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February 28, 2019

VIA ELECTRONIC MAIL
AND UPS NEXT DAY DELIVERY

Mr. James J. Murphy, Vice-Chairman
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Re: Petition No. 1354 – Chatfield Solar Fund, LLC, petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a 1.98-megawatt AC solar photovoltaic electric generating facility located in Killingworth, Connecticut

Dear Vice-Chairman Murphy:

Enclosed please find the original and fifteen (15) copies of the Phase I Archaeological Reconnaissance Survey requested by the Connecticut State Historic Preservation Office that was discussed at the February 21st hearing. The survey recommends no further archaeological conservation efforts with respect to potential prehistoric or historic archaeological resources on the project property.

Please feel free to contact me with any questions concerning this submittal at (203) 772-7787.

Very truly yours,

Bruce L. McDermott

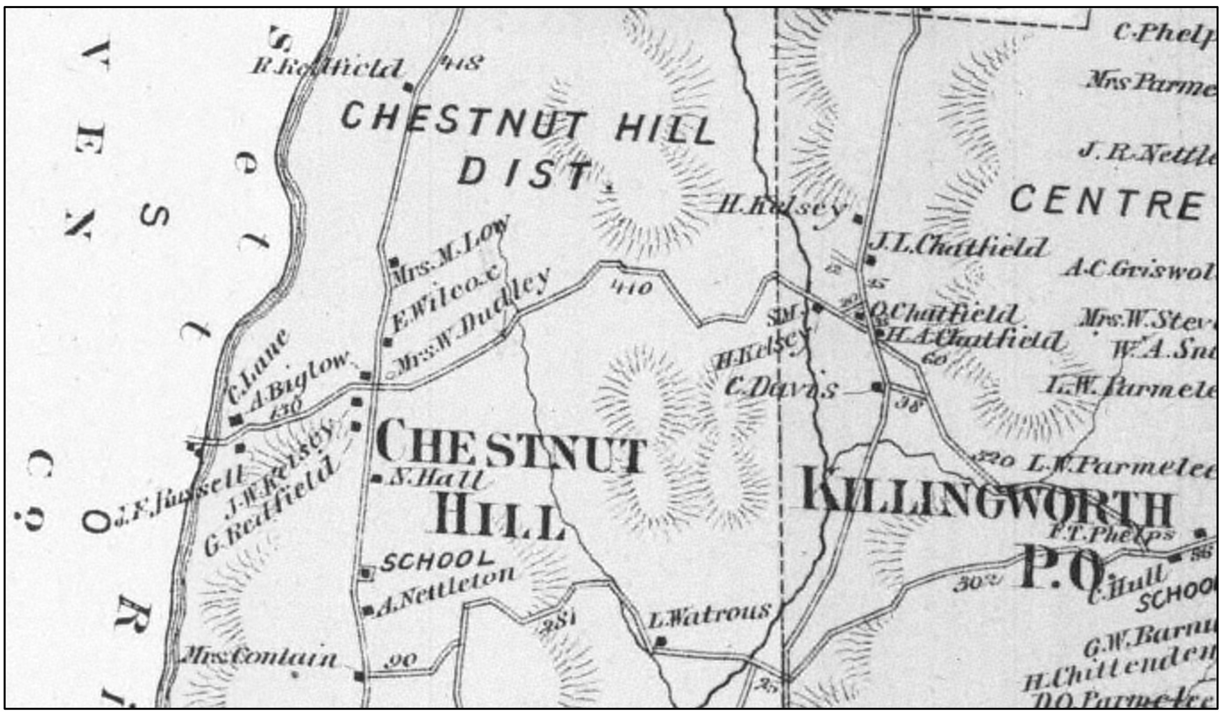
Enclosures

Phase I Archaeological Reconnaissance Survey
of the
Chatfield Solar Farm

in the

Town of Killingworth, Connecticut

November 2018



ACS
◆ ***Archaeological Consulting Services*** ◆

Phase I Archaeological Reconnaissance Survey
Chatfield Solar Farm
Town of Killingworth, Connecticut

by

Gregory F. Walwer, Ph.D.
and
Dorothy N. Walwer, M.A.

of

ACS

for

Loureiro Engineering Associates, Inc.
100 Fort Hill Road
Groton, CT 06340
(860) 448-0400

November, 2018

ACS
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Abstract

This report contains the results of a Phase I archaeological reconnaissance survey conducted by ACS (Archaeological Consulting Services) during the month of November, 2018. The project calls for an evaluation of potential cultural resources to be affected by the construction of a solar field in Killingworth, Connecticut. The survey was requested by the Connecticut Office of State Archaeology in anticipation of requirements by the Connecticut Siting Council and the Connecticut State Historic Preservation Office. The project property measures 25 acres, with the proposed solar arrays to cover about one half the acreage.

The project area lies in western Killingworth on vacant land that is currently wooded. The prevailing soil type is a very rocky Woodbridge fine sandy loam. The wetland bodies in and around the project area are relatively minor, although there are two vernal pools that could have elevated prehistoric resource extraction efforts. There are no previously recorded prehistoric archaeological sites in or near the project area. Historic maps and land record also indicate no major developments within the project area.

There were 50 stratified systematic shovel tests excavated for this survey, revealing soil profiles similar to the projected Woodbridge type, although with a finer texture in the upper stratigraphy of the project area. The tests were undisturbed, although a deeper surface layer than expected may indicate historic agricultural activity for the parcel that is now wooded. There were no historic features recorded during the survey other than various stonewall alignments, some of which had breaks that may represent a former logging road through the area. There were no prehistoric artifacts recovered, and the only historic artifact was a single, small, wrought iron spike found adjacent to a stone wall that may have been related to historic logging activity or the construction of the stone walls.

Given the lack of prehistoric artifacts or features identified during the survey, no further archaeological conservation efforts are warranted with respect to potential prehistoric cultural resources. There were also no significant historic site contexts revealed through subsurface testing. The stone wall alignments of the project area are likely on the order of 200 years old, although they are not rare or unique features of the landscape. Therefore, ACS recommends no further archaeological conservation efforts for historic cultural resources of the project property.

Project Summary

Project Name: Chatfield Solar Farm, Killingworth, Connecticut.

Project Purpose: To investigate possible cultural resources which may be impacted by the construction of a solar field in compliance with requirements of the Connecticut Siting Council and the Connecticut Environmental Policy Act.

Project Funding: Loureiro Engineering, Groton, CT.

Project Location: Tax Map 26, Lot 14-B, Killingworth, Connecticut.

Project Size: 25 acres.

Investigation Type: Phase I archaeological reconnaissance survey.

Investigation Methods: Background research, pedestrian surface survey, 50 systematic subsurface shovel tests.

Dates of Investigation: November, 2018.

Performed by: ACS (Archaeological Consulting Services), 118 Whitfield Street, Guilford, Connecticut 06437, (203) 458-0550 (telephone), (203) 672-2442 (fax), acsinfo@yahoo.com.

Principal Investigators: Gregory F. Walwer, Ph.D. and Dorothy N. Walwer, M.A.

Submitted to:

Alisa Morrison, Principal Engineer, Loureiro Engineering Associates, Inc., 100 Fort Hill Road, Groton, CT 06340, (860) 448-0400.

Connecticut Office of State Archaeology (Dr. Brian Jones, State Archaeologist), University of Connecticut, 354 Mansfield Road, Storrs, Connecticut 06269-1176, (860) 486-5248.

Reviewing Agency:

The Connecticut State Historic Preservation Office, (Catherine Labadia, Staff Archaeologist), One Constitution Plaza, 2nd Floor, Hartford, CT 06103, (860) 256-2761.

Curation:

Artifact bags labeled with project code (KWSF), test # (e.g. 3S-10E), layer (e.g. II).
Artifacts scheduled for submission to Connecticut Office of State Archaeology, Storrs, Connecticut.

Recommendations: No previously recorded prehistoric sites in the vicinity, statistical landscape sensitivity model indicates low prehistoric sensitivity, no prehistoric features or artifacts recorded. Also no historic resources recorded except for common stone wall alignments and a single wrought iron spike. No NRHP properties or state register sites in close proximity. No further archaeological conservation efforts warranted.

Acknowledgments

ACS is indebted to the following people whose assistance helped to make the execution of this project more accessible and thorough:

Catherine Labadia, Staff Archaeologist for the State Historic Preservation Office in Hartford, Connecticut. ACS thanks Catherine Labadia for her help in procuring prehistoric and historic sources pertaining to the region surrounding the project property.

Dr. Brian Jones, State Archaeologist at the Connecticut Office of State Archaeology in Storrs, Connecticut. ACS thanks Dr. Jones for directing ACS towards helpful background research sources relating to the prehistory and history of the region.

Ms. Alisa Morrison, Principal Engineer of Louriero Engineering in Groton, Connecticut. ACS thanks Ms. Morrison for her project coordination efforts.

Mr. Thomas Lentz, Killingworth historian. ACS thanks Mr. Lentz for his information regarding Killingworth and the region surrounding the project area.

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CHAPTER 1: INTRODUCTION

Project Description

This report provides the results of a Phase I archaeological reconnaissance survey conducted by ACS for a proposed solar field in Killingworth, Connecticut. The project area is located in western Killingworth, on the south side of Route 80 (North Branford Road) and to the east of Chestnut Hill Road. The overall property measures 25 acres, with the proposed arrays of solar panels to cover approximately one-half the acreage. The property contains some wetlands and vernal pools whose setbacks, along with property setbacks, account for much of the property acreage to remain undeveloped. Site plans for the proposed project were provided to ACS by Loureiro Engineering Associates, Inc. of Groton, Connecticut. The survey was requested under guidance from the Connecticut Office of State Archaeology and in anticipation of requirements by the Connecticut Siting Council, which would require review by the Connecticut State Historic Preservation Office.

Based on a low projected prehistoric and historic sensitivity for archaeological resources, as determined by the distribution of known historic resources and soil types for prehistoric sensitivity, ACS conducted a highly stratified-systematic subsurface testing strategy, in conjunction with a thorough background research effort and pedestrian surface survey to identify any and all prehistoric and/or historic cultural resources located within the project area. The survey was performed in compliance with the *Environmental Review Primer for Connecticut's Archaeological Resources,* containing guidelines issued by the State Historic Preservation Office (SHPO) for conducting cultural resource management surveys in Connecticut. ACS submitted the proposed research design to SHPO for its approval in advance of any fieldwork, with SHPO to serve as review agency for the final report.

Background Research

The project area is broadly at the boundary of the Southeast Hills ecoregion (IV-C) to the north and the Eastern Coastal ecoregion (V-B) to the south. Underlying bedrock is a mass unit of Monson Gneiss (Omo), an Ordovician formation on the order of 500 to 440 million years old. The property is on hill slope and ridge landforms, with a prominent glacial moraine or drumlin just to the west that supports a segment of Chestnut Hill Road. The dominant soil type for the project area is a moderately well drained, very rocky Woodbridge fine sandy loam (WzC). The project property is within the Chatfield Hollow Brook drainage basin (#5105) that drains into the Hammonasset River a couple of miles to the south, with associated wetlands on the project property and a perennial stream adjacent and to the east. The entire project property is wooded.

A statistical prehistoric landscape sensitivity model developed and utilized by ACS indicates a low sensitivity for potential prehistoric cultural resources on the project property. The prehistoric sensitivity scores for the project area score no higher than 12.8 out of a possible 100.0, and therefore well within the low sensitivity range (0-20). Factors contributing to the low sensitivity include less than ideal drainage, rocky soil contexts, and great distance to major bodies of water, although the minor perennial stream and especially vernal pools in the project area elevate the sensitivity to some degree, and small prehistoric camp sites are known from these settings. The closest previously recorded prehistoric archaeological site is located at Chatfield Hollow a couple of miles to the east of the project area, where collectors found an Archaic era, chert side-notched projectile point at a rockshelter setting.

Historically, the project area also bears a low sensitivity given the absence of historic occupations on or near the property according to historic maps, which show the closest occupations along Chestnut Hill Road to the west, including the Cooper and Hall families to the south and the Dudley family just north of Route 80. The property bears some historic sensitivity, however, because of the known presence of stone wall alignments in the project area and because of proximity to Route 80 and Chestnut Hill Road which were early traveled routes in the region. The closest previously recorded historic archaeological site includes the 19th Century remains of an outbuilding foundation and well on Summer Hill Road in northern Madison about a mile to the west of the project area. Land records and historic maps suggest no major developments on the property, with some land records referring to a logging road. Land records reveal the property to have been owned by the Perkins family during much of the 20th Century, and the Cooper and Dudley families during the latter half of the 19th Century when the land was associated with a historic occupation and land to the west along Chestnut Hill Road. Historic maps of the area show the Cooper and Hall families at the nearest houses on Chestnut Hill Road well to the west of, and uphill from, the project property. The Oak Lodge building, a 1933 Civilian Conservation Corps structure built at Chatfield Hollow State Park, is the closest National Register property and is located within a mile to the northeast of the project area.

Field Results

ACS conducted its field testing for the project in early November, 2018. There were 50 stratified-systematic tests conducted for the survey in standard 50-foot intervals. The tests were located in three long north-south transects in the western part of the eastern half of the project area along the ridge of a hill slope featuring two vernal pools immediately to the west, and in the southwest part of the project area on nearly level to gently sloping terrain near the southern side of the two vernal pools. Soil types were projected to be a fine sandy loam texture for the entire project area, although tests recorded a mix of fine sandy loam and finer silt loam textures. Tests were relatively wet given substantial rains in late October and early November, as well as a relatively high water table for the soils on the property. Substantial rock content prevented most tests from being excavated below two feet deep.

The project area contains numerous stone wall alignments constructed of locally available gneiss field stones. The walls are likely on the order of 200 years old, and reflect different pasture/wood lots and/or property boundaries. Land records reveal a logging road through the area. There were no artifacts recovered during the survey with the exception of a single small wrought iron spike recovered from a test located in close proximity to a stone wall about 150 feet south of the road. The single artifact likely relates to stone wall construction or logging, and the fact that the stone wall is parallel to a wide cleared path that may represent the logging road mentioned in land records.

Recommendations

The project area bears a low sensitivity for potential prehistoric cultural resources according to a statistical landscape sensitivity analysis, although there are two vernal pools on the property that could have been uniquely attractive to prehistoric populations of the region. Shovel tests revealed no traces of prehistoric activity or feature contexts, however. The wetlands on the property could have been attractive to wild game and other resources targeted by indigenous populations of the area, although rockiness of the soil and high water table would have been prohibitive to large or long term occupations. The nearest previously recorded prehistoric archaeological resource is located a mile to the northeast of the project area where a unique rockshelter site is located. Thus ACS recommends no further archaeological conservation efforts are warranted with respect to potential prehistoric cultural resources for the project area.

Historically, land records and historic maps reveal no substantial developments on the property. Land records mention a logging road, and stone walls present on the property include one along a very major path that runs through breaks in the intersecting stone walls, possibly representing a former logging road. Out of 50 shovel tests performed for the property, a single wrought iron spike found adjacent to a stone wall represents the only historic artifact recorded, and likely relates to the use of the property for logging or the construction of stone walls. The stone wall alignments of the project area are of substantial age, but are not especially well built and are common elements of the landscape. Background research and the results of field testing do not reveal more substantial uses or occupations of the project property historically, and a lack of potential visual impacts to surrounding historic resources of the area, thus ACS recommends that no further archaeological conservation or historic preservation efforts are warranted with respect to the proposed development of the project area.

CHAPTER 2: BACKGROUND

Environmental Setting

Location

The project area is located in the Town of Killingworth, Middlesex County, Connecticut (Figure 1). The project setting is near the boundary of the Southeast Hills (IV-C) and Eastern Coastal (V-B) ecoregions, (Figure 2). Roughly square, the project area lies in the western part of Killingworth, to the east of Route 79 (Durham Road), and to the south of Route 80 (North Branford Road). More specifically, the proposed solar field is to be located within one-quarter mile to the east of Chestnut Hill Road and within 100 feet to the south of Route 80 on an undeveloped parcel of land (Figure 3). The proposed project consists of the installation of a racking system supported by steel beams to be driven into the ground and suspending individual solar panels, with associated infrastructure to include underground wires, above-ground equipment, and access roads (Figure 4). According to the Killigworth tax assessor's office, the project property is a 25-acre tract located on Tax Map 26, Lot 14-B. To the nearest 10 meters, the Universal Transverse Mercator (UTM) coordinates for the center of the property are approximately (Zone 18 - easting / northing): 700,650 / 4581,230 (Figure 5).

Climate

The climate of the Eastern Coastal and Southeast Hills ecoregions of Connecticut are strongly influenced by its proximity to the Long Island Sound and Atlantic Ocean (Kirk 1939; Brumbach 1965; Dowhan and Craig 1976; Reynolds 1979). The project region typically experiences 47 inches (~120 centimeters) of precipitation per year. Average annual snowfall is about 35 inches (~90 centimeters). Precipitation amounts are rather evenly distributed throughout the year. Principal storm tracks include the Colorado and South Atlantic lows, and the Plateau and Rocky Mountain, Alberta, and Hudson Bay highs. While the predominant winds are from the southwest, northwest winds are frequent during winter. Normal temperatures vary between approximately 31 F in winter (22 F normal minimum) to 71 F (81 F normal maximum) in summer, with an average year-round temperature at about 50 F. Average relative humidity for the area is about 60-75 percent. These conditions result in a relatively humid environment throughout the year with considerable seasonality in terms of temperature. This limits the growing season for most crops between the middle of April and the middle of October (about 180 days), the average times for last and first killing frosts for the region. The temperate climate in general provides for an abundance of resources that are rather evenly distributed given the moderate topographic relief of the region, but which also vary cyclically based on a marked seasonality. Seasonality is known to have had a greater bearing than large scale spatial factors on prehistoric and early historic resource procurement strategies in regions with a relatively even distribution of wild resources (Butzer 1982), such as that of Connecticut.

Figure 1: Map of Connecticut

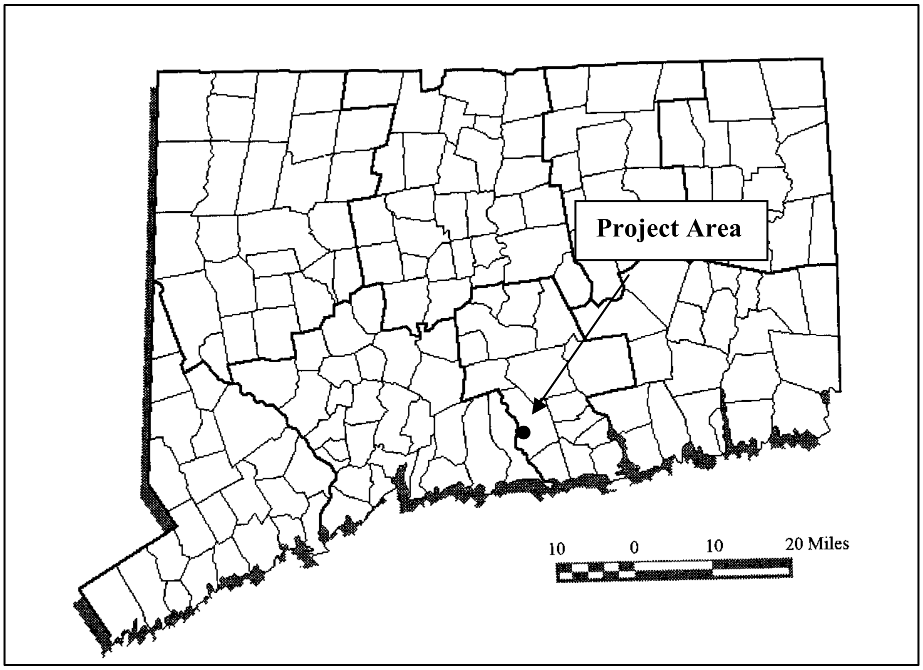

Figure 1: Map of Connecticut showing Middlesex County and the project location.

