



Phase I Archaeological Survey

Millsboro Bypass Project, Areas 3 and 4
Sussex County, Delaware

Parent Agreement #1926F, Task 2

Prepared for:



Delaware Department of Transportation
P.O. Box 778
Dover, Delaware 19903

Prepared by:

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April 2022

ABSTRACT

A.D. Marble conducted a Phase I survey for the Millsboro Bypass on behalf of the Delaware Department of Transportation (DelDOT). The archaeological Area of Potential Effects (APE) consists of the proposed road corridor in test areas the DelDOT cultural resource professionals (CRPs) designated Area 3 and Area 4. The APE encompasses an approximately 14.5-acre (5.9-ha) area in an upland woodland setting at the north end of Millsboro Pond.

DelDOT generated a testing strategy that divided the 7.5-acre (3.0-hectare) Area 3 into two test areas. Its western portion measures 4.5 acres (1.8 ha) and underwent shovel test pit (STP) survey via 50-foot (15.2-m) STP intervals, and its eastern portion measures 3.0 acres (1.2 ha) and underwent survey via 25-foot (7.6-m) STP intervals. The testing strategy divided the 7.0-acre (2.8-ha) Area 4 into three test areas. The western portion measures 2.5 acres (1.0 ha) and underwent survey via 25-foot (7.6-m) STP intervals. The middle portion measures 2.0 acres (0.8 ha) and underwent survey via 50-foot (15.2-m) STP intervals. The eastern portion measures 2.5 acres (1.0 ha) and underwent survey via 25-foot (7.6-m) STP intervals. A.D. Marble excavated 257 STPs in Area 3, and 348 STPs in Area 4.

In Area 3, the field team recovered 12 Native American (Mockley type) sherds from STP 201; and eight historic-era mortar fragments, three brick fragments, and one complete brick (handmade) from STP 214. Both STPs are located in the southeast corner of Area 3. A.D. Marble laid in four radial STPs at 8.0-foot (2.4-m) intervals around STP 201, and recovered no additional cultural materials. They then laid in and excavated two adjacent 1-meter-by-1-meter test units (TUs) at the STP 201 locus, and recovered an additional 94 Mockley sherds (53 sherds in TU 1 and 41 sherds in TU 2). The evidence indicates an early Middle Woodland occupation, which has been designated the Millsboro Pond – Area 3 Site (7S-F-176).

In Area 4, the field team recovered two Native American (Killens) sherds from STP 38, which is located in the southwest corner of the test area. A.D. Marble laid in and excavated four radial STPs at 8.0-foot (2.4-m) intervals around STP 38, and recovered no additional cultural materials. They then laid in and excavated two adjacent 1-meter-by-1-meter TUs at the STP 38 locus, and recovered an additional seven Killens sherds (six in TU 1, and one in TU 2), as well as 34 debitage (15 in TU 1, and 19 in TU 2) and a hafted biface identified as a Stanly type (in TU 1). The Stanly point and 31 of 32 debitage were recovered stratigraphically lower than the Killens sherds, which suggests a Middle Archaic occupation underlies a Woodland II occupation. This location has been designated the Millsboro Pond – Area 4 Site (7S-F-177).

It is A.D. Marble's opinion that both sites are potentially significant archaeological sites, and that the project should avoid or minimize its impacts to them. If the project cannot avoid the sites, Phase II evaluation of both sites should take place to assess their eligibility to be listed in the National Register of Historic Places (NRHP). No potentially significant archaeological deposits were encountered elsewhere in the APE.

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1.0 Introduction

1.0 INTRODUCTION

A.D. Marble conducted a Phase I survey for the Millsboro Bypass project on behalf of the Delaware Department of Transportation (DelDOT) and Federal Highway Administration (FHWA; Figure 1). FHWA and DelDOT are continuing efforts with respect to proposed improvements for the Millsboro-South Area of the US 113 North/South Study in Sussex County, Delaware. The Millsboro-South Area project is a component of the overall US 113 North/South Study to identify an alignment for a continuous limited access roadway from the Maryland/Delaware state line north to SR 1, north of the City of Milford. The current project includes a two-lane connector road between US 113 and State Route (SR) 24 north of Millsboro to improve safety and reduce congestion through town. The new bypass will also include a grade-separated intersection at the US 113/SR 20 intersection. The Undertaking will be federally funded, and therefore DelDOT/FHWA must comply with Section 106 of the National Historic Preservation Act of 1966, as amended, and the implementing regulations outlined in 36 CFR Part 800.

The objective of the archaeological investigation was to identify archaeological resources in the archaeological Area of Potential Effects (APE; Figure 2). The APE consists of the proposed road corridor in the project areas designated by the DelDOT cultural resource professionals (CRPs) as Area 3 and Area 4. The APE encompasses an approximately 14.5-acre (5.9-ha) area. All project staging and stockpiling areas will be contained within the limits of disturbance (LOD). Current conditions of the APE consist of wooded upland settings at the north end of Millsboro Pond.

DelDOT generated a testing strategy that divided the 7.5-acre (3.0-ha) Area 3 into two test areas (see Figure 2). Its western portion measures 4.5 acres (1.8 ha) and underwent shovel test pit (STP) survey via 50-foot (15.2-m) intervals, and its eastern portion measures 3.0 acres (1.2 ha) and underwent survey via 25-foot (7.6-m) STP intervals. The testing strategy divided the 7.0-acre (2.8-ha) Area 4 into three test areas. The western portion measures 2.5 acres (1.0 ha) and underwent survey via 25-foot (7.6-m) STP intervals. The middle portion measures 2.0 acres (0.8 ha) and underwent survey via 50-foot (15.2-m) STP intervals. The eastern portion measures 2.5

acres (1.0 ha) and underwent survey via 25-foot (7.6-m) STP intervals. The fieldwork was completed in April 2021.

This Phase I investigation was performed in compliance with the Delaware State Historic Preservation Office (DE SHPO) Guidelines for Archaeological Survey in Delaware (2015). All cultural resources evaluations were conducted in accordance with Section 106 of The National Historic Preservation Act of 1966, as amended; the Procedures for the Protection of Historic and Cultural Properties set forth in 36 CFR 800, as amended; 23 CFR 771, as amended; guidance published by the Advisory Council on Historic Preservation; Sections 1(3) and 2(b) of Executive Order 11593; and the National Environmental Policy Act of 1969, as amended. A.D. Marble acknowledges Andrew Colucci, who served as field director; and Jen Falchetta, Amadeusz Zajac, and Brock Milligan, who served as field technicians. Amadeusz Zajac and Julie Cressman prepared report figures, Christine Gill served as laboratory supervisor, and Michael Lenert served as report coordinator and author. A.D. Marble extends a very sincere thanks to Sterling Street and Dan Griffith for sharing their knowledge and discussing project results, artifact identifications, and paths forward.

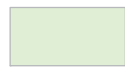
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Area of Potential Effects



Area 3



Area 4

Figure 2
Area of Potential Effects and Test Areas
Millsboro Bypass Project, Areas 3 and 4
Sussex County, Delaware

2.0 Environmental Setting

2.0 ENVIRONMENTAL SETTING

The Millsboro Bypass APE is composed of Areas 3 and 4, located at the north end of Millsboro Pond and in the Coastal/Bay Zone of the Lower Coastal Plain Physiographic Province. The Province is underlain by the Pleistocene sands and gravels of two bordering formations: the Columbia formation with its yellow and reddish brown quartz sand with gravel, and the Omar formation with its interbedded gray to dark gray quartz sand and silts (DE Geologic Society 1976). These deposits have been extensively reworked, resulting in a relatively flat and featureless landscape. Elevation in the APE ranges from approximately 20 to 30 feet above sea level. Prior to sea level rise and the damming that created Millsboro Pond, the APE was wooded upland like it is today, but additional habitable land would have been present when the water was lower. Given Native Americans have occupied the landscape for millennia, A.D. Marble concludes any signs of occupation in those lower elevation settings would likely now be under water.

The north end of Millsboro Pond branches to the northwest and northeast (see Figure 1). The northwest branch separates Areas 3 and 4, and is fed from the north by Sheep Pen Ditch and Mirey Branch. Area 3 stretches west from this branch to almost the Conrail Railroad. The northeastern branch of Millsboro Pond curves around a peninsula that is Area 4 and is fed from the north by Cow Bridge Branch. Creeks at the north end of Millsboro Pond provided water power for saw-, grist-, and bark mills in the vicinity. Millsboro Pond is actually a dammed portion of Indian Creek, which is a tidal drainage that starts below S.R. 0030 (Main Street), and extends 5.5 miles to Indian River Bay and then 7.0 miles east to the Atlantic Ocean.

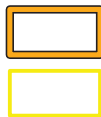
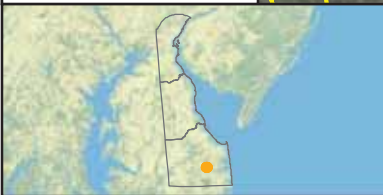
The APE is reported to contain three soils, characterized primarily as sandy and moderately to well drained (Figure 3; Web Soil Survey 2021). Three soils are present in Area 3: Fort Mott-Henlopen complex, 0 to 2 percent slopes (FhA) occurs in the southwest corner; Fort Mott-Henlopen complex, 2 to 5 percent slopes (FhB) occurs in the northwest corner and middle of the test area; and Evesboro loamy sand, 5 to 15 percent slopes (EvD) occurs in the eastern third of the area. EvD occurs along the banks of the peninsula comprising Area 4, and FhB occurs in its

Figure 3 Soils Map

Millsboro Bypass Project, Areas 3 and 4
Sussex County, Delaware

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Area of Potential Effects

Soil Boundaries

center. EvD is derived from sandy aeolian deposits and fluviomarine sediments, exhibits a sequence of loamy sands overlying sand, is excessively drained, and occurs more than 80 inches above the water table. The Fort Mott-Henlopen complex soils (FhA and FhB) are similarly derived from aeolian and fluviomarine sediments, composed of loamy sands and sandy loam, are considered well drained, and occur more than 80 inches above the water table.

In terms of hydrology, Rehoboth Bay, Indian River, and Little Assawoman Bay are the major water features of the Coastal/Bay Zone. Custer (1987:5) notes that large embayed areas with fringing barrier islands of the Baymouth Barrier Complex and tidal marshes are found in the area. Some areas, such as the head of the Indian River at Millsboro Pond, are freshwater, and much of the local area is poorly drained, but well-drained areas (like the project area) are located in well-drained uplands adjacent to the water. The landforms and drainages have considerably evolved over the last 15,000 years due to post-Pleistocene sea level rise, as the ancestral Delaware River would have been located 10 kilometers east of where it is today when sea level was 30 meters below current levels 12,000 to 15,000 years ago (Custer 1987:8-9). No estuarine settings would have existed in the project area at that time. Approximately 7,500 years ago, the Atlantic Coast is estimated to have been where the ancestral Delaware River was located, and estuarine bays would have been present east of the modern coastline. Custer (1987:12) explains how the sea level 4,000 years ago was only 6 meters below current levels, and bays were closer to where they are today, as they were beginning to establish themselves adjacent east of their current location. By 1,500 years ago, the inland bays are mostly in the modern locations.

Custer (1987:Table 2) summarized the major environmental shifts and concomitant changes in paleoecology. Generally, estuarine settings emerge, and both the estuarine and major drainage mesic (wet) conditions become more xeric (dry), and vegetation productivity increases over time. The Millsboro Bypass project area is located on the east edge of what Custer (1987:15) refers to as the Zone III: Interior Water Courses edaphic zone, which includes Indian River, Mirey Branch, Sheep Pen Ditch, and Cow Bridge Branch, the latter three of which are all located at the north end of Millsboro Pond that the APE overlooks to the south. Custer notes fringing marshes are present and some of the drainages are tidal, although there is an abundance of freshwater in the zone.

In terms of plant ecosystems, vegetation patterns in the region broadly shifted from a mosaic pattern to a zoned pattern in the early Holocene (post-10,000 years ago). Pine was dominant, with lesser amounts of hemlock, birch, and oak. After 8,000 years ago, an oak-hickory climax was present, and it was followed by a pine-oak-dominated forest after 5,000 years ago. Mast staples such as acorns increased in importance over time. Historic period vegetation has been described as oak-hickory and marsh climax vegetation. In sum, given the well-drained upland topography adjacent to the APE and proximity to streams at the head of the Indian River (today Millsboro Pond), the project area would have been an attractive landscape for human settlement in both the recent and deeper past.

3.0 Culture History and Archaeological Site Context

3.0 CULTURE HISTORY AND ARCHAEOLOGICAL SITE CONTEXT

3.1 Regional Precontact-Era Context

There are currently five accepted periods regarding the chronological sequencing of Native American cultures of the Delmarva Peninsula: Paleoindian (13,000 to 6500 B.C.), Archaic (6500 to 3000 B.C.), Woodland I (3000 B.C. to A.D. 1000), Woodland II (A.D. 1000 to 1600), and the Contact Period (A.D. 1600 to 1750). Note that precontact-era sites in the vicinity of the APE date to the Woodland I period.

Although five periods are currently accepted, recent discoveries indicate Native American groups inhabited North and South America, including the Mid-Atlantic region, prior to the appearance of the Paleoindian period (Carr 2018:219–223). For example, recent research by Lowery et al. (2010) reveals pre-Paleoindian period evidence (i.e., pre-13,000 B.C.) at the Miles Point Site (18TA365) on the eastern shore of the Chesapeake Bay in Talbot County, Maryland, roughly 50 miles west of the APE. Artifacts from a layer demonstrated to be below Paleoindian period layers include a biface broadly similar to those recovered from Cactus Hill (44SX0202) in a layer also predating the Clovis-bearing layers. Additionally, soils scientist Dan Wagner (personal communication, 2012) has found that an aeolian loess that may be present elsewhere along the eastern shore of Maryland has the potential to contain evidence for early human occupation in the Western Hemisphere. Nonetheless, given no evidence for “Pre-Clovis” habitation has been recovered in Delaware, this discussion will begin with the Paleoindian period.

3.1.1 *Paleoindian Period (13,000 to 6500 B.C.)*

The Paleoindian (13,000 to 6,500 B.C.) period environment is characterized as a mosaic of deciduous, boreal, and grassland biomes with a uniformly cold and alternately wet and dry climate. Human adaptation to these changing environmental conditions resulted in small, mobile bands of hunter-gatherers with movements related to the exploitation of different localized environments and resources. It is purported that Pleistocene megafauna played an important role—albeit a role that is not well understood—in the lives of the earliest inhabitants. Groups likely employed a broad-spectrum diet that included plants and smaller animals, which allowed

people to adapt to changing ecologies they faced within the early pioneer landscape of the Delmarva. Site patterning seems to indicate a preference for riverine environments, with sites located on high terraces or knolls overlooking rivers or streams (Custer 1989). The earliest diagnostic tool forms include fluted and basally thinned points (i.e., respectively Clovis, and Mid-Paleo and Dalton), while later forms include notched (and often serrated) points (i.e., Palmer, Amos, and Kirk). Only one Paleoindian site, 7S-G-19, is known in the local area, and it is located downstream on Indian River, close to where the river empties into the Indian River Bay. This location would have been a floodplain or well-drained upland terrace along an interior drainage at that time (Custer 1987:22).

A detailed discussion of Paleoindian mobility and subsistence strategies is not appropriate for this report. It is sufficient to remark that competing and sometimes complementary theories about Paleoindian mobility and subsistence economies are available in many late-twentieth-century works (see Custer 1996; Custer and Stewart 1990; Gardner 1989; Kelly and Todd 1988; McNett 1986; Meltzer 1993; Moeller 1989).

3.1.2 Archaic Period (6500 to 3000 B.C.)

The Archaic period is marked by the gradual emergence of a Holocene environment within the Atlantic episode. Warmer and wetter climatic conditions prevailed with the disappearance of grasslands and the expansion of mesic forests of oak and hemlock. Mast foods were provided by the mesic forest, which also attracted small game animals, but especially deer and turkey. A marked rise in sea level during the early Holocene had a profound effect on the Delmarva Peninsula. This rise caused lowland flooding and the inundation of river systems, which sped the development of complex estuary systems. Numerous interior swamps also emerged. These changes caused a net increase in floral and faunal resources associated with these new wetland areas. As the climate grew warmer and plant and animal resources began to inhabit larger areas, human groups became more mobile and spread into new ecological settings, and as a result, Archaic period sites are found in a much broader range of topographic settings (Custer 1987).

But overall, Archaic period sites within the Coastal/Bay Zone are few in number. Archaic sites are often associated with drainages and may represent ephemeral hunting and processing

occupations (Custer 1987:105). Increased diversity and frequency of stone tools paralleled the increased diversity in the local ecology and resource seasonality. Tools used for processing plant resources, like mortars, pestles, and grinding stones, became more common. Based on this information, it was anticipated that Archaic period sites might be identified on the edges of uplands overlooking extant, perennial, or relict water sources in the area.

3.1.3 Woodland I (3000 B.C. to A.D. 1000)

In North American archaeology, the Woodland period is traditionally defined (in neoevolutionary terms) as a “stage” of precontact sociocultural development marked by the appearance of: 1) ceramic manufacturing and 2) use of domesticated plants (Willey and Sabloff 1980). These two technological innovations have been deemed significant in that they presuppose greater sedentism with population growth and increased “socioeconomic complexity.” Complexity is perhaps best understood as economic and social intensification. Climatic conditions in Woodland I times were defined by the Subboreal episode, which was generally drier and exhibited greater climatic variation than the previous Atlantic episode. Mesic hemlock-oak forests were replaced by xeric oak-hickory forests and grasslands, as continued sea level rise introduced highly resource-productive, brackish marshes into the area (Custer 1987:31). The changes in the biome allowed groups to aggregate almost year-round in floodplain and estuarine settings.

The Woodland period in general in the greater Mid-Atlantic region is frequently characterized as a period of increased sedentism and a gradual shift toward the exploitation of domesticated cultigens (maize, beans, and squash), together with wild grasses such as amaranth and chenopodium. However, evidence for domesticated plants is sparse on the Delmarva Peninsula, and evidence for increased sedentism is at best tenuous. But plant processing tools do become more common at this time. The Woodland I period data suggest a greater use of aquatic resources. It is during the Woodland I period that large macroband base camps were presumably occupied on a year-round basis (Custer 1989). Storage pits and evidence of house structures are first found during this period. A microband base camp is the predominant site type identified along river floodplains and estuarine marshes, while small procurement camps are found along streams and adjacent to tidal marshes. Interestingly, the APE appears to be on a cusp between

where large base camps and where procurement camps might be expected to occur. Given its proximity to confluences upstream from Indian River, some level of habitation is anticipated, even if only smaller domestic group camps. Custer (1987:43) assigns the local area containing the APE to the Woodland I/II Study Unit of Inland Bay and Major Drainage floodplains area, which is known to contain large and small base camps.

Groups inhabiting the Middle Atlantic region during the Woodland I period appear to have expanded their use of lithic raw materials to include quartz, quartzite, argillite, and rhyolite (Custer 1992; Kinsey 1977; Stewart 1984). Custer (1992:42) suggested that the use of more varied materials reflects a decrease in the size of band territories. The wide distribution of non-local lithic materials, such as South Mountain rhyolite from south-central Pennsylvania, suggests the development of long-distance exchange networks. It might also represent broader local interaction among the groups residing on the Delmarva Peninsula to which these sources were available, or connections to groups with direct access to these non-local sources. Stone and ceramic containers appear and would have brought about more efficient cooking, as well as a way to store surplus foodstuffs. Ceramics help investigators identify individual culture complexes, such as the Clyde Farm, Wolfe Neck/Delmarva Adena, Carey, and Late Carey complexes in Woodland I times, and the Slaughter Creek Complex in the subsequent Woodland II times. Clyde Farm Complex sites are few, but three are located downstream from the APE along the Indian River, and one of these, 7S-G-19, is a relatively large base camp site; and as a group, they contain non-local toolstone, such as argillite, rhyolite, and steatite. Sites affiliated with the remaining Woodland I complexes are located downstream along the river, but they are also nearby upstream along the Cow Bridge Branch and Mirey Branch.

Increased social “complexity” is argued to be evident during the Woodland I period. Some researchers believe that the development of a sedentary lifestyle and the control of surplus food resources may have led to the development of ranked societies at this time (Custer 1989). Evidence for this change presumably comes in the form of non-local grave goods that may indicate mortuary ceremonies, which were practiced in central Delaware between ca. 500 B.C. and 0 B.C. Known as the Delmarva Adena, this culture period is hallmarked by raw materials and finished items similar to those used by Ohio Valley Adena groups (Custer 1984). The

settlement and subsistence patterns 2,000 to 1,000 years ago (in the later Woodland I period) are inferred to have been similar to the earlier Woodland I times.

Altogether, Woodland I artifact assemblages are purported to reflect the intensification of food production concurrent to the development of a more sedentary settlement strategy focused on riverine and estuarine resources (Custer 1984). Mortuary practices incorporating various grave goods such as carved platform pipes; bone and antler tools; and a variety of projectile points, celts, and pestles, are in place during Woodland I as well (Custer 1989:293). Woodland I period sites are the most common type of site in the Atlantic Coastal Zone. Microband base camps of the Woodland I period have been identified near the APE. These include 7S-F-007 on a point near the upper end of Indian River approximately 1.5 miles south of the APE, 7S-F-039 on a knoll overlooking the Cow Bridge Branch floodplain 1 mile north of the APE, and 7S-F-047 on a bluff overlooking Mirey Branch roughly 2 miles northwest of the APE.

3.1.4 *Woodland II (A.D. 1000 to 1600)*

The Woodland II period is associated with the first appearance of the “three sisters” (i.e., maize, beans, and squash) in the Mid-Atlantic region. *Zea mays* (maize) is first dated on the central Delaware River ca. A.D. 900 to 1000 (Stewart 1998:9). Other changes that purportedly mark the later Woodland period in the greater Delaware Valley include:

- A change in lithic technology with the disappearance of a formal biface industry and use of cobbles for tool manufacture;
- Changes in ceramic production and decoration;
- Changes in settlement pattern; and
- Changes in environmental exploitation.

The horizon markers for the Woodland II period are not found uniformly throughout the Delaware Valley. Although the presence of cultigens is documented in the Delaware River drainage by the end of the first millennium A.D., the impact of these food sources is unclear. Evidence suggests that food production and village life was not universally adopted in all sections of the river, and in some areas, it may not have even been adopted prior to European

arrival (Becker 1986). Although there is no consensus among archaeologists, it appears that there was a gradient from south to north for an increased importance in food production among later Woodland/“village farming” Native American societies in the Delaware River drainage. It is hypothesized herein that, like hunter-gather societal intensification elsewhere in North America (i.e., the Pacific Northwest), the clinal change to increased plant husbandry may have been related to decreasing resource diversity and abundance. In other words, the southern end of the Delaware drainage may have exhibited greater resource richness and abundance than the upper reaches of the drainage, where farming was clearly invoked as an economic strategy. Like the Pacific Northwest societies, social and political economies may have become increasingly rigid as kinds and numbers of resources diminished due to space (the narrowing valley) and time (seasonally availability) restrictions on wild resources.

In the lower Delaware River drainage, the emergence of sedentary (or semi-sedentary) villages and food production began to appear by A.D. 1000, but cultigens appear to have supplemented rather than supplanted wild plant gathering and hunting, and “few, if any, Woodland II groups ever became fulltime farmers” along the lower Delaware River and Delaware Bay (Custer 1984:147). Some of the largest sites (macroband base camps such as Indian Field and Indian Landing) produced extensive evidence of wild plant gathering rather than domesticates (Custer 1984:163-166).

