PHASE IA ARCHAEOLOGICAL INVESTIGATIONS FOR THE HEARNS POND DAM IMPROVEMENT PROJECT SEAFORD HUNDRED, SUSSEX COUNTY, DELAWARE

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Abstract

This report discusses the results of the Phase IA Archaeological Survey performed by McCormick Taylor, Inc. for the proposed Hearns Pond Dam Improvement Project in Seaford Hundred, Sussex County, Delaware. The project will be federally permitted by the US Army Corps of Engineers, who are serving as the lead federal agency. The Delaware Department of Transportation (DelDOT) is administering the designs, engineering, and Section 106 compliance for the project. The Delaware Department of Natural Resources and Environmental Control (DNREC) is the owner and facilities manager of the property. The objective of this study was to assess the archaeological potential of the area of potential effects and to provide recommendations for any subsequent archaeological fieldwork. The project is located in the Atlantic Coastal Plain Physiographic Province.

The findings of these investigations indicate that the potential for encountering pre-contact archaeological resources within the APE is low due to prior ground disturbance. The potential for finding historic archaeological resources associated with the 1816 Cannon and Ross Mill is considered to be moderate. Therefore, it is recommended that an archaeological monitor observe the construction activities in the archaeologically sensitive areas around the former wheelhouse and 1912 spillway in the case that remnants of the 1816 mill have survived. Because the spillway was an integral improvement to the mill operations, the archaeological monitor will also photo-document its demolition for any information that can be obtained regarding its construction methods.

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I. Introduction

This report discusses the results of the Phase IA Archaeological Survey performed by McCormick Taylor, Inc. for the proposed Hearns Pond Dam Improvement Project in Seaford Hundred, Sussex County, Delaware ***(Figure 1).*** The project will be federally permitted by the US Army Corps of Engineers, who are serving as the lead federal agency. The Delaware Department of Transportation (DelDOT) is administering the designs, engineering, and Section 106 compliance for the project. The Delaware Department of Natural Resources and Environmental Control (DNREC) is the owner and facilities manager of the property. The objective of this study was to assess the archaeological potential of the area of potential effects and to provide recommendations for any subsequent archaeological fieldwork. The project is located in the Atlantic Coastal Plain Physiographic Province.

Hearns Pond Dam was overtopped during the storms of August 11, 2001 and June 25, 2006 and was severely damaged by these storms. DNREC constructed an auxiliary spillway at the left abutment of the dam in 2012 to alleviate flooding until the final rehabilitation could be designed and constructed. The proposed project will entail the replacement the of this auxiliary spillway and the culvert at the dam with a larger spillway and a larger bridge/culvert to pass the flow of water during 100 year storm events, and to provide embankment overtopping protection. The new spillway will be a two level structure; the lower elevation will be 24.61 feet with a length of 10 feet. The higher elevation of the spillway will be 24.86 feet with a length of 90 feet. The proposed bridge will have twin box culverts with a span of 20 feet each with a 9.75 foot rise. The intact 1912 spillway at the southern tip of the dam, which supplied water to the adjacent Hearn & Rawlins Mill, will also be removed as part of the project. During construction, the flow at the dam will be temporarily diverted through the 4 foot concrete encased cast iron supply pipe situated at the mill at the southernmost section of the dam.

A project's area of potential effects (APE) is defined by 36 CFR §800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties." The project's archaeological area of potential effects (APE), a subset of the larger project APE, is any area in which ground disturbance could occur. This area consists of the Hearn's Pond Permit Area/Limits of Construction for the US Army Corps of Engineers ***(Figure 2).***

The Principal Investigator for the Phase IA investigations was Robert H. Eiswert. Jerry Clouse, Charles Richmond, and Macon Coleman completed the background research. Graphics were produced by John Watson.

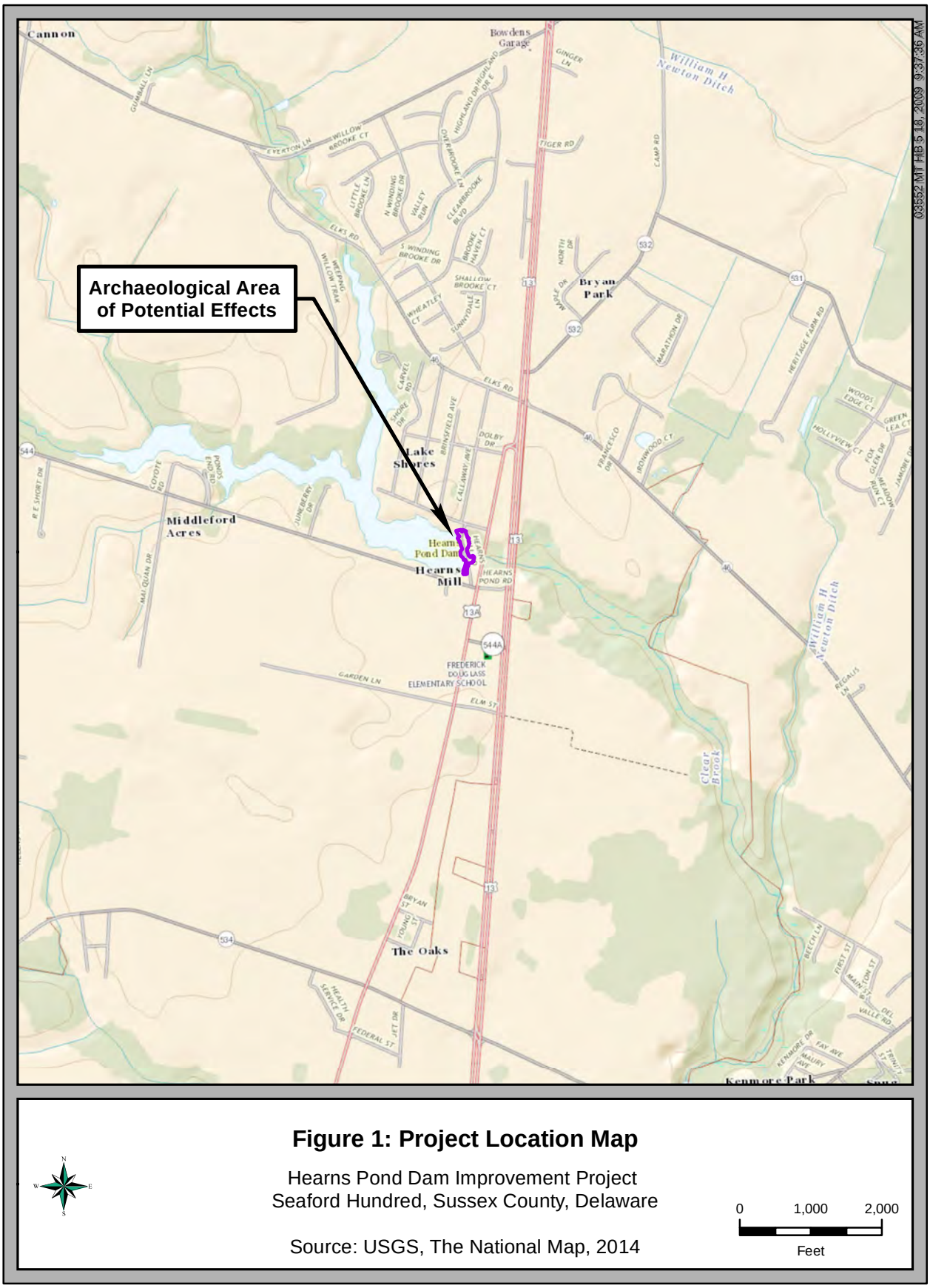

Figure 1: Project Location Map

Hearns Pond Dam Improvement Project
Seaford Hundred, Sussex County, Delaware

Source: USGS, The National Map, 2014

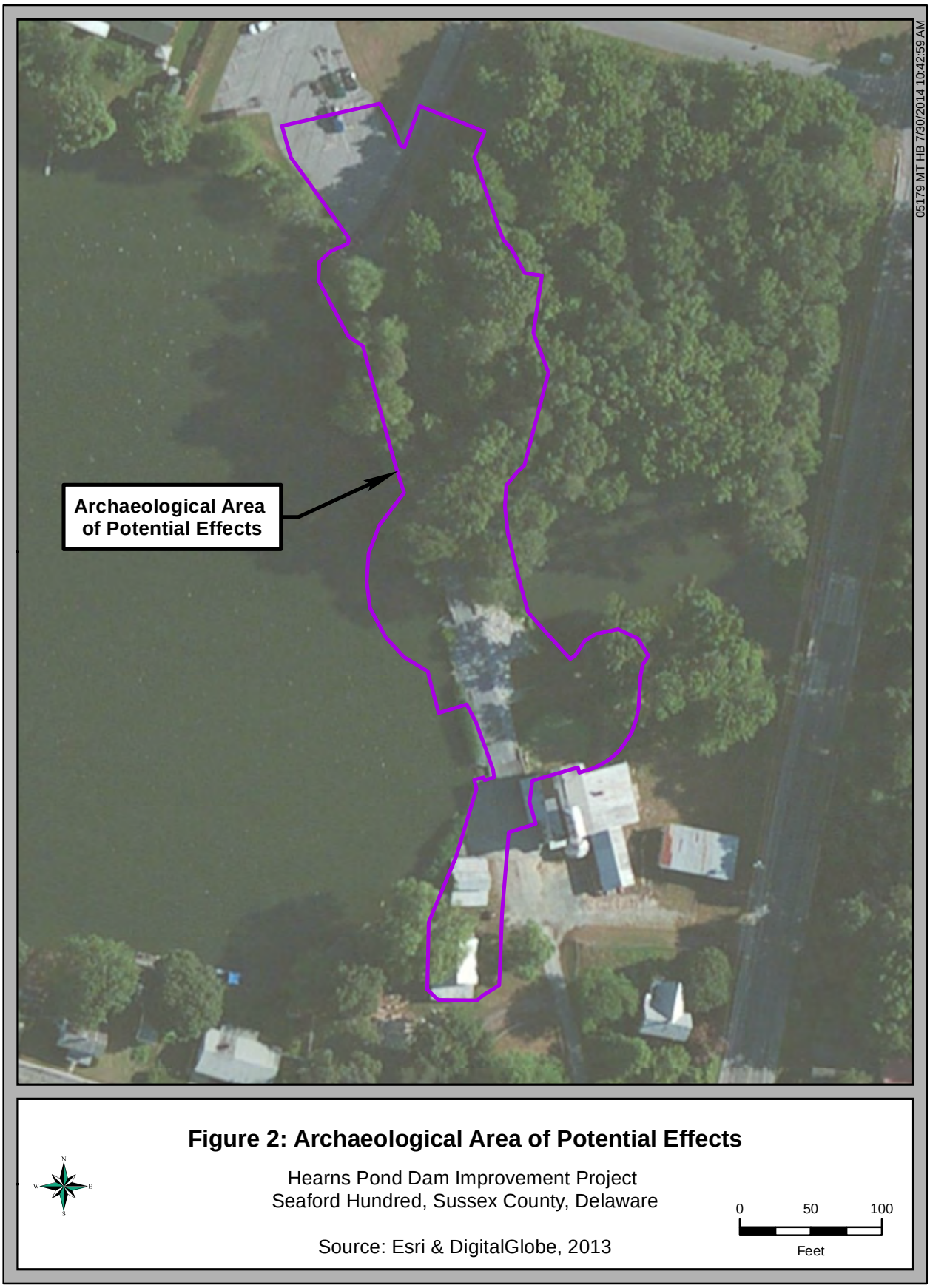

Figure 2: Archaeological Area of Potential Effects

Hearns Pond Dam Improvement Project
Seaford Hundred, Sussex County, Delaware

Source: Esri & DigitalGlobe, 2013

0 50 100
Feet

II. Environmental Setting

The project is located in the Atlantic Coastal Plain Physiographic Province. The Delaware Coastal Plain rises to approximately 100 feet above sea level and is made up of sediments consisting mostly of silt, sand, and gravel that have eroded from the rolling hills of the adjacent Piedmont Physiographic Province and the Appalachian Mountains. These deposits of sediment originate at the Fall Line separating the Coastal Plain from the Piedmont Physiographic and thicken with increasing proximity to the Atlantic Ocean. The thickness of these deposits reaches 10,000 feet along some sections of the Atlantic Ocean coast line (Plank and Schenk 1998: 17). In general, the surface of these sedimentary deposits is composed of a thin veneer of young sand and gravel that was deposited in Delaware by Pleistocene glacial outwash (Plank and Schenk 1998: 17). The landforms of the Coastal Plain are by drained by a dendritic system of streams. The low-lying landforms and flood plains associated with these streams are frequently swampy.