Figure 2: Ecoregions of Connecticut

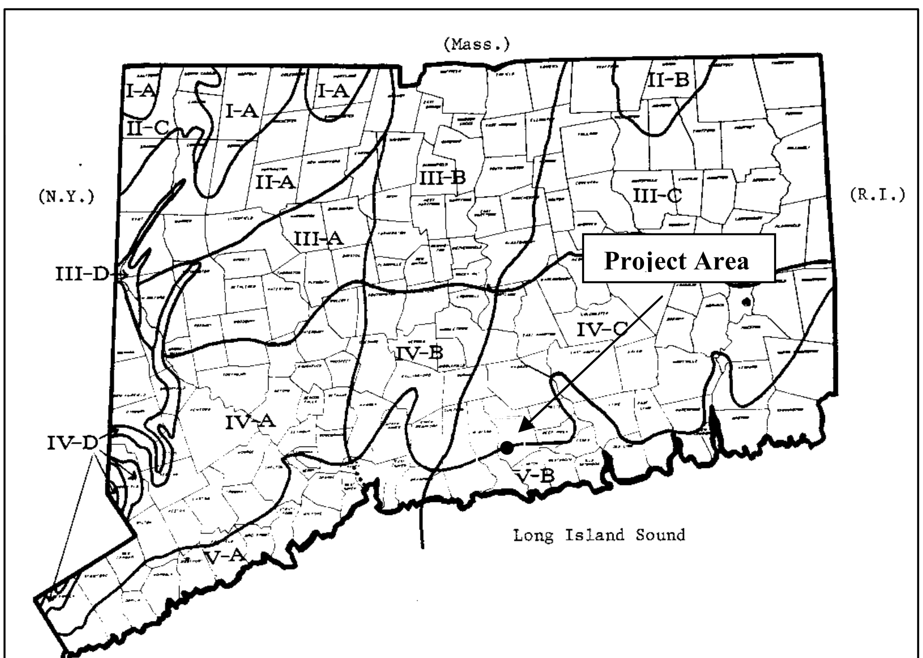

Figure 2: Project area is located at the boundary of the Southeast Hills (IV-C) and Eastern Coastal(V-B) ecoregions of Connecticut. From Dowhan and Craig 1976:26.

Figure 3: Map of the Killingworth Area, CT

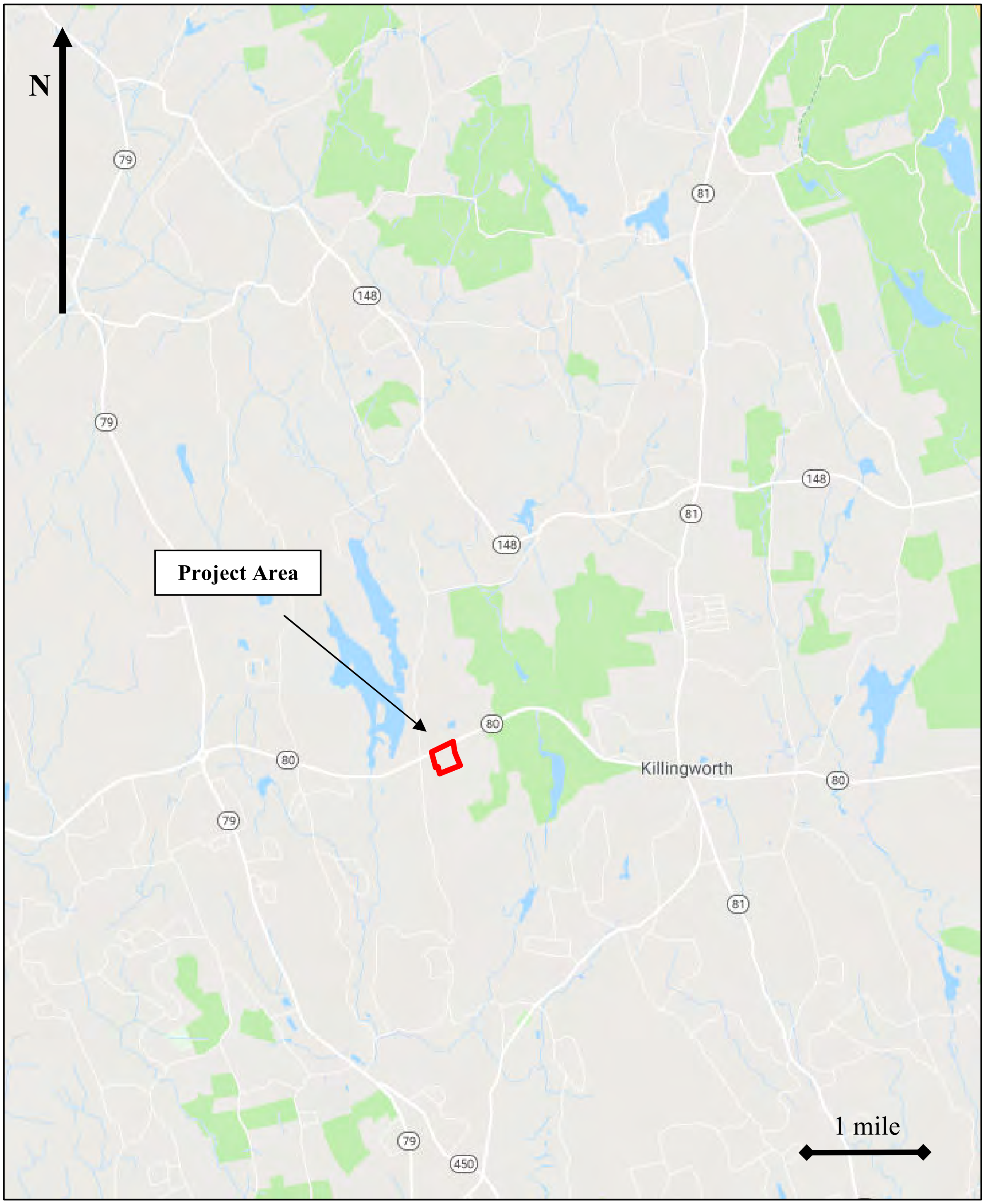

Figure 4: Map of the Project Area

Figure 4: Map of the project area and proposed development, provided by Loureiro Engineering Associates, Inc. of Groton, Connecticut 2018. Scale: 1:4,800 (1" = 400 feet).

Figure 5: USGS 7.5' Topographic Map, Clinton Quadrangle

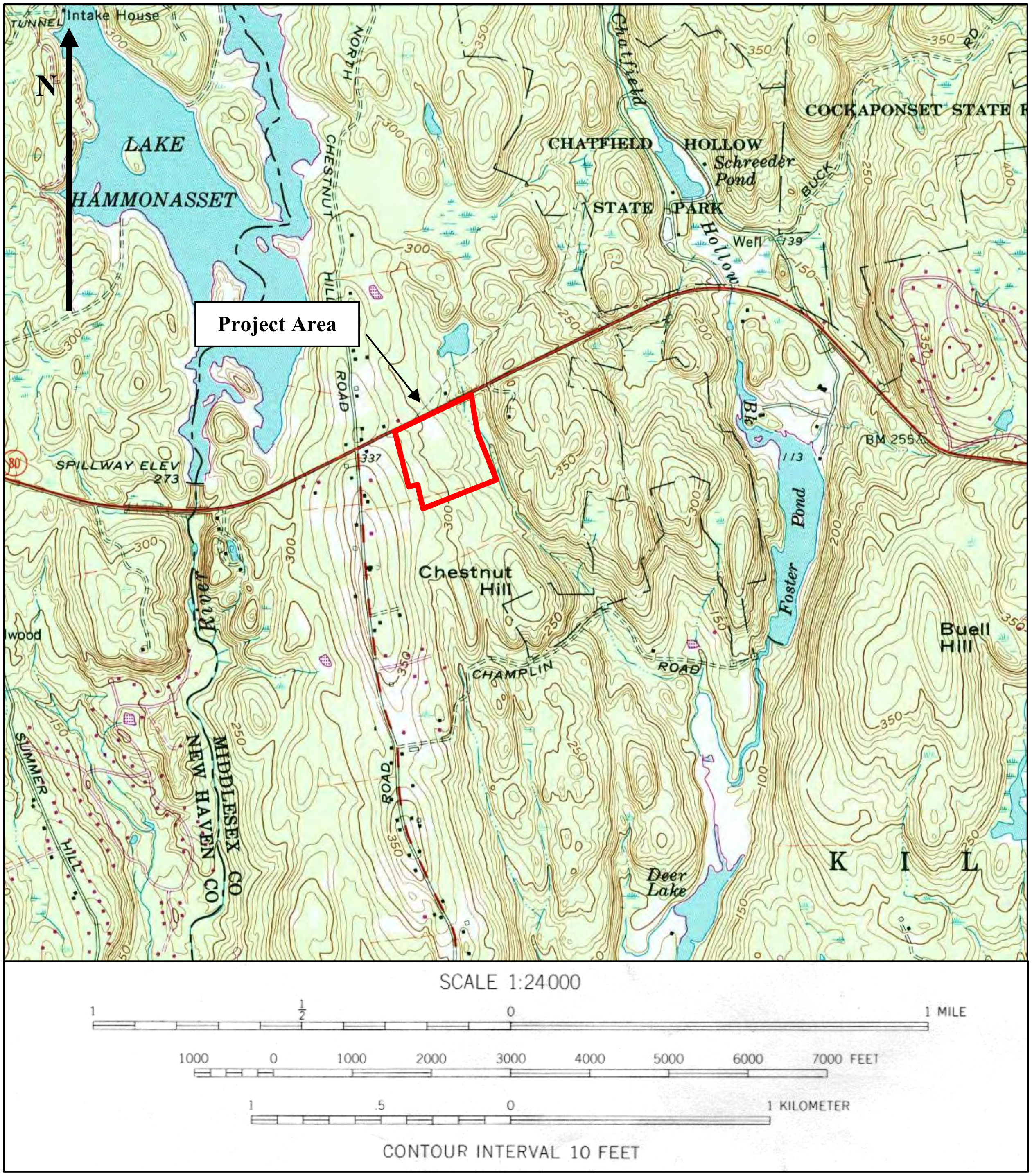

Figure 5: From USGS 1984.

Geology

The project region lies within the Bronson Hill Anticlinorium (layers convex up) of Iapetos (Oceanic) Terrane that constitutes much of the eastern hills ecoregions of Connecticut, and is towards the western end of the Avalonian Anticlinorium (Avalonian Terrane), a Precambrian mass which was originally part of the African plate. The Avalonian Terrane is separated from the Bronson Hill Anticlinorium by an unconformity lying roughly along the lower Connecticut River drainage basin to the east and the coast of the Long Island Sound to the south (Rodgers 1985). The Bronson Hill Anticlinorium is separated from the mesozoic failed rift lowlands of the Hartford and Pomperaug Basins (Newark Terrane) by the Eastern Border Fault lying within five miles to the west of the project area. No major faults exist in the direct vicinity of the project property.

The project property lies within a unit of Monson Gneiss (Omo), a metamorphosed volcanic Ordovician formation on the order of 440 to 500 million years old (Rodgers 1985) (Figure 6). Monson Gneiss is described as a light to dark, medium to coarse-grained gneiss. Principal mineralogical components include plagioclase, quartz, and biotite, with hornblende in some layers and microline in others; traces pf garnet, epidote, and magnetite. Exposures of bedrock in the area reveal beds dipping on the order of 25 to 35 degrees to the northwest. Lundgren and Thurrell (1973) show a similar distribution of formations in the area, with a principal composition of rock in the vicinity consisting of light to dark gray biotite-plagioclase-quartz gneiss with black amphibolite layers, and inclined layers on the order of 15 to 20 degrees with substantial bedrock outcrops to the east of the project property. The Monson Gneiss formation (Om) as analyzed by Lundgren and Thurrell (1973) and as portrayed in reconstructed cross sections of the state (Rodgers 1985) reveal it to be within the Killingworth Dome and anticline. The lack of substantial bedrock exposures in the project area itself prohibits the potential for prehistoric rockshelter sites being present. While used for local building purposes, the gneisses of this area were never historically quarried to any substantial degree (Lundgren and Thurrell 1973:19).

Geomorphology

Although the shape of the landscape in the region surrounding the project property is largely dictated by the metamorphic folding of bedrock formations, other aspects include glacial features. Various landscapes are created depending upon the distribution and density of rock and the shape and melting nature of the incorporating glacier (Tarbuck and Lutgens 1990), as evident in the surrounding region which contains a wide variety of glacial till, moraines, and meltwater features. Most of the glacial geomorphology of the area surrounding the project property is characterized by thin glacial till deposits on hill slopes and ridges, deriving from the last or late Wisconsinan glaciation (Stone et al. 1992). Other prominent glacial landforms of the region include broad, glacially deposited meltwater features such as those found closer to the coast along the Hammonasset River to the west, but also in smaller formations along the Menunketesuck River to the east. There are also large moraines such as the long moraine or drumlin found immediately west of the project area that forms the ridge along which Chestnut Hill Road runs north and south.

Figure 6: CGNHS Bedrock Geologic Map of Connecticut

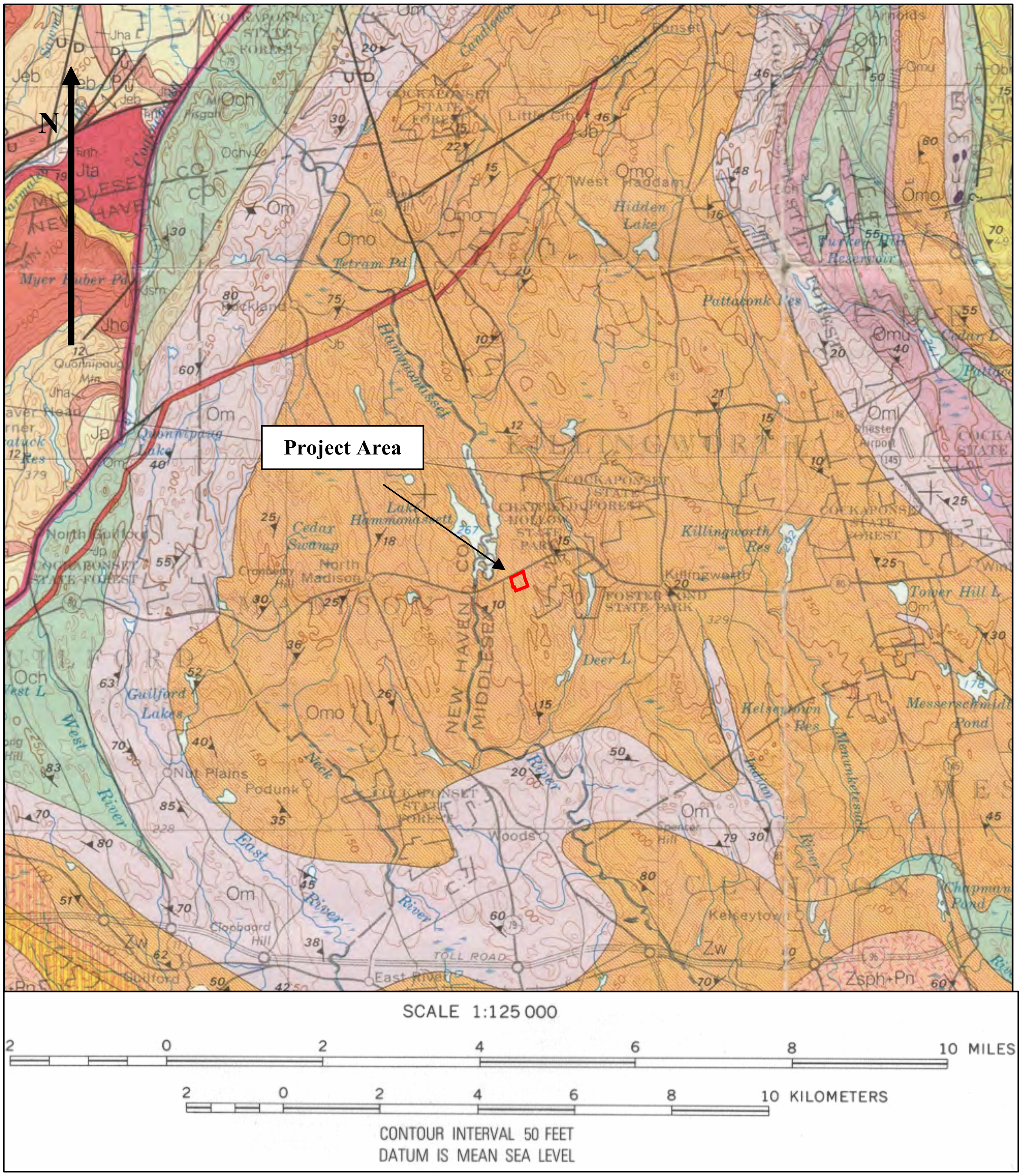

Figure 6: From Rodgers 1985.

