding periods continued, and Sussex County remains today the most important agricultural section of the state. At the start of this period, corn was still dominant as a cash crop, the county producing over 1,676,000 bushels in 1900. In turn-of-the-century Lewes & Rehoboth Hundred, a defining characteristic of the region was the large number of highly productive, small farms operated in many cases by people with economic and cultural connections to both the land and the sea (Conrad 1908:728). One author suggested that many of the inhabitants of the hundred were former mariners who had retired to farming life, “where their later days are spent in ease and quiet,” foreshadowing the present-day trend of retirees taking up residence along the Delaware seashore (Conrad 1908:728). A nineteenth-century example of this was Captain George Hickman, who owned the tract of land containing the project area.

Today corn and soybeans, both used for feed in the broiler industry, are primary products of the county, and Sussex is characterized by a “broiler-corn-soybean complex.” Several large-scale agribusinesses, such as the Newtons and Cannons of Bridgeville and the Townsends of eastern Sussex, dominate the agricultural economy of the county (Munroe 1984:233; Hancock 1976: 100–101). The trends in truck farming and market gardening, started in the 1870s, saw their zenith by 1890, when Sussex became the peach-producing center of the state. By 1900 over seven million quarts of strawberries were grown in the county, making Sussex the leading producer in the nation (Hancock 1976:89). By the early 1960s, however, the orchard crops had been supplanted by other more-lucrative agricultural products.

The holly wreath industry flourished in Sussex from the 1880s until the 1960s, and many farmers supplemented their incomes during the months of November and December in the holly business. It was an especially significant industry during the Depression, and in 1936 over two million wreaths were shipped from the towns of Bridgeville, Milton, Millsboro, and Selbyville.

The industry declined quickly after the Second World War (Eckman 1955:385; Hancock 1976:102).

At the start of the twentieth century, the lumber industry was a significant source of income for Sussex County. In 1909 a record amount of timber, over 55 million cubic feet, was shipped from the county. Most of this was virgin Sussex pine that had grown following the initial cuttings caused by the arrival of the railroad several generations earlier. Along with lumbering, charcoal production was an important related industry of the county; some charcoal was still being produced in the Redden area as late as the 1950s (Passmore et al. 1978:13,14).

The county also experimented with new agricultural methods, most notably in the chicken industry (broilers, or chickens weighing under three pounds). In 1923, Cecile A. [Long] Steele, the wife of farmer David Wilmer Steele, raised chickens for profit in Ocean View, south of the project area. These were sold to urban markets for broiling, frying, and roasting. She was extremely successful, and the poultry industry grew rapidly; the number of broilers raised in Delaware grew from 7 million in 1934 to 54 million in 1942, or over one-quarter of the entire commercial broiler production in the country (Munroe 1984:214–215). By 1944, 60 million broilers were being raised annually, mostly in the southeastern portion of the county in the vicinity of Millville, Millsboro, Ocean View, and Selbyville. Irwin E. Steele, the son of David and Cecile, inherited the family poultry business after the untimely death of his parents in 1940. Seven years later, Irwin Steele was producing 250,000 fryers on seven farms in the Millville area and was described as “one of the most extensive poultry producers in Delaware”(Reed 1947:318–319).

By 1969, Sussex farmers were deriving an income of over 80 million dollars per year from this source and its associated agricultural jobs of soybean and feed production (Hancock 1976:99–101). “Thanks to broilers, Sussex became one of the richest agricultural counties the eastern United States” (Munroe 1984:216).

In 1939, less than 40 percent of the land in Sussex County was farmed. The acreage of land in farms had declined by nearly one-quarter since 1880, and the number of farms in the county had decreased by 15.3 percent between 1910 and 1940. Both of these trends were largely the result of changing economic conditions and the difficulties in farming marginal lands (Bausman 1941:4, 7). At that time, one of the major problems confronting Sussex farmers was drainage, which today has been largely solved through the construction of a vast network of drainage ditches and channelized streams. The growth of corn and soybeans as cash crops in the county has allowed the reclamation of over 35,000 acres of land from swamp and brush to tillable acreage in the last 40 years (Hancock 1976:100).

Grain farming in the late 1930s was spread fairly evenly across the county, with slightly heavy concentrations of farms in Northwest Fork Hundred and in the southeastern portion of the county. Cannery crops, such as lima beans, tomatoes, and string beans, were grown mostly in Broadkill, Cedar Creek, and Lewes and Rehoboth hundreds, while truck crops and fruit crops were mostly produced in the fertile western hundreds. Timber lands, brushlands, and open untillable lands were the dominant landform in 1941 and covered large portions of the central part of Sussex (Bausman 1941:16–21). Significantly, the farmers of Sussex were characterized in 1941 as being more closely tied to the land than the farmers of New Castle or Kent counties. There were few foreign-born inhabitants in Sussex, and the vast majority were native Delawareans; “in fact, most of the farmers of Sussex County were born and reared in Sussex County” (Bausman 1941:61).

Internal transportation and interregional routes continued to develop and connect Sussex more fully with the Mid-Atlantic region. By 1910, the Maryland, Delaware, and Virginia Railroad extended from Lewes to Love Point, a ferry landing on the Chesapeake Bay, providing easier access for the people of the western shore of Maryland to the Delaware beaches. Prior to 1917, Sussex had less than 35 miles of macadam roads in the county, but in that year the first 20 miles of Coleman DuPont's revolutionary concrete highway was completed, connecting Selbyville with Georgetown. By 1924, the DuPont highway (present-day Route 113) ran the length of the state (Rae 1975; LeeDecker et al. 1992). By the early 1960s, several state-maintained highways (Route 13, Route 1) made travel both into and out of the county easier. The improvements in regional transportation in turn stimulated continued tourism growth along the beaches, as witnessed by the establishment of Dewey Beach in 1898 and Bethany a few miles south in 1901 (Hancock 1976:90). Currently, tourism remains a powerful economic force in the county, dominating the eastern portions of Sussex for much of any given year.

Industry in Sussex is represented by the presence of a major DuPont nylon plant in Seaford (built in 1939) and other facilities such as Nanticoke Homes of Greenwood and Vlasic Foods at Millsboro (Munroe 1984:189; Hancock 1976:103). By the mid-1970s, there were over 100 firms in Sussex, employing over 12,000 people, and seven of these, including five food-processing plants, one chemical company, and an instrument manufacturer, employ over 250 persons each (Hancock 1976:103).

The population of Sussex at the start of this period was over 36,000, making it larger than Kent County but smaller than the City of Wilmington and New Castle County. Throughout this period, the population of the county has grown steadily, spurred by the growth of the broiler industry, the reclamation of land, and the arrival of light industry to the area. As of 1980, over 98,000 people made their homes in the county (Munroe 1984:269), and this total swells tremendously during the summer season. In spite of this growth, Sussex is still overwhelmingly rural and agricultural, though intensive suburban and resort development in the last decade are dramatically altering the landscape of the eastern part of the county.

## **2.4 ARCHEOLOGICAL SITES WITHIN ONE MILE OF THE PROJECT AREA**

Twenty archeological sites have been previously identified within a 1-mile radius of the project area (see Table 1). Of those sites, only a handful of the CRS forms contained information regarding recovered artifacts and identified features. The Townsend #2 (7S-D-1; CRS# S-532) site is described as consisting of 4 small refuse pits; this is not related to the better known Townsend #1 site (7S-G-2; CRS# S-262). The Townsend #1 CRS form contained no information. The Miller-Toms site (7S-D-4; CRS# S-537) contained at least 18 pits, of which 13 shell pits were archeologically excavated, one extended and two flexed burials, Mockley ceramics, and bone tools. The Lewes School House site (7S-D-5; CRS# S-539) consisted of a series of shell pits and one burial. The Railway site (7S-D-12; CRS# S-540) contained several burials, but the age was not noted on the form. The Fort Pump site (7S-D-23; CRS# S-542) contained at least one projectile point, but its typology was not identified. 7S-D-37, Area A and B (CRS# S-724) was characterized as both historic (nineteenth and twentieth century artifacts) and prehistoric (jasper flakes and one serrated biface tip). 7S-D-67, Locus 1 (CRS# S-1051) was a nineteenth to twentieth century historic site. 7S-D-49 (CRS# S-7863) was characterized as possibly Woodland I or II, based on recovered Mockley and Townsend ceramics. 7S-D-50 (CRS# S-7864) and 7S-D-51 (CRS# S-7865) were both unnamed, but classified as Woodland Period; widespread clam shell debris was noted for both. 7S-D-52 (CRS# S-7866) was also unnamed, but designated as a possible brick clamp. Four test units were excavated in a "general flake and shell scatter." The

Table 1. Summary of known archeological sites within a 1-mile radius of the project area.

<b>CRS number</b>	<b>Old CRS number</b>	<b>Site Name</b>	<b>Period given on CRS form</b>	<b>Comments on CRS form</b>
S00262	7S-G-002	Townsend #1	unknown	
S00532	7S-D-001	Townsend #2	unknown	4 small refuse pits
S00537	7S-D-004	Miller-Toms	Woodland II	Mockley Ware/bone tools
S00538	7S-D-033	none	unknown	
S00539	7S-D-005	School House (Lewes)	Woodland	shell pits, burial
S00540	7S-D-012	Railway Site	unknown	burials
S00541	7S-D-032	none	unknown	
S00542	7S-D-023	Fort Pump Site	unknown	projectile point
S00565	7S-G-025	none	unknown	
S00720	7S-D-035	none	unknown	
S00721	7S-D-039	none	unknown	
S00723	7S-D-036	none	unknown	
S00724	7S-D-037	7S-D-37, Area A and B	prehistoric, 19th century	
S00725	7S-D-038	none	unknown	
S01051	7S-D-067	Locus 1, Area A, B, and C	19-20th century	
S07863	7S-D-049	none	Woodland I and II	Mockley and Townsend Ware
S07864	7S-D-050	none	Woodland	
S07865	7S-D-051	none	Woodland	
S07866	7S-D-052	none	Historic	possible brick clamp
S10013	7S-D-087	Lewes Boatyard	20th century	boat building yard

Lewes Boatyard (7S-D-08; CRS# S-10013) is an abandoned boat building yard with visible building foundations that date to between 1940 and 1960.

Significant prehistoric sites for which we have information within this list are the Townsend site (7S-G-002; CRS# S-262), the Miller-Toms site (7S-D-4; CRS# S-537), and the School House site (7S-D-005; CRS#-539), all of which are part of the Woodland II Period Slaughter Creek Complex, defined by the presence of Townsend ceramics, triangular projectile points, large macro-band base camps, and a high density of storage features (Custer 1984: 157; Custer 1989: 325). The Townsend site which is to the southeast of the project area was discovered in 1947 and excavated by the Sussex Archeological Association (Sussex Society of Archeology) in 1948. The endeavor included surface inspection, the excavation of over ninety pit features, and the excavation of a disturbed grave feature. A small percentage of the cultural material was lithic, while the bulk was prehistoric pottery, found in every excavated pit feature. With the exception of 162-grit- and/or clay-tempered sherds, all of the pottery (several thousand vessels, rims, and body sherds) were shell tempered and categorized into the Townsend Series. Artifacts of tortoise shell, bone, and antler were also numerous at the Townsend site (Omewake and Stewart 1963). Custer classifies this site as a macro-band base camp or village, or a place of relatively long-term occupation areas for multiple family units (Custer 1984: 76; 1989: 320). The Lewes High School site and Miller-Toms site are classified as micro-band base camps, defined as relatively long-term occupation areas for individual or limited family units (Custer 1984: 76; 1989: 325). Several of the unnamed sites were also characterized as being Woodland Period. Based on this background research, the likelihood of encountering a Woodland I or II Period site was favorable.

## 2.5 PROJECT AREA HISTORIC BACKGROUND

The specific historic background of the properties affected by the proposed trail project was researched using historic maps and aerials available for the region back to the year 1848. Historic deeds and Orphan's Court maps were utilized to track the ownership of these parcels back to 1885. The majority of land through which the proposed trail runs today is composed of the 85.55-acre Tax Parcel 335-8.00-46, sold by Hazell M. Smith to Showfield LLC in 2008 (SCDB: 234). The southern part of the proposed trail runs along the northeastern part of the Breakwater residential development, which was part of Tax Parcel 335-8.00-43 prior to subdivision. It was quickly apparent during research that the majority of this land has been utilized only for agricultural purposes, with sections recently disturbed due to highway construction and housing development. The trail does run through one area that was historically utilized as a farm complex. This was the only known location where significant historic cultural resources might be encountered.

The project area is depicted on the United States Coastal Survey Map of 1848 as a series of agricultural fields, meadow, and woodland (Figure 3). Dwellings and other structures are not depicted as being within the project area. The only landscape feature within the fields is a road that leads across the agricultural fields in a southeasterly direction from Kings Highway. Similarly, no dwellings are depicted in the project area on the Lewes & Rehoboth map (Beers 1868), but neither is the road that is shown in 1848 (Figure 4). The proposed route of the Junction and Breakwater Railroad, built between 1859 and 1868, appears to cross through the project area on Beers' map. Later, more precise maps show that in fact the railway ran parallel to the northern portion of the project area.

As depicted on an 1885 Orphan's Court Plot of the lands of the late Joseph Lafetra (SCOC: 117), a portion of the tracts constituting Tax Parcel 335-8.00-46 were held by Lafetra, William P. Jones

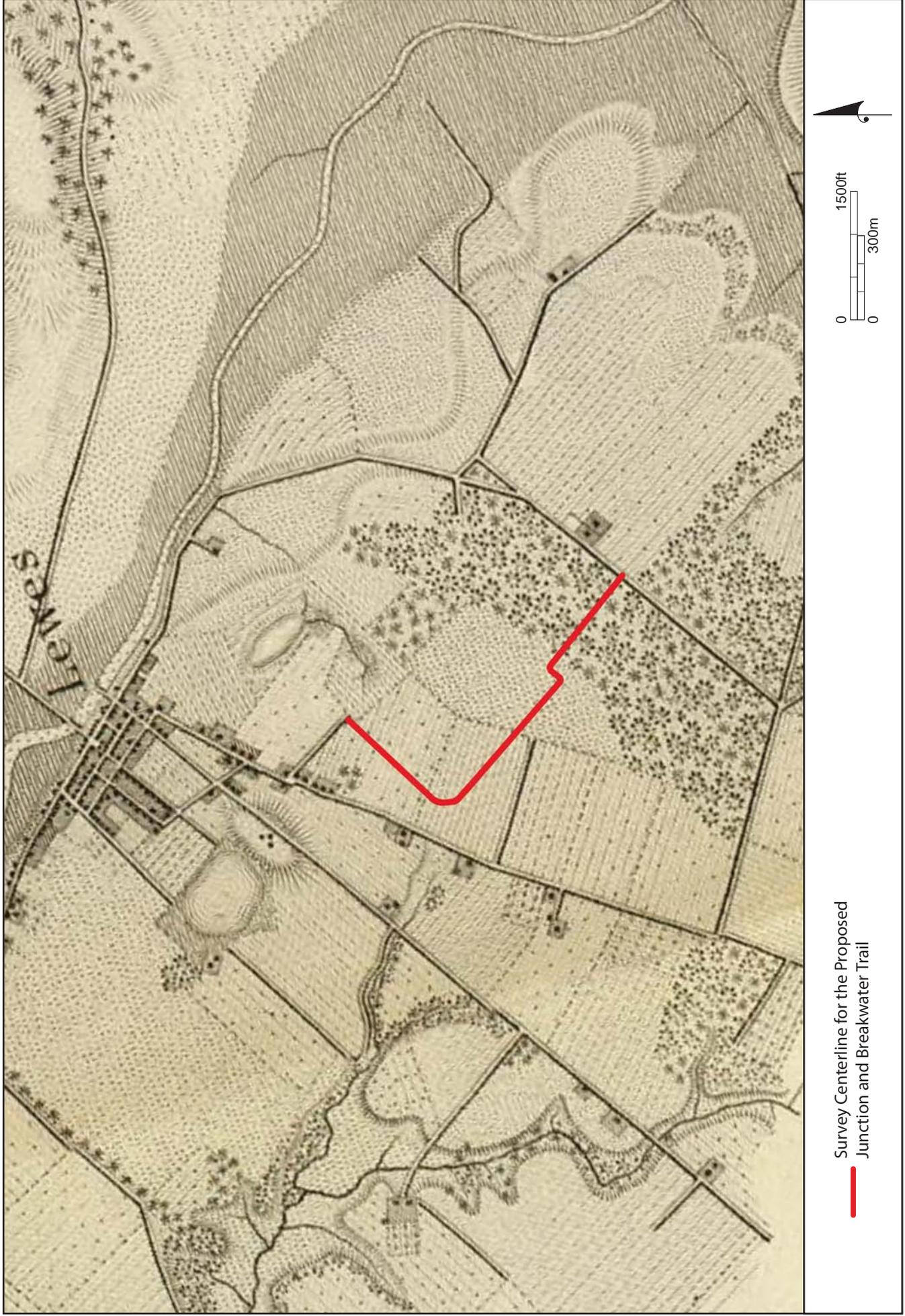


Figure 3. Map of the Delaware Bay and River (USCS 1848) showing approximate location of project area.

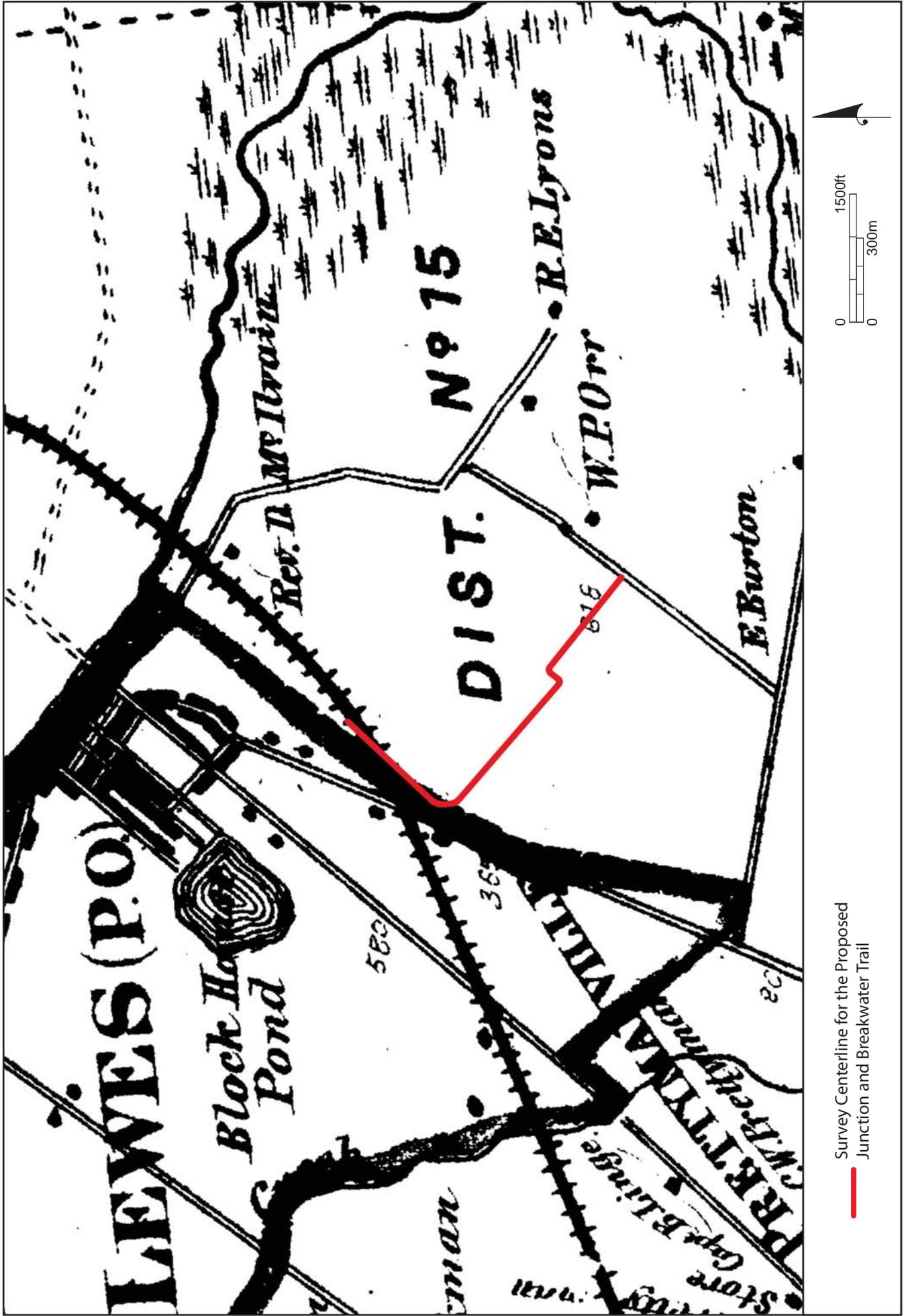


Figure 4. Lewes & Rehoboth, Sussex Co. (Beers 1868), showing approximate location of project area.

and Elihu Morris (Figure 5). The plot also clearly shows how the lines of the Junction and Breakwater Railroad and the Delaware, Maryland and Virginia Railroad line (D. M. & V. Railroad), later known as the Philadelphia, Baltimore, and Washington Railroad, and the Delmarva Division of the Pennsylvania Railroad, divided these once coherent tracts of land. As part of the sale ordered by the court, Morris purchased Lot 1 (16 acres), located on the southwest side of the D. M. & V. Railroad line. Lot 3 (3 acres), on which currently stands the house of Hazell M. Smith, was sold to Theodore Salmons (SCOC 1885: 178). It appears that the remainder of the tax parcel was held in 1881 by David Russel, his heirs selling the tract to Walton T. Virden in 1908 (SCDB 1908: 202, SCDB 1926: 205). However, the 1.31-acre wooded area at the northwest corner of the parcel might not have derived from the land held by Russel. The new property lines and new structures along the railway are depicted on the 1901 Coastal Survey map (USC&GS), but none of these structures are within the project area (Figure 6).