Two geological units underlie the project area ***(Figure 3).*** These consist of Nanticoke deposits, which are mapped at the northern and southern tips of the project area, and Swamp deposits, which are mapped in the eastern portion of the project area. Nanticoke deposits are composed of brown to light gray fine to medium quartz sand, finely laminated to structureless gray to brown clayey silty sand, shelly sandy silt, and sandy clayey silt with fragments of woody material. The Nanticoke deposits overlie the Beaverdam Formation (Andres and Ramsey 1995). Swamp deposits are composed of organic rich gray, brown, and black silty clay to medium quartz sand with inconsistent beds of organic brown silt and peat. They are usually located along the edges of stream channels and in the upper parts of these drainages, Swamp deposits interfinger with alluvium. Swamp deposits overlie the Nanitcoke deposits and Beaverdam Formation, respectively. Detailed data collected from Swamp deposits upstream from Seaford suggests that the course of the Nanticoke River has moved up to 800 feet laterally during the Holocene (Ramsey and Schenck 1990).

Three soil types are mapped within the project area ***(Figure 4).*** Evesboro loamy sand, 5 to 15 percent slopes (EvD) is mapped at the northern edge of the project. This excessively drained soil type is commonly found on fluviomarine terraces, knolls, flats, and dunes. The parent material of Evesboro loamy sand is composed of sandy eolian deposits and/or fluviomarine sediments. It is not classified as prime farmland (USDA 2014). Rosedale loamy sand, 2 to 5 percent slopes (RoB) is mapped at the southern tip of the project. This well-drained soil type is usually found on flat landforms. Its parent material is composed of sandy eolian deposits that overlie fluviomarine sediments. This soil type is classified as prime farmland if irrigated (USDA 2014). The third soil type mapped within the project area is Puckum muck, frequently flooded (Pk). This soil type borders Clear Brook, which is the stream that fills the existing mill pond. Puckum muck is commonly found on floodplains, swamps, and depressions. Its parent material is woody organic material, and this very poorly drained soil type is not classified as prime farmland (USDA 2014).

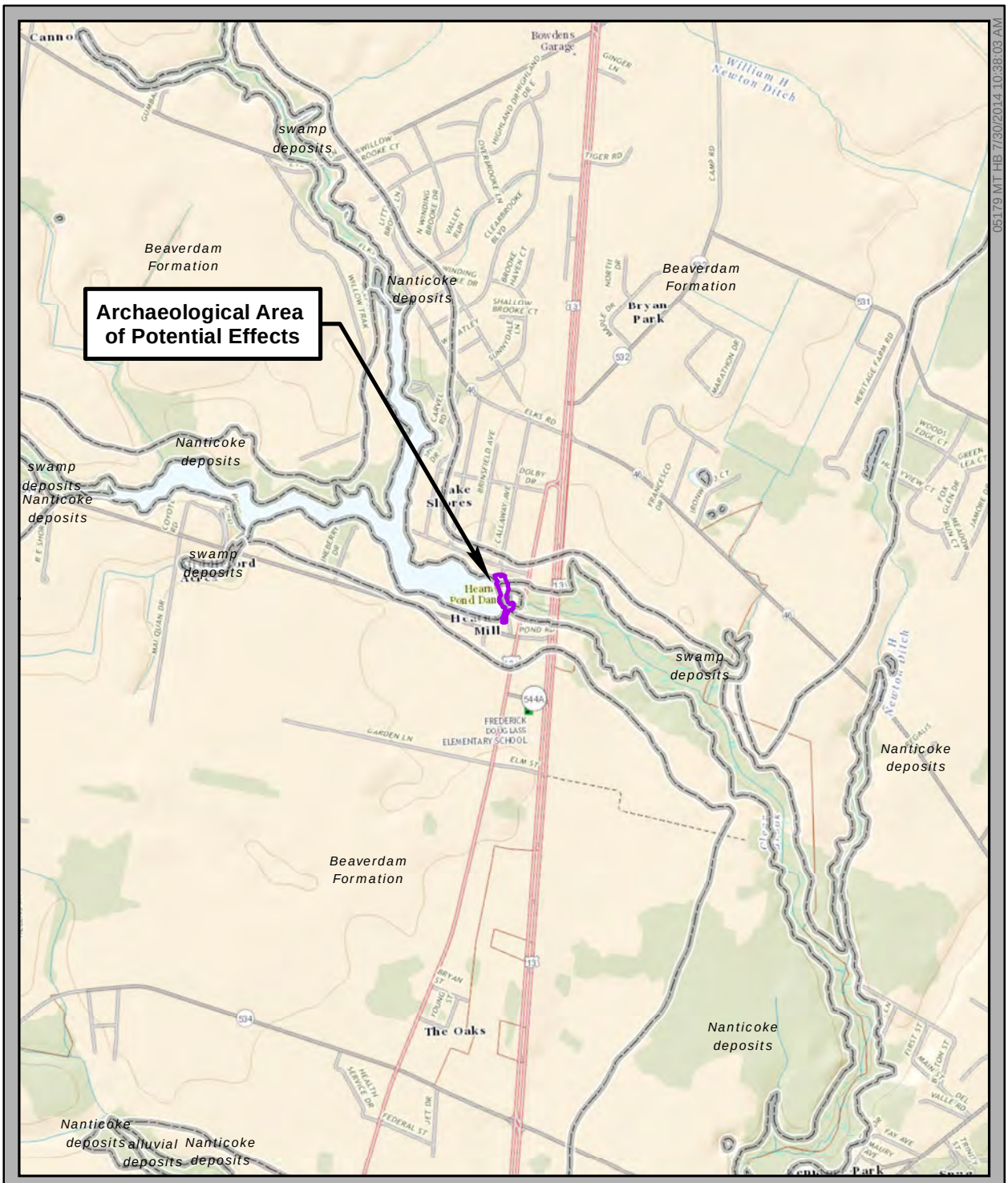

Figure 3: Bedrock Geology within the Archaeological Area of Potential Effects

Hearns Pond Dam Improvement Project
Seaford Hundred, Sussex County, Delaware

Source: USGS, The National Map, 2014 (basemap)
Delaware Geological Survey, 1995

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Feet

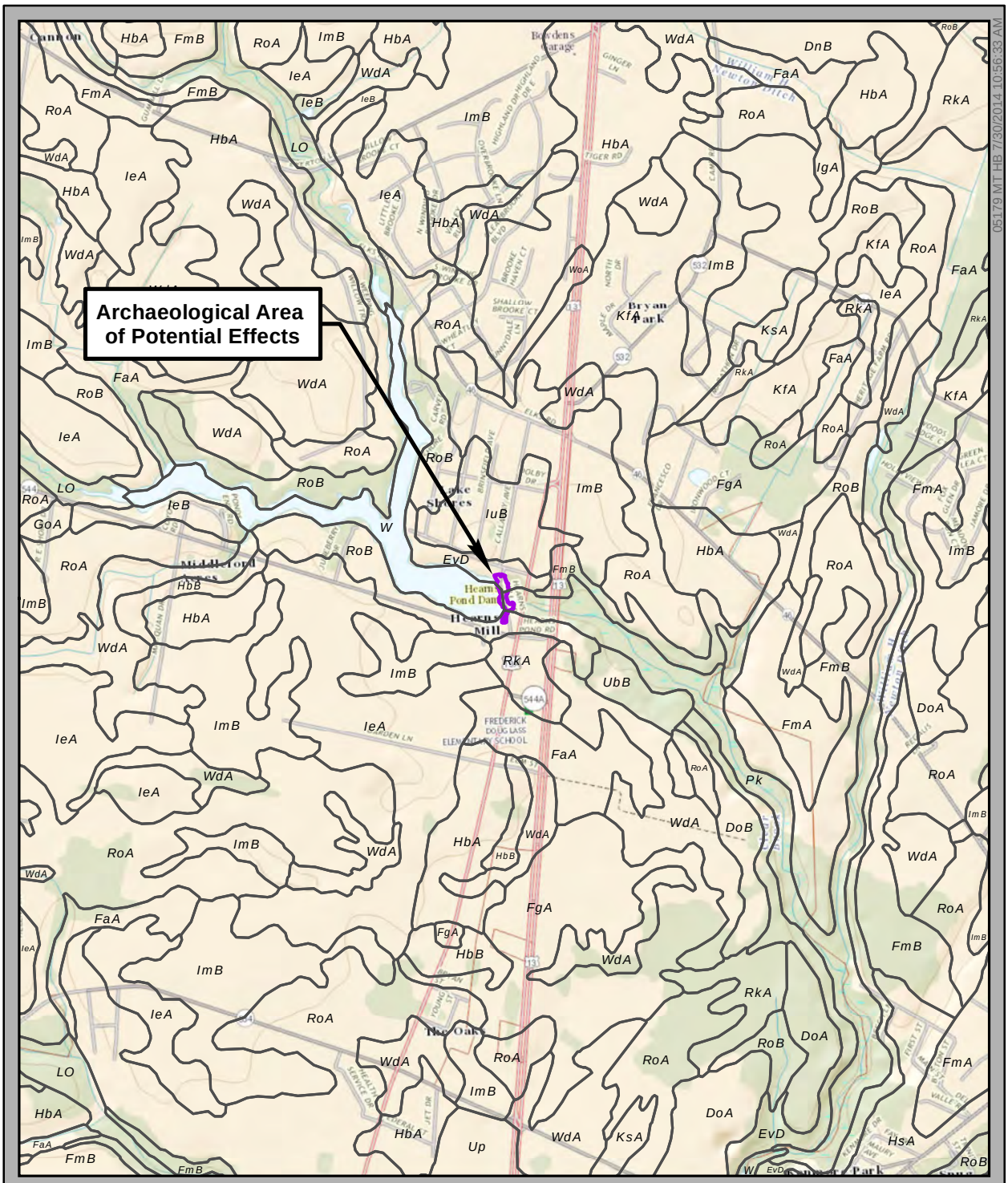


Figure 4: Soil Mapping Units within the Archaeological Area of Potential Effects

Hearns Pond Dam Improvement Project
Seaford Hundred, Sussex County, Delaware

Source: USGS, The National Map, 2014 (basemap)
USDA, 2012

0 1,000 2,000
Feet

III. Background Research

The background research conducted for this project focused on the history and development of the project area in order to assess the potential for locating both pre-contact and historic archaeological resources. The Delaware Cultural Resource Survey (CRS) Inventory and National Register files in Dover were reviewed to determine the presence of known cultural resources within 0.5 miles of the project area. Historic maps and other relevant documentation were obtained at the Delaware Public Archives in order to determine if non-extant buildings or other structures were located within the project's APE. Research was also conducted at the Seaford Historical Society, Seaford, Delaware, Sussex County Chancery Court, Georgetown, Delaware, and the University of Delaware, Newark, Delaware.

