Appendix 5.10-D

Terrestrial Cultural Resources Reports by PAL

TECHNICAL REPORT

TERRESTRIAL ARCHAEOLOGICAL RECONNAISSANCE SURVEY TERRESTRIAL ROUTE ALTERNATIVES #1 and #2 Barnstable, Mashpee, and Yarmouth, Massachusetts and INTENSIVE (LOCATIONAL) ARCHAEOLOGICAL SURVEY, TERRESTRIAL ROUTE ALTERNATIVE #1 CAPE WIND ENERGY PROJECT Barnstable and Yarmouth, Massachusetts

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MANAGEMENT ABSTRACT

PAL has completed reconnaissance archaeological surveys of the Alternative #1 and #2 routes and an intensive (locational) archaeological survey of the preferred Terrestrial Route Alternative #1 as part of permitting review process for the proposed Cape Wind Energy project located on Cape Cod. The proposed project involves the construction of underground utilities between offshore energy facilities and existing utility lines in the towns of Barnstable and Yarmouth, Massachusetts. The proposed Alternative #1 route is situated partly under paved roadways and partly within existing utility easements. Alternative #1 (approximately 5.9 overland miles) makes landfall at Lewis Bay in Yarmouth and extends north and west to connect with existing utilities.

A total of 208, 50-x-50-centimeter test pits was excavated along 10-meter interval transects, and one 5-meter test pit array as part of an intensive (locational) archaeological survey of the Terrestrial Alternative #1 route, conducted under permit from the Massachusetts Historic Commission. One prehistoric site, the Pole #20 Site, was identified during the intensive survey. Based on low artifact density and lack of physical integrity, the Pole #20 Site is not considered eligible for listing to the National Register of Historic Places. **No additional archaeological investigations are recommended for the proposed Cape Wind Terrestrial Route Alternative #1 project area.**

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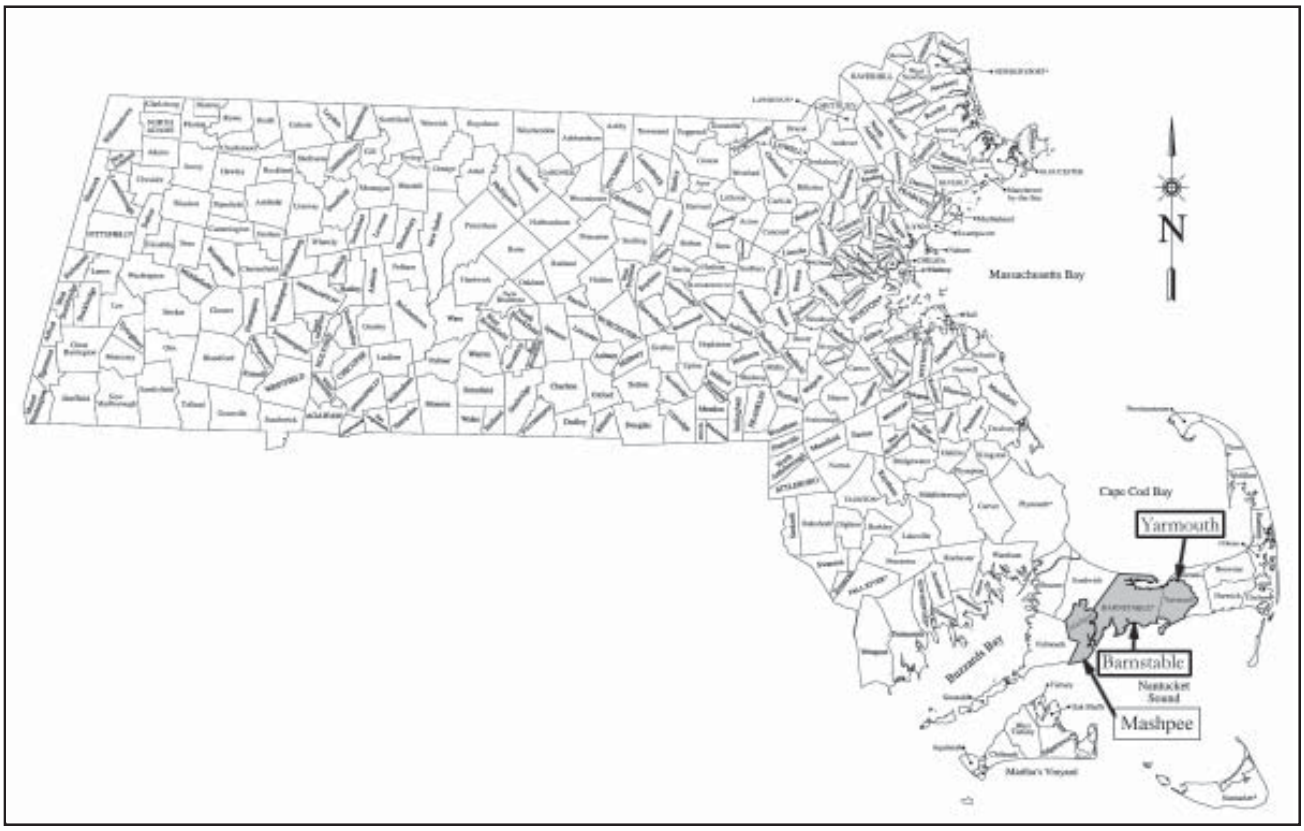
CHAPTER ONE

INTRODUCTION

This report presents the results of an archaeological reconnaissance survey of the Terrestrail Alternative #1 and #2 routes and an intensive (locational) archaeological survey of the Terrestrial Alternative #1 route, as part of the permit application for the proposed Cape Wind Energy project located on Cape Cod. The proposed project involves the development of Wind Turbine Generators across an approximate 24 square-mile portion of Horseshoe Shoals in Nantucket Sound. The proposed project also involves the construction of underground utilities between the offshore energy facilities and existing utility lines in the towns of Barnstable and Yarmouth, Massachusetts (Figure 1-1). The Terrestrial Alternative #1 route (approximately 5.9 overland miles) makes landfall at Lewis Bay in Yarmouth and extends north and west to connect with existing utilities (Figure 1-2). The portion of the route is situated partly below paved roadways and partly within existing utility easements. Terrestrial Route Alternative #2 (approximately 14.2 overland miles) makes landfall at Mashpee Neck Road on Popponesset Bay in Mashpee and extends north and east to connect with existing utilities in Barnstable (Figures 1-3 and 1-4).



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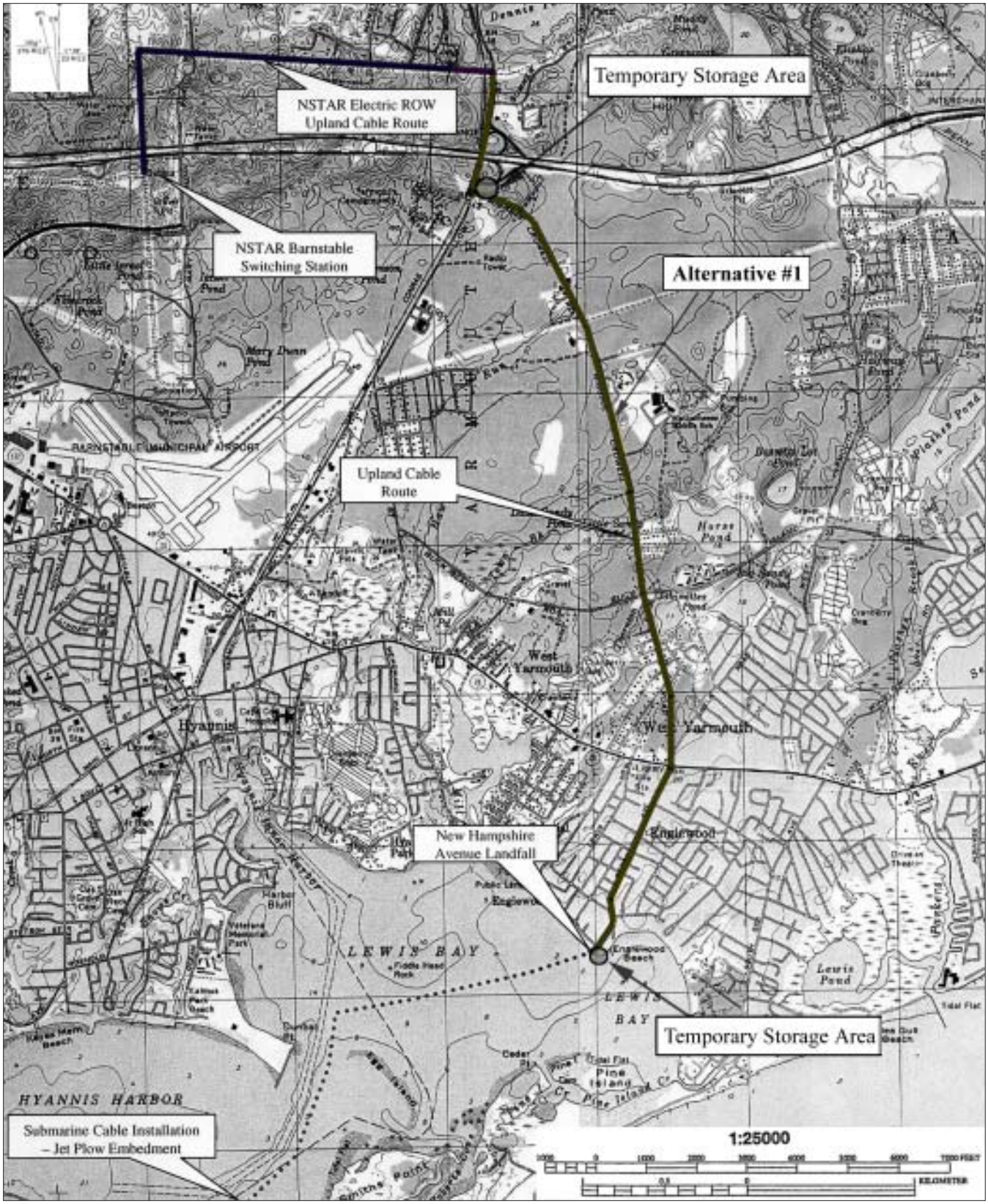

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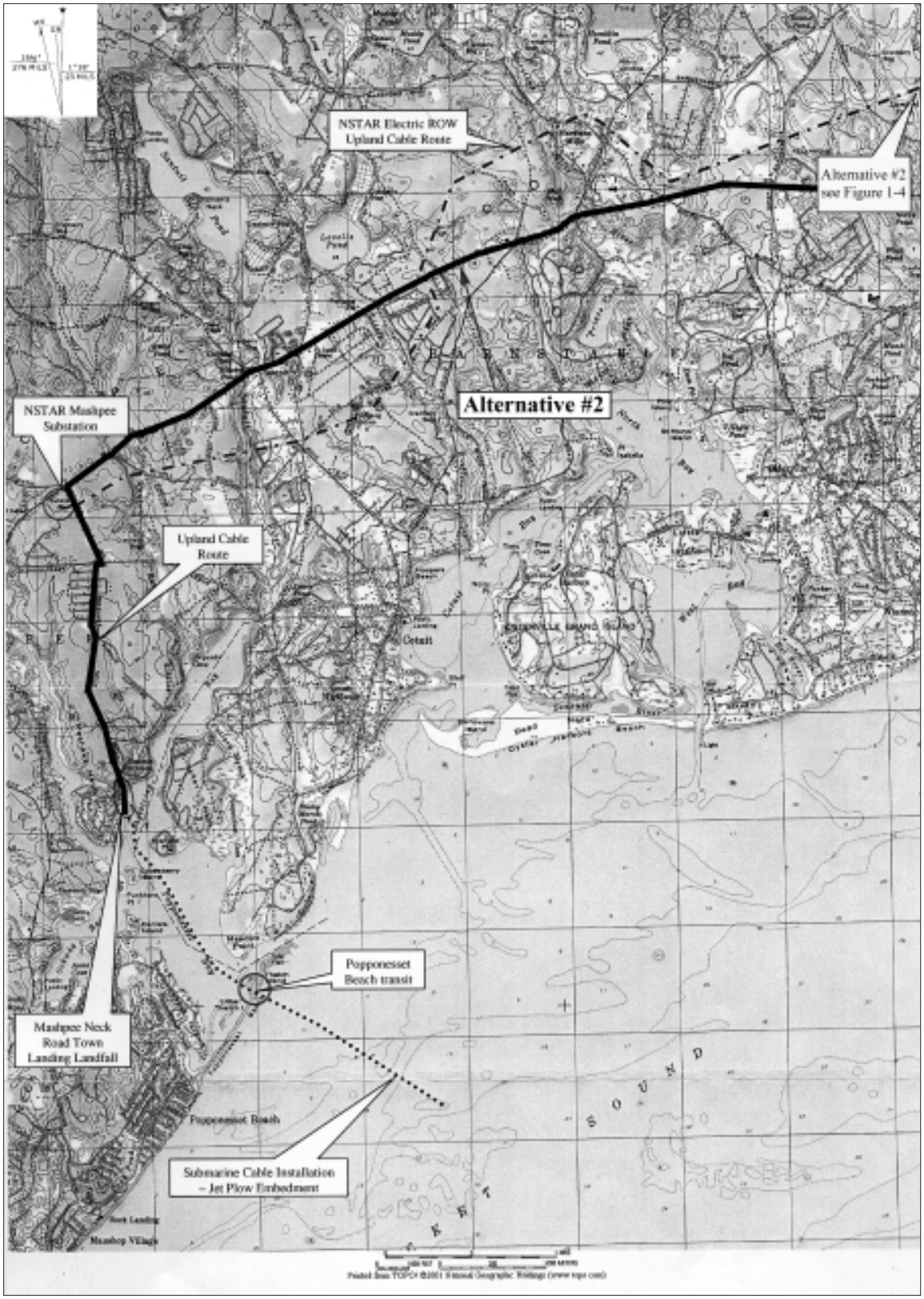

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Project History

In May 2003, PAL conducted an archaeological reconnaissance survey of two potential alternative routes (Cape Wind Terrestrial Route Alternative #1 and Alternative #2) located on Cape Cod. The reconnaissance survey consisted of historic and archival research (including a Massachusetts Historical Commission [MHC] site file search) and a driveover/walkover survey of the Terrestrial Route Alternative #1 and Alternative #2 routes (the study area). The combined results of these tasks were used to stratify the archaeological sensitivity of the two alternative routes.

The archival research/site file search completed as part of the reconnaissance survey determined that more than 50 archaeological sites have been recorded within 1.5 miles of the two Terrestrial Route alternatives. The sites include prehistoric and historic Native American and historic Euro-American deposits, ranging in age from 200 to 10,000 years old. The majority of these sites were reported by avocational collectors and were not the result of professional systematic archaeological surveys. Several sites have been evaluated and determined ineligible for listing in the National Register of Historic Places. Many sites noted in the immediate vicinity of the Terrestrial Route alternatives are known by location only and have no determination of eligibility.

The reconnaissance survey determined that previously unidentified prehistoric and historic Native American and colonial American archaeological sites could be present in the undisturbed portions of each alternative route (PAL 2003). Using the data collected during the reconnaissance survey, the Terrestrial Route Alternatives #1 and #2 were delineated into zones of high, moderate, and low archaeological sensitivity.

Following the reconnaissance survey, Cape Wind proposed Alternative #1 as the preferred route and requested that PAL complete an intensive archaeological survey of the proposed Alternative #1 overland route. The goal of the intensive (locational) archaeological survey was to locate and identify any significant archaeological deposits that may be present within the proposed project impact areas. The results of this intensive survey have been used to make preliminary recommendations regarding the need for additional archaeological investigations within the Alternative #1 project area.

Project Description

The Terrestrial Route Alternative #1 project route makes landfall from Lewis Bay at New Hampshire Avenue in Yarmouth and travels for approximately 18,000 feet (ft) (5,486 meters [m]) beneath Berry Avenue, Higgins Crowell Road, and Willow Street (see Figure 1-2). The proposed Alternative #1 project corridor consists of an approximate 10-ft-wide utility trench that will be located beneath the center of existing paved public roadways along this entire 18,000 ft length to avoid existing belowground utilities along both sides of the road. Several proposed ancillary impact areas have been identified in this section of the project area (see Figure 1-2). An approximately 80-x-80-ft temporary storage area is located just north of the landfall on the east side of New Hampshire Avenue. A second impact area is located at the northeast corner of Higgins Crowell and Willow Street, where an approximately 200-x-100-ft area is proposed for temporary staging.

The Terrestrial Route Alternative #1 project route leaves the roadway just north of the Route 6-Interchange 7 and continues west along the existing NSTAR electrical easement for approximately 11,000 ft (3,300 m). The proposed approximate 8-10 ft-wide utility trench in this portion of the project route will be located entirely within the NSTAR Right-of-Way (ROW). No existing belowground utilities are located in this portion of the project area, with the exception of several perpendicular roadway crossings.

The Terrestrial Route Alternative #2 makes landfall in Mashpee at a town-owned boat ramp located at the end of Mashpee Neck Road (see Figure 1-3). The Terrestrial Route Alternative #2 travels along a series of paved roads until its intersection with the NSTAR Mashpee Substation at the intersection of Orchard Road and Route 28. At this point the Alternative #2 route will be overhead, following an existing NSTAR transmission line from the Mashpee Substation to the Barnstable Switching Station (see Figure 1-4). In addition, a new riser substation is proposed within the existing ROW to connect the upland transmission line to the existing NSTAR transmission line and the new overhead line.

Area of Potential Effect (APE)

An Area of Potential Effect (APE) is generally defined as ". . . the geographic area within which the undertaking may cause changes in the character of or use of historic properties, if any such properties exist" [36 CFR 800.2 (c)]. The APE is defined based on the potential for effect, which may differ for aboveground resources (historic structures and landscapes), belowground or marine resources (archaeological sites). The APE includes all areas where the ground may be disturbed, where land use (i.e., traffic patterns, drainages, etc.) may change, or any locations from which the undertaking may be visible. For purposes of the archaeological investigations, the APE for the Terrestrial Route Alternatives #1 and #2 includes a proposed approximate 8-10 ft-wide utility trench and the identified temporary staging areas described above.

Scope and Authority

PAL is assisting Cape Wind Associates, LLC (Cape Wind) and its consultant, ESS Group, Inc. with cultural resource issues related to the proposed Cape Wind Energy project. PAL's technical assistance includes the identification and documentation of marine (submerged) and terrestrial cultural resources as well as National Register-eligible properties that may be impacted by the project. The archaeological services consist of reconnaissance and intensive level archaeological surveys to assess the potential for significant prehistoric and historic period resources to be present within the terrestrial and marine study areas. The results of the marine surveys are presented in other technical reports.

The proposed Cape Wind Energy project is under review by the US Army Corps of Engineers (USACOE), the Executive Office of Environmental Affairs (EOEA) - MEPA Unit and the Cape Cod Commission (CCC) as a Development of Regional Impact. The MHC reviewed the Environmental Notification Form (ENF) for the proposed project and requested that an archaeological reconnaissance survey be conducted for the terrestrial and marine portions of the project (MHC letter to Bob Durand, MEPA, dated December 24, 2001) (see Appendix D). The results of the reconnaissance survey were used to identify areas of high, moderate, and low archaeological sensitivity. The intensive archaeological survey was conducted following the reconnaissance survey, with subsurface testing completed in areas of moderate and high archaeological sensitivity along the preferred Terrestrial Route Alternative #1.

The archaeological reconnaissance survey was conducted under MHC permit no. 2246, and the intensive (locational) survey was completed under MHC permit no. 2595, both issued by the state archaeologist. The archaeological surveys were conducted in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800); the National Environmental Policy Act, Massachusetts General Laws, Chapter 9, sections 26c-27c, as amended by Chapter 254 of the Acts of 1988 (950 CMR 71); and Massachusetts Environmental Policy Act (MEPA) regulations (301 CMR 11). The proposed project will also require a Section 10 permit from the USACOE (33 CFR 320) under 33 U.S.C. 401 et seq.; U.S.C. 1344; and 33 U.S.C. 1413.