Aerial photographs and USGS topographic quadrangles from 1918 to the present (Figures 7-17) show agricultural structures and landscape features on the Showfield property, though most are not within the project area. At the point where the proposed trail crosses from the Breakwater subdivision into the field are two small sheds, which stand at this location today just to the north of the project area. Only one of these structures is depicted on the earliest USGS topographic maps (Figures 7, 9, 10, 13, and 14), but two structures are clearly visible on the 1954 aerial (Figure 11). Farther into the field, along a road leading to the northeast, a large barn once stood adjacent to the sheds (Figure 8). By 1954 a barn appears farther to the northeast, the older one having had been either moved, or removed and a new one built (Figure 11). It currently still stands at the same location.

Several structures appear on the 1944 USGS topographic map (Figure 9) that we are interpreting as being very large chicken houses. These are gone by 1954 (Figures 10 and 11), though a remnant “ghost” of the largest structure is still visible on the aerial running underneath what appears to be a circular feature with paths leading to it from the northwest, northeast, and southwest. This circle is located across the former railroad tracks from the Smith house. The circle remains today as an overgrown double ring of sycamore trees, open on the side facing due east. The trees were planted as early as 1961 when the paths are abandoned and vegetation within the circle is visible on the aerial (Figure 12). Sometime after 1961 a dirt horseracing track was built to the southeast of the circle. The track was abandoned after 1992, yet is still visible on modern aerial photographs. The only agricultural structures that intersect directly with the project area are located at the northwest bend of the trail, appearing on the 1937 aerial (Figure 8). This farm complex is discussed further below in conjunction with the deed transfers for this tract.

In the 1940s, Norman B. Bayliss acquired Lot 1 and a 21-acre tract once held by Lafetra (SCDB 1942: 476, SCDB 1943: 92). Otis H. and Hazell M. Smith bought both parcels in 1952, transferring the land to the Fish Products Company, which it appears they owned, in 1953 (SCDB 1952: 98, SCDB 1953: 301). In 1972 the company was reformed as the Smith Meal Company, who within a year transferred the parcels to the Smith's (SCDB 1972: 862, SCDB 1973: 476).

In September of 1941, months before Bayliss bought Lot 1, the Millsboro Feed Company, established in 1922 to serve the growing poultry industry, transferred their 49.8 acres of land to the south of Bayliss's to the company owners, brothers Harry E. and John J. Williams and George F. Outten (SCDB 1941: 85). In the next year Harry gained sole ownership, selling the parcel to the Smiths in 1953 (SCDB 1953: 596). John entered politics, becoming a U.S. Senator from Delaware in 1946, and served for 24 years, retiring in 1970.



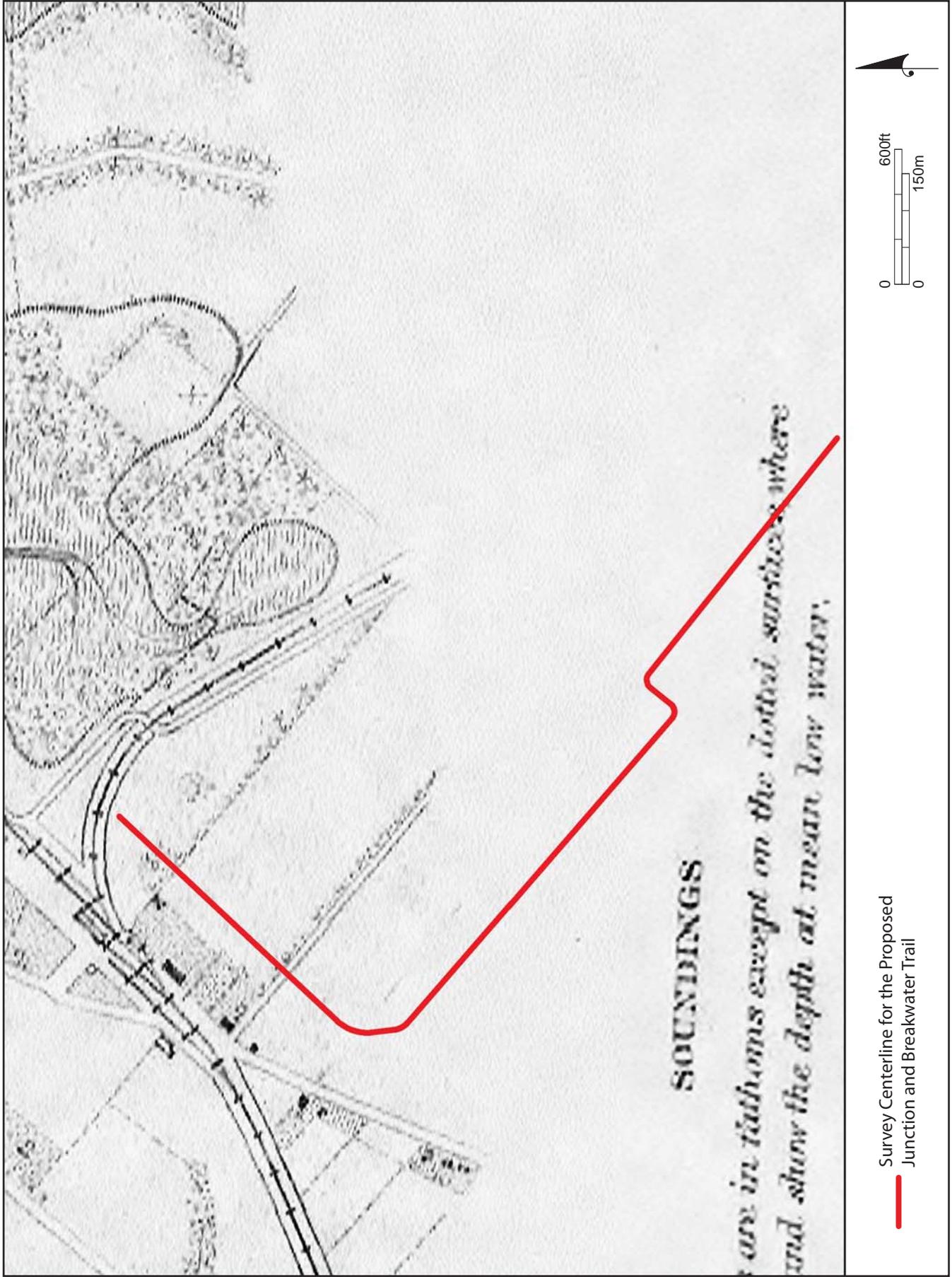
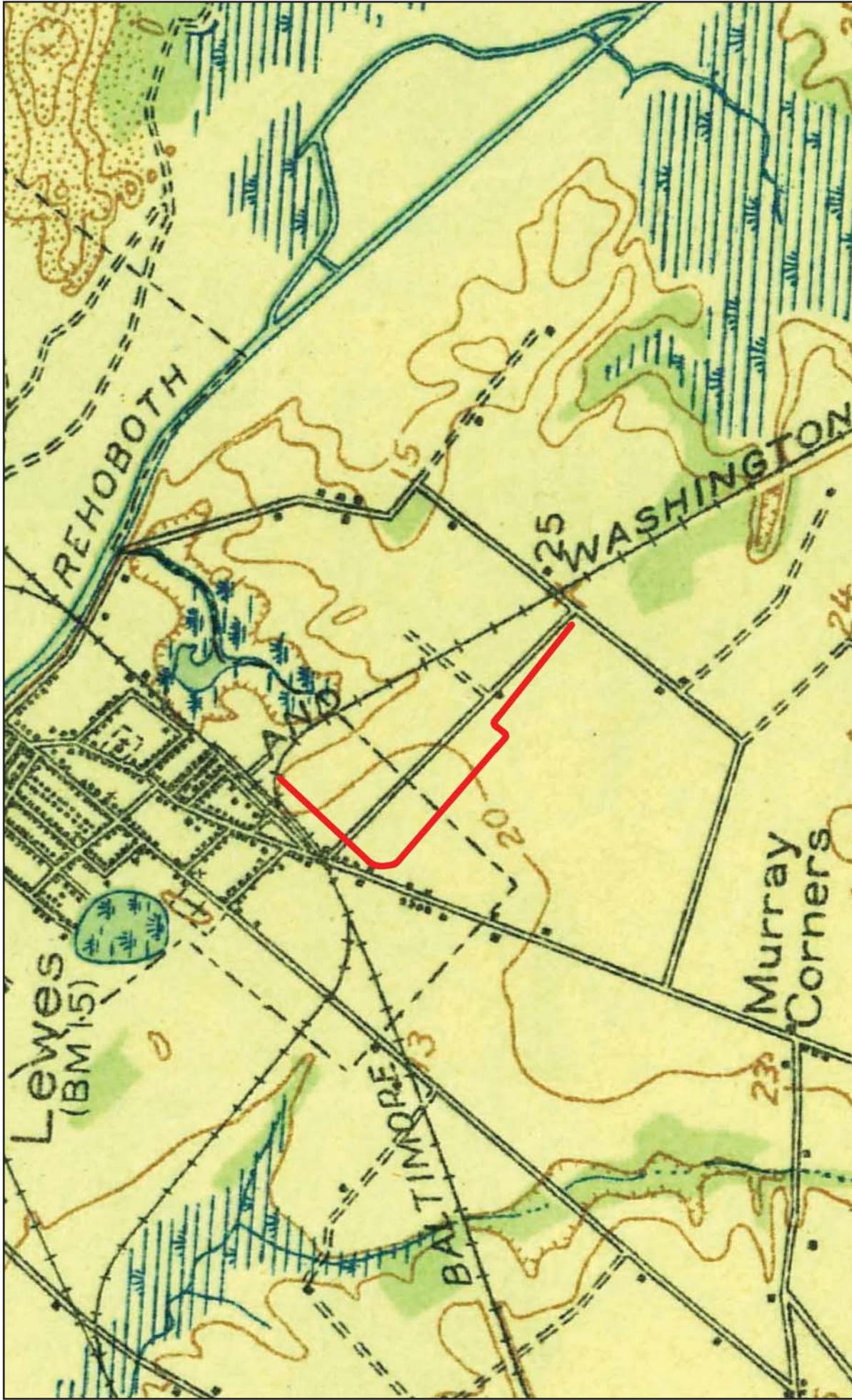


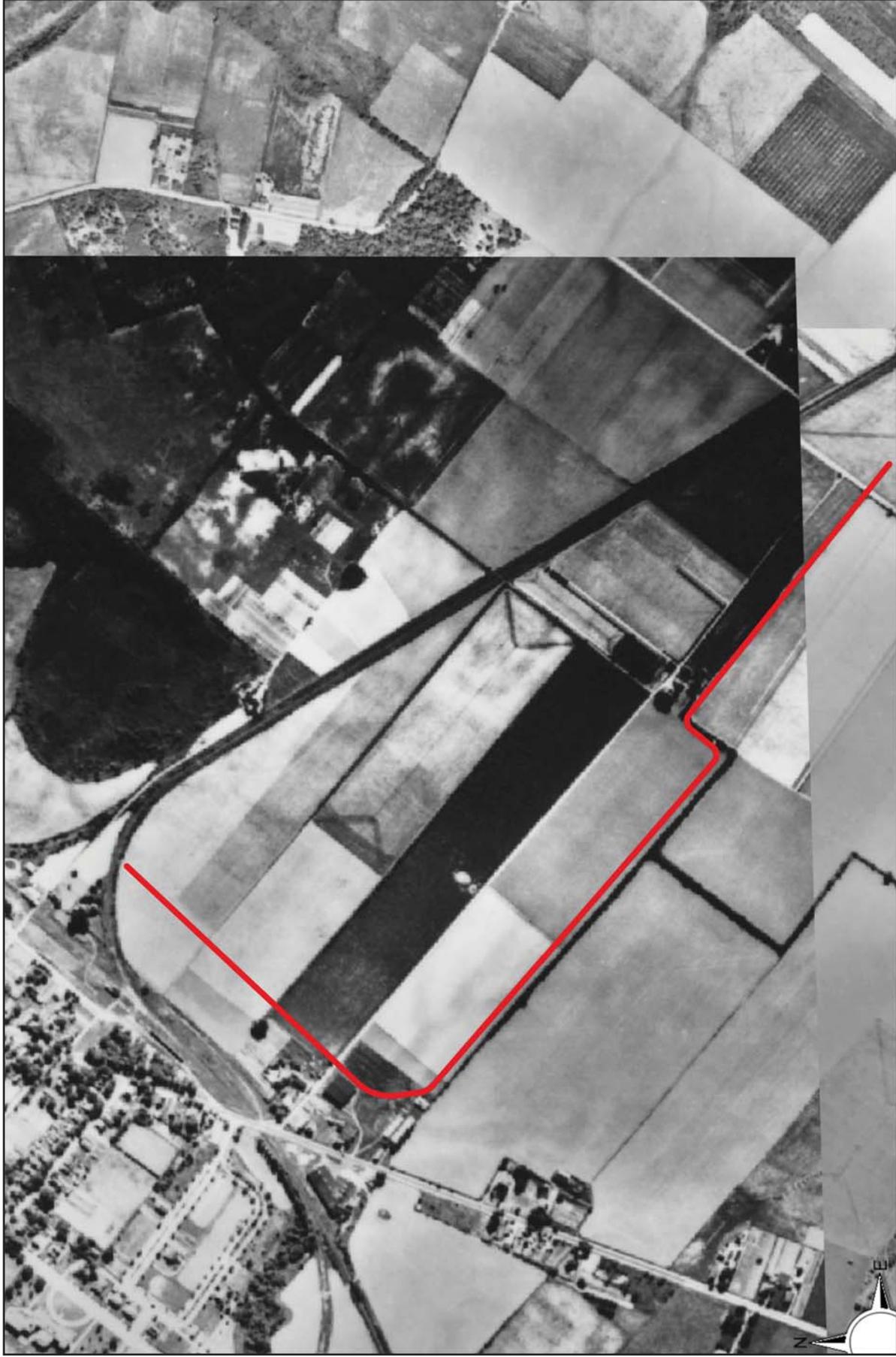
Figure 6. Cape Henlopen and the Delaware Breakwater (USC&GS 1901), showing approximate location of project area.



Survey Centerline for the Proposed  
Junction and Breakwater Trail

1500ft  
300m

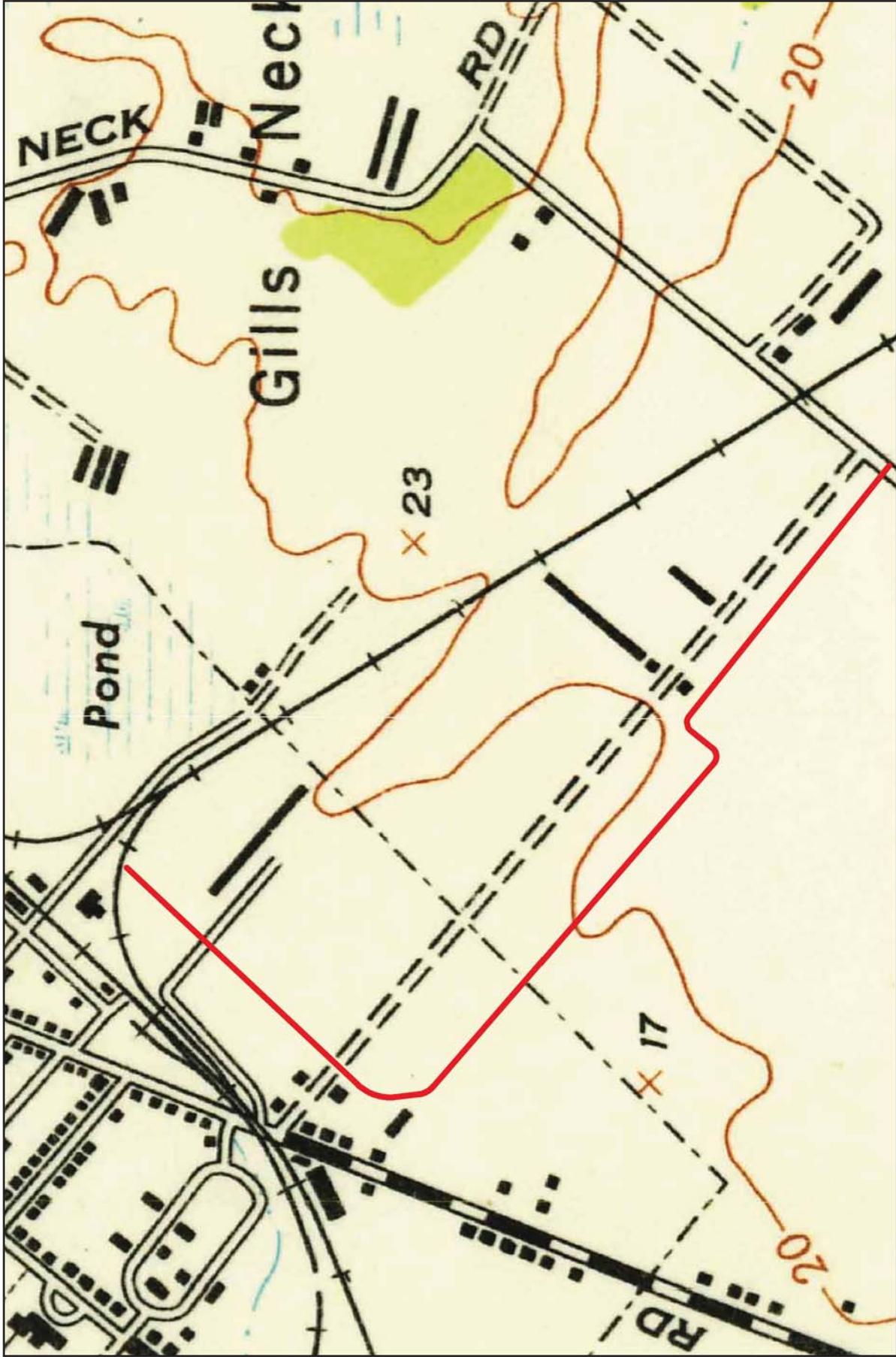
Figure 7. 1918 USGS Cape Henlopen, Sussex County, DE Quadrangle showing approximate location of project area.



— Survey Centerline for the Proposed  
Junction and Breakwater Trail

600ft  
150m  
0 0

Figure 8. 1937 AS&CS aerial showing approximate location of project area.



— Survey Centerline for the Proposed  
 Junction and Breakwater Trail

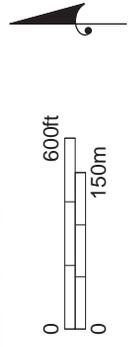


Figure 9. 1944 USGS Lewes, DE 7.5 Minute Quadrangle showing approximate location of project area.