Custer (1984:169-170) believes that food production most likely occurred along tributary rivers to the Delaware Bay south of the Mispillion River. He hypothesized that food production began here because of environmental constraints on maintaining a hunter-gatherer economy in the face of a rising population. Although there have been some finds of cultivated plants in the Atlantic Coast Zone (Doms et al. 1986), those remains are far less common than wild, gathered plant foods (Custer and Griffith 1986:44-49). Microband base camps are found more frequently with site locations corresponding to the earlier Woodland I period microband base camps. Triangle-shaped points appear as the only point type in tool kits at this time, and exterior ceramic vessel surfaces appear with more complex decorations with incised lines and cord-wrapped stick impressions.

Woodland II sites occur downstream on Indian River and on the edges of the Indian River Bay and Rehoboth Bay. The settlement pattern is largely hallmarked by base camps, either in coastal or interior settings (Custer 1987:49; Thomas et al. 1975). Custer (1987:49) aptly infers that the rich estuarine resource base of the Atlantic Coast Zone likely “precluded the adoption of agricultural food production systems and reduced potential population circumscription so that a constant fissioning of groups was likely as critical local population densities were reached.” The same conditioning factor of a rich resource base likely played a profound role in maintaining a relatively egalitarian and perhaps at most a situationally ranked sociopolitical system that never gave rise to formal, institutionalized inequalities. It is suggested that fissioning may have led to dense clusters of sites that represented communities integrated by mortuary ceremonies and ossuaries (Custer 1987: 49). The APE contains no known Woodland II period sites, but one nearby site, 7S-J-033, does contain a Woodland II component.

3.1.5 Contact Period (A.D. 1600 to 1750)

The Contact period in Delaware was marked by the establishment of European settlements, initially occurring along the Delaware River and Bay, and then, later, more generally in the hinterland of the Delmarva Peninsula. This precipitated a major disruption in the lives of the Native Americans already living on the peninsula. European demand for furs affected the indigenous economy; metal and other European goods displaced stone and other traditional materials. The introduction of European diseases and the conflict over control of the fur trade caused catastrophic social and political disruptions. By the end of the period, traditional lifeways were all but abandoned, and few Native American groups remained on the peninsula. Native American descendants (Lenape and Nanticoke) continue to reside in Delaware. There is potential to encounter Contact period sites in the project area; however, sites of the period may not be easily distinguishable from Woodland II sites. The APE and the vicinity contain no known Contact-era sites.

3.2 Regional Historic-Era Context

The history of Delaware has been subdivided into six thematic periods that chronicle the major trends and developments of the state. These include Exploration and Frontier Settlement (1630-1730+/-); Intensified and Durable Occupation (1730-1770+/-); Early Industrialization (1770-

1830+/-); Industrialization and Early Urbanization (1830-1880+/-); Urbanization and Early Suburbanization (1880-1940+/-); and Commercialization and Suburbanization (1940-Present).

3.2.1 Exploration and Frontier Settlement (1630 to 1730+/-)

The European settlement of Delaware was initiated by the competing colonial powers of Sweden and Holland in the 1620s and 1630s. The two countries established several small, fortified settlements along the Delaware River and Delaware Bay. Following a series of military conflicts, the Dutch took control of Delaware in 1656 and established the town of New Amstel (New Castle) near Fort Casimir (Weslager 1961:12). In 1664, the English gained control of the entire Mid-Atlantic region, attacking and winning New Amstel in the north and Whorekil (Lewes) in the south. Afterwards, the Dutch, who swore allegiance to the English, retained their lands and rights to their private property. In 1647, the Whorekil population was 47 Dutch and English (Gehring 1977). In 1673, the Dutch briefly retook New Netherlands, but returned it in 1674 in exchange for Surinam in South America, which the English had captured earlier (Clark, McVarish, and Ziesing 2012). Delaware was under Philadelphia control in 1682 and was considered the Lower Three Counties of Pennsylvania (Munroe 1978).

A few years earlier, the local governor encouraged settlement of Cedar Creek and Assawoman Inlet in Deale County (soon after renamed Sussex) in southern Delaware; land patents were issued at the time, and all had access to navigable water or the coast (Hancock 1976). Whorekil became Lewes, the political, maritime, and commercial center in the region in the 1680s, and to help expand settlement beyond 10 miles of the coast from roughly Milton to Millsboro, highway and bridge surveyors were appointed to establish infrastructure through the local swamps and forests. Gristmills increased in prominence into the late 1600s. Local population hovered around 1,000 people, and most were making a living farming, growing tobacco, corn, wheat, and rye; and raising hogs and cattle (Hancock 1976).

By 1704, relations between the Three Lower Counties and Pennsylvania had soured, and the representatives autonomously began meeting in New Castle, although Pennsylvania continued to appoint their governor (Munroe 1954). The counties nonetheless remained economically somewhat dependent on the Philadelphia market. The presence of Philadelphia-made black

manganese redware vessels (i.e., colloquially referred to by some as “Delaware black”) in Delaware signifies this economic linkage to the northern market. Dwellings and farm-related outbuildings were impermanent structures during this early settlement period in central Delaware. Locals at this time typically built earth-fast dwellings supported by posts set directly into the ground. Such structures were quite common in the region and were, in fact, promoted by Penn himself. Although they did not always succeed in doing so, the builders of such dwellings “expected to replace them with more durable houses within the span of a generation” (Herman 1987:84). No dwellings from this period still stand in the local region.

3.2.2 Intensified and Durable Occupation (1730 to 1770+/-)

Settlement at this time pressed inland; for example, just west of the Georgetown area. Pennsylvania issued land patents to the east half of the county, while Maryland was issuing patents for the west side of the county. Before the dispute over county lands was settled in 1765, the traditional boundary between southern Delaware and Maryland was the Nanticoke River and its tributaries (Clark, McVarish, and Ziesing 2012). The mid-eighteenth century in Delaware witnessed population growth, the maturing of the rural economy, the establishment of local agricultural service center towns, improvements to the transportation network, and the expansion of market-oriented farm production. As in the wider Mid-Atlantic region during this period, farming dominated Delaware’s colonial economy; 80 to 90 percent of the population was engaged in agriculture (Egnal 1975:201). Mixed farming centering on grain production was the primary form of agriculture during this period. Tobacco continued to be produced as well, mainly by relocating Marylanders (Herman et al. 1989:20, 24). This intensified, market-oriented farming required more labor input; in response, farmers increasingly employed a growing labor force in their fields. The number of slaves in Delaware also increased significantly during this time. By 1770, Delaware’s population included an estimated 1,836 African-Americans, a sizable portion of which were enslaved (U.S. Bureau of the Census 1961:756).

The built environment also expanded and became a much more permanent element of central Delaware’s rural landscape during this period. Brick increasingly became a preferred building material for those who could afford it. Nonetheless, log and wood frame construction were most common. While single-cell hall plans persisted among dwellings throughout this period and into

the nineteenth century, chambered-hall and multi-room hall-and-parlor plans became increasingly common. Formal architectural styles, typified by the closed-plan Georgian style, were also increasingly adopted in the construction of the homes of the rural elite (Lanier and Herman 1997:16-24).

3.2.3 Early Industrialization (1770 to 1830+/-)

By this time, Nanticoke River was part of Sussex County, as the land dispute with Maryland had been settled, and “New” Sussex (i.e., Dagsborough, Nanticoke, etc.) merged with “Old” Sussex (i.e., Lewes, Indian River, etc.) to become the largest of the Lower Three Counties. Population topped 19,000 persons. The area near the head of Indian River was sparsely settled, but the local hundreds contained relatively high numbers of enslaved people, including Dagsborough, Baltimore, Lewes and Rehoboth, and Indian River.

This period witnessed profound economic, political, social, and scientific changes, all of which affected the agricultural landscape of central Delaware, both positively and negatively. Southern Delaware was generally spared from the direct effects of military action during the American Revolution, but Lewes was bombarded by the British navy in the War of 1812. Nonetheless, economic disruption caused by the wars and by a series of trade embargoes, along with the depletion of soils and the opening of new lands in the West, impacted farming families. Transportation and rural industry during this period were closely related to the dominant farming economy, which focused on corn and raising livestock. Farm products were transported along the area’s meager road system and via shallow draft boats on the many creeks in the area. Landings were established on the larger creeks. Towns that had landings and were connected to the road network became local commercial hubs, as these “commercial towns” served as focal points for the local society and economy (Heite and Heite 1986). Local creeks and runs also powered an increasing number of gristmills and sawmills.

Homesteads were often a one-and-one-half-story house with a few outbuildings, corn crib, smoke or meat house, and a kitchen; livestock included hogs, sheep, cows, oxen, and an occasional horse (Clark, McVarish, and Ziesing 2012). Only 50 percent of a plantation might be farmed, and extensive subsistence farming, coupled with home manufacturing, tended to

dominate local economies. For example, in 1810 over 80 percent of the looms in Delaware were in Sussex County, where most wool and flax originated. The county also had many distilleries and iron forges at this time.

According to a historic context concerning agricultural tenancy adjacent to the north in central Delaware, but arguably just as relevant here (Siders et al. 1991:18), the period was characterized by intensive building activity that resulted in increased numbers of durable houses. The rural elite, who were engaged in a market-based extensive agricultural economy, contributed significantly to the rural architectural landscape (Herman, Siders, and Balgooy 1992). A variation on the double-pile center-passage plan, the double-pile side-passage plan, which originated in urban areas near the end of the colonial period, spread to the countryside in the early to mid-nineteenth century. Houses continued to be constructed of timber frame and brick. Another dwelling type that appeared more frequently was the tenant house. These open plan structures, built with log or timber frame dwellings, contained one to three rooms and ranged from one to two stories in height (Sheppard, Andrzejewski, and McCarthy 2001:11).

In response to increased needs for tenant housing brought by demographic pressures, changing farm practices, and the influence of agricultural reform, the loose feudal-like “house and garden” plan developed. As part of a formal contract, a farm owner leased his laborer a small house and small plot for raising garden crops and livestock. These tenancies were often clustered together along roadways or tree lines, but always within sight of the main farmstead. Built on piers and thus portable, house and garden tenant houses were easily moved, and farm owners would frequently move these dwellings within the farm (Sheppard, Andrzejewski, and McCarthy 2001). Unfortunately, due to their ephemeral occupational natures, their archaeological signatures remain somewhat ambiguous, as a house and garden is expected to leave behind little trace of formal features and artifact assemblages that might manifest themselves simply as moderately dense historic field scatters.

Elisha Dickerson promoted the establishment of Millsboro in 1792 when he built a dam and bridge using late-eighteenth-century technology at the first narrow neck on the Indian River. His large sawmill and gristmill were located nearby; 13 other mills were established in a 4-mile

radius into the nineteenth century. Originally, “Millsborough” was only on the northeastern side of the river north of Dickerson’s mills, but the southwestern side (which was known as Washington) was incorporated into Millsboro later in 1837 (Institute for Public Administration [IPA] 2004). Waples established a blast furnace in 1817 to process bog ore, and it operated until 1936 and provided iron to the adjacent foundry. Millsboro iron was used in the Eastern State Penitentiary in Philadelphia and Croton Waterworks in New York City (Eckman, Higgins, and Connor 1938).

3.2.4 Industrialization and Early Urbanization (1830 to 1880+/-)

Beginning around 1840 and continuing throughout the mid-nineteenth century, Delaware generally experienced an economic upsurge. As farm values and incomes dramatically rose during this time, the agricultural landscape experienced a period of revitalization. This boom was the result of the convergence of a number of factors, including improved farming techniques, the adoption of new agricultural products, the increasing use of farm machinery, the building of the Delaware Railroad, the full exploitation of the Chesapeake & Delaware (C&D) Canal, the use of steamboat transportation, and the burgeoning of major markets in the industrial cities of the Mid-Atlantic and Northeast. Mixed farming centered on grain (corn and wheat) and livestock production. The extension of the Delaware Railroad southward into Kent and Sussex counties in 1856 facilitated a boom in orchard crops, namely peaches, in the mid-1800s (Reed 1947:382). The southern terminus of the railroad was located at Seaford, and the northern terminus linked with major rail networks in the city of Wilmington (Hoffecker 1977:46). In 1859, the Delaware Railroad reached the Maryland border at a location the railroad company dubbed Delmar (Hayman 1979:19-31). Sussex County was the leading peach producing area of Delaware, but a blight known as the yellows reached the southern counties in the 1880s, and largely wiped out the orchards (Reed 1947:385). Nevertheless, farmers generally had economic success during this period because values of agricultural products and farmlands increased at this time.

Manufacturing expanded in Delaware during this period, with 380 factories in existence at the beginning of the Civil War, and canneries like the one adjacent to a rail depot in Georgetown were built as orchard and truck garden farm production expanded during the second half of the nineteenth century (DeCunzo and Garcia 1992). Mills continued to flourish along the county’s

creeks during this period. Although the iron furnaces ceased operations at this time, the new extractive industry of timbering in the cypress swamp began, and nearby towns established packing companies for shipping local agricultural products (Eckman, Higgins, and Connor 1938; Hancock 1976; Heite 1974). Beaches and coastal areas like Rehoboth began to attract tourists at this time, and helped to begin to diversify the heavily agriculturally focused local economy.

The increased wealth of farmers and the rural gentry precipitated a widespread rebuilding of the built environment. The initial phase of rebuilding focused on remodeling existing houses by adding service wings and replacing dilapidated farm buildings. New house construction also occurred. This involved a mixture of Victorian styles, including Italianate, Second Empire, Gothic, late Federal, and Greek Revival. The dwellings of the non-elite citizens (e.g., tenant farmers and farm laborers) remained unchanged from the previous period. The numbers of simple, vernacular dwellings, however, increased markedly during this period as farm tenancy rose. As a result, this period saw a dramatic increase in house and garden tenancies in central Delaware, and as an equally intensified agricultural economy (also presumably in southern Delaware) further developed (Sheppard, Andrzejewski, and McCarthy 2001).

By the eve of the Civil War in 1860, Sussex County contained over half of the slave population in Delaware. The majority were the property of small farm operations owners and worked as domestic or field laborers; although some were skilled artisans, most free blacks were usually day laborers and hired farm hands, and typically owned no property (Hancock 1976). The Underground Railroad, the emancipation of slaves in 1863, the subsequent Union victory, and economic opportunity brought thousands of free African-Americans to Delaware during this time (Skelcher 1995a). Though emancipation freed the slaves, it did nothing to improve their social and economic status. Small black communities sprang up in Belltown (Lewes) and Jimtown (also Lewes).

3.2.5 Urbanization and Early Suburbanization (1880 to 1940+/-)

During this period, industry and manufacturing greatly expanded in Delaware. The northern part of the state experienced the bulk of this growth. The expansion of industry in general, along with other factors, resulted in a reciprocal decrease in the number of people employed in agricultural-

based businesses. With this change, a greater percentage of the population resided in cities rather than in rural areas. During this time period, the Delaware Railroad remained a major mode of transportation. At the turn of the twentieth century, before the highway era, the railroad provided the most important means of transportation in Delaware (Hoffecker 1988:157). Important improvements in transportation occurred, such as the invention of the automobile and the modernization of the state's roadways. The construction of the DuPont Parkway (present-day U.S. Route 13), an innovative concrete highway, resulted in linking Dover to Wilmington and Philadelphia, which, although not in Sussex County, provided better access to the county and coast. Specifically, the highway helped in the development of the recreational economy because shore towns were now more readily accessible by car.

Nonetheless, Sussex County remained largely a rural zone with an agriculturally based economy. Farming at this time is best described as intensive and commercialized. Mixed farming, focusing on grain production, was abandoned as farmers began to change their products to reflect the changing market demands. This resulted in a move toward large-scale dairy, poultry, and garden vegetable/orchard farming. Farmers began to increasingly rely on mechanized farm equipment and industrially produced fertilizers to increase production (Reed 1947:391-419; DeCunzo and Garcia 1992:96-187). Farmers also began to direct-market their products via farmers markets and roadside stands. Interestingly, highly productive farms along the Indian River often catered to both the land and sea market as farmer-fishers. The county was the peach-producing center of the state in 1890, but corn was the main cash crop.

In 1893, the formal name Millsboro (dropping the "ough") was adopted, and the town of Millsboro incorporated. Millsboro was a center of market garden production, and as a result, the container industry that manufactured baskets, crates, and barrels boomed at this time (Eckman, Higgins, and Connor 1938). The county experimented with the chicken industry, zeroing in on broiler birds (i.e., chickens weighing less than 3 pounds for broiling, frying, and roasting). Many of these were raised in the Millsboro vicinity in the 1940s. Part and parcel were soybean and feed production, as the broiler economy refocused efforts into new agricultural enterprises. Holly wreath manufacturing also became popular during Christmas seasons in the 1880s to 1960s; millions were made and shipped in the Millsboro vicinity (Hancock 1976). Not only was

Millsboro a critical node in the holly wreath industry, it also played a vital role as a distribution center for broiler feed and coal (Eckman, Higgins, and Connor 1938). Its most important twentieth-century industry was manufacturing baskets, trays, and crates for fruits and vegetables, but its use of gum tree lumber for those items almost eradicated the species from the state. Other complimentary industries were a flour and seed mill and tomato cannery; however, none have outshined the broiler chicken industry since the early 1930s.

Toward the end of the period, suburban communities began developing outside of urban centers. Population declined slightly during the first half of this period, which may be attributed to lower demands for agricultural labor and higher demands for industrial workers that caused an out-migration from rural areas to urban centers. African-Americans were increasingly leaving the rural South during this time to escape Jim Crow discrimination and the lack of economic opportunity, and were establishing communities in the industrial cities of the North. This probably influenced a portion of African-Americans from Sussex County to migrate north. African-American populations in rural Delaware especially declined during the 1920s and early 1930s (Skelcher 1995a:114). However, the education of African-Americans in Delaware improved with the establishment of dozens of schools for African-American children, which was a trend that began in the decades after the Civil War (Skelcher 1995b:213). Opportunities for higher education were also afforded to African Americans with the founding of the state college up north in Dover in 1892. By the end of the 1940s, nearly 400 students attended the school.

In terms of architectural developments, this period witnessed a broadening of architectural styles. A wide variety of late Victorian and early modern styles were built, although some styles were more commonly employed than others. Dwelling styles and forms from this period include Second Empire, Stick, Shingle, Queen Anne, Foursquare, Front Gable Cottage, Bungalow, Colonial Revival, Side Gable Cottage, and Cape Cod Cottage. A holdover from earlier periods, the simple vernacular open plan forms were still used for tenant housing. Dwellings during this period were increasingly constructed from milled wood frames. Brick was also used, especially as less costly, machine-made bricks became available. Another important aspect of house construction during this period was the expansion of exterior covering and roofing materials. These included wood clapboards, tar paper, asphalt siding, asphalt shingles, and tin roofing.

3.2.6 Commercialization and Suburbanization (1940 to Present)

Corn and soybeans remained important feed industries for the broiler chicken industry; in fact, Sussex is distinguished as the embodiment of the “broiler-corn-soybean complex.” Several large-scale corporations dominated the agricultural economy in Sussex County. Human population rose from 500+ in 1960, to 2,300+ in 2000, to 4,300+ today. During the early part of this time, passenger ridership on the Delaware Railroad began to wane; therefore, passenger train operations between Wilmington and Delmar ended in December 1965. Freight service on the railroad continued, however, and it increased as the local economy sustained its focus on broiler chickens, which in turn gave rise to the complimentary industries of veterinary research and development in Millsboro.

As transportation networks expanded and automobiles became common after World War II, suburbanization spread throughout Delaware, but less so in Sussex County, as dense suburbanization and commercialization centered on Wilmington and Dover and their vicinities. The major towns of Lewes, Rehoboth, and Georgetown saw populations increase as subdivisions sprang up. The US 113 corridor became the focus of intermittent strip mall/shopping center construction. Strip malls contain many roadside commercial buildings that include retail shopping, dining, and automotive-related establishments. Some large-scale box retail stores began to appear in the 1990s. Residential development continues today, as rural agricultural areas adjacent to larger towns are increasingly developed for housing. The pressure for more housing and the concomitant increase in real estate values persuaded many land-owning farmers to sell their farms to developers. The pattern of decreasing farmland and increasing residential development continues to the present. In the twenty-first century, rural areas have become increasingly attractive and new residential developments have arisen, but not to the extent that they have to the north. Today, Sussex County largely retains its rural character with equally strong agricultural and tourist economies.

3.3 Historic Maps and Aerials

Historic atlas and topographic mapping and historic aerials shed light on the potential presence of historic archaeological resources in the archaeological resource-sensitive areas investigated during the Phase I survey. The 1801 Varle map shows the town of Dagsborough to the south,

plantations owned by “Koloak” to the west, a mill at the confluence of Shoales Branch and the Indian River, a property apparently owned by “Frame,” and a church to the northeast (Figure 4). The road running north-south west of the APE is a post road; the remaining nearby roads are common roads. Note the APE is located on the east edge of Dagsboro Hundred, but in order to provide a full geospatial context, Indian River Hundred is referenced adjacent to the east. No recorded occupations are inside the APE.

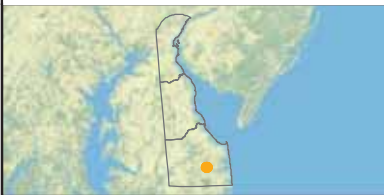
The 1868 Beers map of Dagsborough Hundred shows Millsborough has been established to the south on Indian River, and Geo. W.C. Hearn owns the property south of the APE (Figure 5). It is easiest to describe map features based on the waterways that bound the APE, but note that the names of the tributaries on the 1868 atlas map are not consistent with their twenty-first century names. Famy’s Branch on the 1868 map is today Sheep Pen Ditch, while Sheepen Creek on the 1868 map is today Mirey Branch. Cow Bridge Branch remains today the same name it was in 1868. A sawmill and bark mill were located upstream on Sheepen Creek (today Mirey Branch) north of Area 3 of the APE, and a gristmill and sawmill were located along Famy’s Branch (today Sheep Pen Ditch) south of Area 3 of the APE; Geo. W.C. Hearn owned all four of these mills. Other properties owned by Hearn and T.S. Johnson are located north of the APE. No historic-era occupations are recorded inside the APE. Cow Bridge connects the east to west side of the banks of Cow Bridge Branch, slightly north of Area 4 of the APE. Curiously, the two nearby uplands containing Areas 3 and 4 appear to have never been settled in the historic period. The 1868 Beers map of Indian River Hundred incorrectly shows the Cow Bridge south of the mill dam, where it should be located (Figure 6). Based on the 1868 Dagsborough Hundred map and twentieth-century U.S. Geological Survey (USGS) topographic maps, the bridge should instead be located adjacent to the structure associated with B.B. Jones. Deo Bridge Mill was located to the east, on the opposite side of Cow Bridge Branch from Area 4. The Presbyterian Church and Frame property shown on the 1801 Varle map appear on the 1868 map. Properties owned by “Fooks” and “Collens” have been established by this time.