Project Personnel

PAL personnel involved in the project include Deborah C. Cox (principal investigator), Anna K. Graves and Holly Herbster (project archaeologists), and Mike Duffin, Erin Flynn, Gregg Laskoski, Fred Lumb, Jennifer Ort, and Sarah-Jane Poindexter (project assistants).

Disposition of Project Materials

All project information (i.e., field recording forms, maps, cultural materials, photographs) is currently on file at PAL, 210 Lonsdale Avenue, Pawtucket, Rhode Island. PAL serves as a temporary curation facility until such time as the Commonwealth of Massachusetts designates a permanent state repository.

CHAPTER TWO

RESEARCH FRAMEWORK AND METHODOLOGY

The archaeological investigations conducted for the Cape Wind Terrestrial Route Alternatives #1 and #2 (the study areas) were designed to collect specific types of information that assist in the identification, evaluation, and management of cultural resources present within proposed impact areas. The following chapter presents the research and field methodologies developed for the reconnaissance and intensive (locational) surveys.

Reconnaissance Survey Objectives

The goal of the reconnaissance survey was to stratify the Terrestrial Route Alternatives #1 and #2 routes into zones of low, moderate, and high archaeological sensitivity. In order to accomplish this objective, three research strategies were employed:

- collection and interpretation of historic and archival research, including a review of known archaeological sites in the vicinity of the study areas;
- review of environmental data, including wetland areas, soils, and slope within the study areas; and
- walkover/driveover of along each alternative route to assess existing conditions within these areas.

The information collected through the above tasks was used to develop preliminary archaeological sensitivity maps of both routes and to make recommendations regarding the need for additional archaeological investigations.

Archaeological sensitivity is defined as the likelihood for prehistoric and historic period resources to be present based on various categories of information. These categories include:

- known locational, functional, and temporal characteristics of identified prehistoric and historic sites in the project area or vicinity; and
- site-specific, local, and regional environmental data used in conjunction with existing study-area conditions observed during the walkover.

Intensive Survey Objectives

The goal of the intensive (locational) archaeological survey of the preferred Terrestrial Route Alternative #1 overland route was to locate and identify any potentially significant prehistoric and historic cultural resources that might be impacted by the proposed project. To accomplish this objective, three research strategies were used:

- walkover survey to refine the preliminary archaeological sensitivity assessment and select locations for subsurface testing; and
- field investigations, including documentation of existing conditions and subsurface testing; and
- laboratory processing and analyses of recovered cultural material.

The results of the intensive survey were used to interpret identified archaeological deposits and make recommendations regarding the need for additional archaeological investigations.

Subsurface testing was conducted in portions of the Terrestrial Route Alternative #1 ranked as having a high to moderate potential to contain archaeological deposits. All recovered cultural materials were processed in the laboratory and analyzed to interpret the nature of past human activities they represent. This interpretation enables an evaluation of the potential significance of the recovered cultural resources and their eligibility for listing in the National Register of Historic Places (NRHP).

Archaeological Significance and Historic Contexts

The different phases of archaeological investigation (reconnaissance, intensive survey, site examination, and data recovery) reflect preservation planning standards for the identification, evaluation, registration, and treatment of historic properties (including a district, site, building, structure or object) developed by the National Park Service [NPS 1983]. This planning structure allows for the assessment of the eligibility of cultural resources for inclusion in the National Register of Historic Places. The National Register is the official federal list of properties that have been studied and found worthy of preservation. The results of an intensive (locational) survey are used to make recommendations about the significance and eligibility of any resource.

The standards used to determine the significance of historic properties are the guidelines provided by the NPS (36 CFR 60): the National Register Criteria for Evaluation. Four criteria are listed by which the "quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling and association":

A. that are associated with events that have made a significant contribution to the broad patterns of our history; or

B. that are associated with the lives of persons significant in our past; or

C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. that have yielded, or may be likely to yield, information important to prehistory or history.

Most archaeological sites listed in the National Register of Historic Places have been determined eligible under criterion A or D. For eligibility under these criteria a number of issues must be addressed, including the kind of data contained in the site, the relative importance of research topics that can be addressed by the data, whether these data are unique or redundant, and the current state of knowledge relating to the research topic(s) (McManamon 1990). A defensible argument must establish that a site "has important legitimate associations and/or information value based upon existing knowledge and interpretations that have been made, evaluated, and accepted" (McManamon 1990).

The criteria used to evaluate the significance of historic properties are applied in relation to the historical contexts of the resources. A historical context is defined as follows:

> At minimum, a historical context is a body of information about past events and historic processes organized by theme, place, and time. In a broader sense, an historic context is a unit of organized information about our prehistory and history according to the stages of development occurring at various times and places (NPS 1985).

Historical contexts provide an organizational format that groups information about related historical properties, based on a theme, geographic limits, and chronological period. A historical context may be developed for Native American, historic, and/or modern cultural resources. Each historical context is related to the developmental history of an area, region, or theme (e.g., agriculture, transportation, waterpower), and it identifies the significant patterns that particular resource can represent.

Historical contexts are developed by:

- identifying the concept, time period, and geographic limits for the context;
- collecting and assessing existing information about these limits;
- identifying locational patterns and current conditions of the associated property types;
- synthesizing the information in a written narrative; and
- identifying information needs.

"Property types" are groupings of individual sites or properties based on common physical and associative characteristics. They serve to link the concepts presented in the historical contexts with properties illustrating those ideas (NPS 1983:44719).

A summary of an area's history can be developed by a set of historical contexts. This formulation of contexts is a logical first step in the design of any archaeological survey. It is also crucial to the evaluation of individual properties in the absence of a comprehensive survey of a region (NPS 1983:9). The result is an approach that structures information collection and analyses. This approach further ties work tasks to the types and levels of information required to identify and evaluate potentially important cultural resources.

The following research contexts were utilized to organize the data relating to the prehistoric and historic period cultural resources expected and/or identified within the study area:

- Native American Land Use and Settlement in the mid-Cape area, circa (ca.) 12,500 to 300 years before present (B.P.); and

- Historic Native and Euro-American Land Use and Settlement Patterns in Barnstable, Mashpee, and Yarmouth, ca. A.D. 1650 to Present.

These historical contexts, along with expected site types and locational patterns, are discussed in detail in Chapters 4 and 5. The potential research value of the known and expected prehistoric and historic archaeological resources in the study area is evaluated in terms of these historical contexts. The results of the archaeological investigations and management recommendations are presented in Chapter 6.

Reconnaissance Survey Methodology

The reconnaissance survey included historic/archival research and environmental analyses to predict the types and locations of cultural resources that could be present within the study area. The data collected during the reconnaissance survey was used to stratify the Terrestrial Route Alternatives #1 and #2 into zones of high, moderate, and low archaeological sensitivity.

Prehistoric Period/Native American Archaeological Sensitivity

Sets of key environmental variables used to predict the location of Native American sites have been compiled from research conducted by professional archaeologists. These studies have demonstrated that certain environmental and topographical settings are strongly associated with the presence of Native American sites. The most productive studies have been of large areas with a variety of environmental settings that were field tested to determine the validity of the predictive model. For example, analysis of several hundred sites in southeastern New England (Thorbahn et al. 1980) found that the highest density and greatest clustering of prehistoric sites occurred within 300 m of low-ranking streams and large wetlands. The distribution of sites found along the 14-mile I–495 highway corridor in the same area confirmed this observation (Thorbahn 1982).

Other studies have found that site locations are strongly associated with modern wetland densities (Mulholland 1984). Wetlands provide both a home and breeding habitat for a diverse set of animals and support foods and other vegetation exploited by Native American groups. Prehistoric Native Americans sought the most productive wetlands, including those with a wide variety of resources and

those with consistent and reliable resource availability (Hasenstab 1991; Nicholas 1991; Thorbahn et al. 1980; Thorbahn 1982).

Geologic data provides information about lithic resources and about current and past environmental settings and climate. Bedrock geology helps to identify where prehistoric groups obtained raw materials for stone tools and how far lithic materials were transported or traded. The variety and amount of available natural resources are dependent on soil composition and drainage, which also play a significant role in determining wildlife habitats and forest and plant communities.

Geomorphology assists in reconstructing the paleoenvironment of an area and is particularly useful for early Holocene (PaleoIndian and Early Archaic Period) sites in areas that are physically different from 10,000 years ago (Simon 1991). In some cases recent landscape changes, such as drainage impoundments for highways and railroads, the creation of artificial wetlands to replace wetlands impacted by construction, or wetlands drained for agricultural use, make it difficult to assess an area's original configuration and current archaeological potential (Hasenstab 1991).

Archaeologists have attempted to go beyond predicting where sites are located to associating cultural and temporal groups with changes in environmental settings of sites. Changes in the way prehistoric groups used the landscape can be investigated through formal multivariates such as site location, intensity of land use, and specificity of land use (Nicholas 1991). However, interpreting land use patterns and their evolution through the prehistoric period is problematic because of the difficulty of distinguishing between repeated short-term, roughly contemporaneous occupations and long-term settlement (Nicholas 1991).

Historic Period Archaeological Sensitivity

The landscape of a project area is used to predict the types of historic period sites likely to be present. Major locational attributes differ according to the function of a site type. Domestic and agrarian sites (houses and farms) characteristically have water sources and are located near arable lands and transportation networks. Industrial sites (e.g., mills, tanneries, forges, and blacksmith shops), at least those predating the late nineteenth century, are typically located in proximity to waterpower sources and to transportation networks. Commercial and public or institutional sites (e.g., stores, taverns, inns, schools, and churches) are usually situated near settlement concentrations with access to local and regional road systems (Ritchie et al. 1988).

Written and cartographic documents aid in determining historic archaeological sensitivity. Historic maps are particularly useful for locating sites in a given area, determining a period of occupation, establishing the names of past owners, and providing indications of past use(s) of a property. Town histories provide information about important sites including previous functions, ownership, local socioeconomic conditions, and political development. These details assist in placing the site within its historical context, facilitating assessments of the potential importance of a particular site.

Archival research alone, however, is not sufficient to locate potential historic period archaeological sites. A large-scale archaeological study by King (1988) showed that in rural areas only 63 percent of

the sites discovered were identifiable through documentary research. This suggests that approximately one-third of New England's rural historic archaeological sites may not appear on historical maps or in town and regional histories. Local informant interviews, walkover inspections, and subsurface testing are required to locate and identify potential historic sites.

Historic and Archival Research

The information necessary to develop a historical context and assess the potential for archaeological resources began with the examination of primary and secondary documentary sources. These sources include written and cartographic documents relating both to past and present environmental conditions and to prehistoric and historic period resources in or close to the route. These background data assisted with the formulation of predictive models or statements about the project area and were an integral part of the intensive (locational) survey. Variables within each category of background data were used to define the overall archaeological and historical context of the project area.

The following sources were reviewed as part of the historic and archival research for the proposed Cape Wind Terrestrial Route Alternatives #1 and #2 (specific citations are included in the References section):

State Site Files and Town Reconnaissance Surveys

The state site files at the MHC were reviewed to locate any known prehistoric or historic period sites in or close to the alternate routes. The MHC maintains the Inventory of Historic and Prehistoric Assets of the Commonwealth, a compilation of information on historic and archaeological properties in the state. These files include historic properties listed or eligible for listing in the National Register of Historic Places as well as resources determined to be National Register ineligible. The MHC reconnaissance survey reports for Barnstable (MHC 1984a), Yarmouth (MHC 1984b), and Mashpee (MHC 1984c) provided general information about patterns of land use, a chronology of historic period development, and the archaeological resource potential for the area. A synthesis of archaeological research in the region is provided in *Historic and Archaeological Resources of Cape Cod and the Islands* (MHC 1987).

Historic period development and settlement patterns are documented through a series of acetate transparencies and overlays on file at the MHC. The MHC's Barnstable, Mashpee, and Yarmouth files also contain copies of historic period maps housed at the State Archives, State House Library, and other curatorial facilities. These resources were used to develop predictive statements regarding the location and survival potential of historic archaeological sites.

Cultural Resource Management Reports

A number of cultural resource management (CRM) projects have been conducted within Barnstable, Mashpee, Yarmouth and the immediate vicinity in the past several years. These include a Cape Cod cultural landscape survey (Adams and Jenkins 1995), historic preservation plans (Barnstable Historical Commission 1985; Zimmerman et al. 1987), archaeological surveys for housing developments (Chartier 2000; Davin 1989; Gallagher 1982; Gallagher and Loparto 1982; PAL 1991a, 1991b; Shaw and McArdle

1987), municipal and county developments (Clements 1997; Doucette et al. 1990, Dudek et al. 2001; Fragola and Garman 1997; Mair 2000), golf courses (Begley 1999; Davin and Glover 1988; Ingham et al. 2001; Shaw and Savulis 1988), and cellular towers (Gellar-Duffy 2000). A newly completed inventory of Mashpee's historic architectural resources was examined for relevant resources within or near the Mashpee Alternative #2 route (Harrington 2000).

Environmental Studies

The bedrock, surficial geology, and geomorphology of the project vicinity were studied to understand depositional, erosional, and drainage patterns. Information was collected on the physical structure, geological resources, climatic changes, and hydrology of the study area (Cameron and Naylor 1976; Chamberlain 1964; Fenneman 1938; Strahler 1966). These sources were consulted to help understand the environmental settings that may have existed during the prehistoric period, and to reconstruct the natural landscape.

Bedrock and surficial geological studies provide information about the region's physical structure and about geological resources near the project area. The United States Department of Agriculture (USDA) Soil Conservation Service soil survey of Barnstable County (1993) supplied information about soil types and surficial deposits within the study area, and the general categories of flora and fauna that these soil types support.

Town Histories and Maps

General histories and historical maps and atlases help chronicle changes in land use and often provide information concerning the development of transportation networks, an important variable in the location of historic sites. Regional and local histories (Deyo 1890; Freeman 1869; Kittredge 1930; Speck 1928; Trayser 1939; Vuilleumier 1970), and state and local records (Earle 1861) provided information about the historical background of the towns of Barnstable and Yarmouth and their development through the historic period.

Historical maps of Barnstable, Mashpee, and Yarmouth (Anonymous 1795; Bassett 1795; Cahoon 1877; Hales 1831a, 1831b; Matthews 1830; Walker 1880a and 1880b; Walling 1858) were consulted to identify possible locations of historic/modern period sites within and in close proximity to the Terrestrial Route Alternatives #1 and #2.

Walkover/Drive Over

A combination walkover/windshield survey was conducted of the Terrestrial Route Alternatives #1 and #2 as part of the reconnaissance survey. This task was designed to visually identify the associated impact areas, examine the general physical condition of each route, and assist in the development of the archaeological sensitivity assessment. The drive over allowed the project team to examine the entire length of each overland route. Where access was possible, the alternative routes were examined more closely by completing limited walkover survey/ground inspection.

The physical condition of a project area is largely defined by the degree to which the landscape has been previously disturbed. Previous disturbance can affect the potential for the presence of cultural resources, reducing the probability they will be found in their original archaeological contexts. Another purpose of the walkover/driveover was to note surface indications of archaeological sites. While Native American sites in New England are most often found belowground, artifact scatters are sometimes exposed on the surface through cultural and natural processes such as road use, gravel pitting, construction activity, or erosion (see Chapter 3 for a more detailed description of the physical condition of the alternative routes at the time of the reconnaissance and intensive surveys).

Archaeological Sensitivity Assessment

The archaeological sensitivity assessment utilized general and specific environmental information including aspects of the physical setting of each alternative route. The assessment also included the data collected through historic and archival research to determine the presence of documented sites within and/or surrounding each route and the walkover/driveover survey to evaluate site integrity. These tasks led to the ranking of the Terrestrial Route Alternatives #1 and #2 according to the potential for cultural resources to be present within these areas.

Table 2-1. Terrestrial Archaeological Sensitivity Ranking.

Factors								*Ranking*
Presence of Sites		Proximity to Favorable Cultural/ Environmental Characteristics			Degree of Disturbance			
Known	Unknown	≤ 150 m	150-500 m	> 500 m	None/ Minimal	Moderate	Extensive	Sensitivity
•		•			•			*High*
•		•				•		*High*
•		•					•	*Low*
•			•		•			*High*
•			•			•		*High*
•			•				•	*Low*
•				•	•			*High*
•				•		•		*High*
•				•			•	*Low*
	•	•			•			*High*
	•	•				•		*High*
	•	•					•	*Low*
	•		•		•			*High*
	•		•			•		*Moderate*
	•		•				•	*Low*
	•			•	•			*Moderate*
	•			•		•		*Low*
	•			•			•	*Low*

The sensitivity rankings were based on the criteria presented in Table 2-1. These criteria, developed by professional archaeologists for the region of southern New England, consist of the presence of documented sites within and/or surrounding the route and proximity of favorable cultural and environmental characteristics. The degree of existing disturbance (particularly with regard to existing roadways) within the Terrestrial Route Alternatives #1 and #2 was also factored into the sensitivity assessment and rankings. The results of the sensitivity assessment were used to create maps showing preliminary zones of high, moderate, and low archaeological sensitivity within each alternative route (see Chapter 6).

Intensive Survey Methodology

The intensive survey methodology combined the data collected during the reconnaissance survey with a walkover survey of the Terrestrial Route Alternative #1 to refine the preliminary archaeological sensitivity assessment and select the specific locations for testing. Subsurface testing was conducted in areas of moderate to high archaeological sensitivity.

Walkover Survey

The first step in the fieldwork portion of the intensive survey was a walkover/surface inspection of the moderate and high sensitivity portions of the Terrestrial Route Alternative #1. The walkover was designed to collect environmental information and to examine the current physical condition of the terrestrial project area. Environmental information noted included the presence, types, and extent of fresh water, drainage characteristics, presence of bedrock outcrops, steepness of slopes, and presence of level terraces. The current physical condition of the terrestrial project area is largely defined by the presence, absence, and degree of previous disturbance to the natural landscape.

Plowing, gravel or soil mining, or previous construction and site preparation activities may have affected the current physical condition of the terrestrial project area. Disturbance can affect both the potential for the presence of cultural resources and reduce the probability that they will be found in their original archaeological contexts. The most common type of disturbance in New England is plowing, which can move artifacts from their original vertical and horizontal contexts. However, plowing is not as severe as soil or gravel mining, which can result in the complete removal of archaeological deposits.

The walkover was also conducted to recognize any surface indications of archaeological sites. While prehistoric sites in New England are most often found below the current ground surface, it is not unusual to find artifact scatters exposed on the surface from cultural and natural processes, including road use, gravel pitting, construction activity, and erosion. Historic site types that might be visible include stone foundations, stone walls, trash deposits, and dams. If a historic farmstead is present within the project area, a cellar hole might be found associated with a number of landscape features, such as stone walls, orchards, fields, and ornamental plantings.

The information collected during the walkover was recorded on project maps and used to determine where subsurface testing would occur.

Subsurface Testing

The subsurface testing within the proposed Terrestrial Route Alternative #1 was completed with a series of 50-x-50-centimeter (cm) test pits placed at 10-m intervals along 17 linear judgmental transects (Transects A–Q), and one 5-m interval test pit array. A total of 208 test pits was excavated within the Terrestrial Route Alternative #1 project area during the intensive survey.

All test pits were excavated by shovel in arbitrary 10-cm levels to sterile subsoils. All excavated soil was hand-screened through ¼-inch hardware cloth and all cultural materials at least ¼ inch in size remaining in the screen were bagged by level in each unit. The count and type of all recovered cultural material were noted. Soil profiles, including depths of soil horizons, colors, and textures, were recorded for each test pit on standard PAL test pit profile forms. All test pits were filled in and the ground surface was restored to its original contour following excavation. Color slides and black-and-white photographs were taken of the general project area.