A. Previously Recorded Cultural Resources Near the APE

Examination of the Delaware SHPO's site maps indicated that no previously identified archaeological sites are recorded within or adjacent to the APE. A map depicting all 33 of the Cultural Resource Survey points within 0.5 miles of the project APE can be found in ***Figure 5***. These resources are listed in ***Table 1***.

In terms of previous predictive models for Native American site locations, the project APE is mapped in an area of high site probability in Custer (1984). Just two previously recorded archaeological sites (7S-E-36 and 7S-E-199) lie within 0.5 mile of the project area. 7S-E-36 (S-810) is mapped along Clear Brook about 2,200 feet (670.5 meters) to the southeast of the project area. Unfortunately no information regarding site characteristics are recorded on the archaeological site form. Site 7S-E-199 (S-6084) lies adjacent to Route 13 approximately 2,200 feet (670.5 meters) to the north of the APE. It is an historic site that was discovered during the Phase I survey for the Open Season Pipeline Project. The site was found in a disturbed area that was bisected by a gravel driveway and an existing gas pipeline. The site yielded one piece of whiteware, one aqua glass fragment, and 13 pieces of clear bottle glass.

The project APE is at the location of the Hearn & Rawlins Mill. The Hearn & Rawlins Mill was determined to be eligible for listing in the National Register of Historic Places under Criteria A and C on May 22, 1978 (Heite 1977) ***(Figure 6)*** and is being re-evaluated as a separate part of this project. The mill complex is associated with agricultural and industrial development of Sussex County, Delaware under Criterion A (association with a pattern of events that made a significant contribution to the development of the state and nation). The Hearn & Rawlins Mill is significant as a late nineteenth/early twentieth century grist mill complex in Sussex County under Criterion A. As evaluated under Criterion B, the Hearn & Rawlins Mill is not known to be significant for its association with any individuals of local, state, or national importance. The mill site was associated with several local businessmen, such as Nathaniel Ross and William Cannon during the early-to-late nineteenth century and Marcellus Hearn during the late nineteenth and early twentieth centuries. The Hearn & Rawlins Mill is not significant under Criterion B. Under Criterion C, the Hearn & Rawlins Mill is a good representative example of a

Table 1: Previously Identified Cultural Resources in Proximity to the APE

CRS NUMBER	LISTED	NAME/PROPERTY TYPE	ARCHAEOLOGICAL SITE NUMBER
S00213	Yes	Hearn and Rawlins Mill	
S00810	No	archaeological site	7S-E-036
S03998	No	State Bridge No. 202	
S04045	No	Hearns Pond Bridge and Dam	
S06083	No	dwelling complex	
S06084	No	agricultural complex	7S-E-199
S06130	No	garage	
S06131	No	agricultural complex	
S06132	No	dwelling	
S06133	No	dwelling complex	
S06134	No	dwelling complex	
S06135	No	dwelling complex	
S06136	No	dwelling complex	
S06137	No	dwelling complex	
S06138	No	dwelling complex	
S06140	No	dwelling complex	
S06141	No	dwelling complex	
S06142	No	dwelling complex	
S06149	No	house ruin	
S06259	No	dwelling	
S06260	No	dwelling complex	
S06261	No	dwelling complex	
S06263	No	agricultural complex	
S06264	No	dwelling complex	
S06265	No	agricultural complex	
S06266	No	agricultural complex	
S06267	No	agricultural complex	
S06280	No	dwelling site	
S06282	No	agricultural complex	
S06283	No	dwelling complex	
S06284	No	dwelling complex	
S06286	No	dwelling complex	
S09092	No	Bridge 255 - R. Conc. Box Culvert	

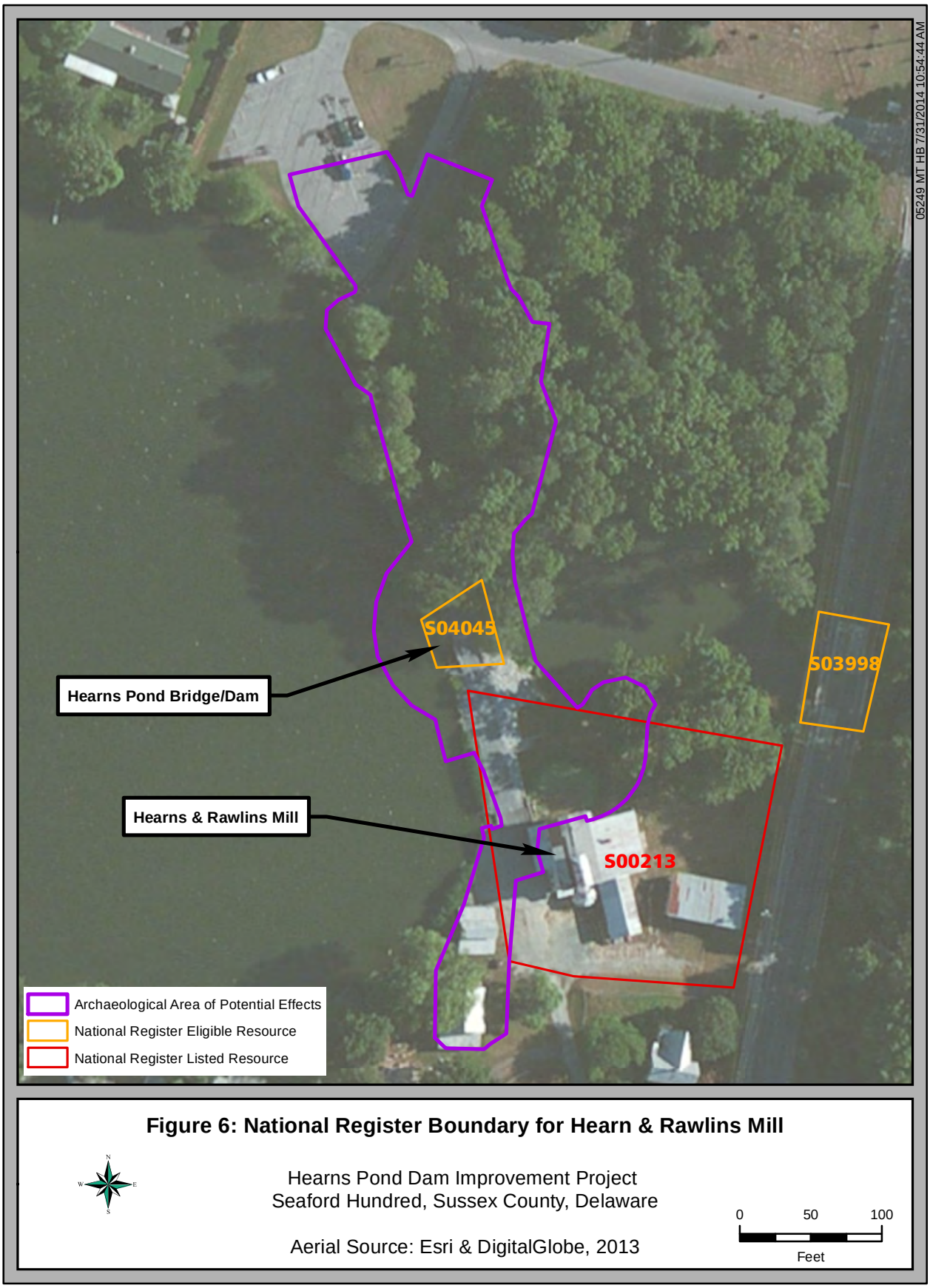


Figure 6: National Register Boundary for Hearn & Rawlins Mill

Hearns Pond Dam Improvement Project
Seaford Hundred, Sussex County, Delaware

Aerial Source: Esri & DigitalGlobe, 2013

0 50 100
Feet

late nineteenth/twentieth century grist mill complex. The Hearn & Rawlins Mill is one of a small number of remaining grist mill complexes in the state of Delaware. The mill building has experienced the loss of elements, such as the wheel house, but overall it retains a strong degree of integrity. The mill complex includes several contributing elements, including the mill, Marcellus Hearn House, warehouse, granary/vehicle shed, and barn/stable. The original early twentieth century dam has been significantly altered as a result of flood damage and reconstruction efforts. As evaluated under Criterion C, the Hearn & Rawlins Mill is eligible for the National Register as a good representative example of a mill complex which retains a strong degree of integrity. The resource's eligibility under Criterion D (potential to yield information important to history or prehistory) cannot be assessed at this time as archaeological investigations have not been conducted. The Hearn's Pond Bridge and Dam (S04045) ***(Figure 6),*** which was essential to the mill operations, was determined to be individually eligible for the National Register, although the bridge was replaced and dam has been rehabilitated due to several recent storm events. The dam is considered a non-contributing element of the mill complex.

The following historic context provides an historic overview of the Hearn & Rawlins Mill within the framework outlined in the *Management Plan for Delaware's Historic Archaeological Resources* (DeCunzo and Catts 1990).

B. Historic Context

1. 1630-1730+/- Exploration and Frontier Settlement

Several European countries explored the east coast of North America in the sixteenth and seventeenth centuries. The native Delaware recalled that the Spanish or Portuguese were the first to come to their country. This likely occurred prior to the 1580s. Nevertheless, the Dutch claimed the Delaware River region based upon Henry Hudson's explorations of 1609. In 1631 the Dutch established a trading post at present-day Lewes, the colony was known as Zwaanendael, or "Valley of the Swans". The Dutch established additional settlements, including Fort Casimir, at present-day New Castle. Fort Casimir was established as a defensive measure against the incursions of the Swedish into territories claimed by the Dutch. In 1638 the Swedes established Fort Christina at present-day Wilmington. The Dutch and Swedish conflict eventually led to the defeat and expulsion of the Swedish military in 1656.

The English established claims to the territory as well. In 1634 Lord Baltimore established the Maryland colony. Lord Baltimore claimed much of present-day Sussex County, Delaware, as under his authority. However, James, Duke of York, was ceded all lands between the Connecticut and Delaware rivers in 1664. The border between Maryland and Delaware created land disputes and conflict that would continue until the late eighteenth century. In 1682 William Penn organized the three colonies of Delaware and renamed Somerset County as Sussex County.

In taking over the Dutch claim to the Delaware, the English crown claimed their prior discovery by John Cabot in 1497 of the Northeast coast superseded Henry Hudson's 1609 discovery. In 1681 William Penn received a charter from King Charles II for land west of the Delaware to be

called Pennsylvania, and in 1682 he received another grant for what became known as the lower counties, later Delaware (Klein & Hoogenboom 1986). Under Penn's proprietorship, a system of "hundreds" was established. These hundreds consisted of tracts of land roughly equivalent to townships in other states (Siders et al 1991: 6).

The region began to experience development following the establishment of English control. By 1700 approximately 1,000 people resided in Sussex County. In this period Lewes remained as the main commercial center of the county. The political instability contributed to the lack of growth and development within the county during this period. In 1704 Pennsylvania and the lower counties (New Castle, Kent, and Sussex) agreed to establish their own legislative bodies, but retained a single governor.