The 1917 USGS topographic map shows no occupation in the APE, and by now Sheepen Creek has been renamed Vines Branch (Figure 7). Cow Bridge is correctly depicted north of the APE, and the area between Areas 3 and 4 is swampland. By this time, the railroad is west of Area 3,

Figure 4
Detail of 1801 Varle Map
Millsboro Bypass Project, Areas 3 and 4
Sussex County, Delaware

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culturally sensitive material

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Area of Potential Effects

***NOT TO SCALE**

Figure 5
Detail of 1868 Beers Map of Dagsborough Hundred
Millsboro Bypass Project, Areas 3 and 4
Sussex County, Delaware

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culturally sensitive material

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Area of Potential Effects

***NOT TO SCALE**

Figure 6
Detail of 1868 Beers Map of Indian River Hundred
Millsboro Bypass Project, Areas 3 and 4
Sussex County, Delaware

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culturally sensitive material

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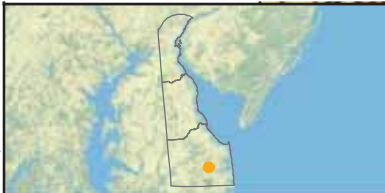
Area of Potential Effects

***NOT TO SCALE**

Figure 7
Detail of 1917 Millsboro USGS Map
Millsboro Bypass Project, Areas 3 and 4
Sussex County, Delaware

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Area of Potential Effects

and the body of water south of the APE is labeled Millsboro Pond. The 1938 USGS topographic map similarly shows the bridge north of the APE, swamp between the two areas inside the APE, and also Vines Branch, Famys Branch, the railroad west of the APE, and Millsboro Pond, but still no occupation inside the APE (Figure 8). The 1954 USGS map shows Cow Bridge on Cow Bridge Branch is gone, there is a gravel pit north of where the bridge stood, Millsboro Pond, and Vines Creek (formerly Sheepen Branch) is now Mirey Branch, and Famys Branch is now named “Sheeppen Ditch” (Figure 9). The APE is unoccupied at this time. The 1992 USGS map shows the same, but “Sheeppen Ditch” is now Sheep Pen Ditch. The APE is unoccupied (Figure 10).

This series of USGS maps reflects two additional points. First, it is important to note the east halves of Area 3 and Area 4 slope gently downward in elevation, and large portions were swamp or underwater (see Figures 7 and 8). One can then see how the APE was almost entirely on fastland by 1954 (see Figure 9). The second point is that chicken coops were in and near the northwest corner of Area 3. The Millsboro area is well known for its roaster chicken economy, so it is not surprising to see coops on the 1954 USGS map (Figure 9), as well as coops throughout the broader local area. Coops appear on the subsequent 1981 USGS map (not included herein), but then they are almost all absent by the time of the 1992 USGS map (see Figure 10). Coop ruins in and near Area 3 were composed of pieces of corrugated plastic roofing, asphalt shingles, tar paper, and rusted metal.

The lack of historic period occupation besides the chicken coops indicates the potential for identifying historic-era archaeological sites in the APE is low. Conversely, given the APE would have been an attractive setting for Native American settlement, A.D. Marble considered the potential for encountering precontact period archaeological sites in the APE to be very high. A.D. Marble expected any sites would likely be relatively intact due to the apparent lack of plowing, and thus offer high quality information potential.

3.4 Local Archaeological Site Context

An examination of the Delaware Cultural Resource Survey (CRS) archaeological site forms and the Cultural and Historical Resource Information System (CHRIS) website (accessed September 2021) demonstrates abundant pre-European contact occupations in the vicinity of the APE. No

Figure 8
Detail of 1938 Millsboro USGS Map
Millsboro Bypass Project, Areas 3 and 4
Sussex County, Delaware

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Area of Potential Effects

Figure 9
Detail of 1954 Millsboro USGS Map
Millsboro Bypass Project, Areas 3 and 4
Sussex County, Delaware

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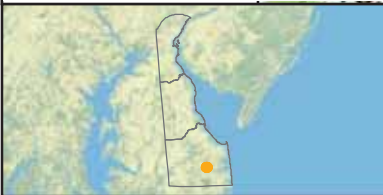


Area of Potential Effects

Figure 10
Detail of 1992 Millsboro USGS Map
Millsboro Bypass Project, Areas 3 and 4
Sussex County, Delaware

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Area of Potential Effects

sites occur inside the APE, but most occur in settings like the APE, which are uplands adjacent to a water course. Sites near the APE are primarily associated with Indian River, Cow Bridge Branch, Mirey Branch, Shoals Branch, and Iron Branch. Most of the sites were identified on the margins of these waterways in adjacent upland settings in woods or in cultivated fields.

Fourteen recorded archaeological sites are located within an approximately 2-mile radius of the APE (Table 1). All 14 contain evidence for pre-European contact occupations. Four of these contain evidence for Woodland I occupations, one contains evidence for a Woodland II occupation, and the remainder contain evidence for undated precontact-era components. Based on the density of sites, A.D. Marble inferred the portions of the APE in upland settings closest to Millsboro Pond exhibit high sensitivity for precontact archaeological resources. Given the general lack of recorded historic-era occupation in or near the APE, A.D. Marble inferred low sensitivity for historic archaeological resources.

Table 1. Recorded Archaeological Sites within a 2.0-Mile (3.2-Km) Radius of APE.

| CRS # | Site # | Site Name | Period | Site Type | Site Setting |
|--------|----------|------------------|------------|---------------------|---|
| S00636 | 7S-F-001 | Indian River 1 | Precontact | Unknown | Near the north bank of Indian River, southeast of the APE. |
| S00634 | 7S-F-006 | Millsboro 1 | Precontact | Unknown | Near the south bank of Indian River, southeast of the APE. |
| S00635 | 7S-F-007 | Millsboro 2 | Woodland I | Unknown | Near the south bank of Indian River, southeast of the APE. |
| S06950 | 7S-F-038 | Anderson Farm | Precontact | Unknown | Relict dunes east of Cow Bridge Branch, north of the APE. |
| S06951 | 7S-F-039 | Rust Ida Farm I | Woodland I | Procurement Station | Knoll adjacent east of Cow Bridge Branch, north of the APE. |
| S06952 | 7S-F-040 | Rust Ida Farm II | Precontact | Unknown | Slight rise east of Cow Bridge Branch, north of the APE. |
| S06953 | 7S-F-041 | Stockley Center | Precontact | Unknown | Slight rise adjacent west of Cow Bridge Branch, north of the APE. |
| S06959 | 7S-F-047 | Mirey Branch IV | Woodland I | Base Camp | Slope adjacent north of Mirey Branch, northwest of the APE. |
| S06960 | 7S-F-048 | Mirey Branch V | Precontact | Unknown | Knoll adjacent west of Mirey Branch, northwest of the APE. |
| S07928 | 7S-F-064 | - | Woodland I | Procurement Station | South bank of Betts Pond on Shoals Branch, southwest of the APE. |

| CRS # | Site # | Site Name | Period | Site Type | Site Setting |
|--------|----------|-----------|--|---|---|
| S07929 | 7S-F-065 | - | Precontact | Unknown | Upland adjacent south of Shoals Branch, southwest of the APE. |
| S00674 | 7S-J-003 | - | Precontact | Unknown | North of Iron Branch, no adjacent water course, south of the APE. |
| S07934 | 7S-J-032 | - | Precontact | Procurement Station | Knoll adjacent north of Iron Branch, south of the APE. |
| S07935 | 7S-J-033 | - | Woodland II and E. 19th Century Historic | Procurement Station and Historic Domestic | High bluffs overlooking Iron Branch, south of the APE. |

Source: Delaware CRS forms; CHRIS website, accessed September 2021

The four sites containing Woodland I components were assigned based on diagnostic lithic artifacts recovered at each site. Sites 7S-F-7 and 7S-F-47 contain Wolfe Neck, Coulbourne, and Mockley type sherds, and 7S-F-39 and 7S-F-64 contain only Wolfe Neck sherds. Sites 7S-F-39 and 7S-F-64 are both procurement stations, whereas 7S-F-47 is interpreted as a base camp. Also recovered from 7F-S-47 was a triangle projectile point, and the person who identified the site (Glenn Mellin) notes they observed over “perhaps 500 sherds which I did not disturb.” 7S-J-033 contains a Woodland II component with Townsend ceramics, as well as an early-nineteenth-century historic domestic component with early period redware and clam shell. The remainder (n=9 sites) contain non-diagnostic precontact lithics that included thermally altered rock, utilized flakes, choppers, cores, generalized bifaces, and/or debitage.

It is clear that the project area contains potential to yield evidence for at least Woodland I occupations and possibly a Woodland II occupation. Most of the known sites in and near the APE are located near water. Based on the local archaeological site contents and natural settings, it was anticipated that the APE was most likely to contain evidence of the last 1,000 years (later Woodland period) of human occupation in southern Delaware.

4.0 Research Design and Methods

4.0 RESEARCH DESIGN AND METHODS

4.1 Research Design

The purpose of the Phase I investigation was to identify archaeological resources in the APE. The goals of this study were to identify archaeological-bearing deposits, then determine the integrity of those deposits, and discover the range of historic and precontact activities that may have occurred within the APE. The APE is based on the proposed limits of construction for two areas of the Millsboro Bypass corridor. Prior to the start of the fieldwork, DelDOT assessed the sensitivity of the APE and generated a testing strategy (see Figure 2). DelDOT, in consultation with a representative of the DE SHPO, agreed to employ a testing strategy that included 50-foot (15-m) and 25-foot (7.5-m) intervals in both Areas 3 and 4. The closer interval testing would be conducted in portions closer to Millsboro Pond. The anticipation was that smaller procurement and processing activity areas may be located in those portions of the APE. For Area 4, the east and west ends were subjected to the closer interval with an understanding that positive results in these portions would indicate a need to consider closer intervals for the central portion in later phases of the archaeological investigation.

As previously mentioned, the testing strategy divided the 7.5-acre (3.0-ha) Area 3 into two test areas. Its western portion measures 4.5 acres (1.8 ha) and underwent STP survey via 50-foot (15.2-m) STP intervals, and its eastern portion measures 3.0 acres (1.2 ha) and underwent survey via 25-foot (7.6-m) STP intervals. The testing strategy divided the 7.0-acre (2.8-ha) Area 4 into three test areas. The western portion measures 2.5 acres (1.0 ha) and underwent survey via 25-foot (7.6-m) STP intervals. The middle portion measures 2.0 acres (0.8 ha) and underwent survey via 50-foot (15.2-m) STP intervals. The eastern portion measures 2.5 acres (1.0 ha) and underwent survey via 25-foot (7.6-m) STP intervals. The fieldwork took place in April to May 2021.

The survey was conducted in light of the *Delaware Statewide Comprehensive Historic Preservation Plan* (Ames, Herman and Siders 1987; see also Bedell 2002; Herman and Siders 1989; Catts and De Cunzo 1999; De Cunzo 2004). The Plan identifies five historic periods:

-
- 1630 to 1730 – Exploration and frontier settlement
 - 1730 to 1770 – Intensification and durable occupation
 - 1770 to 1830 – Early industrialization
 - 1830 to 1880 – Industrialization and early urbanization
 - 1880 to 1940 – Urbanization and early suburbanization

Given the occupation history of the project area, all five periods of dating were considered relevant. Based on the known resources near the APE, it was expected that if any historic resources might be identified, they would date to the early nineteenth to mid-twentieth centuries and reflect the *longue durée* of “cultures of agriculture” in the local area. A.D. Marble expected research domains outlined by DeCunzo and Catts (1990), namely, the themes of domestic economy and landscape, as well as settlement patterns and demography, would be linked to any historic resources encountered in the APE. Artifacts associated with historic farmstead properties dating to the nineteenth century that are/were located adjacent to the APE were anticipated to dominate any historic artifact assemblages recovered during the investigation.

A.D. Marble also conducted the survey in light of the *Management Plan for the Prehistoric Archaeological Resources of Delaware’s Atlantic Coastal Region* (Custer 1987). The project area falls within the Coastal/Bay physiographic setting and the Indian River Management Unit of the Plan. Probability for finding sites dating to the various precontact eras was determined via information gathered during previous investigations in the Unit. In general, the probability for finding ALL period sites (i.e., Paleoindian, Archaic, Woodland I, Woodland II, and European Contact) is high, and ALL sites in the Unit are considered likely to yield significant data (Custer 1987). Based on the local precontact archaeological site information documenting four Woodland I sites in the nearby area, the likelihood of identifying sites attributed to this period during this survey was considered high. Interestingly, the US 113 North/South Study of Archaeological Sensitivity report is effectively a companion publication to the 1987 management plan (Chadwick et al. 2005). The authors examined two study areas within the US 113 corridor. The Georgetown South Study Area actually contains the Millsboro Bypass project APE. According to their predictive model, the APE occurs at the intersection of most of the factors for early historic period sensitivity: proximity to a drainage and the coast, near the head of tide, on

arable soils, and on a well-drained landform. Later period historic sensitivity is based on proximity to roads and railroads, both of which the APE is near, but not close enough to confer anything but low historic sensitivity. The survey results were negative for historic period sites. In term of precontact site predictions, the earlier and US 113 North/South-related study (John Milner Associates, Inc. [JMA] 2004) that also included the current APE concluded the presence of precontact archaeological site sensitivity in the Millsboro Bypass APE.

4.2 Background Research Methods

A.D. Marble performed background research that consisted of examining the CHRIS and relevant Delaware archaeological site files, National Register of Historic Places (NRHP) files, and cultural resource management reports and management plans. Research included a review of aerial photographs, and historic topographic and atlas maps; as well as an examination of environmental attributes (e.g., water, slope of terrain, soil types) pertaining to the geographic and ecological makeup of the project area. A.D. Marble also consulted with Nanticoke historian Sterling Street, and former Division of Historical and Cultural Affairs (DHCA) SHPO officer Dan Griffith. Both gentlemen were gracious in sharing information relevant to the survey.

4.3 Field Methods

Archaeological survey was first conducted via a systematic sampling strategy employing 50-foot (15.2-m) and 25-foot (7.6-m) interval STP excavations in Areas 3 and 4. All STPs measured approximately 1.5 feet (0.46 m) in diameter and were excavated by naturally occurring strata at least 4 inches (0.10 m) into culturally sterile subsoil. Excavated soil was screened through 0.25-inch (0.64-cm) hardware cloth, and the artifacts were bagged and labeled with their provenience. A.D. Marble recorded depth of strata, soil Munsell color and texture, and artifact content. With the exception of modern debris (plastic, aluminum foil, etc.), all artifacts were retained for processing and analysis. STP locations were recorded via handheld global positioning system (GPS), and the entire APE was photo-documented.

Upon finding Native American artifact concentrations in each test area, DelDOT instructed A.D. Marble to excavate two 1-meter-by-1-meter (3.3-ft-by-3.3-ft) test units (TUs) at each location. TUs were excavated in 10-centimeter (4-in) levels within naturally occurring strata. Like the

STPs, the TUs were excavated by strata at least 4 inches into culturally sterile subsoil, the soil was screened through 0.25-inch (0.64-cm) hardware cloth, and the artifacts were bagged and labeled with their provenience. A.D. Marble recorded depth of strata, Munsell color and texture, and artifact content. Researchers profiled and photo-documented the TU walls and recorded the TU locations.

4.4 Lab Methods

All artifacts recovered during the investigation were washed, inventoried, cataloged, and prepared following the curation standards of the Delaware State Museum. Artifacts recovered during the survey were analyzed according to their relevant attributes; artifacts were characterized as to their type, function, period of attribution, and diagnostic features. Various sources were consulted for identifying the historic materials; these included works by Noël Hume (1969, 2001), Jones et al. (1989), Miller (1980), and South (1977). Works by Custer (1989, 2001) and Fogelman (1988), as well as our personal meeting with Dan Griffith and Sterling Street, were sources for identifying the Native American artifacts.

Analyses of the field findings included basic numeric and qualitative assessments of the artifacts to evaluate the nature of the artifact assemblages and their depositional contexts. The goal of these analyses was to determine, if possible, the integrity of the archaeological deposits and their potential to provide new and significant historical information.

5.0 Field Results

5.0 FIELD RESULTS

This section reviews the results of the Phase I survey. The Phase I investigation identified two precontact-era archaeological sites. The Millsboro Pond – Area 3 Site (7S-F-176; CRS 13425), is located in the southeast corner of Area 3 of the APE; and the Millsboro Pond – Area 4 Site (7S-F-177; CRS 13426) is located in the southwest corner of Area 4 of the APE. The following sections review the findings in Areas 3 and 4.

5.1 Area 3

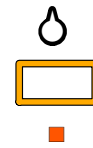
Area 3 is a 7.5-acre (3-ha) area on a wooded upland overlooking the north end of Millsboro Pond. The west half of the area is generally level, but the east half slopes gradually lower in elevation to the east. The area is adjacent south of the confluence of Sheep Pen Ditch and Millsboro Pond, and adjacent east of the Conrail Railroad. DelDOT archaeologists divided it into two test areas: the western portion measures 4.5 acres (1.8 ha) and underwent STP survey via 50-foot (15.2-m) STP intervals, and the eastern portion measures 3.0 acres (1.2 ha) and underwent STP survey via 25-foot (7.6-m) STP intervals (Figure 11; Photographs 1 to 12). Background research determined there is no recorded historic period occupation other than two chicken coops that intersected the northwest corner of the area in the mid- to late twentieth century. No precontact or historic archaeological sites have been identified in the area; however, the natural setting would have been conducive to Native American settlement (i.e., an upland overlooking a tributary to Indian River), so A.D. Marble considered Area 3 to have precontact site potential.

Area 3: STPs

The field team laid in and excavated 253 STPs in Area 3: 89 50-foot interval STPs, and 164 25-foot interval STPs (see Figure 11). The field team recovered 12 Native American (Mockley type [Stephenson and Ferguson 1963]) sherds from STP 201; and eight historic-era mortar fragments, three brick fragments, and one complete brick (handmade) from STP 214. Both STPs are located in the southeast corner of Area 3. The sherds have cord impressions on the exterior surface, a smoothed interior, and shell and quartz temper (Photograph 13). The shell tempering is visible as small holes where the shell has disintegrated. Mockley dates to the Woodland I period ca. A.D. 200 to 900. Artusy (1976; see also Griffith 2012a) notes cord-marked and net-impressed varieties

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Photograph Locations
Area of Potential Effects
Test Unit Locations

Negative STP
Positive STP
Unexcavated STP

Figure 11
Area 3 STP and TU Locations
Millsboro Bypass Project, Areas 3 and 4
Sussex County, Delaware



Photograph 1: View of general conditions, showing the wood line at the east edge of Area 3, facing north



Photograph 2: View of general conditions, showing the southeast corner of Area 3, facing west



Photograph 3: View of general conditions, showing Area 3 near STPs 103 and 92 at the 25-foot and 50-foot STP interval border, facing southwest



Photograph 4: View of general conditions, showing Area 3 near the northcentral boundary of Area 3, facing southwest



Photograph 5: View of general conditions in the center of the 50-foot STP interval portion of Area 3 near STP 40, facing northeast



Photograph 6: View of general conditions, showing the dense west edge of Area 3 near STP 15, facing south



Photograph 7: View of general conditions, showing the west side of Area 3 near STP 15, facing northeast



Photograph 8: View of general conditions, showing dense underbrush in the southwest corner of Area 3, facing east



Photograph 9: View of general conditions near the northwest corner of Area 3, facing east



Photograph 10: View of wooden frame ruins and asphalt shingle/tar paper near STP 1 of Area 3, facing east



Photograph 11: View of wooden ruins and cleared land north of STP 1 in Area 3, facing north



Photograph 12: View of a pile of wood (possible coop roof superstructure) and cinder block ruins near northwest corner of Area 3, facing northwest



Photograph 13: Stratum I Mockley sherds from Area 3, STP 201

of Mockley; the sherds found here are cord-marked. He also notes that ribbed mussel shell was used as temper in southern Delaware, whereas oyster shell was used as temper in Maryland. Mockley occurs throughout Delaware, but mostly from Dover south into Maryland. In the broader region, it is considered to exhibit a circum-Chesapeake Bay distribution that also covers most of Delaware. Griffith (2012a:23) narrows down the use of Mockley ware to the period ca. A.D. 100 to 850. The field team laid in four radial STPs at 8.0-foot intervals around STP 201, and recovered no additional cultural materials. The field crew excavated a total of 257 STPs in Area 3.

STP 201 consisted of an A-B1-B2 stratigraphic sequence: a 36-centimeter thick 10YR 5/3 brown sandy loam A-horizon overlies a 34-centimeter thick 10YR 5/6 yellowish brown sand B1-horizon above a 2.5Y 7/6 yellow sand B2-horizon, in which the field team terminated excavation at 120 centimeters below surface (Figure 12). The field team recovered the 12 Mockley sherds from near the base of the A-horizon. The brick and mortar recovered nearby in STP 214 originated from the A-horizon as well. No other STPs in Area 3 yielded additional cultural materials.

Stratigraphy in Area 3 generally consisted of combinations of A-, E-, and B-horizon sequences, but a few STPs also contained fill layers on top of A- or B- horizons. A few STP excavations were halted at the water table or due to a root impasse. Standing water along the southern edge of the western portion of Area 3, precluded testing in two small localized areas (see Figure 11). The remains of chicken coops are in and near the northwest corner of Area 3. We previously discussed how USGS maps associate these outbuildings to a ca. 1954-1992 timeframe. STPs 6, 35, 63, 79, 128, 191, 210, 253, and 257 provide a cross-section of the profiles encountered in Area 3 (see Figure 12 and Appendix A). Stratigraphic sequences vary, but a few patterns emerge. E-horizons appear most commonly in sequences from STPs on the east side of Area 3, which is also where water table was encountered more frequently. STPs terminated due to root impasses occurred sporadically throughout the area. When fill layers occur, they occur in STPs in the northeast corner of the area.