All cultural materials were returned to the PAL facility in Pawtucket, Rhode Island for processing and analyses. Processing activities consisted of cleaning, visual identifications, and computer cataloging.

Laboratory Processing and Analyses

All cultural materials recovered from the Cape Wind Terrestrial Route Alternative #1 were organized by site and provenience, and recorded and logged in on a daily basis. Cultural materials were sorted by type and either dry-brushed or cleaned with tap water depending on the material or artifact type and condition.

All cultural materials were cataloged into a custom computer program designed using a combination of FoxPro 2.5 and FoxExpress database software. This program consists of a core of databases relationally linked to multiple material-type-specific databases that allow for in-depth analysis of cultural materials. Materials that display similar attributes such as material type, functional and typological classes, size range, color, etc. were grouped and cataloged together. These lots of material were stored in 2-milliliter thick polyethylene resealable bags with acid-free tags containing provenience identification information.

Chipping debris recovered during the survey was identified in terms of lithic material, size (0–1 cm, 1–3 cm, 3–5 cm, etc.), color, and weight. A lithic-type collection, maintained at PAL and containing materials from various source areas in New England and adjacent regions such as New York and Pennsylvania, was used to identify all lithic materials. Chipping debris was also classified as either flakes or shatter. Pieces of debitage showing evidence of a striking platform or bulb percussions, or identifiable dorsal or ventral surfaces were called flakes. Debitage without these attributes, and exhibiting angular or blocky forms, were classified as shatter. Lithic debris was also examined for edges that had been modified by use wear or intentional retouch.

Historic cultural materials were cataloged according to material (e.g., ceramic, glass, coal, synthetic) and functional (e.g., plate, bowl, bottle, building material) categories. Temporally sensitive historic artifacts, such as ceramics, were also identified in terms of type (e.g., redware, pearl ware, whiteware)

when possible. In addition, ceramic sherds and bottle glass were examined for distinguishing attributes that provide more precise date ranges of manufacture and use. These included maker's marks, decorative patterns, and embossed or raised lettering.

Curation

Following the laboratory processing and cataloging activities, all recovered cultural materials were stored in acid-free Hollinger boxes with box content lists and labels printed on acid-free paper. These boxes are temporarily stored at PAL according to curation guidelines established by state historic preservation offices, until a suitable permanent curation facility is identified.

CHAPTER THREE

ENVIRONMENTAL CONTEXT

An understanding of the environmental and geological characteristics of Mashpee, Barnstable, Yarmouth and all of Cape Cod is important to understanding prehistoric and historic period land use in and around the proposed Cape Wind project area. The topography of Cape Cod is the result of glacial, fluvial, and coastal dynamics. Surficial geology, topography, vegetation, and location relative to major drainage systems and coastal bodies all affected human settlement in the past. Historic and modern period settlement in this section of the Cape has led to portions of Barnstable, Mashpee and Yarmouth being developed for both year-round residential use and seasonal tourism. These factors are also important variables to consider in addressing use of the area by Native American and Euro-American occupants.

General Physical Description

The towns of Barnstable, Mashpee, and Yarmouth are located in Barnstable County in the midwestern portion of Cape Cod. All of Cape Cod is situated within the Coastal Plain, an alluvial or stream-deposited surface adjacent to the Atlantic Ocean (Figure 3-1). A thick wedge of sedimentary deposits carried by streams, and erosion from the uplands to the edge of the continent underlies the Coastal Plain. Cape Cod is composed of two broad physiographic zones that reflect the underlying glacial deposits that formed this peninsula, and the subsequent modifications caused by sea level rise and wave action. One of these zones is characterized by rolling and hilly topography while the other consists of several broad, coalescing plains. There are more than 200 small ponds and lakes on the Cape ranging in size from a few acres to more than 1,000 acres.

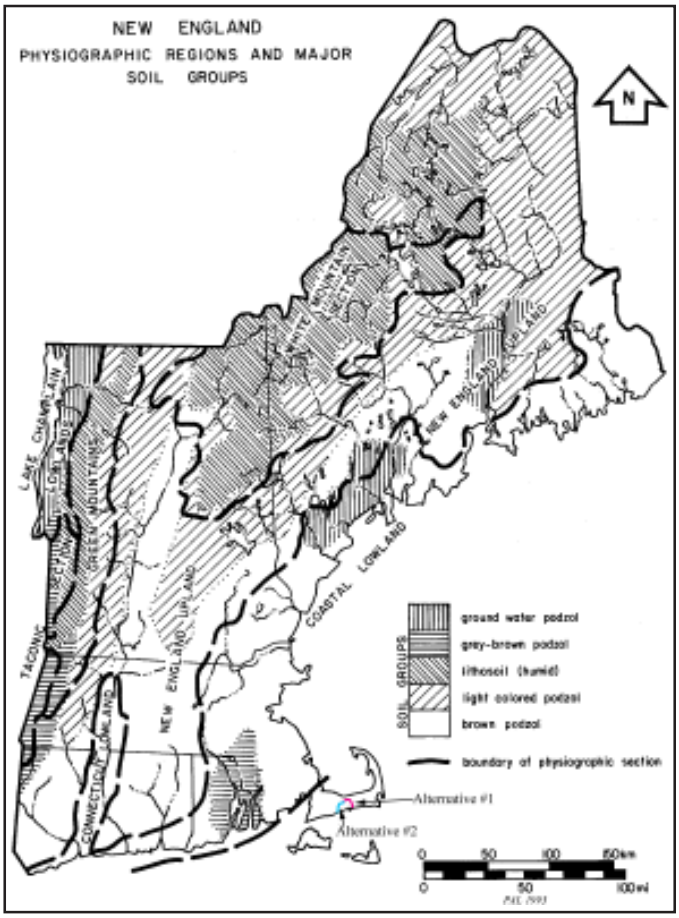

Figure 3-1. Physiographic zones of southern New England, with the location of the Cape Wind Alternative #1 and #2 routes (Fenneman 1938).

Cape Cod's 300 miles of shoreline supports highly varied ecological habitats that have been used by Native American and historic/modern period Euro-American populations for fishing, shellfish gathering and various maritime related

activities. All of the rivers on Cape Cod are minor waterways, generally flowing from inland lakes/ ponds to the ocean (Bickford and Dymon 1990).

Regional habitats include coastal plain ponds, sandplain grasslands, and heathlands. Variations in soil types between the southern and northern shores have produced some variations in species. In general the soils along the northern portion of Cape Cod support moister conditions than the sandier soils that dominate the southern coast. Some taller tree species such as the American holly and flowering dogwood are found in settings with wetter soils.

Surficial Geology

During the Pleistocene Period, there were repeated episodes of glacier advance and retreat with the final Wisconsin Stage occurring about 22,000 years ago. At this time, the glacier was largely confined to Canada and northern New England, but at its maximum it extended in three lobes to an area near the offshore islands of Nantucket and Martha's Vineyard. The easternmost South Channel lobe was located along the eastern edge of the outer Cape; the middle Cape Cod Bay lobe included most of Cape Cod, Nantucket and eastern Martha's Vineyard; and the Buzzards Bay lobe extended across western Cape Cod, western Martha's Vineyard, and eastern Massachusetts (Figure 3-2). Nantucket Sound and Cape Cod Bay occupy depressions that once contained the Cape Cod Bay lobe. Vineyard Sound and Buzzards Bay occupy the depression that contained the eastern part of the Buzzards Bay lobe. It is estimated that the retreat of ice from Cape Cod occurred around 18,000 years ago (Oldale 1992). By that time, most of the Coastal Plain deposits north of the islands had been removed by glacial activity. Gay Head Cliff at Martha's Vineyard is one of the few areas where Coastal Plain deposits survived, although even here the deposits have been moved and altered by the glaciers.

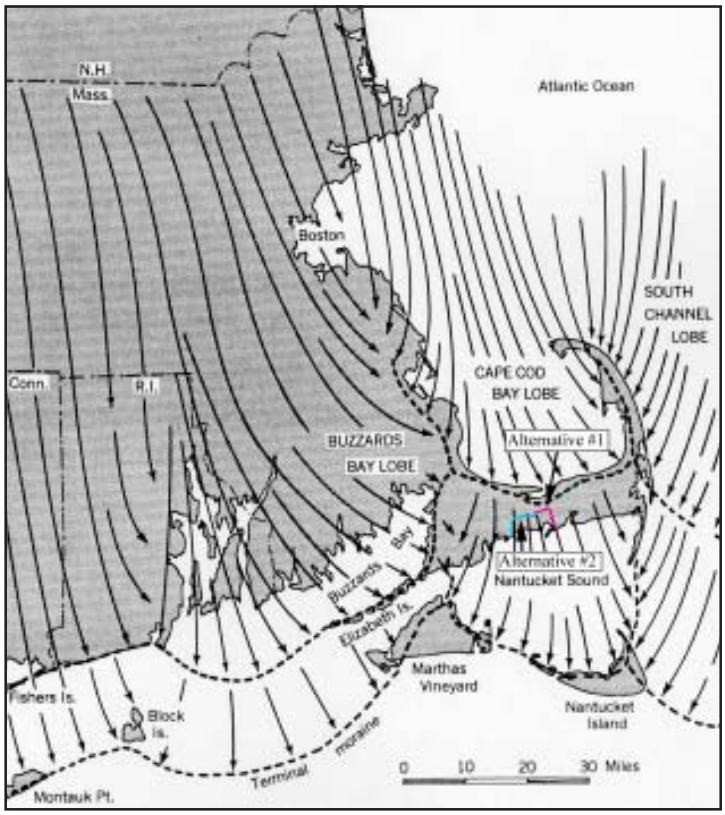

Figure 3-2. Wisconsin Stage glacial lobes, with the location of the Cape Wind Alternative #1 and #2 routes (Strahler 1966:8).

Glacial activity carried material derived from the bedrock of southern New England and deposited it in different forms on the Cape (Figure 3-3). One of the Cape's most prominent landscape features is the end moraines located along the shores of Buzzards Bay—the Buzzards Bay moraine—and parallel to Cape Cod Bay, the Sandwich moraine. The moraines are segments of a long chain of end moraines

extending from Long Island to the Cape, and marking the location of an ice front. They contain cobbles derived from bedrock generally located from areas just north of where the moraine material was deposited.

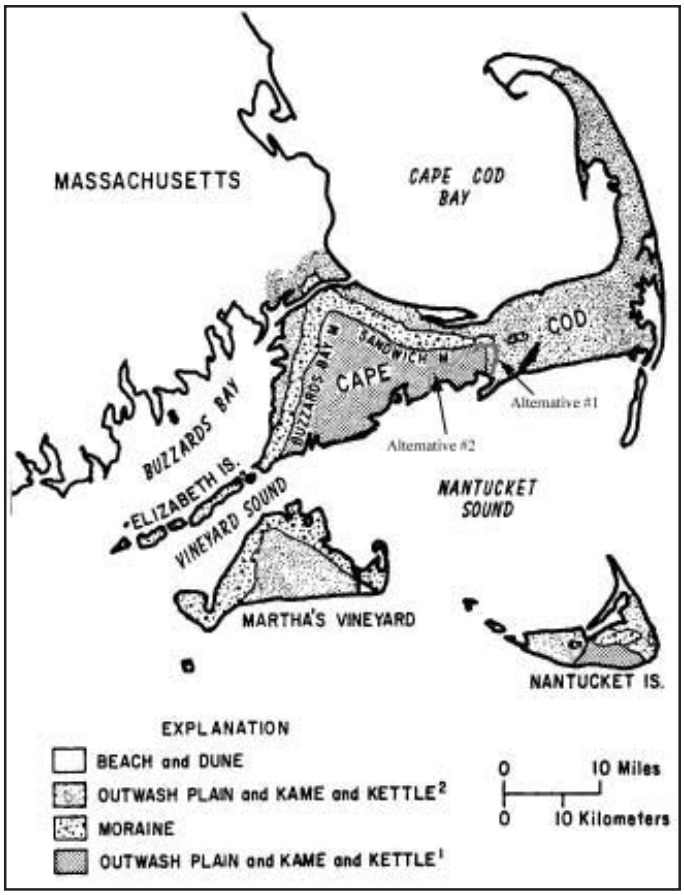

Figure 3-3. Glacial deposits on Cape Cod, with the location of the Cape Wind Alternative #1 and #2 routes (Oldale 1992:4).

Outwash plains, broad flat alluvial surfaces formed by meltwater streams that flowed from the glaciers as they were receding, are the most common glacial deposits on Cape Cod. The outwash plains in the inner Cape slope southward and were formed by streams draining from the Cape Cod glacial lobe. Certain outwash plains, such as the Mashpee pitted plain, contain closed depressions known as kettles. These were formed by remnant blocks of ice that were completely or partly buried by outwash deposits. When the ice melted, the deposits slumped down to form a depression. Ponds formed in those deep enough to encounter the water table. Some of the kettle holes extend between 140 ft above sea level to 60 ft below sea level indicating that the blocks of ice that produced such depressions were approximately 200 ft thick (Oldale 1992). Mashpee Pond in Mashpee and Cliff Pond in Brewster extend to about 85 ft below sea level and are the deepest known examples on Cape Cod. The oldest postglacial deposits on the Cape are the freshwater sediments like sand, silt, and clay laid down in depressions on the glacial surface. Freshwater peat deposits, present by 13,000 years ago, formed marshes and swamps that occupy kettle holes and broad valleys of collapsed drift.

Soils

The soils within the Cape Wind Terrestrial Alternatives #1 and #2 are varied across the large study area. Soils in the majority of both routes belong to the Carver soil series. These soils were formed in glacial outwash on outwash plains and kames. The Carver soils within the study area are excessively drained coarse loamy sands, poorly suited for agriculture because of a low water capacity (USDA 1993).

Specific soil units within the southern portion of the Terrestrial Route Alternative #1 project area (New Hampshire Avenue landfall to Higgins Crowell Road) include Carver coarse sand and Carver loamy coarse sand. The proposed storage/staging area at the intersection of Higgins Crowell Road and Willow Street contains soils that belong to the Plymouth-Barnstable complex and a small section of Udorthents, which are soils that are created by disturbance and grading. The Plymouth-Barnstable complex consists of excessively drained sand and loam that forms in glacial outwash and till (USDA 1993).

The northern portion of the Terrestrial Route Alternative #1 is also primarily comprised of soils belonging to the Plymouth-Barnstable complex. Specific soils within the northern portion of the project area include excessively drained, very bouldery sands with slopes between 1 and 8 percent. Small pockets of the Plymouth-Barnstable-Nantucket soil series are also located within the proposed Terrestrial Route Alternative #1. This complex consists of steep, excessively drained, and very bouldery sands, where boulders cover between 1 and 3 percent of the ground surface (USDA 1993). These soils tend to form mostly on hills and ridges of glacial moraines.

Representative soil profiles within the proposed Terrestrial Route Alternative #1 project area are presented in Chapter 6 of this report.

Study Area Conditions

The Terrestrial Route Alternative #1 project route makes landfall from Lewis Bay at New Hampshire Avenue and travels for approximately 18,000 ft (5,486 m) beneath Berry Avenue, Higgins Crowell Road, and Willow Street (see Figure 1-2). This portion of the route is located entirely beneath two-lane paved public roadways and passes through several residential neighborhoods and commercial areas. West of Willow Street, the proposed project corridor is located within an existing NSTAR electrical easement that has been cleared of trees. Low vegetation such as sassafras, blueberry, sumac, green briar and scrub grasses are still present within the proposed ROW. Two small wetland areas were noted during the walkover survey; in a low and disturbed area west of Marstons Lane and immediately south of a private road near the western end of the proposed route. The topography of the existing NSTAR corridor is rolling, with several low-lying flat areas interspersed with steep slopes and low hills.

Several large areas of disturbance were noted along the proposed Terrestrial Route Alternative #1 during the walkover survey. These areas included approximately 120 m of the route immediately west of Willow Street that is under active construction and is bisected by a railroad easement. Additional areas of disturbance include the Route 6 crossing and substation at the western end of the proposed route and all major road and driveway crossings. In some areas, exposed soils have been stripped and/or cut-away for road construction and drainage purposes.

The proposed Terrestrial Route Alternative #1 also includes two storage/staging areas (see Figure 1-2). The New Hampshire Avenue staging area is located within a paved parking lot with no remaining intact soils. The Higgins Crowell/Willow Street staging area occupies a low, wooded area immediately east of Willow Street in Yarmouth. Vegetation in this proposed staging area consists of relatively new growth hardwood trees, with blueberry and other low-lying brush.

The examination of the Terrestrial Route Alternative #2 was limited primarily to a windshield/driveover survey along public roads. While portions of the Alternative #2 route are located beneath paved roadways, the majority of the route is located within existing overhead utility corridors. The roadway and ROW portions of the route pass through several large areas of extensive disturbance, including gravel pits, commercial/industrial developments, and highway corridors.

CHAPTER FOUR

PREHISTORIC LAND USE PATTERNS

This section provides regional and local information regarding known prehistoric subsistence and settlement patterns of prehistoric groups. The individual sites known on Cape Cod, when viewed as interrelated components of a larger complex system, provide a prehistoric framework for the project area, and the cultural resources that have been located there.

The Cape has been divided into three sections. The inner Cape consists of the area west of Cotuit and contains the towns of Bourne, Sandwich, Falmouth, and Mashpee. This region contains the largest land mass, the highest elevations, and a variety of water resources. The mid-Cape area lies between Barnstable and Harwich. This area contains numerous freshwater kettle ponds and brackish rivers. It also contains salt marshes and an extensive coastal zone including Sandy Neck. The section of Cape Cod situated east of Harwich is referred to as the outer Cape. This area is primarily coastal, containing beaches and salt marshes.

Archaeological research has been conducted all over the Cape. The outer Cape, however, has been more intensively researched than areas to the west. A large, multifocused study was conducted at the Cape Cod National Seashore (McManamon et al. 1984). The outer Cape has also been the primary focus of amateur archaeologists and collectors (Mahlstedt 1985). The inner and mid-Cape areas have, until recently, received the least amount of attention in terms of their archaeological resources. Recent developmental trends on the Cape have led to an increasing number of CRM surveys in this area. The results of these surveys indicate that the entire Cape was part of the prehistoric land use system. These surveys also suggest that settlement and subsistence patterns were slightly different on the Cape than elsewhere in southeastern Massachusetts, perhaps because of the different environmental settings.

Completed archaeological surveys in the study area vicinity have investigated a variety of environmental settings. A survey along the northern edge of Hathaway Pond in Barnstable, located west of the Terrestrial Route Alternative #1, identified two prehistoric sites. The Hathaway Pond I Site (19-BN-623) contained evidence of occupation from possibly as early as the PaleoIndian Period (12,500–10,000 B.P.) through the Contact Period (450–300 B.P.). The Hathaway Pond II Site was found to contain evidence of occupation from the Middle Archaic (7500–5000 B.P.) to the Late Woodland (1000–450 B.P.) periods (Davin 1989).

In Hyannis, a reconnaissance survey was conducted for a roadway along Lewis Bay (Anuskiewcz and Teltser 1977), with several sites and highly sensitive areas identified along Route 28 during archaeological investigations (Mueller 1977). Archaeological investigations along the Santuit River and Santuit Pond in Barnstable and Mashpee discovered a number of important prehistoric and early historic sites (Begley 1999; Mair 1998; Shaw and McArdle 1987; Shaw and Savulis 1988). An intensive survey of the

proposed Barnstable Municipal Golf Course found only low-density scatters of prehistoric cultural material (Davin and Glover 1988). An intensive survey of the 445-acre Independence Park immediately north of Barnstable Municipal Airport located evidence of sporadic, low-intensity use of the area during prehistoric and historic times (Doucette et al. 1990).