Located in the northwestern corner of Sussex County, Northwest Fork Hundred was originally part of Dorchester County, Maryland, and included all of the territory west of the northwest fork of the Nanticoke River. The Penns exercised no control over the hundred and did not make any grants of land within its bounds. All of the land patented up to 1776 was upon Maryland patents. Large numbers of settlers came into the hundred when the line between Maryland and Delaware was established. Northwest Fork Hundred contained the largest and best body of farm land in the county. Wheat and corn are the predominant crops (Scharf 1888: 1276).

2. 1730-1770+/- Intensified and Durable Occupation

During this period New Castle, Kent and Sussex Counties assumed greater autonomy in relation to the political authority of Pennsylvania. In 1735 Delaware established a Levy Court to serve as the governing bodies for each of the three counties, although Philadelphia remained the commercial center for much of Delaware. Conflict with Maryland continued over ownership of land in the border areas. Between 1768 and 1774 Charles Mason and Jeremiah Dixon surveyed and established the boundary between Delaware and Maryland in order to resolve disputes.

The first half of the eighteenth century witnessed an increase in the settlement of inland areas and an attendant growth in the network of connecting roads. To a great extent, the period 1730-1770 represented an intensification of this trend, driven by a second influx of immigration. Farms emerged across the interior, extending Philadelphia's farming hinterland across northern Delaware and into Maryland (Lemon 1967). During this period slave labor was active in all three counties of Delaware, although a free-African American population was present at this time as well. During this period several industrial operations were established in Sussex County, including the Deep Creek Iron Works and Nanticoke Forge.

During this period, Delaware, like Pennsylvania, was not only involved in a subsistence economy, but also in an Atlantic trading economy which was centered in London. Rural farmers, merchants, and millers were connected by a chain of credit through Philadelphia merchants with London merchants. The Atlantic trade also included trade with other mainland colonies such as in New England and the West Indies and southern Europe. After about 1740, farmers of middling status were selling from a third to one half of their grain production. This would have likely gone to Philadelphia, but from there it may have ended up in the West Indies or Europe (Lemon 1972: 27-29).

Accompanying the growth and spread of the internal road system, hamlets also emerged at major road crossings. Generally comprised of no more than a handful of dwellings, these communities thrived because they offered necessary services to travelers in remote areas. Typically, they centered around taverns and blacksmith/wheelwright shops (Lemon 1967). During the middle of the eighteenth century, "hamlets" began to emerge at transportation junctures. The largest of these communities had grown from early mill stations along waterways and were typically located at a point where a major road crossed a tributary stream.

In Northwest Fork Hundred several villages were established during the early-to-mid eighteenth century, including Bridge Branch and Middleford. The town of Bridgeville was established during the mid-eighteenth century as Bridge Branch. The town was designated as Bridgeville in 1810 by an act of the Delaware General Assembly. The town included taverns and shops which thrived during the late eighteenth and early nineteenth centuries. The Cannon and Ross families were active in the commercial life of Bridgeville throughout the early nineteenth century. During the mid-1760s the village of Middleford came into existence as a mill seat for the surrounding agricultural community.

The changes that took place in the economy and settlement pattern of Sussex County during this period were driven by a wave of English and Scotch-Irish immigrants who arrived in the region between 1725 and 1755. Most of these immigrants were indentured servants, contracted to local farmers for a period of 3 to 7 years of service (Munroe 1978: 196). In addition to these laborers, some Delaware farmers also owned African slaves (Catts and Kellogg 2000: 12).

Farm practices of the period took the form of mixed husbandry, typically combining grain cultivation with livestock raising (Bidwell and Falconer 1941: 84). Land use is described as "extensive," meaning that crop fields were not rotated, nor fertilized with manure or lime. When soils became exhausted, new areas were opened up for cultivation. Though soil conservation and crop rotation were practiced in Europe at this time, Delaware farmers clung to older techniques because they lacked adequate labor to clear areas for rotation and also because the market demand for wheat discouraged the use of other crops to replenish fields (Lemon 1972: 179).

The average farmstead occupied a little less than half an acre and was comprised of a domestic structure as well as six to eight outbuildings. Outbuilding types included: detached kitchens, corn cribs, stables, meat or smokehouses, barns, and tenant houses (in descending order of appearance). Domestic-oriented outbuildings and gardens were located in proximity to the house, while agricultural buildings were closer to fields. Gardens contained the draw-well, and were fenced to keep out farm animals (Herman *et al.* 1989: 63-65).

Farmhouses of the period averaged 16 to 20 feet (~5 to 6 meters) square. Typical construction was log or frame (or stone depending on locality) on a one-room plan, and either one or two stories high. The ground-floor room was accessed directly from the outside, with windows on either side of the entrance as well as a window in the gable opposite the chimney. If it was a two-story structure, the second floor was usually accessed by a spiral staircase in the corner adjacent to the hearth. This "hall-plan" style house afforded scant privacy within the family and little separation between it and the outside world. While Sussex County farmsteads typically had

either a separate or adjoining kitchen, most domestic and social interaction took place within the ground-floor room of the main house (Herman *et al.* 1989: 14-19).

3. 1770-1830+/- Early Industrialization

During this period the State of Delaware was established as a separate political entity from Pennsylvania. Prior to the American Revolution the counties comprising present-day Delaware were officially part of the Pennsylvania colonial government, although extensive local jurisdiction had been granted by the proprietorship. In 1787 the State of Delaware was the first to ratify the Constitution. The State of Delaware was among the most densely populated regions of continent at the time of the American Revolution. By 1790 Sussex County had a population of 20,488. The population declined slightly to 19,358 in 1800, but increased to 24,057 in 1820.

In 1790 approximately 37% of the total slave population in Delaware was located in Sussex County. By 1810 over half the slave population was in Sussex County (Williams 1996: 99). The slave population was primarily engaged in agriculture and domestic service. By 1790, there were 2,570 free African Americans in Kent County, 639 in New Castle and 600 in Sussex County. In general, freedom was obtained through manumission by slave-owners, through the purchase of freedom by those with resources, or by birth to free persons. The free African American population of Delaware faced significant barriers in their political, economic and social life. In 1831, in response to fears from the recent Nat Turner uprising in Virginia, the Delaware legislature enacted laws to prohibit and curtail the rights of free African-Americans from owning fire arms, conducting religious events, and gathering in public. William Ross, a slave owner and prominent member of Northwest Fork Hundred was a leading proponent of the severe measures.

During this period agriculture was the main economic enterprise in Delaware. Delaware's first farms ranged in size from a few acres to thousands of acres, but the more typical farm consisted of between 100 and 150 acres. The first large-scale changes in land ownership took place during and after the American Revolution. In 1793 and 1794 the legislature abolished laws which tied land inheritance to certain family lines as well as first son privileges (Passmore 1978: 5-6).

Farms of only a few acres with a single cow and a few swine would be considered subsistence whereby anything produced would be used by the farm family itself. However, middling sized farms of 75 to 100 acres with more than two milk cows and more than eight swine would have sufficient butter and grain to be sent to market. Farms of this size would also have at least one horse and a cart or wagon to haul the grain and butter to the nearest mill. The miller was not only able to convert the grain to flour or feed but also often acted as an agent in buying local produce such as butter and eggs. Often times there were stores at the mills where various items of produce could be sold or traded (Kennedy 2000: 606).

Because there was increased availability of land in the Delaware as opposed to what was found in Europe, settlers developed farming patterns which were markedly different than those of the Old World. Here farmers would clear plots of their land and farm intensively until production dropped, then more of their acreage would be cleared, and the cycle would continue until much of the farmer's land was exhausted. The abundance of land also explains why lime and gypsum

and other fertility restoring measures were not used at first. The first great American push westward in the early 1800s came just as Delaware soils were at their lowest fertility level ever (Passmore 1978: 6; Schneider 1994: 7-8).

Following years of extensive single-crop farming, agricultural lands in the region became exhausted, and, by the late eighteenth century, local farming appears to have entered into a period of decline. Economic crises in the early years of the nineteenth century combined to force many farmers to abandon their lands and settle elsewhere. At this time, many small farm holdings were bought up by wealthy landowners. Workable farms were tenanted, while more marginal properties were left fallow or put in pasture for livestock (De Cunzo and Catts 1990; Munroe 1978).

These shifts in the region's mode of production occurred against a backdrop of fluctuating agricultural markets and periods of conflict with England over taxation and trade-restrictions against American farm-products in the British West Indies. Both the Revolutionary War and the War of 1812 resulted in boycotts of American goods and blockades of American shipping centers by British forces (Lindstrom 1978: 20). These political and economic conflicts resulted in profound changes to the cultural fabric of the entire Delaware region (Catts and Kellogg 2000).

The most significant and enduring effect of the Revolutionary War on Delaware was the British blockade of the Delaware and Chesapeake Bays. The blockade forced regional manufacturers and agriculturalists to shift from ocean-based international trade to land-based regional trade in the Philadelphia - Delaware - Baltimore corridor. The emergence of this trade network facilitated the growth and diversification of manufacturing and agricultural goods throughout the region. In northern Delaware, much of this growth was localized to the Piedmont region, where commercial growth surged from 1790 through 1810 (De Cunzo and Catts 1990: 58-59; Welsh 1956).

After the Revolution, the country began a long period of internal improvements meant to assist in trade and an increase in manufactures. The first turnpike, the Philadelphia & Lancaster Turnpike, was begun in 1792. It extended 62 miles from Philadelphia to Lancaster City and more fully opened up the rich interior of Pennsylvania to trade. The success of this turnpike spurred work on smaller turnpikes, including the 1809 Gap & Newport Turnpike, which ran from Gap, Lancaster County, Pennsylvania, to Newport, Delaware. Delaware had turnpikes constructed in all directions from the Wilmington area to the Pennsylvania state line to meet the demand of farmers and millers of that state (Scharf 1888: 756-757).

Canals were also begun during this period to promote commerce. In 1801 the Chesapeake & Delaware Canal was chartered. Actually begun in 1809, the Chesapeake & Delaware was not completed until 1829. This canal enabled the merchants from Pennsylvania and Delaware to carry a large portion of its produce of the Susquehanna Valley to the markets served by the canal (Gordon 1832: 41, 45).

The Sussex County court routinely addressed the needs for public roads and responded to the petitions of inhabitants. Roads were built to connect local places of importance, such as

churches, market towns, and mills. Roads were petitioned by residents and were authorized by the local courts with jurisdiction. Sussex County, like other counties, appointed road overseers, or commissioners, to investigate the need for roads. The overseers would also be responsible for confirming that roads were built as specified by the court. In Northwest Fork Hundred water transportation was important for commerce and industry as well. The community of Seaford, established ca. 1799, was founded along the Nanticoke River and became an important local shipping center.

In 1826 The Philadelphia, Dover & Norfolk Steamboat & Transportation Company began operations (Hancock & Hite 1981: 54). Eventually routes were established to Yorktown and Richmond (Hancock & Hite 1981: 77). As the century progressed the shipping interests at Seaford expanded operations and eventually established associated industries, such as shipbuilding. Local shipping interests were frequently engaged in transporting agricultural goods and raw materials, such as timber, along the Nanticoke River and its tributaries. The port of Vienna, Maryland, on the Chesapeake Bay was a shipping destination for Sussex County. During the mid-century M. Colburn and John Scott were recorded as ship owners in Seaford. M. Colburn was an active merchant in Seaford and operated several shops and warehouses (Hancock & Hite 1981: 107).