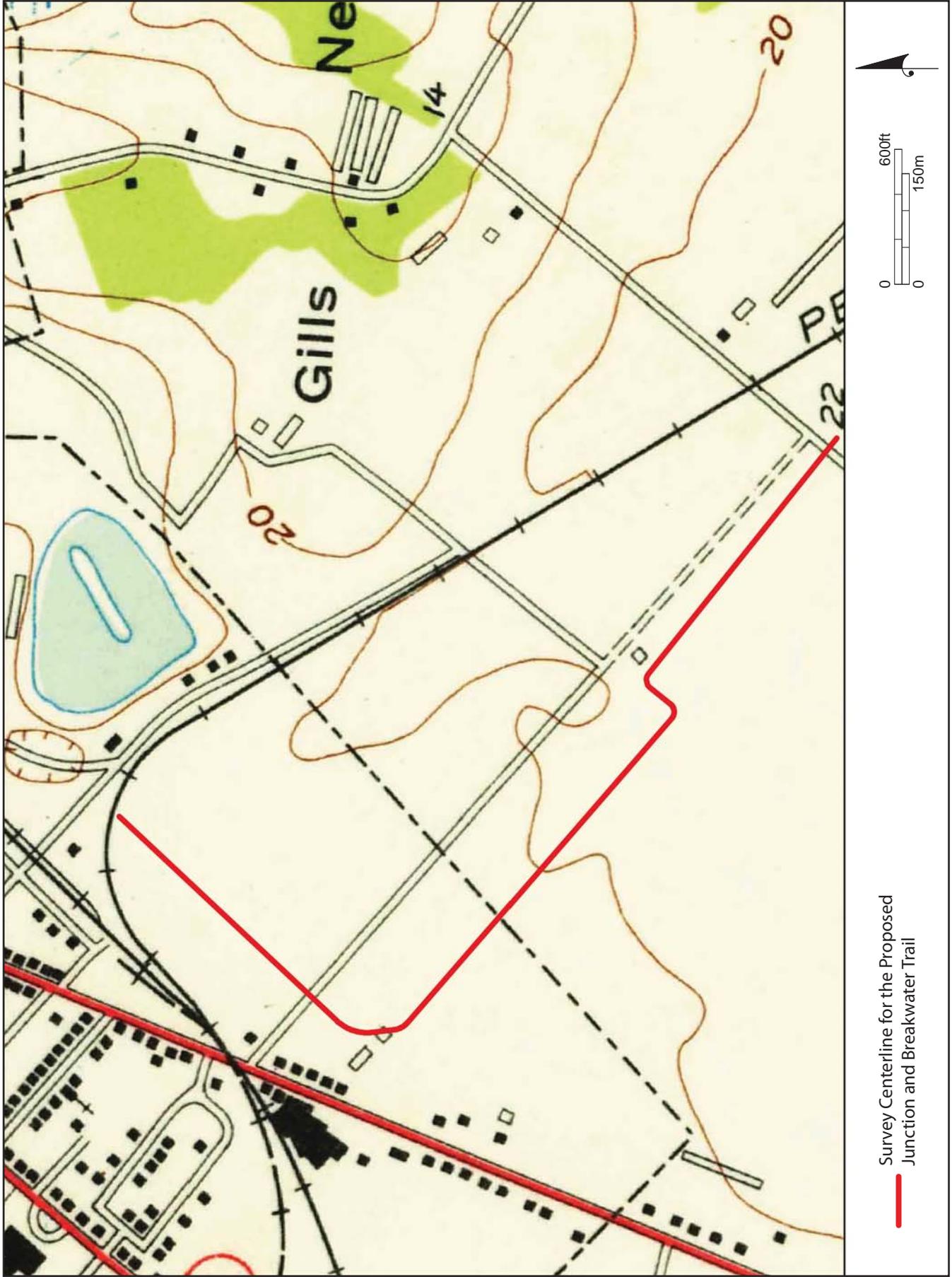


Figure 10. 1954 USGS Lewes, DE 7.5 Minute Quadrangle showing approximate location of project area.



— Survey Centerline for the Proposed  
Junction and Breakwater Trail

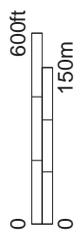


Figure 11. 1954 AS&CS aerial showing approximate location of project area.



— Survey Centerline for the Proposed  
Junction and Breakwater Trail

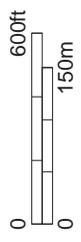


Figure 12. 1961 AS&CS aerial showing approximate location of project area.

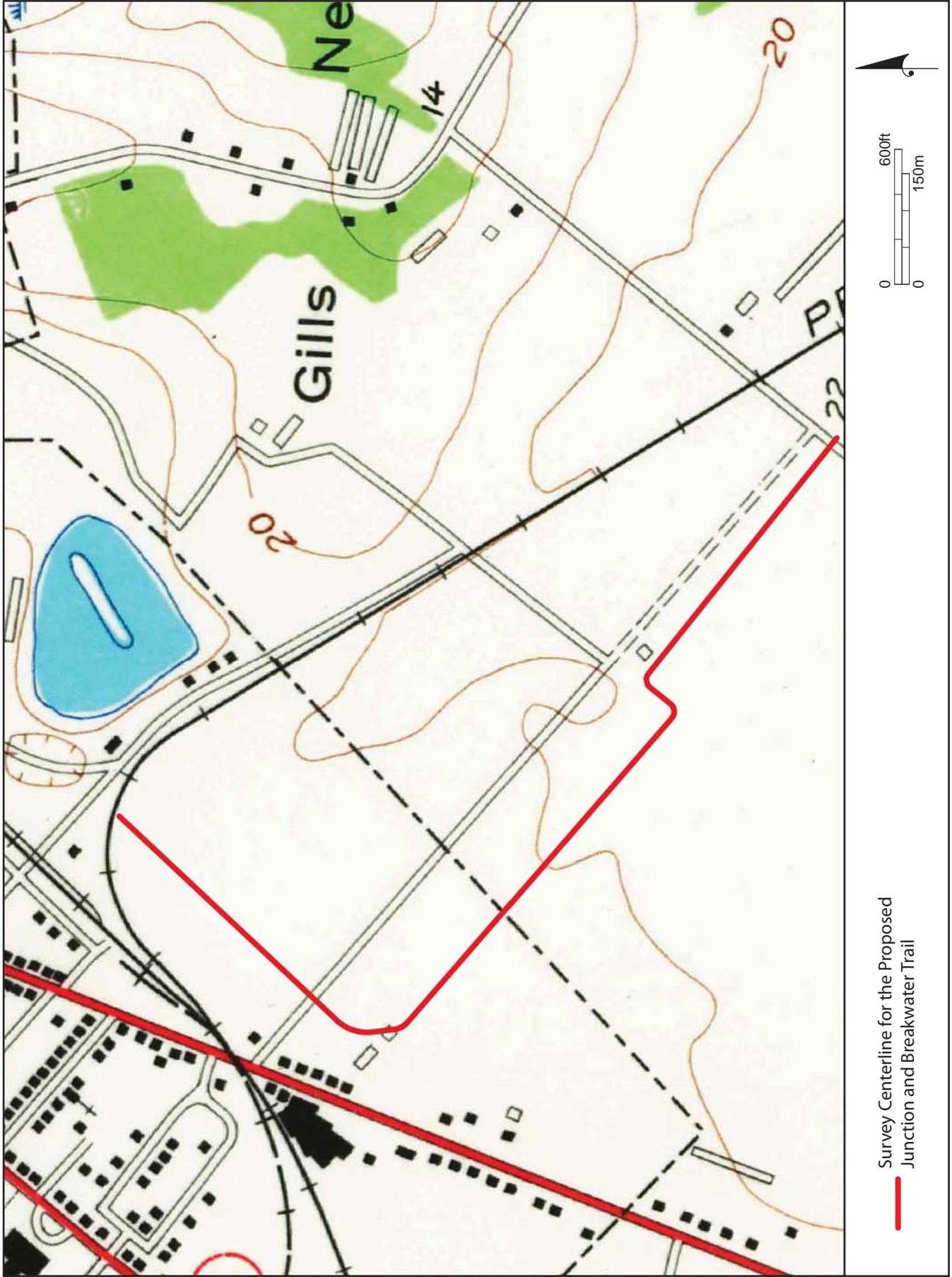


Figure 13. 1968 USGS Lewes, DE 7.5 Minute Quadrangle showing approximate location of project area.

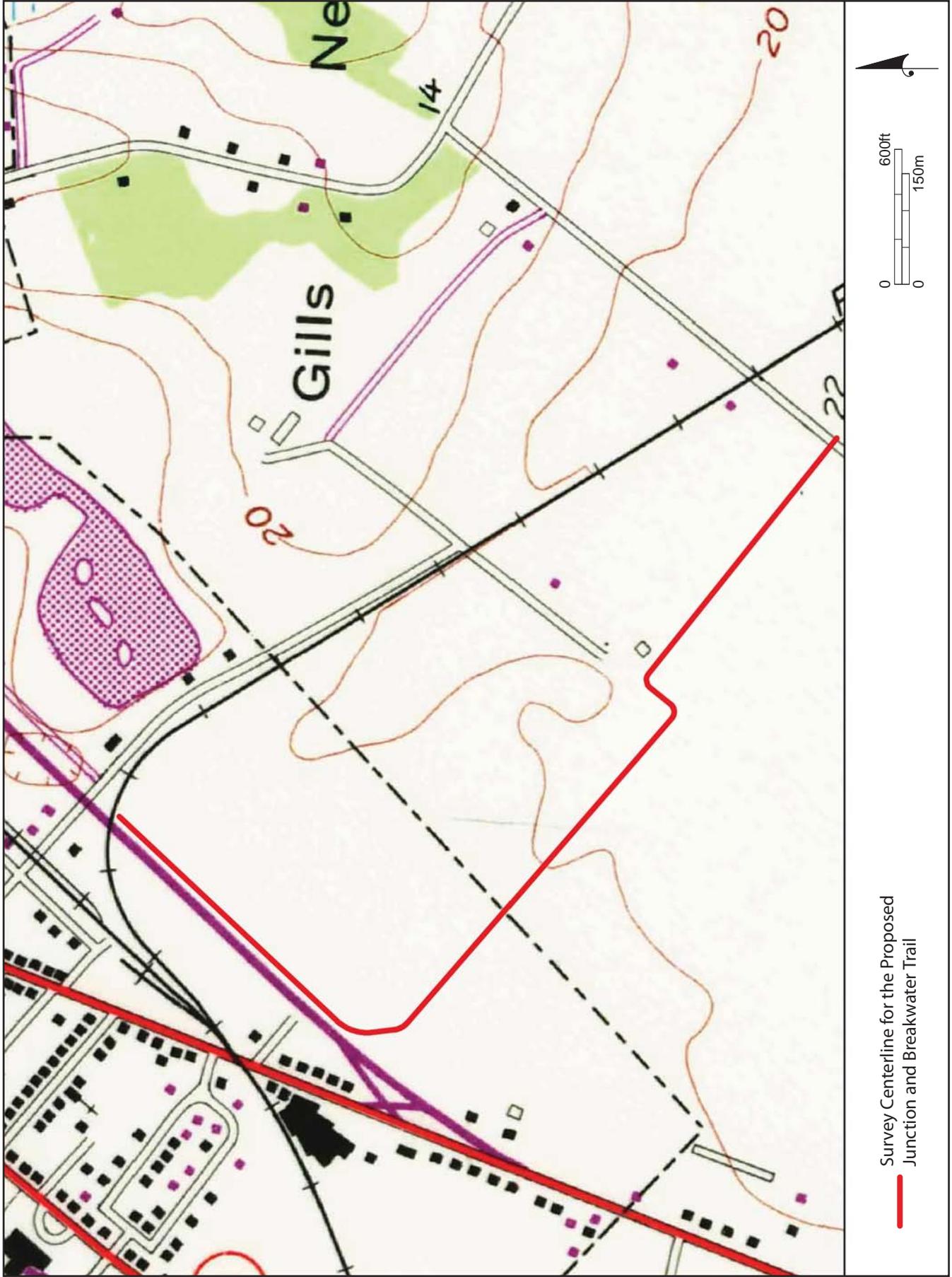


Figure 14. 1972 USGS Lewes, DE 7.5 Minute Quadrangle showing approximate location of project area.

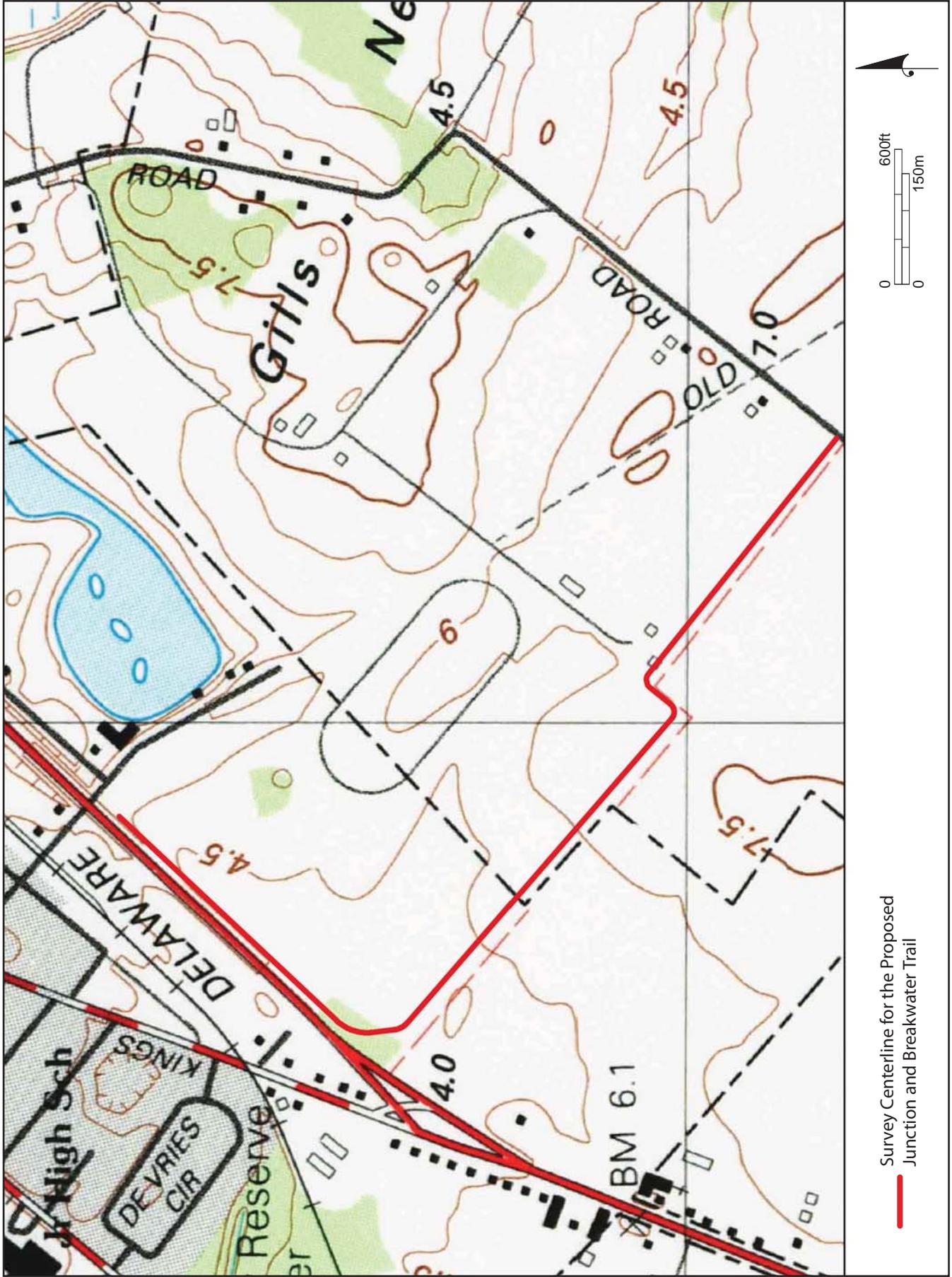
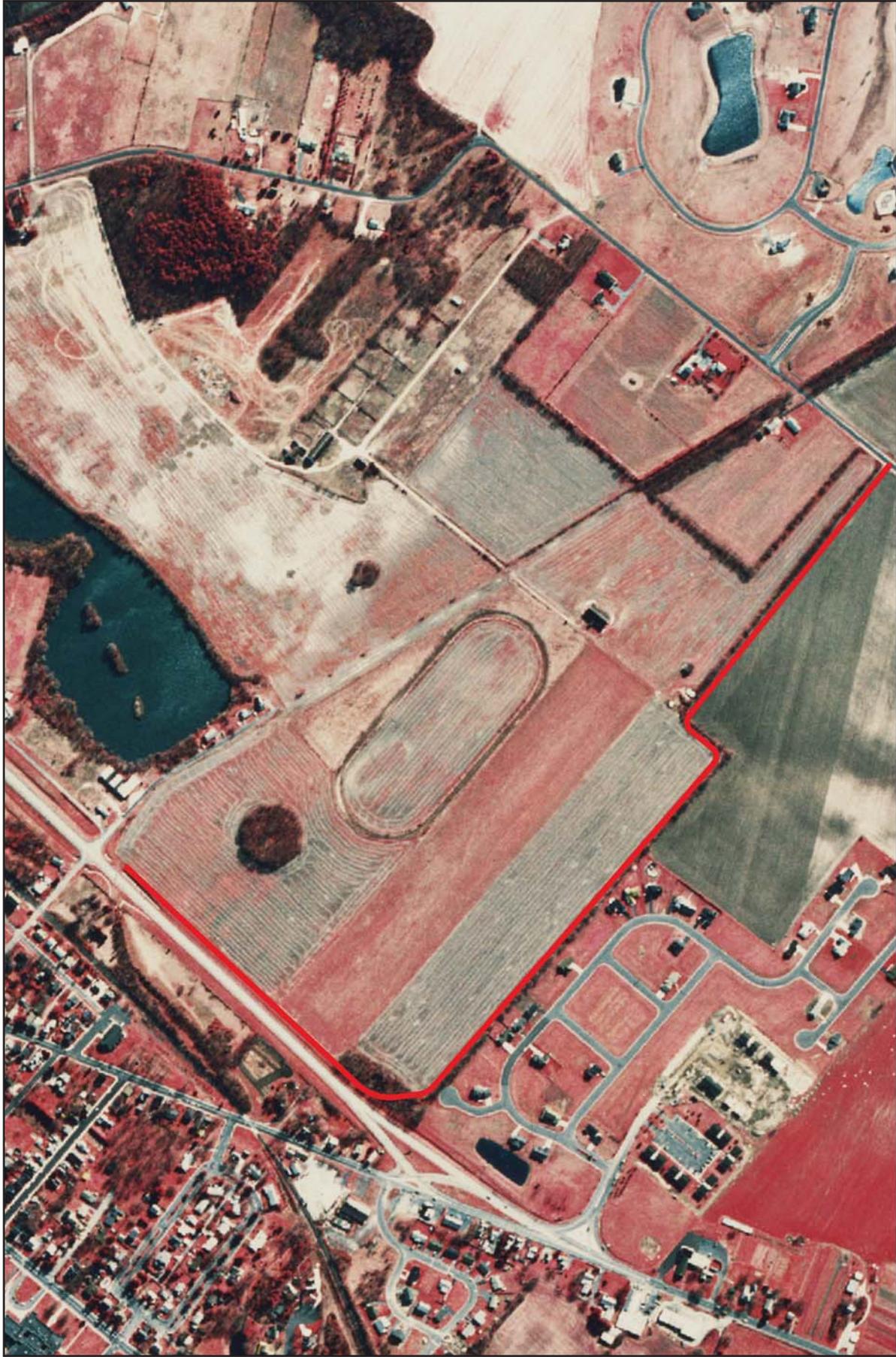


Figure 15. 1984 USGS Lewes, DE 7.5 Minute Quadrangle showing approximate location of project area.



— Survey Centerline for the Proposed  
Junction and Breakwater Trail

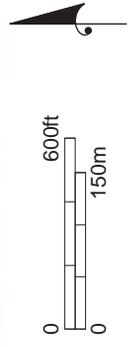


Figure 16. 1992 State of Delaware aerial showing approximate location of project area.