Prehistoric Native American Context

On a large scale, the towns of Barnstable, Mashpee, and Yarmouth are part of the southern New England region that encompasses southeastern Massachusetts, Rhode Island, and eastern Connecticut. Table 4-1 provides an overview of the recognized cultural chronology of southern New England, beginning with the PaleoIndian Period and continuing through the Contact and early historic period. A brief description of the cultural aspects associated with each period is included in the table.

Traditionally, Cape Cod has not been considered an area where much evidence of PaleoIndian (12,500–10,000 B.P.) occupation would be located. Generally sites of this age and the subsequent Early Archaic Period (10,000–7500 B.P.) are believed to be primarily located in coastal areas now inundated by rising sea levels. Until recently, evidence of occupation during these time periods has largely been restricted to surface finds adjacent to rivers in the central section of Cape Cod. An Eden-like projectile point was recovered from the Hathaway Pond I Site (19-BN-623), a possible Eden-like projectile point was found along the banks of the Herring River (Bells Neck Road I Site) (19-BN-517) in West Harwich, and a possible fluted point was recovered from the Bass River Site in Yarmouth (19-BN-41) (Mahlstedt 1985). The recovery of these points indicates that the pond and these rivers, which would have been inland freshwater sources, were exploited during the PaleoIndian Period. No evidence of PaleoIndian occupation has been recovered to date from the outer Cape, where there are few freshwater sources.

Diagnostic Early Archaic projectile points have also been recovered in low densities. Two reported finds are known for the Herring River section of the mid-Cape, and one bifurcate point was recovered from the outer Cape at Indian Rock (Mahlstedt 1985; Towle 1984).

Archaeological research concerning both the PaleoIndian and Early Archaic periods on the Cape needs to focus on understanding the resources that would have been exploited at this time. The effects of glaciation and deglaciation were significant factors in determining local environmental conditions. The most obvious was the much greater landmass that was present because of the lower sea levels. Today, distance to the coast is no more than 10 miles at the widest point. Eight thousand years ago, the distances would have been appreciably greater. These rivers; which today are brackish, would have been sources of fresh water. Then, the headwaters of the rivers were more than 30 miles from the coast. The water levels in kettle ponds also fluctuated in response to the changing sea levels.

Riverine settings continued to be a focus of exploitation during the Middle Archaic Period (7500–5000 B.P.). Diagnostic artifacts have been located both in situ and as surface collections in significantly greater numbers. The locations of Middle Archaic sites strongly suggest that anadromous fishing was an important aspect of the subsistence strategy. Middle Archaic sites have also been located adjacent to kettle hole ponds in both the inner and outer Cape, where rivers are not in close proximity to each other (Davin and Gallagher 1987; McManamon et al. 1984).

Table 4-1. Native American Cultural Chronology for Southern New England.

Period	*Years*	*Identified Temporal Subdivisions*[1]	*Cultural Aspects*
PaleoIndian	12,500–10,000 B.P.[2] (10,500–8000 B.C.)	• Eastern Clovis • Plano	Exploitation of migratory game animals by highly mobile bands of hunter-gatherers with a specialized lithic technology.
Early Archaic	10,000–7500 B.P. (8000–5500 B.C.)	• Bifurcate-Base Point Assemblages	Few sites are known, possibly because of problems with archaeological recognition. This period represents a transition from specialized hunting strategies to the beginnings of more generalized and adaptable hunting and gathering, due in part to changing environmental circumstances.
Middle Archaic	7500–5000 B.P. (5500–3000 B.C.)	• Neville • Stark • Merrimack • Otter Creek • Vosburg	Regular harvesting of anadramous fish and various plant resources is combined with generalized hunting. Major sites are located at falls and rapids along river drainages. Ground-stone technology first utilized. There is a reliance on local lithic materials for a variety of bifacial and unifacial tools.
Late Archaic	5000–3000 B.P. (3000–1000 B.C.)	• Brewerton • Squibnocket • Small Stemmed Point Assemblage	Intensive hunting and gathering were the rule in diverse environments. Evidence for regularized shellfish exploitation is first seen during this period. Abundant sites suggest increasing populations, with specialized adaptations to particular resource zones. Notable differences between coastal and interior assemblages are seen.
Transitional	3600–2500 B.P. (1600–500 B.C.)	• Atlantic • Watertown • Orient • Coburn	Same economy as the earlier periods, but there may have been groups migrating into New England, or local groups developing technologies strikingly different from those previously used. Trade in soapstone became important. Evidence for complex mortuary rituals is frequently encountered.
Early Woodland	3000–1600 B.P. (1000 B.C.–A.D. 300)	• Meadowood • Lagoon	A scarcity of sites suggests population decline. Pottery was first made. Little is known of social organization or economy, although evidence for complex mortuary rituals is present. Influences from the midwestern Adena culture are seen in some areas.
Middle Woodland	1650–1000 B.P. (A.D. 300–950)	• Fox Creek • Jack's Reef	Economy focused on coastal resources. Horticulture may have appeared late in the period. Hunting and gathering were still important. Population may have increased from the previous low in the Early Woodland. Extensive interaction between groups throughout the Northeast is seen in the widespread distribution of exotic lithics and other materials.
Late Woodland	1000–450 B.P. (A.D. 950–1500)	• Levanna	Horticulture was established in some areas. Coastal areas seem to be preferred. Large groups sometimes lived in fortified villages, and may have been organized in complicated political alliances. Some groups may still have relied solely on hunting and gathering.
ProtoHistoric and Contact	450–300 B.P. (A.D. 1500–1650)	• Algonquian	Groups such as the Wampanoag, Narragansett, and Nipmuck were settled in the area. Political, social, and economic organizations were relatively complex, and underwent rapid change during European colonization.

[1] Termed Phases or Complexes
[2] Before Present

The Bass and Herring rivers on the mid-Cape have both contained significant Middle Archaic depositions. In particular, the Farham Collection contains 56 Middle Archaic projectile points, primarily from the Bells Neck Road I (West Harwich), Swan River (Dennis), and Blue Rock (Yarmouth) sites (Mahlstedt 1985). Neville projectile points were also found at both the Hathaway I and II sites (Davin 1989). A Middle Archaic Stark point was recovered from the Fox-5 Site, adjacent to the Santuit River in Mashpee, and at the Round Swamp Site in Bourne (Davin and Gallagher 1987; Shaw and Savulis 1988). On the outer Cape, there are only a few scattered indications of Middle Archaic utilization. These are primarily located around kettle hole ponds. The locations of these known sites indicated that freshwater and associated resources were important to Middle Archaic groups (McManamon et al. 1985).

Land use patterns on the Cape during the Late Archaic Period (5000–3000 B.P.) are similar to the rest of southern New England. Small Stemmed projectile points are the most frequently found artifacts on the mid and inner Cape areas and are recovered from a wide variety of environmental settings (Mahlstedt 1985). On the outer Cape, Small Stemmed points are second only to Late Woodland (1000-450 B.P.) Levanna projectile points (McManamon 1984). The widespread prevalence of these projectile points has been attributed both to population growth and environmental stresses. The latter explanation suggests that a dry spell occurred during the Late Archaic Period (Thorbahn 1982). Prehistoric groups would have responded to this by using a wider range of exploitation areas to avoid depleting the existing resources.

Late Archaic sites and artifacts are relatively well represented on riverine sites in the mid-Cape area. Artifact collections from the Bass River area show that Susquehanna tradition projectile points are numerous (Mahlstedt 1985). Atlantic and Susquehanna Broad points are numerous at the Blue Rock Site in Yarmouth. The Herring River area, however, contains a much lower density of Susquehanna artifacts and sites. The Coburn Phase of the Susquehanna tradition has a relatively strong presence on the outer Cape. The type-site for this phase is located in Orleans, where there was a secondary cremation burial. Types of sites other than burials are relatively rare for the Coburn Phase and, as a result, the Oak Ridge Site, a Coburn lithic manufacturing area, was particularly important (Loparto 1985).

Late Archaic artifacts have also been found at the Spruce Swamp Site in Sandwich (Davin and Gallagher 1987) and at the Hathaway Pond II Site in Barnstable (Davin 1989). The Santuit River 1 Site in Mashpee contained a variety of Late Archaic tool types including Brewerton and Squibnocket Triangle projectile points (Ingham et al. 2001). This multicomponent site also contained evidence of Early through Late Woodland Period activity.

The period of transition from the Archaic to Woodland is not well understood or defined. Site locations indicate a shift toward increasing utilization of coastal resources, but the pattern is difficult to define because of the low number of sites with Early Woodland (3000–1600 B.P.) cultural materials. One of the most obvious difficulties is using a Small Stemmed projectile point as diagnostic of only the Late Archaic Period. Elsewhere in southern New England these projectile points have been found in association with Early Woodland ceramic types (Thorbahn 1982).

This problem of designation, as well as the paucity of known sites containing other artifacts diagnostic of the Early Woodland, is currently an important research topic. One other explanation for the low density of sites and artifacts is a decline in population levels.

While definite Early Woodland sites are infrequent, they have been located in all areas of the Cape. In Bourne, the Round Swamp Site contained a Meadowood point (Davin and Gallagher 1987). Early Woodland Rossville projectile points were recovered from the Fox-3, Fox-5, and Santuit River I sites in Mashpee (MHC site files). These sites are all multicomponent, with occupations dating from the Middle Archaic to the Woodland periods at Round Swamp and Fox-5 and from the Late Archaic to Woodland at Fox-3 and Santuit River I (Ingham et al. 2001). A slight concentration of Early Woodland Period activity has been identified for the Herring River area (Mahlstedt 1985). At least seven Early Woodland sites have been identified in the town of Harwich. Few Early Woodland components have been located on the outer Cape (McManamon 1984).

Middle Woodland Period (1600–1000 B.P.) sites and depositions are relatively numerous in southeastern Massachusetts, including Cape Cod. During the archaeological investigations of the Cape Cod National Seashore, a number of Middle Woodland components were discovered. One site along Nauset Marsh contained eight Jack's Reef points, as well as evidence of winter exploitation of shellfish (Borstel 1984). In the mid-Cape area, Middle Woodland sites have been identified along the Herring and Bass rivers, particularly at the Blue Rock Site in Yarmouth. Known Middle Woodland sites on the inner Cape have been located at the Fox-5 Site in Mashpee (Shaw and Savulis 1988), at the Round Swamp and Orchard Road sites in Bourne (Davin and Gallagher 1987), and at the Hathaway Pond II Site in Barnstable (Davin 1989). The Santuit River I Site contained a Middle Woodland Fox Creek-like point fashioned from quartzite (Ingham et al. 2001).

Late Woodland Period (1000–450 B.P.) sites, depositions, and artifacts dominate the archaeology of the outer Cape (McManamon 1984). Levanna projectile points are the single most numerous artifacts east of Harwich. Sites on the mid- and inner Cape areas also consistently contain Levanna projectile points, but not in the same densities as on the outer Cape. While artifacts are numerous, site locations are not as varied as those associated with earlier periods. On the outer Cape, shell middens located adjacent to protected bays and estuaries are a dominant pattern. Shell middens are located next to both saltwater and freshwater on the inner and mid-Cape areas. One of the most intensively utilized areas on the Cape was Sandy Neck (19-BN-80/81), a barrier beach bordering Cape Cod Bay. Sites in this area include Middle and Late Woodland middens that contain evidence of intensive shellfish exploitation (Bullen and Brooks 1948; Powell 1967). Late Woodland deposits at the Santuit River I Site included a Levanna-like projectile point, and shell midden/refuse pit features that may be indicative of a Late Woodland occupation (Ingham et al. 2001).

Predictive Statements for Prehistoric Period Resources

Prior to the archaeological surveys, there were 10 recorded prehistoric archaeological sites within 1.5 miles of the proposed Terrestrial Route Alternative #1, although none of these sites are located directly within the proposed terrestrial project area. Archival research determined that there were 29 recorded prehistoric archaeological sites within 1.5 miles of the Terrestrial Route Alternative #2. Three of these (19-BN-29, -289 and MAS-HA-3) are located within or in immediate proximity to the Terrestrial Route Alternative #2.

Based on the data collected through archival research and the environmental assessment, prehistoric archaeological deposits within the Terrestrial Route Alternatives #1 and #2 were expected to range

from low-density scatters of lithic cultural materials or small, short-term campsites to larger, more complex habitation and/or ceremonial site areas. Archaeological evidence of more intensive exploitation of the area by prehistoric period Native American groups could include, but not be limited to, subsistence-related features (hearths, food storage/disposal pits, living areas including post molds), shell midden deposits, ritual/ceremonial features (including human burials), lithic workshops, and diagnostic chipped- and ground-stone tool assemblages. Sites of these types have been previously identified in the vicinity of the Terrestrial Route Alternatives #1 and #2.

CHAPTER FIVE

HISTORIC LAND USE PATTERNS

Contact Period (A.D. 1500–1650)

During the Contact Period, southern New England Native American settlement systems involved seasonal relocations that were related to the cultivation of corn, beans, the hunting of game in wooded valleys of the interior, as well as to the seasonal harvesting of maritime and freshwater species (Simmons 1986). Giovanni da Verrazzano reported the first recorded account of contact between Europeans and the Native inhabitants of Narragansett Bay in 1524. Bartholomew Gosnold in 1602, Captain Martin Pring in 1603, Samuel de Champlain in 1604, and Adrian Block in 1614 afforded other images of the New England landscape and Native American lifeways.

The records of these early explorers provide insight into Native American dress, diet, behavior, social and political structure, and exploitation of natural resources. Both Simmons (1978) and Robinson et al. (1985) note that the writings and correspondences of Roger Williams provide the most critical primary source information, disclosing details about seventeenth-century southern New England Indian culture before, during, and after European contact.

Present-day Barnstable, Mashpee and Yarmouth were occupied by Native Americans prior to and after the Contact Period. Early-seventeenth-century colonial accounts of journeys to Cape Cod verify that groups were present at Sandy Neck and in the Buzzards Bay and Falmouth areas (Figure 5-1). A relatively limited number of Contact Period sites are known for the Cape, despite the historical accounts that Native American groups were present. Of the known sites, at least five are burials and six are refuse deposits. One Contact Period site has been identified on Sandy Neck in Barnstable (19-BN-81) and another may have been identified to the south at Hathaway Pond (19-BN-623) around a kettle hole (Davin 1989).

Few Contact Period sites have been professionally documented on Cape Cod. The Uncle Robert's Cove Site (19-BN-647) on Smith's Point in Yarmouthport recovered materials from the Late Woodland through Contact periods. Smith's Point is located approximately 1.25 miles southwest from the proposed Terrestrial Route Alternative #1 (New Hampshire Avenue) landfall. In addition to cultural material, excavations at the Uncle Robert's Cove Site revealed stratified shell deposits, evidence of structures (post molds), intact living surfaces, textiles (blue cloth), European artifacts (beads, iron, clay pipe fragments), and more than 42 intact cornhills in a preserved prehistoric landscape (PAL 1991a). The Uncle Robert's Cove Site dates to approximately the late sixteenth to early seventeenth century and documents a heavily utilized domestic area that allowed a detailed study of Contact Period Native American horticultural practices. Based on the materials collected and research from original documents,

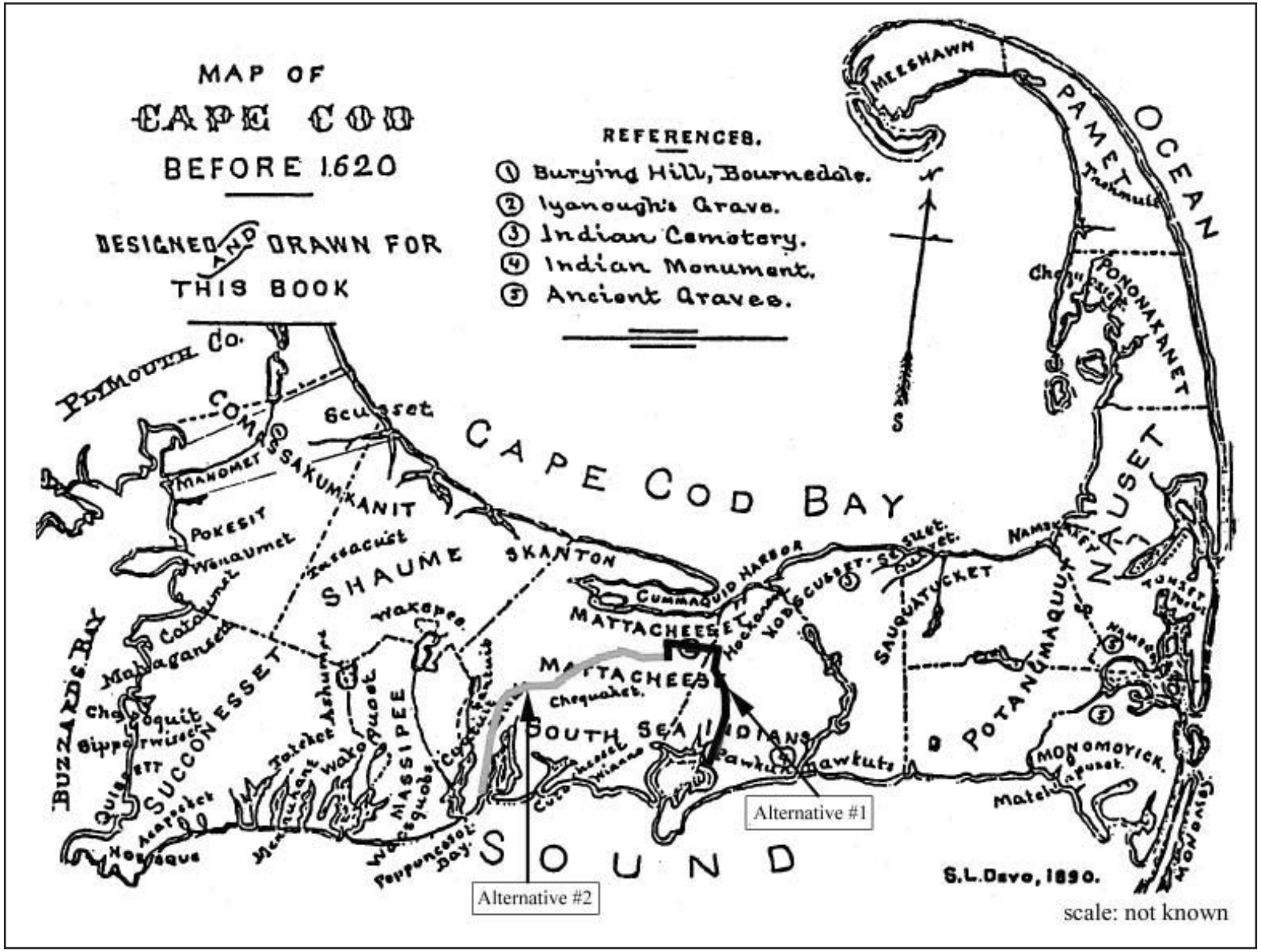

Figure 5-1. Nineteenth-century reconstruction of early historic period Native American settlement areas on Cape Cod with locations of Terrestrial Route Alternatives #1 and #2 (Deyo 1890).

it is considered possible that the Uncle Robert's Cove Site also represents an area visited by Gosnold in 1602 (PAL 1991b).

The areas of Barnstable, West Barnstable, South Yarmouth, and Yarmouth were occupied by a subgroup of the Wampanoag Indian Federation. The Mattacheesett tribe was ruled by the Sachem Iyanough, a Wampanoag Sagamore. The South Sea Indians, another subgroup of the Wampanoag Indian Federation, occupied the Centerville, Popponessit, Santuit, Cotuit and Marston Mills areas. The Massipees, a subgroup of the South Sea people, reportedly lived in what is today Mashpee (Vuilleumier 1970) (see Figure 5-1). These groups subsisted on the combined use of wild and domestic food resources such as shelled clams, quahogs, and mussels, as well as various fish species and turtles that were abundant along the coastal areas of Cape Cod Bay. Hunting for mammals such as wolves, mink, otter, and deer could have also been exploited in inland areas (MHC 1984c).