Figure 7: CGNHS 7.5' Surficial Geologic Map, Clinton Quadrangle

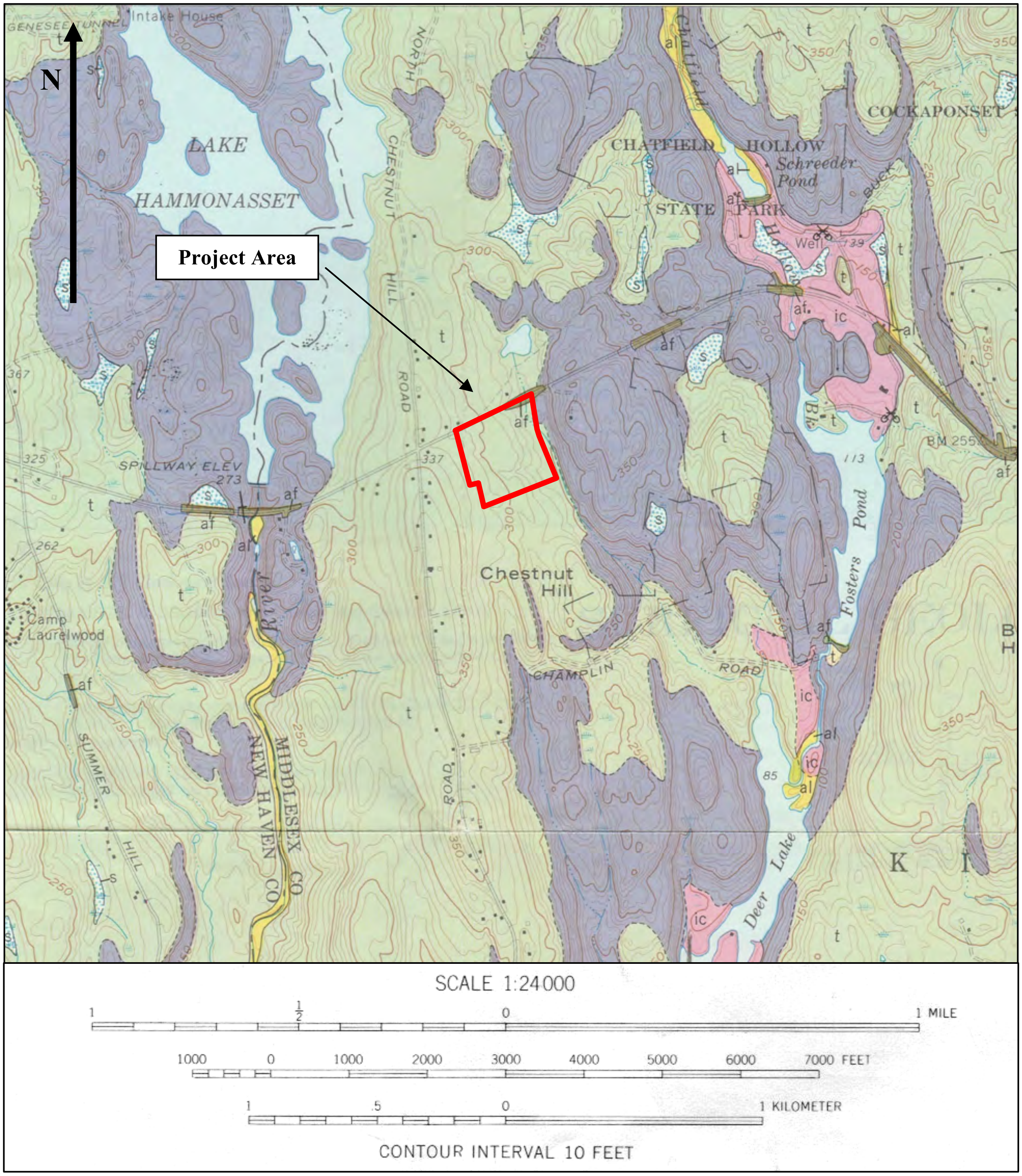

Figure 7: From Flint 1971.

The geomorphology of the project property itself can be broadly characterized as hill slope and ridge (Figure 7), with locally derived glacial till (t) and a complex mix of small outcrop exposures and shallow depths to bedrock (Flint 1971). The property is centered to the east of Chestnut Hill on its eastern flank, with gently sloping to moderately sloping surfaces generally dipping to the east. Elevations for the project area vary between roughly 330 feet above mean sea level at the far western boundary, to roughly 250 feet above mean sea level at the far eastern boundary.

Till deposits on some of the more durable formations of the region tend to be thin or non-existent as most till was derived from the bedrock formations which lay directly beneath them or a short distance north, and since steeper hills derived from more durable formations are more readily subject to surface erosion. The thickness of till on the project property itself has not been recorded, although test cores in non-moraine settings of the broader area have revealed till up to 30 feet deep above bedrock. Most till deposits in the area tend to be on the order of several feet thick, however, with thinner deposits on hill ridges (particularly in areas of bedrock exposure) and thicker deposits towards the base of hill slopes. Most of the till is subangular, indicating little transport distance before deposition. Thus unlike areas whose landscape is affected by glacial meltwater and post-glacial deposition, the geomorphology of the project property has consistently retained its form in recent geological history with the exception of minor traces of glacial till (Lundgren and Thurrell 1973; Flint 1971:6). Some streamlining of hills can be attributed to glacial erosion, however, as evidenced by the common orientation of north-northwest to south-southeast ridge lines, bearing a strike similar to the orientation of the many glacial scouring marks recorded on bedrock surfaces in the region (Flint 1971:9-10).

While the hill slope setting of the project property has been statistically shown to have been occupied less extensively by prehistoric inhabitants of the region, these settings frequently served as hunting and gathering grounds and as locations for short-term, seasonally restricted occupations, particularly during winter. This would especially be the case for nearly level to gently sloping areas that would have provided more habitable surface conditions.

Pedology

The soils of the region can be broadly classified as Gray-Brown Podzolic soils. The project property is contained within an area dominated by the Hollis-Charlton soil association, characterized by gently sloping to steep, somewhat excessively drained and well drained loamy soils on glacial till uplands shaped mostly by bedrock (Reynolds 1979). The dominant soil type for the project area is a very rocky Woodbridge fine sandy loam (WzC) according the USDA SCS soil book for New Haven County (Figure 8), designations generally conforming with current NRCS mapping (http://websoilsurvey.nrcs.usda.gov). The moderately well drained soil typically has a surface layer of dark brown fine sandy loam about three inches thick, followed by a subsoil of dark yellowish brown to yellowish brown and olive subsoil layers about 25 inches thick, overlying a substratum of mottled olive fine sandy loam to five feet deep or more. The southwest section of the project area has a slightly less rocky version of the Woodbridge fine sandy loam (WyB), with essentially similar stratigraphy. The rockiness of these soils prohibited crops, but they were used historically for pasturing and logging. The soils feature high water tables, slow permeability, and are highly acidic, thus not actively sought for habitation purposes.

Figure 8: USDA SCS Soil Map, Middlesex County (Sheet #35 + 38)

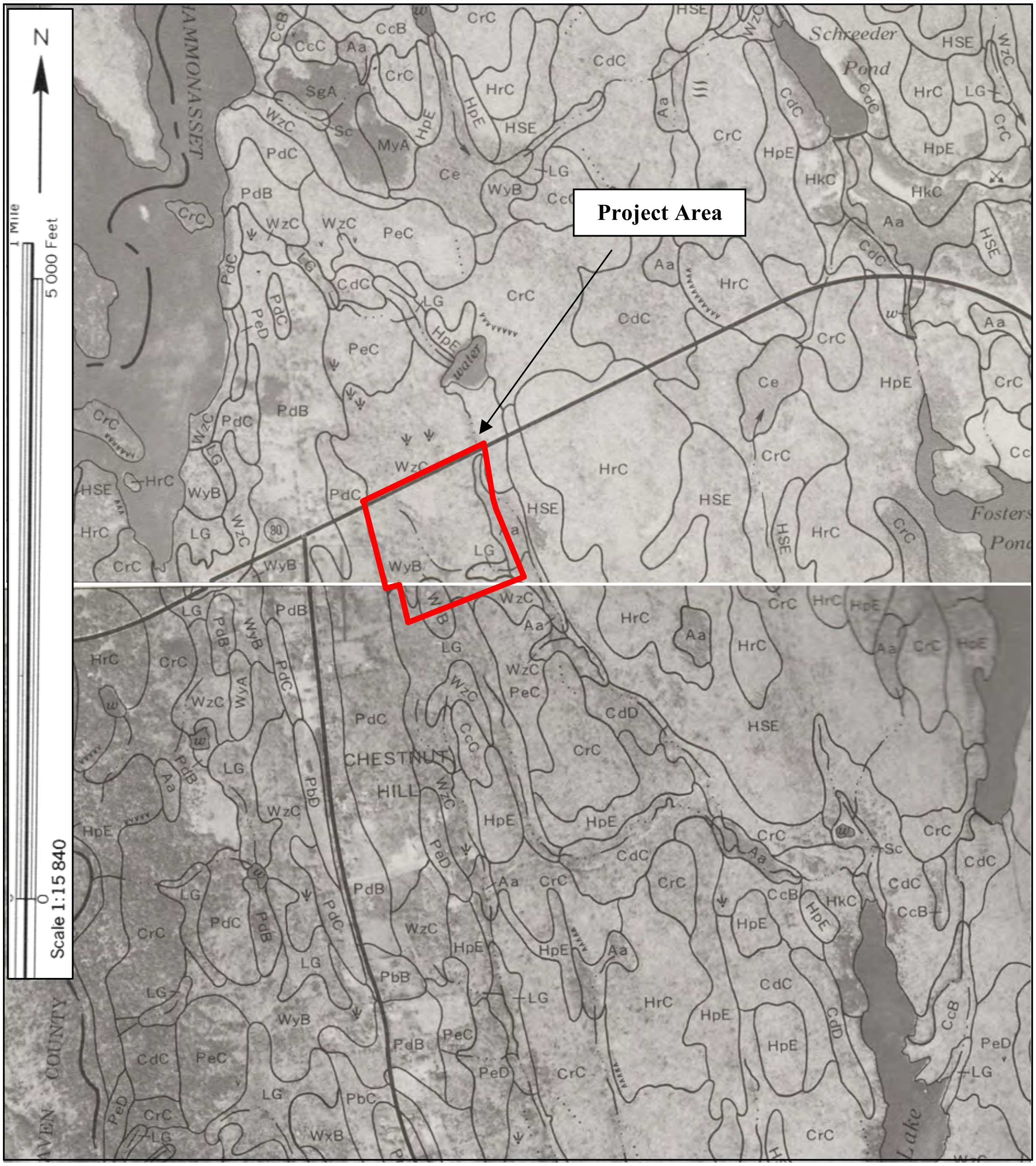

Figure 8: From Reynolds 1979.

Figure 9: CGNHS Drainage Basin Map of Connecticut

Figure 9: From McElroy 1991.

Hydrology

The drainage patterns of southern Connecticut and the region encompassing the project property were mostly established before the onset of the last glaciation (Flint 1930). In the region surrounding the project area, the usual trend of streams is to the south-southeast, somewhat in line with the strike of many bedrock formations, indicating that the glacial history of the area had only a partial effect on general drainage patterns. Thus they appear to be largely dictated by the strike of the faults and folds of the bedrock formations exposed at the surface, where they are subject to differential weathering and erosion depending on the resilience of the constituent beds (see Flint 1971:6; Lundgren and Thurrell 1973:19). Some streamlining as indicated by glacial scouring and north-northwest to south-southeast orientation of drumlins does indicate glacial influence of topography and drainage patterns (Flint 1971:9).

The project area lies within the Chatfield Hollow Brook drainage basin (#5105) (McElroy 1991). Dammed up in several sections, Chatfield Hollow Brook runs south about a mile to the east of the project area, and separates the complex topography of Chestnut Hill from Buell Hill to the east (Figure 9). The drainage forms a confluence with the Hammonasset River about two miles to the south of the project area. An intermittent stream lines the eastern boundary of the property, and drains directly into Chatfield Hollow Brook about one-half mile to the southeast of the project area. A lesser intermittent stream courses through the project area itself, and features two vernal pools delineated on submitted site plans. The wetlands and especially vernal pools would have been attractive to prehistoric occupants of the region, although they would not have been substantial enough to provide hydrological power for historic occupants of the region.

Flora and Fauna

The Eastern Coastal and Southeast Hills ecoregions are dominated by coastal hardwoods and central hardwoods-hemlock vegetation, including various oaks and hickories, tulip or yellow poplar, sassafras, black birch, white ash, and hemlock (Dowhan and Craig 1976:40). Historically, the broader area contained large quantities of cedar, white pine, and chestnut as well (Steiner 1897:179). Briers and various shrubs and vines form thickets in open or disturbed areas. The project area today is wooded, with a low scrub growth of mostly briers. Most crops of the broader region are grown between the middle of April and the middle of October, with a low suitability for cultivated crops on the property.

Typical mammals for the project region include deer, raccoon, rabbit, skunk, opossum, chipmunk, squirrel, fox, and woodchuck (Reynolds 1979), and formerly wildcats and wolves (Steiner 1897:236-237). Birds include songbirds, sparrows, crow, woodcock, thrushes, woodpeckers, ruffed grouse, hawks, and the barn owl, as well as ducks, geese, and other waterfowl (Dowhan and Craig 1976; Reynolds 1979). The soil units represented on the property are rated fair to poor for supporting woodland wildlife (Reynolds 1979), although the proximity to surrounding wetlands and especially vernal pools would have been attractive to hunted game targeted by prehistoric and historic occupants of the region.

Cultural Setting

Regional Prehistory

The prehistory of the project region and New England in general can be broadly divided into periods reflecting changes in environment, Native American subsistence and settlement patterns, and the material culture which is preserved in the archaeological record (Table 1). Although it remains controversial today, the conservative estimates for the first occupations of North America are about 18,000 to 15,000 years ago, just after the maximum extent of the last glaciation and the broadest extent of the Bering land bridge (Kehoe 1981:7; Parker 1987:4; Jennings 1989:52). Southern Connecticut itself remained glaciated until about 15,200 B.P. (Snow 1980:103; Gordon 1983:71; Parker 1987:5; McWeeney 1994:181, 1999:6).

Paleo-Indian

The Paleo-Indian period is documented in Connecticut after 12,000 years ago and extends to roughly 9,500 B.P. (Swigart 1974; Snow 1980:101; Lavin 1984:7; Moeller 1984, 1999). This was a period of climatic amelioration from full glacial conditions, and a rise in sea levels which fell short of inundating the continental shelf. It was during this time that tundra vegetation was replaced by patches of boreal forests dominated by spruce trees (Snow 1980:114; Parker 1987:5-6), and eventually white pine and several pioneering deciduous genera (McWeeney 1994:182, 1999:7). Early in the period, the environment was conducive to the existence of large herbivores and a low population density of humans who procured these animals as a major subsistence resource, although warming temperatures and denser forests contributed to the extinction of certain species. The projected human social and settlement patterns are those of small bands of semi-nomadic or restricted wandering people who hunted mammoth, mastodon, bison, elk, caribou, musk ox, and several smaller mammals (Ritchie 1969:10-11; Snow 1980:117-120). Episodes of sparse vegetation during this period encouraged the use of high lookout points over hollows and larger valleys by people in pursuit of large game. The southern part of New England had an earlier recovery from glacial conditions when compared to areas to the north, however, with a higher density of vegetation that might have precluded Paleo-Indians of Connecticut from focussing heavily on the larger mammals (McWeeney 1994:182).

The cultural material associated with this period includes large to medium-sized, fluted projectile points (cf. Clovis), in addition to knives, drills, pieces esquillees and gravers, scrapers, perforators, awls, abraders, spokeshaves, retouched pieces, utilized flakes, and hammerstones (Wilbur 1978:5; Snow 1980:122-127; Moeller 1980). Although numerous finds from this period have been found in Connecticut, only a few, small *in situ* sites exist throughout the state. Finds tend to be located near very large streams in the lower Connecticut River Valley, and in rockshelters of other regions (McBride 1981). A survey performed by the Connecticut Office of State Archaeology and the Archaeological Society of Connecticut resulted in the documentation of 53 Paleo-Indian "find spots" in Connecticut (Bellantoni and Jordan 1995).

Table 1: Regional Prehistoric Chronology

Paleo-Indian Period (12,000-9,500 B.P.)

Environment: Dry and very cold, tundra herbaceous plants and sparse spruce forests shifting to pine forests.
Settlement: Semi-nomadic, restricted wandering.
Subsistence: Very large grazing herbivores and smaller mammals.
Material: Large fluted points (cf. Clovis), knives, drills, scrapers, awls, abraders, perforators, spokeshaves, and hammerstones.
Ritual: Unknown.

Early Archaic Period (9,500-7,500 B.P.)

Environment: Cold, dense pine and deciduous forests.
Settlement: Central-based wandering.
Subsistence: Large foraging herbivores and smaller mammals.
Material: Atlatl, stemmed and bifurcated (Stanly, cf. Kanawha and Lecroy) points, choppers, anvil stones, and others from earlier periods.
Ritual: Unknown.

Middle Archaic Period (7,500-6,000 B.P.)

Environment: Cool, deciduous hardwoods and pine.
Settlement: Central-based, seasonally circulating.
Subsistence: Foraging mammals, fish, and shellfish.
Material: Contracting stemmed points (Neville, Stark, and Merrimac), semi-lunar groundstone knives, banner stones, net plummets, gouges, denticulates, grooved axes, percussed celts and adzes, and others from earlier periods.
Ritual: Unknown.

Late Archaic Period (6,000-3,700 B.P.)

Environment: Moderate, deciduous hardwoods.
Settlement: Central-based or semi-sedentary, seasonally circulating and radiating.
Subsistence: Foraging mammals (deer), small mammals, turtles, birds, fish, shellfish, berries, nuts, seeds.
Material: Groundstone manos, mortars, pestles, and bowls, stone pipes, bone tools, perforated weights, decorative gorgets, corner-notched (Vosburg, Brewerton, and Vestal), side-notched (Otter Creek, Brewerton, and Normanskill), narrow-stemmed (Dustin, Lamoka, Squibnocket, and Wading River), and triangular points (Squibnocket, Brewerton, and Beekman), fish weirs and harpoons, and others from previous periods.
Ritual: Cremation burials with utilitarian funerary objects for limited groups, suggesting possible access to restricted resources (e.g. transportation routes).

Terminal Archaic Period (3,700-2,700 B.P.)

Environment: Moderate, deciduous hardwoods.

Settlement: Semi-sedentary, short-term radiating, long-term seasonally circulating.

Subsistence: Foraging mammals (deer), small mammals, fish, shellfish, turtles, birds, berries, nuts, seeds.

Material: Susquehanna corner-notched points, side-notched and large stemmed points, steatite bowls, canoes, Vinette I pottery, and others from previous periods.

Ritual: Elaborate secondary cremation burials containing high proportions of highly stylized artifacts of non-local material in specialized cemetery sites for limited groups with access to restricted resources (e.g. steatite, transportation routes), suggesting a stratified society and semi-sedentism for some groups.

Early Woodland Period (2,700-2,000 B.P.)

Environment: Cool, deciduous hardwood trees.

Settlement: Central-based, seasonally circulating.

Subsistence: Foraging mammals (deer), small mammals, fish, shellfish, turtles, birds.

Material: Bow and arrow, Early Windsor cord-marked and Linear Dentate ceramics, stemmed (Adena-Rossville) and side-notched (Meadowood and Fulton) points, Steubenville points, some exotic Adena material, and others from previous periods.

Ritual: Combination of cremation burials and primary inhumations, often in habitation settings, suggesting some latent retention of class distinctions during a period of declining ceremonialism and undifferentiated control over critical resources.

Middle Woodland Period (2,000 B.P.-1,000 B.P.)

Environment: Moderate, deciduous hardwood trees.

Settlement: Semi-sedentary, short-term radiating, long-term seasonally circulating.

Subsistence: Agriculture (squash, beans, corn, sunflower, tobacco), foraging mammals (deer), small mammals, fish, shellfish, turtles, birds, berries, and nuts.

Material: Groundstone hoes, cylindrical pestles, many ceramic styles (Rocker Dentate, Windsor Brushed, Sebonac Stamped, Hollister Stamped, Selden Island, and Windsor Plain), projectile points (Snyders corner-notched, Long Bay and Port Maitland, Rossville stemmed, Greene), and others from previous periods.

Ritual: Unknown (not yet distinguished from the Late Woodland).

Late Woodland Period (1,000-1,600 A.D.)

Environment: Moderate, deciduous hardwood trees.

Settlement: Semi-sedentary, short-term radiating, long-term seasonally circulating.

Subsistence: Agriculture (squash, beans, corn, sunflower, tobacco, Jerusalem artichoke), foraging mammals (deer), small mammals, fish, shellfish, turtles, birds, berries, nuts, and tubers.

Material: Wigwam homes, Jack's Reef, and Madison and Levanna triangular points, Late Windsor and East River ceramics, and others from previous periods.

Ritual: Primary inhumations in habitation sites, suggesting egalitarian society.