An example of the importance of river transportation was witnessed in 1826 when the merchants and business leaders of Seaford expressed their concerns about potential shipping opportunities in the region. A petition was presented to local authorities to encourage the development of suitable wharfs and warehouses to promote trade. The petitioners noted that merchants at Seaford annually purchased 50,000 bushels of wheat and 1000 cords of wood from operations at Middleford and Concord. The merchants expressed concerns that other communities along the Nanticoke River and its tributaries may expand opportunities for shipping, resulting in a decline for Seaford's shipping industry and merchants (Hancock & Hite 1981: 54).

Following a century of extensive farming, farm productivity dropped dramatically during this period. In the early 1800s, national financial crises worsened prospects for local farmers. Hard-pressed to support themselves even on a subsistence level, a considerable portion of the working agrarian population either moved west to clear new areas or was absorbed into the emergent industrial sector in and around Wilmington (De Cunzo and Catts 1990: 52-53, 59; Herman *et al.* 1989; Lindstrom 1979: 300; Hancock 1947: 374). While population and agricultural growth leveled in the period from 1810-1830 (Hancock 1947: 374), by the end of the period, some local agriculturalists had made productive in-roads by diversifying crop species. The popularity of this technique increased during the following period (Lindstrom 1978: 20).

The period architecture of Delaware shared much in common with that of the Piedmont Region in the neighboring states of Maryland, Pennsylvania, and New Jersey. The housing found in northern Delaware retains many characteristics of the dwellings built by the English and Scotch-Irish Quakers who settled southeastern Pennsylvania (Sheppard 2009: 28). There were decades of gradual change occurring from the first period of durable architecture in the early 1800s on through to more radical transformations in architecture and agriculture during the middle decades of the nineteenth century (Herman 1987: 2).

Agricultural tenancy played a role in the shift to more durable building material for housing. Large land holders soon realized that they were more likely to attract reliable and productive tenants if they offered a farm with a sturdy house in good condition. The farmer's wife likely participated in the decision to rent a prospective farm, and the condition of the farmhouse would have played a key role in the ultimate decision to rent a particular farm (Sheppard 2009: 167).

In 1785 John Robinson, who owned much of the land that was later owned by Nathaniel Ross, appears on the assessment list for Northwest Fork Hundred (Scharf 1888: 1279). In 1816, the year that the Ross grist mill was erected, Northwest Fork Hundred included 220 domestic dwellings. In the village of Seaford, located within the hundred, there were twenty-seven houses, one tavern, three shops, four granaries, and one tannery (Hancock & Hite 1981: 51). In that year Nathaniel Ross was among those in Northwest Fork Hundred with more than 200 acres. In fact, he was assessed with 1,000 acres that year (Scharf 1888: 1280).

Nathaniel Ross acquired several tracts along Clear Brook in Northwest Fork Hundred (later Seaford Hundred) during 1810 and 1811. By 1816 Ross had built a grist mill along Clear Brook, north of Seaford. In 1816 Nathaniel Ross petitioned Sussex County to build a road over the mill dam he was constructing (Sussex County Road Papers – Petition of Nath'l Ross, April 24, 1816). Sussex County determined that a road over Nathaniel Ross' mill road would serve the general public and approved its construction (Sussex County Road Papers – Order of Court for a Road over N. Ross' Mill Dam, November 23, 1816).

In 1816 the mill complex consisted of the grist mill, a miller's house, and a small dwelling. In addition to the grist mill, Ross owned a two-story frame residence and two tenant farms in Northwest Fork Hundred (Northwest Fork Hundred Tax Assessment 1816). In 1816-17 Nathaniel Ross is taxed with a 25-acre tract improved with a grist mill, two pair of stones, one wheel mill house and a small dwelling. The Ross holdings in Northwest Fork Hundred totaled over 1,100 acres (Sharf 1888: 1280).

Nathaniel Ross was married to Sally Ross and they had five children: Curtis, Maria, Edward, Elizabeth, and Hiram. Nathaniel Ross was a slave-owner and owned eight slaves at the time of his death on November 13, 1822. Nathaniel Ross's 1822 will bequeathed all of his real estate to his wife Sally. The will also appointed Curtis Ross (son) to ensure that each child would receive payment of $500 upon reaching adulthood (Will of Nathaniel Ross; Sussex County Will Book 7: 269). Curtis Ross and Edward Ross each received one half interest in the grist mill.

In 1826 Curtis J. Ross petitioned the Orphans Court (Sussex County Deed Book O: 34) for a division of his father Nathaniel's 1,100 acres. A plot plan was prepared in 1830 for the Nathaniel Ross mill property (Sussex County Orphans Court Book P: 50) ***(Figure 7).*** The 1836 tax assessment for Northwest Fork Hundred recorded Sally Ross, widow, with 200 acres, three slaves, and farm animals. That same year Curtis J. Ross was noted with 310 acres, 18 acres, one half grist mill, one half water lot, three slaves, and farm animals.

4. 1830-1880+/- Industrialization and Early Urbanization

The years between 1830 and 1880 encompass the most complex and dynamic period of social

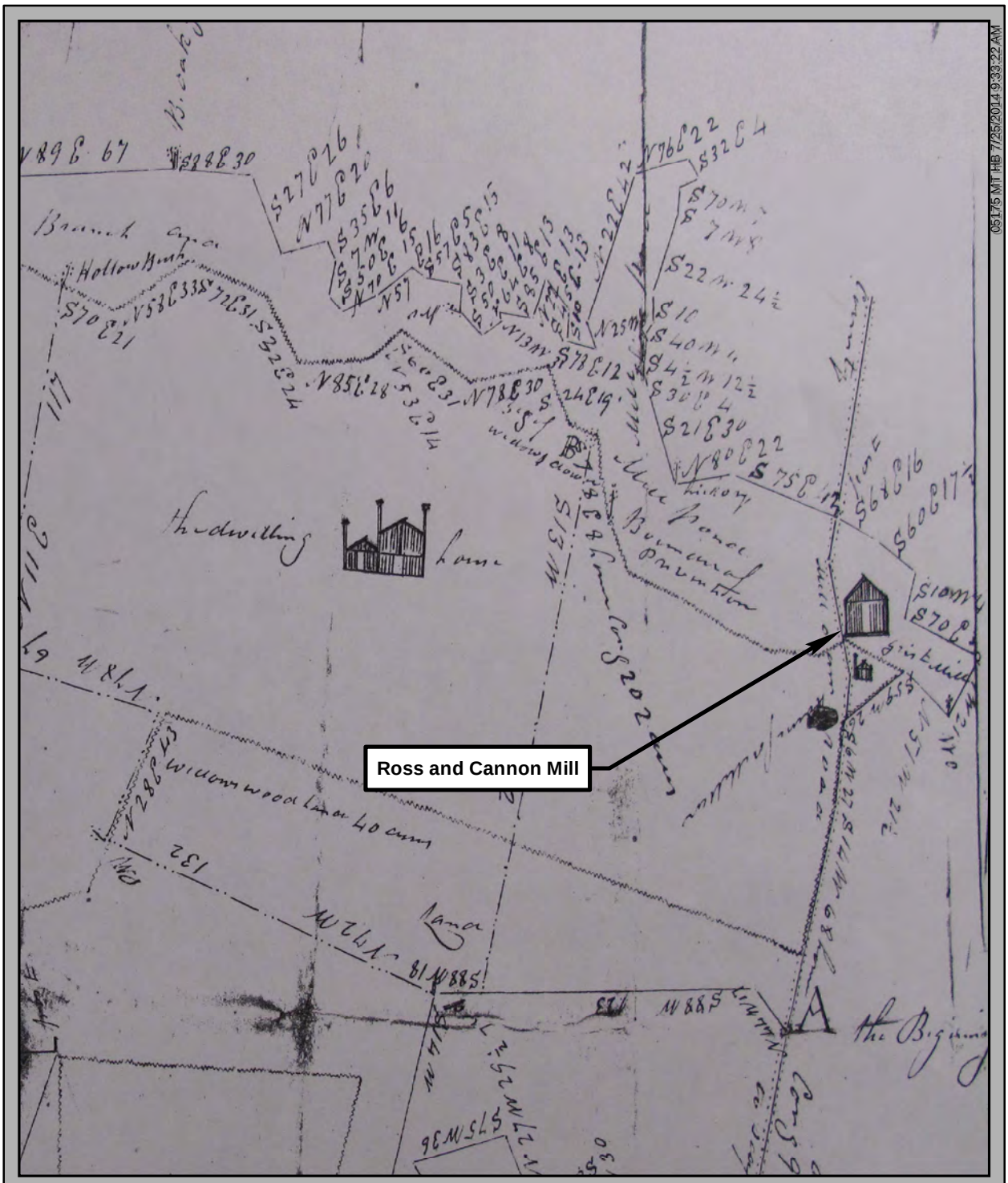


Figure 7: Historic Map, 1830

Ross & Cannon Mill Site
Seaford Hundred, Sussex County, Delaware

Not to Scale

Source: Orphans Court Bk. P:50, 1830

and economic development in the history of Delaware. Improvements in local and regional transportation, the continued expansion and diversification of industrial activities, the rise of Baltimore as a trading center, and the revolution in agriculture taking place across the region all contributed to a shift away from market-dependence on Philadelphia and a movement towards a more locally-based economy (Lindstrom 1978: 122). In 1869 an act of the Delaware legislature created Seaford Hundred out of Northwest Fork Hundred in Sussex County (Scharf 1888: 1301). Seaford Hundred was lower half of Northwest Fork Hundred.

The population of Sussex County was 25,093 in 1840. In 1860 the county had a population of 29,615, including 1341 slaves and 4,370 free African-Americans. The county had the largest slave population in the State of Delaware, which maintained strong socio-economic ties with the South. By 1880 the population had increased to 36,018. The county remained largely rural and agricultural, although improvements in transportation and technological innovations encouraged the growth of industry.

During the Civil War, the State of Delaware was identified as a border state which remained with the Union, but continued to accept slavery. The state provided manpower, resources, and facilities to support the Union cause. While the state supported the Union, there were many pro-Southern sympathizers among Delaware's population. The strongest Pro-Southern contingent was located in Sussex County, which also was home to the largest slaves owning population in the state. Sussex County maintained close economic and social ties with the slave-owning region of the country. Sussex County was also home to a large free-black population.

Improvements in regional transportation routes had begun in the first quarter of the century with the completion of a number of interstate turnpikes. These early road works were the first stage in a campaign of internal transportation improvements that reached its zenith with the completion of the Philadelphia, Wilmington, and Baltimore Railroad in 1839. Competing with the Chesapeake and Delaware Canal, which was begun in 1809 but not completed until 1829, the Philadelphia, Wilmington, and Baltimore Railroad soon handled the bulk of transportation and shipping across the state. After its completion, a number of other railroads soon connected northern Delaware to the Pittsburgh area and the Ohio River Valley.

The construction of the Delaware Railroad was a major transportation undertaking and had a significant impact upon commerce of Sussex County. The Delaware Railroad was incorporated on June 20, 1836. Initial construction of the railroad did not begin until 1852. In 1858 the Delaware Railroad had reached Bridgeville and passed through Northwest Fork Hundred (Scharf 1888: 1276). The railroad was completed in 1859 and extended from Delaware Junction, in the northern part of the state, to Laurel, on the Maryland-Delaware border in Sussex County (Baer 1981). The railroad passed through the communities of Bridgeville, Seaford and Laurel in Sussex County and vastly improved commerce in the region. The completion of the railroad also contributed to the decline of the shipping industry of the region.