Historic Development of Barnstable, Mashpee, and Yarmouth

The historic period development of Barnstable and Yarmouth is primarily tied to patterns of Euro-American settlement and land use and follows many of the other towns on Cape Cod. Mashpee's historical development is more closely associated with its Native American residents.

Throughout the Colonial Period (1675-1775) the regional topography of the Cape, along with a small population of limited wealth and technology produced a dispersed settlement pattern of small, mixed-use village clusters separated by large areas of isolated farmsteads and undeveloped land. The villages formed around natural coves and harbors, sources of fresh water, fertile lands, important roadways and intersections, meetinghouses, and grain mills. Some villages included undefined open spaces that served as common pastureland and militia training fields.

The first European settlement in Barnstable was in 1637 by the Reverend Stephen Bachiler who, along with six people, set up a church in the northeastern portion of the township. In 1639, the area was officially established as a town by the Reverend John Lothrop (MHC 1984a). This township became Barnstable Village. Between 1644 and 1680 the sachems of both the Mattacheesett and South Sea Indian groups allowed the colonists to make five successive land purchases, thereby expanding the town to its present boundaries. Some communities grew large enough to establish second parishes, as in Barnstable where the West Parish was formed in 1717 and Dennis, which became the East Parish of Yarmouth in 1721.

One of the first official references to Mashpee appears in the Plymouth Colony records in 1654. Richard Bourne and other prominent citizens of Sandwich were granted outlying parcels of land as increasing numbers of people settled the town center. Although much of what is now Mashpee was divided up among these men by the mid-seventeenth century, they continued to live on their town estates. Lovell notes that after 1660, no one other than Richard Bourne is mentioned in deeds for land in Mashpee (1984:61). Bourne acted as a Christian missionary among the Native population and in 1660 the Plantation of Mashpee was established as the largest of three Christian Indian reservations on the Cape. The tract consisted of approximately 13,500 acres of land (MHC 1987:72).

The transferral of authority that occurred when Plymouth Colony ended and the Massachusetts Bay Province took over control of the Cape had an effect on the inhabitants of Mashpee. Now that the local control had shifted to Boston, the Indians were dealt with in a much different way. In 1693/4 the General Court in Boston passed the "Act for the Better Rule and Government of the Indians" that promoted the continued Christianization of the state's Indian groups. The act promoted the already popular practice of encouraging Indians to borrow money or goods from the English settlers. There was little opportunity on the reservation to make any money. Knowing the Indians would not be able to pay the money back, the court relied on servitude to settle the account.

By 1717, West Barnstable had been set off from Barnstable Village, and the southern settlements began to develop their own social, economic, and religious institutions. Agriculture continued to be the principal source of subsistence needs, supplying food resources of pork, poultry, rye, barley, wheat, Indian corn, and a variety of vegetables. By the mid-eighteenth century, local merchants were common in the Barnstable Village area, with the establishment of taverns, warehouses, and wharfs along County Road.

The Barnstable and Yarmouth Harbor area also experienced a significant phase of development during the eighteenth century, as coastal trade flourished between Boston and the Cape (Figure 5-2). Small-scale industrial activity took hold in the southern portion of Barnstable where a locus of mill activity developed along the Marston Mills River (Figure 5-3).

In 1793 the General Court passed an act making Mashpee a district under the control of the state (Figure 5-4). The Mashpees were to elect five overseers, two of whom were to be white. The idea was to have some English control while allowing the Mashpee residents to make most of the decisions. The right to vote, however, was limited to proprietors. In order to become a proprietor, a person had to prove that either their mother or father were Mashpee. The proprietors were also able to decide who could live in Mashpee.

As the Mashpee district became slightly more democratic, an increase in population began to occur, mainly after 1763. This influx also brought a change to the character of the population. Among those listed are other Indians from New England and Long Island, Hessian soldiers, a Mexican, and a man from Bombay. The largest increase appears to be freed and escaped black servants who sought refuge within the reservation. By 1763, official acts referred to the "Indian and mulatto inhabitants" (Lovell 1984:184).

Non-Indian settlers were also in Mashpee during this period, though their numbers were somewhat limited. By 1794, several gristmills were operating on the Mashpee and Santuit rivers and wood was being sold to support the local economy (MHC 1984c). Residents of the Mashpee community made and traded brooms, baskets, and other crafts, but were limited in the amount of income these items could generate.

The Revolutionary War and War of 1812 disrupted maritime activities on Cape Cod in the short run, but enhanced them in the long run by forcing self-reliance. This produced an unprecedented economic boom and a concurrent doubling of the population in most towns. The Cape Cod landscape was transformed by an increasingly large and diverse citizenry with greater wealth and mobility, and more sophisticated technology. Most of the region's historic resources result from this golden age of growth

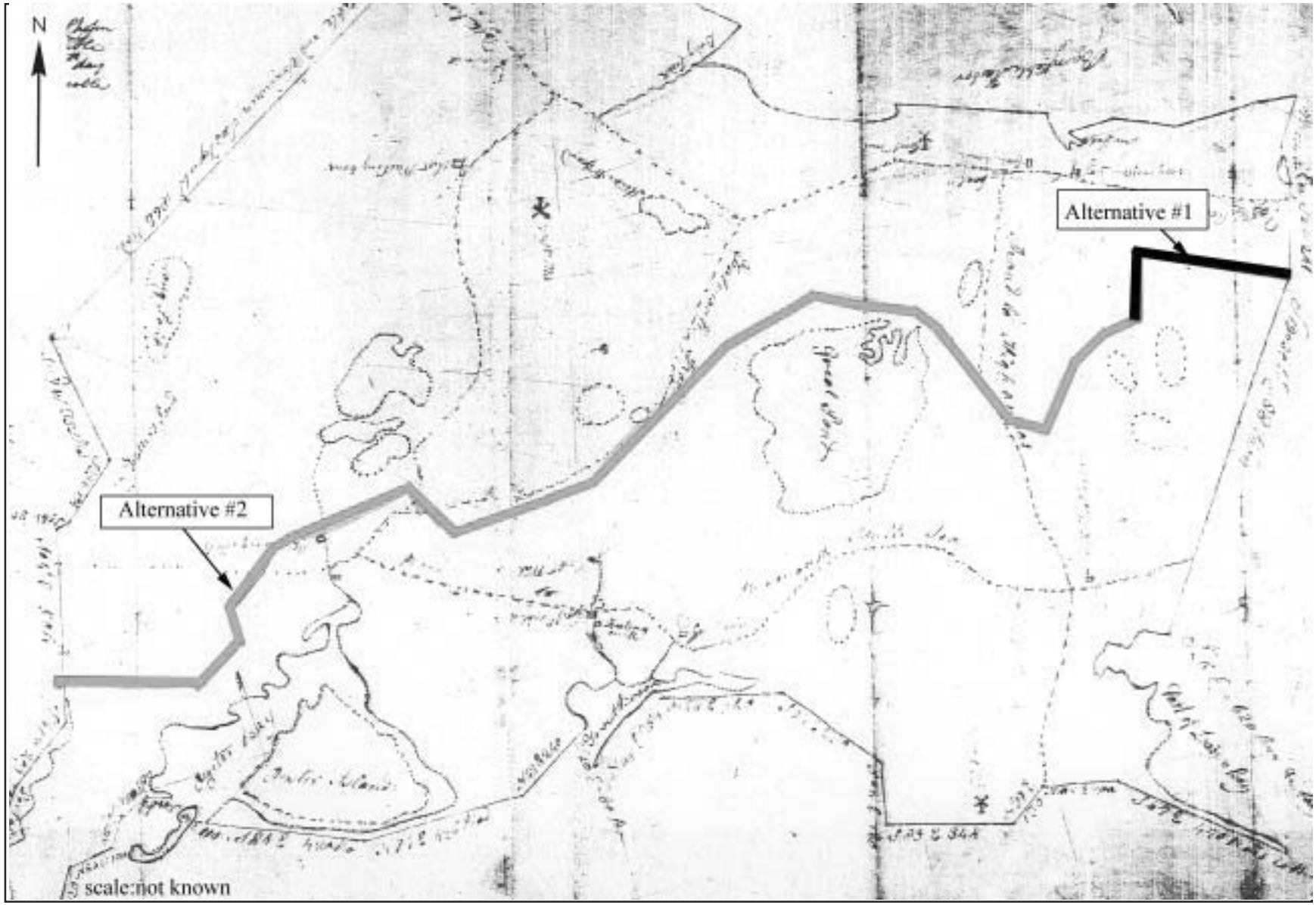

Figure 5-2. 1795 map of Barnstable, showing the location of the Cape Wind Alternative #1 and #2 routes (source: Bassett 1795).

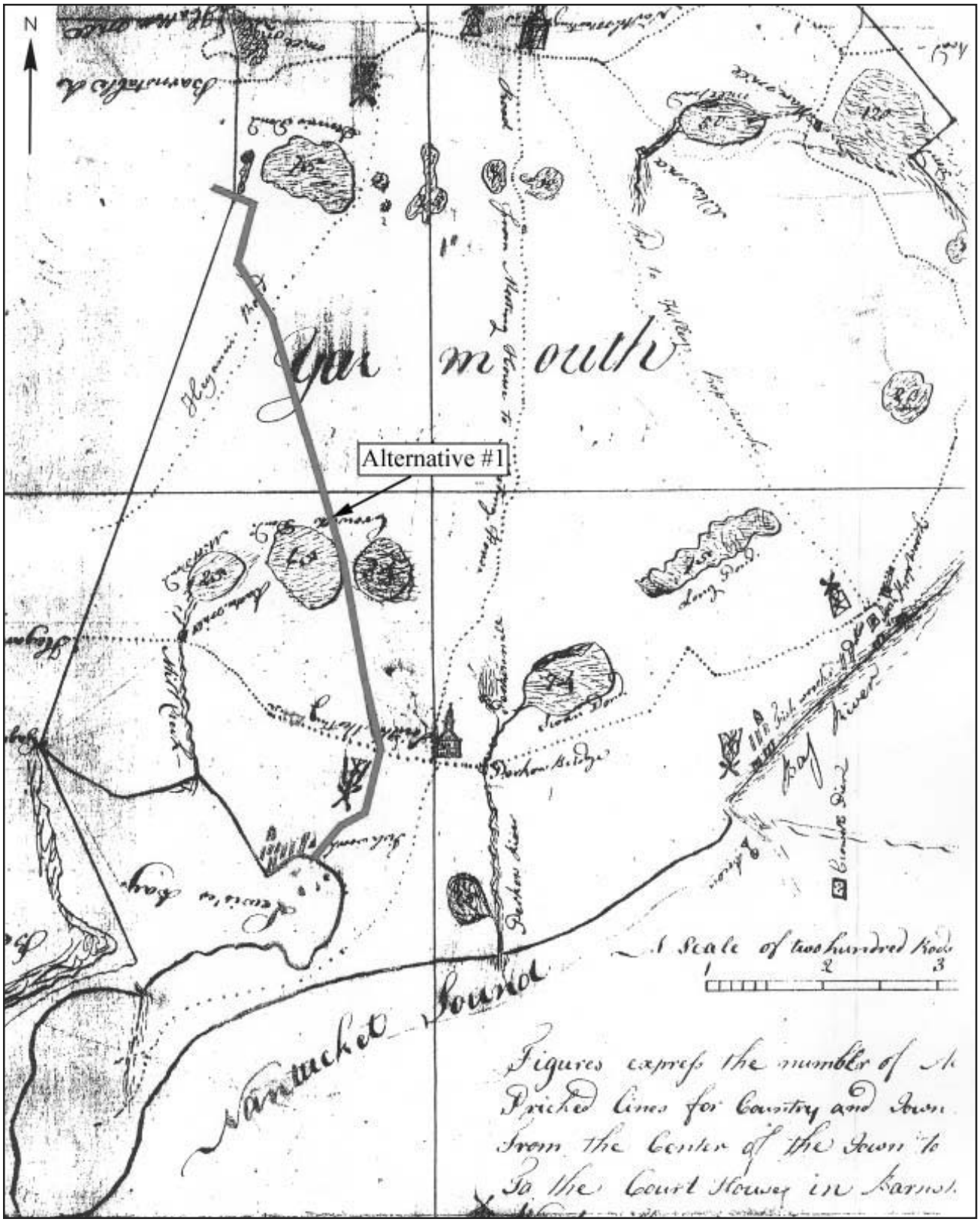

Figure 5-3. 1795 map of Yarmouth, showing the location of the Cape Wind Terrestrial Route Alternative #1 (source: Anon 1795).

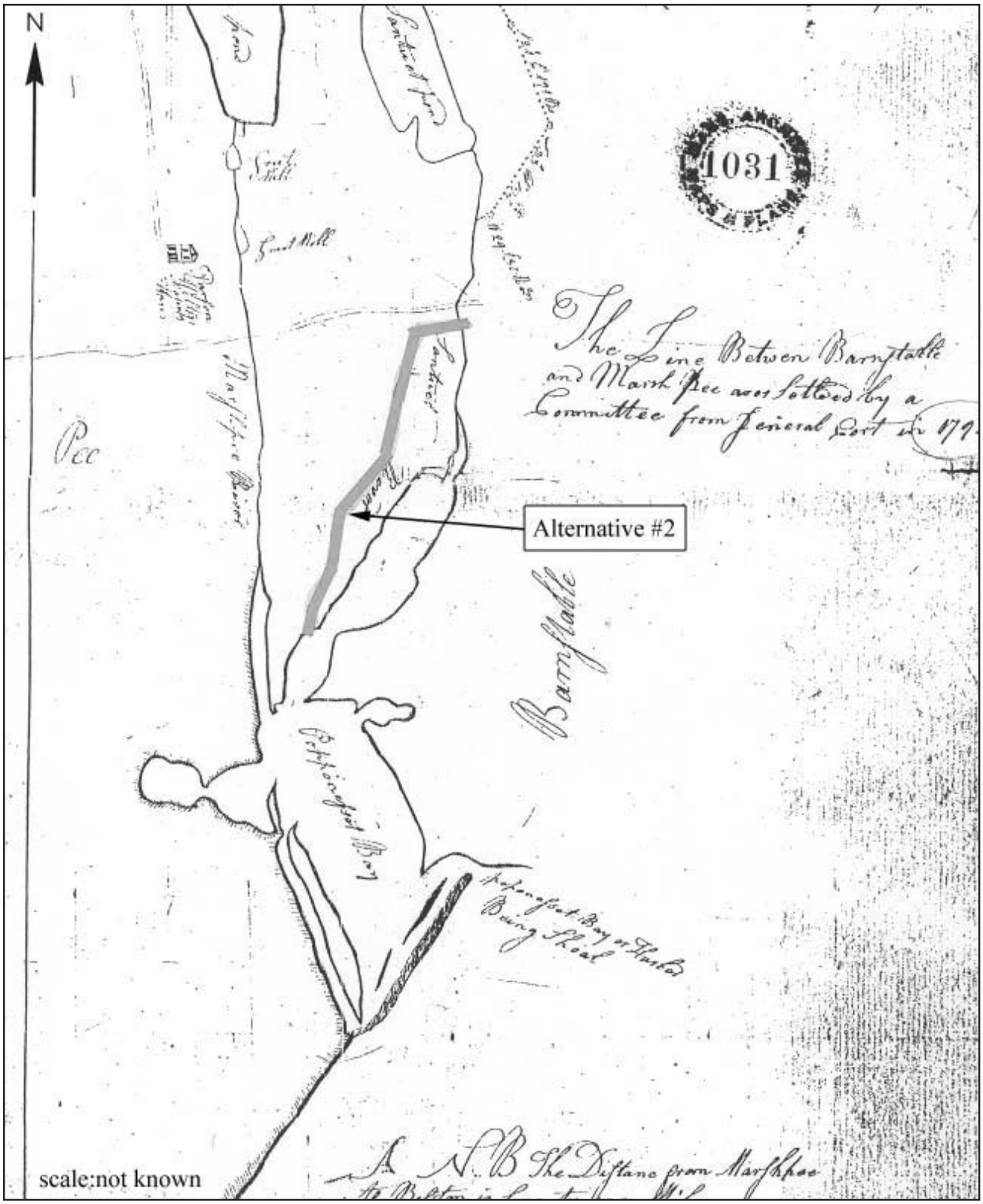

Figure 5-4. 1801 map of Mashpee, showing the location of the Cape Wind Terrestrial Route Alternative #2 (source: Anon 1801).

and prosperity. Dispersed settlement continued in the areas outside Marston Mills and Hyannis centers, generally in the form of small subsistence farmsteads. The amount of cultivated land increased during this period, and the fishing industries in Barnstable and Yarmouth reached their peak productivity, providing employment for a large portion of the towns' male working population.

By the nineteenth century, Native Americans and other town residents in Mashpee were involved in a number of subsistence activities that supplemented the traditional hunting, farming, fishing, and whaling (Bragdon 1987). This included cordwood production that was such a major means of obtaining money that large tracts of land were left nearly treeless. Savulis suggests that the relatively high number of Native American dwellings documented in Mashpee may not reflect high population levels as suggested by some researchers, but a dispersed settlement pattern with small family groups having more than one residence as they practiced what Bragdon (1987:129) describes as "a seasonally varied and multibased economy" (Savulis 1990).

The second half of the nineteenth century was a time of settlement intensification in the established centers of both the northern and southern sections of Barnstable and Yarmouth although peripheral areas remained undeveloped (Figure 5-5 and Figure 5-6). A railroad connection in 1854, linking Barnstable to Boston and other Cape Cod communities, facilitated growth in population, and maritime and agricultural activities.

When the focus of the market changed, settlement shifted in Yarmouth to the villages of South and West Yarmouth near the Bass River. During the late 1830s there were 13 vessels employed in the cod and mackerel industries (Barber 1839:58). By the 1880s, however, population levels declined when the cod and mackerel fisheries were less productive and whaling had been completely abandoned (Cogswell 1880:11).

In 1842 each Mashpee District proprietor was given 60 acres within the district for private use (Figure 5-7). Each land grantee had to be a 20-year resident of Mashpee and had to be approved by the other proprietors. Sales of land to those living outside of Mashpee were not allowed, but transfer to another proprietor was allowed. A state census conducted in 1861 provided the first real statistics on persons living in the various Indian communities. Milton Earle's (1861) report combined a historical account of each reservation with census information. The report also recommended that the residents of the reservations be made full citizens. In 1870, Mashpee was officially granted town status.