Early Archaic

The Early Archaic period lasted from approximately 9,500 B.P. to 7,500 B.P. (Snow 1980:159; Lavin 1984:9; Moeller 1984). Sea levels and temperatures continued to rise during this period as denser stands of forests dominated by pine and various deciduous species replaced the vegetation of the former period (Davis 1969:418-419; Snow 1980:114; Parker 1987:9; McWeeney 1994:184-185, 1999:8-9). This environmental change was rapid and caused a major shift in the animals it supported, including deer, moose, other small to medium-sized mammals, migratory birds, fish, and shellfish. The material culture changed along with the environmental conditions to include the atlatl and smaller stemmed and bifurcated projectile points (Stanly, cf. Kanawha and Lecroy) for procuring smaller, faster game in more closed settings (Wilbur 1978:6-7). The expanded tool set included choppers and anvil stones. Settlement patterns were probably becoming more territorialized towards a central-based wandering character (Snow 1980:171; see also Forrest 1999). The Early Archaic period is poorly represented in Connecticut and the lower coastal river valleys, probably resulting from a combined effect of low population densities in response to rapidly changing environmental conditions, as well as site location and preservation factors (Snow 1980:168; McBride 1981; McBride and Dewar 1981:45; Lavin 1984:9; McWeeney 1986; see also Forrest 1999).

Middle Archaic

The Middle Archaic period extended from approximately 7,500 B.P. to 6,000 B.P. (Snow 1980:173; Lavin 1984:9; McBride 1984; Jones 1999). It was by the end of this period of increased warming that sea levels and coastal configurations had stabilized and approached their present conditions (Kehoe 1981:211; Gordon 1983:82; Parker 1987:9). The period is marked by the establishment of forests with increasing proportions of deciduous hardwoods in relation to the pine predecessors in Connecticut (Davis 1969; Snow 1980:114; McWeeney 1999:10). The material culture included square or contracting-stemmed points (Neville, Stark, and Merrimac), semi-lunar groundstone knives, ground and winged banner stones for atlatls, plummets for nets, gouges, denticulates, perforators, percussed celts and adzes and grooved axes for woodworking (Snow 1980:183-184), as well as tools used in previous periods. This more extensive range of material culture indicates a broader subsistence base than in previous periods, including greater fish and shellfish procurement (Wilbur 1978:8; Snow 1980:178-182) which was associated with the stabilization of sea levels towards the end of the period. The increased breadth of subsistence resources had the effect of increasing scheduling efforts and may have caused settlement patterns to take on more of a central-based or seasonally circulating pattern with bands joining and dispersing on a seasonal basis (Snow 1980:183). Sites found in the lower Connecticut River Valley region suggest that a wider range of environments and associated site types were exploited, including both large and special task sites in upland areas (McBride 1981, 1984:56). This regional pattern may confirm the suggested settlement pattern of central-based, seasonally circulating or restricted circulating groups of people supported by logistical procurement sites throughout the state. Middle Archaic sites are fairly rare in Connecticut, again a combined product of rising sea levels and poor site preservation (see Forrest 1999).

Late Archaic

The Late Archaic period ranged from approximately 6,000 B.P. to 3,700 B.P. (Snow 1980:187; Lavin 1984:11; McBride 1984; Pfeiffer 1984; Cassedy 1999). This period is marked by a warm-dry maximum evident from pollen cores in the region (Davis 1969:414; Ogden 1977). Hardwood, oak-dominated forests very similar in character to ones established today covered most of Connecticut by the Late Archaic (Parker 1987:10). The Late Archaic in Connecticut has been divided into two traditions: the Laurentian and the Narrow Point (Lavin 1984:11), with the former perhaps being distributed more in the interior. The Laurentian tradition is defined by wider-bladed, notched and eared triangular points, and ground slate points and ulus, while the Narrow Point tradition includes smaller, thicker, and narrower points. The tool kit and general material culture became even more expanded during this period, with the advent of ground stone manos, nut mortars, pestles, and bowls, as well as stone pipes, bone tools, corner-notched (Vosburg, Brewerton, and Vestal), side-notched (Otter Creek, Brewerton, Normanskill), smaller narrow-stemmed (Dustin, Lamoka, Squibnocket, and Wading River), and triangular points (Squibnocket, Brewerton, and Beekman), grooved and perforated weights, fish weirs and harpoons, and decorative gorgets (Wilbur 1978:15-24; Snow 1980:228-231). The groundstone material has been inferred as being associated with an increased vegetable diet that consisted of berries, nuts, and seeds (Snow 1980:231; Lavin 1984:13), including acorn, butternut, chestnut, walnut, hickory, bayberry, blackberry, goose foot, cranberry, partridge berry, service berry, strawberry, and swamp current (Cruson 1991:29). Deer continued to be the predominant meat source, although animal remains recovered from archaeological sites in the region include black bear, raccoon, woodchuck, rabbit, otter, gray squirrel, red fox, gray fox, wolf, wild turkey, grouse, pigeon, migratory fowl, and anadromous and freshwater fish and shellfish (Cruson 1991:28-29). Various sea mammals and fish were procured along the coast.

The increasing breadth of the subsistence base and material culture was in turn associated with a central-based settlement pattern in which a restricted range of seasonally scheduled and used areas were exploited in a more semi-sedentary fashion than previously (Lavin 1984:13; Dincauze 1990:25). Sites in the lower Connecticut River Valley suggest that the larger rivers served more as long-term bases within a central-based circulating system than in the Middle Archaic (McBride 1981; McBride and Dewar 1981:48). The interior uplands of Connecticut may have supported a relatively independent set of seasonally circulating groups which used larger wetlands as long-term bases (Wadleigh 1981). Mortuary practices of the time suggest some sedentism for certain groups of people who were buried in specialized secondary cremation cemeteries and who may have had some control over restricted resources (e.g. riparian transportation routes) (Walwer 1996). Although the cremation sites largely include utilitarian funerary objects, some contain non-local materials which suggest trade association with cultures to the west of Connecticut (Walwer 1996).

Terminal Archaic

The Terminal Archaic period extended from approximately 3,700 B.P. to 2,700 B.P., as defined by the Susquehanna and Small-Stemmed traditions (Swigart 1974; Snow 1980:235; Lavin 1984:14; Pfeiffer 1984; Pagoulatos 1988; Cruson 1991; Cassedy 1999). Steatite, or soapstone, was a frequently used material by this time, and could be fashioned into bowls and other objects. The mass, permanency, and labor intensiveness of creating these heavy items have led to the inference of more sedentary base camps, especially on large rivers where the development of a canoe technology had become fully established and increased the effective catchment area within which groups of people were gathering resources on a continuous basis. The material culture of the period was very similar to the Late Archaic, with a proliferation of stemmed projectile point types including Snook Kill, Bare Island and Poplar Island stemmed points, Orient Fishtail points, Sylvan and Vestal side-notched points, and Susquehanna corner-notched points. The resource base continued to consist of deer and small mammals, nuts, shellfish, turtles, and birds (Snow 1980:249). The first signs of ceramics (Vinette I pottery) tempered with steatite fragments appeared during this period (Lavin 1984:15; Lavin and Kra 1994:37; see also Cassedy 1999:131), and archaeological evidence of trade with other regions becomes more substantial for this time (Pfeiffer 1984:84).

The distribution of sites and site types in the lower Connecticut River Valley during this period suggests that there was a change in settlement to one with fewer, yet larger sites in riverine settings, and associated satellite task-specific sites in the uplands (McBride 1981; McBride and Dewar 1981:49). The implications are less foraging-strategy residential movement and more task-oriented collection activities within a radiating settlement pattern, but probably one in which some degree of seasonal circulation of settlement took place. Pagoulatos (1988) has shown that while sites associated with the Small-Stemmed tradition tend to suggest a more mobile settlement pattern in the interior uplands, sites of the Susquehanna tradition indicate a semi-sedentary collector strategy in major riverine and estuarine environments. At least certain groups exhibited semi-sedentism and some control over restricted resources, as indicated by the elaborate burials of the Terminal Archaic (Walwer 1996). Mortuary practices from the period include secondary cremation interments in formalized cemetery areas, with individual pits containing fragmented utilitarian material from communal cremation areas, as well as highly stylized funerary objects from non-local material (Walwer 1996). The lack of other, less formalized burial types evident in the archaeological record may be a matter of poor preservation, in which case it has been proposed that the cremation cemeteries are representative of a hierarchical society in which a portion of the people (of the Susquehanna "tradition") were able to generate a surplus economy that supported a semi-sedentary settlement pattern. This surplus may have been generated by the procurement and control over the transportation of steatite from various areas in Connecticut and surrounding territory.

Early Woodland

The Early Woodland period in Connecticut extended from about 2,700 B.P. to 2,000 B.P. (Lavin 1984:17; Juli and McBride 1984; Cruson 1991; Juli 1999). A cooling trend during the Early Woodland (Davis 1969:414; Parker 1987:10; McWeeney 1999:11) is thought to have reduced population sizes and regional ethnic distinction as the hickory nut portion of the resource base was significantly decreased, although the apparent decline in populations may possibly be related to other factors such as the inability to confidently distinguish Early Woodland sites from those of other periods (Filios 1989; Concannon 1993). Climatic deterioration and depopulation are in turn thought to have inhibited the progression towards, and association with, more complex social structures and networks that were developing further to the west and south

(Kehoe 1981:215). A proliferation of tobacco pipes may indicate the beginnings of agricultural efforts in the northeast. The Early Woodland of this region, however, exhibits no direct traces of subsistence crop remains, indicating continuity with previous periods in terms of subsistence practices (Lavin 1984:18).

Materially, the period is marked by a substantial development of a ceramic technology, with the Early Windsor tradition of pottery being dominant in the Early Woodland of Connecticut (Rouse 1980:68; Lavin 1984:17, 1987). Both Early Windsor cord-marked and Linear Dentate ceramic forms were being produced at this time. Diagnostic projectile points can be developmentally traced to indigenous points of previous periods, consisting of many stemmed forms in addition to Meadowood and Fulton side-notched points, Steubenville points, and Adena-Rossville types, but now may have been used in conjunction with the bow and arrow (Lavin 1984:18). Adena-like boatstones are also found in this period. Although rare contact with the Adena culture is evident throughout assemblages of the period, the Early Woodland in southern New England remained a very gradual transitional period (Snow 1980:279,287; Lavin 1984:19).

A heightened use of ceramics has been erroneously promoted as an automatic indication of increased sedentism in many areas. Instead, central-based camps with restricted seasonal encampments appear to be the dominant settlement pattern (Snow 1980:287). Minimal archaeological evidence from the lower Connecticut River Valley appears to suggest a similar settlement pattern to the Terminal Archaic in which large riverine sites served as central bases with upland seasonal dispersal or specific task sites (McBride 1981; McBride and Dewar 1981:49), but with a lesser degree of sedentism. Interior uplands populations also decreased during the Woodland era, perhaps related to the intensification of agricultural resources along major riverine and coastal areas (Wadleigh 1981:83). The trend towards greater mobility may in part be attributed to the decline in the use of steatite that no longer gave certain groups control over critical and restricted resources, as indicated by the declining ceremonialism of burial sites at the time which were more often located in habitation sites and exhibited combinations of secondary cremation features and primary inhumations (Walwer 1996). This transition in the socio-economics of the region was brought about by the decrease in importance of steatite as ceramics obscured its value for producing durable containers. Partially preserved primary inhumations appear for the first time in the region based on preservation considerations.

Middle Woodland

The Middle Woodland period lasted from about 2,000 B.P. to 1,000 B.P. (Lavin 1984:19; Juli and McBride 1984; Cruson 1991; Juli 1999). The climate was returning to the conditions basically witnessed today (Davis 1969:420; McWeeney 1999:11). It is a period which exhibited considerable continuity with previous periods in terms of both subsistence and material culture. Cylindrical pestles and groundstone hoes are tools diagnostic of the period and reflect developing agricultural efforts, including the cultivation of squash, corn, and beans on a seasonally tended basis (Snow 1980:279). Direct evidence for agriculture in the form of preserved vegetal remains, however, does not generally appear until the early Late Woodland (Lavin 1984:21) when corn is thought to have been introduced into the Connecticut River Valley from the upper Susquehanna and Delaware River Valleys (Bendremer and Dewar 1993:386). Projectile point forms from the period include Snyders corner-notched, LongBay and Port Maitland side-notched, Rossville stemmed, and Greene lanceolate types. A proliferation of ceramic styles was witnessed during the Middle Woodland (Rouse 1980; Lavin 1984:19-20, 1987; Lavin and Kra 1984:37), including Rocker Dentate, Windsor Brushed, Sebonac Stamped, Hollister Stamped, Selden Island, and Windsor Plain types that were all also produced in the Late Woodland, with the exception of the Rocker Dentate. Ceramic forms from the Early Woodland were still being produced as well. Minor traces of the Hopewell cultures to the west are also present in the archaeological record of this period. Site types and distributions in the lower Connecticut River Valley imply that a moderate increase of sedentism with aspects of a radiating settlement pattern took place on large rivers, supported by differentiated upland task sites (McBride 1981; McBride and Dewar 1981:49). This trend may have been supported by the expansion of tidal marshes up larger rivers (McBride 1992:14).

Late Woodland

The Late Woodland period extended from approximately 1,000 B.P. to 1600 A.D., the time of widespread European contact in the broader region (Snow 1980:307; Kehoe 1981:231; Lavin 1984:21; Feder 1984, 1999). A warmer climate and increased employment of large scale agriculture for subsistence in New England were associated with increased population densities, more sedentary settlements, and more permanent living structures and facilities in larger villages. Settlements in Connecticut, however, tended to remain smaller with only small scale agricultural efforts, and as part of a seasonal round in which smaller post-harvest hunting and task-specific settlements were established in fall, and protected settlements occupied in winter (Guillette 1979:CI5-6; McBride and Bellantoni 1982; Lavin 1984:23; Starna 1990:36-37). Instead of maintaining permanent villages near agricultural plots, aboriginal populations engaged in the slashing and burning new plots and let old plots lie fallow periodically (Salwen 1983:89). In this area, domestic resources included corn, beans, squash, Jerusalem artichoke, and tobacco (Guillette 1979:CI5; Starna 1990:35). Agriculture was largely maintained by women, with the exception of tobacco (Salwen 1983:89; Starna 1990:36). Deer, small mammals, fish and shellfish, migratory birds, nuts and berries, and other wild foods continued to contribute significantly to the diet (Waters 1965:10-11; Russell 1980). Many of the foods produced were dried and/or smoked and stored in baskets and subterranean holes or trenches.

The increasing diversity of wild estuary resources may have served to increase sedentism in the coastal ecoregions of Connecticut (Lavin 1988:110; Bragdon 1996:67), while agriculture and sedentism may have been even more prominent along the larger river bottoms (Bragdon 1996:71). Late Woodland settlement patterns of groups in the uplands interior ecozones of Connecticut may have included the highest degree of mobility, while many sites from the central lowlands represent task-specific sites associated with larger settlements along the Connecticut River (McBride 1992:16). House structures consisted of wigwams or dome-shaped wooden pole frameworks lashed and covered with hides or woven mats, and clothing was made from animal hides (Guillette 1979:CI7-8; Starna 1990:37-38). Pottery for the period is defined as the Late Windsor tradition in Connecticut (Rouse 1980:68; Lavin 1984:22, 1987). Most of the ceramic forms of the Middle Woodland were still being produced, in addition to the newer Niantic Stamped and Hackney Pond forms. Ceramics of the East River tradition also appear in the area during the Late Woodland, having originated and been concentrated in the New York area (Rouse 1980; Wiegand 1987; Lavin 1987). The period exhibits some continuity in terms of projectile point forms, although the Jack's Reef, Madison triangular, and Levanna points are considered diagnostic for the period. As likely with earlier periods, the material culture included various textile products such as baskets and mats, and wooden utensils such as bowls, cups, and spoons (Willoughby 1935; Russell 1980:56).

Unlike groups of the Mississippi valley, the overall cultural pattern for the entire Connecticut Woodland era exhibits considerable continuity. Interregional contact increased during this period, however, with non-local lithic materials increasing from as low as 10% to as high as 90% from the early Middle Woodland to the Late Woodland (McBride and Bellantoni 1982:54; Feder 1984:105), although most trade appears to have been done between neighboring groups rather than initiated through long-distance forays (Salwen 1983:94). The lack of enormous agricultural surpluses for the time is indicated by the low density of small storage features in habitation sites, as well as the ubiquitous primary inhumation of people without a select portion of graves exhibiting special treatment that would require high energy expenditure (Walwer 1996). As confirmed by early ethnohistoric accounts, this suggests a largely egalitarian and relatively mobile society for the Late Woodland despite the fact that this period marks the highest development of food production (i.e. agriculture) during the course of prehistory in the region. Corn was undoubtedly important, however, as a disproportionate amount of the simple, flexed burials were oriented towards the southwest which was the aboriginally acknowledged direction for the origins of corn and the Spirit Land.

Local Sites and Surveys

There are no previously documented prehistoric sites in the direct vicinity of the project area, with only a few prehistoric sites listed with the Connecticut Office of State Archaeology (CT OSA 2018) or Connecticut State Historic Preservation Office (CT SHPO 2018) within a couple of miles of the project property (Figure 10). The Chatfield Hollow site (70-004) is located on Chatfield Hollow Brook about a mile northeast of the project area, where amateur excavations produced a yellow chert (jasper) side-notched projectile point. About two miles to the northeast on a smaller stream and associated wetlands in Cockaponsett State Forest, Sackett's Cave (70-003) is a Woodland era rockshelter site where excavated material reported by amateur archaeologists in the 1930s included a turkey bone awl, aboriginal ceramic fragments, gray chert projectile points, and reportedly the partial remains of at least eight human skeletons making the site a potentially rare burial context, although the site was also highly disturbed at the time of excavation (Coffin 1963:8-9). The Dudley Pond Rockshelter (76-005) is located several miles to the northwest of the project area on Pond Brook, where surface debris from prior looting includes shell and mammal bone fragments, and quartz debitage and lithic tools. A site (70:001) in Cockaponsett State Forest several miles to the north of the project area on a tributary of the Hammonassett River was uncovered by Yale University excavations in the 1930s, with bone and chert artifacts collected.