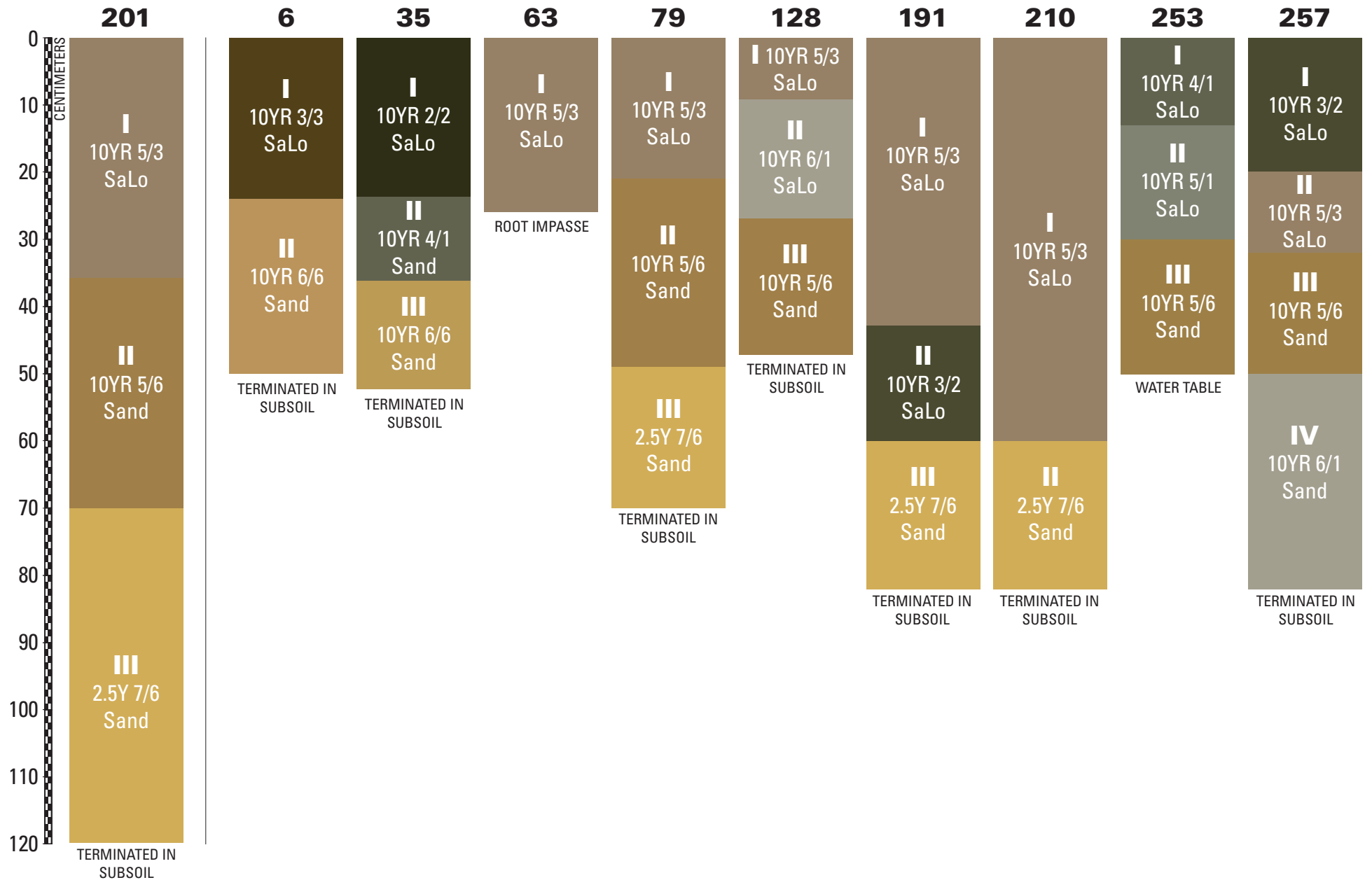


Figure 12
Area 3: Representative Shovel Test Pit Profiles
 Millsboro Bypass Project, Areas 3 and 4
 Sussex County, Delaware



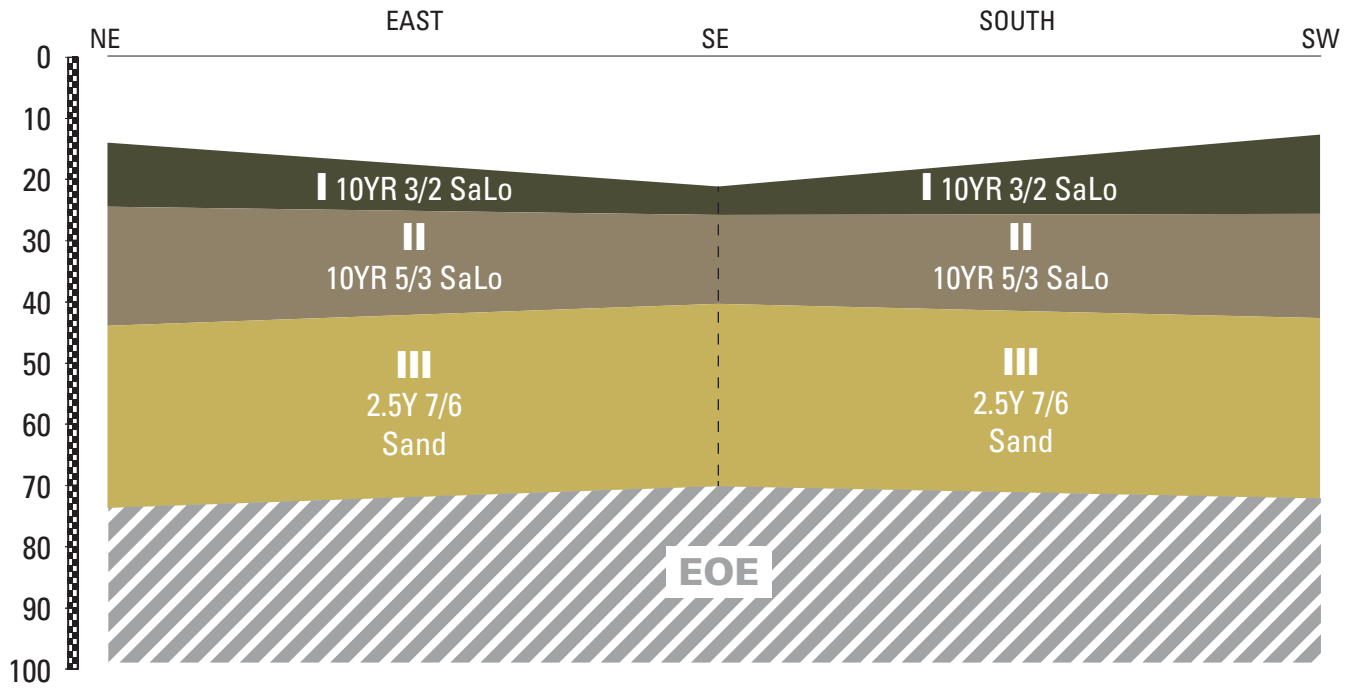
Area 3: TUs

The field team laid in two adjacent 1-meter-by-1-meter TUs (TUs 1 and 2) where they recovered the 12 Mockley pottery sherds in STP 201 (see Figure 11). A.D. Marble discusses their stratigraphy as a single 1-meter-by-2-meter excavation because they share a stratigraphic sequence, but discusses their contents individually and collectively. TUs 1 and 2 reveal a three-layer sequence: an approximately 10-centimeter thick 10YR 3/2 very dark grayish brown sandy loam A-horizon overlies an approximately 20-centimeter thick 10YR 5/3 brown sandy loam B1-horizon on a 2.5Y 7/6 yellow sand B2-horizon (Figure 13; Photograph 14). The field team recovered 50 Mockley sherds from the lower half (ca. 38 to 43 centimeters below surface) of the TU 1 B1-horizon, and 37 more Mockley from an equivalent depth in TU 2; the crew point-provenienced many of these sherds (Figure 14; Photographs 15 and 16). The team then recovered three Mockley sherds from the upper B2-horizon in TU 1, and four Mockley sherds at the same depth in TU 2. The field team then dug two culturally sterile 10-centimeter levels deeper into the B2-horizon. The total 94 sherds in the TUs and 12 sherds from STP 201 come from a roughly 60-centimeter-by-60-centimeter area.

Initially, it was a shock to find the 12 sherds in STP 201 after digging 200 STPs with no cultural materials. Finding additional Mockley sherds in the TUs next to where the first 12 were recovered led to hypothesizing that someone in the Woodland I period maybe forgot, misplaced, or discarded a pot at this location, and that over time the pot slowly disintegrated, collapsed, and broke into pieces, only to be found again 2,000 years later. Who made this pot, what did they do with it, and why was it here? A.D. Marble visited the Nanticoke Museum and met Sterling Street and Dan Griffith, and they confirmed the sherds were indeed Mockley and that they are likely from the same vessel.

In his 2012 Gray Farm Site ceramic analysis, Griffith perceptively remarks Mockley may have spread quickly and possibly from the east, around the same time as sea level rise accelerated ca. 2000 B.P. in the Delaware Bay. Mockley-producing peoples may have inhabited coastal estuaries in the now-submerged portions of the Coastal Plain, but as waters rose, they were forced to settle inland over time as coastal environments moved westward to what would have formerly been inland. He points out this may have been a widespread phenomenon, from coastal

TEST UNIT 1



TEST UNIT 2

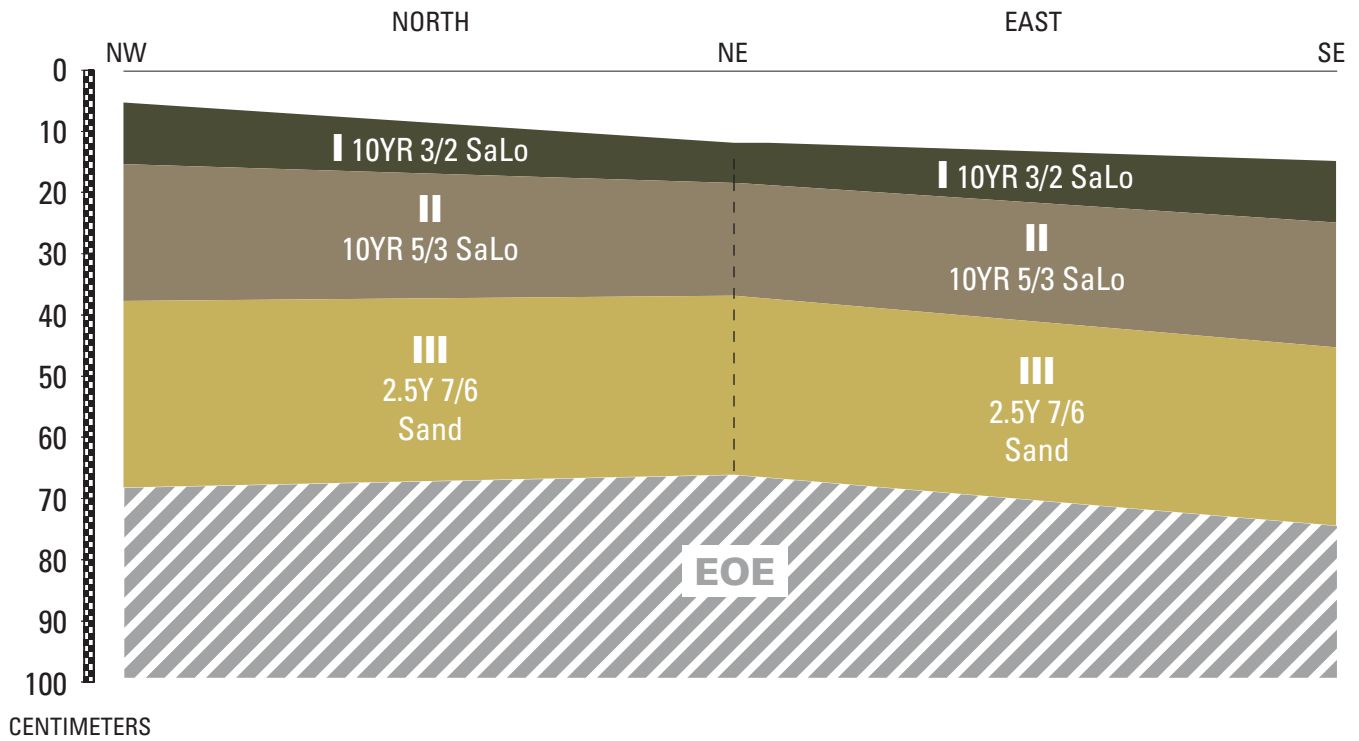


Figure 13
Area 3: Test Unit 1 and Test Unit 2 Profiles
 Millsboro Bypass Project, Areas 3 and 4
 Sussex County, Delaware





Photograph 14: View of Area 3, TU 1 and TU 1 east wall profile



Photograph 15: View of Area 3, TU 1 and TU 2, Stratum II, Level 1, Mockley sherds in situ



Stratum II, Level 1, ca. 38-41 cmbd

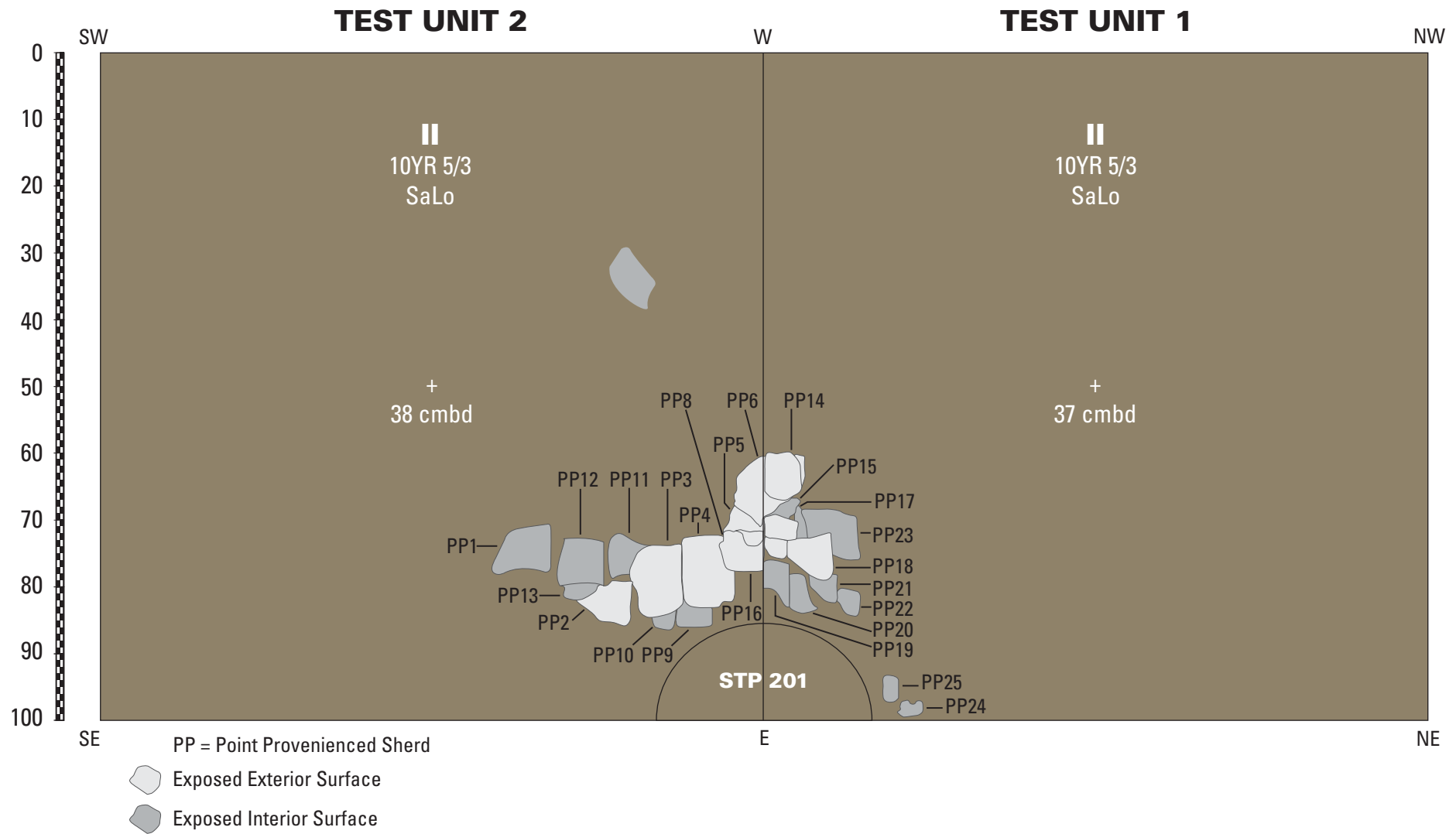


Figure 14
Area 3: Test Unit 1 and Test Unit 2 Planview Showing Mockley Vessel Sherds
 Millsboro Bypass Project, Areas 3 and 4
 Sussex County, Delaware





Photograph 16: Level 1 Mockley sherds from Area 3, TU 1 Stratum II

North Carolina to central and southern New Jersey (Griffith 2012b:53; also see Stewart 1998 for similar pottery in New York and New Jersey). The resulting widespread Mid-Atlantic regional interaction brought on by rising sea level could have then precipitated novel and sustained, mutually beneficial social interactions. Overlapping learning networks and cultural transmission (*sensu* Richeson and Boyd 2005) in circumscribed conditions could have helped give rise to a pan-regional distribution of Mockley style ceramics (see Griffith 2012b). Given the proximity to estuarine settings, finding Mockley in the upper end of Indian River in Area 3 is perhaps not surprising, especially if coastal groups assimilated into the local population, and the local population appropriated the newcomer's pottery technology. However, independent innovation throughout the Mid-Atlantic may have also prompted genesis of the pan-coastal Mockley distribution pattern.

For Area 3, the Mockley sherds indicate an early Middle Woodland occupation, which has been designated the Millsboro Pond – Area 3 Site (7S-F-176). The site is currently defined by where the 106 Mockley vessel sherds were recovered, and therefore it is confined to the small locus at STP 201/TUs 1 and 2 in the southeast corner of the area. The site lies on an upland landform that would have overlooked a small tributary that fed into Indian River not far from the site. One can imagine the narrow creek valley attracted terrestrial and marine resources, was home to various important plant resources, and served as a navigation route to and from the Indian River. Investigators identified no buried living surface at the site, but the possibility remains that additional cultural materials may be present and could shed more light on the occupation. The historic artifacts (i.e., eight mortar, and four brick) in the STP 214 A-horizon are assumed to be secondary refuse deposited in historic or recent times, as other items like brickbats, concrete chunks, corrugated plastic, 5-gallon buckets, plastic bags, and other detritus were observed on the surface in the vicinity.

In sum for Area 3, it is the opinion of A.D. Marble that 7S-F-176 is a potentially significant archaeological resource, and additional diagnostic precontact materials or features (i.e., pits, postholes, living surfaces) may be present. A.D. Marble recommends that the project avoid the site, but if it cannot, then additional investigation via a block of 1-meter-by-1-meter TUs should be excavated to generate artifact and possibly feature information that will allow investigators to evaluate the eligibility of the site to be listed in the NRHP.

5.2 Area 4

Area 4 is a 7.0-acre (2.8-ha) area on a wooded upland overlooking the north end of Millsboro Pond. The area is generally level, a fire lane skirts along the north edge of the area, and the east half gradually slopes down in elevation to the east. Much of the east half of the peninsula where Area 4 is located was underwater in the first half of the twentieth century (see Figures 7 and 8). The area is adjacent east of the confluence of Mirey Branch and Millsboro Pond, and adjacent west of the confluence of Cow Bridge Branch and Millsboro Pond. DelDOT archaeologists divided it into three test areas: the western portion measures 2.5 acres (1.0 ha) and underwent survey via 25-foot STP intervals, the central portion measures 2.0 acres (0.8 ha) and underwent survey via 50-foot STP intervals, and the eastern portion measures 2.5 acres (1.0 ha) and underwent survey via 25-foot STP intervals (Figure 15; Photographs 17 to 28). Background research determined there are no recorded historic period occupations in or near the area, and no precontact or historic archaeological sites are recorded. But like Area 3, the upland setting overlooking a tributary to the nearby Indian River would have been conducive to Native American settlement, so A.D. Marble considered Area 4 to have precontact site potential.

Area 4: STPs

The field team laid in and excavated 344 STPs in Area 4: 171 25-foot interval STPs in the western third of the area, 45 50-foot interval STPs in the central third, and 128 25-foot interval STPs in the eastern third (see Figure 15). Investigators recovered two Native American (Killens type) sherds from STP 38 in the southwestern corner of the area (Photograph 29). Dan Griffith (personal communication, 2021) identified the sherds, which exhibit a fabric-impressed exterior, smooth interior surface, and a mix of fine shell and very fine grit temper. Griffith (2012a:20, 2012b) notes Killens is a Late Woodland II ware that is contemporary with and possibly a regional variant of Townsend ceramics in central and southern Delaware; Killens ware dates generally cluster around the mid- to late A.D. 1500s.

The field team laid in four radial STPs at 8.0-foot intervals around STP 38 and recovered no additional cultural materials; therefore, the field crew excavated a total of 348 STPs in Area 4. The team then laid in and excavated two adjacent 1-meter-by-1-meter TUS (TUs 1 and 2)

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Photograph Locations



Area of Potential Effects



Test Unit Locations



Negative STP



Positive STP



Unexcavated STP

Figure 15
Area 4 STP and TU Locations
Millsboro Bypass Project, Areas 3 and 4
Sussex County, Delaware



Photograph 17: View of general conditions in Area 4 near STP 93, facing northeast



Photograph 18: View of general conditions in Area 4 near STP 87, facing west



Photograph 19: View of general conditions in Area 4 near STP 14, facing southwest



Photograph 20: View of general conditions in Area 4 near STP 48, facing northwest



Photograph 21: View of general conditions in Area 4 near STP 119, facing southwest



Photograph 22: View of general conditions in Area 4 near STP 108, facing southeast



Photograph 23: View of general conditions in Area 4 near STP 191, facing southwest



Photograph 24: View of general conditions in Area 4 near STP 202, facing west



Photograph 25: View of general conditions in Area 4 near STP 199, facing south



Photograph 26: View of general conditions in Area 4 near STP 318, facing southeast



Photograph 27: View of general conditions in Area 4 near STP 344, facing north



Photograph 28: View of general conditions in Area 4 near STP 296, facing east



Photograph 29: Stratum II Killens sherds from Area 4, STP 38

at the STP 38 locus, and recovered an additional seven Killens sherds (six in TU 1, and one in TU 2), as well as 34 debitage (15 in TU 1, and 19 in TU 2) and a hafted biface identified as a Stanly type (in TU 1; Coe 1964). The sherds represent a Woodland II-era occupation, while the Stanly hafted biface represents a Middle Archaic occupation. Most (33 of 34 debitage) were recovered at the same level or below the Stanly biface, so most may be associated with the Middle Archaic period. The site is designated the Millsboro Pond – Area 4 Site (7S-F-177).

STP 38 consisted of an A-E-B stratigraphic sequence: a 12-centimeter thick 7.5YR 3/3 dark brown sandy loam A-horizon overlies a 12-centimeter thick 7.5YR 4/2 brown sandy loam B1-horizon above a 10YR 5/6 yellowish brown sand B2-horizon, in which the field team terminated excavation at 43 centimeters below surface (Figure 16). The field team recovered the two sherds from the B1-horizon. No other STPs in Area 4 yielded additional cultural materials.

Like Area 3, the stratigraphic profiles encountered in Area 4 consisted of combinations of A-, E-, and B-horizon sequences. A small number of STP excavations were halted at the water table or due to root impasse. Excessive slope precluded testing in small areas along the southwestern and northeastern edges of Area 4 (see Figure 15). STPs 61, 114, 125, 179, 184, 285, 308, and 336 represent a cross-section of the profiles the field team encountered in Area 4 (see Figure 16 and Appendix A). Stratigraphic sequences vary, and no clear patterns among them emerge. E-horizons appear intermittently in the area. Tree-throws are common, and have likely disturbed some of the profiles, but A.D. Marble generally encountered intact A-B or A-E-B sequences throughout the area. Given the presence of an E-horizon, A.D. Marble infers that, like Area 3, Area 4 may have never been plowed, and as a result, may be relatively intact and exhibit stratigraphic integrity. A few STPs along the southwest edge and east edge exhibited high water tables. Like in Area 3, STPs terminated due to root impasses also occurred sporadically throughout Area 4.