Bolstered by new transportation routes, a large native and immigrant labor pool, and a ready supply of raw materials, northern Delaware's industries grew and diversified at an unprecedented rate during this period. Having devoted much of its resources to industrial development, by the start of the Civil War, New Castle County boasted a total of 380 manufactures (De Cunzo and

Catts 1990: 73; Lindstrom 1978: 122). By the 1860s, Wilmington emerged as the state's most densely settled urban region. In addition to its textile mills, the city was also becoming a leading manufacturer of transportation-related equipment such as carriages, railroad cars, and iron ships (Hoffecker 1977).

These dramatic changes in industry were paralleled by important shifts in agricultural practices in the region's hinterland. After abandoning its market reliance on wheat exports to Philadelphia during the first quarter of the century, the farm economy of northern and central Delaware restructured itself around a diversified and locally consumed produce base in the middle of the century. By providing fruits, meat and dairy items to the new urban markets in Wilmington and Baltimore, farmers in Sussex County rebounded from the stagnancy of the past decades.

In 1842 Curtis Ross sold his share in "Clear Brook Mill" to Daniel Cannon (Sussex County Deed Book 50: 37). That same year Edward Ross conveyed his share to Miles Tendale, Jr., described as all that property "with dams, causeways, bridges, buildings and improvements with that valuable grist mill and all machinery attached" (Sussex County Deed Book 50: 309). The following month Tendale sold his half of the property to Daniel Cannon (Sussex County Deed Book 50: 310), such that Cannon owned the entire property.

The 1844 tax assessment for Northwest Fork Hundred shows Daniel Cannon with over 2,000 acres, including a grist mill, houses and lots. He also owned 10 male slaves, five female slaves, four ounces of silver, and numerous horses, cows, sheep, and hogs. The 1850 Sussex County population census notes Daniel Cannon, aged 54, as a farmer with $17,500 of real estate. The census also shows that although Daniel was born in Delaware, his son William, aged 23, was born in Maryland.

Daniel Cannon operated the mill property during the 1840s and early 1850s. The 1850 population census notes Daniel Cannon, aged 54, as a farmer and head of household. He is listed with $17,500 worth of real estate. Also in the household is Elizabeth Cannon, aged 29, William Cannon, aged 23, and Isaac Cannon, aged one. There were four others in the household, evidently non-family members, who likely acted as servants or housekeepers. Although Daniel was born in Delaware, the rest of the family was born in Maryland. Daniel expanded the mill complex with the addition of a bark mill at some point during his ownership. The 1850 Industry Schedule (Manufactures Census) notes Daniel Cannon in the First Subdivision of Sussex County. He is listed as a bark manufacturer with $500 capital invested in the business. The bark mill was operated by water power. The mill employed one male with at an average monthly cost of $15. The mill produced 100 ton of lumber and bark valued at $3,600.

In 1850 Daniel Cannon owned nineteen slaves, making him one of the largest slave owners in Northwest Fork Hundred. William H. Ross owned fourteen slaves (Hancock & Hite 1981: 75). In 1860 there were 350 slaves residing in Northwest Fork Hundred. That same year, 581 free blacks also resided in the hundred. Some of the largest slave owning families during this period included the Ross, Cannon and Wright families (Hancokc & Hite 1981: 68).

In 1856 Daniel Cannon died, and his property went to his wife, Elizabeth. Elizabeth Cannon transferred the grist mill to her son, William Huffington Cannon. At the time of Daniel

Cannon's death he possessed 382 bushels of wheat and 1,553 bushels of yellow corn at his mill, in addition to his land holdings. He was also owner of sixteen slaves, which passed to his son William.

The 1860 Industry Schedule (Manufactures Census) for Northwest Fork Hundred notes William Huffington Cannon with a wheat and corn mill with $1,500 invested in it. The mill was run by water power and used two run of stones. A single male was employed at an average monthly cost of $10. The mill production included, 500 bushels of wheat producing 100 barrels of flour valued at $750; 2,000 bushels of corn, producing 2,000 bushels of meal valued at $1,500; and 40 bushels of rye, producing seven barrels of rye flour valued at $40. Other wheat and corn mills in Northwest Fork Hundred in 1860 included those owned by John M. Rawlins, Jacob Williams, William Cannon, Roger Adams, and J. B. Walker. The Rawlins mill produced 600 barrels of flour, 3,000 bushels of corn meal, and 400 pounds of buckwheat flour. So the Rawlins mill, located at Middleford, had a substantially greater output than the Cannon mill.

The same Industry Schedule lists William Huffington Cannon as a bark manufacturer with $500 invested in the business. The bark mill used water power, and the mill employed one person with an average monthly salary of $15. The mill produced 25 ton of black oak bark valued at $700. The 1860 population census for Northwest Fork Hundred notes William H. Cannon, aged 32, as a farmer and head of household. He was single, and had two other male farm laborers living in the household. His real estate was valued at $20,000 and his personal estate at $5,000.

The 1868 *Atlas of Sussex County, Delaware* records "W.H. Cannon" as owner of the grist mill and the farmstead immediately southwest of the grist mill. The grist mill property ***(Figure 8)*** included 510 acres of surrounding land. The 1870 Industry Schedules (Manufactures Census) for Seaford Hundred notes William Cannon with $1,000 invested in his grist mill operation. The water power was received from a wooden wheel which produced 18 horsepower. The mill used four stones for grinding. The mill's capacity was 10 bushels of wheat and 15 bushels of corn per day. Production that year included 500 bushels of wheat which produced 100 barrels of flour valued at $800; 1,000 bushels of corn which produced 1,200 bushels of meal valued at $1,200; and 200 bushels of rye which produced 40 barrels of flour valued at $200. There were two other grist mills in Seaford Hundred that year, J. Rawlins & Brother and Jacob Williams.

Evidently, William Huffington Cannon was unable to meet his financial obligations and at least some of his property had to be sold to satisfy his debts. (According to Sussex County Death records, William H. Cannon, single son of Daniel and Louisa Cannon, died September 8, 1885, aged 62 years, at Seaford.) In 1876 Sussex Sheriff William Gray sold the 5-acre lot in Seaford Hundred with the grist mill complex, which included a bark mill, two single-story dwellings and stables, to William McCaulley (Sussex County Deed Book 89: 203). The five-acre tract was part of the William Huffington Cannon property. The property was seized and sold in order to pay debts incurred by William H. Cannon. In 1878 William McCaulley sold the mill property to John Willey (Sussex County Deed Book 90: 465). Several historical accounts of the mill provide conflicting dates indicating that the property was damaged or destroyed by fire during the late nineteenth century and was later rebuilt (Thomas 1975).

5. 1880-1940+/- Urbanization and Early Suburbanization

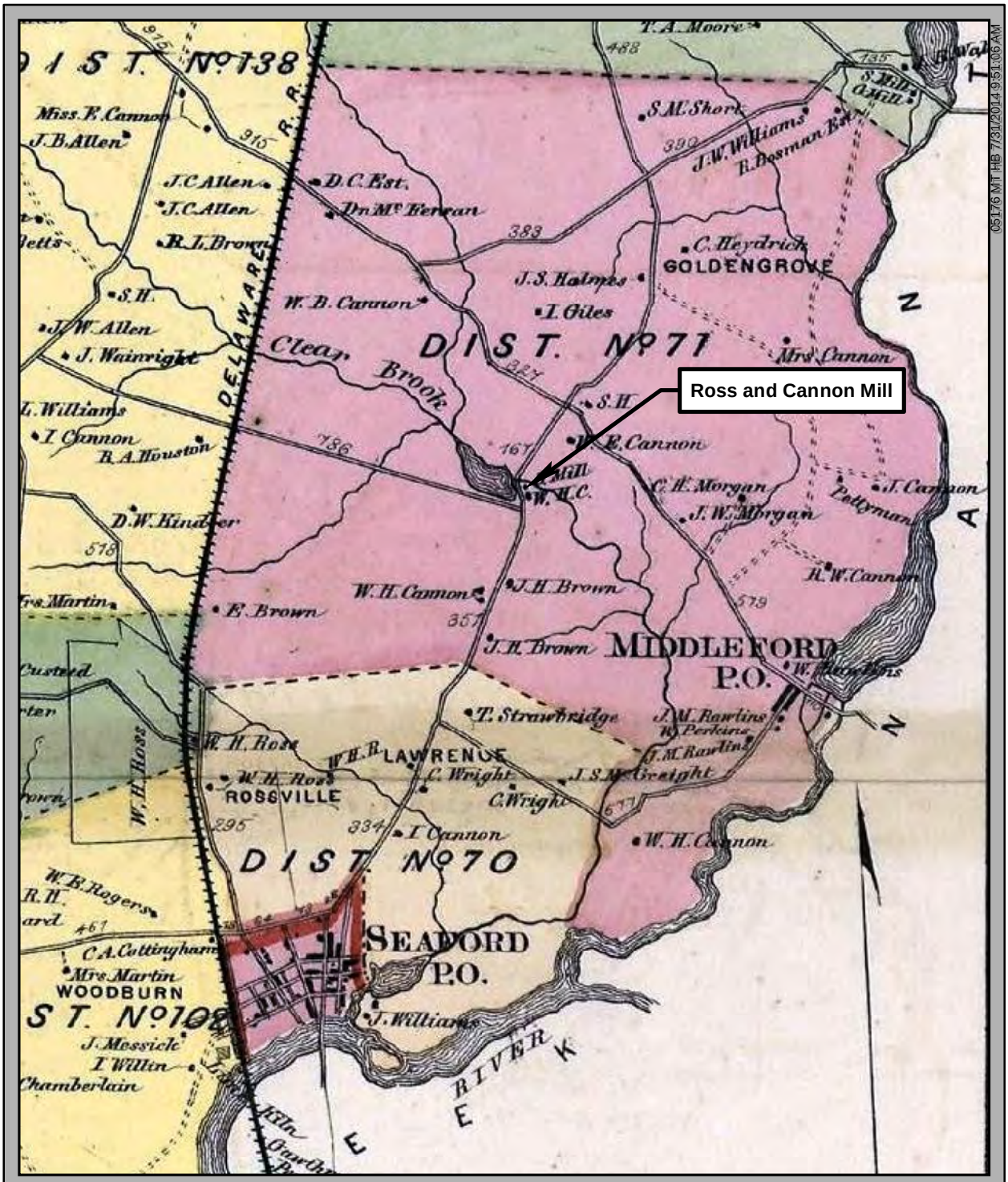


Figure 8: Mill Location in 1868

Hearns Pond Dam Improvement Project
Seaford Hundred, Sussex County, Delaware

Not to Scale

Source: Atlas of the State of Delaware, 1868

General census figures from the turn of the century show that, for the first time in its history, agriculture ceased to be the predominant occupation in the state of Delaware. While a number of trade occupations rose in importance during the years between 1870 and 1900, the largest shift occurred between industry (rising from 23.5% to 31% of the state's work force) and agriculture (declining from 39.5% to 26%). The majority of industrial and trade jobs would have been centered around Wilmington (De Cunzo and Catts 1990: 77-78).