Figure 10: Prehistoric Sites of the Region

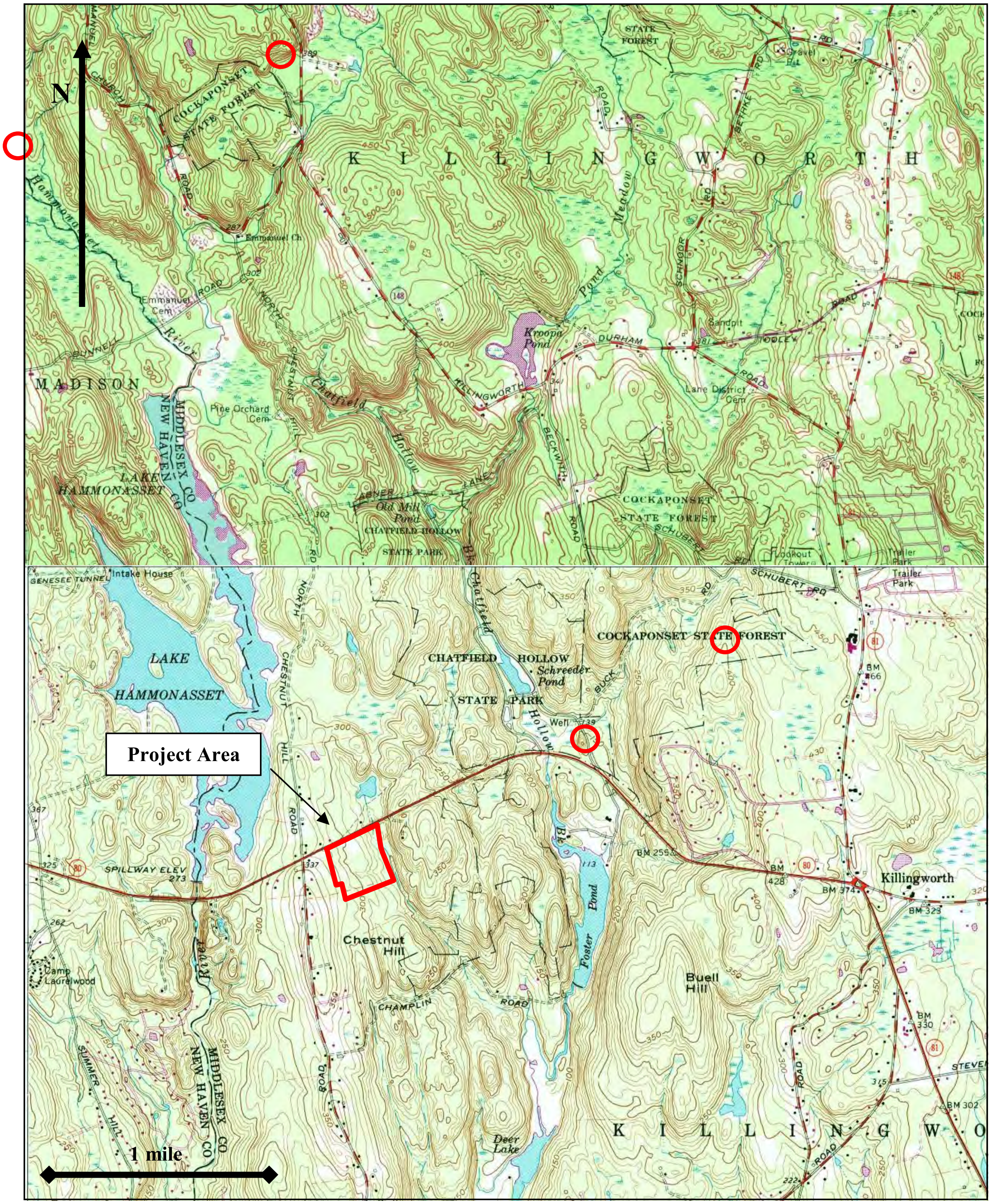

Figure 10: Prehistoric site locations approximated by red circles.

Summary

In summary, there is a low density of prehistoric sites that have been previously recorded within a couple of miles of the project area. For the few sites that have been found, however, there is support for current prehistoric settlement models applicable to the entire region. The larger of the habitation sites tend to be located in close proximity to perennial streams or rivers, and in particular where glacial meltwater sedimentary deposits result in very well drained soils lacking in till. These characteristics provided suitable conditions for the extraction of resources as well as workable soil contexts for structural features. Alternatively, small sites representing either winter occupations or task-specific extraction sites, or short-term subseasonal camp sites, would have been located in more secluded stream and wetland settings and in rockshelters, and on smaller glacial sedimentary landforms. While the rockiness of soils at the project area and minor size of wetlands at or near the property would have precluded large scale settlement, the two vernal pools of the project area could have attracted short-term, intermittent use of the property for the extraction of related resources.

Historic Background

Contact Period

The Contact period is designated here as the time ranging from the first substantial contact between European explorers and Native American inhabitants of Connecticut to the time of initial occupation by European settlers, roughly 1600 to 1700 (Table 2). Initial contact in the broader region occurred in 1524 when Verrazano reached the coast of New England (Terry 1917:16). Others followed in the first decade of the 1600s (Salwen 1983), and in 1614 Dutch explorers reached the Connecticut River (DeForest 1852:70; DeLaet 1909 [1625-1640]). The Dutch were met by the Quinnipiacs at New Haven Harbor in 1625 (Brusic 1986:9) when they initiated fur trading relationships with several local tribes. The trade relationship between local tribes and the Dutch was short-lived, however, coming to an abrupt end by the mid-1630s (Guillette 1979:WP2) when substantial English settlements were being established in the area. DeForest (1852:48) estimates about 6,000 to 7,000 Native Americans in pre-epidemic Connecticut (early 1630s), while others consider the aboriginal population to have been as high as 16,000 to 20,000 or more (Trumbull 1818:40; Gookin 1970 [1674]; Cook 1976; Snow 1980:35; Bragdon 1996:25).

The spatial configuration of tribal territories at the time of initial contact is fairly well known, although boundaries are known to have fluctuated significantly, as did the political alliances by which the tribes could be defined (Thomas 1985:138). Three major divisions of Algonkian speaking groups can be delineated in eastern Connecticut, and their original territories conform well to present ecozone distributions (see Dowhan and Craig 1976:26 and Speck 1928:Plate 20). Centralized in East Windsor and South Windsor (Trumbull 1818:40; DeForest 1852:54-55; Spiess 1933), the Podunks occupied that part of the Connecticut River drainage basin which constitutes the North-Central Lowlands east of the river. Linguistically, the Podunks were part of the Wappinger or Mattabesec Confederacy of tribes that extended west of the Connecticut River and onto Long Island (Speck 1928). The validity of the Wappinger-Mattabesec Confederacy as a cultural entity has been challenged (Salwen 1983:108-109), with many smaller and somewhat independent tribes occupying much of the western half of the state. In the northeast part of the state, the Nipmucs occupied areas covering the Northeast Uplands and Northeast Hills ecoregions, but were centrally based in Massachusetts (Gookin 1970 [1674]; Van Dusen 1975:21; DeForest 1852:57). Blanketing the Southeast Hills and Eastern Coastal regions, the territory of the Pequots lay adjacent to the Narragansetts of Rhode Island to the east (Speck 1928).

Several cultural distinctions can be made at a higher level of resolution within these three broad divisions. For instance, the Western Nehantics were concentrated just east of the Connecticut River on the coast, while the Eastern Nehantics occupied the southeast corner of the state and part of Rhode Island (Speck 1928: Plate 20; Swanton 1952:31 and map insert). Although considered to be two separate cultural groups, the Nehantics may have been historically divided by an incursion of the Mohegan-Pequots. The Western Nehantics are frequently cited as having been confederates of the Pequots (Guillette 1979:WP2), while the Eastern Nehantics may have been more aligned with the Narragansetts of Rhode Island (Caulkins 1895:20).

Table 2: Regional Historic Chronology

Contact (17th Century)

Hammonassets occupy project region.
Various European explorations along coastal Connecticut in the early 1600s.
Adrian Block makes direct contact along the coast in 1614.
Severe disease epidemics in 1616-1619, and 1633 reduce Native American populations.
Dutch trade relationships established until 1635.
Pequot War of 1637 decimates Pequots.
Daughter of Hammonasset Sachem marries Uncas.
Territory of Clinton, Killingworth, and Madison granted to proprietors by General Court in 1663.
Uncas signs deed transferring land in Killingworth to Colonel George Fenwick and others in 1669.
Boundary between Killingworth and Saybrook family finally settled in 1687.

18th Century

Killingworth incorporated in 1703, including present towns of Clinton and Killingworth.
North Killingworth remained unsettled until 1716.
Northern Killingworth recognized as second parish or society in 1735.
First Congregational Church of Killingworth built by 1736-1738.
Congregational Church replaced by second structure in 1743.
Killingworth remains lightly settled during 18th Century with agricultural base, minor milling efforts.
Agricultural products include corn, wheat, flax, orchard fruit, wool, beef from cattle.
Population of Clinton and Killingworth approaches 2,000 by revolutionary War.
Last of the recorded Hammonasset populations in north Killingworth.
Project property likely utilized for pasturing/wood lots.

19th Century

Local economy continues to be driven by agricultural concerns.
Multiple Christian denominations emerge.
Second Congregational Church structure abandoned or burned down in 1820.
Present town of Killingworth incorporated in 1838.
Henry Cook sells 70 acres to Eli Cooper with homestead in 1846.
Clinton and Killingworth reach population peak of 2,500 in mid-19th Century.
Clinton experiences greater economic diversity, while Killingworth remains agricultural.
Small enterprises - blacksmith shops, ax helve factories, grist mills, paper mills, steel furnace, iron mining.
Grange #66 established in Killingworth in 1887.
Project property part of Eli Cooper and Edwin Dudley farmstead.

20th Century+

Modern developments occur late, with first paved roads in 1921.
Agriculture shift to dairying in broader area.
Population of Killingworth drops below 500 by 1930.
Continued decline in agriculture, boom in housing and population after World War II.
Population shifts from farmers to commuters.
Route 80 widened and straightened.
Civic organizations multiply, parks established.
Population reaches 2,000 by 1970, over 5,000 by end of 20th Century.
Project property owned by Perkins family for most of the 20th Century.
Project property proposed for solar farm.

There is considerable debate as to the origins of the Pequots, or Mohegan-Pequots who would eventually split into two distinct tribes. Many authors believe that they originated in the Hudson Valley or upstate New York (Caulkins 1895:21; Learned 1903:52; Speck 1909:184; Tantaquidgeon 1972:65; Fawcett 1995:10), with cultural and traditional knowledge links to the Lenni Lenape (Delaware) of the Pennsylvania region who have stories of their wolf clan having moved to the northeast, later migrating to southeastern Connecticut during the late 16th to early 17th Century. Others cite archaeological and linguistic evidence to support the idea that they developed *in situ* (Salwen 1969, 1983:107; Rouse 1980). The Pequots may have received their name from an Algonkian word for "destroyers" (Salwen 1969:81; Guillette 1979:WP1) or "powerful ones" (Avery 1901:254) or "invaders" (Fawcett 1995:10). Alternatively, it may have derived from the informal name of several Pequot Sachems shortly before the arrival of Euroamericans, including Wopiguand (Wo-pequoit or Wo-pequand or Pekoath) (Caulkins 1895:21) or Tamaquashad (Pekoath or Pequot) (Guillette 1979:WP1).

Most early historic accounts describe the Pequots as an invading tribe which had forcibly entered southeast Connecticut, although it is not clear what their motivation for migration might have been. While the Pequots were concentrated near the southern coast between the Thames River and the Pawcatuck or Wecapaug River (Guillette 1979:WP2), Pequot political control was more extensive, in the form of tributes exacted on aboriginal populations on parts of Long Island and some of the "river" tribes including the Menunketucks and Hammonassets to the west. The Narragansetts of Rhode Island were the principal rivals of the Pequots, for they were most able to resist Pequot aggression (Guillette 1979:WP2). Tribes who were subject to Pequot power approached Dutch traders and English colonists in Massachusetts with offers of attractive settlement areas in order to help defend against Pequot domination (DeForest 1852).

The Pequot Sachem Wopiguand was killed in the early 1630s by the Dutch over trade disagreements (DeForest 1852:73), essentially ending the Dutch-Pequot trade relationship and initiating a pattern of increased hostilities between Euroamericans and Native Americans of the region (Hauptman 1990). Political turmoil ensued within the Pequot tribe as to who should succeed Wopiguand and how best to engage the Europeans. The choice of Sassacus to lead the tribe and subsequent disputes as to tribal policy with respect to the Europeans prompted Uncas and his supporters to defect as the Mohegan tribe (DeForest 1852:84; Fawcett 1995:11). The Mohegan base of settlement was situated at the confluences of the Shetucket, Quinebaug, and Yantic Rivers, and along the Thames River in Montville (Baker 1896:10; Speck 1909:185). The Mohegans were, however, still largely under the control of the Pequots, as were the southern groups of Nipmucs (i.e. Quinebaugs) who occupied northeast Connecticut (Gookin 1970 [1674]:7). Smaller, independent tribes such as the Hammonassets, based in Madison and Clinton / Killingworth, occupied the area surrounding the project property, although the tribe was to some degree under the domain of Pequot control at the time of contact (Beers 1884:447; Spiess 1933:28-29).

The Hammonassets occupied the region surrounding the project property at the time of contact (DeForest 1852:52,182). Hammonasset has been variably interpreted as meaning "where we dig the ground," or simply as consisting of territory bounded by the sound to the south, the East River of Guilford to the west, the Connecticut River to the east, and Wangunk territory to the north (Spiess 1933:28-29; see also Trumbull 1974[1881]:14). They were known to have occupied Madison as far west as the East River that borders Guilford, with one village up the

Hammonasset River several miles from the coast (Spiess 1933:29), and another possible village located several miles to the east near the Menunketesuck River on the north side of Route 80 (Lentz 2004:ii). The daughter of Hammonasset Sachem Sebequanash eventually married Uncas, expanding the territory of the Mohegans to reach as far west as Guilford. Most of the Hammonassets appear to have been concentrated in Clinton, Killingworth, and Madison shortly after contact (Spiess 1933:29).

The fluctuating nature of tribal territory boundaries can be additionally attributed to aspects of mobility and subsistence before the arrival of Europeans. Ethnohistoric sources offer descriptions of terminal Woodland and early Contact subsistence-settlement strategies of the area (McBride and Bellantoni 1982; Starna 1990:36-37). Spring settlements were located to take advantage of anadromous fish runs in larger drainages and along the coast. By late spring, attention was focussed on tending corn fields on alluvial terraces and glacial meltwater features along perennial streams and rivers. Semi-sedentary settlements near these fields were supported by task-specific hunting and gathering sites. Dispersal in the late fall and winter brought smaller groups into protected, upland or interior valleys where hunting and gathering continued. This model is confirmed by an archaeological survey of the lower Connecticut River Valley (McBride and Dewar 1981:49-50) in which large, early Contact period villages were found to be a part of a central-based circulating settlement pattern. Family units occupied major villages on a seasonal basis. The dispersal phase had a longer duration in the Contact period than the Late Woodland, and consisted of smaller subsistence units (single families).

The fortification of some larger villages in the early Contact period was likely a response to intertribal and intercultural political conflicts resulting from increased economic pressures induced by Euroamerican trade relationships (Salwen 1983:94; McBride 1990:101; but see Thomas 1985:136). The fortified villages are representative of the trend towards increasing sedentism and territoriality during the Contact period. Eventually, Native American populations became dispersed and afflicted by disease, warfare, and intertribal conflict to the point that small, scattered reservations served as the final restricted territories for some indigenous populations. The economic base for Native Americans in eastern Connecticut during the Contact period continued to consist of hunting deer and small mammals, gathering berries, nuts, and roots, and procuring shellfish and fish on larger drainages and along the coast (Waters 1965:7; Salwen 1970:5). This basic subsistence strategy was supported by various horticultural products, including corn as a staple, squash, beans, Jerusalem artichoke, and tobacco (Guillette 1979:CI5; Starna 1990:35). The importance of corn is evident in historic descriptions of ritual activities, including variations of the Green Corn Festival that extended with various groups, including the Mohegans, into the present day (Speck 1909:194; Speck 1928:255; Tantaquidgeon 1972:81; Fawcett 1995:54-57). Elderly women possessed extensive knowledge of wild plants which provided a host of medicines and treatments (Russell 1980:35-37).

The material culture included a mix of aboriginal forms and European goods such as metal kettles and implements (e.g. knives and projectile points), cloth, glass beads, and kaolin pipes (Salwen 1966, 1983:94-96). Wigwams continued to serve as the principal form of housing, in some cases well into the 18th Century (Sturtevant 1975). Unlike the Late Woodland, however, Contact aboriginal lithic products were predominantly manufactured from local quartz sources (McBride and Bellantoni 1982:54). Dugout canoes may have continued to provide a major form of transportation in larger drainages (Salwen 1983:91). Late Contact period Euroamerican trade goods included various metal tools, glass bottles, ceramic vessels, kaolin clay pipes, and nails (McBride and Grumet 1992).

Wampum (shell beads) served as an important item for exchange by Native Americans with European traders, but their original use was in the form of belts as symbolic signs of allegiance or reciprocity between tribes, and as sacred markers or tokens of honor for individuals (Guillette 1979:CI8; Ceci 1990:58-59; Salisbury 1990:87; Fawcett 1995:59). With European metal drill bits, tribes along the coast were now mass producing wampum for trade with the Dutch and English, who in turn used the shell beads to trade for fur procured by other tribes farther inland (Salwen 1983:96; Ceci 1990:58). Control of wampum production along the eastern Connecticut coast may have contributed to Pequot dominance over other tribes at this time. Although wampum was initially traded for Euroamerican goods, it was eventually used to pay fines imposed by colony governments on the tribes for "illegal" acts. While colonization brought new material goods to Native Americans in the area in exchange for fur, land, and services, the indigenous inhabitants became increasingly subject to legislative economic restrictions by the colonists (Salisbury 1990:83).

Sachems and councils of leading males formed the basic political unit for groups of villages (Gookin 1970 [1674]; Simmons 1986:12). The authoritative roles of clan mothers had diminished as a result of a strong European leadership bias towards males in trade relationships (Fawcett pers. comm. 1996). Tributes paid to sachems were generally used as reserves for the tribe at large. Although sachems were generally assigned by hereditary lineage, this was not always the case (Bragdon 1996:140-141). Additionally, authority was usually enforced by persuasion of a council. Shamans were "magico-religious" specialists of the tribes who also had a considerable role in leadership and decision-making (Speck 1909:195-196; Simmons 1986:43; Starna 1990:42-43). Other special status roles included warriors and persons who had visions, thus social status was largely based on achievement and recognition. Rules of obligation and reciprocity operated on all levels of tribal-wide decision-making (Bragdon 1996:131-134), serving to diffuse centralized authority. While the assignment of lineality (i.e. matrilineal vs. patrilineal) for the area tribes is still debated (Bragdon 1996:157), the well established practice of bride-pricing and traditional accounts support a patrilineal social organization (Speck 1909:193; Salwen 1983:97). Post-marital residence appears to have been ambilocal.

On a larger scale, more powerful tribes demanded tributes from smaller ones, often resulting in loose alliances between the latter. This process created a dynamic political environment that prompted intertribal conflict, especially after contact with Euroamericans (Guillette 1979; Bragdon 1996). The European settlers of the Contact period used this embedded rivalry system to their advantage in trade relationships and the procurement of land. The colonists were placed at a further political advantage because of the severe reduction in aboriginal populations as a result of disease (Starna 1992). Major epidemics occurred between 1616 and 1619, and more severely around 1633 (Snow and Lanphear 1988; Starna 1990:45; Snow and Starna 1989). Diseases introduced into the Americas included chicken pox, cholera, diphtheria, malaria, measles, oncercerosis, poliomyelitis, scarlet fever, smallpox, tapeworms, trachoma, trichinosis, typhoid fever, whooping cough, and yellow fever (Newman 1976:671).