By the Late Industrial Period (1870–1915), Barnstable's population had grown considerably and diversified in the sectors of agriculture, maritime trade, commercial businesses, and small industries. The town's proportion of foreign immigrants had also increased considerably by 1900. Agriculture pursuits, particularly in West Barnstable, attracted the Finns, Portuguese and others. Consequently, numerous new religious organizations and voluntary associations were established in the community to serve both year-round and seasonal residents. In the outlying eastern and western sections of Barnstable, major period developments took place as resort communities grew along coastal areas, provoking a subsequent rise in the community's summer-resort business (Figure 5-8). Barnstable was also the largest agricultural town in the north-central section of the Cape, leading in dairy goods production, poultry, and fruits (cranberries) (Figure 5-9). A local businessman, Abel D. Makepeace, entered the cranberry

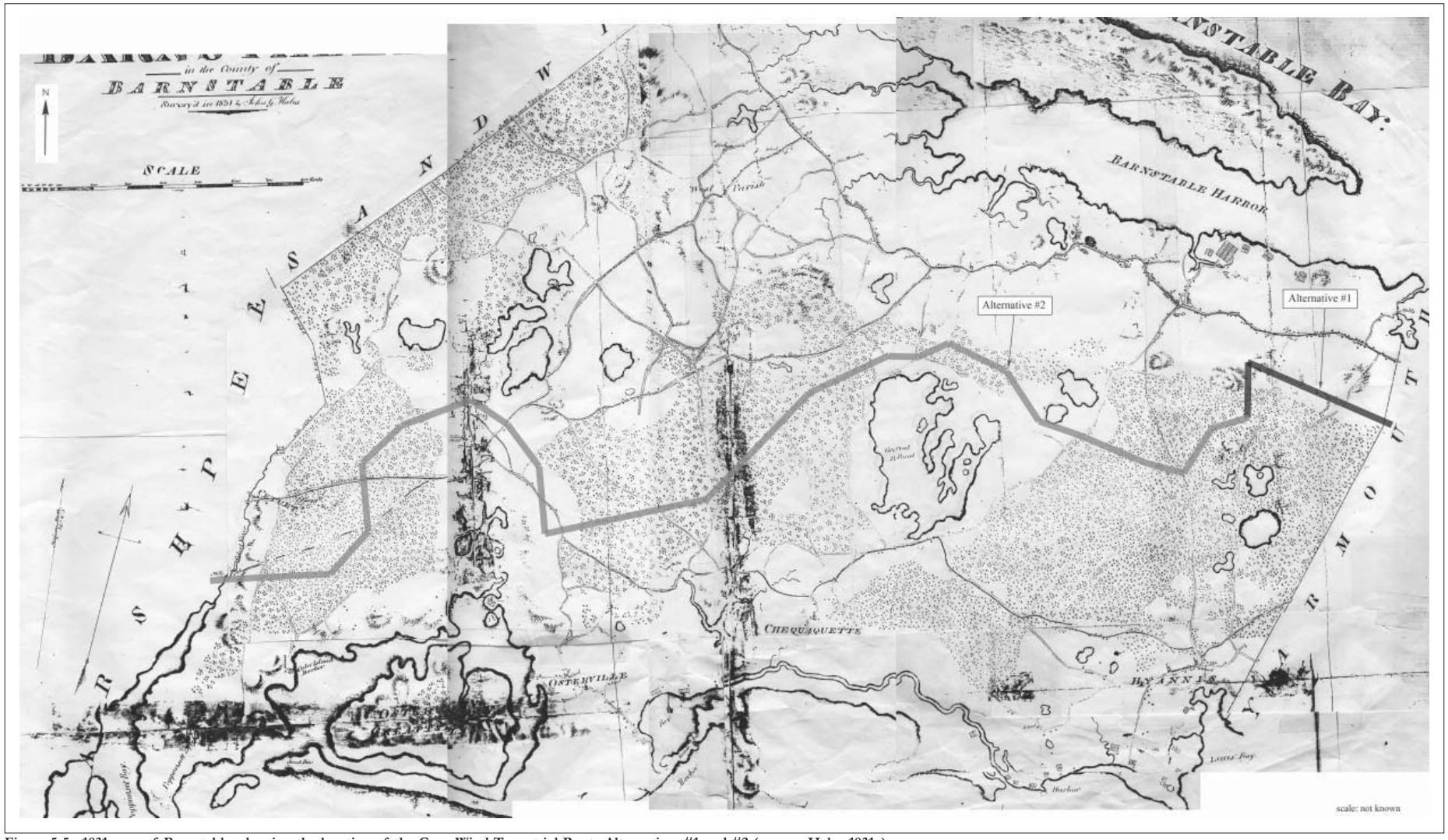

Figure 5-5. 1831 map of Barnstable, showing the location of the Cape Wind Terrestrial Route Alternatives #1 and #2 (source: Hales 1831a).

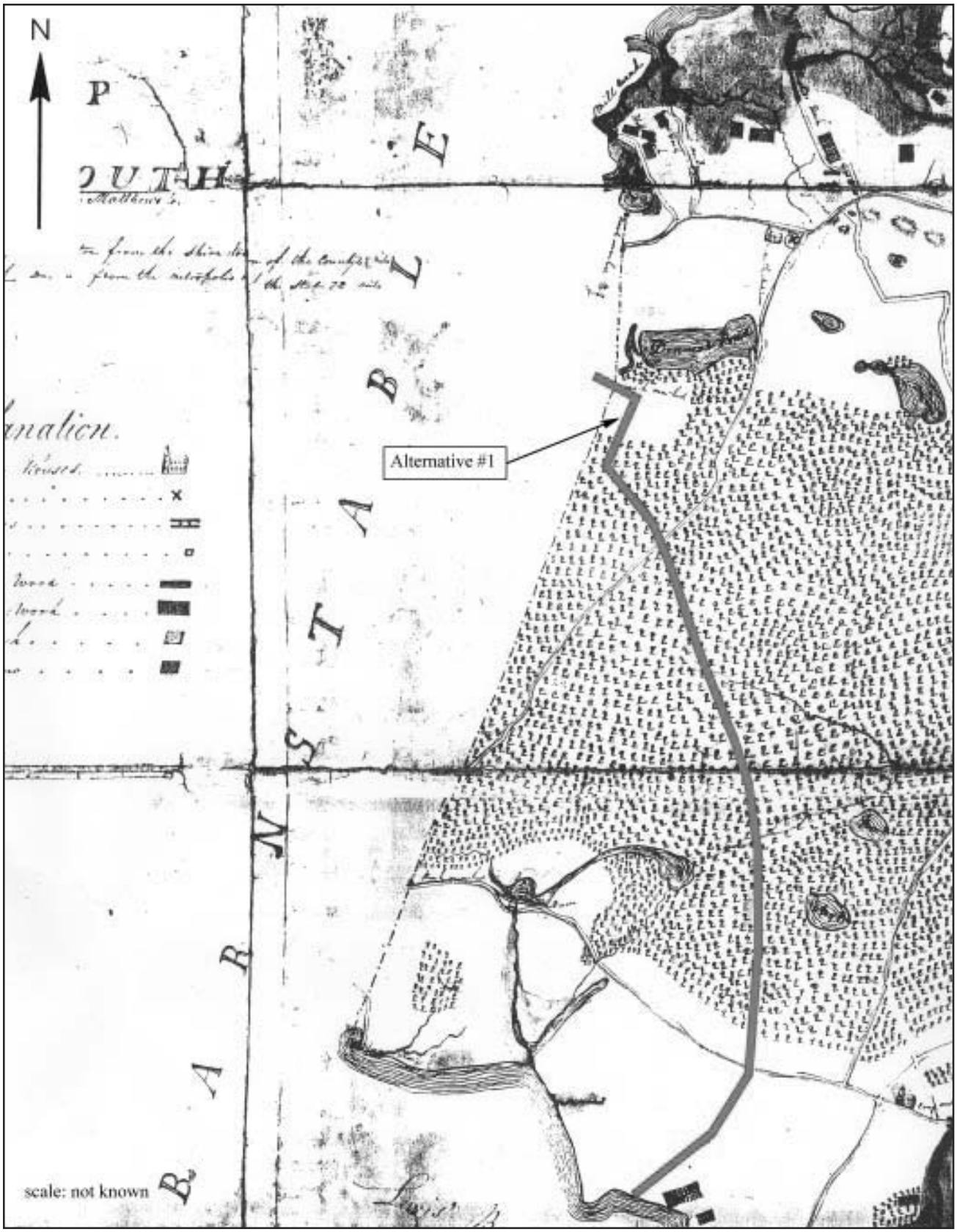

Figure 5-6. 1830 map of Yarmouth, showing the location of the Cape Wind Terrestrial Route Alternative #1 (source: Matthews 1830).

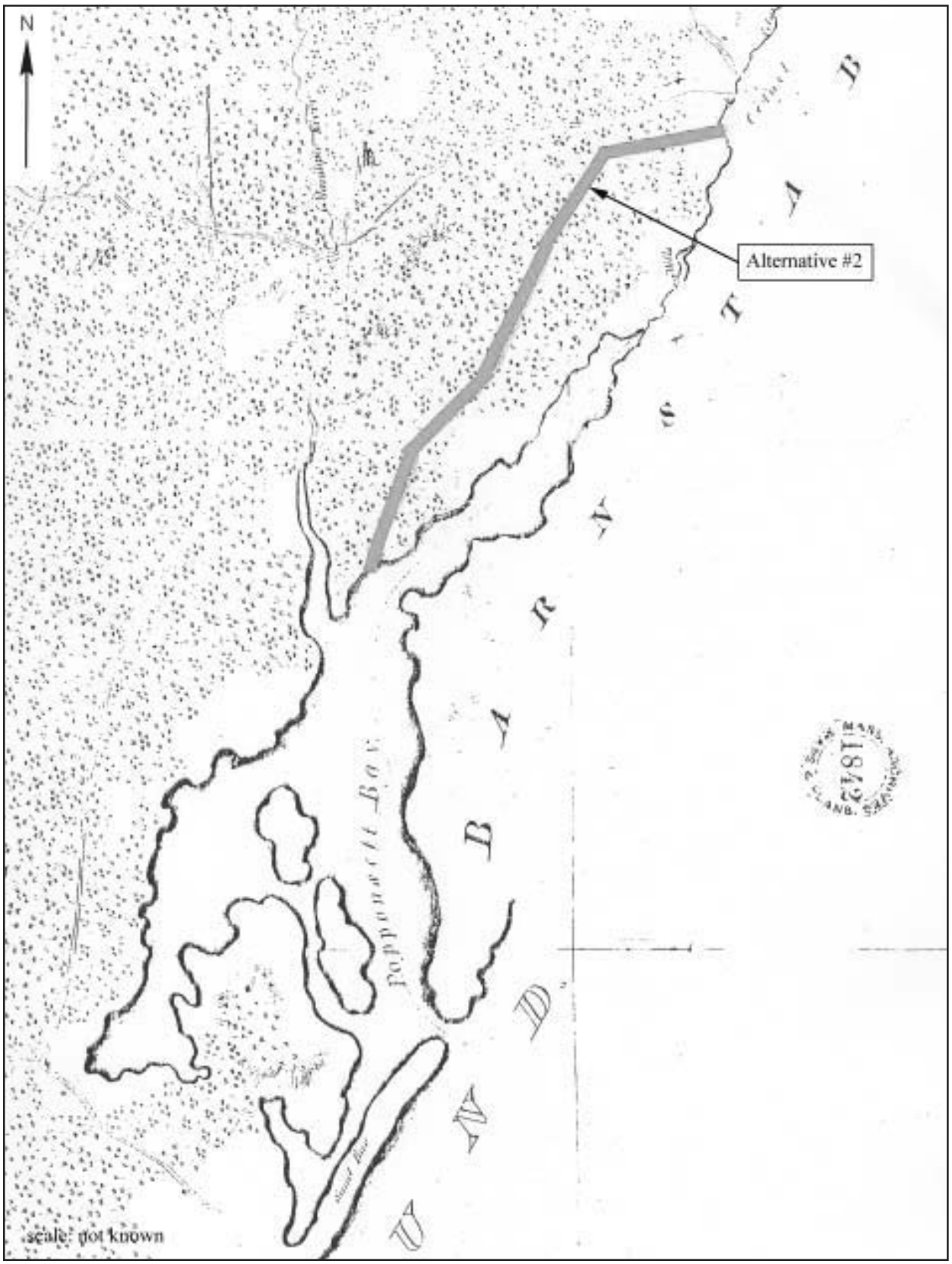

Figure 5-7. 1831 map of Mashpee, showing the location of the Cape Wind Terrestrial Route Alternative #2 (source: Hales 1831b).

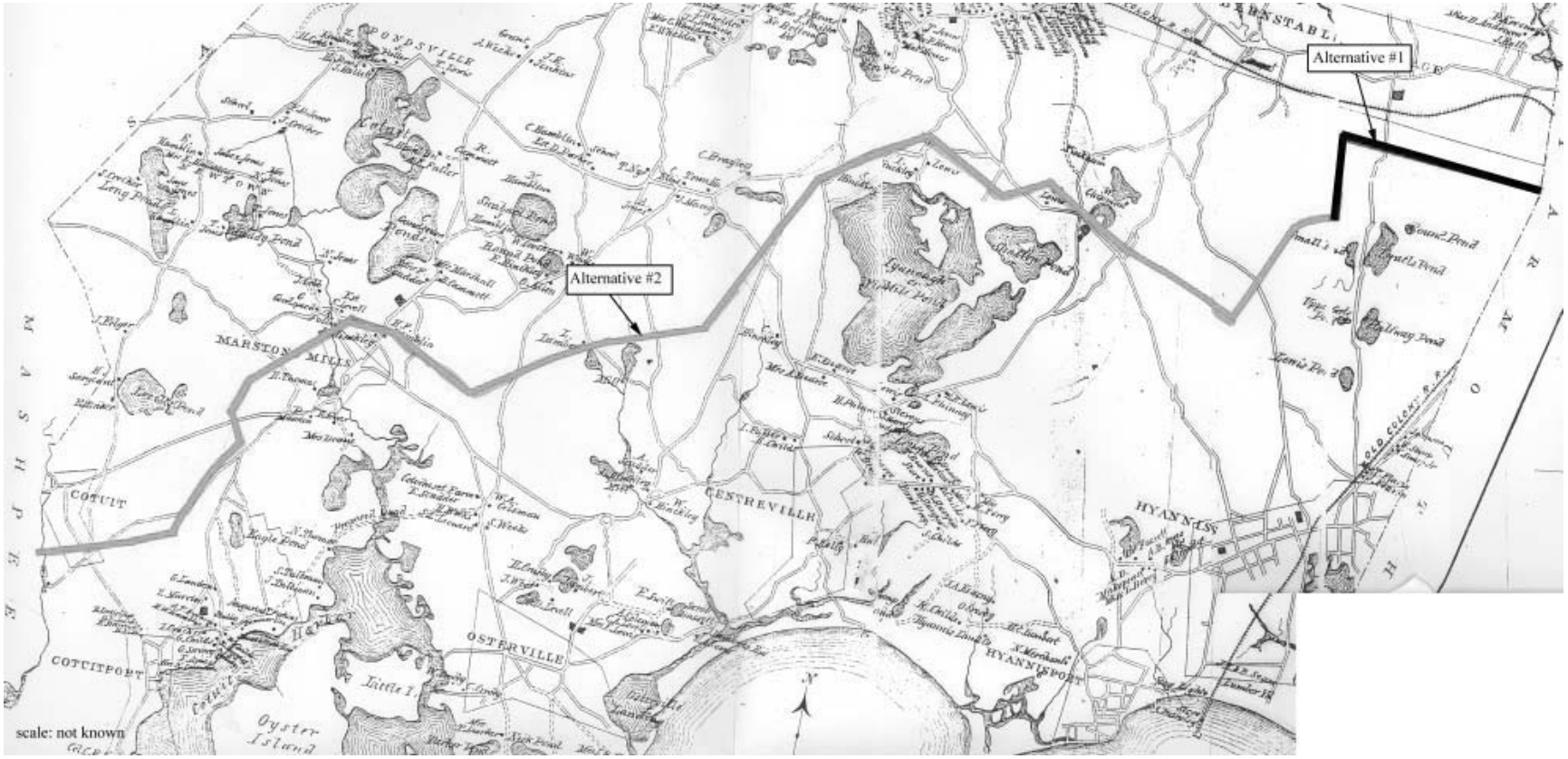

Figure 5-8. 1880 map of Barnstable, showing the location of the Cape Wind Terrestrial Route Alternatives #1 and #2 (source: Walker 1880a).

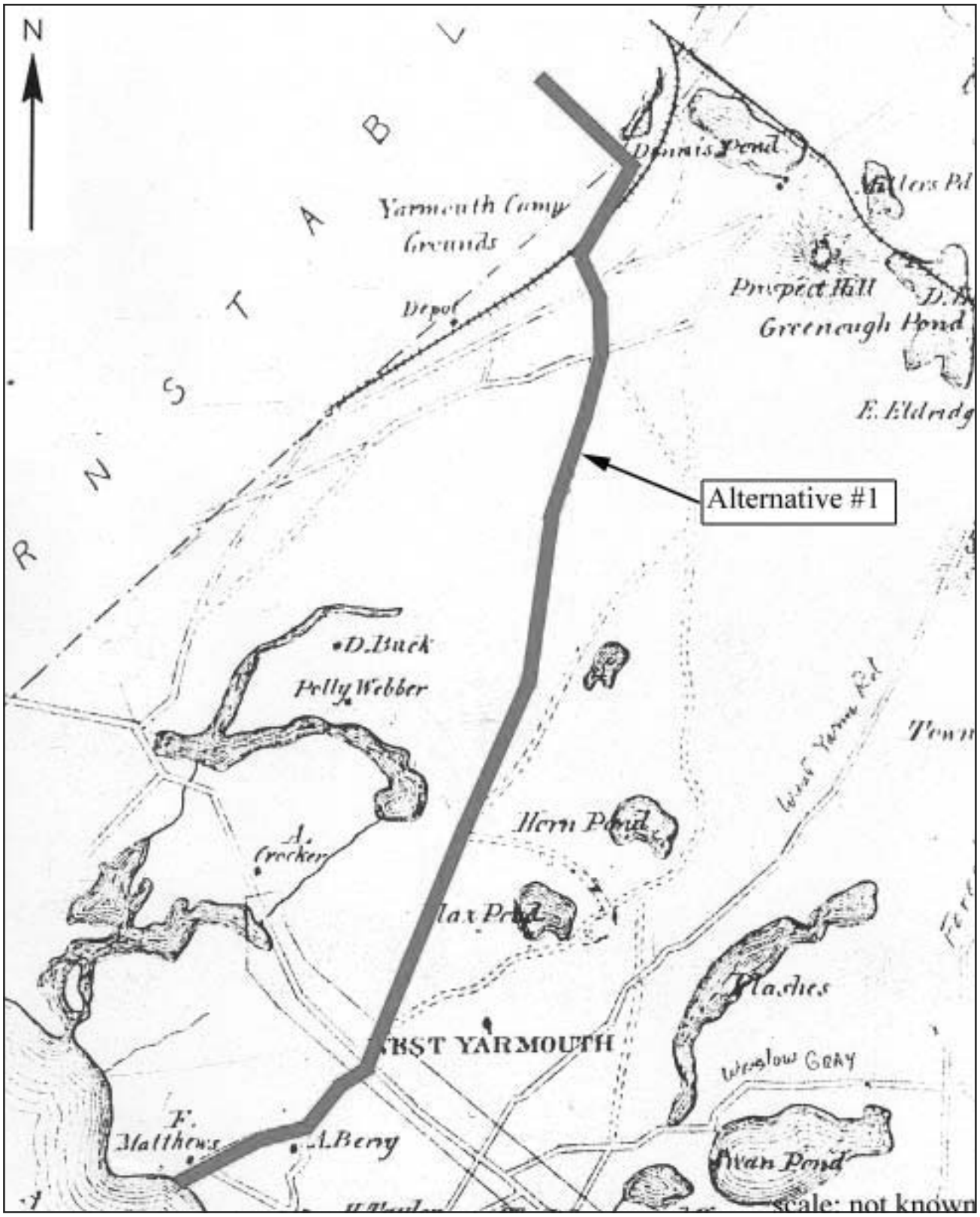

Figure 5-9. 1880 map of Yarmouth, showing the location of the Cape Wind Terrestrial Route Alternative #1 (source: Walker 1880b).

business in the 1870s and through a series of early-twentieth-century bog purchases made his firm the largest global cranberry producer.

In the early twentieth century, the extensive marshlands along Cape Cod's north side began to attract increasing numbers of recreational sportsman. After maritime industries collapsed on the Cape in the late nineteenth century, their shoreline locations were gradually assumed by a variety of resort and recreational uses. As the twentieth century progressed, former ship landings, saltworks, and fish weirs were replaced by bathing beaches, hotels, and colonies of summer cabins. The Cape Cod Railroad, which provided reliable connections to the rest of the state and nation, encouraged regional growth as a summer resort destination, but it was quickly eclipsed by private automobile travel.