Area 4: TUs

The field team laid in two adjacent 1-meter-by-1-meter TUs (TUs 1 and 2) where they recovered the two Killens pottery sherds in STP 38 (see Figure 15). Similar to the TUs in Area 3, A.D. Marble discuss the stratigraphy here as a single 1-meter-by-2-meter excavation because they

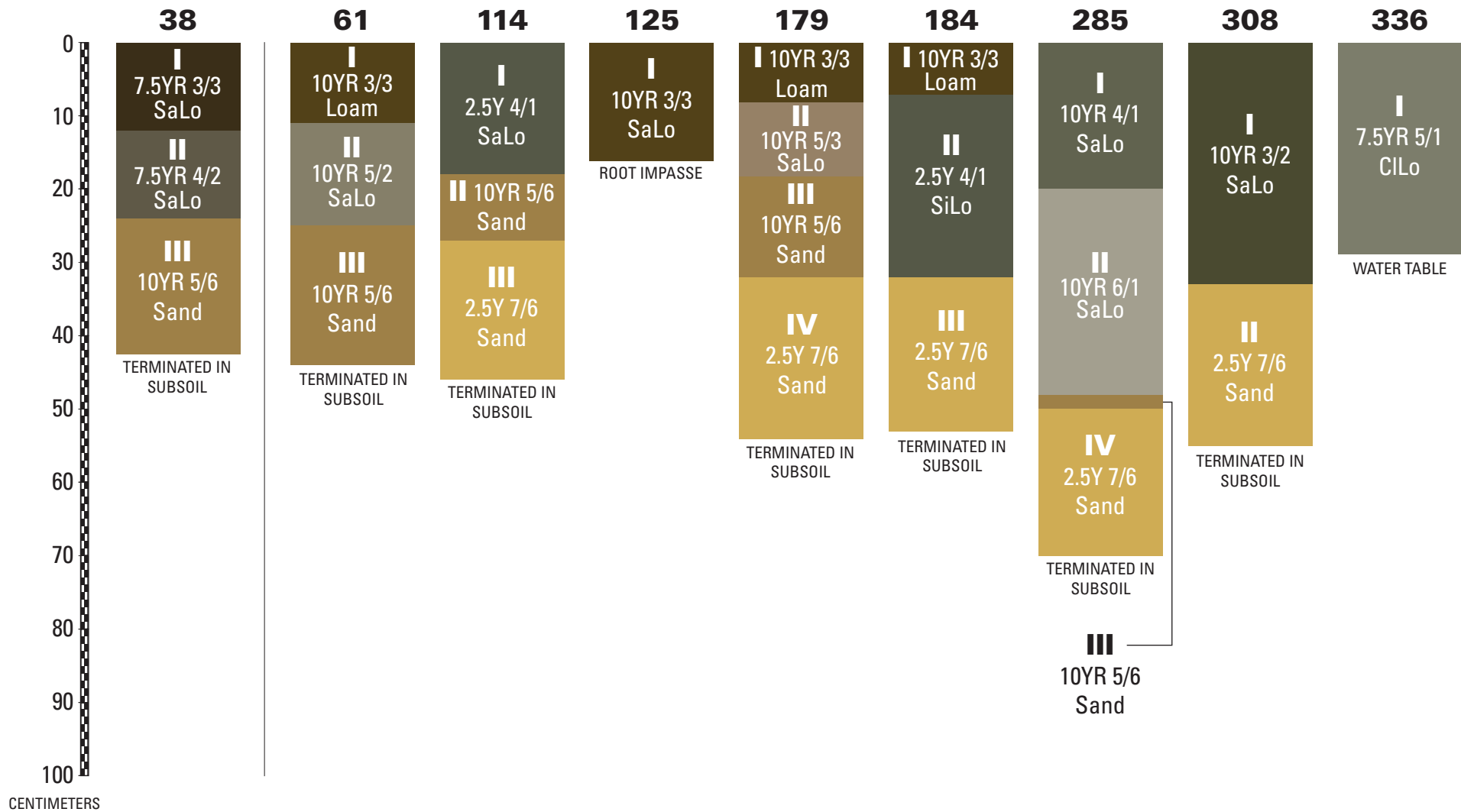


Figure 16
Area 4: Representative Shovel Test Pit Profiles
 Millsboro Bypass Project, Areas 3 and 4
 Sussex County, Delaware

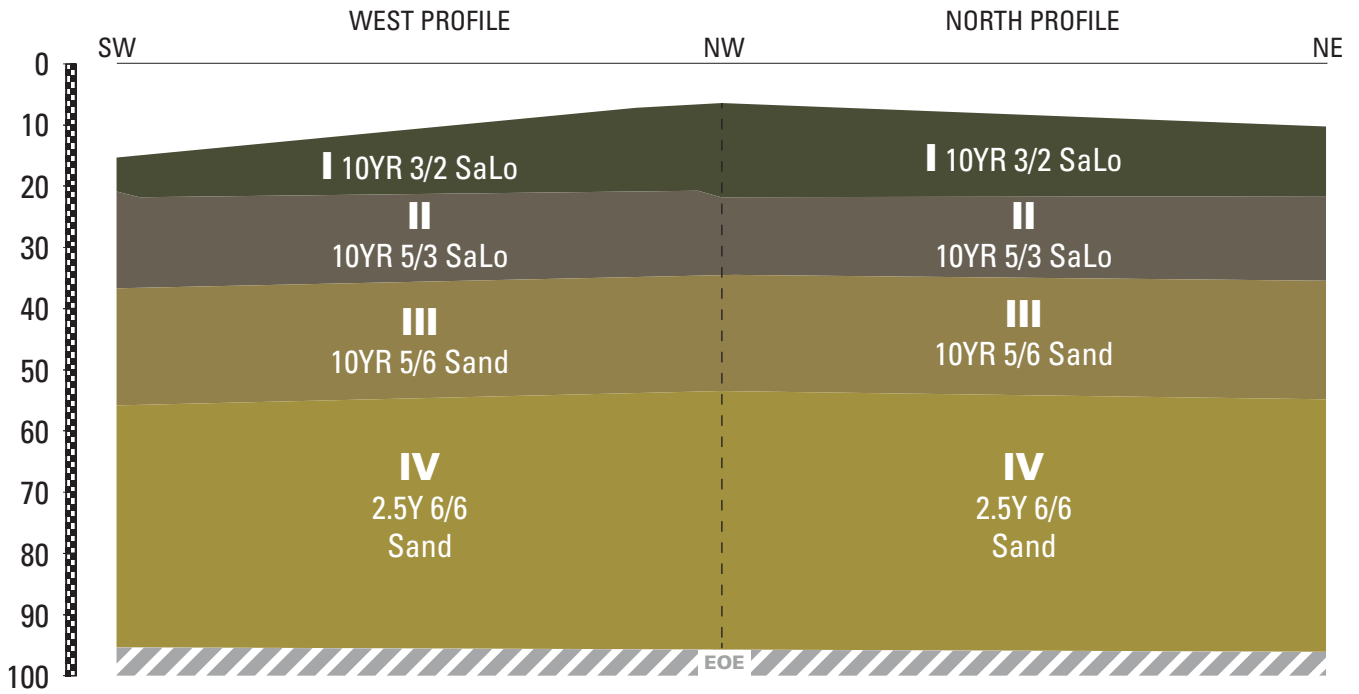


share the stratigraphic sequence, but material culture contents are discussed individually and collectively. TUs 1 and 2 reveal a four-layer sequence: a 10- to 15-centimeter thick 10YR 3/2 very dark grayish brown sandy loam A-horizon overlies a 10- to 20-centimeter thick 10YR 5/3 brown sandy loam E-horizon above a 20-centimeter thick 10YR 5/6 yellowish brown sand B1-horizon on a 2.5Y 6/6 olive-yellow sand B2-horizon (Figure 17; Photograph 30).

The field team recovered 42 Native American artifacts in TUs 1 and 2, in addition to the two Killens sherds in STP 38 (Table 2; see Appendix B). The TU 1 and TU2 A-horizon contained no cultural materials. The underlying E-horizon in TU 1 contained six Killens sherds and a thermally altered piece of chert debitage; the E-horizon in TU 2 contained one Killens sherd (Photograph 31). The B1-horizon was excavated in two 10-centimeter levels: the first level in TU 1 contained no cultural materials; the first level in TU 2 contained three jasper debitage. Excavators recovered from the second level of B1-horizon a Stanly type hafted biface made on chalcedony, along with single pieces of chalcedony and jasper debitage (Photograph 32). The second level of B1 in TU 2 contained three jasper debitage. Only the first two levels of the B2-horizon contained cultural materials. Investigators recovered six jasper and one chert debitage in the first level of B2-horizon in TU 1; and seven jasper and a single quartz and chert debitage in the first layer of B2 in TU 2. Five jasper debitage in TU 1, and three jasper and one chert debitage constitute the B2 Level 2 assemblage. Investigators then removed an additional 20 centimeters, and found no additional cultural materials.

Thirteen flakes (11 jasper, two chert) were thermally altered, and most debitage is non-cortical and small (0.5 to 1.0 centimeter) sized (Photograph 33). Dan Griffith (personal communication, 2021) confirmed that the pebble chert and jasper like those used on-site are toolstone that would have been available from the local creek banks. Heat altering lithic material is a strategy used to produce toolstone that is easier to manipulate because the heat changes the chemical makeup and “tightens” the crystalline structure. In the end, it represents a technological strategy that makes it easier for the flintknapper to direct forces they exert on the base material to more easily shape the tool. Jasper is a commonly thermally altered raw material; some of the jasper in the assemblage exhibits potlidding (“spalls”) that pop off when a toolstone is heated to high temperatures. The potlidding may have occurred on-site or elsewhere. If it occurred on-site, one

TEST UNIT 1



TEST UNIT 2

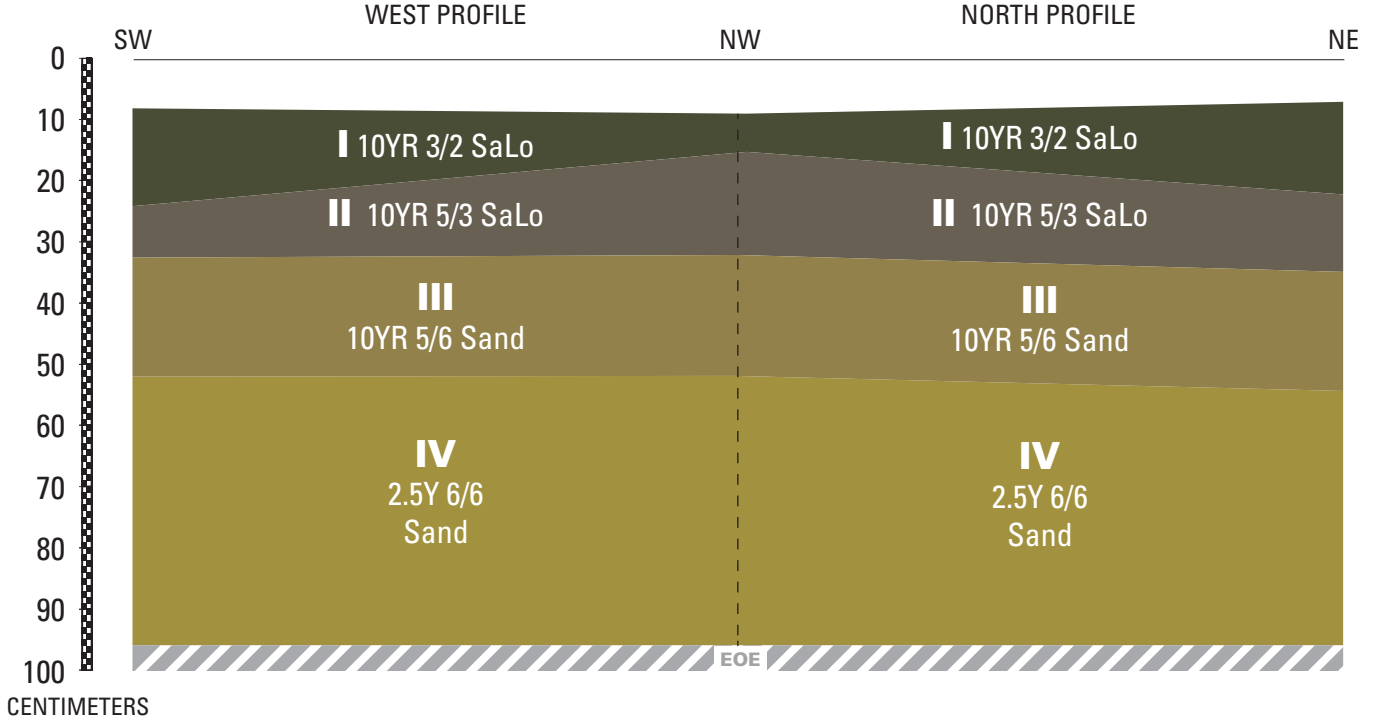


Figure 17
Area 4: Test Unit 1 and Test Unit 2 Profiles
 Millsboro Bypass Project, Areas 3 and 4
 Sussex County, Delaware





Photograph 30: Area 4, TU 1 west wall profile



Photograph 31: Killens sherds from Area 4, TU 1, Stratum II, Level 1



Photograph 32: Stanly type biface from Area 4, TU 1 Stratum III, Level 2



Photograph 33: Debitage from Area 4, TU 2, Stratum IV, Level 1

would anticipate hearth features to be buried nearby. The mostly small-sized debitage suggests later stage biface tool production and maintenance took place at the site. Site function is unknown at this time, but the debitage and hafted biface suggest it may have been a hunting/fishing station; the overlying ceramic sherds suggest processing, procurement, or simply subsistence as a small group waited for fish traps to fill, or game to appear in the narrow valley.

Table 2. Area 4 TU 1 and TU 2 Artifact Assemblage.

| Stratum – Level* | TU 1 | TU 2 | Layer Quantity |
|-------------------------|--|--|-----------------------|
| II – 1 E | 6 – Killens sherds 1 – debitage, chert (TA)** | 1 – Killens sherd | 8 |
| III – 1 B1 | NCM*** | 3 – debitage, jasper (1 TA) | 3 |
| III – 2 B1 | 1 – Stanly hafted biface 1 – debitage, jasper 1 – debitage, chalcedony | 3 – debitage, jasper (3 TA) | 6 |
| IV – 1 B2 | 6 – debitage, jasper (2 TA) 1 – debitage, chert | 7 – debitage, jasper (2 TA) 1 – debitage, chert 1 – debitage, quartz | 16 |
| IV – 2 B2 | 5 – debitage, jasper (1 TA) | 3 – debitage, jasper (2 TA) 1 – debitage, chert (TA) | 9 |
| IV- 3 B2 | NCM | NCM | 0 |
| IV – 4 B2 | NCM | NCM | 0 |
| TOTAL | 22 | 20 | 42 |

*TUs were excavated in 10-centimeter levels within natural strata

**TA = thermally altered

***NCM = no cultural materials

It was surprising to find the two sherds in STP 38 after digging 300+ STPs with no cultural materials. Finding additional Killens sherds above the Stanly point, and finding debitage in each, led to the inference that this location contains a stratified site characterized by Middle Archaic period and Woodland II period occupations. A.D. Marble’s visit to the Nanticoke Museum and meeting with Sterling Street and Dan Griffith helped identify the sherds as Killens type pottery, and that the hafted biface is a Stanly type biface. The site, designated the Millsboro Pond – Area 4 Site (7S-F-177), is currently defined by where the 44 Native American artifacts were recovered and is confined to a small area surrounding the two TUs and STP in the southwest corner of Area 4. Like 7S-F-176, the Millsboro Pond Area 4 Site is also on an upland landform that would have overlooked a small tributary that fed Indian River and ran through a narrow creek valley that likely attracted terrestrial and marine resources. It was home to various important plant resources, and served as a navigation route. Investigators identified no buried living surfaces at

the site, but the possibility remains that additional cultural materials are present that would shed more light on the occupation at this location.

In sum for Area 4, it is the opinion of A.D. Marble that 7S-F-177 is a potentially significant archaeological resource. Additional precontact materials and possibly features (i.e., pits, postholes, living surfaces) are present at the site, and would be determined through further investigation. A.D. Marble recommends that the project avoid the site, but if it cannot, then Phase II investigation is recommended via a block of 1-meter-by-meter TUs at 7S-F-177 to find artifact and feature information that will allow investigators to evaluate whether the site is eligible for listing in the NRHP.

5.3 Summary

A.D. Marble identified two sites during the investigation: the Millsboro Pond – Area 3 Site (7S-F-176) and the Millsboro Pond – Area 4 Site (7S-F-177). The Millsboro Pond – Area 3 Site (7S-F-176) contains Mockley ceramic sherds that represent a Middle Woodland period occupation. The Millsboro Pond – Area 4 Site (7S-F-177) contains Killens ceramic sherds, jasper, chert, and quartz debitage, and a Stanly type hafted biface that represent a Woodland II and Middle Archaic occupation. The upland setting overlooking Millsboro Pond, which would have been a narrow creek bank leading downstream to Indian River in the deeper past, is shared by both sites, and suggests the sites may have functioned as procurement stations. Dan Griffith and Sterling Street (personal communication, 2021) noted the site is located in ancestral Nanticoke lands, and people residing in the area in the later Woodland period lived in a dispersed, around-the-bay settlement pattern, which would appear to map well onto the Area 4 site and its later Woodland component characterized by the Killens sherds. They noted sites from this later period sometimes contained “cabins,” and perhaps the site in Area 4 could be near a cabin or represent a dispersed cabin type settlement. In the eighteenth century, the Indian River Native Americans, who were originally Assateagues, lived in the vicinity after 1705, after they had been forced from their homes in Assawoman. Maryland authorities provided them 1,000 acres on the south side of Indian River, but these acres were sold off to white settlers soon thereafter (Weslager 1942; see also De Valinger 1941). Pressure from white settlers also drove the Nanticoke Indians farther

upstream. Griffith and Street remarked that one should not rule out the possibility that the Area 4 site could be associated with an early-eighteenth-century occupation.

Griffith and Street also pointed out a possible similarity with the Poplar Thicket Site (7S-G-22), a late Woodland II Slaughter Creek Phase occupation, which is recognized by Townsend ceramics. Griffith noted the similarity between the Killens and Townsend type ceramics, but concluded the sherds in Area 4 contained less shell, so they were likely Killens. The Poplar Thicket Site is largely undisturbed and on the north side of Indian River Bay, and it contained the first semi-subterranean, subrectangular dwelling with a centrally placed hearth (Thomas 1976; see also Griffith and Artusy 1975). Superstructure supports and benches were recorded, along with a storage pit and a processing feature some 60 meters away from the structure. The site assemblage contains fabric-impressed ceramics and lithics. Investigators did not identify a living surface or floor at 7S-F-177, so perhaps the site is outside but near a later Woodland period dwelling. The nomination (Thomas 1976) notes the Poplar Thicket Site is the best remaining chance to understand the later precontact Slaughter Creek Phase occupation in Delaware. An exciting prospect is that both of the sites A.D. Marble identified during the investigation occur in what appear to be uncultivated contexts, so relatively pristine conditions are ripe for finding more site evidence, and if there is more, researchers may be able to infer activities via material culture patterns that would be largely intact.

6.0 Conclusions and Recommendations

6.0 CONCLUSIONS AND RECOMMENDATIONS

A.D. Marble identified two archaeological sites in the APE (Figure 18). The Millsboro Pond – Area 3 Site (7S-F-176) is a small Middle Woodland period Native American site in the southeastern corner of Area 3, and is represented by an assemblage of 106 Mockley sherds that investigators recovered in an STP and two TUs. The Millsboro Pond – Area 4 Site (7S-F-177) is a small Native American site with Middle Archaic and Woodland II occupation components that is located in the southwestern corner of Area 4. An assemblage of Killens sherds and debitage overlies more debitage and a Stanly type hafted biface. Like the site in Area 3, investigators recovered these materials in one STP and two TUs. Both sites are very small sites; A.D. Marble estimates both are a 5.0-meter radius centering on their respective assemblages. No archaeological features were identified, but the artifact density suggests that features may be present.

It is methodologically surprising that out of 257 STPs in Area 3 and 348 STPs in Area 4, one STP in each generated Native American artifacts. Although the radial STPs excavated around each STP yielded no artifacts, the TUs around each STP yielded additional cultural material, and in the case of Area 4, the TUs provided evidence that demonstrated the site (7S-F-177) contains stratified occupations: a Middle Archaic period occupation underlies a Woodland II occupation. It is also perplexing, perhaps, that the STP in Area 3 that produced 12 Mockley sherds only produced additional Mockley sherds and no additional artifact types. This is unlike the STP (STP 38) in Area 4 that only produced two Killens sherds; here, the TUs around it produced lithics and a projectile point demonstrating stratified occupations. The results suggest that TUs, and not STPs, may be a more fruitful way to identify sites at seemingly isolated finds. As a result, A.D. Marble recommends that DelDOT include TU efforts in Phase I investigations when isolated finds are encountered.

A.D. Marble recommends the project avoid both sites because they represent potentially significant archaeological resources (Table 3). If the project cannot avoid them, A.D. Marble recommends Phase II evaluation-level study at both sites to determine if subsurface features or artifact patterning within the site deposits are present, and to better determine the integrity of

Figure 18
Two Archaeological Sites Identified during Phase I Investigation
Millsboro Bypass Project, Areas 3 and 4
Sussex County, Delaware

This page has been edited to protect the location of
culturally sensitive material

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- Millsboro Pond – Area 3 Site (7S-F-176)
- Millsboro Pond – Area 4 Site (7S-F-177)

those deposits. Ultimately, any additional investigations would allow cultural resource managers to evaluate the integrity and eligibility of each site to be listed in the NRHP. No other potentially significant archaeological properties were identified elsewhere in the APE.