By the middle of the 17th Century, the territory covered by the present towns of Clinton, Madison, and Killingworth were unclaimed by the relatively established colonies of New Haven to the west and Saybrook to the east (Buell 1884:417; Pierce 1961:1; KTC 1967). The territory, known originally as Homonssoit and measuring over 30,000 acres, was finally granted to several proprietors in 1663 by the General Court of Connecticut. The territory stretched between the Menunketesuck River at the eastern end to the East River at the western end. The area was shortly thereafter named "Kenilworth," the same name as the town in England where Killingworth's first delegate (Edward Griswold) to the General Court was born (Buell 1884:417; Pierce 1961:3; KTC 1967). Uncas of the Mohegans finalized sales of Killingworth in 1669, with the exception of a small six-acre area which was reserved for the aboriginal procurement of game and other natural resources (Buell 1884:419-420; Pierce 19611:3,20; KTC 1967). The town subsequently created two fortifications in anticipation of potential threats from Native American groups during King Philip's War of 1675, a series of altercations which never impacted the Killingworth area (Buell 1884:421; Pierce 1961; KTC 1967). The boundary of Saybrook and Killingworth was under dispute until finally settled in 1687 (Buell 1884:420-421; Pierce 1961:4).

18th Century

The name "Killingworth" was consistently used for the town after the start of the 18th Century. Killingworth was incorporated in 1703, including the present towns of Clinton and Killingworth. North Killingworth was initially settled in 1716, with a light density of agrarian settlements during the 18th Century (Buell 1884:427; KTC 1967). As with many other towns in the region, especially those along the coast with a core settlement closer to the coast where a greater diversity of economic activity occurred, residents in the distant northern parts of the town were having difficulty maintaining regularly required appearances to the church located in what is now Clinton (Pierce 1961:11). The Northern Society was finally granted its separate place of worship in 1730, with the northern two-thirds of the town set off as the Second or Northern Parish which was officially recognized by the Connecticut General Assembly in 1735 with an order to construct the first meeting house (Buell 1884:427; Pierce 1961:13; KTC 1967). The first church was built shortly after a couple of miles to the east of the project property and just west of Route 81, replaced by a second structure in 1743 (Buell 1884:429-430; KTC 1967). Distance to place of worship was not the only factor separating northern and southern residents of the town, however, as a political disparity between the Democrats of the north and the Whigs of the south also led to a push by the northern society to become its own town, a realization that would not occur until well into the next century. The third Congregational Church was built afterwards during a time when the State Constitution called for the separation of church and state, thus losing its obligatory focus as the center of town civic affairs (Buell 1884:430; KTC 1967).

The first settlers of Killingworth engaged in a self subsistence agricultural economy (Buell 1884:424; Pierce 1961:4-5). Typical products included corn, wheat, flax, orchard fruit, wool, and beef. Towards the coast, settlers took advantage of abundant salt hay to provide bedding, insulation, mulch, and food for cattle. Seafood included oysters, clams, and numerous fish species such as shad which were eventually caught in such great abundance as to serve as a product of export to the West Indies (Pierce 1961:5; KTC 1967). Industry in Killingworth at this time included grist mills and shipbuilding yards (Pierce 1976:11). Annually, five vessels were constructed of local timber in shipyards on the Indian River in what is now Clinton, reflecting the different character of the agrarian northern and coastal southern areas of Killingworth (Pierce 1961:11). Much of the lumber industry focused in upland areas and would have included territory in the vicinity of the project property.

19th Century

The Beginning of the 19th Century witnessed an end to the Congregational Church serving as the sole place of worship and civic affairs. As stated earlier, the new state constitution called for the separation of church and state. In addition, some degree of religious diversity was recognized in Killingworth with the construction of an Episcopal church about 1800, a church whose organization occurred nearly 100 years earlier in neighboring North Bristol (North Madison) (Buell 1884:430-431; KTC 1967). Similarly, a Methodist church was built about 40 years later in the northeast part of Killingworth (Buell 1884:431; KTC 1967). The town of Killingworth had eight school districts in the 19th Century, with the project property as part of the Chestnut Hill School District (KTC 1967). The one room Chestnut Hill school house was located just to the southwest of the project area one half mile south of Route 80 on Chestnut Hill Road. There were 40 students enrolled in the Chestnut Hill School in 1814 (Lentz 2004:49). The schools, originally maintained by each district, were finally consolidated under town control in 1896 (KTC 1967).

The second society was finally recognized as the town of Killingworth in 1838, with the southern portion and original area formerly acknowledged as the center of town renamed Clinton (Pierce 1961:14; KTC 1967). The approximate courses of what are now Routes 80 and 81 had already been well formed as turnpike roads. Both towns reached a peak of population at nearly 2,500 people at the time of separation. Among other things already described, Clinton had a different character than Killingworth based on economic diversity. While Killingworth was almost exclusively agrarian with a concentration on farming, Clinton had its shipyards, fishing operations, various stores, and a more direct connection with surrounding territory via the Boston Post Road (Pierce 1961:14; KTC 1967). Small enterprises of the early part of the century in Killingworth included blacksmith shops, ax helve factories, grist mills, shingle mills, saw mills, carding mills, grist mills, flour mills, paper mills, blacksmiths, tanneries, a steel furnace, and two small iron lining operations (KTC 1967: Smith 1975; Lentz 2004:87). The town center of Killingworth, located at the intersection of Routes 80 and 81 and the surrounding vicinity, included the church, two stores, a blacksmith shop, post office, hotel, and school (Smith 1975). Otherwise, the town's agricultural focus was epitomized by its agricultural fairs which continued well into the late 19th Century and was further marked by the establishment of the Grange #66 of Killingworth in 1887 (KTC 1967; see also Buell 1884:428).

At the end of the 19th Century, many of the inhabitants of Killingworth began to move to the midwest lured by the prime, flat, rockless land and profitable agricultural products now reaching the markets of the east coast (Lentz 2004:87). At the turn of the century, many immigrants were buying the farms of Killingworth at low prices and maintaining chicken farms and dairies, but abandoning the mills (Lentz 2004:87-88).

The agrarian nature of Killingworth continued to be reflected in the ownership and use of the project property during the 19th Century. Home industries nearby included the witch hazel distillery of neighbor Rufus Redfield (Lentz 2017:20; Lentz 2004:87). Other local farmers also operated black birch distilleries which produced wintergreen flavoring (Lentz 2017:20). Most of the trees in Killingworth had been cleared more agrarian purposes and for the production of charcoal (Lentz 2004:91).

Land records (Table 3) indicate that Henry Cook sold 70 acres along with a homestead on Chestnut Hill Road to Eli Cooper on a parcel that included the project area in 1846. In 1856, Cooper sold the homestead with barn and outbuildings to Edwin Dudley, who owned the land for most of the latter half of the 19th Century. Land records for the land and adjacent parcels confirm that the area was dominated by pasture and wood lots. Historic maps (Figures 11a and 11b) confirm the location of the Eli Cooper homestead in the 1850s on Chestnut Hill Road, a short distance to the south of what is now Route 80, but by the 1874 the house is no longer present on historic maps and land records thereafter refer to the property as part of a farm that continued to consist of pasture and wood lots.

Table 3: Principal Transfers of Property Title

Route 80
Tax Assessor Map 26, Lot 14B (25 acres)
Killingworth, CT

Killingworth Land Records:

2013	Vol. 256, pg. 748	Charles L. Moser to Rajvilla, LLC 25 acres
2010	Vol. 240, pg. 686	Beatrice P. Moser (estate) to Charles L. Moser et al.
1988	Vol. 102, pg. 459	Robert L. Perkins et al. To Beatrice P. Moser
1986	Vol. 88, pg. 577	A. Leslie Perkins to Robert L. Perkins et al. 64 acres
1926	Vol. 40, pg. 455	Sidney D. Kelsey to A. Leslie Perkins 25.5 acres, includes Eli Cooper Farmstead
1904	Vol. 35, pg. 329	Nelson G. Burr to Sidney D. Kelsey 2 parcels, 51 acres, includes Eli Cooper Farmstead
1890	Vol. 34, pg. 296	Edwin Dudley (estate) to Nelson G. Burr et al. 50 acres, includes Eli Cooper Farmstead
1856	Vol. 30, pg. 63	Eli Cooper to Edwin Dudley 67 acres with dwelling house, barns, outbuildings
1846	Vol. 28, pg. 222	Henry Cook to Eli Cooper 70 acres including homestead

20th Century

While the Congregational Church of Killingworth no longer holds control as the focus of the town's civic affairs, the church still survives as a place of worship and center of community activity in the form of fairs and other events (KTC 1967). The economy of the first half of the 20th Century was still based largely on agriculture, although there was a clear shift to dairying as the agrarian focus (KTC 1967). The agricultural base of the town is evident in the continuation

Figure 11a: Historic Sites of the Area (1859)

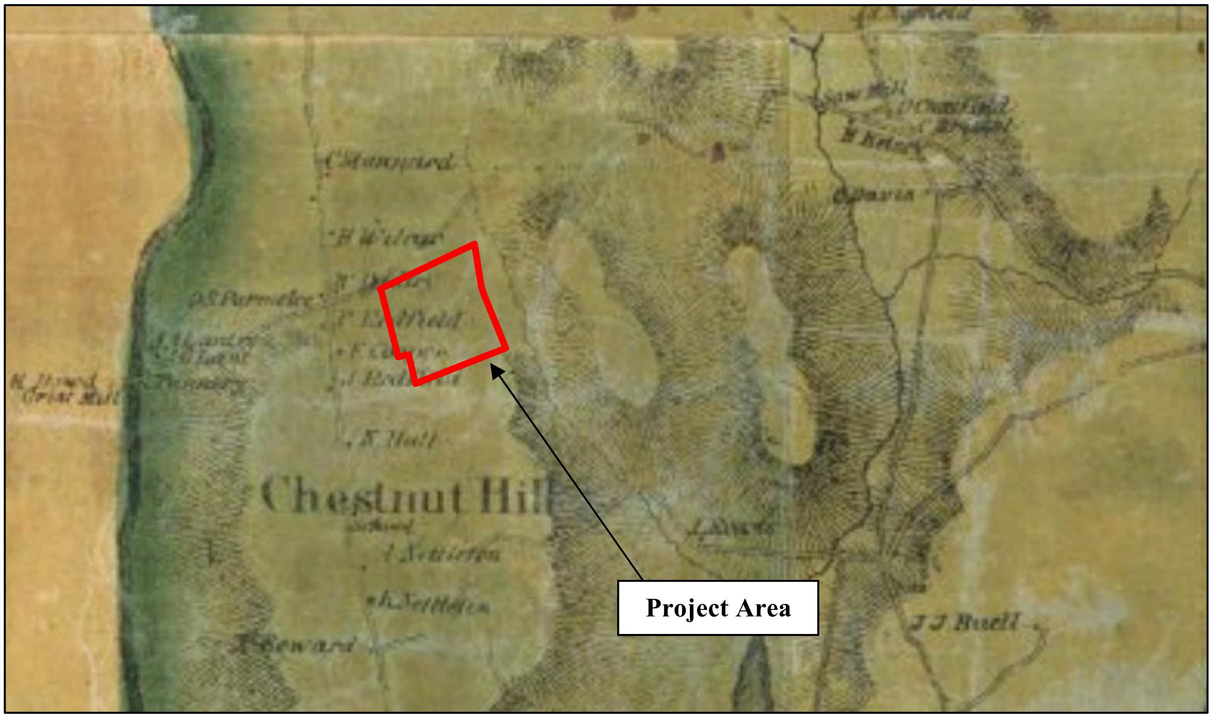

Figure 11a: From Walling 1859.

Figure 11b: Historic Sites of the Area (1874)

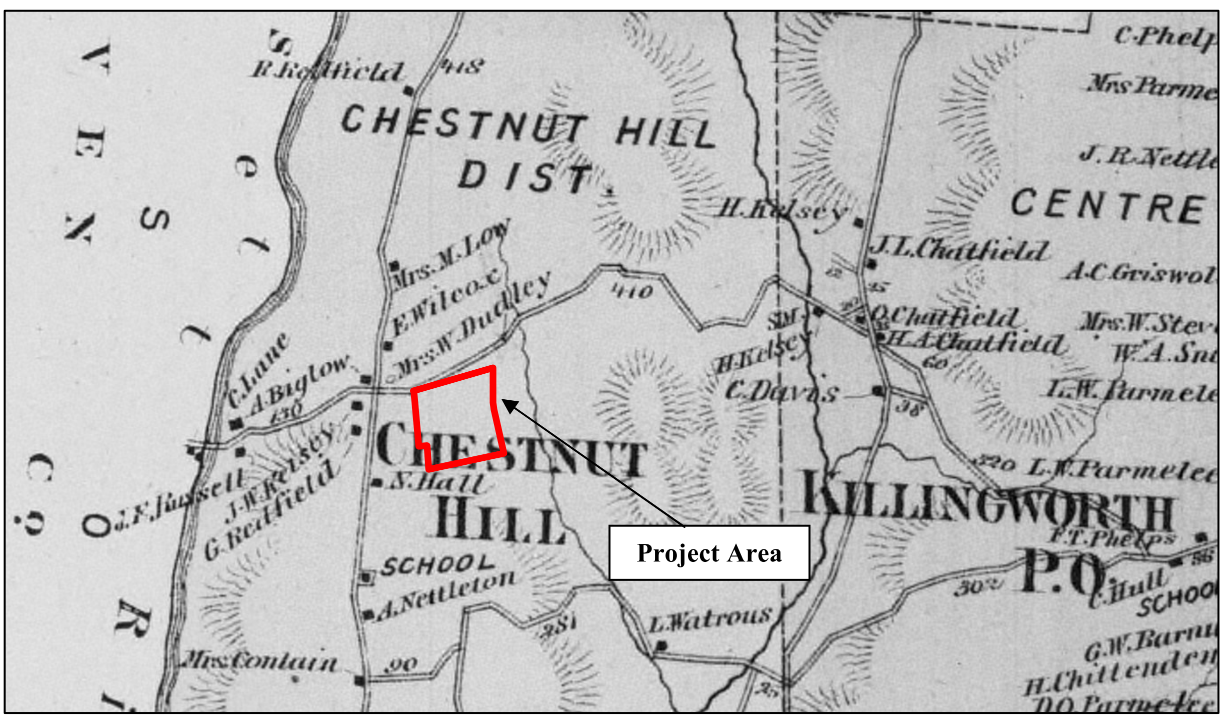

Figure 11b: From Beers 1874.

Figure 11c: Historic Sites of the Area (1893)

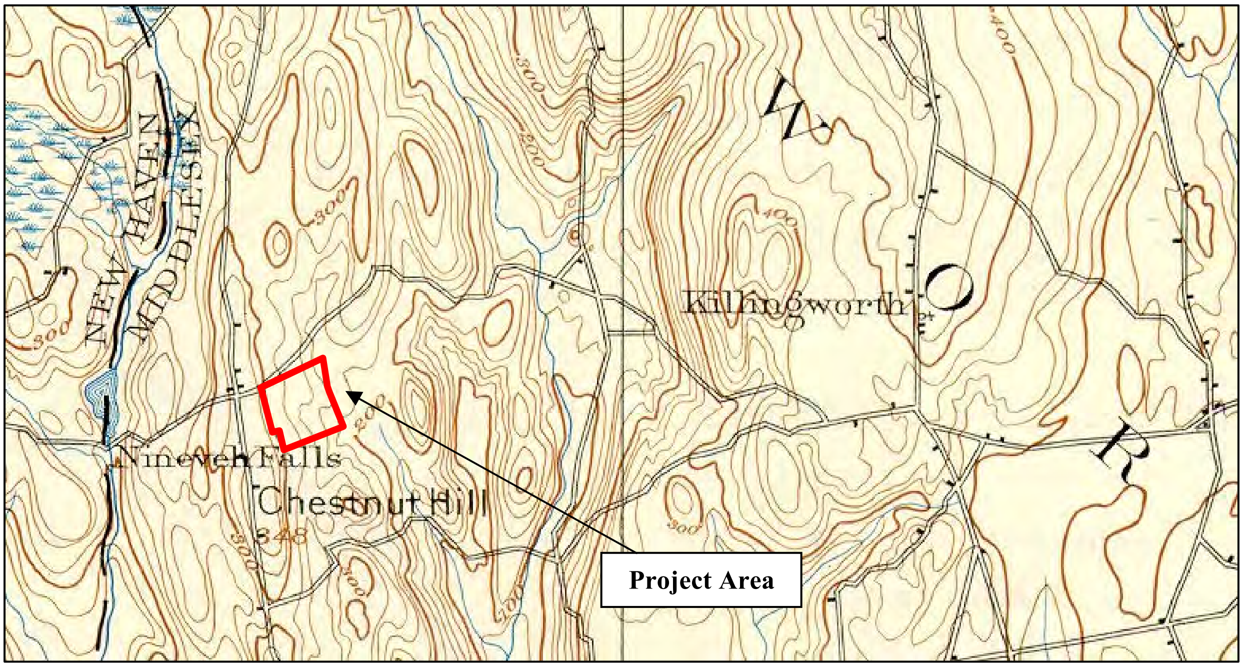

Figure 11c: From USGS 1893.

Figure 11d: Historic Sites of the Area (1934)

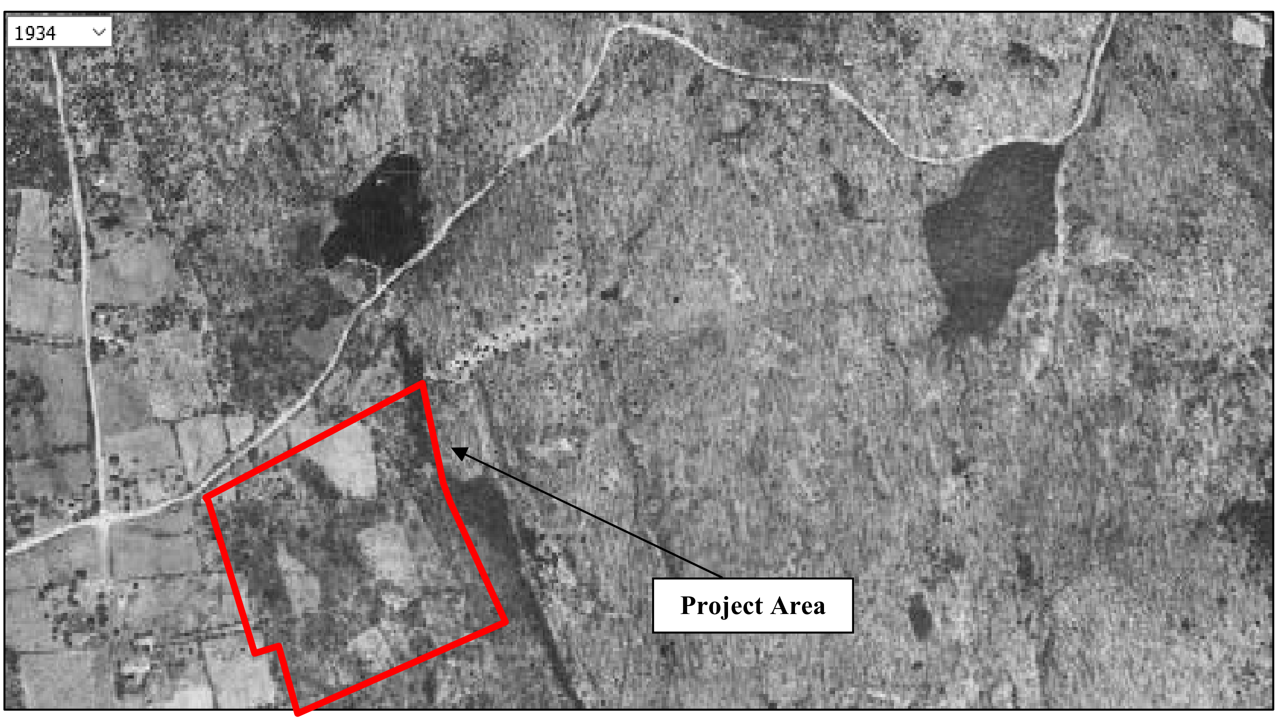

Figure 11d: From Fairchild 1934.

of the Grange which purchased the original town hall in 1910 (KTC 1967), although a decline in agriculture was mirrored by a decline in population, with only 660 residents in 1910 and 482 in 1930. The various town schools were consolidated further in the 1940s. The town was somewhat slow in incorporating modern utility services and amenities, with the first paved roads constructed in 1921.