The beginning of the twentieth century also marked a change for Mashpee and the town started to follow the pattern of other Cape communities (Figure 5-10). Tourism began to add to the local economy and farming was phased out to allow for more cranberry production. The ratio of Indian to non-Indian residents changed, with increasing numbers of non-Indian summer and permanent residents.

Resort development and tourism were the principal generators of local growth during the Early Modern Period (1915–1940). Economic growth during the 1920s stimulated seasonal resort development, and local commercial businesses began to orient their services toward the expanding summer population. The construction of two automobile bridges over the Cape Cod Canal in the 1930s, combined with the development of Route 6 as a highway, brought an influx of tourists and summer residents to the Cape's interior communities. The rise in tourism provoked widespread coastal cottage construction, as well as local harbor improvements (MHC 1987). Two new connector routes, Route 28 (oriented east-west) and Route 132 (oriented north-south), facilitated the continued development of Barnstable, Mashpee and Yarmouth's commercial and resort centers. In 1936, air service to the area was made available by the construction of two local airfields: Hyannis Airport, which expanded to become Barnstable Municipal Airport, and Cape Cod Airport situated northeast of Mystic Lake along Race Lane.

Predictive Statements for Historic Period Resources

The historic archaeological sensitivity of the Terrestrial Route Alternatives #1 and #2 is defined primarily on the basis of recorded historic and modern period activity in the vicinity, including the historic period development of Barnstable, Mashpee, and Yarmouth. Archival research determined that no previously recorded historic archaeological sites are located within 1.5 miles of the proposed Terrestrial Route Alternative #1. There are 19 previously recorded historic archaeological sites within 1.5 miles of the Terrestrial Route Alternative #2.

If present, historic period deposits were expected to relate to domestic, agricultural and/or industrial land use. Archaeological features could include foundations, stone wall sections, animal pens and bar ways, along with eighteenth- and nineteenth-century field trash scatters of domestic and/or structural debris. In coastal portions of the routes, historic deposits could be related to harbor use and civic/commercial development.

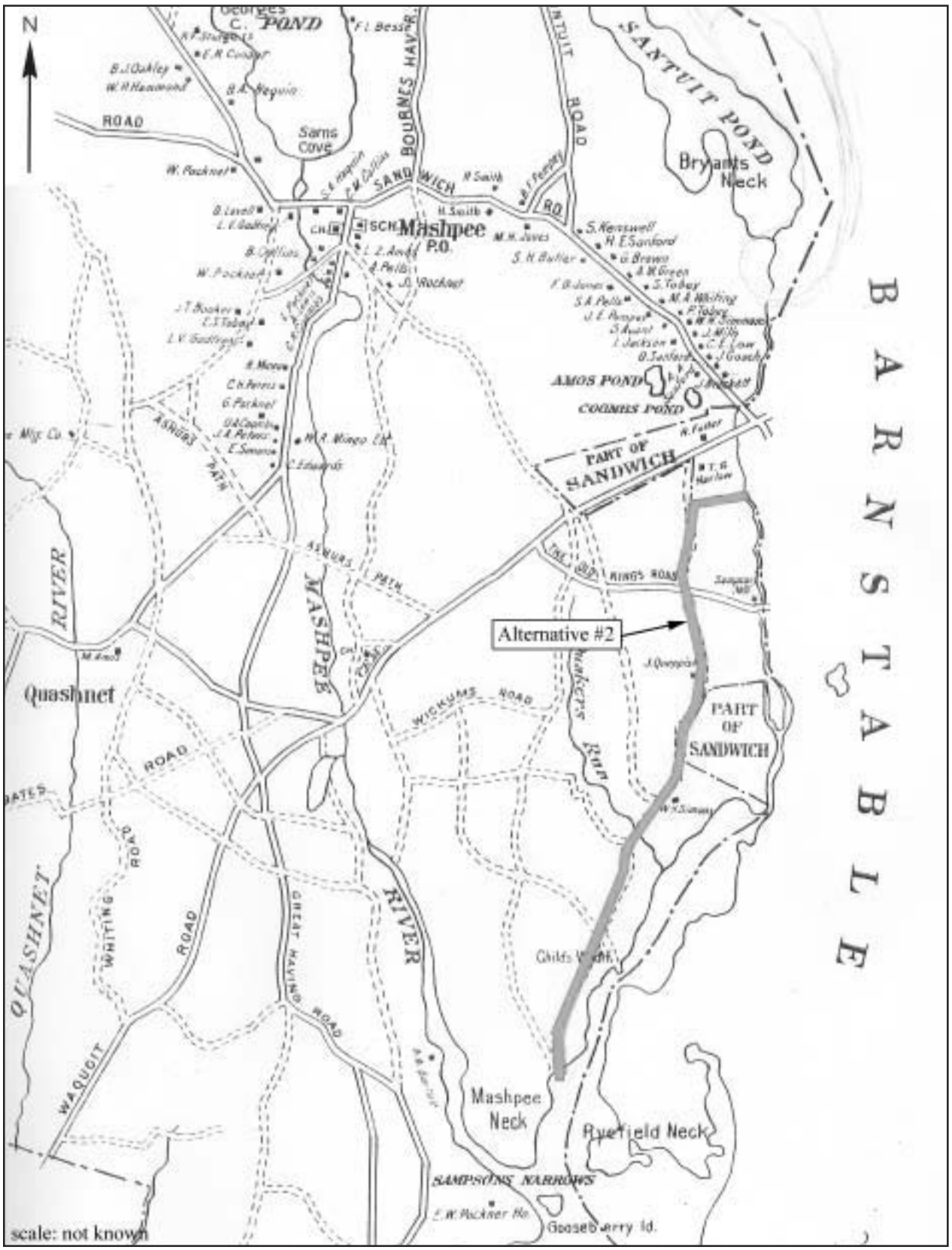

Figure 5-10. 1907 map of Mashpee, showing the location of the Cape Wind Terrestrial Route Alternative #2 (source: Anon 1907).

CHAPTER SIX

RESULTS AND RECOMMENDATIONS

This chapter presents the results of the cultural resource surveys conducted within the Cape Wind Terrestrial Route Alternatives #1 and #2 study areas. The reconnaissance survey was completed for both alternative routes; the intensive survey was completed within the proposed Terrestrial Route Alternative #1 only. This section includes discussions of the results of the historic and archival research, walkover inspection, and subsurface testing. The final section of the chapter includes recommendations regarding identified archaeological deposits.

Results of the Reconnaissance Survey

PAL completed the reconnaissance survey fieldwork in May 2003. The reconnaissance survey included historic and archival research, an environmental assessment, and a walkover/drive over survey of the Terrestrial Route Alternatives #1 and #2. The results of these activities were used to stratify these alternative routes into predictive zones of low, moderate, and high archaeological sensitivity (PAL 2003).

Historic/Archival Research

The reconnaissance survey began with the collection of background information about the location and types of known archaeological sites in the vicinity of the study areas. A MHC site file search determined that approximately 58 recorded prehistoric and historic period archaeological sites are located within approximately 1.5 miles of the Terrestrial Alternatives #1 and #2 routes.

Ten of the sites (19-BN-29, -237, -238, -289, -623, -671, -691, -694, MAS-HA-3, BRN-HA-17) are mapped within or immediately adjacent (within 1,000 ft) to the Terrestrial Route Alternatives #1 or Alternative #2. The sites include prehistoric and historic Native American and historic Euro-American deposits, ranging in age from 200 to 10,000 years old. The majority of these sites have been reported by avocational collectors rather than as a result of professional systematic archaeological surveys. Several sites (19-BN-807, -815, -817, -829) have been evaluated and determined ineligible for listing in the National Register of Historic Places. Many sites noted in the immediate vicinity of the alternative routes are known by location only and have no determination of eligibility.

Prior to the archaeological surveys, there were 10 recorded prehistoric archaeological sites within 1 mile of the proposed Terrestrial Route Alternative #1, although none of these sites are located directly within the proposed project area. Sites 19-BN-74, -237, -541, -578, and -604 document artifact collection locations, and were recorded by avocational archaeologists. Little information regarding their size or content is available. Four additional prehistoric sites (19-BN-666, -667, -668, -670) were identified

through CRM surveys as small, single-component site areas primarily documenting lithic tool maintenance and production. The site form for 19-BN-238 indicates that six Native American burials were found in the vicinity of Pine Cone Drive in Yarmouth, one block east of the proposed Terrestrial Route Alternative #1. No additional information is available on the age or location of these burials.

Archival research determined that there were 29 recorded prehistoric archaeological sites within 1.5 miles of the Terrestrial Route Alternative #2. Three of these (19-BN-29, -289 and MAS-HA-3) are located within or in immediate proximity to the Terrestrial Route Alternative #2. Site 19-BN-29 is located at the Mashpee Neck Road Town Landing location. No additional information is available for this resource. Site 19-BN-289 is located immediately within the Terrestrial Route Alternative #2. Again, no further information regarding its size or temporal range is available. A site form filed at the MHC for 19-BN-613 indicates that one Native American burial was found in the vicinity of Old King's Road in Mashpee, approximately 1,500 feet south of the Terrestrial Route Alternative #2. Reported by the Barnstable Historical Commission, the burial was further investigated and documented by MHC staff in the 1990s but the exact location is unknown.

Archival research determined that no previously recorded historic archaeological sites are located within 1.5 miles of the proposed Terrestrial Route Alternative #1. A preliminary review of historic maps did not indicate any documented eighteenth-, nineteenth-, or early-twentieth-century historic period structures within the project corridor. The majority of the existing NSTAR ROW is located outside of historic development areas and appears to have been utilized as woodland and/or pasture for much of the historic period.

There are more than 30 recorded historic buildings in the hamlets of West Yarmouth and Englewood, near the Cape Wind Terrestrial Route Alternative #1 landfall. The majority of these historic buildings, while not considered a historic district, date from the early 1700s to late 1800s. Most are documented as belonging to sea captains or other wealthy members of Yarmouth society. The buildings are arranged in three clusters within 1.5 miles of the southern portion of the Terrestrial Route Alternative #1, between the New Hampshire Avenue Landfall and Route 28. The first cluster of buildings is located along Route 28 (Main Street), between Trader's Lane and Winslow Gray Road. The second cluster of buildings is located along Berry Avenue, north of the landfall and South of Route 28. The third cluster of buildings is located along South Sea Avenue, south of Route 28.

Two historic buildings and a historic cemetery are located in Barnstable within three-quarters of a mile from the northern portion of the Terrestrial Route Alternative #1. Both historic buildings are located off of Marstons Lane; the cemetery is located on Mary Dunn Road.

There are 19 previously recorded historic archaeological sites within 1.5 miles of the Terrestrial Route Alternative #2. The Sampson's Mill Site (MAS-HA-3) is the location of a mostly demolished eighteenth-century mill located on Old Mill Road in Mashpee, immediately adjacent to the route. Several other historic mills are recorded in the hamlet of Marstons Mills in Barnstable, an area crossed by the proposed route. The Terrestrial Route Alternative #2 also passes near several Native American and Euro-American

historic period settlement areas including the villages of Santuit and Marstons Mills. These areas generally possess a moderate or high sensitivity for historic period resources, including home or farmsteads, mills or other industrial sites, and/or transportation-related sites such as remnant roads.

Historic Map Research

A review of historic maps of Barnstable and Yarmouth showed that both Higgins Crowell Road and Mary Dunn Road are historic roadways that were built prior to 1880 (Hales 1831a; Walker 1880a, 1880b) (see Figures 5-5, 5-8 and 5-9). Both roads provided access from Lewis Bay to the northern portions of Barnstable and Yarmouth. Portions of Mary Dunn Road have since been demolished by the construction of the Barnstable Municipal Airport, but the Higgins Crowell Road remains intact. New Hampshire Avenue is also visible on the 1880 (Walker) map of Yarmouth (see Figure 5-9). In 1880, one building belonging to "F. Mathews" is visible on the western side of New Hampshire Avenue, near the proposed Terrestrial Route Alternative #1 landfall (Walker) (see Figure 5-9).

Mary Dunn Road follows the course of what was once a probable Native American trail (MAS 74). Early Colonial accounts refer to "an Indian Trail, which ran between Hyannis and Barnstable." It was later named Mary Dunn Road after Mary Dunn, a slave who arrived via the Underground Railroad and lived in a little cottage halfway between Hyannis and Barnstable on the Indian trail. Mary Dunn was said to have brewed excellent "yarb beer" and entertained the meek and lowly until she burned to death in her cottage in 1850 (Trayser 1939). Other historical accounts recall the Blatchford family, who lived on a small farm on the borders of Half Way Pond (Mary Dunn Pond). Mrs. Blatchford, also known as Liza Tower Hill because her husband's family came from the Tower Hill section of London, was said to have been a witch. The historic map research indicates that the southern portion of the proposed Terrestrial Route Alternative #1 passes through the Lewis Bay harbor area, an area of early development in Yarmouth, and along the historic Higgins Crowell Road.

The northern portion of the proposed Terrestrial Route Alternative #1 is located in an area maintained as woodland in 1795 (see Figure 5-2). The southern portion crosses two historic roads depicted on the 1795 map of Yarmouth, including the Hyannis Road, which is partially intact to this day (Anonymous) (see Figure 5-3). By 1831, three historic roads cross the proposed route in Barnstable, including Mary Dunn Road (Hales) (see Figure 5-5). Only Mary Dunn Road is visible on a later map of the area, and it is possible that the other roads had since been abandoned (Walker 1880a) (see Figure 5-8). No structures were noted within the proposed route on the historic maps of the region.

Walkover/Drive over Survey

The windshield survey was designed to collect information about existing conditions within the two alternative routes and to identify areas that, where possible, a closer walkover inspection was warranted. The Terrestrial Route Alternatives #1 and #2 are located partially within paved secondary roadways and partially within existing electrical easements. Surficial indicators of existing buried utilities (e.g., fire hydrants, telephone/electric boxes) are present along the roadside of both the Terrestrial Route Alternatives #1 and #2 corridors, suggesting at least some degree of previous disturbance below existing paved roadways.

The portions of the Terrestrial Route Alternatives #1 and #2 that pass through the NSTAR easement are maintained as part of the existing utility ROW. All existing utilities in this portion of the study area are located aboveground and consist of groups of overhead high-tension electrical wires supported by wooden poles and metal towers. Visible ground disturbance in this part of the study area is generally limited to small areas of sand and/or gravel extraction, intersecting road cuts, and pole/tower installation.

Both alternative routes also pass perpendicular to major road crossings, including Route 6. These areas are generally extensively disturbed with large cut and/or fill features and artificial ground contours. Other areas of extensive disturbance within and/or immediately adjacent to the routes include commercial gravel/sand pits, commercial strip development, and dense residential subdivisions.

Sensitivity Assessment

The information collected through archival and map research and the walkover/drive over were used to help develop the sensitivity assessment for the Terrestrial Route Alternatives #1 and #2. The results of these tasks were used to rank the two alternative routes as having a high, moderate or low potential to contain previously unidentified archaeological resources. Figures 6-1 through 6-3 depict the archaeological sensitivity for the proposed Terrestrial Route Alternatives #1 and #2.

The drive over/windshield survey determined that the Berry Avenue, Higgins Crowell Road, and Willow Street portions of the Terrestrial Route Alternative #1 are located beneath paved secondary roadways that are well maintained for two-way vehicular traffic. An analysis of data about existing underground utilities beneath and to either side of these roadways determined that the proposed utility trench is located within soils that have been extensively disturbed by road and utility construction and maintenance. The construction of existing belowground utilities to either side of the proposed trench, combined with the grading and filling associated with roadway construction and maintenance, affect the likelihood that intact archaeological deposits could be located in these areas. Therefore, the approximately 18,000 ft roadway portion of the Alternative #1 route was assessed as having a low archaeological sensitivity (see Figure 6-1).

The portion of the Alternative #1 route that passes through the existing NSTAR easement was given an overall moderate sensitivity to contain prehistoric period resources. Areas of high sensitivity include margins of wetlands such as Long Pond, although the route does not directly cross any water bodies. The reconnaissance survey determined that the transmission easement in this section appears to be relatively undisturbed and was expected to contain isolated artifacts or small sites associated with near-interior hunting and/or gathering activities (PAL 2003). The sensitivity for historic period resources was considered to be generally low for this portion of the route given the lack of documented historic period development/land use in the area.

The archaeological sensitivity of the Alternative #2 route included areas of high and moderate sensitivity and several small areas of low sensitivity (see Figures 6-2 and 6-3). The southerly portion of the route is located along Mashpee Neck Road, which extends notherly from Mashpee Neck, then notherly along Orchard Road to the existing transmission easement at the Mashpee Substation. As discussed above, the sensitivity of the below-road portion of the route was based primarily on existing conditions on either side of the paved roads. Utility indicators (hydrants, electrical boxes) are visible on both sides of

the road. This section of the route was ranked as having an overall high sensitivity for archaeological deposits, which could date from the prehistoric and/or historic periods. A number of archaeological sites have been identified in close proximity to the Terrestrial Route Alternative #2, suggesting that even though the area has been developed as a residential neighborhood, intact/undisturbed archaeological deposits could still be present. The roadway passes through the Mashpee River Woodlands conservation area as it heads north from the shoreline, and the area immediately surrounding the paved roadway appears relatively undisturbed with level, sandy soils along the river's margin.

The sensitivity assessment of the Terrestrial Route Alternative #2 along the existing transmission easement included numerous small areas of high sensitivity at the major wetland crossings (Quaker Run, Santuit River, Little River), several of which contain previously recorded prehistoric period archaeological sites. Other high sensitivity areas were located in proximity to large water bodies such as Wequaquet Lake and Hathaway Pond and smaller, unnamed streams, swamps and bogs.

Conclusions/Recommendations- Reconnaissance Survey

The reconnaissance survey determined that overall the Terrestrial Route Alternative #2 possesses a higher archaeological sensitivity than does the Terrestrial Route Alternative #1. In addition to being nearly three times longer than the Terrestrial Route Alternative #1, the Terrestrial Route Alternative #2 is located in proximity to more known prehistoric and historic period archaeological sites and has a greater degree of favorable environmental attributes such as wetland crossings, which are favorable for level, well-drained soils and access to fresh water. These attributes would have been attractive to prehistoric period groups in the area.

Based on the reconnaissance results, PAL recommended that an intensive (locational) survey be completed within the preferred Alternative #1 Terrestrial project area. The intensive survey would be designed to investigate areas of moderate and high archaeological sensitivity to determine the presence or absence of archaeological deposits. The actual testing locations would be chosen based on detailed project plans as well as a walkover/close ground inspection of the actual impact area.

Following the reconnaissance survey, Cape Wind proposed Terrestrial Route Alternative #1 as the preferred route and requested that PAL complete an intensive archaeological survey of the proposed Terrestrial Route Alternative #1 overland route. No additional archaeological investigations were completed for the Terrestrial Route Alternative #2.