Nonetheless, agriculture continued to play an important role in the regional economy. The trend towards non-staple crops, perishables, and truck farming initiated in the second quarter of the nineteenth century continued in much of the state, as new transportation routes connected the region to emerging urban areas throughout the northeast. Wilmington's continued growth insured continued demand for dairy products from the Piedmont, allowing this form of agriculture to thrive well into the twentieth century. Agricultural tenancy and share-cropping also held even, with over half of all farms engaged in some form of tenant arrangement at the turn of the century (De Cunzo and Catts 1990: 78-80).

Between the mid-nineteenth century and 1900 a combination of factors shaped Delaware farmers' responses to changing markets. Two of the largest factors were the rapid growth of urban centers along the east coast, and the agricultural expansion of the Midwest which flooded markets with cheap wheat. In 1840 Wilmington was a town of 8,367, but by 1920 it had grown to over 110,000. Philadelphia rose by nearly the same percentage, from 155,000 in 1840 to over 1,800,000 in 1920 (Sheppard 2009: 232-233).

The rapid growth of urban populations spurred the rise in demand for fluid milk. There had been a previous desire for milk in the cities but prior to the opening of the rail line between Philadelphia, Wilmington, and points south in Delaware in the 1850s, there was not a rapid or easy access to the city markets. Transportation improvements along with better refrigeration methods encouraged the growth of fluid milk production. This rise in fluid milk production coincided with the large population growth in nearby cities (Sheppard 2009: 280).

The 1880 Industry Schedules (Manufactures Census) for Seaford Hundred notes John Willey with $4,500 invested in his milling operation that year. His mill processed 1,200 bushels of wheat, 5,000 bushels of other grain, and 3,600 bushels of buckwheat. The total value of Willey's finished products was $6,776. There were three other grist mills in Seaford Hundred that year: William Dulaney, James Rawlins & Co., and Jacob Williams. The value of the products for the Dulaney mill was $2,928; for the Rawlins mill was $1,400; and for the Williams mill was $6,776. Although Willey had the least amount invested in his mill operation, the value of his product equaled that of his nearest competitor. The 1880 population census for Seaford Hundred shows John Willey, aged 37, as a miller and head of household. Also in the household was his wife, Sallie, aged 26, and their five children aged from one year to 13 years.

In 1883 John Willey sold the mill property to Marcellus W. Hearn (Sussex County Deed Book 106: 37). In 1892 Hearn is noted as having rebuilt the mill along Clear Brook (Runk 1899: 980-981). Hearn also constructed a home for his family near the mill. The 1892 tax assessment for Seaford Hundred lists Marcellus with a mill property valued at $3,000, a house valued at $1,000, and two horses valued at $200. The 1901 tax assessment for Seaford Hundred shows Marcellus

with a mill property, a dwelling and barn, two horses, a cow, and 20 acres of land. The 1910 population census notes Marcellus W. Hearn, aged 69, as the proprietor of a flour mill. In the household at that time was his wife Aseneth, aged 64, daughter Mary C. Rawlins, aged 34 and her husband Philip Rawlins, aged 35, a house carpenter. Also in the household was the Rawlins' daughter Mary, aged 1 year, and Mary's son Jacob Moore, aged 10 years. Marcellus' son, George H. Hearn, aged 41, was living next door with his wife Pearl. He was listed as the manager of a flour mill (US Census Bureau 1910).

Hearn also constructed a home for his family near the mill. The 1913 tax assessment for Seaford Hundred assesses M. W. Hearn with a dwelling and barn valued at $1,200; a dwelling valued at $800; a dwelling valued at $1,000; the mill property valued at $3,000; and a dwelling valued at $300. Mr. Hearn also owned two horses and two cows that year. The mill operation eventually was established as a partnership among the various heirs of Marcellus Hearn. Marcellus Hearn was active in the civic and business community of southwestern Sussux County throughout the late nineteenth and early twentieth century. Marcellus W. Hearn died on February 10, 1916. Hearn's will stated that one-half interest in the mill operation would go to two of his children, George Hearn and Mary Corrine Rawlins.

Marcellus Hearn's 1915 will divided his estate as follows: Assenath R. Hearn (wife) received the family house, $1,000, and all of the chickens, one cow, one horse, and carriage; George H. Hearn (son), the house where he lives and a half interest in my mill in Seaford Hundred; Amanda Jane Ricards (daughter) $6,000; Mary Corrine Rawlins (daughter) family house– after mother's death - and a half interest in my mill in Seaford Hundred; Theodosia Wilson Smith (daughter) a house and $3,000; and Jacob H. Moore (grandson), $2,000, six acres of land on the north side of my millpond, and one-half interest in a gristmill at Galestown, Maryland (Will of Marcellus W. Hearn, Sussex County Will Book 22: 70). The mill location in 1915 is depicted in ***Figure 9.***

George H. Hearn was born on March 2, 1869 in the Town of Seaford. He attended local school and at the age of fourteen began working at the family mill, under the proprietorship of his father Marcellus Hearn. George eventually assumed management of the mill operations. George and his sister Mary C. Philip operated the mill after the death of Marcellus Hearn in 1916. George Hearn was a member of the Wyoming Milling Company, along with J. Fred Dolby and his brother-in-law Philip Rawlins. Hearn also served as a director of the Delaware Trust Company. In November 1906 he married Pearl W. Wroten, of Bridgeville, Delaware (Bevan 1929: 384). In 1906 the couple built a house immediately south of the Hearn & Rawlins Mill, which is no longer extant.

Philip H. Rawlins, the husband of Mary, became employed with the mill firm in 1915. Philip Rawlins was born on September 28, 1875 in the village of Middleford, in Seaford Hundred. The Rawlins family operated a mill and other business interests in Middleford during the nineteenth century. Rawlins attended the public school system and then engaged in carpentry and farming. He also served as postmaster at Middleford. Philip Rawlins was a member of the firm which also operated the Wyoming Milling Company (Bevan 1929: 284). The 1920 population census for Seaford notes Philip H. Rawlins, aged 44, as a miller of a flour mill and the head of household. The household included his wife, Mary C., aged 44; step-son Jacob H., aged 20, a machinist; and daughter Catherine, aged 11 years. Ella Quillen was a boarder in the household at

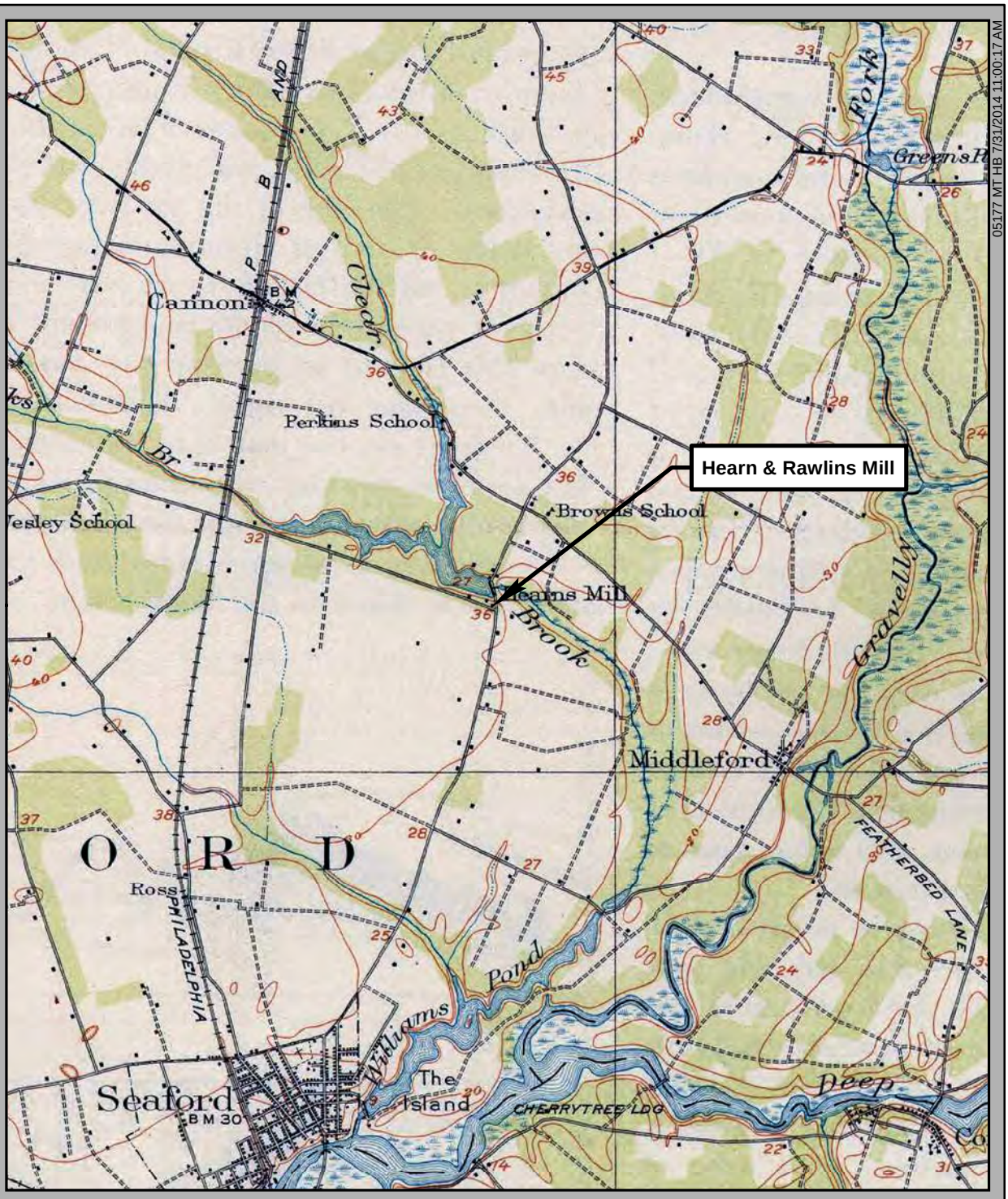


Figure 9: Mill Location in 1915

Hearns Pond Dam Improvement Project
Seaford Hundred, Sussex County, Delaware

Source: Seaford, DE 7.5" USGS Historic Quadrangle, 1915

the time. Adjoining the Rawlins household was George H. Hearn, aged 50, also a miller of a flour mill and head of household. Only his wife Pearl, aged 46, was in his household.

The 1930 population census for District 3 of Sussex County shows Philip H. Rawlins, aged 54, as the miller of a grist mill and head of household. Also in the household are his wife Mary C., aged 54; daughter Catherine E. Griffith, aged 21; son-in-law, Russell Griffith, aged 22; Esther E. Quillen, aged 70; and grandson Russell Griffith, aged two years. Adjoining the Rawlins household is William P. Quillen, aged 51, a miller at a grist mill and head of household. Only his wife Lula J. is in his household. Adjoining the Quillen household is that of George H. Hearn, aged 61, also a miller of a grist mill and head of household. Hearn's wife has evidently died by this time, and Perry Caston, a laborer at a truck farm and his wife Sarah are living in the house. The 1930 population census for Seaford notes Jacob H. Moore, aged 30, as a retail grocery merchant. Also in the household is his wife Arsie, aged 30, son Jacob H., aged two years, and mother-in-law, Mary Blizzard, aged 70.

6. 1940-1960 +/- Suburbanization and Early Ex-urbanization

In 1940 Sussex County had a population of 52,502. By 1960 the population increased to 73,195. The county experienced growth during the period due in part to increased industrial operations, such as nylon production. The improved highway system further supported development of the region and encouraged tourism, including the Lewes area. Agriculture remained an important economic factor in the county. Truck farming, with an emphasis of fruit and orchard products, and the broiler chicken industry continued to be an important industry for Sussex County. The population of Sussex County increased significantly during the late twentieth century, reaching 156,638 by 2000 and tripling in size since 1940.