— Survey Centerline for the Proposed  
— Junction and Breakwater Trail

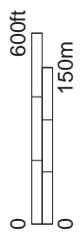


Figure 17. 2010-2011 Microsoft® Bing™ hybrid aerial showing approximate location of project area.

The portion of the tax parcel acquired by Virden in 1908 remained in the family until sold to the Smiths in 1980 by his daughter-in-law, the wife of Virden's son Gilbert (SCWB 1942: 297, SCLOA 1944, SCWB 1966: 5, SCDB 1980: 229).

The 1.31-acre wooded area is the remnant of a larger parcel that held the farm complex that is transected by the project area, shown on the 1937 aerial (Figure 8). In the 1930s it was owned by Letitia McKeurick Woodward and Clarence Gray and described as holding a 1½-story frame dwelling (SCDB 1934: 37). In 1944 the parcel and two other tracts were sold to Henlopen Poultry Inc. (later Henlopen Poultry Co.), owned by Edwin R. and John H. Powell, Joshua Turner, and Carol M. Berger (SCDB 1944a: 556, SCDB 1944b: 171). By 1954 the parcel held houses along Kings Highway, with two outbuildings at the rear of a wooded area, a larger outbuilding and a second smaller building closer to the field that was likely a shed (Figures 10 and 11). The large barn that stood to the north of these outbuildings is gone by this time. The remnant of the parcel with what appears to have been a shed is the only portion within the project area, the remainder to the northwest was bisected from the original parcel and covered by the Freeman Highway. Road papers for the highway dating to 1964 depict the larger outbuilding, labeled as “Barracks” (Figure 18). The shed structure does not appear on these plans, possibly already abandoned and fully razed with the highway construction. Hazell Smith bought this remnant to the southeast of the Highway from the descendants of Edwin R. Powell and Joshua E. Turner in 1997 (SCDB 1997: 256).

Tax Parcel 335-8.00-43 was fully in the hands of the J. G. Townsend Company from 1945 until a part was bought in for development of a subdivision in 2003 (SCDB: 143). Townsend had bought the parcel from heirs George, Sarah, and Howard Riggins, and Anna and Charles Torbert. No structures or cultural landscape elements were evident on the portion constituting the project area on any of the maps or aerial photographs consulted.



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## 3.0 METHODS

### 3.1 RESEARCH DESIGN

The research design for the project was aimed at providing cultural contexts for identifying and evaluating archeological resources, if any, that might be affected by the proposed trail extension construction project. The approach focuses on settlement patterns during the various cultural time periods represented in the region based on previous investigations, syntheses of regional data, and management documents for the region. Landscape and/or environmental variables influenced prehistoric settlement, as well as interactions between neighboring groups and the surrounding regions. This approach is congruent with the “biosocial” perspective on culture advocated by Custer (1984a:21–22; 1986a:2–8; 1987:1–3; 1989:23–25) and by Thomas et al. (1975). The basic assumption is that past cultures adapted to combinations of natural and social constraints operating in a given area at any particular time. Contexts for historical sites were based in part on a similar approach, augmented with knowledge of transportation networks and historical maps of the project region. In addition, a fuller knowledge of social processes, trends, and patterns is available for the historic period based on manuscript documents and published histories.

JMA’s archeological research was conducted under the Secretary of the Interior’s *Standards and Guidelines for Archeology and Historic Preservation* (September 1983), as well as guidelines specific to the State of Delaware, including, but not limited to, *A Management Plan for Delaware’s Prehistoric Cultural Resources* (Custer 1986a), *A Management Plan for the Prehistoric Archaeological Resources of Delaware’s Atlantic Coastal Region* (Custer 1987), the *Management Plan for Delaware’s Historical Archaeological Resources* (De Cunzo and Catts 1990), and the *Delaware Statewide Comprehensive Historic Preservation Plan* (Ames et al. 1987). Field investigations were conducted in accordance with SHPO guidelines (Delaware State Historic Preservation Office 1993, 1997).

### 3.2 BACKGROUND RESEARCH

Background research for the Proposed Extension of the Junction and Breakwater Trail Project included a literature review of relevant geological, ecological, archeological, and historical sources. Previous JMA reports and gathered research for various other projects in the region were utilized, as well as online resources, various archives, and road papers for the Freeman Highway provided by the Department.

Environmental background and information on geology, soils, and waterways came from a variety of sources including, but not limited to digitized historic maps, online articles, published articles and books on file at the John Milner Associates, Inc. office in West Chester, the NRCS soils website, and the online USGS Historical Topographic Map Collection.

Review of previous archeological research relied on the report files maintained at the SHPO in Dover. Previously published JMA reports and research gathered for these reports were utilized. Primary documentation included the 1963 publication on the Townsend Site by the Sussex Society of Archeology and History.

JMA historians also interviewed several individuals with knowledge regarding the history and archeology of the Lewes area in general, and with the Showfield property in particular. Among these are Russell McCabe, former Delaware State archivist, Daniel Griffith, former Delaware State Historic Preservation Officer, Hazel Brittingham, Lewes historian, Michael DePaolo,

director of the Lewes Historical Society, Major General William Duncan (ret), Cherie Clarke, Department of Natural Resources and Environmental Control, Michael Hahn, Delaware Department of Transportation, and former landowners George Virden and the descendants of Hazell Smith.

Regarding historical archeological research, the *Management Plan for Delaware's Historical Archaeological Resources* (De Cunzo and Catts 1990) and the historical context developed for examining the archeology of agriculture and rural life in Sussex County (De Cunzo and Garcia 1992) provided the basis for areas of investigation and delineation of property types. Regional historical data was gleaned from JMA's extensive library and various archival sources. Project specific history included the gathering of information from historic maps, deed records, will records, and court documents. Map sources (both published and manuscript) for Sussex County are extremely limited. Historical maps examined for the project included 19<sup>th</sup> and 20<sup>th</sup> century Coastal Survey maps, the 1868 *Lewes & Rehoboth* Beers Map, early USGS topographic quadrangles (USGS 1918, 1944, 1954, 1968, 1972, 1984, and 1991), and historic Agricultural Stabilization & Conservation Service (AS&CS) aeriels accessed from the Delaware DataMIL. Maps and aeriels were precise enough to be brought into Geographic Information System (GIS) software and georeferenced to the correct position in order that the project area could be accurately placed on each map or aerial.

### **3.3 ARCHEOLOGICAL SURVEY**

Phase I field survey included initial surface inspection of exposed areas and the excavation of shovel test units (STUs). STUs were laid out at a 15-meter interval along the proposed centerline of the Junction and Breakwater extension trail using geographic information system (GIS) software in order to ensure accuracy and to make sure testing was carried out only within the Project Area limits. The shovel test units were laid out using a sub-meter accurate Trimble GPS system. Radial STUs were laid out in the field using the GPS system at 7.5 meter intervals. In some locations, STUs and radials were not excavated due to previous surface or subsurface disturbances, such as proximity to road beds, a gas line, demolition debris, and hazardous overhead conditions. STUs were excavated 10 centimeters into subsoil or to one meter if subsoil was not encountered. One 1x1 meter unit was excavated in order to investigate a probable prehistoric feature located in STU 50 which contained part of a prehistoric pipe bowl. Excavated soils were screened through one-quarter inch mesh screen, and any recovered artifacts were retained in bags marked with standard provenience information. Stratigraphy observed in the shovel test units was recorded on standardized forms with depth, soil texture, Munsell color, and posited depositional environment. Photographs were taken to document the setting of the study area and to illustrate the survey findings.

### **3.4 LABORATORY PROCEDURES AND ANALYSIS**

Artifacts recovered in the course of the field investigations were cleaned and inventoried following curatorial guidelines and standards established by the Delaware State Historic Preservation Office. To the extent possible, the recovered artifacts were identified as to material, temporal or cultural/chronological association, style, and function. Analysis sought patterns in the relative composition of the recovered artifact assemblages, particularly to the extent that such patterns may indicate the functional nature of the assemblages and/or the site formation processes associated with their deposition. The attributes are particularly relevant for the evaluation for the site's archeological and interpretative potential. All cultural material resulting from the project and the associated documentation will be submitted to the Delaware State Historic Preservation Office.

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## 4.0 RESULTS

### 4.1 EXPECTED PROPERTY TYPES

#### 4.1.1 PREHISTORIC ARCHEOLOGY

Based on the background research, expectations for archeological resources in the project area were developed. For prehistoric archeological sites the discussion is guided primarily by the management plan for the Delaware Atlantic Coastal Region (DACR) (Custer 1987) with reference to more recent work (e.g., Custer 1989; Custer and Mellin 1991). The survey was conducted over transects considered both relatively undisturbed and disturbed in different areas based on a review of historic maps and aeriels.

Custer (1987:22) identified only one site dating to the Paleoindian period (7S-G-19) on the southern Delmarva Peninsula; however, isolated points have been found in the project region. For example, Custer (1989:94) illustrates a fluted point find west of the project area. Two Study Units were defined for the Paleoindian period: major drainage and interior (Custer 1987:27). Base camps might be expected in the major drainage zone, while procurement sites and stations might occur almost anywhere. Data quality is poor for the Paleoindian period, as only one site is known. The single known site is situated on the north shore of tidal Indian River near its opening into the bay. Any finds of Paleoindian cultural material in the project area would be considered potentially significant.

The study units defined by Custer (1987:31) for the Archaic period are identical to the Paleoindian units (i.e., major drainage and interior). However, climatic conditions were probably drier ca. 9000 years BP (Kellogg and Custer 1994:21–24), so that Archaic sites might be expected closer to reliable or predictable water sources. As with the Paleoindian period, only a few Archaic sites are known for the DACR. Custer (1987:30–31) identifies three sites. The one site, south of the project area, is the same site as noted for the Paleoindian period. Thus, basic data collection is also needed for the Archaic period (Custer 1987:55).

The archeology of the Woodland I and II periods is much better known than that of the preceding Paleoindian and Archaic periods. By 5000 years BP, climatic conditions had attained an essentially modern character, and the rate of sea-level rise had slowed. The slowing of sea-level rise led to the development of stable and more extensive coastal environments and estuarine resources. Prehistoric population densities increased, and large sites representing long-term camps were established (Custer 1987:31). Woodland I sites are numerous in the DACR. Three study units are defined for the Woodland I period (Custer 1987:43). Study Unit I is on Cape Henlopen, Study Unit II encompasses the inland bays and floodplains of the major drainages of the region, and Study Unit III consists of interior areas used primarily for resource procurement; Study Unit II is relevant to the current project area. Base camp sites are expected in Study Unit II (Custer 1987:43). Data quality is considered poor/fair for Study Unit II and poor for Study Unit III (Custer 1987:45). Because the Woodland I period is fairly well known for the DACR, a wider variety of research questions could be addressed in archeological research (Custer 1987:55–56). For example, storage features become more prevalent in the transition from the Woodland I to the Woodland II period, suggesting food surpluses, perhaps resulting from the development of plant cultivation and horticulture (see LeeDecker et al. 1996).

The archeology of the Woodland II period is also well known for the DACR, chiefly through the early efforts of the SSAH. The dominant cultural manifestation in the region during the Woodland II period was the Slaughter Creek complex. Sites of the Slaughter Creek complex are often extensive with many subsurface features, many containing shellfish remains. The Woodland

II study units are the same as for the earlier Woodland I period (Custer 1987:49, 52). A seasonal round of shifting base camps is hypothesized for the Woodland II period, with spring and summer camps near the coast and falls and winters spent farther inland (Custer 1987:52). Data quality for the Woodland II is comparable to the Woodland I period (Custer 1987:45).

The Junction and Breakwater Trail extension project area falls into the Southern Bay subsection of the Coastal Management Unit (Custer 1987:178). Site probabilities for the management unit range from low to high for the various time periods, with low or moderate probability for Paleoindian and Archaic sites, low to high probability for Woodland I sites, high probability for Woodland II sites, and low probability for Contact sites. Data quality, on the other hand, is generally considered poor or fair for the management unit. Data for the Paleoindian, Archaic, and Contact periods are poor because so few sites are known. For the Woodland I and II periods, data quality is better (fair/good) because more sites are known. Relatively few sites have been excavated, however.

#### 4.1.2 HISTORICAL ARCHEOLOGY

General historical archeological expectations are based more directly on the documentary sources. The state plan for Delaware's historical archeological resources (De Cunzo and Catts 1990) provides an initial basis for evaluating potential archeological sites of all time periods in the project area. A more project-specific historical context has also been developed and will serve to guide the present investigation. In "*Neither a Desert nor a Paradise: Historic Context for the Archeology of Agriculture and Rural Life, Sussex County, Delaware, 1770–1940*" (De Cunzo and Garcia 1992:248–260), the authors define seven property types associated with the archeological investigation of farmsteads: agricultural complex, agricultural dwelling, agricultural outbuilding, agricultural quarter, agricultural transport facility, agricultural structure, and Agricultural commercial/industrial outbuilding. The property types defined by De Cunzo and Garcia were developed for the period from 1770–1940, but they are also applicable to the 1630–1730 and 1730–1770 periods. After historic background research, it was expected that the archeological survey along the proposed trail would only encounter two possible property types.

1. *Agricultural Dwelling*: the residence of a farm owner-operator, tenant farmer, farm manager, or other free agricultural laborer and his or her family household. It encompasses at least one dwelling, as well as domestic outbuildings and yards, gardens, and associated activity areas (De Cunzo and Garcia 1992:251).

2. *Agricultural Outbuilding*: One or more outbuildings of the same or different agricultural functions located on farms but isolated from the farmstead or agricultural complex (defined above). The outbuilding(s) also includes associated work and storage yards (De Cunzo and Garcia 1992:252).

## 4.2 PHASE I ARCHEOLOGICAL SURVEY

### 4.2.1 SHOVEL TESTING

Shovel testing was undertaken February 12–25, 2013. A total of one hundred twenty-two (122) shovel test units were excavated, including radials for STUs that were positive for prehistoric artifacts (Figure 2). Thirty-two (32) STU's slated for excavation were not excavated, due to former ground disturbance, proximity with road beds, a buried gas line, demolition debris, and hazardous overhead conditions caused by a series of dead, lodged trees. One of the excavated

STUs was placed farther into the agricultural field outside of the project area in order to ascertain whether the prehistoric artifacts covered a much larger area than just the APE of the proposed Trail.

For this discussion of the results of the field investigations, the proposed trail can be divided roughly into four sections based on the stratigraphy seen in the shovel test units: 1) the development berm; 2) the agricultural field; 3) the wooded area; and 4) the highway ROW. The following discussion of the shovel test units will include a detailed description of one shovel test that represents each type of stratigraphy encountered during the survey.

#### 4.2.1.1 The Development Berm

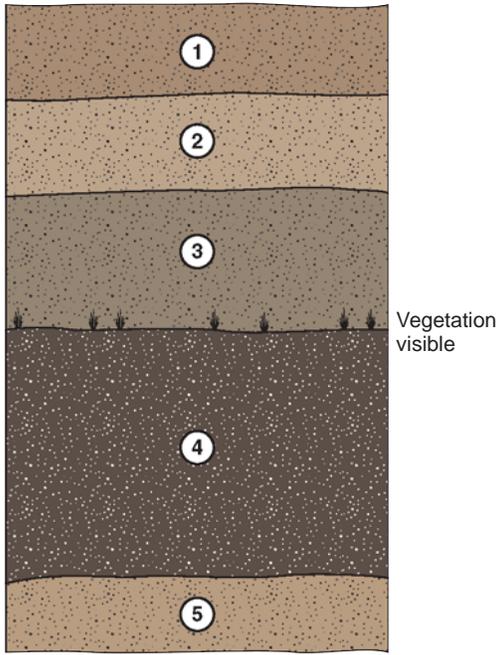
Shovel test units 2-28 (STU 1 was located too near the road bed) were located along the top of the development berm at the southeast end of the project area. To the southwest of the centerline was a drainage ditch for the development and to the northeast was the tree line that bordered an agricultural field. These shovel tests were all similar in that they consisted of one or two thick, compact fill units overlying a buried plowzone. Often the buried vegetation was still visible, as this berm was constructed less than ten years ago. STU 11 is an example of the typical profile seen in these shovel test units (Figure 19). The first level of the STU consisted of an artificial topsoil laid down after the creation of the berm. This was a dark yellowish brown (10YR 3/4) silty sand that was typically about 12cm thick. Below this was a very compact mottled fill characterized as dark yellowish brown (10YR 4/4) mottled with yellowish brown (10YR 5/6), typically a silty sand. This fill reached a depth of 25cm bgs where it transitioned to compacted, re-deposited plowzone sediments characterized as brown (10YR 4/3) sandy silt. It is posited that the topsoil (or plowzone) in the area to the south was stripped when the development was built, re-deposited, and compacted either intentionally or unintentionally by machinery. The contact between this layer and the intact plowzone was marked by a change in compaction and the surface vegetation that was still visible after being buried. This intact plowzone was reached at approximately 40-60cm bgs depending on the fill thickness. Several STU's did not contain the re-deposited plowzone level (level 3), and instead had a thicker mottled fill unit (level 2). The intact plowzone was typically 20cm thick with an underlying B horizon characterized as a yellowish brown (10YR 5/6) silty sand. No prehistoric artifacts were recovered from any of these STUs. A few historic artifacts came from the fill units, and only one piece of bottle glass was recovered from the intact plowzone.

#### 4.2.1.2 The Agricultural Field

STUs 29-71 and radials for STU 50, 59, 61, 63, 67, 68, and 71 were all located along the southwestern edge of a large agricultural field that once belonged to Hazell M. Smith and is now slated to be developed. All of these STUs (see Figure 19 for example) had a dark brown (10YR 3/3) fine sandy silt – silty sand Ap horizon, generally 25-30cm thick. This overlay a B horizon characterized as a yellowish brown (10YR 5/6) fine sandy clay silt that became more oxidized with depth. In several of the STUs, an intact AB horizon was noted. All of the STUs between STU 29 and 59 were either negative or positive for only historic artifacts, with the exception of STU 50. STU 50 contained a possible prehistoric feature (Feature 1) identified from 25 to 60cm bgs that contained a low-fired red, quartz-tempered clay pipe bowl. All radials around STU 50 were negative for prehistoric artifacts.

After consultation with the Department, an excavation unit (EU 1) was placed to the northeast of STU 50 to further examine this feature where it appeared to be deepest. The Ap horizon was excavated and screened, revealing the outline of Feature 1 along the southwest edge of the unit at

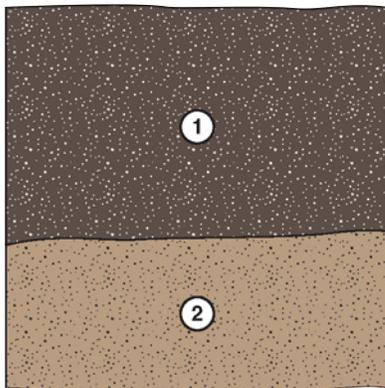
### STU 11



- 1 10YR 3/4 dark yellowish brown silty sand; artificial topsoil
- 2 10YR 4/4 dark yellowish brown mottled with 10YR 5/6 yellowish brown silty sand; mottled compact fill
- 3 10YR 4/3 dark yellowish brown sandy silt; compact redeposited plowzone
- 4 10YR 3/3 dark brown fine sandy silt; APb (buried plowzone)
- 5 10YR 5/6 yellowish brown silty sand; B horizon (subsoil)



### STU 62



- 1 10YR 3/3 dark brown silty fine sand; AP (plowzone)
- 2 10YR 5/6 yellowish brown fine sandy clay silt, more oxidation with depth; B horizon (subsoil)



Figure 19. Graphical representation and photos of soil profiles, STUs 11 and 62.

approximately 25cm bgs (Figure 20). Feature 1 was excavated in two layers (see Figure 21). Layer I was arbitrarily excavated in 10cm levels (1-3). This layer was characterized as a yellowish brown to dark yellowish brown (10YR 5/6-4/6) slightly clayey silty sand with less than 1 percent gravels, charcoal flecking, and pockets of compact light yellowish brown (10YR 6/4) concretions. Layer II was a dark brown (10YR 3/3) organic fine sandy silt with pockets of burnt earth. Subsoil was reached at 60cm bgs (Figure 21). Unidentified Prehistoric Ware was recovered from Layer I, Levels 1 and 3; the ceramics from Level 3 appear to be burnt. The pipe bowl recovered in STU came from between 45-60cm bgs, corresponding to either the lowest level of Layer I or possibly Layer II (Plate 5). No cultural material was recovered from Layer 2 of the Feature within EU 1. Only the eastern boundary of this feature was defined; however, this is possibly a “D” shaped prehistoric pit, typical of Woodland sites, with the deeper, relatively straight-sided edge seen in the unit, sloping up to the southwest in STU 50. The bottom of the feature was not flat, with a rise visible in the western wall profile. A recent discussion on the theories concerning “D” shaped prehistoric pits suggests the possibility that these are “culturally induced tree fall” features, rather than house pits or natural tree throws (Egghart 2005: 87). The amount of charcoal and burnt earth present throughout Feature 1 lends support to this “D” shaped pit theory.