Table 3. Archaeological Sites and Recommendations.

| Area | Site Name | CRS# | Recommendation |
|-------------|---------------------------------------|-------------|--|
| 3 | Millsboro Pond – Area 3 (7S-F-176) | S13425 | Concentration of Mockley ceramic sherds on former upland overlooking tributary of Indian River; Woodland I occupation; appears to exhibit archaeological integrity; recommending Phase II |
| 4 | Millsboro Pond – Area 4 (7S-F-177) | S13426 | Concentration of Killens ceramic sherds, debitage, and a Stanly point on former upland overlooking tributary of Indian River; appears to exhibit archaeological integrity; stratified occupations: Middle Archaic and Woodland II; recommending Phase II |

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Appendix A

STP Soils Log

Appendix A
STP Log: Area 3

| STP | Strat | Layer Type | Op (cm) | Clos (cm) | Termination | Soil Description/Munsell | Notes/Observations/Artifacts |
|-----|-------|------------|---------|-----------|-----------------------|--|------------------------------|
| 1 | I | Fill | 0 | 55 | | 10YR 5/3 brown mottled with 7.5R 4/4 weak red Sand | |
| 1 | II | E | 55 | 65 | Root Impasse | 10YR 4/1 dark gray Sand | |
| 2 | I | Ao | 0 | 22 | | 10YR 2/2 very dark brown Sandy Loam | |
| 2 | II | E | 22 | 35 | | 10YR 4/1 dark gray Sand | |
| 2 | III | B | 35 | 55 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 3 | I | Ao | 0 | 24 | | 10YR 2/2 very dark brown Sandy Loam | |
| 3 | II | E | 24 | 55 | | 10YR 4/1 dark gray Sand | |
| 3 | III | B | 55 | 75 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 4 | I | Ao | 0 | 22 | | 10YR 2/2 very dark brown Sandy Loam | |
| 4 | II | E | 22 | 40 | | 10YR 4/1 dark gray Sand | |
| 4 | III | B | 40 | 59 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 5 | I | Ao | 0 | 22 | | 10YR 2/2 very dark brown Sandy Loam | |
| 5 | II | E | 22 | 40 | | 10YR 4/1 dark gray Sand | |
| 5 | III | B | 40 | 59 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 6 | I | A | 0 | 24 | | 10YR 3/3 dark brown Sandy Loam | |
| 6 | II | B | 24 | 50 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 7 | I | A | 0 | 24 | | 10YR 3/3 dark brown Sandy Loam | |
| 7 | II | B | 24 | 51 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 8 | I | A | 0 | 22 | | 10YR 3/3 dark brown Sandy Loam | |
| 8 | II | B | 22 | 60 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 9 | I | A | 0 | 27 | | 10YR 3/3 dark brown Sandy Loam | |
| 9 | II | B | 27 | 55 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 10 | I | A | 0 | 22 | | 10YR 3/3 dark brown Sandy Loam | |
| 10 | II | B1 | 22 | 36 | | 10YR 6/6 brownish yellow Sand | |
| 10 | III | B2 | 36 | 52 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 11 | I | A | 0 | 20 | | 10YR 5/3 brown Sandy Loam | |
| 11 | II | B | 20 | 40 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 12 | I | A | 0 | 24 | | 10YR 5/3 brown Sandy Loam | |
| 12 | II | B | 24 | 60 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 13 | I | A | 0 | 23 | | 10YR 3/3 dark brown Sandy Loam | |
| 13 | II | B | 23 | 47 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 14 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 14 | II | B | 26 | 46 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 15 | I | A | 0 | 29 | | 10YR 5/3 brown Sandy Loam | |
| 15 | II | B | 29 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 16 | I | A | 0 | 29 | | 10YR 5/3 brown Sandy Loam | |
| 16 | II | B | 29 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 17 | I | Ao | 0 | 25 | | 10YR 2/2 very dark brown Sandy Loam | |
| 17 | II | E | 25 | 36 | | 10YR 4/1 dark gray Sand | |
| 17 | III | B | 36 | 62 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 18 | I | Ao | 0 | 18 | | 10YR 2/2 very dark brown Sandy Loam | |
| 18 | II | E | 18 | 34 | | 10YR 4/1 dark gray Sand | |

**Appendix A
STP Log: Area 3**

| STP | Strat | Layer Type | Op (cm) | Clos (cm) | Termination | Soil Description/Munsell | Notes/Observations/Artifacts |
|-----|-------|------------|---------|-----------|-----------------------|-------------------------------------|------------------------------|
| 18 | III | B | 34 | 60 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 19 | I | Ao | 0 | 23 | | 10YR 2/2 very dark brown Sandy Loam | |
| 19 | II | E | 23 | 38 | | 10YR 4/1 dark gray Sand | |
| 19 | III | B | 38 | 58 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 20 | I | Ao | 0 | 27 | | 10YR 2/2 very dark brown Sandy Loam | |
| 20 | II | E | 27 | 37 | | 10YR 4/1 dark gray Sand | |
| 20 | III | B | 37 | 59 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 21 | I | Ao | 0 | 26 | | 10YR 2/2 very dark brown Sandy Loam | |
| 21 | II | E | 26 | 39 | | 10YR 4/1 dark gray Sand | |
| 21 | III | B | 39 | 60 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 22 | I | Ao | 0 | 22 | | 10YR 2/2 very dark brown Sandy Loam | |
| 22 | III | B | 22 | 50 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 23 | I | Ao | 0 | 22 | | 10YR 2/2 very dark brown Sandy Loam | |
| 23 | II | E | 22 | 40 | | 10YR 4/1 dark gray Sandy Loam | |
| 23 | III | B | 40 | 60 | Terminated in Subsoil | 10YR 2/2 very dark brown Sandy Loam | |
| 24 | I | Ao | 0 | 23 | | 10YR 2/2 very dark brown Sandy Loam | |
| 24 | II | E | 23 | 35 | | 10YR 4/1 dark gray Sand | |
| 24 | III | B | 35 | 55 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 25 | I | Ao | 0 | 19 | | 10YR 2/2 very dark brown Sandy Loam | |
| 25 | II | E | 19 | 33 | | 10YR 4/1 dark gray Sand | |
| 25 | III | B | 33 | 58 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 26 | I | Ao | 0 | 21 | | 10YR 2/2 very dark brown Sandy Loam | |
| 26 | II | E | 21 | 35 | | 10YR 4/1 dark gray Sand | |
| 26 | III | B | 35 | 59 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 27 | I | Ao | 0 | 23 | | 10YR 2/2 very dark brown Sandy Loam | |
| 27 | II | E | 23 | 38 | | 10YR 4/1 dark gray Sand | |
| 27 | III | B | 38 | 59 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 28 | I | Ao | 0 | 24 | | 10YR 2/2 very dark brown Sandy Loam | |
| 28 | II | E | 24 | 38 | | 10YR 4/1 dark gray Sand | |
| 28 | III | B | 38 | 55 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 29 | I | Ao | 0 | 22 | | 10YR 2/2 very dark brown Sandy Loam | |
| 29 | II | E | 22 | 35 | | 10YR 4/1 dark gray Sand | |
| 29 | III | B | 35 | 60 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 30 | I | Ao | 0 | 24 | | 10YR 2/2 very dark brown Sandy Loam | |
| 30 | II | E | 24 | 38 | | 10YR 4/1 dark gray Sand | |
| 30 | III | B | 38 | 58 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 31 | I | A | 0 | 22 | | 10YR 2/2 very dark brown Sandy Loam | |
| 31 | II | E | 22 | 35 | | 10YR 4/1 dark gray Sand | |
| 31 | III | B | 35 | 60 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 32 | I | Ao | 0 | 22 | | 10YR 2/2 very dark brown Sandy Loam | |
| 32 | II | E | 22 | 36 | | 10YR 4/1 dark gray Sand | |
| 32 | III | B | 36 | 64 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |

Appendix A
STP Log: Area 3

| STP | Strat | Layer Type | Op (cm) | Clos (cm) | Termination | Soil Description/Munsell | Notes/Observations/Artifacts |
|-----|-------|------------|---------|-----------|-----------------------|-------------------------------------|------------------------------|
| 33 | I | Ao | 0 | 25 | | 10YR 2/2 very dark brown Sandy Loam | |
| 33 | II | E | 25 | 43 | | 10YR 4/1 dark gray Sand | |
| 33 | III | B | 43 | 62 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 34 | I | Ao | 0 | 22 | | 10YR 2/2 very dark brown Sandy Loam | |
| 34 | II | E | 22 | 38 | | 10YR 4/1 dark gray Sand | |
| 34 | III | B | 38 | 55 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 35 | I | Ao | 0 | 24 | | 10YR 2/2 very dark brown Sandy Loam | |
| 35 | II | E | 24 | 36 | | 10YR 4/1 dark gray Sand | |
| 35 | III | B | 36 | 53 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 36 | I | Ao | 0 | 26 | | 10YR 2/2 very dark brown Sandy Loam | |
| 36 | II | E | 26 | 38 | | 10YR 4/1 dark gray Sand | |
| 36 | III | B | 38 | 60 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 37 | I | Ao | 0 | 22 | | 10YR 2/2 very dark brown Sand | |
| 37 | II | E | 22 | 42 | | 10YR 4/1 dark gray Sand | |
| 37 | III | B | 42 | 66 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 38 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |
| 38 | II | B | 23 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 39 | I | A | 0 | 18 | | 10YR 5/3 brown Sandy Loam | |
| 39 | II | B | 18 | 40 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 40 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |
| 40 | II | B | 23 | 45 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 41 | I | A | 0 | 20 | | 10YR 5/3 brown Sandy Loam | |
| 41 | II | B | 20 | 43 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 42 | I | A | 0 | 20 | | 10YR 5/3 brown Sandy Loam | |
| 42 | II | B | 20 | 56 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 43 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 43 | II | B | 26 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 44 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 44 | II | B | 26 | 49 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sandy Loam | |
| 45 | I | A | 0 | 20 | | 10YR 5/3 brown Sandy Loam | |
| 45 | II | B | 20 | 46 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 46 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |
| 46 | II | B | 23 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 47 | I | A | 0 | 20 | | 10YR 5/3 brown Sandy Loam | |
| 47 | II | B | 20 | 49 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 48 | I | A | 0 | 18 | | 10YR 5/3 brown Sandy Loam | |
| 48 | II | B | 18 | 48 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 49 | I | A | 0 | 25 | | 10YR 5/3 brown Sandy Loam | |
| 49 | II | B | 25 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 50 | I | A | 0 | 18 | | 10YR 5/3 brown Sandy Loam | |
| 50 | II | B | 18 | 60 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 51 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |

Appendix A
STP Log: Area 3

| STP | Strat | Layer Type | Op (cm) | Clos (cm) | Termination | Soil Description/Munsell | Notes/Observations/Artifacts |
|-----|-------|------------|---------|-----------|-----------------------|-------------------------------|------------------------------|
| 51 | II | B | 26 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 52 | I | A | 0 | 29 | | 10YR 5/3 brown Sandy Loam | |
| 52 | II | B | 29 | 53 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 53 | I | A | 0 | 20 | Root Impasse | 10YR 5/3 brown Sandy Loam | |
| 54 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |
| 54 | II | B | 23 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 55 | I | A | 0 | 22 | | 10YR 5/3 brown Sandy Loam | |
| 55 | II | B | 22 | 52 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 56 | I | A | 0 | 19 | | 10YR 5/3 brown Sandy Loam | |
| 56 | II | B | 19 | 48 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 57 | I | A | 0 | 24 | | 10YR 5/3 brown Sandy Loam | |
| 57 | II | B | 24 | 60 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 58 | I | A | 0 | 24 | | 10YR 5/3 brown Sandy Loam | |
| 58 | II | B | 24 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 59 | I | A | 0 | 19 | | 10YR 5/3 brown Sandy Loam | |
| 59 | II | B | 19 | 40 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 60 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |
| 60 | II | B | 23 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 61 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |
| 61 | II | B | 23 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 62 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |
| 62 | II | B | 23 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 63 | I | A | 0 | 26 | Root Impasse | 10YR 5/3 brown Sandy Loam | |
| 64 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 64 | II | B | 26 | 48 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 65 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |
| 65 | II | B | 23 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 66 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 66 | II | B | 26 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 67 | I | A | 0 | 21 | | 10YR 5/3 brown Sandy Loam | |
| 67 | II | B | 21 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 68 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |
| 68 | II | B | 23 | 50 | Terminated in Subsoil | 10YR 5/3 brown Sand | |
| 69 | I | A | 0 | 21 | | 10YR 5/3 brown Sandy Loam | |
| 69 | II | B | 21 | 49 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 70 | I | A | 0 | 18 | | 10YR 5/3 brown Sandy Loam | |
| 70 | II | B | 18 | 45 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 71 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 71 | II | B | 26 | 48 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 72 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |
| 72 | II | B | 23 | 53 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 73 | I | A | 0 | 27 | | 10YR 5/3 brown Sandy Loam | |

**Appendix A
STP Log: Area 3**

| STP | Strat | Layer Type | Op (cm) | Clos (cm) | Termination | Soil Description/Munsell | Notes/Observations/Artifacts |
|-----|-------|------------|---------|-----------|-----------------------|-------------------------------|------------------------------|
| 73 | II | B | 27 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 74 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 74 | II | B | 26 | 51 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 75 | I | A | 0 | 22 | | 10YR 5/3 brown Sandy Loam | |
| 75 | II | B | 22 | 56 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 76 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 76 | II | B | 26 | 52 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 77 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |
| 77 | II | B | 23 | 49 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 78 | I | A | 0 | 21 | | 10YR 5/3 brown Sandy Loam | |
| 78 | II | B | 21 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 79 | I | A | 0 | 21 | | 10YR 5/3 brown Sandy Loam | |
| 79 | II | B1 | 21 | 49 | | 10YR 5/6 yellowish brown Sand | |
| 79 | III | B2 | 49 | 70 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 80 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 80 | II | B | 26 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 81 | I | A | 0 | 28 | | 10YR null null Sandy Loam | |
| 81 | II | B | 28 | 48 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 82 | I | A | 0 | 27 | | 10YR 5/3 brown Sandy Loam | |
| 82 | II | B | 27 | 48 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 83 | I | A | 0 | 24 | | 10YR 5/3 brown Sandy Loam | |
| 83 | II | B | 24 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 84 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 84 | II | B | 26 | 52 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 85 | I | A | 0 | 24 | | 10YR 5/3 brown Sandy Loam | |
| 85 | II | B | 24 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 86 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 86 | II | B | 26 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 87 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |
| 87 | II | B | 23 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 88 | I | A | 0 | 31 | | 10YR 5/3 brown Sandy Loam | |
| 88 | II | B | 31 | 55 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 89 | I | A | 0 | 29 | | 10YR 5/3 brown Sandy Loam | |
| 89 | II | B | 29 | 51 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 90 | I | A | 0 | 21 | | 10YR 5/3 brown Sandy Loam | |
| 90 | II | B | 21 | 53 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 91 | I | A | 0 | 25 | | 10YR 5/3 brown Sandy Loam | |
| 91 | II | B | 25 | 49 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 92 | I | A | 0 | 27 | | 10YR 5/3 brown Sandy Loam | |
| 92 | II | B | 27 | 55 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 93 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 93 | II | B | 26 | 52 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |

Appendix A
STP Log: Area 3

| STP | Strat | Layer Type | Op (cm) | Clos (cm) | Termination | Soil Description/Munsell | Notes/Observations/Artifacts |
|-----|-------|------------|---------|-----------|-----------------------|-------------------------------------|------------------------------|
| 94 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |
| 94 | II | E | 23 | 55 | | 10YR 4/1 dark gray Sand | |
| 94 | III | B | 55 | 65 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 95 | I | Ao | 0 | 25 | | 10YR 2/2 very dark brown Sandy Loam | |
| 95 | II | E | 25 | 38 | | 10YR 4/1 dark gray Sand | |
| 95 | III | B | 38 | 55 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 96 | I | Ao | 0 | 18 | | 10YR 2/2 very dark brown Sandy Loam | |
| 96 | II | E | 18 | 33 | | 10YR 4/1 dark gray Sand | |
| 96 | III | B | 33 | 55 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 97 | I | Ao | 0 | 20 | | 10YR 2/2 very dark brown Sandy Loam | |
| 97 | II | E | 20 | 40 | | 10YR 4/1 dark gray Sand | |
| 97 | III | B | 40 | 55 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 98 | I | Ao | 0 | 10 | | 10YR 5/3 brown Sandy Loam | |
| 98 | II | E | 10 | 23 | Terminated in Subsoil | 10YR 6/1 gray Sand | |
| 98 | III | B | 23 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 99 | I | Ao | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 99 | II | B | 26 | 51 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 100 | I | Ao | 0 | 13 | | 10YR 5/3 brown Sandy Loam | |
| 100 | II | B1 | 13 | 30 | | 10YR 5/6 yellowish brown Sand | |
| 100 | III | B2 | 30 | 51 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 101 | I | Ao | 0 | 21 | | 10YR 5/3 brown Sandy Loam | |
| 101 | II | B | 21 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 102 | I | Ao | 0 | 25 | | 10YR 5/3 brown Sandy Loam | |
| 102 | II | B | 25 | 51 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 103 | I | Ao | 0 | 20 | | 10YR 5/3 brown Sandy Loam | |
| 103 | II | B | 20 | 55 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 104 | I | Ao | 0 | 23 | | 10YR 2/2 very dark brown Loam | |
| 104 | II | E | 23 | 35 | | 10YR 4/1 dark gray Sand | |
| 104 | III | B | 35 | 50 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 105 | I | Ao | 0 | 21 | | 10YR 2/2 very dark brown Loam | |
| 105 | II | E | 21 | 33 | | 10YR 4/1 dark gray Sand | |
| 105 | III | B | 33 | 57 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 106 | I | Ao | 0 | 21 | | 10YR 2/2 very dark brown Loam | |
| 106 | II | E | 21 | 33 | | 10YR 4/1 dark gray Sand | |
| 106 | III | B | 33 | 57 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 107 | I | Ao | 0 | 23 | | 10YR 2/2 very dark brown Loam | |
| 107 | II | E | 23 | 44 | | 10YR 4/1 dark gray Sand | |
| 107 | III | B | 44 | 55 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 108 | I | Ao | 0 | 22 | | 10YR 2/2 very dark brown Loam | |
| 108 | II | E | 22 | 35 | | 10YR 4/1 dark gray Sand | |
| 108 | III | B | 35 | 52 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 109 | I | Ao | 0 | 24 | | 10YR 2/2 very dark brown Loam | |

Appendix A
STP Log: Area 3

| STP | Strat | Layer Type | Op (cm) | Clos (cm) | Termination | Soil Description/Munsell | Notes/Observations/Artifacts |
|-----|-------|------------|---------|-----------|-----------------------|-------------------------------------|------------------------------|
| 109 | II | E | 24 | 36 | | 10YR 4/1 dark gray Sand | |
| 109 | III | B | 36 | 55 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 110 | I | Ao | 0 | 22 | | 10YR 2/2 very dark brown Loam | |
| 110 | II | E | 22 | 43 | | 10YR 4/1 dark gray Sand | |
| 110 | III | B | 43 | 55 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 111 | I | Ao | 0 | 20 | | 10YR 2/2 very dark brown Loam | |
| 111 | II | E | 20 | 32 | | 10YR 4/1 dark gray Sand | |
| 111 | III | B | 32 | 55 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 112 | I | Ao | 0 | 19 | | 10YR 2/2 very dark brown Loam | |
| 112 | II | E | 19 | 33 | | 10YR 4/1 dark gray Sand | |
| 112 | III | B | 33 | 55 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 113 | I | Ao | 0 | 23 | | 10YR 2/2 very dark brown Loam | |
| 113 | II | E | 23 | 40 | | 10YR 4/1 dark gray Sand | |
| 113 | III | B | 40 | 51 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 114 | I | Ao | 0 | 16 | | 10YR 2/2 very dark brown Loam | |
| 114 | II | E | 16 | 26 | | 10YR 4/1 dark gray Sand | |
| 114 | III | B | 26 | 55 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 115 | I | Ao | 0 | 23 | | 10YR 2/2 very dark brown Loam | |
| 115 | II | E | 23 | 43 | | 10YR 4/1 dark gray Sand | |
| 115 | III | B | 43 | 56 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 116 | I | Ao | 0 | 25 | | 10YR 2/2 very dark brown Sandy Loam | |
| 116 | II | E | 25 | 38 | | 10YR 4/1 dark gray Sand | |
| 116 | III | B | 38 | 55 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 117 | I | A | 0 | 25 | | 10YR 5/3 brown Sandy Loam | |
| 117 | II | E | 25 | 60 | | 10YR 4/1 dark gray Silt Loam | |
| 117 | III | B | 60 | 70 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 118 | I | A | 0 | 25 | | 10YR 5/3 brown Sandy Loam | |
| 118 | II | E | 25 | 60 | | 10YR 4/1 dark gray Silt Loam | |
| 118 | III | B | 60 | 70 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 119 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 119 | II | E | 26 | 59 | | 10YR 4/1 dark gray Silt Loam | |
| 119 | III | B | 59 | 70 | Terminated in Subsoil | 10YR 6/6 brownish yellow Sand | |
| 120 | I | A | 0 | 32 | | 10YR 5/3 brown Sandy Loam | |
| 120 | II | B | 32 | 53 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 121 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 121 | II | B | 26 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 122 | I | A | 0 | 27 | | 10YR 5/3 brown Sandy Loam | |
| 122 | II | B | 27 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 123 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 123 | II | B | 26 | 49 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 124 | I | A | 0 | 29 | | 10YR 5/3 brown Sandy Loam | |
| 124 | II | B | 29 | 46 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |

**Appendix A
STP Log: Area 3**

| STP | Strat | Layer Type | Op (cm) | Clos (cm) | Termination | Soil Description/Munsell | Notes/Observations/Artifacts |
|-----|-------|------------|---------|-----------|-----------------------|---|------------------------------|
| 125 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 125 | II | B | 26 | 50 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 126 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |
| 126 | II | B | 23 | 50 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 127 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 127 | II | B | 26 | 47 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 128 | I | A | 0 | 9 | | 10YR 5/3 brown Sandy Loam | |
| 128 | II | E | 9 | 27 | | 10YR 6/1 gray Sandy Loam | |
| 128 | III | B | 27 | 47 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 129 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |
| 129 | II | E | 23 | 32 | | 10YR 6/1 gray Sandy Loam | |
| 129 | III | B | 32 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 130 | I | A | 0 | 16 | | 10YR 5/3 brown Sandy Loam | |
| 130 | II | E | 16 | 30 | | 10YR 6/1 gray Sandy Loam | |
| 130 | III | B | 30 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 131 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |
| 131 | II | B | 23 | 46 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 132 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 132 | II | B | 26 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 133 | I | A | 0 | 29 | Root Impasse | 10YR 5/3 brown Sandy Loam | |
| 134 | I | A | 0 | 27 | | 10YR 5/3 brown Sandy Loam | |
| 134 | II | B | 27 | 56 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sandy Loam | |
| 135 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 135 | II | B | 26 | 49 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sandy Loam | |
| 136 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |
| 136 | II | B | 23 | 46 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 137 | I | Ao | 0 | 6 | | 10YR 3/2 very dark grayish brown Sandy Loam | |
| 137 | II | E | 6 | 31 | | 10YR 6/1 gray Sandy Loam | |
| 137 | III | B | 31 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 138 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |
| 138 | II | B | 23 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 139 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 139 | II | B | 26 | 46 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 140 | I | A | 0 | 12 | | 10YR 5/3 brown Sandy Loam | |
| 140 | II | B1 | 12 | 35 | | 10YR 5/6 yellowish brown Sand | |
| 140 | III | B2 | 35 | 55 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 141 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 141 | II | B | 26 | 52 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 142 | I | A | 0 | 27 | | 10YR 5/3 brown Sandy Loam | |
| 142 | II | B | 27 | 52 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 143 | I | A | 0 | 21 | | 10YR 5/3 brown Sandy Loam | |
| 143 | II | B | 21 | 42 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |

Appendix A
STP Log: Area 3

| STP | Strat | Layer Type | Op (cm) | Clos (cm) | Termination | Soil Description/Munsell | Notes/Observations/Artifacts |
|-----|-------|------------|---------|-----------|-----------------------|-------------------------------|------------------------------|
| 144 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 144 | II | B | 26 | 50 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 145 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 145 | II | B | 26 | 52 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 146 | I | A | 0 | 29 | | 10YR 5/3 brown Sandy Loam | |
| 146 | II | B1 | 29 | 48 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 146 | III | B2 | 48 | 66 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 147 | I | A | 0 | 27 | | 10YR 5/3 brown Sandy Loam | |
| 147 | II | B | 27 | 52 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 148 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 148 | II | B | 26 | 55 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 149 | I | A | 0 | 27 | | 10YR 5/3 brown Sandy Loam | |
| 149 | II | B | 27 | 55 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 150 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 150 | II | B | 26 | 52 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 151 | I | A | 0 | 22 | | 10YR 5/3 brown Sandy Loam | |
| 151 | II | B | 22 | 55 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 152 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |
| 152 | II | B1 | 23 | 45 | | 10YR 5/6 yellowish brown Sand | |
| 152 | III | B2 | 45 | 66 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 153 | I | A | 0 | 33 | | 10YR 5/3 brown Sandy Loam | |
| 153 | II | B | 33 | 54 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 154 | I | A | 0 | 30 | | 10YR 5/3 brown Sandy Loam | |
| 154 | II | B | 30 | 56 | Terminated in Subsoil | 10YR null null Sand | |
| 155 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |
| 155 | II | B | 23 | 45 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 156 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 156 | II | B | 26 | 55 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 157 | I | A | 0 | 30 | | 10YR 5/3 brown Sandy Loam | |
| 157 | II | B | 30 | 56 | Terminated in Subsoil | 10YR null null Sand | |
| 158 | I | A | 0 | 25 | | 10YR 5/3 brown Sandy Loam | |
| 158 | II | B | 25 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 159 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 159 | II | B | 26 | 53 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 160 | I | A | 0 | 32 | | 10YR 5/3 brown Sandy Loam | |
| 160 | II | B | 32 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 161 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 161 | II | B | 26 | 55 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 162 | I | A | 0 | 20 | | 10YR 5/3 brown Sandy Loam | |
| 162 | II | B | 20 | 52 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 163 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 163 | II | B | 26 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |

Appendix A
STP Log: Area 3

| STP | Strat | Layer Type | Op (cm) | Clos (cm) | Termination | Soil Description/Munsell | Notes/Observations/Artifacts |
|-----|-------|------------|---------|-----------|-----------------------|---------------------------------|------------------------------|
| 164 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 164 | II | E | 26 | 33 | | 10YR 6/1 gray Sand | |
| 164 | III | B | 33 | 55 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 165 | I | A | 0 | 23 | | 10YR null null Sandy Loam | |
| 165 | II | E | 23 | 33 | | 10YR 6/1 gray Sand | |
| 165 | III | B | 33 | 52 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 166 | I | A | 0 | 16 | | 10YR 6/1 gray Sandy Loam | |
| 166 | II | B | 16 | 50 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 167 | I | A | 0 | 20 | | 10YR 5/3 brown Sandy Loam | |
| 167 | II | E | 20 | 35 | | 10YR 6/1 gray Sandy Loam | |
| 167 | III | B | 35 | 52 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 168 | I | A | 0 | 6 | | 10YR 4/1 dark gray Sandy Loam | |
| 168 | II | E | 6 | 30 | | 10YR 6/1 gray Sandy Loam | |
| 168 | III | B | 30 | 52 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 169 | I | A | 0 | 31 | | 10YR 5/3 brown Sandy Loam | |
| 169 | II | B | 31 | 50 | Terminated in Subsoil | 2.5Y 5/6 light olive brown Sand | |
| 170 | I | A | 0 | 28 | | 10YR 5/3 brown Sandy Loam | |
| 170 | II | B | 28 | 50 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 171 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 171 | II | B | 26 | 50 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 172 | I | A | 0 | 27 | | 10YR 5/3 brown Sandy Loam | |
| 172 | II | B | 27 | 55 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 173 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 173 | II | B | 26 | 46 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 174 | I | A | 0 | 24 | | 10YR 5/3 brown Sandy Loam | |
| 174 | II | B | 24 | 48 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 175 | I | A | 0 | 27 | | 10YR 5/3 brown Sandy Loam | |
| 175 | II | B | 27 | 55 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 176 | I | A | 0 | 29 | | 10YR 5/3 brown Sandy Loam | |
| 176 | II | B | 29 | 50 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 177 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 177 | II | B | 26 | 50 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 178 | I | A | 0 | 27 | | 10YR 5/3 brown Sandy Loam | |
| 178 | II | B | 27 | 52 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 179 | I | A | 0 | 31 | | 10YR 5/3 brown Sandy Loam | |
| 179 | II | B | 31 | 53 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 180 | I | A | 0 | 31 | | 10YR 5/3 brown Sandy Loam | |
| 180 | II | E | 31 | 56 | | 10YR 6/1 gray Sandy Loam | |
| 180 | III | B | 56 | 76 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 181 | I | A | 0 | 29 | | 10YR 5/3 brown Sandy Loam | |
| 181 | II | B | 29 | 50 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 182 | I | A | 0 | 23 | | 10YR 5/3 brown Sandy Loam | |

**Appendix A
STP Log: Area 3**

| STP | Strat | Layer Type | Op (cm) | Clos (cm) | Termination | Soil Description/Munsell | Notes/Observations/Artifacts |
|-----|-------|------------|---------|-----------|-----------------------|---|--------------------------------|
| 182 | II | B | 23 | 48 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 183 | I | A | 0 | 22 | | 10YR 5/3 brown Sandy Loam | |
| 183 | II | B | 22 | 43 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 184 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 184 | II | B | 26 | 49 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 185 | I | A | 0 | 31 | | 10YR 5/3 brown Sandy Loam | |
| 185 | II | B | 31 | 53 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 186 | I | A | 0 | 27 | | 10YR 5/3 brown Sandy Loam | |
| 186 | II | B | 27 | 53 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 187 | I | A | 0 | 33 | | 10YR 5/3 brown Sandy Loam | |
| 187 | II | B | 33 | 53 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 188 | I | A | 0 | 32 | | 10YR 5/3 brown Sandy Loam | |
| 188 | II | B | 32 | 52 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 189 | I | A | 0 | 35 | | 10YR 5/3 brown Sandy Loam | |
| 189 | II | B | 35 | 56 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 190 | I | A | 0 | 12 | | 10YR 3/2 very dark grayish brown Sandy Loam | |
| 190 | II | E | 12 | 36 | | 10YR 6/1 gray Sandy Loam | |
| 190 | III | B | 36 | 60 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 191 | I | Fill | 0 | 43 | | 10YR 5/3 brown Sandy Loam | |
| 191 | II | Ab | 43 | 60 | | 10YR 3/2 very dark grayish brown Sandy Loam | |
| 191 | III | B | 60 | 82 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 192 | I | A | 0 | 39 | | 10YR 5/3 brown Sandy Loam | |
| 192 | II | B | 39 | 56 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 193 | I | A | 0 | 33 | | 10YR 5/3 brown Sandy Loam | |
| 193 | II | B | 33 | 58 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 194 | I | A | 0 | 36 | | 10YR 5/3 brown Sandy Loam | |
| 194 | II | B | 36 | 60 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 195 | I | A | 0 | 36 | | 10YR 5/3 brown Sandy Loam | |
| 195 | II | B | 36 | 58 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 196 | I | A | 0 | 12 | | 10YR 5/3 brown Sandy Loam | |
| 196 | II | B | 12 | 53 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 197 | I | A | 0 | 33 | | 10YR 5/3 brown Sandy Loam | |
| 197 | II | B | 33 | 50 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 198 | I | A | 0 | 30 | | 10YR 5/3 brown Sandy Loam | |
| 198 | II | B1 | 30 | 44 | | 10YR 5/6 yellowish brown Sand | |
| 198 | III | B2 | 44 | 69 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 199 | I | A | 0 | 32 | | 10YR 5/3 brown Sandy Loam | |
| 199 | II | B | 32 | 60 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 200 | I | A | 0 | 32 | | 10YR 5/3 brown Sandy Loam | |
| 200 | II | B | 32 | 76 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 201 | I | A | 0 | 36 | | 10YR 5/3 brown Sandy Loam | 12 Mockley type ceramic sherds |
| 201 | II | B1 | 36 | 70 | | 10YR 5/6 yellowish brown Sand | |

Appendix A
STP Log: Area 3

| STP | Strat | Layer Type | Op (cm) | Clos (cm) | Termination | Soil Description/Munsell | Notes/Observations/Artifacts |
|-----|-------|------------|---------|-----------|-----------------------|--------------------------------|------------------------------|
| 201 | III | B2 | 70 | 120 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 202 | I | A | 0 | 30 | | 10YR 5/3 brown Sandy Loam | |
| 202 | II | B | 30 | 53 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 203 | I | A | 0 | 27 | | 10YR 5/3 brown Sandy Loam | |
| 203 | II | B | 27 | 49 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 204 | I | A | 0 | 12 | | 10YR 4/1 dark gray Sandy Loam | |
| 204 | II | E | 12 | 30 | | 10YR 6/1 gray Sandy Loam | |
| 204 | III | B | 30 | 52 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 205 | I | A | 0 | 8 | | 10YR 5/3 brown Sandy Loam | |
| 205 | II | E | 8 | 23 | | 10YR 6/1 gray Sandy Loam | |
| 205 | III | B | 23 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 206 | I | A | 0 | 9 | | 10YR 5/3 brown Silty Clay Loam | |
| 206 | II | E | 9 | 31 | | 10YR 6/1 gray Sandy Loam | |
| 206 | III | B | 31 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 207 | I | A | 0 | 30 | | 10YR 5/3 brown Sandy Loam | |
| 207 | II | B | 30 | 51 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 208 | I | A | 0 | 12 | | 10YR 4/1 dark gray Sandy Loam | |
| 208 | II | E | 12 | 30 | | 10YR 6/1 gray Sandy Loam | |
| 208 | III | B | 30 | 55 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 209 | I | A | 0 | 13 | | 10YR 5/3 brown Sandy Loam | |
| 209 | II | E | 13 | 26 | | 10YR 6/1 gray Sandy Loam | |
| 209 | III | B | 26 | 49 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 210 | I | Fill | 0 | 60 | | 10YR 5/3 brown Sandy Loam | |
| 210 | II | B | 60 | 82 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 211 | I | A | 0 | 13 | | 10YR 5/3 brown Sandy Loam | |
| 211 | II | E | 13 | 23 | | 10YR 6/1 gray Sandy Loam | |
| 211 | III | B | 23 | 47 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 212 | I | A | 0 | 9 | | 10YR 5/3 brown Sandy Loam | |
| 212 | II | E | 9 | 28 | | 10YR 6/1 gray Sandy Loam | |
| 212 | III | B | 28 | 44 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 213 | I | A | 0 | 36 | | 10YR 5/3 brown Sandy Loam | |
| 213 | II | B | 36 | 55 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 214 | I | A | 0 | 42 | | 10YR 5/3 brown Sandy Loam | 4 brick, 8 mortar fragments |
| 214 | II | B | 42 | 70 | Terminated in Subsoil | 2.5Y 7/8 yellow Sand | |
| 215 | I | A | 0 | 35 | | 10YR 5/3 brown Sandy Loam | |
| 215 | II | B | 35 | 60 | Water table | 10YR 5/6 yellowish brown Sand | |
| 216 | I | A | 0 | 36 | | 10YR 5/3 brown Sandy Loam | |
| 216 | II | B | 36 | 52 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 217 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 217 | II | B | 26 | 46 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 218 | I | A | 0 | 24 | | 10YR 5/3 brown Sandy Loam | |
| 218 | II | B | 24 | 50 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |

Appendix A
STP Log: Area 3

| STP | Strat | Layer Type | Op (cm) | Clos (cm) | Termination | Soil Description/Munsell | Notes/Observations/Artifacts |
|-----|-------|------------|---------|-----------|-----------------------|-------------------------------|------------------------------|
| 219 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 219 | II | B | 26 | 50 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 220 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 220 | II | B | 26 | 50 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 221 | I | A | 0 | 29 | | 10YR 5/3 brown Sandy Loam | |
| 221 | II | B | 29 | 50 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 222 | I | A | 0 | 26 | | 10YR 4/1 dark gray Sandy Loam | |
| 222 | II | E | 26 | 40 | | 10YR 6/1 gray Sandy Loam | |
| 222 | III | B | 40 | 60 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 223 | I | A | 0 | 23 | | 10YR 4/1 dark gray Sandy Loam | |
| 223 | II | E | 23 | 35 | | 10YR 6/1 gray Sandy Loam | |
| 223 | III | B | 35 | 53 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 224 | I | A | 0 | 18 | | 10YR 4/1 dark gray Sandy Loam | |
| 224 | II | E | 18 | 32 | | 10YR 6/1 gray Sandy Loam | |
| 224 | III | B | 32 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 225 | I | A | 0 | 23 | | 10YR 4/1 dark gray Sandy Loam | |
| 225 | II | E | 23 | 35 | | 10YR 6/1 gray Sandy Loam | |
| 225 | III | B | 35 | 53 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 226 | I | A | 0 | 21 | | 10YR 4/1 dark gray Sandy Loam | |
| 226 | II | B | 21 | 50 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 227 | I | A | 0 | 24 | | 10YR 4/1 dark gray Sandy Loam | |
| 227 | II | B | 24 | 50 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 228 | I | A | 0 | 30 | Root Impasse | 10YR 4/1 dark gray Sandy Loam | |
| 229 | I | A | 0 | 26 | | 10YR 4/1 dark gray Sandy Loam | |
| 229 | II | E | 26 | 43 | | 10YR 6/1 gray Sandy Loam | |
| 229 | III | B | 43 | 60 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 230 | I | A | 0 | 28 | | 10YR 4/1 dark gray Sandy Loam | |
| 230 | II | E | 28 | 41 | | 10YR 6/1 gray Sand | |
| 230 | III | B | 41 | 60 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 231 | I | A | 0 | 20 | | 10YR 4/1 dark gray Sandy Loam | |
| 231 | II | B1 | 20 | 39 | | 10YR 5/6 yellowish brown Sand | |
| 231 | III | B2 | 39 | 56 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 232 | I | A | 0 | 26 | | 10YR 4/1 dark gray Sandy Loam | |
| 232 | II | E | 26 | 41 | | 10YR 6/1 gray Sandy Loam | |
| 232 | III | B | 41 | 60 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 233 | I | A | 0 | 70 | | 10YR 4/1 dark gray Sandy Loam | |
| 233 | II | B | 70 | 91 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 234 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 234 | II | E | 26 | 50 | | 10YR 6/1 gray Sandy Loam | |
| 234 | III | B | 50 | 72 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 235 | I | A | 0 | 26 | | 10YR 5/3 brown Sandy Loam | |
| 235 | II | E | 26 | 40 | Root Impasse | 10YR 6/1 gray Sandy Loam | |

**Appendix A
STP Log: Area 3**

| STP | Strat | Layer Type | Op (cm) | Clos (cm) | Termination | Soil Description/Munsell | Notes/Observations/Artifacts |
|-----|-------|------------|---------|-----------|-----------------------|---|------------------------------|
| 236 | I | A | 0 | 27 | | 10YR 4/1 dark gray Sandy Loam | |
| 236 | II | E | 27 | 46 | | 10YR 6/1 gray Sandy Loam | |
| 236 | III | B | 46 | 70 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 237 | I | A | 0 | 16 | | 10YR 4/1 dark gray Sandy Loam | |
| 237 | II | E | 16 | 35 | | 10YR 6/1 gray Sandy Loam | |
| 237 | III | B | 35 | 59 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 238 | I | A | 0 | 30 | | 10YR 4/1 dark gray Sandy Loam | |
| 238 | II | E | 30 | 42 | | 10YR 6/1 gray Sandy Loam | |
| 238 | III | B | 42 | 60 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 239 | I | A | 0 | 31 | | 10YR 4/1 dark gray Sandy Loam | |
| 239 | II | B1 | 31 | 40 | | 10YR 5/6 yellowish brown Sand | |
| 239 | III | B2 | 40 | 60 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand | |
| 240 | I | A | 0 | 29 | | 10YR 4/1 dark gray Sandy Loam | |
| 240 | II | E | 29 | 40 | | 10YR 6/1 gray Sandy Loam | |
| 240 | III | B | 40 | 60 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 241 | I | A | 0 | 39 | | 10YR 5/3 brown Sandy Loam | |
| 241 | II | B | 39 | 50 | Water table | 10YR 5/6 yellowish brown Sand | |
| 242 | I | A | 0 | 30 | Water table | 10YR null null Sandy Loam | |
| 243 | I | A | 0 | 24 | Root Impasse | 10YR 3/2 very dark grayish brown Sandy Loam | |
| 244 | I | A | 0 | 26 | | 10YR 4/1 dark gray Sandy Loam | |
| 244 | II | E | 26 | 40 | | 10YR 6/1 gray Sandy Loam | |
| 244 | III | B | 40 | 60 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 245 | I | A | 0 | 30 | | 10YR 5/3 brown Sandy Loam | |
| 245 | II | B | 30 | 55 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 246 | I | Ao | 0 | 16 | | 10YR 4/1 dark gray Loam | |
| 246 | II | E | 16 | 30 | | 10YR 6/1 gray Sandy Loam | |
| 246 | III | B | 30 | 50 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 247 | I | A | 0 | 26 | | 10YR 4/1 dark gray Sandy Loam | |
| 247 | II | E | 26 | 40 | | 10YR 6/1 gray Sand | |
| 247 | III | B | 40 | 61 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 248 | I | Ao | 0 | 13 | | 10YR 3/2 very dark grayish brown Loam | |
| 248 | II | A | 13 | 39 | | 10YR 5/3 brown Sandy Loam | |
| 248 | III | E | 39 | 50 | | 10YR 6/1 gray Sandy Loam | |
| 248 | IV | B | 50 | 70 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand | |
| 249 | I | Ao | 0 | 20 | Water table | 10YR 3/2 very dark grayish brown Loam | |
| 250 | I | A | 0 | 26 | Water table | 10YR 3/1 very dark gray Sandy Loam | |
| 251 | I | A | 0 | 23 | Water table | 10YR 3/2 very dark grayish brown Sandy Loam | |
| 252 | I | A | 0 | 25 | Root Impasse | 10YR 4/1 dark gray Sandy Loam | |
| 253 | I | A | 0 | 13 | | 10YR 4/1 dark gray Sandy Loam | |
| 253 | II | E | 13 | 30 | | 10YR 5/1 gray Sandy Loam | |
| 253 | III | B | 30 | 50 | Water table | 10YR 5/6 yellowish brown Sand | |
| 254 | I | Ao | 0 | 20 | | 10YR 3/2 very dark grayish brown Sandy Loam | 8 ft West of STP 201 |

**Appendix A
STP Log: Area 3**

| STP | Strat | Layer Type | Op (cm) | Clos (cm) | Termination | Soil Description/Munsell | Notes/Observations/Artifacts |
|-----|-------|------------|---------|-----------|-----------------------|---|------------------------------|
| 254 | II | A | 20 | 28 | | 10YR 5/3 brown Sandy Loam | 8 ft West of STP 201 |
| 254 | III | B1 | 28 | 50 | | 10YR 6/3 pale brown Sand | 8 ft West of STP 201 |
| 254 | IV | B2 | 50 | 80 | Terminated in Subsoil | 10YR 6/1 gray Sand | 8 ft West of STP 201 |
| 255 | I | Ao | 0 | 35 | | 10YR 3/2 very dark grayish brown Sandy Loam | 8 ft South of STP 201 |
| 255 | II | A | 35 | 55 | | 10YR 5/3 brown Sandy Loam | 8 ft South of STP 201 |
| 255 | III | B | 55 | 120 | Terminated in Subsoil | 10YR 6/2 light brownish gray Sandy Clay | 8 ft South of STP 201 |
| 256 | I | Ao | 0 | 19 | | 10YR 3/2 very dark grayish brown Sandy Loam | 8 ft North of STP 201 |
| 256 | II | A | 19 | 26 | Root Impasse | 10YR 5/3 brown Sandy Loam | 8 ft North of STP 201 |
| 257 | I | Ao | 0 | 20 | | 10YR 3/2 very dark grayish brown Sandy Loam | 8 ft East of STP 201 |
| 257 | II | A | 20 | 32 | | 10YR 5/3 brown Sandy Loam | 8 ft East of STP 201 |
| 257 | III | B1 | 32 | 50 | | 10YR 5/6 yellowish brown Sand | 8 ft East of STP 201 |
| 257 | IV | B2 | 50 | 82 | Terminated in Subsoil | 10YR 6/1 gray Sand | 8 ft East of STP 201 |

Appendix A
STP Log: Area 4

| STP | Soil Designation | Strat | Layer Type | Op (cm) | Clos (cm) | Termination | Soil Description/Munsell |
|-----|------------------|-------|------------|---------|-----------|-----------------------|---|
| 38 | | I | Ao | 0 | 12 | | 7.5YR 3/3 dark brown Loam |
| 38 | | II | E | 12 | 24 | | 7.5YR 4/2 brown Sandy Loam |
| 38 | | III | B | 24 | 43 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand |
| | | | | | | | |
| 61 | | I | A | 0 | 11 | | 10YR 3/3 dark brown Loam |
| 61 | | II | E | 11 | 25 | | 10YR 5/2 grayish brown Sandy Loam |
| 61 | | III | B | 25 | 44 | Terminated in Subsoil | 10YR 5/6 yellowish brown Sand |
| | | | | | | | |
| 114 | | I | Ao | 0 | 18 | | 2.5Y 4/1 dark gray Sandy Loam |
| 114 | | II | B1 | 18 | 27 | | 10YR 5/6 yellowish brown Sand |
| 114 | | III | B2 | 27 | 46 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand |
| | | | | | | | |
| 125 | | I | Ao | 0 | 16 | Root Impasse | 10YR 3/3 dark brown Loam |
| | | | | | | | |
| 179 | | I | Ao | 0 | 8 | | 10YR 3/3 dark brown Loam |
| 179 | | II | A | 8 | 18 | | 10YR 5/3 brown Sandy Loam |
| 179 | | III | B1 | 18 | 32 | | 10YR 5/6 yellowish brown Sand |
| 179 | | IV | B2 | 32 | 54 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand |
| | | | | | | | |
| 184 | | I | Ao | 0 | 7 | | 10YR 3/3 dark brown Loam |
| 184 | | II | A | 7 | 32 | | 2.5Y 4/1 dark gray Silt Loam |
| 184 | | III | B | 32 | 53 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand |
| | | | | | | | |
| 285 | | I | A | 0 | 20 | | 10YR 4/1 dark gray Sandy Loam |
| 285 | | II | E | 20 | 48 | | 10YR 6/1 gray Sandy Loam |
| 285 | | III | B1 | 48 | 50 | | 10YR 5/6 yellowish brown Sand |
| 285 | | IV | B2 | 50 | 70 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand |
| | | | | | | | |
| 308 | | I | A | 0 | 33 | | 10YR 3/2 very dark grayish brown Sandy Loam |
| 308 | | II | B | 33 | 55 | Terminated in Subsoil | 2.5Y 7/6 yellow Sand |
| | | | | | | | |
| 336 | | I | A | 0 | 29 | Water table | 7.5YR 5/1 gray Clay Loam |

Appendix B

Artifact Catalog

**Appendix B
Artifact Catalog: Area 3**

| STP | TU | Strat | Lv | Op | Clo | N | Class | Group | Type | Material | Notes | Date Range | Portion | Wt (g) |
|-----|----|-------|----|----|-----|----|------------|---------------|---------|----------|--|----------------------------------|----------|--------|
| 201 | | I | 1 | 0 | 36 | 12 | Precontact | Ceramic | Mockley | Ceramic | cord textured exterior surface, smoothed interior; crushed quartz temper, slightly sandy paste | Middle Woodland: AD 200 - AD 900 | Fragment | 151 |
| 214 | | I | 1 | 0 | 42 | 8 | Historic | Architectural | Mortar | Ceramic | | | Fragment | 110.9 |
| 214 | | I | 1 | 0 | 42 | 4 | Historic | Architectural | Brick | Ceramic | 1 complete brick, 3 frags, sandy paste, handmade | | | 1347.9 |
| | | | | | | | | | | | | | | |
| | 1 | II | 1 | 24 | 44 | 3 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell temper | Middle Woodland: AD 200 - AD 900 | Fragment | 103.3 |
| | 1 | II | 1 | 24 | 44 | 24 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland: AD 200 - AD 900 | Fragment | 261.4 |
| | 1 | II | 1 | 24 | 44 | 2 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland: AD 200 - AD 900 | Fragment | 106.8 |
| | 1 | II | 1 | 24 | 44 | 3 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland: AD 200 - AD 900 | Fragment | 14.7 |
| | 1 | II | 1 | 24 | 44 | 1 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland: AD 200 - AD 900 | Fragment | 35 |
| | 1 | II | 1 | 24 | 44 | 4 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland: AD 200 - AD 900 | Fragment | 60.4 |
| | 1 | II | 1 | 24 | 44 | 4 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland: AD 200 - AD 900 | Fragment | 38 |
| | 1 | II | 1 | 24 | 44 | 3 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland: AD 200 - AD 900 | Fragment | 38 |
| | 1 | II | 1 | 24 | 44 | 1 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland: AD 200 - AD 900 | Fragment | 80.7 |
| | 1 | II | 1 | 24 | 44 | 1 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland: AD 200 - AD 900 | Fragment | 54.7 |
| | 1 | II | 1 | 24 | 44 | 1 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell temper | Middle Woodland: AD 200 - AD 900 | Fragment | 36.6 |
| | 1 | II | 1 | 24 | 44 | 1 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland: AD 200 - AD 900 | Fragment | 57.4 |
| | 1 | II | 1 | 24 | 44 | 1 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland: AD 200- AD 900 | Fragment | 52.3 |
| | 1 | II | 1 | 24 | 44 | 1 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland: AD 200 - AD 900 | Fragment | 17.2 |
| | 1 | III | 1 | 44 | 54 | 3 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, eroded interior; shell and quartz temper | Middle Woodland; AD 200 - AD 900 | Fragment | 7.3 |
| | | | | | | | | | | | | | | |
| | 2 | II | 1 | 24 | 44 | 2 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland: AD 200 - AD 900 | Fragment | 44.1 |
| | 2 | II | 1 | 24 | 44 | 14 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland: AD 200 - AD 900 | Fragment | 46.8 |
| | 2 | II | 1 | 24 | 44 | 1 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland: AD 200 - AD 900 | Fragment | 21.8 |
| | 2 | II | 1 | 24 | 44 | 1 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland: AD 200 - AD 900 | Fragment | 27.2 |
| | 2 | II | 1 | 24 | 44 | 1 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland: AD 200 - AD 900 | Fragment | 45.1 |
| | 2 | II | 1 | 24 | 44 | 1 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland: AD 200 - AD 900 | Fragment | 22.7 |
| | 2 | II | 1 | 24 | 44 | 5 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland: AD 200 - AD 900 | Fragment | 193.3 |
| | 2 | II | 1 | 24 | 44 | 3 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland: AD 200 - AD 900 | Fragment | 8.3 |
| | 2 | II | 1 | 24 | 44 | 1 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell and quartz temper | Middle Woodland; AD 200 - AD 900 | Fragment | 57.5 |