After World War II, Killingworth witnessed a shift to suburbanization, which included the construction of new homes on formerly abandoned farms properties. Most residents of Killingworth now commute to larger cities to work (KTC 1967). In 1948, the whole school system was consolidated, with a new elementary school built on Route 81. A year later, the Center Schoolhouse was selected as the site for the Killingworth Fire House. The population of Killingworth has increased substantially in the last half-century, with nearly 2,000 by 1970 and more than 5,000 by the end of the 20th Century. Despite rapid development and population growth, much of the town remained as open space after the war, with 345 acres designated for Chatfield Hollow State Park, more than 1,500 acres for Cockaponset State Forest, and another 1,800 acres for a total of about 5,000 acres representing one-fourth of the town's 20,000 acres.

In 1948, an observation tower was constructed on top of the one room Chestnut Hill School building so that observers could survey the skies for enemy planes. The location of the school house on Chestnut Hill Road to the southwest of the project property provides a view of Long Island Sound (Lentz 2004:55). Route 80 was formerly called the Deep River Turnpike, whose intersection with Chestnut Hill Road was historically altered multiple times (compare Figures 11c and 11d with Figure 5; Lentz 2004:108), most recently in the mid 20th Century for the widening and rerouting of what is now Route 80. There may have been one or two outbuildings located along the former southern boundary of the road in the vicinity of the northwest part of the project property and outside the bounds of the project area in the early 20th Century (see Figure 11d). The project property is now proposed to be used for the construction of a solar farm, after having been owned by the Perkins family for most of the 20th Century as a distinct 25 acre parcel variably sold with other parcels over time.

Local Sites and Surveys

The Hammonasset (E.W. Cooper) Paper Mill (76:006) is a late 19th Century industrial site located on the Hammonasset River several miles south of the project area, with surviving traces including the remains of a headrace, tailrace, dam, associated building foundations, machinery footings, and stone walls. The site was evaluated in detail during a professional archaeological survey conducted in the mid-1990s (Clouette and Soulsby 1994), and is listed with the National Register of Historic Places (NRHP) (Soulsby and Clouette 1995a).

Remains associated with the original Killingworth Congregational church site and associated memorial marker were documented in a survey (70:006) two miles to the east of the project area in Killingworth Center (Walwer and Walwer 2002). Stone features, wrought nails, mortar, window glass, creamware, and wrought axe head were found at the site, which was in use from 1739 to 1820.

One mile to the east on Buell Hill, professional surveys led to the documentation of the site of the original 18th Century Buell family homestead (70-009), featuring the remains of structural foundations and intricate alignments of stone walls used to contain cattle and garden plots (Walwer and Walwer 2003). That survey also led to the photo-documentation and detailed analysis of nearly 400 stone pile features on the property (70-008), determined to likely originate from 19th Century agricultural clearing efforts, but controversially cited by some as relating to prehistoric, religious, or astrological origins (Walwer and Walwer 2005).

On Summer Hill Road about a mile to the west of the project area, a subdivision survey led to the identification of a 19th Century historic outbuilding foundation and stone well (76-011) (Walwer and Walwer 2009). Another professional survey project located just northwest of the intersection of Route 80 and Route 81 in Killingworth a couple of miles east of the project area revealed a 19th Century agrarian site containing the foundations of two outbuildings and a generous density of structural and household artifacts (Lavin, Dumas, and Kania 1999a, 2000). Several miles northwest of the project area, a survey led to the identification of late 19th through 20th Century artifacts on a property containing late historic residential agrarian structures determined to be ineligible for the NRHP (George et al. 2004). Other professional surveys in the area (Walwer and Walwer 1994; Soulsby and Clouette 1995b; Lavin, Dumas, and Kania 1999b; McCarthy 2007) have not revealed significant traces of historic archaeological remains.

Some historic archaeological sites of the area are known through local historic literature. On the north side of Route 80 to the west of Chestnut Hill Road, the town pound is a stone wall enclosure historically used to impound stray domestic livestock (Lentz 2004:67). On Abner Lane about one mile north of the project area, the remains of an axe handle factory include a foundation and a stone raceway connected to Pond Meadow Brook (Lentz 2004:98).

There are numerous historic buildings in Killingworth and neighboring north Madison within a couple of miles of the project area. The Oak Lodge building (CT SHPO 2018) is located in Chatfield Hollow State Park about a mile to the east of the project area in Killingworth, consisting of a wood-frame recreational lodge structure built in 1937 by the Civilian Conservation Corps, and is listed with the NRHP. Another mile east at the intersection of Routes 80 and 81, the existing Congregational Church of Killingworth was built in 1820 and is listed with the Connecticut Register of Historic Places. The Emmanuel Church of northwest Killingworth is an early 19th-Century post and beam wood-frame structure and is significant as an early, non-Congregational religious building representing the increase of religious diversity in the history of the area, and is also listed with the NRHP (Clouette 1999). About two miles to the northeast of the project area, the Parmelee House dates to about 1770 and is listed with the NRHP based on some rare domestic colonial architecture attributes as well as its occupation by a prominent family in Killingworth history (Cunningham 2006).

Built in 1934, the bridge (#1132) that carries Route 80 across the Hammonasset River to the east of the project area is also listed with the NRHP (Clouette 2003), consisting of a 100-foot long span serving as an example of early 20th Century open-spandrel concrete arch bridge design (see Lord and Montgomery 1998:53). The historic houses closest to the project area are located along Chestnut Hill Road to the west as documented in a local historic and architectural survey (CHC 1980). These include a center chimney cape (District 60-3) located on the east side of North Chestnut Hill Road and the north side of Route 80 at the intersection which was built in 1809 by Elihu Wilcox; the N. Hall house (District 60-7) built circa 1790-1840 to the south of the no longer extent Eli Cooper home associated with the project property; and the Chestnut Hill District Schoolhouse (District 60-8) measuring 18' x 25' and built in 1799.

Several historic cemeteries have been recorded by the Hale Cemetery Index of the 1930s to the west of the project area in northern Madison. A late historic cemetery featuring graves of at least five Civil War soldiers lies on the south side of Route 80 to the west of Summer Hill Road (Clayton and Lord 1976:90-91), a site sometimes confused with the Indian Cemetery site to the east of Summer Hill Road where gravel quarrying reportedly revealed Native American burial remains (Cleaver 2006:3).

Summary

There is a low density of previously recorded historic archaeological sites within a couple of miles of the project area, limited to traces of a 19^{th} Century mill, remains of a small axe factory, and some agrarian residential occupations. This low density in part mirrors the relatively light settlement density of Killingworth throughout its history which never realized a significant industrial base that developed in other towns and cities. The historic agrarian setting of the town is reflected in the past ownership and use of the project area itself which appears to be largely pastured fields and/or wooded lots. Ownership of the parcel was predominantly by families with occupations along Chestnut Hill Road to the west, including the Cook, Cooper, and Dudley families during the mid to late 19^{th} Century, and then the Perkins family for much of the 20^{th} Century. Historic maps and land records reveal no major developments on the property, and also reveal closest historic homes along Chestnut Hill Road to the west. Route 80 that borders the project area to the north was substantially widened and rerouted south to its current alignment in the mid 20^{th} Century, thus historic structures located along the historic course of the turnpike were located well away from the current bounds of the project area. The closest property listed with the National Register of Historic Places (NRHP) consists of the Oak Lodge Building at Chatfield Hollow State Park about one mile to the east, with some historic houses located along Chestnut Hill Road over several hundred feet uphill and to the west.

CHAPTER 3: METHODOLOGY

Research Methodology

Background

Establishing background information is critical in constructing a research design that is problem oriented. Here the problem is assessment of cultural resources, including traces of both prehistoric and historic activity. Background information provides an understanding as to which parts of a survey area are likely to be culturally sensitive. It may also dictate the nature of the excavation and distribution or density of testing. Finally, all data must be related to an historic and ecological context if they are to provide meaningful information.

The background research in this study is basically aligned along the sections already covered. Primary environmental information was procured from USGS quadrangle 7.5' series topographic maps; CGNHS quadrangle 7.5' series bedrock geology and surficial materials maps; CGNHS bedrock geology, surficial materials, and drainage basin maps of Connecticut; the USDA SCS soil book for New Haven County and the online USDA NRCS web soil survey; preliminary site plans; and various bulletins published by the Connecticut State Geological and Natural History Survey. Secondary sources such as general texts and various guides useful for interpreting what plant and animal life is and may have been relevant to the cultural use of the area were also consulted.

Establishing the present and any past environmental information for an area is critical as cultural behavior is highly integrated with and founded upon resource procurement, while resources are in turn highly integrated with the conditions of the environment (Jochim 1979; Butzer 1982). This relationship is especially greater as one considers earlier groups of people whose technological and social networks may not have provided for the mesh of buffers intervening between humans and the environment that is evident in today's modern industrial settings. Once the past and/or present environmental conditions for a project area have been assessed, they can be related to what is known about land-use as indicated by other sites and surveys in the region for predicting archaeological sensitivity across space (Kohler and Parker 1986; Kvamme 1990; Walwer and Pagoulatos 1990; Walwer 1996).

Several types of sources are critical for gathering background cultural information. Prehistoric cultural data must be procured via past archaeological surveys and excavations. These studies often rely upon rational application, ethnographic analogy, or less frequently, ethnohistoric, experimental, and folklore studies to provide behavioral interpretations of data derived from the archaeological record. Nevertheless, an abundance of independent sources for a region may provide fruitful information in relation to prehistoric cultural behavior. Sources consulted in this study include information from books on Native Americans in the northeast, articles from publications such as the *Bulletin of the Archaeological Society of Connecticut* and *Man in the Northeast* (*Northeast Anthropology*), existing archaeological surveys of the area, and Connecticut State Historic Preservation Office (SHPO) site files which give valuable summary information for individual sites in the region. Professional and avocational archaeologists as well as landowners, municipal historians, and project engineers are typically consulted as to knowledge of significant remains in the project area or surrounding region.

For the historic component of the background research, there are records which can be consulted. For this study, primary documents such as historic maps and land records were reviewed, as were secondary documents in the form of local histories and registers of historic places. As with prehistoric background research, local informants, historians, and project officials can also be important sources of historic cultural resource information. The combined research of these types of sources helps to indicate the potential sensitivity for historic cultural remains within a project setting.

Various institutions were approached for information concerning the environmental and cultural background of the area. The State Historic Preservation Office (SHPO) in Hartford yielded the information on past archaeological and historic architecture surveys in the area, as well as site files which yielded detailed information about individual prehistoric and historic sites. The Killingworth Town Hall contains land records dating back to its incorporation in 1703. Libraries consulted for environmental and cultural history sources include the Killingworth Library, and various libraries at Yale University in New Haven, such as Sterling Memorial, Kline Science, Henry S. Graves Forestry, Geology, Mudd, and Cross Campus. Informants include project engineer, Alissa Morrison of Loureiro Engineering in Groton, Connecticut.

Methodology and Analysis

Research for methodology is based on a combination of past experience and formal training. Part of the formal training for the directors of ACS includes lectures and text books which cover methodological issues such as research design and excavation. Research for analysis of the archaeological record is also based upon formal training and published identification guide books. With respect to artifacts, analysis is segmented according to time (prehistoric and historic), and material types (i.e. wooden, metal, lithic, ceramic, etc.), while structures and features are analyzed by comparing case studies. Coordinating the information into a summary and meaningful form is based on knowledge gleaned from both theoretical and practical lectures, articles, and texts.

Field Methodology

Testing Design

In the face of temporal and monetary constraints when considering cultural resource management, sampling design is critical. In this process, a portion or sample of the entire sample frame or population of sample units is selected which will ideally represent the nature of what is to be described (Binford 1964; Ragir 1967; Thomas 1986). A sample strategy that employs the whim of the investigator to position subsurface testing has been shown to be subject to severe biases and results in invalid statements when statistically extrapolating sample data to a whole area or site. Judgmental testing, however, can be fruitful in cases where something is known about the history of a project area, or if prior work has yielded results which require further clarification. Random sampling achieves validity, but may result in large areas remaining untested despite an adequate sample fraction. Where certain portions of an area to be tested have been statistically shown to be more sensitive or prone to the incorporation of cultural material, it may be appropriate to stratify or partition an area into sections which receive differential proportions of testing. The small size of the project area in this case and a low to moderate sensitivity with respect to potential prehistoric and historic cultural resources warranted a stratified-systematic sample fraction of testing.

A statistical model has been developed by ACS for significant prehistoric sites in Connecticut (see Walwer 1996; *www.acsarchaeology.com*), and was used to assess the sensitivity of the property with respect to the potential of the project area to contain significant sites. Qualitatively, the most sensitive areas tend to be those on nearly level, well drained soils overlying glacial meltwater features and alluvial sediments in close proximity to major waterways. Project areas are typically partitioned according to areas scoring between 0 and 100 in increments of 10, with a score of more than 20 representing a moderate to high likelihood of containing prehistoric sites. In this case, the project area scores only as high as 12.8 out of a possible 100, and therefore within the low sensitivity range (0-20). The sensitivity of the project area can be mostly attributed to its location in close proximity to wetlands, particulary the vernal pools which would have provided small but rich resource bases. Mitigating this sensitivity, however, is the small size of the wetlands, sloping settings, and high rock content of the soil. The testing pattern was therefore set to concentrate on nearly level to gently sloping areas in closest proximity to the vernal pools or related wetlands. The stratified-systematic subsurface shovel testing pattern designed to test for the possibility of prehistoric cultural resources resulted in the plotting of 50 systematic tests at standard 50-foot intervals, which was also utilized to test for potential historic activity related to the vernal pools on the property (Figure 12).

Easy access to the project area allowed for a complete pedestrian surface survey alignment, with a mature secondary tree cover and low scrub growth mostly in the form of briers throughout the property. The pedestrian surface survey is an important technique in cases where historic features such as foundations leave depressions in the landscape, and often with signs of disturbance or differentiation in vegetation type. Additionally, prehistoric features and artifacts may be identified in areas where erosion out-paces soil development or deposition of leaf cover, or where historic agricultural activity brings materials from buried archaeological contexts to the surface. The deep sedimentary and soil contexts of the project area, and most of this part of the country, however, requires that subsurface testing be employed as well. This is generally true in cases where thick vegetation or maintained grass, landscaping, and/or a relative lack of erosion encourage deep sedimentary and soil profiles.

Test Execution

The pedestrian surface survey was performed by two people for the project. Pedestrian traverses were made along 50-foot interval grid lines for areas to be tested, and in a less systematic fashion for the rest of the project area. Notes were taken as to any remnant features or structures, with the possibility that judgmental subsurface testing be applied in response to the results of the pedestrian survey. Any collected artifacts which are clearly in excess of 50 years in age are bagged and provenienced according to the nearest subsurface test location within areas subjected to the traverses, or to the nearest group of tests and/or major landscape area otherwise.

Figure 12: Subsurface Testing Pattern

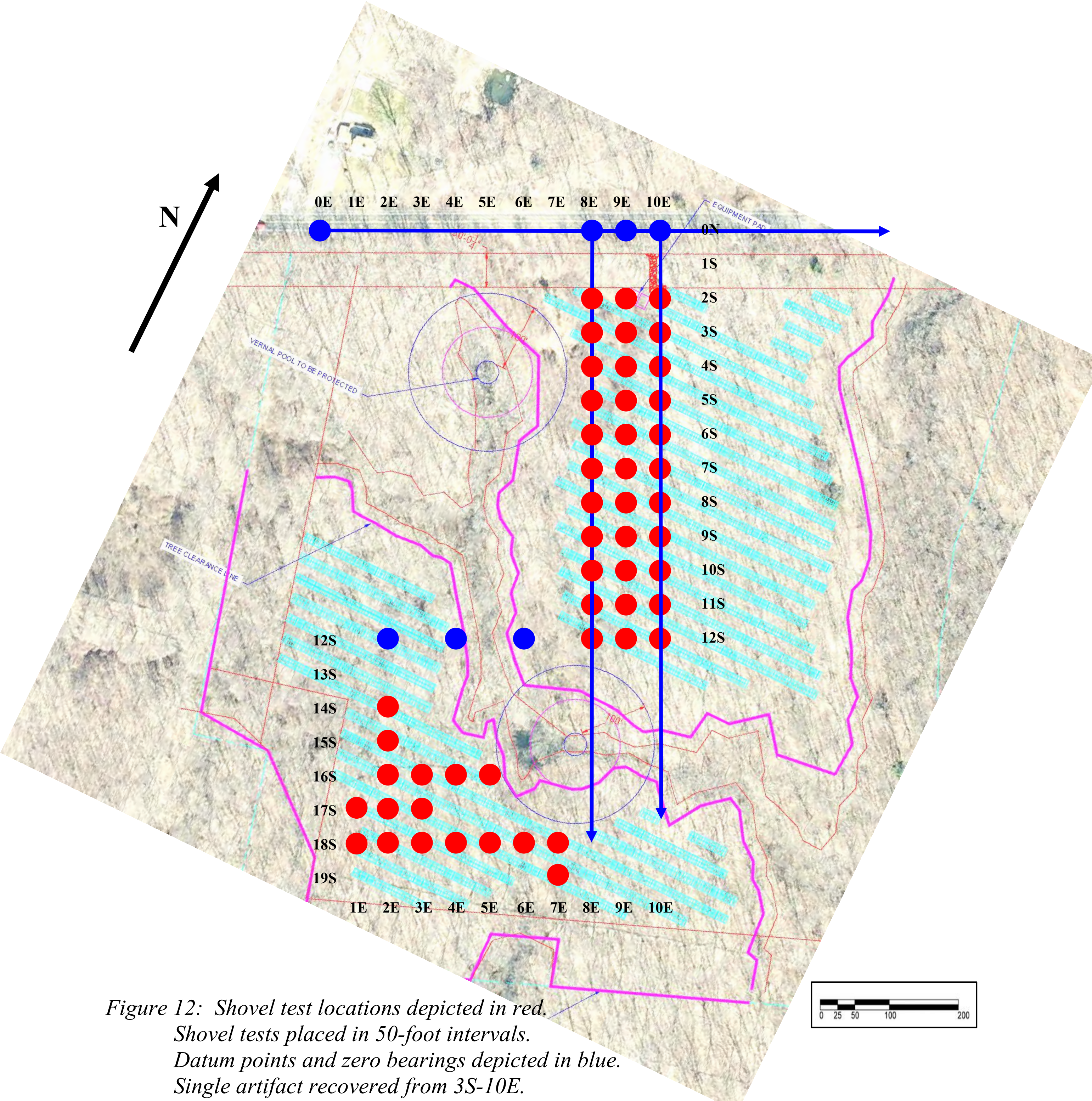

Figure 12: Shovel test locations depicted in red.
Shovel tests placed in 50-foot intervals.
Datum points and zero bearings depicted in blue.
Single artifact recovered from 3S-10E.
Scale 1" = 200' (1:2,400).