The prehistoric artifacts found in Feature 1 (STU 50 and EU 1) are isolated, over 130 meters from the edge of the prehistoric concentration found to the northwest, starting at STU 59 (see Figure 2). The density and distribution of prehistoric artifacts from STU 59 to STU 71 is fairly sparse but consistent, with the higher number of artifacts concentrating in STU 67 and STU 71. An extra radial was placed to the east of STU 71, outside the project area in order to determine whether the artifact distribution continued beyond the limits of the APE. This STU clarified that the prehistoric artifacts continue beyond the boundary of the trail project area. All of the artifacts from these units were collected from the Ap horizon. One possible historic feature (Feature 2) that had the appearance of a posthole was recorded in STU 61, with one piece of window glass recovered from it.

#### 4.2.1.3 The Wooded Area

STU's 72-75 and radials 73 E, 73 W, 74 S, 74 E, 74 W, and 75 E were all excavated in the overgrown wooded area in between the agricultural field and the highway ROW. According to historic maps and road papers provided by the Department, several outbuildings once stood in this area (see figures 10 and 18) and were demolished during the construction of the highway circa 1964 to 1972. The demolition debris pile located between STU 72 and 73 is likely related to one of these outbuildings. This overgrown area is low lying, and many of the trees are dead and fallen over. Two types of stratigraphy were recorded in the shovel tests in this area.

The shovel test units closest to the agricultural field (STU 72, 73 E, 73 W, and 75 E all contained a plowzone over a B horizon (subsoil), similar to that seen in shovel test units in the field. Two of these STU's contained prehistoric artifacts below the plowzone (STU 73 and 73 E). STU's 72 and 73 W only produced historic artifacts within the plowzone. The excavation of STU 73 to the north of the building debris pile revealed a 30cm thick plowzone which was a brown (10YR 4/3) silty sand. Cultural materials from this stratum included a cut nail, brick, coal, and concrete. Below this the B Horizon (subsoil) was excavated to 60cm, becoming more oxidized and increasing in clay content with depth. The prehistoric ceramic collected from this layer came from the upper 15cm.

STU's 74, 74 S, 74 W, 74 E, and 75 are quite different than any other of the shovel test units excavated for this project. They all contain sediments that suggest this area was once a wetland or

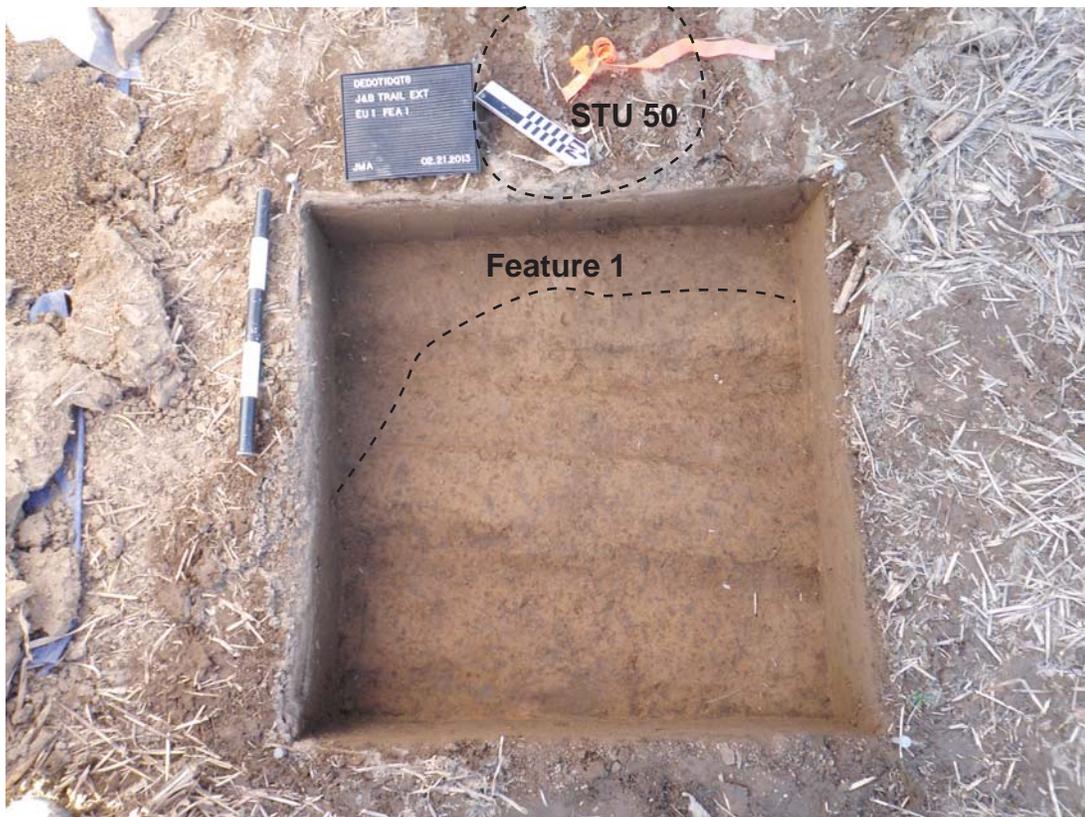
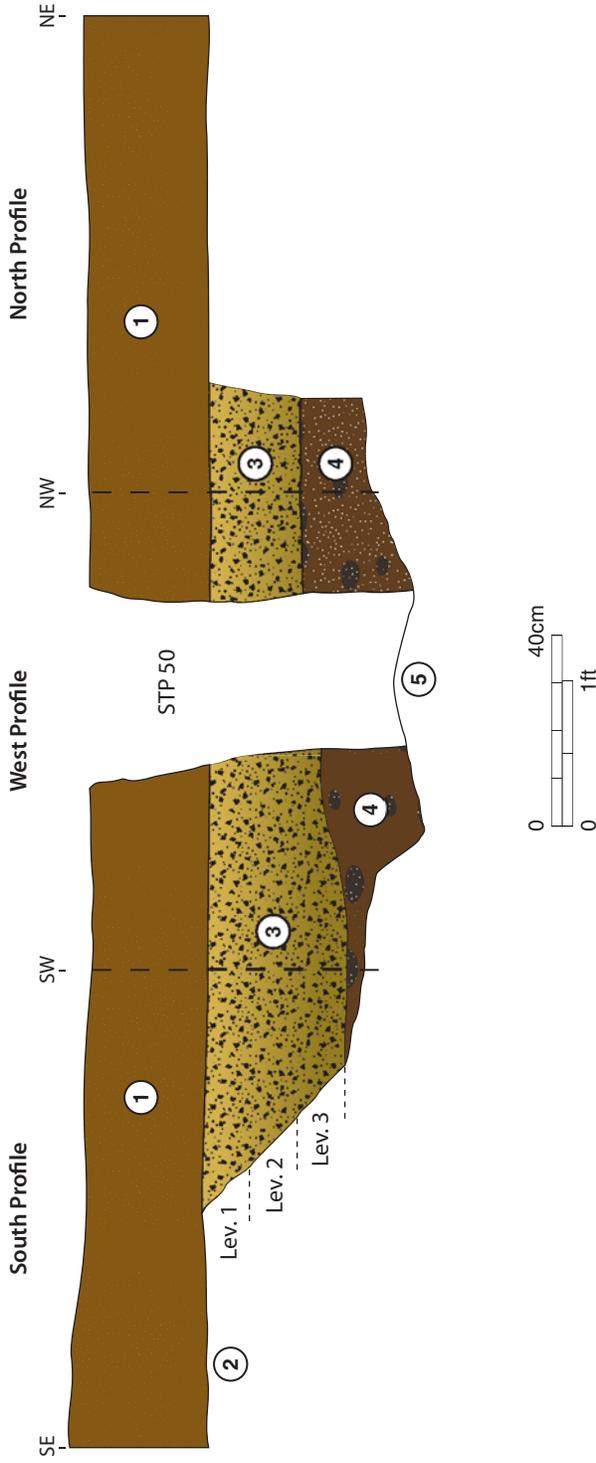


Figure 20. EU 1, plan views of the base of Level 1 and top of Feature 1 (1) and final depth of Feature 1 (2).

### Excavation Unit 1



- 1 10YR 4/3 brown sandy silt; Ap horizon
- 2 10YR 5/6 yellowish brown clayey silt; B horizon
- 3 10YR 5/6-4/6 yellowish brown to dark yellowish brown slightly clayey silty sand with < 1% gravels with pockets of compact 10YR 6/4 light yellowish brown crunchy concretions and charcoal flecking; Feature 1, Layer I, Levels 1-3
- 4 10YR 3/3 dark brown very "organic feeling" fine sandy silt with pockets of burnt earth; Feature 1, Layer II
- 5 10YR 5/6-5/8 yellowish brown clayey silt; subsoil

Figure 21. South, West, and North profiles of Excavation Unit 1, showing Feature 1.



Plate 5. Prehistoric pipe bowl fragments and burnt pottery recovered from Feature 1.

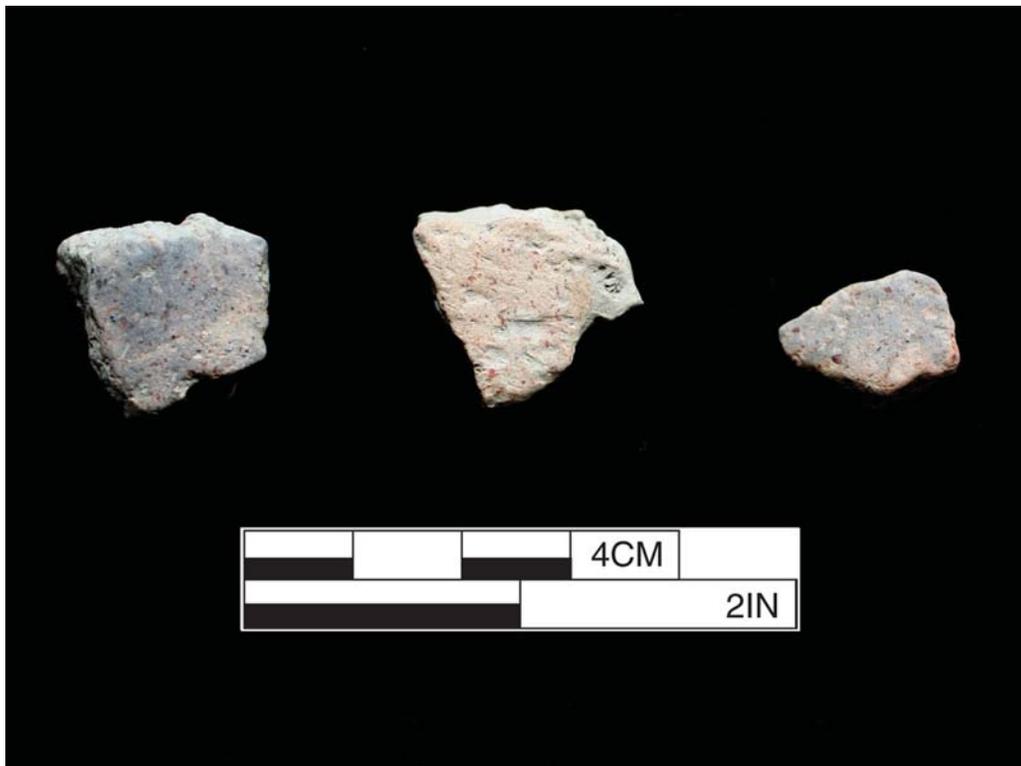


Plate 6. Sample of the largest fragments of Coulbourne Ware recovered during the Phase I survey: STU 61, 61N, and 68.

low-lying area infilled by colluviation. The sediment becomes more organic with depth and grain size become smaller towards the top of the sediment column (fines upwards). Below this “wetland” is evidence of an occupation surface. Prehistoric artifacts were recovered from this surface as well as the wetland sediments. STU 74 is an example of this fining upwards and increase in organics with depth (see Figure 22). It did not appear that the buried surface was plowed, but rather a natural soil development over a B horizon. It is possible that the infilling of this low area is due to historic colluviation exacerbated by runoff from the adjacent field.

#### 4.2.1.4 The Highway ROW

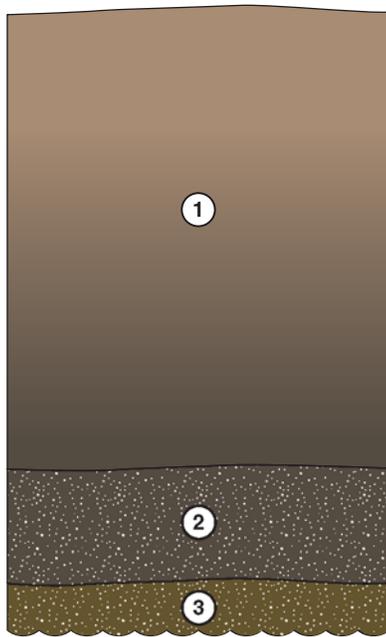
STU’s 101-104 were located at the northwest end of the proposed Junction and Breakwater Trail. These were able to be excavated as the gas line which follows the highway ROW turns towards the highway and follows a drainage ditch to the northwest of the Trail centerline. This area was disturbed by the construction of the highway in the 1960s. All four STUs had an artificial topsoil over a series of fill and/or disturbed plow zone sediments. As an example, see Figure 22. STU 102 had an artificial A horizon (topsoil), a dark brown (10YR 3/3) silty sand that would have been lain down after construction. Below this was a fill unit to 20cm bgs, a dark olive brown (2.5Y 3/3) silty fine sand containing slag, coal, glass, and whiteware. A very compact layer was below this, from which one prehistoric flake was recovered. It is posited that this could be a compacted plow zone due to the clear contact with subsoil; however, the sediment was mottled, and olive brown (2.5 Y 4/3) mottled with light olive brown (2.5Y 5/4), which one would not usually encounter with a plow zone. This is likely another fill level. The B horizon, seen at 32cm bgs, was a yellow brown (10YR 5/6) silty fine to medium sand.

#### 4.2.2 ARTIFACTS

A total of 158 historic artifacts and 70 prehistoric artifacts were recovered during this survey. The historic artifacts were widely and thinly distributed. The artifacts were also quite small (generally less than 2cm) suggesting that this material has been spread over time through agricultural activity. Historic artifacts included brick, window glass, nails, redware, whiteware, white granite ware, pearlware, creamware, porcelain, bottle glass, and one kaolin tobacco pipe stem. The pipe stem, pearlware, and creamware, while indicative of a possible eighteenth or early nineteenth century occupation, were not recovered in a concentrated area and are thinly distributed, and the artifacts so small, that is likely that these are in a secondary context. It is possible that these artifacts are coming from the farm complex at the northwest bend in the trail, but these structures are not depicted until after the 1918. A piece of free-blown bottle glass and early refined earthenware (manganese mottled) from STU 103 and 102 within the highway ROW are the earliest historic artifacts (early eighteenth century), but they were from a disturbed context and in a portion of the APE with extremely limited undisturbed ground surface. It is unknown whether the disturbed/fill units from these shovel tests are of a local source or brought in from elsewhere. Even if the artifacts are from the area, they were mixed with prehistoric and more recent historic artifacts, and the STU’s are bounded by the drainage ditch and fence line; therefore no further work could be done in this location.

The prehistoric artifacts recovered during this survey were concentrated between STU 75 and STU 59, with the exception of artifacts recovered from Feature 1 in EU 1 and STU 50 and the disturbed context of STU 101-104. The majority of the prehistoric cultural material collected is lithic debitage-waste flakes from stone tool manufacture. Lithic materials include reddish and yellow (tan) jaspers (54%) and chert (46%). Cobble cortex was present on 65 percent of the debitage flakes indicating the use of locally available, Columbia Formation gravels as a source of

### STU 74

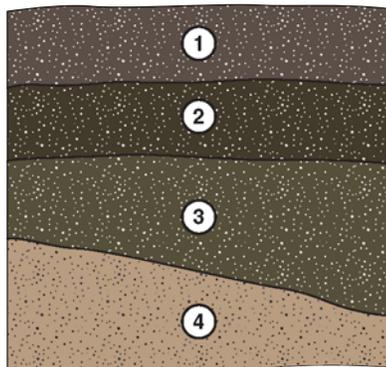


Water table

- 1 10YR 3/4 dark yellowish brown silty clay transitioning to 10YR 2/2 very dark brown fine sandy silty clay; sediment that coarsens and becomes more organic with depth suggesting colluvial infilling of low spot/possible wetland
- 2 10YR 2/2 very dark brown fine sandy clay silt; Ab (buried surface)
- 3 10YR 3/4 dark yellowish brown fine sandy silt; B horizon



### STU 104



- 1 10YR 3/3 dark brown silty sand (artificial topsoil)
- 2 2.5Y 3/3 dark olive brown silty fine sand (fill)
- 3 2.5Y 4/3 olive brown silty sand with mottles of 2.5Y 5/4 light olive brown; compact redeposited plowzone
- 4 10YR 5/6 yellowish brown silty fine-medium sand; B horizon



Figure 22. Graphical representation and photos of soil profiles, STUs 74 and 104.

lithic raw materials. No exotic lithic materials such as rhyolite, chalcedony, or argillite (Custer 1989: 55-59) were recovered. No diagnostic lithic artifacts were recovered. Thirty-one (31) pieces of prehistoric ware were collected during this survey (generally less than 2cm); the small size of the ceramics made positive identification difficult. Based on surface treatment and temper, seventeen of the ceramics could be identified as Coulbourne Ware, mostly plain with a few that appear cord or net impressed. Four (4) of the wares were shell tempered, two (2) were sand/mica tempered, and eight (8) were unidentified due to size and/or being burnt. Coulbourne Ware from nearby Wolfe Neck Site dates to  $2325 \pm 65$  BP, corresponding to the Woodland I period (Griffith 1982: 53).

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## 5.0 SUMMARY AND RECOMMENDATIONS

A Phase I archeological survey of the proposed Extension of the Junction and Breakwater Trail project area was undertaken by JMA February 12-25, 2013. A total of one hundred twenty-two (122) STUs were excavated within four distinct areas: the development berm, the agricultural field, the wooded area, and the highway ROW; a 1x1-m unit was then excavated to examine a possible prehistoric feature identified during shovel testing. The stratigraphy of the development berm consisted of an artificial topsoil deposited over thick, compact fill units that buried an intact Ap-B horizonation; despite the intact soil horizons, very few artifacts were recovered from these STUs. The four STUs excavated along the Freeman Highway ROW had varying stratigraphic levels that clearly indicated that both historic and prehistoric artifacts recovered from this portion of the APE were from disturbed settings and/or out of context.

Most of the cultural materials recovered were from the agricultural field and the wooded area. STUs within the agricultural field generally contained one or two historic artifacts ranging from the eighteenth- to twentieth-century within the Ap (plow zone), but the majority of these artifacts were very small in size, suggesting that they were secondarily deposited through trash disposal or fertilizing. Historical period artifacts recovered closer to the wooded area may be related to the farm complex that was in existence in the vicinity of the project area during the first part of the twentieth century. A building debris pile composed of brick, concrete, shingles, and other relatively modern building materials was located between STU 72 and 73. This is likely the remnant of one of the farm outbuildings razed when Freeman Highway was constructed.

Prehistoric artifacts including Coulbourne Ware (circa 2300 BP, or Woodland I), unidentified prehistoric ceramics, and lithic debitage were recovered from STUs within the wooded area and the northern section of the agricultural field. A prehistoric pipe bowl and several unidentified prehistoric wares were recovered from a possible "D" shaped pit feature which was isolated from the rest of the prehistoric site to the northwest. Prehistoric artifacts all came from the Ap horizon within the agricultural field, but came from undisturbed contexts within the wooded area. The stratigraphy in this area suggests that this was once a low area, possibly a wetland that has been gradually filled in colluvially. At a depth of approximately 50-60cm bgs flakes and prehistoric ware were recovered from buried intact surfaces. Several of the STUs have sediment above the buried surface that is heavily organic, suggesting a wetland environment. Prehistoric artifacts were recovered from this sediment as well.