Marcellus Hearn's heirs who continued in the milling business included his son George who died without issue; his daughter Mary C., the wife of Philip Rawlins; Mary's son Jacob Hearn Moore, and her daughter Kathryn, the wife of Russell Griffith. Philip Rawlins died in 1957. In 1959, Jacob H. Moore and his wife Mary, Kathryn Griffith and husband Russell, Mary C. Rawlins and Jennie Ricards deeded the mill property to Hearn & Rawlins, a corporation of Delaware (Sussex County Deed Book 502: 536). Mary C. Rawlins died in 1967, and Russell Griffith died in 1968. Marcellus's grandson Jacob H. Moore died in 1988. In 1999, Hearn & Rawlins, Inc. sold the mill property to the United Nation of Islam, Inc. (Sussex County Deed Book 2387: 343).

IV. Archaeological Assessment and Recommendations

The results of the background research and the examination of the existing conditions of the archaeological APE ***(Figure 10)*** were utilized to assess the probability of encountering pre-contact and historic archaeological resources within the project area.

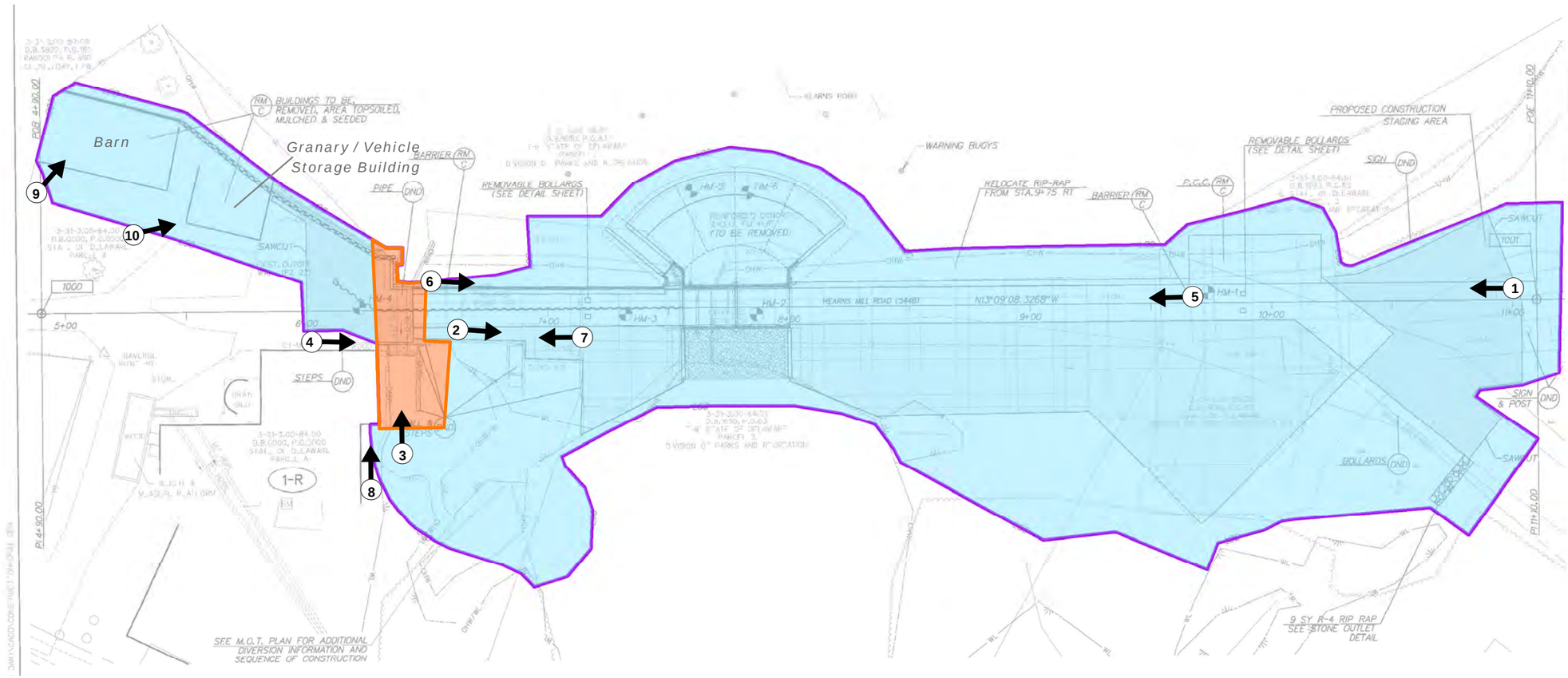
A. Pre-Contact Archaeological Potential

Although several pre-contact sites have been previously identified in the Clear Brook drainage on similar topographic settings to the project area, and the area is mapped within a high probability zone for encountering pre-contact sites, the archaeological potential for encountering these resources should be considered low due to prior ground disturbance within the APE. The APE on the north side of the dam is confined to the paved areas associated with the existing boat ramp, parking lot, and the Shore Drive access road ***(Figure 10 and Photograph 1).*** The areas in lawn to the east of the dam and to the south of the parking lot are obviously composed of graded, sloping fill material with low archaeological potential ***(Figure 10 and Photograph 2).*** Pre-contact archaeological potential is also considered to be low within the APE to the south of the dam due to major flood events and disturbances associated with the siting of the existing mill buildings, road, parking areas, and the recent rehabilitation of the dam.

B. Historic Archaeological Potential

The background research and historic maps ***(Figures 7, 8, and 9)*** suggest that the milling operations associated with the Hearns Pond Dam were always situated at the present location of the Hearn & Rawlins Mill complex on the south side of the dam. Due to the previous disturbance described above and lack of mill-related activities and structures, historic archaeological potential within the APE to the north of the dam is also considered to be low.

The original mill, known as the Cannon and Ross Mill, was constructed ca. 1816 and was situated to the south of the dam, but was damaged by fire in 1879. In 1883 Marcellus Hearn acquired the property and re-constructed the mill building in the same location. The Hearns Pond Dam was constructed in 1912 and a concrete spillway ***(Photographs 3 and 4)*** that supplied water to the mill was constructed at that time. The spillway structure was an integral part of the mill complex. This structure differs from other similar dam culverts in that it its floodgates and tracts were constructed of steel rather that wood gates and concrete tracks. Although heavy storms in 2001 and 2006 ***(Photographs 5 and 6)*** caused significant damage to the dam, the 1912 spillway remains largely intact. Subsequent to the 2001 storm event, the Hearns Pond Dam was reconstructed in the area to the north of the spillway ***(Photographs 7 and 8)***. Collectively, these storms and extensive repairs have compromised the archaeological integrity of the original dam and the landforms associated with it, therefore historic archaeological potential associated with the dam and the landforms to the north of the 1912 concrete spillway is considered to be relatively low. The portion of the dam containing the 1912 spillway was left intact during the



Area Exhibiting Low Archaeological Potential, No Testing Recommended

Area of Archaeological Sensitivity, Archaeological Monitoring Recommended

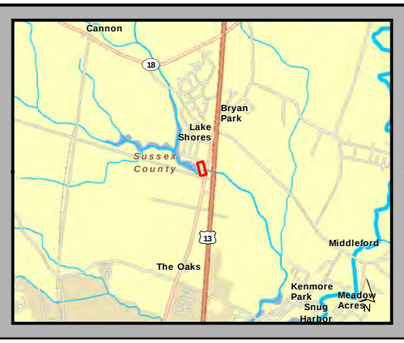
Archaeological Area of Potential Effects

Photograph Locations

0 25 50 100 Feet

0 5 10 20 30 Meters

McCORMICK TAYLOR



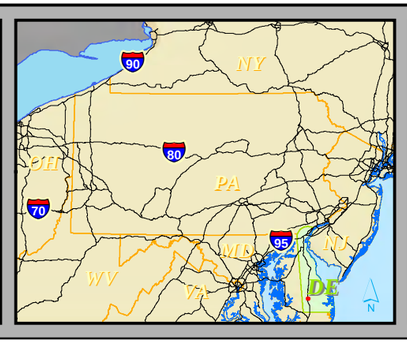


Figure 10
Archaeological Area of Potential Effects and Photograph Key

Hearns Pond Dam Improvement Project
Seaford Hundred, Sussex County, Delaware

Photograph 1: Disturbance associated with the existing boat ramp and parking lot, facing south.

Photograph 2: View of the filled sloping landforms to the east of the dam, facing south.

Photograph 3: View of the 1912 spillway, facing west.

Photograph 4: View of the 1912 spillway, facing north.

Photograph 5: View of the damage after the 2001 storm event, facing south. (Photograph courtesy of DelDOT.)

Photograph 6: View of the damage after the 2006 storm event, facing north. (Photograph courtesy of DelDOT.)

Photograph 7: View of the dam and mill during the 2002 rehabilitations, facing south. (Photograph courtesy of DelDOT.)

Photograph 8: View of the dam during the 2002 rehabilitations, facing west. (Photograph courtesy of DelDOT.)

twentieth century repairs, and modern disturbances in the area of the former wheelhouse were less severe than the repairs than those made to the dam to the east of the spillway. There is moderate potential that some of the structural elements of the ca. 1816 mill survived the mill reconstruction in 1883 and the spillway improvements made in 1912. This area of archaeological sensitivity is depicted in ***Figure 10.***

The APE to the west and south of the mill building contains two mill-related buildings, a barn/stable ***(Figure 10 and Photograph 9)*** and a granary/vehicle storage building ***(Figure 10 and Photograph 10),*** which will be removed as part of the project. Most of the area between the mill and the outbuildings is paved or is composed of gravel parking areas, although a sliver of lawn with a maximum width of about 15 feet (4.6 meters) lies just to the east of the barn. The section of lawn is also likely disturbed, resulting from the use of the barn's central bay as a drive-through for wagons. Therefore, the historic archaeological potential within the APE to the west and south of the mill building was also considered to be low.

C. Recommendations

The potential for finding archaeological resources associated with the 1816 Cannon and Ross Mill is considered to be moderate. It is recommended that an archaeological monitor observe the construction activities in the archaeologically sensitive areas around the former wheelhouse and spillway in the case that remnants of the 1816 mill have survived. Because the 1912 spillway was an integral improvement to the mill operations, the archaeological monitor will also photo-document its demolition for any information that can be obtained regarding its construction methods.

Monitoring involves the active observation of the earth moving activities or other activities that may adversely affect potentially significant archaeological resources. As part of the monitoring protocol, the archaeologist will be granted the authority as per the National Historic Preservation Act, 36CFR800, to halt all construction in that area in the event of a discovery. If archaeological resources are discovered during construction, the work will be stopped until the archaeological monitor evaluates the find. If the archaeologist determines that the find is potentially significant, the DelDOT project archaeologist will be consulted on how to proceed with the work at the site. Once the construction activities are completed in the archaeologically sensitive areas, the archaeological monitoring program will be halted. Any archaeological monitor supervising the construction activities must meet the Occupational Safety and Health Administration Hazardous Waste Operations and Emergency Response Worker Training Certification (29CFR§1910.120). The archaeological monitor observing the construction activities must meet the Secretary of the Interior's Professional Qualifications Standards for Archaeology (36CFR§61).

Photograph 9: View of the barn associated with the mill, facing west.

Photograph 10: View of the granary/vehicle storage building associated with the mill, facing northwest.

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