**Appendix B
Artifact Catalog: Area 3**

| STP | TU | Strat | Lv | Op | Clo | N | Class | Group | Type | Material | Notes | Date Range | Portion | Wt (g) |
|-----|----|-------|----|----|-----|---|------------|---------|---------|----------|---|----------------------------------|----------|--------|
| | 2 | II | 1 | 24 | 44 | 3 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper; possible rim sherd | Middle Woodland: AD 200 - AD 900 | Fragment | 19.1 |
| | 2 | II | 1 | 24 | 44 | 1 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell & quartz temper | Middle Woodland; AD 200 - AD 900 | Fragment | 22.4 |
| | 2 | II | 1 | 24 | 44 | 2 | Precontact | Ceramic | Mockley | Ceramic | eroded exterior, smoothed interior; shell & quartz temper | Middle Woodland; AD 200 - AD 900 | Fragment | 6.5 |
| | 2 | II | 1 | 24 | 44 | 2 | Precontact | Ceramic | Mockley | Ceramic | cord impressed exterior surface texture, smoothed interior; shell temper | Middle Woodland; AD 200-AD 900 | Fragment | 25.4 |
| | 2 | III | 1 | 44 | 54 | 4 | Precontact | Ceramic | Mockley | Ceramic | lightly textured surface, most likely cord or net impressed; Smoothed interior. Visually differs from other sherds collected, slightly lighter (pink-buff) paste, very thick sherds, shell tempered with some quartz. | Middle Woodland; AD 200-AD 900 | Fragment | 84.4 |

**Appendix B
Artifact Catalog: Area 4**

| STP | TU | Strat | Lv | Op | Clos | N | Class | Group | Type | Material | Notes | Cortex | Date Range | Portion | Wt (g) |
|-----|----|-------|----|----|------|---|------------|----------|------------------|------------|---|-----------|-----------------------------|-----------------|--------|
| 38 | | II | 1 | 12 | 24 | 2 | Precontact | Ceramic | Killens | Ceramic | Fabric-impressed exterior surface, smoothed interior surface; lightly crushed shell tempered and grit | | Late Woodland, 1200-1700 AD | Fragment | 12.3 |
| | 1 | II | 1 | 24 | 35 | 1 | Precontact | Debitage | Flake | Chert | Size S, thermally altered, proximal fragment | | | Fragment | 3.1 |
| | 1 | II | 1 | 24 | 35 | 6 | Precontact | Ceramic | Killens | Ceramic | Fabric-impressed exterior surface, smoothed interior surface; lightly crushed shell tempered and grit | Tertiary | Late Woodland, 1200-1700 AD | Fragment | 56.7 |
| | 1 | III | 2 | 48 | 56 | 1 | Precontact | Tool | Projectile Point | Chalcedony | Asymmetric, narrow stem, distal tip missing, one slightly excurvate/one straight margin, one rounded/one barbed shoulder, convex cross-sec, random flaking, possibly heavily resharpened Stanley type hafted biface; 2.7x2.5x0.4 cm | | Middle Archaic, ca. 5000 BC | 75-95% Complete | 4.2 |
| | 1 | III | 2 | 48 | 56 | 1 | Precontact | Debitage | Flake | Jasper | Size S | Secondary | | Complete | 0.2 |
| | 1 | III | 2 | 48 | 56 | 1 | Precontact | Debitage | Flake | Chalcedony | Size S, distal fragment | Secondary | | Fragment | 0.3 |
| | 1 | IV | 1 | 56 | 66 | 1 | Precontact | Debitage | Flake | Jasper | Size S; proximal fragment | Tertiary | | Fragment | 0.05 |
| | 1 | IV | 1 | 56 | 66 | 1 | Precontact | Debitage | Flake | Jasper | Size S; distal fragment | Tertiary | | Fragment | 0.01 |
| | 1 | IV | 1 | 56 | 66 | 1 | Precontact | Debitage | Flake | Chert | Size S | Tertiary | | Complete | 0.2 |
| | 1 | IV | 1 | 56 | 66 | 1 | Precontact | Debitage | Flake | Jasper | Size M; heat altered, spalled, cortical | Primary | | Complete | 0.9 |
| | 1 | IV | 1 | 56 | 66 | 1 | Precontact | Debitage | Flake | Jasper | Size S, cortical | Primary | | Complete | 0.1 |
| | 1 | IV | 1 | 56 | 66 | 1 | Precontact | Debitage | Flake | Jasper | Size XS | Secondary | | Fragment | 0.01 |
| | 1 | IV | 1 | 56 | 66 | 1 | Precontact | Debitage | Flake | Jasper | Size S; heat altered | Tertiary | | Complete | 0.2 |
| | 1 | IV | 2 | 66 | 76 | 1 | Precontact | Debitage | Flake | Jasper | Size S; heat altered, spalled. | Primary | | Complete | 0.1 |
| | 1 | IV | 2 | 66 | 76 | 1 | Precontact | Debitage | Flake | Jasper | Size S | Secondary | | Complete | 0.2 |
| | 1 | IV | 2 | 66 | 76 | 1 | Precontact | Debitage | Flake | Jasper | Size S; proximal fragment | Secondary | | Fragment | 0.1 |
| | 1 | IV | 2 | 66 | 76 | 1 | Precontact | Debitage | Flake | Jasper | Size XS; medial fragment | Secondary | | Fragment | 0.01 |
| | 1 | IV | 2 | 66 | 76 | 1 | Precontact | Debitage | Flake | Jasper | Size M; proximal fragment | Tertiary | | Fragment | 0.3 |
| | | | | | | | | | | | | | | | |
| | 2 | II | 1 | 15 | 32 | 1 | Precontact | Ceramic | Killens | Ceramic | Fabric-impressed exterior surface, smoothed interior surface; lightly crushed shell tempered and grit | | Late Woodland, 1200-1700 AD | Fragment | 9.4 |
| | 2 | III | 1 | 32 | 42 | 1 | Precontact | Debitage | Flake | Jasper | Size L; heat altered | Primary | | Complete | 1.3 |
| | 2 | III | 1 | 32 | 42 | 1 | Precontact | Debitage | Flake | Jasper | Size S | Tertiary | | Complete | 0.1 |
| | 2 | III | 1 | 32 | 42 | 1 | Precontact | Debitage | Flake | Jasper | Size S; distal fragment | Tertiary | | Fragment | 0.1 |
| | 2 | III | 2 | 42 | 52 | 1 | Precontact | Debitage | Flake | Jasper | Size L; heat altered, spalled | Primary | | Complete | 2.4 |
| | 2 | III | 2 | 42 | 52 | 1 | Precontact | Debitage | Flake | Jasper | Size L; proximal fragment, heat altered, cortical | Primary | | Fragment | 3.1 |
| | 2 | III | 2 | 42 | 52 | 1 | Precontact | Debitage | Flake | Jasper | Size M; heat altered, spalled, cortical | Primary | | Complete | 0.4 |
| | 2 | IV | 1 | 52 | 66 | 1 | Precontact | Debitage | Flake | Jasper | Size M | Secondary | | Complete | 0.1 |
| | 2 | IV | 1 | 52 | 66 | 1 | Precontact | Debitage | Flake | Jasper | Size M | Tertiary | | Complete | 0.2 |
| | 2 | IV | 1 | 52 | 66 | 1 | Precontact | Debitage | Flake | Jasper | Size S; distal fragment | Tertiary | | Fragment | 0.05 |
| | 2 | IV | 1 | 52 | 66 | 1 | Precontact | Debitage | Flake | Quartz | Size XS; distal fragment | Tertiary | | Fragment | 0.05 |
| | 2 | IV | 1 | 52 | 66 | 1 | Precontact | Debitage | Flake | Chert | Size M; cortical, non-or/shatter | Primary | | Complete | 0.8 |
| | 2 | IV | 1 | 52 | 66 | 1 | Precontact | Debitage | Flake | Jasper | Size S; blocky | Primary | | Complete | 0.2 |
| | 2 | IV | 1 | 52 | 66 | 1 | Precontact | Debitage | Flake | Jasper | Size S; heat altered | Primary | | Complete | 0.3 |
| | 2 | IV | 1 | 52 | 66 | 1 | Precontact | Debitage | Flake | Jasper | Size S; heat altered, spalled | Secondary | | Complete | 0.1 |
| | 2 | IV | 1 | 52 | 66 | 1 | Precontact | Debitage | Flake | Jasper | Size XS | Secondary | | Complete | 0.05 |
| | 2 | IV | 2 | 66 | 76 | 1 | Precontact | Debitage | Flake | Chert | Size M; distal fragment | Tertiary | | Fragment | 0.4 |
| | 2 | IV | 2 | 66 | 76 | 1 | Precontact | Debitage | Flake | Jasper | Size S; cortical | Primary | | Complete | 0.2 |
| | 2 | IV | 2 | 66 | 76 | 1 | Precontact | Debitage | Flake | Jasper | Size S | Secondary | | Complete | 0.5 |
| | 2 | IV | 2 | 66 | 76 | 1 | Precontact | Debitage | Flake | Jasper | Size M; heat altered, spalled | Secondary | | Complete | 1.1 |

Appendix C

Qualifications of Researchers

Michael Lenert, Ph.D., RPA #989430
Principal Archaeologist

Dr. Lenert is an archaeologist who specializes in navigating projects through the Section 106 process for private and public sector clients. He has experience with Phase I assessment and identification, Phase II evaluation, Phase III mitigation, and archaeological monitoring projects in Pennsylvania, Delaware, Maryland, New Jersey, Washington D.C., New York, West Virginia, Florida, Georgia, and Vermont. Dr. Lenert manages all project domains, including investigation fieldwork, data analyses, budgets, client and agency coordination, project documentation, and compliance report production. He meets the requirements for Professional Archaeologist as specified by the Secretary of the Interior in 36 CFR 61.

Over his 26+ years of experience, he has developed and implemented compliance project research designs, supervised field crews, and served as archaeology group leader and laboratory supervisor. Most recently, Dr. Lenert is a consultant Cultural Resource Professional (CRP) for PennDOT Engineering Districts 5-0 and 6-0, and for the statewide Pennsylvania P3 bridge replacement project. He has performed at a similar capacity as the On-Call Archaeologist for the City of Frederick, Maryland. In this role, he closely shepherds projects through the Section 106 process for federal and state agencies.

Education

- 2007 Ph.D., Anthropology, University of California, Los Angeles
- 2000 M.A., Anthropology, University of Montana
- 1990 B.A., Anthropology and Geography, University of Delaware

Professional Experience

- 2019 – Present A.D. Marble *Principal Investigator/Archaeologist*
- 2017 – 2019 JMT *Principal Investigator/Archaeologist*
- 2007 – 2017 A.D. Marble *Principal Investigator/Archaeologist*
- 1993 – 1998 Hunter Research, Inc. *Archaeologist*
- 1990 – 1993 U of DE, Center for Archaeological Research *Archaeologist*

Academic Experience

- 2004-2006 Maccallum and Katz Site Investigations, B.C., Canada *Project Director*
- 2002-2006 Fraser Valley Archaeological Project, B.C., Canada *Research Team Member*
- 1999-2003 Keatley Creek and Bridge River, B.C., Canada *Research Team Member*

Professional Affiliations

Society for American Archaeology
Archaeological Society of Delaware
Middle Atlantic Archaeology Conference
Pennsylvania Archaeological Council
Register of Professional Archaeologists

Society for Pennsylvania Archaeology
Northern Chesapeake Archaeological Society
Philadelphia Archaeological Forum
Archaeological Society of New Jersey
Eastern States Archaeological Federation

Amadeusz Zajac
Field Director/Crew Chief

Amadeusz Zajac is an archaeological field director with nine years of experience in cultural resources management. His primary responsibilities consist of conducting and directing Phase I through III archaeological testing and performing laboratory analysis, including supporting research and curation for the state repositories in the surrounding area. Mr. Zajac has worked on archaeological excavation and curation in numerous states throughout the Mid-Atlantic region. His education centered on physical anthropology, archaeology, and geological science.

Education

- 2011 Archaeological Field School, Jamestown
- 2011 B.S., Evolutionary Anthropology, Rutgers University

Professional Experience

| | | |
|--------------|---------------------|---|
| 2012-Present | A.D. Marble | <i>Archaeological Crew Chief</i> |
| 2012 | Stell Environmental | <i>Archaeological Field Technician</i> |
| 2012 | TEC Inc. | <i>Archaeological Field Technician</i> |
| 2011 – 2012 | A.D. Marble | <i>Archaeological Laboratory/Field Technician</i> |
| 2011 | AECOM | <i>Field Archaeologist</i> |

Jennifer Falchetta, M.A., RPA
Field Director

Jennifer Falchetta has more than 13 years of experience in archaeology in the northeastern United States. She has managed more than 50 archaeological field projects in New Jersey, Pennsylvania, Delaware, and New York. She specializes in prehistoric archaeology of northeastern North America; historic archaeology, with experience in both rural and urban settings (eighteenth to twentieth centuries); cultural resource management; and prehistoric ceramic and artifact analysis. She has been involved in all aspects of historic and prehistoric archaeology from Phase I surveys to data recovery projects on farmsteads, industrial sites, and floodplain and residual settings.

Education

- 2018 M.A., Anthropology, Monmouth University
- 2007 B.A., Anthropology, West Chester University of Pennsylvania

Professional Experience

| | | |
|----------------|------------------------|--|
| 2018 – Present | A.D. Marble | <i>Archaeological Field Director</i> |
| 2018 – 2018 | Maser Consulting | <i>Archaeological Field Director</i> |
| 2013 – 2018 | RGA, Inc. | <i>Crew Chief/Field Technician</i> |
| 2012 – 2013 | NJ HPO | <i>Historic Preservation Associate</i> |
| 2010 – 2012 | URS, Corp. (now AECOM) | <i>Graduate Archaeologist</i> |
| 2008 – 2010 | RGA, Inc. | <i>Field Technician</i> |

Professional Training

- 40-Hour OSHA HAZWOPER Training
- 10-Hour OSHA Construction Training

Affiliations

Register of Professional Archaeologists (18019)

Christine D. Gill
Archaeology Laboratory Director

Ms. Gill is A.D. Marble’s laboratory director and has 25 years of experience in laboratory and field archaeology, conservation science, material analysis, and geoarchaeology. She has excavated and analyzed artifacts at all phases of archaeological testing. She oversees all functions of the archaeological laboratory and staff, including: cleaning, identification, dating, and inventorying artifacts; and preparation of artifacts, photographs, and field documentation for permanent curation. Ms. Gill is familiar with curation under the state guidelines of Pennsylvania, New Jersey, Maryland, Delaware, New York, Virginia, Alaska, Indiana, and the National Park Service. She has experience working under NAGPRA legislation and has evaluated and repatriated NAGPRA collections.

Ms. Gill has designed and maintained custom databases for photographic and archaeological collections, including the artifact cataloging system used by A.D. Marble. She is trained in field conservation and in safe methods of moving and transporting fragile artifacts in both field and museum environments. She enjoys public outreach and has run programs for both adults and children on archaeology-related topics. Ms. Gill’s prior experience includes material analysis for architectural restoration, waste water and lead paint testing, hazardous material containment and removal, process chemistry, and analytical chemical testing.

Education

1996 B.S., Chemistry, Rochester Institute of Technology

Professional Experience

| | | |
|----------------|---|--|
| 2004 – Present | A.D. Marble | <i>Archaeological Lab Director/ Archaeologist</i> |
| 2003 - 2004 | General Motors Acceptance Corporation | <i>Credit Administrator</i> |
| 2002 - 2003 | LaPorta & Associates Geologic Consulting, LLC | <i>Archaeologist</i> |
| 2002 - 2003 | Independent Contractor for Historic Elk Landing, Inc. | <i>Laboratory Director</i> |
| 2001 - 2002 | Bristol Myers-Squibb Field Sales Service Center | <i>Administrative Assistant</i> |
| 1998 - 2001 | Cultural Heritage Research Services, Inc. | <i>Assistant Laboratory Director, Acting Laboratory Director, Field Technician</i> |

Professional Training

8 hr HAZWOPER Refresher (no card)
Convergence Training through
RedVector.com
May 18, 2021

Permit and Non-Permit Confined Space Entry
OSHA 29 CFR 1910.146 Training through
ComplianceTrainingOnline.com
May 13, 2020

Ethics for Professionals
Instructed by David Williams through
RedVector.com
1 hr. training
May 7, 2020

Business Ethics
Convergence Training through
RedVector.com
0.5 hr. training
May 4, 2020

Identification and Recording of Anchors
Bubble Media and Museo Maritimo ria de Bilbao, Biscay
35 hour on-line Training Course
March 7 – April 3, 2016

Protecting Collections, Disaster Prevention, Planning & Response
Conservation Center for Art & Historic Artifacts Collections Care Training / Philadelphia Stewardship
Program
Philadelphia, PA
October 18 and December 15, 2011

Understanding Integrated Prevention Pest Management & Mold
Conservation Center for Art & Historic Artifacts Collections Care Training / Philadelphia Stewardship
Program
Philadelphia, PA
September 21, 2011

ANCS+ / ICMS Training
National Park Service Interior Collections Management System (ICMS)
Instructor: Gail Frace
Northeast Regional Archaeology Program (NRAP)
On-Site Training at A.D. Marble & Company, Conshohocken, PA
Fall 2007

Summer School in Archaeological Curation, Conservation & Collections Management
Maryland Archaeological Conservation Laboratory at Jefferson Patterson Park and Museum
St. Leonard, MD
June – August 2000

Historic Archeology Summer Field School
Strawbery Banke Museum
Portsmouth, NH
July – August 1997

Professional Publications

Archaeological Investigations at Point State Park, Point State Park, City of Pittsburgh, Allegheny County, Pennsylvania. A.D. Marble and Company (Blades with contributions from Bevan, Butina, Crabtree, Dirkmaat, Dorfman, Fall, Lavold, Gill, Hood, Johnson, Mikolic, Vento, Walker & Yost), Prepared for Pennsylvania Department of Conservation and Natural Resources (DCNR) (2009)

Survey West of Cedar Lane: Grant's Headquarters at City Point Phase I Archeological Survey, Rehabilitate Wharf Area to Control Erosion, Reduce Hazards, and Prevent Loss of Resources Project, Petersburg National Battlefield, Hopewell, Virginia, A.D. Marble & Company (Blades, Gill, Walker and Bevan), Prepared for The National Park Service (2008)

Combined Phase IB Archaeological Survey and Phase II Archaeological Investigation, SR 1 North Frederica Grade Separated Intersection, Frederica, Kent County, Delaware. A.D. Marble & Company (Emory, Fanz, Hayes, Schopp & Gill). Prepared for Delaware Department of Transportation (2007)

Archaeological Monitoring Survey Abbreviated Report, Mount Pleasant Mansion, Fairmount Park, Philadelphia, Pennsylvania. A.D. Marble & Company (Gill and Bailey), Prepared for the Philadelphia Museum of Art (2006)

Phase I and II Archaeological Survey Report, S.R. 2031, Section 05B, Spinnerstown Road Bridge over Hosensack Creek Replacement Project, Lower Milford Township, Lehigh County, Pennsylvania., A.D. Marble & Company, (Bailey, Weinberg, Groben, Schopp and Blades), Prepared for PennDOT District 5-0 (2005)

Phase IB Archaeological Survey Addendum Report, Mainline of the Pennsylvania Turnpike from the Valley Forge Interchange (MP 326.1) to Flint Hill Road (MP 331.33), Storm Water Management Basin #4, Upper Merion Township, Montgomery County, Pennsylvania, Addendum to Phase IA Archaeological Survey Report (May 2001). A.D. Marble & Company, (Walker, Groben, Baily and Wagner), Prepared for The Pennsylvania Turnpike Commission (2004)

Cultural Resources Survey Report, Scoping Study of Job's Point Bridge No. EH-32 C.R. 559 over Patcong Creek, Egg Harbor Township and City of Somers Point, Atlantic County, New Jersey., A.D. Marble & Company (Emory, Groben & Walker), Prepared for County of Atlantic Division of Engineering Department of Regional Planning Economic Development (2004)

Phase I Archaeological Survey and Limited Phase II Testing at Historic Elk Landing, Elkton, Maryland., Pickett, Heinrich and Groben. Prepared for the Historic Elk Landing Foundation, Inc. and the Maryland Historic Trust (2002)

Listed in the New Jersey Architectural Twentieth Century Materials database for material analysis of "Zenitherm", an early acoustic building material. (1994)

Professional Presentations

Upper Dublin Township Tricentennial History Day, October 6, 2019

Emlen House and the Battle of Whitemarsh

Presenter of Archaeological studies done at the Emlen House, Fort Washington, PA. Led a sandbox Archaeological dig for children centering on colonial farming, Washington's Headquarters and the Revolutionary War Encampment at the site. Displayed artifacts and photographs of actual

Archaeological excavations at the site, and answered questions about Archaeology, artifacts and the Section 106 process.

Expanding Horizons Speaker, April 20, 2017

Author and Presenter of “SugarHouse Casino Site: Archaeologist’s View of a Philadelphia Neighborhood” a look at the Fishtown Neighborhood from 2100 BC to 2017 for the Senior Continuing Education Spring Course Series.

Expanding Horizons Speaker, April 9, 2015

Author and Presenter of “Archaeology in Our Neighborhood” an overview of Cultural Resource Management Archaeology for the Senior Continuing Education Spring Course Series.

Council for North East Historical Archaeology Annual Meeting, 2008

Author and presenter of paper exploring applications of Fithian Predictive Model for 17th Century Sites in Kent County, Delaware

Elk Landing Speakers Series 2007

Keynote Speaker for February. Author and Presenter of “Archaeology at Elk Landing” for Historic Elk Landing

Pennsylvania Archeological Society speaker 2006

Author and presenter of educational session on rust and archaeological metal

The Society for Historical Archaeology Annual Meeting: Providence, RI, January 2003

Author, Organizer and Presenter of a dedicated session for Historic Elk Landing

The Society for Historical Archaeology Annual Meeting: Long Beach, CA, January 2001

Presenter “War of 1812 Survey”, for Maryland Historic Trust Underwater Archaeology

25th Annual North East Regional Meeting of the American Chemical Society: Rochester, NY, October 1995

Author and Presenter of Material Research and Testing for the Memorial Art Gallery and Rochester Institute of Technology

Professional Affiliations

The Long Now Foundation

The Science History Institute

The Girl Scouts of America

Appendix D

Site Forms

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