Based on the distribution and condition of the historical period artifacts, the absence on historical maps of any structures other than outbuildings in the vicinity, the lack of any documented cultural features from surface or subsurface context, and the degree of previous disturbance that has occurred in several areas along the trail APE, JMA is of the opinion that the historical period artifacts recovered within the project area do not represent a potentially significant historical archeological site. The available evidence indicates that only agricultural rather than domestic activities occurred across the location. Accordingly, JMA recommends no further archeological consideration for the historical period cultural resources within the Proposed Extension of the Junction and Breakwater Trail.

Based on the on the 29 STUs that were positive for prehistoric artifacts along the northwestern edge of the agricultural field and within the wooded area, JMA has defined a tentative site boundary for the Smith Farm site (site number pending) (Figure 23), with the knowledge that the true boundary has not been delineated due to the APE boundary which constrained the field testing. The date for the occupation of this site during the Woodland I period is based on the

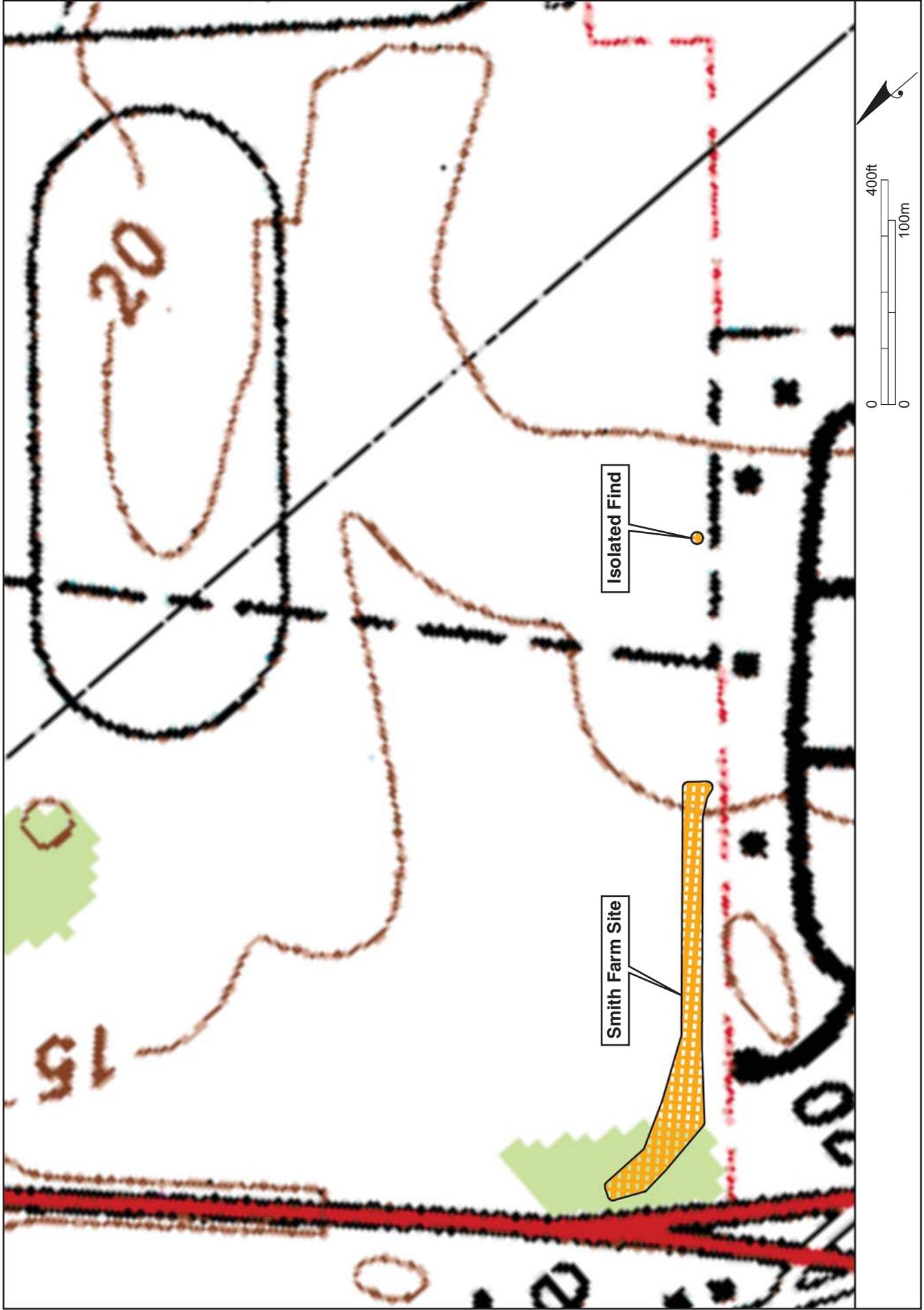


Figure 23. Proposed site boundary for the prehistoric Smith Farm site (site number pending), within the APE of the proposed extension for the Junction and Breakwater Trail.

recovered Coulbourn Ware. Delaware has a high concentration of known Woodland I sites, so much data has already been gathered on this type of site; however, the potential significance for this site is in the unplowed, undisturbed surface within the wooded area of the project. JMA recommends either avoidance of this area or a Phase II survey in order to better delineate the extent and significance of this site.

Feature 1, located in STU 50 and EU 1 (see Figure 23 for location), is a prehistoric feature isolated from the Smith Farm site to the northwest. Prehistoric pipe bowl fragments and several unidentified/burnt prehistoric wares were recovered from the feature. All radials, however, were negative. It is possible that this feature is part of a site that is outside the APE for this project, but currently it will remain enigmatic. JMA is not seeking a site designation for this feature, but does recommend avoidance if possible.

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Appendix I:  
Artifact Inventory

Artifact Inventory  
Phase I Archeological Survey of the Proposed Extension of the Junction and Breakwater Trail  
Lewes, Delaware  
February 12-25, 2013 JMA

LOT	STU/EU	LEVEL	DEPTH	CT	ARTIFACT DESCRIPTION	COMMENTS	DATE RANGE
1	STU 2	2	34-56 cm bgs	1	Unidentified Bottle Fragment: Clear		
1	STU 2	2	34-56 cm bgs	1	Unidentified Bottle Fragment: Amber		
2	STU 9	2	65-85 cm bgs	1	Unidentified Bottle Fragment: Clear		
3	STU 18	4	43-62 cm bgs	1	Nail: Unidentified		
4	STU 26	2	18-58 cm bgs	1	Redware: Brown Glaze	Glazed Both Surfaces	
5	STU 29	1	0-33 cm bgs	2	Unidentified Bottle Fragment: Amber		
5	STU 29	1	0-33 cm bgs	1	Unidentified Bottle Fragment: Aqua		
6	STU 29	2	33-52 cm bgs	1	Nail: Unidentified		
7	STU 30	1	0-27 cm bgs	1	Redware: Unglazed		
8	STU 31	1	0-28 cm bgs	1	Kitchen Glass: Canning-Lid Liner, Milk Glass	"...W Y..."	1869-present
8	STU 31	1	0-28 cm bgs	1	Miscellaneous, Metal: Iron Buckle		
9	STU 35	1	0-30 cm bgs	1	Window Glass: All Thicknesses		
9	STU 35	1	0-30 cm bgs	1	Brick, Fragment: Unidentified, Unglazed		
10	STU 36	1	0-28 cm bgs	1	Fastener, Metal: Spike		
11	STU 37	1	0-30 cm bgs	1	Window Glass: All Thicknesses		1810-2000
11	STU 37	1	0-30 cm bgs	1	Whiteware: Plain		
12	STU 39	1	0-30 cm bgs	1	Window Glass: All Thicknesses		
13	STU 40	1	0-30 cm bgs	1	Redware: Brown Glaze	Glazed Interior, Unglazed Exterior	
14	STU 41	1	0-30 cm bgs	1	Pearlware: Plain		1779-1830
15	STU 42	1	0-28 cm bgs	1	Unidentified Nail: Head Only		
15	STU 42	1	0-28 cm bgs	1	Pearlware: Plain		1779-1830
16	STU 43	1	0-27 cm bgs	1	Redware: Brown Glaze	Glazed Both Surfaces	
16	STU 43	1	0-27 cm bgs	1	Yellowware: Plain		1830-1930
17	STU 44	1	0-27 cm bgs	1	Unidentified Bottle Fragment: Clear		
17	STU 44	1	0-27 cm bgs	1	Unidentified Bottle Fragment: Aqua		
18	STU 45	1	0-30 cm bgs	1	Unidentified Bottle Fragment: Clear		
19	STU 45	Fea 2	30-95 cm bgs	1	Coal, Wood: Charcoal	C14 Sample	
20	STU 46	1	0-25 cm bgs	1	Cut Common Nail: Fragment		1805-2000
20	STU 46	1	0-25 cm bgs	1	Miscellaneous Glass Object: Unidentified	Melted	
21	STU 47	1	0-30 cm bgs	1	Pearlware: Shell Edge	Green	1779-1830
22	STU 49	1	0-30 cm bgs	1	Brick, Fragment: Unidentified, Unglazed		
23	STU 50	1	0-25 cm bgs	1	Whiteware: Blue Transfer Print		1815-1915
24	STU 50	Fea 1	45-60 cm bgs	11	Pipe: Bowl Fragment	Parts of One Pipe; Red Body with Quartz Temper	
25	STU 50N	1	0-30 cm bgs	1	Whiteware: Plain		1810-2000
26	STU 53	1	0-32 cm bgs	1	Whiteware: Plain		1810-2000

Artifact Inventory  
Phase I Archeological Survey of the Proposed Extension of the Junction and Breakwater Trail  
Lewes, Delaware  
February 12-25, 2013 JMA

LOT	STU/EU	LEVEL	DEPTH	CT	ARTIFACT DESCRIPTION	COMMENTS	DATE RANGE
27	STU 54	1	0-27 cm bgs	1	Brick, Fragment: Unidentified, Unglazed		
27	STU 54	1	0-27 cm bgs	1	Redware: Unglazed		
27	STU 54	1	0-27 cm bgs	1	Redware: Brown Glaze		
28	STU 55	1	0-30 cm bgs	1	Redware: Thick Black Glaze		
28	STU 55	1	0-30 cm bgs	1	Unidentified Ceramic: Earthenware	White Bodied, Surfaces Missing	1779-1830
28	STU 55	1	0-30 cm bgs	1	Pearlware: Plain		1810-2000
28	STU 55	1	0-30 cm bgs	1	Whiteware: Unidentified	Pink Glaze	1842-1930
29	STU 56	1	0-28 cm bgs	1	White Granite Ware: Plain		
29	STU 56	1	0-28 cm bgs	1	Redware: Brown Glaze	Glazed One Surface	
29	STU 56	1	0-28 cm bgs	2	Unidentified Bottle Fragment: Aqua		
29	STU 56	1	0-28 cm bgs	1	Decorated/Embossed Glass Fragment: Clear		
30	STU 57	1	0-30 cm bgs	2	Nail: Unidentified		
30	STU 57	1	0-30 cm bgs	1	Pearlware: Plain		1779-1830
30	STU 57	1	0-30 cm bgs	1	Whiteware: Plain		1810-2000
30	STU 57	1	0-30 cm bgs	2	Redware: Brown Glaze		
31	STU 58	1	0-29 cm bgs	1	Brick, Fragment: Unidentified, Unglazed		
31	STU 58	1	0-29 cm bgs	1	Whiteware: Plain		1810-2000
31	STU 58	1	0-29 cm bgs	1	Miscellaneous, Metal: Unidentified		
32	STU 59	1	0-30 cm bgs	1	Coulbourn Ware: Cordmarked, Body	Cord or Net Impressed	2350-2050
33	STU 59 N	1	0-32 cm bgs	1	Window Glass: All Thicknesses		
33	STU 59 N	1	0-32 cm bgs	1	Whiteware: Blue Transfer Print		1815-1915
33	STU 59 N	1	0-32 cm bgs	2	Unidentified Prehistoric Ware: Shell Tempered, Body	Mockley or Townsend, Plain Body	
34	STU 59 E	1	0-26 cm bgs	1	Flake 11-15mm: Jasper		
35	STU 59 W	1	0-38 cm bgs	1	Brick, Fragment: Unidentified, Unglazed		
36	STU 60	1	0-34 cm bgs	1	Whiteware: Plain		1810-2000
37	STU 61	1	0-30 cm bgs	1	Brick, Fragment: Unidentified, Unglazed		
37	STU 61	1	0-30 cm bgs	3	Nail: Unidentified		
37	STU 61	1	0-30 cm bgs	2	Window Glass: All Thicknesses		
37	STU 61	1	0-30 cm bgs	1	Whiteware: Plain		1810-2000
37	STU 61	1	0-30 cm bgs	1	Coulbourn Ware: Plain, Body		2350-2050
37	STU 61	1	0-30 cm bgs	1	Flake w/Cortex 16-20mm: Jasper		
38	STU 61 S	1	0-37 cm bgs	1	Unidentified Prehistoric Ware: Unidentified	Coulbourn Ware (?)	
38	STU 61 S	1	0-37 cm bgs	1	Whiteware: Plain		1810-2000
38	STU 61 S	1	0-37 cm bgs	1	Pipe Stem: 5/64th-Inch Ball Clay		1710-1750
39	STU 61 E	1	0-36 cm bgs	1	Unidentified Bottle Fragment: Aqua		

Artifact Inventory  
Phase I Archeological Survey of the Proposed Extension of the Junction and Breakwater Trail  
Lewes, Delaware  
February 12-25, 2013 JMA

LOT	STU/EU	LEVEL	DEPTH	CT	ARTIFACT DESCRIPTION	COMMENTS	DATE RANGE
39	STU 61 E	1	0-36 cm bgs	2	Unidentified Prehistoric Ware: Quartz/Mica/Sand Tempered, Body	Possibly Wolfe Neck	
40	STU 61 N	1	0-32 cm bgs	1	Unidentified Nail: Shaft Only		
40	STU 61 N	1	0-32 cm bgs	2	Brick, Fragment: Unidentified, Unglazed		
40	STU 61 N	1	0-32 cm bgs	1	Window Glass: All Thicknesses		
40	STU 61 N	1	0-32 cm bgs	4	Coulbourn Ware: Plain, Body		2350-2050
41	STU 63	1	0-35 cm bgs	1	Nail: Unidentified		
41	STU 63	1	0-35 cm bgs	2	Coulbourn Ware: Cordmarked, Body	Cord or Net Impressed	2350-2050
42	STU 63 E	1	0-30 cm bgs	1	Unidentified Prehistoric Ware: Unidentified		
42	STU 63 E	1	0-30 cm bgs	1	Flake 11-15mm: Chert		
43	STU 63 N	1	0-29 cm bgs	1	Flake 6-10mm: Jasper		
44	STU 63 S	1	0-34 cm bgs	1	Redware: Unglazed		
44	STU 63 S	1	0-34 cm bgs	1	Coulbourn Ware: Cordmarked, Body		2350-2050
45	STU 64	1	0-28 cm bgs	1	Creamware: Light-Colored Yellow		1775-1820
45	STU 64	1	0-28 cm bgs	1	Whiteware: Plain		1810-2000
46	STU 65	1	0-30 cm bgs	3	Unidentified Nail: Shaft Only		
46	STU 65	1	0-30 cm bgs	1	Brick, Fragment: Unidentified, Unglazed		
46	STU 65	1	0-30 cm bgs	1	Unidentified Bottle Fragment: Olive Green		
46	STU 65	1	0-30 cm bgs	1	Creamware: Light-Colored Yellow		1775-1820
46	STU 65	1	0-30 cm bgs	1	Unidentified Ceramic: Earthenware	White Bodied	
46	STU 65	1	0-30 cm bgs	1	Redware: Clear Glaze Exterior/White Slip Interior		
47	STU 66	1	0-30 cm bgs	1	Brick, Fragment: Unidentified, Unglazed		
47	STU 66	1	0-30 cm bgs	1	Yellowware: Plain		1830-1930
47	STU 66	1	0-30 cm bgs	1	Flake 11-15mm: Jasper		
48	STU 67	1	0-28 cm bgs	1	Coulbourn Ware: Plain, Body		2350-2050
48	STU 67	1	0-28 cm bgs	1	Flake w/Cortex 16-20mm: Jasper		
49	STU 67 E	1	0-26 cm bgs	1	Unidentified Ceramic: Earthenware	White Bodied; Burnt Whiteware (?) Heat Treated	
49	STU 67 E	1	0-26 cm bgs	1	Blocky Fragment 11-15mm: Jasper		2350-2050
50	STU 67 S	1	0-28 cm bgs	1	Coulbourn Ware: Plain, Body		
50	STU 67 S	1	0-28 cm bgs	2	Flake w/Cortex 11-15mm: Chert	Or Jasper (?)	
51	STU 68	1	0-30 cm bgs	1	Window Glass: All Thicknesses		
51	STU 68	1	0-30 cm bgs	1	Brick, Fragment: Unidentified, Unglazed		
51	STU 68	1	0-30 cm bgs	1	Pearlware: Hand-Painted Underglaze Polychrome	Blue and Brown Band	1795-1830
51	STU 68	1	0-30 cm bgs	1	Coulbourn Ware: Plain, Body		2350-2050

Artifact Inventory  
Phase I Archeological Survey of the Proposed Extension of the Junction and Breakwater Trail  
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LOT	STU/EU	LEVEL	DEPTH	CT	ARTIFACT DESCRIPTION	COMMENTS	DATE RANGE
52	STU 68 E	1	0-31 cm bgs	1	White Granite Ware: Plain		1842-1930
53	STU 68 N	1	0-27 cm bgs	1	Hard-Paste Porcelain: Plain		
53	STU 68 N	1	0-27 cm bgs	1	Creamware: Light-Colored Yellow		1775-1820
53	STU 68 N	1	0-27 cm bgs	1	Unidentified Prehistoric Ware: Shell Tempered, Body		
53	STU 68 N	1	0-27 cm bgs	1	Flake w/Cortex 16-20mm: Jasper		
54	STU 68 S	1	0-24 cm bgs	1	Creamware: Light-Colored Yellow		1775-1820
54	STU 68 S	1	0-24 cm bgs	1	Whiteware: Plain		1810-2000
54	STU 68 S	1	0-24 cm bgs	1	Redware: Brown Glaze		
55	STU 71	1	0-23 cm bgs	1	Flake 11-15mm: Jasper		
56	STU 71 S	1	0-34 cm bgs	1	Whiteware: Plain	Burnt	1810-2000
56	STU 71 S	1	0-34 cm bgs	1	Creamware: Light-Colored Yellow		1775-1820
56	STU 71 S	1	0-34 cm bgs	1	Unidentified Bottle Fragment: Aqua		
56	STU 71 S	1	0-34 cm bgs	1	Decorated/Embossed Glass Fragment: Clear		
56	STU 71 S	1	0-34 cm bgs	1	Flake w/Cortex 11-15mm: Chert		
56	STU 71 S	1	0-34 cm bgs	1	Flake w/Cortex 11-15mm: Jasper		
57	STU 71 N	1	0-23 cm bgs	1	Unidentified Bottle Fragment: Olive Green		
57	STU 71 N	1	0-23 cm bgs	1	Pearlware: Monochrome Hand Painted	Blue	1779-1830
58	STU 71 W	1	0-34 cm bgs	1	Unidentified Bottle Fragment: Aqua		
58	STU 71 W	1	0-34 cm bgs	1	Machine-Made Bottle Fragment: Clear		1903-2000
58	STU 71 W	1	0-34 cm bgs	1	Whiteware: Plain		1810-2000
58	STU 71 W	1	0-34 cm bgs	1	Flake w/Cortex 6-10mm: Chert		
58	STU 71 W	1	0-34 cm bgs	1	Flake w/Cortex 26-30mm: Chert		
59	STU 71 E	1	0-27 cm bgs	1	Machine-Made Bottle Fragment: Clear		1903-2000
59	STU 71 E	1	0-27 cm bgs	1	Whiteware: Plain		1810-2000
59	STU 71 E	1	0-27 cm bgs	1	Flake w/Cortex 31-35mm: Chert		
60	STU 71 E Rad	1	0-24 cm bgs	1	Unidentified Bottle Fragment: Aqua		
60	STU 71 E Radial	1	0-24 cm bgs	1	Whiteware: Blue Transfer Print		1815-1915
60	STU 71 E Radial	1	0-24 cm bgs	1	Redware: Thick Black Glaze		
60	STU 71 E Radial	1	0-24 cm bgs	1	Redware: Plain, Clear Glaze	Glazed Interior, Unglazed Exterior	
60	STU 71 E Radial	1	0-24 cm bgs	1	Redware: Unglazed		
60	STU 71 E Radial	1	0-24 cm bgs	1	Imported Brown Stoneware: Unidentified	Eroded	
60	STU 71 E Radial	1	0-24 cm bgs	1	Flake 6-10mm: Jasper		
60	STU 71 E Radial	1	0-24 cm bgs	1	Flake 11-15mm: Chert		
60	STU 71 E Radial	1	0-24 cm bgs	1	Flake w/Cortex 11-15mm: Chert		
61	STU 72	2	8-30 cm bgs	2	Brick, Fragment: Unidentified, Unglazed		