Round shovel tests measuring 1.5 feet in diameter were excavated according to natural or cultural layers, with the use of round-point shovels, trowels, and trench spades. Augers were used at the end of each test to confirm aspects of stratigraphy. Surface conditions were noted for each test prior to excavation, including any signs of natural or cultural disturbance. Standardized shovel test forms were used to record information such as soil types encountered, their depths, any bags for soil samples or artifacts collected, closing depth and reason for test termination, and any comments pertaining to unique conditions encountered. Extracted soil was screened and any artifacts retained. Hand screens consisted of wood frames with 1/4" mesh through which soil was passed for the recovery of artifacts. Recovered artifacts were provenienced according to test number and layer, and placed in labelled zip-lock bags for laboratory processing. Material that could be positively identified as modern debris was merely noted and left in place.

All test units were generally excavated to a depth which confidently exhausts any possibility of cultural resources being present, as often indicated by bedrock or Pleistocene gravels and sand that comprise the "C" horizon of soil units in the project area. North American archaeologists have the advantage of knowledge that humans were present in the New World only after the end of the Pleistocene, thus Pleistocene sediments are an extremely useful indication for unit termination. Tarps were used to retain shovel test backfill piles, which were returned to the test units subsequent to complete excavation and recording.

Laboratory Procedures

Processing

Processing procedures include those involving cleaning, labeling, conservation, and documentation, as mandated by the Connecticut Office of State Archaeology (OSA) and the Connecticut State Historic Preservation Office (SHPO) (Poirier 1987). A daily record of soil sample and artifact bags retrieved from the field was maintained in the laboratory. Cleaning procedures depend upon material type. Ceramics, glass, lithic artifacts, and well preserved bone and shell are washed in warm water and scrubbed with plastic brushes. Heavily rusted artifacts are dry-brushed lightly with a soft wire brush. Non-rusted metal artifacts, wood, and poorly preserved bone and shell are cleaned with a dry, soft plastic brush. Charcoal or burnt wood is separated and dry-brushed if necessary. Artifacts cleaned with water are dried on plastic trays, while those processed dry are bagged immediately. All artifacts are given new zip-lock bags, fresh tags, and significant artifacts are bagged separately according to material type. In the case of this study, labeled bags are given abbreviated codes for project area (KWSF); test number by grid coordinates using 50-foot intervals from an established datm point (e.g. 3S-2W); and layer below surface by Roman numeral (e.g. II). For the current survey, the datum (0N-0E) was located on the south edge of the road, 400 feet east of the eastern edge of the driveway for 497 Route 80, with a zero bearing along the south edge of the road looking west. Highly significant artifacts are labeled with India ink covered by an acetate solvent nail-polish, or given a separate labeled bag if labeling jeopardizes the integrity of the material or its potential to be studied in the future. Labeled artifacts bear an abbreviated indication of provenience. At the end of the project, all artifacts are scheduled to be submitted to the Laboratory of Archaeology and Museum of Natural History (LAMNH) at the University of Connecticut (UCONN) in Storrs, Connecticut.

Analysis

Analysis of artifacts in terms of individual identification are performed with the use of identification guide books, type collections (where possible), past experience, and standardized forms. The artifacts are separated by material type, with each material analyzed for designated variables. The variables selected for each material type reflect their significance in terms of identifying chronological and cultural demarcations, as well as variables which may ultimately shed light on the dynamics of the cultural behavior with which they were associated.

ACS has generated standardized data forms for lithic materials, faunal remains, and ceramics. This does not exhaust the potential range of material types, however it covers those which are most often preserved or which show the greatest degree of variability through time and across space. Variables assessed for all materials include those of material type, horizontal and vertical provenience, and for those other than modern debris, shell, or metal - weight, color, and condition or portion present. Lithic artifacts are analyzed for variables of raw material type and texture, manufacturing method, stage in the reduction sequence (including tool type where applicable), presence of heat treatment, indications of use and curation efforts, as well as those involving metric dimensions (size and weight). Ceramic materials are analyzed for variables of raw material or ware type, inclusions or tempering, manufacturing method, firing method, surface treatment, thickness, rim and vessel diameters, container volume, decoration, and maker's marks. Shell is analyzed for species and weight. Finally, bone is analyzed for taxonomic classification, element, age, sex, seasonality, human modification, exposure to heat, and possible use as tools. Weight measurements of all artifacts are made to the nearest 0.1 gram using an Acculab V-1200 electronic balance. Metric measurements are made with the use of electronic calipers.

Soil samples are analyzed for standard variables of color, texture, and pH. Color is measured along the variables of hue or color, value or shade, and chroma or degree of saturation. The standardized Munsell charts also provide names of colors which may be universally recognized. Texture is assessed based on behavior in hand samples as indicated by standard soil science manuals.

Architectural features and sites are documented in standardized forms published by the Connecticut State Historic Preservation Office (SHPO). For purposes of the general report, architectural features and prehistoric sites as a whole are analyzed in terms of their capacity to explain cultural and historic phenomena, and tend to involve a less standardized procedure based on examining similar case studies. Analysis of artifacts and features will frequently involve factors such as the spatial distribution, density, and association of artifacts within a site. Copies of all field records and copies of the final report are sent to LAMNH along with the processed artifacts. In addition, analysis raw data sheets and a CD with the raw data stored in standard Excel format are sent to the LAMNH in cases where large databases are generated, or upon request.

Expectations

Prehistoric

Prehistoric site locations have been shown to be fairly consistent in terms of landscape setting, as were the resources being procured and the environmental setting in which people operated. According to a model developed and utilized by ACS, prehistoric landscape sensitivity scores for the project area only reach as high as 12.8 out of a possible 100.0, and therefore well within the low sensitivity range (0-20). The low sensitivity of the property derives from its sloping, rocky soil contexts and minor wetlands in the vicinity, although there are two vernal pools in the wetlands body that courses through the property, and these could have been the focus of prehistoric resource extraction given a broader diversity of plants and wildlife at these locations. It is therefore projected that any evidence of prehistoric activity on the property will be in the form of short-term camp or single task sites related to the procurement and/or processing of wetlands-related resources, represented by minor quantities of lithic tool debitage and/or minor feature contexts such as small hearths.

Historic

Assessment of historic sensitivity was based on a compilation of documents such as historic maps, land records, and local histories. Historic maps and land records do not reveal any major developments within the project property, which appears to have remained as a combination of pasture and wood lots over the years. Primary owners appear to have lived along Chestnut Hill Road to the west, and it is likely that the use of the project property was limited to either pasturing cattle and/or logging over time. The original course of the road to the north of the project property appears to have been further to the north, therefore decreasing the likelihood of historic occupations being present within the project area. Any finds are likely to be in the form of isolated artifacts related to the agriculture and/or logging of the property.

CHAPTER 4: RESULTS

Field Conditions and Test Summary

ACS performed the fieldwork for the archaeological survey during the month of November, 2018. Field conditions were relatively cool and wet, with no snow on the ground by the time of fieldwork completion. The project area is in the western part of Killingworth, on the south side of Route 80 which is a major east-west corridor through town that was substantially widened and straightened in the mid 20th Century. The project property is roughly square in shape, with a mostly gently sloping and undulating hill slope surface that descends to the east. There are two principal wetlands bodies relevant to the project area - an intermittent stream that lines the eastern boundary of the property, and a lesser intermittent stream that courses through the property from northwest to southeast that also features two vernal pools. The property is now entirely wooded, but with a secondary forest cover that was at one time principally open pasture fields. There is a low scrub growth prominent throughout the property, with a high density of low briers that are on average knee high. The trees of the property are mostly deciduous, with a substantial leaf cover on the ground. The only historic features observed on the property are series of stone wall alignments (Figures 13 and 14), likely on the order of a couple of hundred years old, and likely delineating former pasture / wood lots and property boundaries. The walls are on the order of several feet high and wide, and are constructed from locally available gneiss fieldstones. There are breaks in the stone wall sections relating to former paths, particularly in the central part of the property that may relate to a former logging road.

There were 50 subsurface shovel tests plotted for the reconnaissance survey (Appendix A). The tests were plotted in standard 50-foot intervals (see Figure 12). Recall that soil profiles were projected to be an ideal Woodbridge rocky fine sandy loam, with a surface layer of dark brown fine sandy loam about three inches thick, overlying subsoils of dark yellowish brown (12 inches thick) to yellowish brown and olive (13 inches thick) fine sandy loam (25 inches thick total subsoil), over a mottled olive fine sandy loam substratum to five feet deep or more. Soil stratigraphy in the field was similar, although with some notable differences. The surface layer of soil tended to be thicker, to about ten inches below the surface, possibly related to historic farming of the property, and the texture was a finer silt loam. The color of the surface layer tended to be a very dark grayish brown (10YR 3/2). The subsoil tended to be a yellowish brown (10YR 5/4) color as expected, but often only down to about 1.5 feet and was either a fine sandy loam or finer silt loam texture. The substratum, where encountered, tended to be a light yellowish brown or light olive brown color (2.5Y 5/4 or 2.5Y 6/4), and the texture was a coarser and gravelly sandy loam or sand. Soils were typically rocky as expected. Some of the interpreted colors and textures in the field may have been affected by substantial fall rains, which also resulted in high water tables that seeped into the bottom of some tests. No substantial disturbances were noted in subsurface tests. Only one artifact was recovered from any of the shovel tests on the project property, consisting of a single, small wrought iron spike recovered from test 3S-10E, Layer I (Appendix B), adjacent to a stone wall in the northern part of the project area that may relate to splitting field stones for the construction of the wall, or former logging activity as the stone wall alignment appears to delineate a prominent north-south path through the property.

Figure 13: Stone Wall

Figure 13: Northeast view of typical stone wall alignment, southern vernal pool in background. Scale bar five feet.

Figure 14: Stone Wall

Figure 14: North view of a break in stone wall alignments near test #7S-8E, showing what may have been used historically as a logging road. Scale bar five feet.

CHAPTER 5: CONCLUSION

Cultural Resource Summary

In conclusion, the archaeological reconnaissance survey did not reveal any positive traces of prehistoric activity on the project property. Rock outcrops were not substantial enough to provide potential rockshelter sites, and there were no subsurface prehistoric feature contexts or artifacts revealed in any of the 50 stratified-systematic shovel tests conducted for the survey. There was only one historic artifact recovered, consisting of a small, hand-wrought iron spike found in a shovel test placed adjacent to a stone wall on the property. The artifact may relate to the splitting of fieldstones for the construction of the stone wall, or may relate to former logging activities on or near the property, as the stone wall appears to delineate a very broad north-south path through the property. The various stone wall alignments on the property are constructed from locally available gneiss fieldstones, and are likely on the order of 200 years old. The stone walls likely served to delineate pasture and wood lots, as well as property boundaries.

Recommendations

The archaeological reconnaissance survey of the project area did not reveal any traces of significant prehistoric or historic cultural resources. Background research revealed no prehistoric sites in close proximity to the project area, and nearby historic house sites were located along Chestnut Hill Road well uphill and to the west. The present course of Route 80 along the north side of the property was substantially straightened and redirected from the original road route well to the north. Historic maps and land records additionally reveal no substantial developments on the property. Only a single historic artifact was recovered, and the stone wall alignments represent common historic features found throughout the landscape of southern New England. ACS therefore recommends no further archaeological conservation efforts with respect to potential prehistoric or historic archaeological resources on the project property.

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Appendix A: Field Test Summary

Test #	Layer I Color	Layer I Texture	Layer I Depth"	Layer II Color	Layer II Texture	Layer II Depth"	Layer III Color	Layer III Texture	Layer III Depth"	Auger"	Close Reason	Comments
2S-8E	10YR3/2	sloam	12	10YR5/4	sloam	24				16	grv	gravel in Lay II
2S-9E	10YR3/2	sloam	8	10YR5/4	sloam	28				18	grv	rock in Lay II
2S-10E	10YR3/2	fsl	16	10YR4/4	fsl	19				13	grv	6’ W of stone wall running N-S; dense roots in Lay I, dense gravel in Lay II
3S-8E	10YR3/2	sloam	9	10YR5/4	sloam	18	2.5Y5/4	sloam	28		rck	gravel in Lay III
3S-9E	10YR3/2	sloam	10	10YR5/4	sloam	17	2.5Y54	sloam	34	24	grv	gravel in Lay II
3S-10E	10YR3/2	fsl	18							12	grv	Offset 5’ due to stone wall and large tree; dense root in Lay I
4S-8E	10YR3/2	sloam	10	10YR5/4	sloam	18	2.5Y5/4	sloam	30	24	arb	Lay IV 2.5YR6/2 coarse sand to 36”; water at 36”
4S-9E	10YR3/2	fsl	10	10YR5/4	fsl	14	2.5Y5/4	sloam	30	24	grv	cobbles in Lay II
4S-10E	10YR3/2	fsl	14								rck	E side of stone wall; dense roots and rocks
5S-8E	10YR3/2	sloam	12	10YR5/4	sloam	18	2.5Y5/4	sloam	22		rck	gravel in Lay III
5S-9E	10YR3/2	sloam	16								rck	6’ W of N-S stone wall; rocks throughout
5S-10E	10YR3/2	fsl	8	10YR4/4	fsl	13	2.5Y5/4	fsl	26	24	rck	E side of stone wall; cobbles in Lay I and II; gravel in Lay II
6S-8E	10YR3/2	sloam	6	10YR5/4	sloam	12					wtr	
6S-9E	10YR3/2	sloam	10	10YR5/4	sloam	12					rck	surface boulders; 3’ E of N-S stone wall; rocks in Lay II
6S-10E	10YR3/2	sloam	8	10YR5/4	sloam	26				21	rck	E side of stone wall; cobbles in Lay II
7S-8E	10YR3/2	sloam	10	10YR5/4	sloam	12					rck	abundant surface rocks and boulders
7S-9E	10YR3/2	sloam	14								rck	large rocks on surface; 10’N of E-W stone wall’ 20’ E of N-S stone wall
7S-10E	10YR3/2	sloam	9	10YR5/4	sloam	24				17	wtr	E side of stone wall; cobbles in Lay II
8S-8E	10YR3/2	sloam	10	10YR5/4	sloam	20					rck/wtr	boulders on surface; cobbles throughout
8S-9E	10YR3/2	sloam	7	10YR5/4	sloam	14					rck	rocks on surface; rocks throughout
8S-10E	10YR 2/2	sloam	6	10YR5/4	sloam	11					wtr	W/S side of stone wall; cobbles throughout
9S-8E	10YR3/2	sloam	10	10YR5/4	sloam	20					rck/root	S side of E-W stone wall adjacent to wall; dense root and rock in Lay II
9S-9E	10YR3/2	sloam	8								rck	2’ W of N-S running stone wall
9S-10E	10YR3/2	sloam	12	10YR5/4	sloam	16				12	rck	surface boulders; cobbles throughout
10S-8E	10YR3/2	sloam	8	10YR5/4	sloam	20	2.5Y6/6	sl	24	12	rck	gravel in Lay III
10S-9E	10YR3/2	sloam	9	10YR5/4	sloam	19	10YR6/4	sloam	38	19	arb	3’ E of N-S running stone wall
10S-10E	10YR3/2	sloam	12								rck	surface rocks; rocks and cobbles throughout
11S-8E	10YR3/2	sloam	9	10YR5/4	sloam	17	2.5Y6/4	coarse sand	32	19	grv	gravel in Lay III
11S-9E	10YR3/2	sloam	11	10YR5/4	sloam	24				18	grv	Dense roots and rocks in Lay I; cobbles in Lay II
11S-10E	10YR3/2	sloam	13								rck	surface boulders; cobbles throughout
12S-8E	10YR3/2	sloam	10	10YR5/4	sloam	19	2.5Y6/4	coarse sand	30	24	grv	gravel in Lay III
12S-9E	10YR3/2	sloam	9	10YR5/4	sloam	18	2.5Y5/4	sloam	26	19	grv	cobbles in Lay II and III; gravel in Lay III
12S-10E	10YR 3/2	sloam	9	10YR5/4	sloam	12					rck	surface boulders; cobbles in Lay II
14S-2E	10YR3/2	sloam	10	10YR5/4	sloam	16					rck	surface boulders and water
15S-2E	10YR3/2	sloam	11								rck	standing water adjacent to N and all around; cobbles throughout
16S-2E	10YR3/2	sloam	16	10YR5/4	sloam	20					rck	rock in Lay II; located 6’ S of rock wall
16S-3E	10YR3/2	sloam	8	10YR5/4	sloam	16	2.5Y6/4	sloam	27	21	rck	cobbles in Lay II
16S-4E	10YR3/2	sloam	8								rck	just E of N-S running stone wall

Appendix A: Field Test Summary, continued

Test #	Layer I Color	Layer I Texture	Layer I Depth"	Layer II Color	Layer II Texture	Layer II Depth"	Layer III Color	Layer III Texture	Layer III Depth"	Auger"	Close Reason	Comments
16S-5E	10YR2/3	sloam	10	10YR5/4	sloam	16					wtr/rck	20' W of water; rocks in Lay II
17S-1E	10YR3/2	sloam	8	10YR5/4	sloam	12					arb	
17S-2E	10YR3/2	sloam	12	10YR5/4	sloam	12					arb	
17S-3E	10YR3/2	sloam	6	10YR5/4	sloam	16					rck	
18S-1E	10YR3/2	sloam	9	10YR5/4	sloam	22					rck	cobbles in Lay II
18S-2E	10YR3/2	sloam	10	10YR5/4	sloam	20	2.5Y6/4	coarse sand	26	16	rck	
18S-3E	10YR3/2	sloam	8	10YR5/4	sloam	14	2.5Y6/2	sloam	23	20	arb	Lay IV 2.5Y6/4 ciarse sand to 34"
18S-4E	10YR3/2	sloam	8	10YR5/4	sloam	17					rck	Adjacent to E of N-S running stone wall; cobbles throughout
18S-5E	10YR3/2	sloam	9	10YR5/4	sloam	17	2.5Y6/4	sloam	25		wtr	South of rock pile; gravel in Lay II and II
18S-6E	10YR3/2	sloam	9	10YR5/4	sloam	20				18	rck	Just E of large stone pile; Lay II gravelly with rocks
18S-7E	10YR3/2	sloam	9	10YR5/4	sloam	17	2.5Y6/4	coarse sand	20	14	grv	rock in Lay II and III; gravel in Lay III
19S-7E	10YR3/2	sloam	8	10YR5/4	sloam	14	10YR6/4	sloam	32	24	arb	Lay IV 2.5Y6/2 sloam to 36"; gravel in Lay II and III

Abbreviations:

arb - arbitrary termination
com - termination due to compact soil; compact
fsand - fine sand
fsl - fine sandy loam
grv - termination due to dense gravel; gravel, gravelly
lfs - loamy fine sand
lo - lower
lsand - loamy sand
mtld - mottled
prof - profile
rck - termination due to rock; rock, rocky
scl - sandy clay loam
sl - sandy loam
sloam - silt loam
unc - termination due to unconsolidated sediments
wtr - termination due to water

Appendix B: Features and Artifacts by Test Unit

Test #	*Layer*	*Features and Artifacts*
3S-10E	I	1 wrought-iron spike, shaft length ~74mm, shaft width ~12x8mm, 26.9g.