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LOT	STU/EU	LEVEL	DEPTH	CT	ARTIFACT DESCRIPTION	COMMENTS	DATE RANGE
61	STU 72	2	8-30 cm bgs	1	Petroleum Product: Asphalt	Shingle	1920-2000
61	STU 72	2	8-30 cm bgs	1	Unidentified Bottle Fragment: Aqua		
61	STU 72	2	8-30 cm bgs	1	Whiteware: Plain		
61	STU 72	2	8-30 cm bgs	1	Whiteware: Annular	Blue	1810-2000
62	STU 73	1	0-30 cm bgs	1	Cut Common Nail: 1.5 - 2 Inch Long		1810-2000
63	STU 73	2	30-45 cm bgs	1	Coulbourn Ware: Cordmarked, Body		1805-2000
64	STU 73 W	2	15-33 cm bgs	1	Brick, Fragment: Unidentified, Unglazed		2350-2050
64	STU 73 W	2	15-33 cm bgs	2	Unidentified Bottle Fragment: Amethyst		1880-1915
64	STU 73 W	2	15-33 cm bgs	1	Creamware: Light-Colored Yellow		1775-1820
64	STU 73 W	2	15-33 cm bgs	1	Whiteware: Molded		1810-2000
65	STU 73 E	2	12-30 cm bgs	1	Redware: Unglazed		
65	STU 73 E	2	12-30 cm bgs	2	Whiteware: Plain		1810-2000
65	STU 73 E	2	12-30 cm bgs	1	Unidentified Bottle Fragment: Aqua		
66	STU 73 E	3	30-43 cm bgs	1	Accokeek Ware: Plain, Body		2350-1950
67	STU 74	2	60-75 cm bgs	1	Flake w/Cortex 16-20mm: Chert		
67	STU 74	2	60-75 cm bgs	1	Flake w/Cortex 11-15mm: Jasper		
68	STU 74 S	4	63-83 cm bgs	2	Coulbourn Ware: Cordmarked, Body		2350-2050
68	STU 74 S	4	63-83 cm bgs	1	Flake 6-10mm: Jasper		
69	STU 74 W	3	20-48 cm bgs	1	Wire Common Nail: 2 - 2.5 Inch Long		1850-2000
69	STU 74 W	3	20-48 cm bgs	1	Button: Shell	Burnt	
69	STU 74 W	3	20-48 cm bgs	1	Fastener, Metal: Spike		
69	STU 74 W	3	20-48 cm bgs	1	White Granite Ware: Plain		1842-1930
69	STU 74 W	3	20-48 cm bgs	1	Decorated/Embossed Glass Fragment: Clear		
70	STU 74 W	4	48-67 cm bgs	1	Flake w/Cortex 16-20mm: Jasper		
70	STU 74 W	4	48-67 cm bgs	1	Flake w/Cortex 21-25mm: Chert		
71	STU 75	3	48-64 cm bgs	2	Coulbourn Ware: Plain, Body	Crushed Quartz and Grog Tempered	2350-2050
71	STU 75	3	48-64 cm bgs	1	Unidentified Prehistoric Ware: Shell Tempered, Body		
72	STU 75 E	2	16-39 cm bgs	1	Brick, Fragment: Unidentified, Unglazed		
72	STU 75 E	2	16-39 cm bgs	1	Nail: Unidentified		
72	STU 75 E	2	16-39 cm bgs	1	Redware: Unglazed		
73	STU 101	2	20-50 cm bgs	1	Unidentified Bottle Fragment: Clear		1815-1915
73	STU 101	2	20-50 cm bgs	1	Whiteware: Blue Transfer Print		
74	STU 102	2	10-20 cm bgs	1	Free-Blown Bottle Fragment: Olive Green		
74	STU 102	2	10-20 cm bgs	1	Whiteware: Color Glaze	Blue	1815-2000
75	STU 102	3	20-32 cm bgs	1	Flake w/Cortex 16-20mm: Chert		

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LOT	STU/EU	LEVEL	DEPTH	CT	ARTIFACT DESCRIPTION	COMMENTS	DATE RANGE
76	STU 103	3	30-55 cm bgs	1	White Granite Ware: Plain		1842-1930
76	STU 103	3	30-55 cm bgs	1	Early Refined Earthenware: Buff Body, Manganese Mottled	Tiny Fragment	1680-1780
76	STU 103	3	30-55 cm bgs	1	Flake 6-10mm: Jasper		
77	STU 103	4	55-62 cm bgs	1	White Granite Ware: Plain	"...Made In..."	1842-1930
77	STU 103	4	55-62 cm bgs	1	Unidentified Glass Object: Slag		
78	STU 104	2	11-49 cm bgs	1	Whiteware: Plain		1810-2000
78	STU 104	2	11-49 cm bgs	1	Whiteware: Blue Hand Painted		1810-1930
78	STU 104	2	11-49 cm bgs	2	Pearlware: Plain		1779-1830
78	STU 104	2	11-49 cm bgs	1	Redware: Plain, Clear Glaze		
78	STU 104	2	11-49 cm bgs	1	Redware: Brown Glaze	Glazed One Surface	
78	STU 104	2	11-49 cm bgs	2	Unidentified Glass Object: Slag		
78	STU 104	2	11-49 cm bgs	1	Flake w/Cortex 11-15mm: Jasper		
78	STU 104	2	11-49 cm bgs	1	Fire-Cracked Rock: Untyped		
79	EU 1	1	0-25 cm bgs	1	Brick, Fragment: Unidentified, Unglazed		
79	EU 1	1	0-25 cm bgs	1	Cut Common Nail: Fragment		1805-2000
79	EU 1	1	0-25 cm bgs	1	Window Glass: All Thicknesses		
79	EU 1	1	0-25 cm bgs	1	Unidentified Bottle Fragment: Clear		
80	EU 1	Fea 1, Lyr I, Lvl 1	25-35 cm bgs	1	Other: Unspecified	C14 Sample	
80	EU 1	Fea 1, Lyr I, Lvl 1	25-35 cm bgs	4	Unidentified Prehistoric Ware: Unidentified		
81	EU 1	Fea 1, Lyr I, Lvl 2	35-45 cm bgs	1	Other: Unspecified	C14 Sample	
82	EU 1	Fea 1, Lyr I, Lvl 3	45-51 cm bgs	2	Unidentified Prehistoric Ware: Unidentified	Burnt (?)	
83	EU 1	Fea 1, Lyr II	51-61 cm bgs	1	Flotation: Heavy Fraction		
83	EU 1	Fea 1, Lyr II	51-61 cm bgs	1	Flotation: Light Fraction		
				Total:	234		

Appendix II:  
Personnel Qualifications



**ELISABETH LAVIGNE**

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(610) 436-8468 (fax)  
elavigne@johnmilnerassociates.com

**EDUCATION**

M.A.	Boston University, MA	Geoarcheology	2009
B.A.	Wheaton College, IL	Archeology	2004

**EXPERIENCE PROFILE**

Elisabeth LaVigne, RPA serves JMA as a Project Geoarcheologist. She holds a Bachelor of Arts degree in Archeology from Wheaton College, IL, and a Master of Arts degree in Geoarcheology from Boston University where she specialized in micromorphology. Her training includes GIS, quantitative geomorphology, sedimentology, geochemistry, and paleoethnobotany. Before coming to JMA, she worked with the Monadnock Archeology Consulting and the State Conservation and Rescue Archeology Program in NH as a lab and field technician. She also has excavated at Gault, TX; Ashkelon, Israel; and Pompeii, Italy, and conducted sediment sample analysis from the Maya site of K'axob in Belize. Since joining JMA, she has been involved in archeological survey, deep testing and trenching projects, and topographic surveying within the Mid-Atlantic, primarily in Pennsylvania and Delaware. Elisabeth also has extensive experience with geographic information systems in archeological contexts. She has worked on numerous geospatial projects for JMA, creating and populating cultural resource geodatabases, modeling viewsheds, georeferencing historic maps, recreating historic survey data, creating archaeological survey maps, and processing field data.

**LICENSES/CERTIFICATIONS/TRAINING**

Registered Professional Archeologist since 2011  
Section 106 Review Process workshop (Chester County Historical Society Cultural Center - 2011)  
OSHA 40 Hour HAZWOPER (2011; updated)  
OSHA 8 Hour Training for Supervisors (2011)  
OSHA Excavation Safety training (2011)  
OSHA Confined Spaces Safety training (2011)  
UNH Cooperative Extension – ArcGIS 9.3 (2010)

**SOFTWARE PROFICIENCIES**

ESRI ArcGIS 9.0 – 10  
Golden Software's SURFER  
TDS Survey Works Foresight DXM  
TDS Survey Works Survey Pro  
Trimble Pathfinder Office  
Microsoft Office Program Suite

**PROFESSIONAL AFFILIATIONS**

Registry of Professional Archaeologists

**PROJECT EXPERIENCE** (John Milner Associates, Inc.)

- 2012-2013 A Phase I archeological survey and GIS-based investigation at Red Lion Dike, New Castle Delaware undertaken in order to determine how the dike was built and changed over time. A prehistoric site was also located during the survey.
- 2012 Phase I archeological survey at Sandy Hook, NJ for a proposed biking path.
- 2012 Phase I archeological survey at the Hopewell Furnace National Historic. Evidence for a historic road for the furnace was located during the survey.
- 2012 Phase I archeological survey for Eastern University, Radnor, PA.
- 2012 Phase I and II archeological survey at the historic Dover Green, Delaware which identified the likely location of a historic prison and buried living surfaces.
- 2012 Archeological Investigation at West Shipyard, Philadelphia, PA. Trenching and archeological excavation were utilized to investigate the remains of a 17<sup>th</sup> century shipyard.
- 2012 Phase I archeological survey of field near Sunset Lake, Delaware. Participated in monitoring of metal detection survey, pedestrian survey, and performed historical, GIS-based investigation through the use of historic maps, road plans, and aerials.
- 2012 GIS-based investigation of the French Mill complex area in East Pikeland, PA, using historic aerials, maps, and road plans. Subsequent geomorphological investigations of the mill race, the possible location of historic races, and mill locations.
- 2012 Investigation of the Battle at Cooch's Bridge, Delaware. Participated in monitoring of metal detection survey and performed historical, GIS-based investigation through the use of historic maps, road plans, and aerials.
- 2012 Phase Ib archeological survey at Gettysburg, Pennsylvania. Tested previously identified GPR anomalies and metal detection artifact clusters.
- 2012 Phase I Archeological Investigation and Phase II Archeological evaluation at a wastewater facility in Sussex County, Delaware.
- 2011-2012 Phase II Geomorphic assessment, Cobb's Creek Water Reservoir Project, Cumberland County, VA, which included deep testing, trenching, and monitoring of engineering borings; Phase II archeological survey; topographic survey; and GIS-based viewshed analysis.
- 2011-2012 Fort Christina investigation, Wilmington, DE. Utilized GIS to overlay historic maps in order to locate where the fort may have once been located. Volunteered to assist with the GPR investigation and topography survey at possible location of Fort Christina.
- 2011 Phase I archeological survey for the proposed PEMA Headquarters in Harrisburg, PA.
- 2011 Phase I Geomorphic Assessment, Cobb's Creek Water Reservoir Project, Cumberland County, VA. Assessment conducted through deep testing with hand-operated Eijkelkamp Edelman augers. Located two different buried paleosols with archeological potential within the floodplain project area.
- 2011 Topographic survey at Old Brick Church, Dover, Delaware
- 2011 Archeological survey at the Dutch House undertaken to investigate sub-surface anomalies detected through a GPR investigation
- 2011 Topographic survey at the Allee House, Bombay Hook National Wildlife Refuge, Delaware.
- 2010-2011 NHPA Section 110 Compliance, Cultural resources Investigations, U.S. Army Corps of Engineers American Recovery & Reinvestment Act 2009. 17 Districts of the U.S Army Corps of Engineers. Geodatabase population of cultural resource locations and attributes.

- 2010 Geomorphologic Assessment, Virginia Avenue Tunnel Railroad Project for the CSX Transportation, Inc. National Gateway Initiative, Washington, District of Columbia. Assessment conducted through use of a geoprobe to locate potential buried landscapes.
- 2010 Geomorphologic Assessment, U.S. Wildlife Refuge – Mason Neck. Soil cores taken and analyzed to locate potential buried prehistoric landscapes.
- 2010 Historic Structure Integrity in the Barren Lake study area. Georeferenced historic maps to determine where historic structures may still be preserved for the Army Corps of Engineers.

**PROJECT EXPERIENCE** (other/previous)

- 2010 Ground Penetrating Radar and coring project in and around the wetland areas at the Paleoindian Potter Site, Randolph, NH.
- 2010 Phase Ib/ III Archeological Survey and Geoarcheological Evaluation at the Tenant Swamp Paleoindian site, Keene, NH. Worked as field technician and assisted geomorphologist in the augering and recording of off-site stratigraphy to determine past geomorphic processes and their relation to the site. (Monadnock Archeology Consulting)
- 2010 Phase I Archeological Surveys in Concord, Effingham, Pembroke, and Newbury, NH. (Monadnock Archeology Consulting)
- 2010 Rescue/Phase I Archeological Survey which located Paleoindian artifacts in Jefferson, NH.
- 2010 Excavation and paleomagnetism core retrieval within Archaic and Late Paleoindian levels at Gault, TX.
- 2010 Lab technician for the NH State Conservation and Rescue Archeology Program. Cleaned, identified, and catalogued artifacts in the state archeology lab.
- 2008-2009 Micromorphological Analysis of sediments from the Maya site of K'axob in Belize. Found evidence for anthropological activity, past change in water flow direction, and geochemical changes within the soil due to a possible number of causes.
- 2008 Leon Levy Expedition, Ashkelon, Israel. Participated in the excavation of Bronze and Iron Age levels and the geoarcheological evaluation of possible Iron Age Harbor at Ashkelon. Assisted geoarcheologist to determine the absence of proposed harbor through the use of bucket augering and sediment analysis.
- 2008 Rowley Marsh Project: Investigated the formation and deterioration of marsh surface ponds through surveying, the analysis of vibracores, and the use of GIS to determine past pond/channel locations and depositional history.



**TIMOTHY J. MANCL**

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tmancl@johnmilnerassociates.com (e-mail)

**EDUCATION**

M.S.	Michigan Technological University	Industrial Archaeology	2003
M.A.	University of Delaware	American History	2001
B.A.	Western Connecticut State University	American Studies	1998

**PROFESSIONAL CERTIFICATIONS AND SPECIALIZED TRAINING**

OSHA 40-hour Hazardous Waste Operations Certification since 2004.  
Registered Professional Archeologist since 2003.

**EXPERIENCE PROFILE**

Timothy J. Mancl is a graduate of Western Connecticut State University, and holds Master’s degrees in American History from the Hagley Program at the University of Delaware and in Industrial Archeology from Michigan Technological University. Mr. Mancl specializes in the history and archeology of nineteenth century American industrial development and processes from New England to the Mid-Atlantic. He has researched and conducted archeological investigations of prehistoric, and urban, industrial, and rural historic-period sites in Connecticut, Delaware, Kentucky, Massachusetts, Michigan, New York, and Pennsylvania, and has conducted state-level documentation of engineering structures in Connecticut and Maryland.

**KEY PROJECTS**

- 2012 Project Archeologist, Archeological Investigations on a portion of the Dover Green., Kent County, Delaware. Delaware Department of Historical and Cultural Affairs.
- 2012 Project Archeologist, Phase I Archeological Survey and Phase II Archeological Evaluation of the proposed Phase 2A Expansion at the Inland Bays Regional Wastewater Treatment Facility, Sussex County, Delaware. Whitman, Requardt and Associates, LLP, and the Sussex County Engineering Department.
- 2011 Project Archeologist, Archeological Investigations at the Old Brick Church, Dover, Kent County, Delaware. Delaware Department of Historical and Cultural Affairs.
- 2011 Project Archeologist, Booklet on the Wilmington, Delaware Water Works and Documentation of the Brandywine Filtration Plant. City of Wilmington, Delaware.
- 2011 Project Archeologist, Archeological Investigations at the Dutch House, New Castle, Delaware. New Castle Historical Society.
- 2010 Project Archeologist, Archeological Evaluation of Industrial Sites at Birch Hill Dam, Worcester County, Massachusetts. Army Corps of Engineers. New England District.
- 2010 Project Archeologist, Archeological Inventory and Assessment of the Sayers Lake Shoreline, Centre County, Pennsylvania. Army Corps of Engineers. Baltimore District.

- 2009 Project Archeologist, Archeological Inventory and Assessment of the Barren River Lake Shoreline, Allen and Barren Counties, Kentucky. Army Corps of Engineers. Louisville District.
- 2009 Project Archeologist, Phase II Archeological Evaluation of the Button Site, and the Harmons Hill Road Site, Angola Neck Sanitary Sewer District, Sussex County, Delaware. Whitman, Requardt and Associates, LLP, and the Sussex County Engineering Department.
- 2008 Project Archeologist, Phase II Archeological Evaluation of the Delaware Airpark Wetland Mitigation Area, Blackiston, Kent County, Delaware. The Federal Aviation Administration, the Delaware Department of Transportation, and the Delaware River and Bay Authority.
- 2008 Project Archeologist, Phase III Archeological Data Recovery of Dodd-Moore Site, Cheswold, Kent County, Delaware. The Federal Aviation Administration, the Delaware Department of Transportation, and the Delaware River and Bay Authority.
- 2007 Principal Investigator, Burial Recovery and Cemetery Delineation within the Creekside Development, Millville, Baltimore Hundred, Sussex County, Delaware. Caldera Properties.
- 2006-2007 Principal Investigator, Phase I and II Archaeological Testing of the Joseph Bancroft & Sons Kentmere Mills, Wilmington, New Castle County, Delaware in connection with the Rockford Falls Development Project. O'Neill Properties Group.
- 2004-2008 Principal Investigator, fieldworker, and editor, Phase III Mitigation of the Laban Rogers House Site, the Herring Creek Site, and the Olla White Bay Site, and delineation of the Derrickson Cemetery, Baltimore County, Delaware. Carl M. Freeman Companies.
- 2004 Assistant Field Director, Phase III Data Recovery at the Cruttenden Carriage Works Site, New Haven, Connecticut. Fitzgerald & Halliday, Inc., and the Connecticut Department of Transportation.
- 2002 Field Director, Archaeological Investigations at the Carp River Forge, Negaunee, Michigan. The Michigan Iron Industry Museum/Michigan Department of History, Arts, and Libraries.

#### **SUMMARY OF PROFESSIONAL ACTIVITIES**

Mr. Mancl is the author or co-author of over forty (40) cultural resource reports, and four (4) cultural resource studies. He has served as President of the Archaeological Society of Delaware (2006 to 2011), as a Director for the Society for Industrial Archaeology (2008-2011), and as a board member of the New Castle Historical Society (2009-2012). He currently serves on the Nominations Committee for the Society for Industrial Archaeology (2011-2014).



**WADE P. CATTS**

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**EDUCATION**

M.A.	University of Delaware	American History	1988
B.A.	University of Delaware	History/Anthropology	1981

**PROFESSIONAL CERTIFICATIONS AND SPECIALIZED TRAINING**

- 2003 Section 106: Principles and Practice Workshop
- 2003 Integrating Section 106 and the National Environmental Policy Act Workshop
- 1999 Registered Professional Archeologist
- 1998 OSHA 40-hour Hazardous Waste Operations Training

**MEMBERSHIPS AND AFFILIATIONS**

- President Elect, American Cultural Resources Association, 2011-2013
- Member, Delaware Military Heritage Education Foundation, 2012-2014
- Member, Middle Atlantic Archaeological Conference
- Member, Society for Historical Archaeology/Council for Underwater Archaeology
- Member, Council for Northeast Historical Archaeology (Board Member 1999-2001)
- Member, Society for Army Historical Research (UK)
- Member, Company of Military Historians
- Member, Delaware Academy of Science (past President)
- Member, New Castle County Historic Review Board, 1996-2009

**HONORS/ASSISTANTSHIPS**

- 1990 Graduate Assistant, Department of History, University of Delaware
- 1986 Member, Rotary Group Study Exchange Trip to Southeastern England, District 763
- 1981 Phi Alpha Theta, National History Honor Society

**EXPERIENCE PROFILE**

Wade P. Catts is a graduate of the University of Delaware, and he also holds a Master’s degree in American History from the same institution. Prior to joining JMA (John Milner Associates, Inc.) in 1993, Mr. Catts was employed for over a decade as a research historian and archeologist at a University of Delaware-based consulting division that focused its research efforts on the history and prehistory of the Delmarva Peninsula. Since joining JMA, Mr. Catts’ research efforts have included historical and

archeological data recovery investigations at the New Geneva Pottery Waster site in Fayette County, Pennsylvania, the eighteenth-century Ashcomb's Quarter site in Solomons Island, Maryland, Beverwyck Plantation in Morris County, New Jersey, New Castle Courthouse Museum in New Castle, Delaware, and Raritan Landing near New Brunswick, New Jersey. He has conducted Phase II evaluation investigations at numerous historic sites in Pennsylvania, Maryland, New Jersey, Delaware, and Virginia, and Phase I surveys throughout the Middle Atlantic region. Further, he has conducted historical background and archival research for a broad range of archeological and historical projects.

Mr. Catts' Revolutionary War historical and archeological experience spans several states. In Pennsylvania he has completed projects at Valley Forge and at the site of Camp Security, a British POW camp near York. In New Jersey he was involved in the Beverwyck Plantation project in Morris County – where Washington, his officers, and the French ambassadors were entertained – and excavations at Raritan Landing, where British forces cantoned during the winter-spring of 1777. He directed an ABPP-funded survey of the battlefield at Princeton, and managed the JMA team that completed an ABPP-funded archeological survey and draft National Register nomination for the Short Hills battlefield near Plainfield, New Jersey. In New York he managed the field component of an ABPP-funded project at Fish Creek, a portion of the Siege of Saratoga. Mr. Catts is a Registered Professional Archeologist (RPA), a member of national and regional professional archaeological organizations, and a member of both the Company of Military Historians (US) and the Society for Army Historical Research (UK). With the assistance of a McKinstry Award from the Delaware Heritage Commission, he is completing a book on the history and archeology of the Battle of Cooch's Bridge, Delaware's only Revolutionary War engagement.

Mr. Catts is a recognized historian and historical archeologist with research interests in the history of farmsteads and agricultural landscapes, urban development, military history and archeology, environmental history, African-American studies, and Middle Atlantic regional history and historic preservation.

#### **REPRESENTATIVE PROJECTS**

- 2012 Project Manager for the archeological mitigation planning for the site of the new Museum of the American Revolution, 3<sup>rd</sup> and Chestnut Streets, Philadelphia. The American Revolution Center.
- 2012 Principal in Charge of Phase I Archeological Survey of the proposed construction site of a water retention basin and dewatering system associated with the Sunset Lake project. New Castle Conservation District.
- 2012 Principal in Charge of geoarcheological and archeological survey of the site of seventeenth-century Fort Casimir, City of New Castle, Delaware. Delaware Division of Historical and Cultural Affairs.
- 2012 Project Manager for the terminal exhibits at the Delaware Airpark, Cheswold, Delaware. A series of interpretative panels relating the story to the visiting public of the Lenape Indians, the history of the village of Cheswold, the history and archeology of the Airpark, and the story of Flloyd Durham, the founder of the airpark. Delaware River and Bay Authority.
- 2012 Principal in Charge of historical, geoarcheological, and archeological investigations at the Cooch's Bridge Battlefield in New Castle County, Delaware. Delaware Division of Historical and Cultural Affairs.
- 2012 Principal in charge of historical, geoarcheological, and archeological investigations at the site of the Continental Powder Works and Gun Factory on French Creek, Chester County, Pennsylvania. An American Battlefield Protection Program (ABPP) grant. East Pikeland Township Historical Commission.

- 2011 Principal in charge of archeological investigations of the New Castle Green, a field project completed in advance of storm water management installation to the rear of the Arsenal Building. Delaware Division of Historical and Cultural Affairs.
- 2011 Managed, conducted historical research, directed archeological investigations, and co-authored the American Battlefield Protection Program (ABPP) project at the Short Hills Battlefield, New Jersey. Metuchen-Edison Historical Society.
- 2011 Managed, conducted historical research and archeological investigation, and co-authored a study of the Continental Powder Works site on French Creek, Pennsylvania. East Pikeland Township Historical Commission, Chester County, Pennsylvania.
- 2011 Project manager for the development of a traveling exhibit designed to tell the story of the archeology and history of Delaware farming. The Delaware River and Bay Authority.
- 2010 Managed archeological investigations and oversaw historical research associated with the study of an unmarked historic-period cemetery beneath River Road, Oak Orchard, Sussex County, Delaware. Subsequent historical research identified the site as a family cemetery on a tract called Batchelor's Lott. Sussex County Engineering Department.
- 2010 Managed, conducted archeological investigations, and co-authored the Fish Creek Cultural Landscape Study and archeological verification of a purported Revolutionary War earthwork. Schulyerville, New York. Funded by the American Battlefield Protection Program. Saratoga Preserving Land and Nature (PLAN).
- 2010 Managed, conducted historical and archeological research, and co-authored the Princeton Battlefield mapping project, funded by the American Battlefield Protection Program (ABPP). Princeton, New Jersey. Princeton Battlefield Society.
- 2008 Served as Principal-in-Charge of archeological and historical Phase I investigations of the Hershey Run project area, associated with the former Koppers Newport Superfund Site, Delaware. Langan Environmental.
- 2008 Directed archeological and historical investigations of three root cellars on the campus of Moravian College, Bethlehem, Pennsylvania. Moravian College.
- 2007 Managed the archeological and historical Phase I and II investigations of the former Koppers Newport Superfund Site, Delaware. The site area contains numerous prehistoric and historic archeological sites, including two seventeenth-century settlement sites. Langan Environmental.
- 2006 Directed the JMA team that developed a feasibility study for the Dennis Farm Charitable Land Trust, Susquehanna County, Pennsylvania, a property owned by the descendants of an African-American family for over 200 years. Dennis Farm Charitable Land Trust and Endless Mountains Heritage Region, Inc.
- 2006 Managed archeological investigations and historical research of the former New Castle County Almshouse, part of Section 106 requirements associated with the improvements of I-295. Rummel Klepper & Kahl, L.L.P.
- 2005 Managed data recovery investigations, including field investigations and historical research, at 1803 and 1805 North Market Street, two National Register-listed historic properties in Wilmington, Delaware. Wilmington Senior Center.
- 2005 Conducted historical research and field investigations at the location of a Revolutionary War musketry range at Valley Forge National Historical Park. Boyles, Smyth Inc.

- 2004 Co-authored the National Register of Historic Places nomination for the Beverwyck Plantation archeological site, Morris County, New Jersey. The site was listed to the National Register in 2004.
- 2003 Managed archeological investigations, including historical research and report authorship, at Old New Castle Courthouse, New Castle Delaware, as part of renovation/restoration activities. Delaware State Museums.
- 2003 Managed historical documentation compilation, including GIS data inventory, of the Indian River Bridge Project, Sussex County, Delaware. Rummel, Klepper & Kahl, LLP, for Delaware Department of Transportation.
- 2002-2003 Directed Data Recovery Investigations at two historic sites as part of the multi-consultant team at Raritan Landing Archeological District, Route 18 Extension Project, Middlesex County, New Jersey. New Jersey Department of Transportation.
- 2001-2003 Conducted historical research regarding British military occupation and copper processing at Raritan Landing as part of the Route 18 Extension Project, Middlesex County, New Jersey. New Jersey Department of Transportation.
- 2002 Conducted Historical Research for Historic Structure Report of United States Marine Hospital National Historic Landmark, Louisville, KY. City of Louisville, Louisville Development Authority.
- 2002 Directed Phase I and Phase II archeological and historical research at the proposed site of the Delaware National Guard Readiness Center, Smyrna, Delaware. Delaware National Guard.
- 2002 Directed archeological overview and assessment of Hopewell Furnace National Historic Park, Birdsboro, PA. National Park Service.
- 2002 Conducted historical research and assisted in the preparation of a Historic Structures Report for the U.S. Marine Hospital, National Historic Landmark. Louisville, KY.
- 2001 Conducted historical and archeological investigations of five eighteenth and nineteenth century historic sites of Hopewell Furnace National Historic Park, Birdsboro, PA. National Park Service.
- 2001 Co-directed data recovery investigations and conducted historical research of the Raritan Landing Project, New Brunswick, NJ. New Jersey Department of Transportation.
- 2001 Conducted historical research and assisted in developing historic commemorative contexts for seven national military parks (Chickamauga/Chattanooga, Gettysburg, Shiloh, Vicksburg, Antietam, Valley Forge, Minute Man). National Park Service.
- 2001 Conducted historical research and directed Phase I archeological investigations at Hopewell Furnace National Park. National Park Service.
- 2001 Conducted historical research and co-directed data recovery investigations for the eighteenth-century Beverwyck Plantation site, Morris County, New Jersey. New Jersey Department of Transportation.
- 2000 Directed archeological investigations at Block III, John Dickinson Plantation, Delaware. Delaware State Museums.

- 2000 Conducted historical research and assisted in preparing historic contexts for Valley Forge National Historic Park. National Park Service.
- 2000 Conducted historical research and Phase I archeological survey at site of Camp Security/Camp Indulgence, a British Revolutionary War Prisoner-of-War encampment, York County, Pennsylvania. Pasch Construction.
- 2000 Directed historical research and prepared historic context for the Blue Ball Properties Master Plan, New Castle County, Delaware. Wallace, Roberts & Todd.
- 2000 Directed historical research and prepared historic context for Phase IA cultural resources investigation for a proposed parking facility at the site of the eighteenth and nineteenth century Second Street Market, Lower Market Street Historic District, Wilmington, Delaware. Wilmington Renaissance Corporation.
- 2000 Directed historical research and developed historic context for the Triangle Woods Archeological Site, New Castle County, Delaware. Delaware Department of Natural Resources and Environmental Control. The site was the location of an early twentieth century gypsy camp.
- 1999 Directed and conducted historical research on the AstraZeneca Triangle Property, New Castle County, Delaware. AstraZeneca Pharmaceutical, Inc.
- 1999 Conducted historical research on the North Pownal Tannery, North Pownal, Vermont. Stone and Webster.
- 1999 Directed historical research of the Lincoln Cemetery, an African-American burial ground, Gettysburg, Adams County, Pennsylvania. Borough of Gettysburg.
- 1998 Conducted historical research for the Jacob M. Zook House, Exton Square Mall expansion, Chester County, Pennsylvania. The Rouse Company.
- 1998 Conducted historical research for Buena Vista Conference Center, former home of Senator John M. Clayton, New Castle County, Delaware. Delaware State Museums.
- 1998 Conducted historical research for the Diggs-Monroe and Culp-Mundorff sites, Gettysburg, Pennsylvania. The Borough of Gettysburg.
- 1998 Directed historical research and prepared historic context for the Joseph Carrell, Jr. Farmstead site, Street Road Commercial Development Project, Bucks County, Pennsylvania. Newman Development Group of Warrington, L.L.P.
- 1997 Prepared historical context and conducted historical research for Governors Island, New York Harbor. General Services Administration.
- 1997 Prepared historical context and conducted historical research for the Thonsville and Gabel Park Woods Sites, Lancaster Township, Lancaster County, Pennsylvania. Pennsylvania Department of Transportation, District 8-0.
- 1997 Prepared historical context and conducted historical research for Phase IA cultural resources investigation of sediment removal areas in the Christina River, Newport, New Castle County, Delaware. DuPont Environmental Remediation Services.

- 1997 Conducted historical research for Phase I archeological survey of the proposed Andorra Glen Apartment Complex, Whitemarsh Township, Montgomery County, Pennsylvania. The Andorra Group.
- 1996 Conducted historical research for Phase IB archeological survey of the former Koppers Company, Inc. Property, Newport, New Castle County, Delaware. Beazer East and DuPont Specialty Chemicals in association with Woodward-Clyde Consultants, Inc.
- 1995 Conducted historical research for Phase II evaluation of the Motts Run Water Filtration Plant Site, Spotsylvania County, Virginia. Hayes, Seay, Mattern & Mattern, Inc.
- 1994 Conducted historical research for Phase I archeological investigations at the Pennell House Site, Delaware County, Pennsylvania. Wawa Dairies, Inc.
- 1993 Prepared historical context and conducted historical research for data recovery excavations at the New Geneva Pottery Waster Dump Site, Fayette County, Pennsylvania. Pittsburgh District, U.S. Army Corps of Engineers.
- 1992 Prepared historical context and conducted historical research of the Mermaid Tavern Blacksmith and Wheelwright Shops, New Castle Co., Delaware, Delmarva Department of Transportation.
- 1991 Conducted extensive historical research for community of Christiana Bridge and the Eagle Run Tenant House Site and the William Patterson Mansion House and Boat Dock, New Castle County, Delaware. Delaware Department of Transportation.
- 1990 Prepared historical context and conducted historical documentary research of the Thomas Williams Site (7NC-D-130), an African American household, New Castle County, Delaware. Delaware Department of Transportation.
- 1990 Prepared historical context and conducted historical research for Delaware's management plan for historical archeological resources. University of Delaware and Delaware State Historical Preservation office.
- 1989 Prepared historic context and conducted extensive historical research for the southeast Sussex Corridor cultural resources survey, Sussex County, Delaware. Delaware Department of Transportation.

#### **SELECTED PUBLICATIONS**

- Forthcoming Archaeology, Computer Technology and the Battle of Princeton as a Cross-Cultural, Trans-Atlantic Encounter. Springer Press.
- 2007 "Newark and Newarkers in the Era of the American Revolution", in *Histories of Newark, 1758-2008*, edited by Deborah Haskell, pgs. 18-29 (Wallflower Press, Newark, DE).
- 2001-2002 Research Questions for the Archaeology of Rural Places: Experiences from the Middle Atlantic. *Northeast Historical Archaeology* 30-31:143-154.
- 1999 "Down on the Farm": Questions, Directions and Interpretations of the Archeology of Delaware Agriculture and Farm Life, 1800-1950 (with LuAnn DeCunzo). *Bulletin of the Archaeological Society of Delaware* 36:19-27.
- 1993 From "White Man's Garbage" to the Study of Material Culture: A review of Historical Archaeology in Delaware (with Lu Ann De Cunzo). *Delaware History* 25(3):174-199.

- 1993 Small Wonder, There's Diversity! Current Historical Archaeology in Delaware (with David Grettler). *Bulletin of the Archaeological Society of Delaware* 30.
- 1993 "Entertained . . . at ye Tavern Close By." Historical Archaeological Inquiry at Thomas Ogle's Tavern, Ogetown (with Angela Hoeseth and Ellis C. Coleman). *Bulletin of the Archaeological Society of Delaware* 30:5-16.
- 1991 A Report of the Archaeological Investigations at the House of Thomas Cuff, A Free Black Laborer, 108 Cannon Street, Chestertown, Kent County, Maryland (with Doug McCall). *North American Archaeologist* 12(2):155-181.
- 1990 Building a Framework for Research: Delaware's Management Plan for Historical Archaeological Resources (with LuAnn DeCunzo). *Northeast Historical Archaeology* 19:1-49.
- 1988 *Slaves, Free Blacks, and French Negroes: An Archaeological and Historical Perspective on Wilmington's Forgotten Folk*. M.A. thesis, Department of History, University of Delaware, Newark.
- 1986 Soil Chemistry and Historic Archaeological Site Activity Areas: A Test Case from Northern Delaware (with Jay F. Custer, Ellis C. Colman, and Kevin W. Cunningham). *Historical Archaeology* 20(2):89-94.

#### **SELECTED PRESENTED PAPERS**

- 2011 Archaeology, Computer Technology and The Battle Of Princeton As A Cross-Cultural, Trans-Atlantic Encounter. Presenter and Co-author a paper presented at the International Committee on Archaeological Heritage Management (ICAHM) at the International Council on Monuments and Site (ICOMOS) annual meeting, Paris, France.
- 2011 "We Have Allowed the Rebels too much Time in Which to Become Soldiers": Deciphering Revolutionary War American Military Formations through Historical Archeology. Paper presented at the Annual Meeting of the Council for Northeast Historical Archeology, Utica, New York.
- 2010 Family, Farm, and Freedom: The Legacy of the Dennis Farm, Susquehanna County, Pennsylvania. Paper presented at the Pennsylvania Byways Conference, Harrisburg, Pennsylvania.
- 2010 "Built At Ye Back Side Of Ye Towne": Archeology At The New Castle Court House Museum, New Castle, Delaware. Paper presented at the annual meeting of the Society for Historical Archaeology, Amelia Island, Florida.
- 2008 The Perambulations of Lieutenant Nutt's Button: Camp Security and Camp Indulgence, York County, Pennsylvania. Paper presented at the Annual Meeting of the Middle Atlantic Archeological Society, Ocean City, MD.
- 2008 Quakers in the Philadelphia Hinterland: The Archaeology of Public Spaces and Domestic Places. Co-authored with Rebecca Yamin. Paper presented at the annual meeting of the Society for Historical Archeology, Albuquerque, New Mexico.
- 2007 From the Mountains to the Sea: Using the Delaware River Watershed as a Model for Regional Farmstead Archeology. Paper presented at the annual meeting of the Society for Historical Archeology, Williamsburg, Virginia.

- 2007 Give Them As Much Trouble As You Possibly Can: The Battle of Cooch's Bridge, September 3<sup>rd</sup>, 1777. Paper presented to the Washington DC Revolutionary War Roundtable.
- 2007 "Make Sure You Aim, For One Shot Well-Pointed is Worth a Dozen Thrown Away: Archeological Evidence of a Musketry Range at Valley Forge National Historical Park, Pennsylvania, USA. Paper Presented at the Council for Northeast Historical Archeology Annual Meeting, Buffalo, NY.
- 2006 "A System of Easy Manuvers..." Archeological Evidence of a Musketry Range at Valley Forge National Historical Park, Pennsylvania, USA. Paper presented at the 4<sup>th</sup> Annual Fields of Conflict Conference, Leeds, UK.
- 2006 A Spirited Little Affair: History and Archeological Potential of the Cooch's Bridge Battlefield, New Castle County, Delaware. Paper presented at the Society of Historical Archeology Annual Meeting, Sacramento, CA.
- 2005 Tradition, History and the Archeological Potential of the Cooch's Bridge Battlefield, New Castle County, Delaware. Paper presented at the annual meeting of the Middle Atlantic Archeological Conference, Rehoboth Beach, DE.
- 2005 Wintering on the Raritan: The Private Correspondence of a British Officer. Paper presented at the annual meeting of the Council for Northeast Historical Archeology, Trenton, NJ.
- 2000 "We Live in a World of Company": Archeology and History of Beverwyck Plantation, Morris County, New Jersey during the American Revolution. Paper presented at the annual meeting of the Society for Historical Archaeology, Mobile, AL.
- 2000 "The Keep the Banks, Dams, and Sluices in Repair...": An Archaeological Study of Marsh Architecture. Paper presented at the annual meeting of the Society for Historical Archaeology, Quebec, Canada.

#### **SUMMARY OF PROFESSIONAL ACTIVITIES**

Mr. Catts is author or co-author of over sixty-five (65) cultural resources reports, fourteen (15) scholarly articles and monographs, five (5) book reviews, thirty-one (31) papers presented at professional meetings, six (6) symposia organized at professional meetings, and one (1) professional conference organized.