Results of the Intensive Survey

Walkover Survey

The first field task of the intensive survey consisted of a refined walkover of the entire terrestrial project area. The walkover was designed to refine the archaeological sensitivity of the proposed Terrestrial Route Alternative #1. Several large areas of disturbance were noted along the proposed route during the walkover survey. These areas included approximately 120 m of the route immediately west of Willow Street that is under active construction and is bisected by a railroad easement (Figure 6-4). The proposed 80-x-80 ft storage area located on the east side of New Hampshire Avenue is an existing

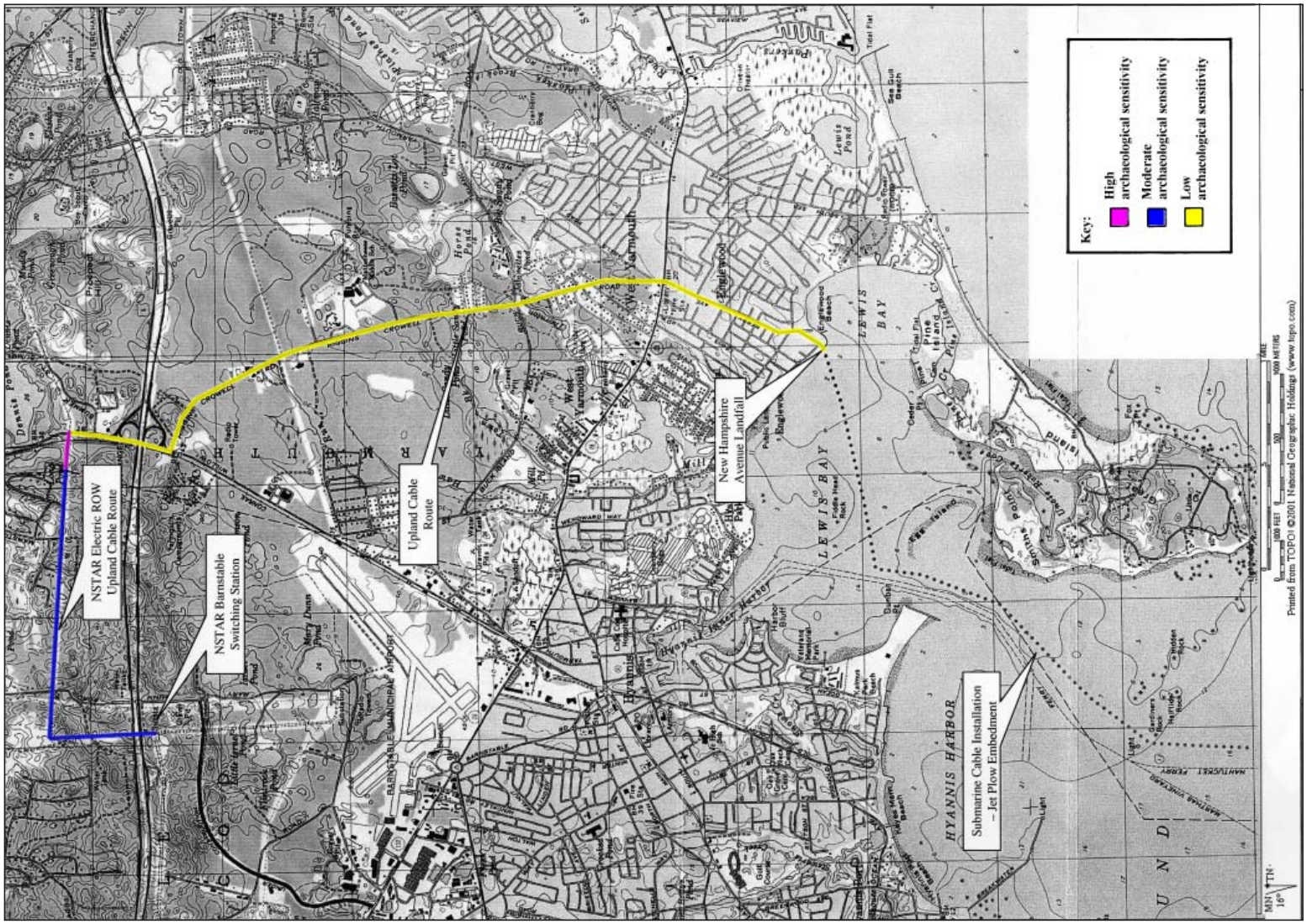

Figure 6-1. Cape Wind Terrestrial Route Alternative #1 showing archaeological sensitivity.

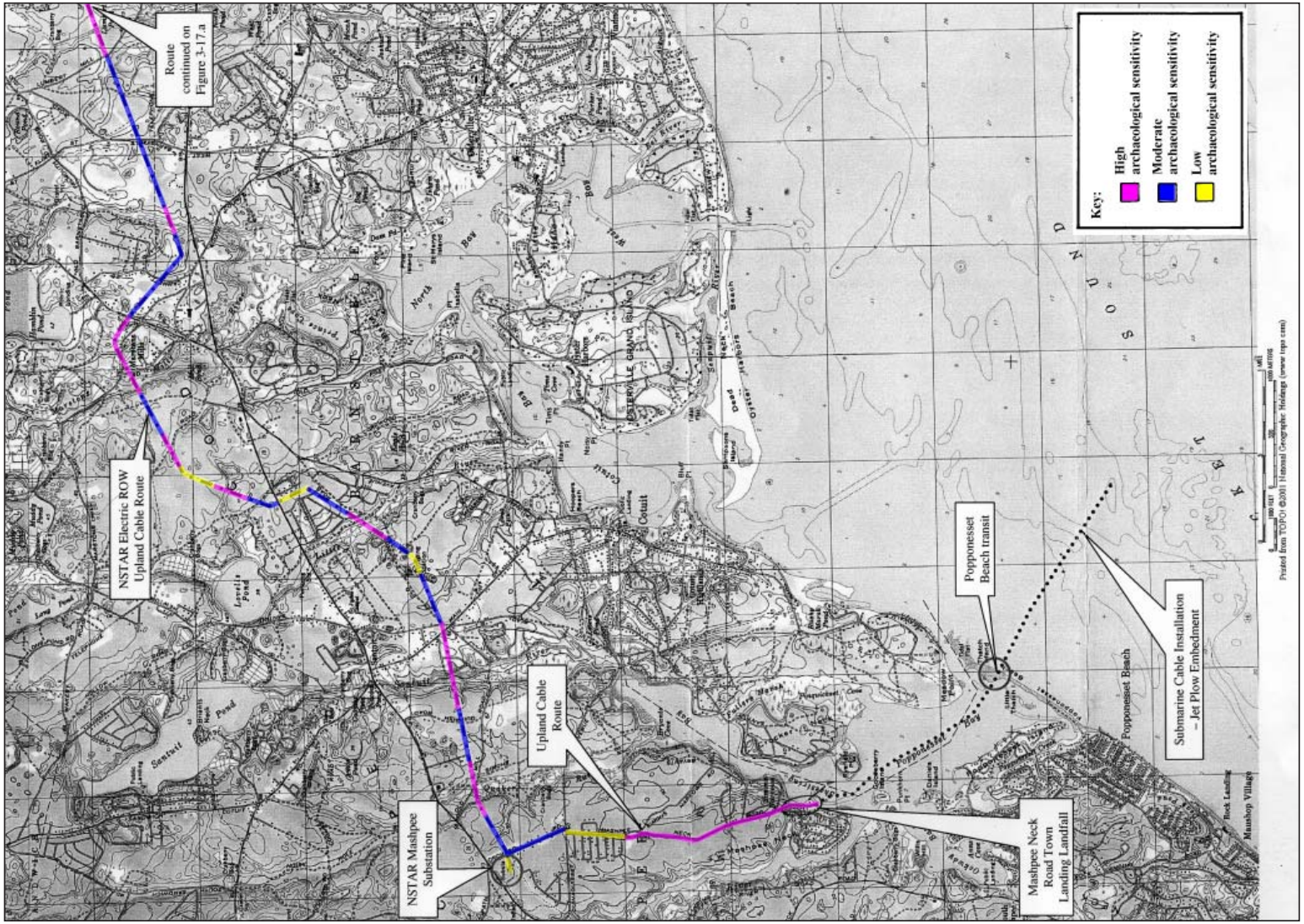

Figure 6-2. Western portion of Cape Wind Terrestrial Route Alternative #2 showing archaeological sensitivity.

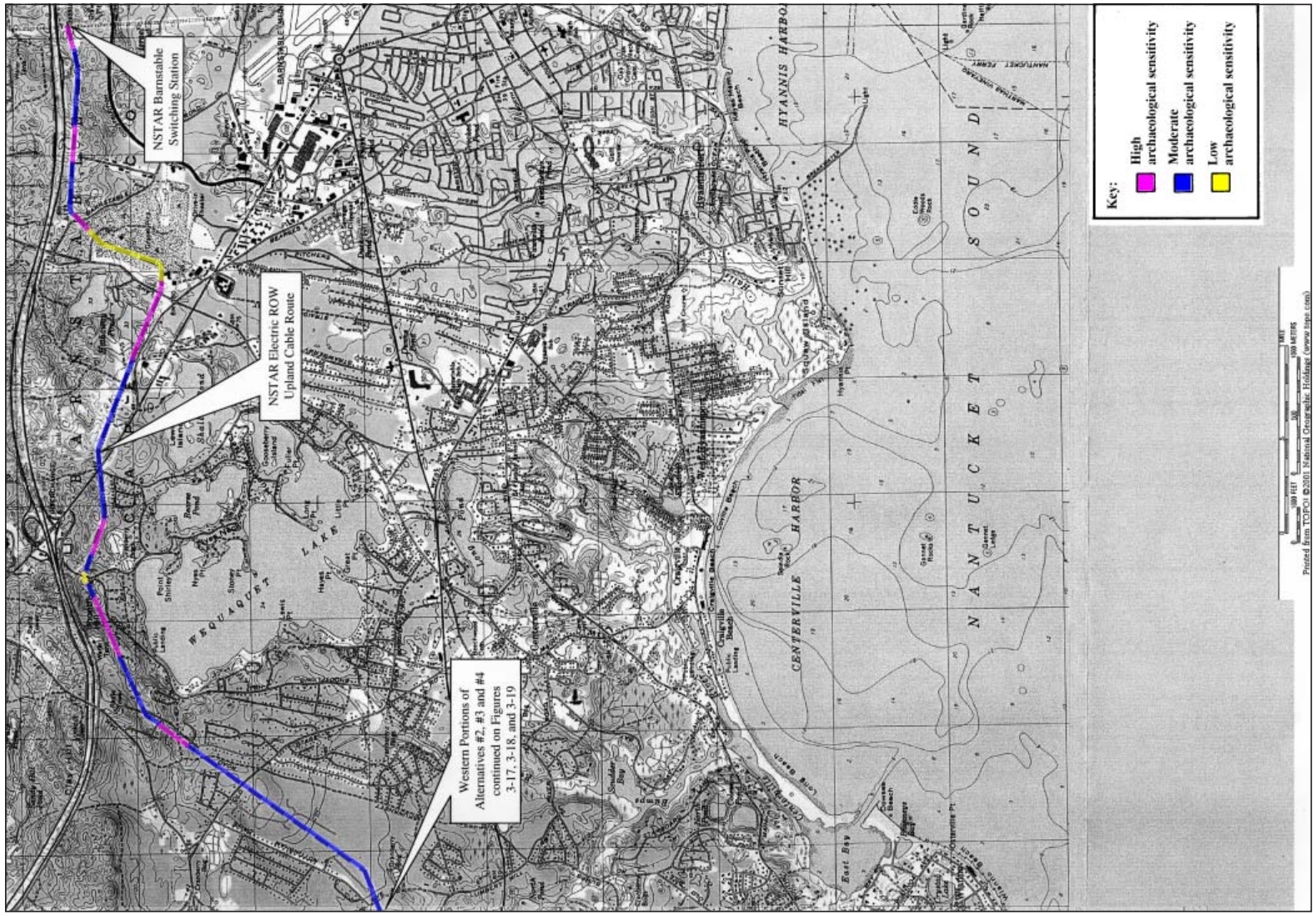

Figure 6-3. Eastern potion of Cape Wind Terrestrial Route Alternative #2 showing archaeological sensitivity.

Figure 6-4. View west of existing conditions of the Cape Wind Terrestrial Route Alternative #1, immediately west of Willow Street, Barnstable, MA.

Figure 6-5. View southeast of existing conditions at the proposed New Hampshire Avenue storage/staging area.

paved parking lot, with no remaining intact soils (Figure 6-5). Additional areas of disturbance include the Route 6 crossing and substation at the western end of the proposed route and all major road and driveway crossings (Appendix A-10). In selected areas, exposed soils have been stripped and/or cut away for road construction and drainage purposes. Soil augers placed along the route helped to further delineate disturbance. Augers 1–7 were placed in portions of the proposed Terrestrial Route Alternative #1 that appeared to have been cut away or graveled (Appendix A-8, A-9). All field testing locations and identified areas of disturbance are shown in Appendix A.

West of Willow Street, the proposed project corridor is located within an existing NSTAR electrical easement that has been cleared of trees. Low vegetation such as sassafras, blueberry, sumac, green briar and scrub grasses are still present within the proposed ROW. Two small wetland areas were noted during the walkover survey, in a low and disturbed area west of Marstons Lane and immediately south of a private road near the western end of the proposed route.

The topography of the corridor is rolling, with several low-lying flat areas interspersed with steep slopes and low hills. Areas of low archaeological sensitivity included portions of the proposed route that exhibited very steep slope or standing water. No evidence of structures (e.g., cellar holes, depressions, wall sections) or other historic period features was noted during the walkover.

Subsurface Testing

A total of 208, 50-x-50-cm test pits was excavated within the proposed impact areas of the main route, including the staging area located at the intersection of Higgins Crowell Road and Willow Street, and the main route west of Willow Street. The testing was completed in 17 linear test pit transects and one test pit array. All intensive survey testing locations are depicted in Appendix A.

Non-Site Areas

The proposed staging area occupies a low, wooded area immediately east of Willow Street in Yarmouth. Current plans place the proposed utility trench at the top of a steep slope east of the proposed staging area. Transects A and Q included 11 test pits placed at 10-m intervals within the proposed staging area and utility trench (Appendix A-7). The observed soil profiles indicated that little disturbance has occurred in this area. Typical soil profiles in this area show an intact, gray A_e/podzol, and a light brown A_1 horizon followed by dark yellowish brown and yellowish brown B subsoils (Figure 6-6). All soils consisted of silty fine to medium sands with little to no gravel or rock content. Vegetation in the proposed staging area consisted of relatively new growth hardwood trees, with blueberry and other low-lying brush. No cultural material was recovered from this portion of the project area.

Transects B through P were placed within areas of the proposed Terrestrial Route Alternative #1 that possessed high to moderate archaeological sensitivity, west of Willow Street (see Appendix A). Transects B and C were placed in a high sensitivity area south of Long Pond along the existing NSTAR easement. Soil profiles from this area indicated that stripping and grading from the construction of the NSTAR easement has disturbed the upper 20–30 cm of soil (see Figure 6-6). In other cases, intact soils have been buried by 10–20 cm of overburden soils. Areas of severe disturbance included a portion of the

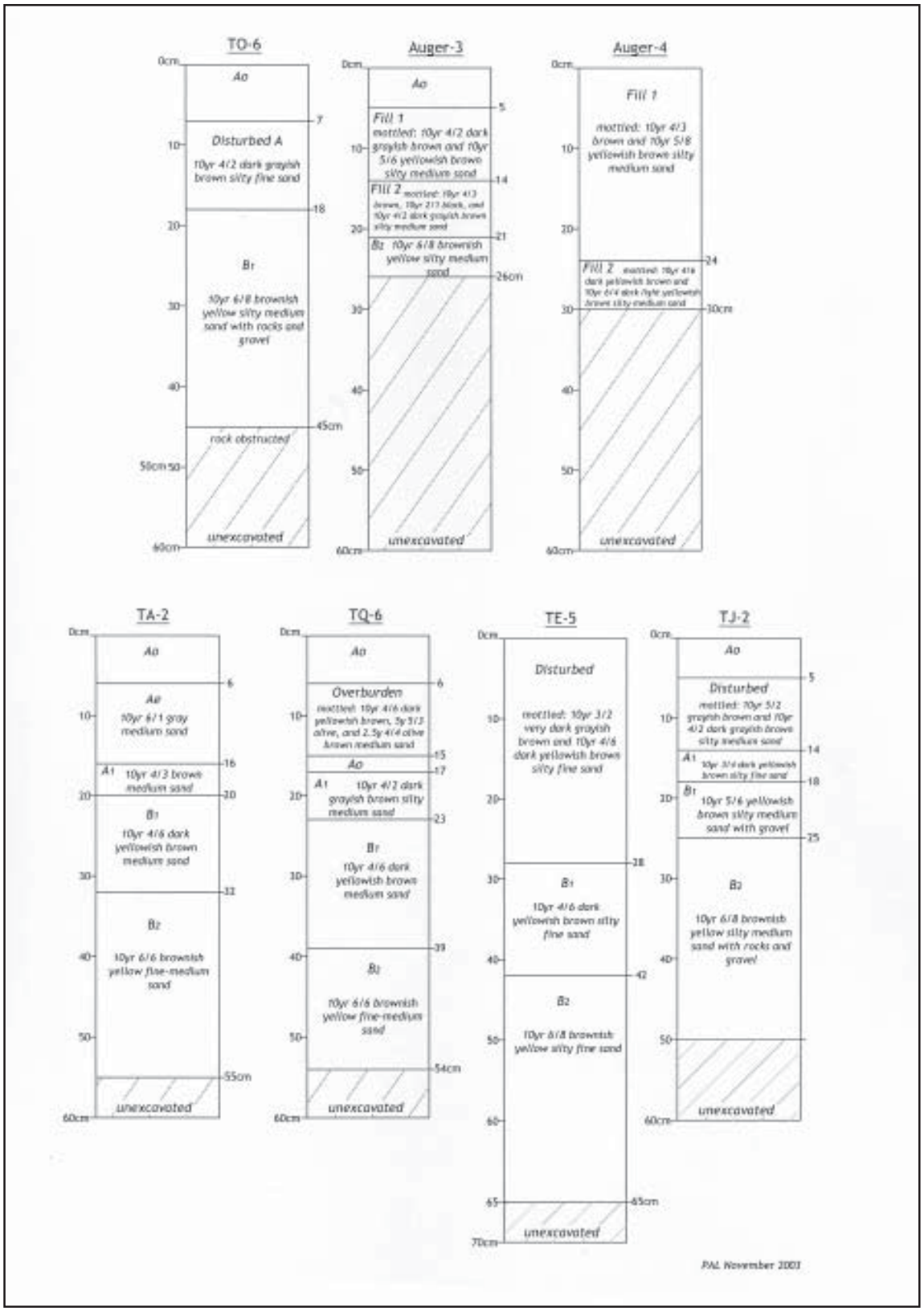

Figure 6-6. Representative soil profiles from the Cape Wind Terrestrial Route Alternative #1.

proposed route between transects B and C that appears to have been cut away. Auger cores 1 and 2 were placed in this area to further examine and delineate the disturbance.

Areas of moderate sensitivity included portions of the proposed Terrestrial Route Alternative #1 west of the Barnstable town line along the existing NSTAR easement. Transects D–P were placed along this portion of the route in intact, level and moderately sloped areas. The majority of the test pit soil profiles from this area revealed that the upper 20–40 cm of soil had been heavily disturbed through grading and filling (see Figure 6-6). In some cases, a thick overburden layer exists above intact but buried A and B soil horizons. Examination of several soil profiles also indicated that grading and filling has occurred in the near vicinity of all road and driveway crossings to depths of up to 60–70 cm below surface (cmbs) (see Figure 6-6).

The subsurface testing conducted for the Cape Wind Terrestrial Route Alternative #1 resulted in the recovery of a low density of nineteenth- and twentieth-century cultural material scattered throughout the APE. No specific concentrations of historic period materials were noted. Recovered historic materials include bottle glass, redware and porcelain electrical insulator fragments (Appendix B). Asphalt, window glass, brick, plastic, and other modern materials were recovered from disturbed soils but were not saved.

Figure 6-7. View east of the Pole #20 Site, Barnstable, MA.

The subsurface testing also resulted in the recovery of a low density of prehistoric cultural material near Pole #20, west of Mary Dunn Road in the town of Barnstable.

Pole #20 Site

The Pole #20 Site is located within a small flat area between a gentle slope up to the east and a steep slope up to the west (Figure 6-7). Seven test pits were excavated within a 10-m radius of the Pole #20 Site (Figure 6-8). One piece of rhyolite chipping debris was recovered in test pit O-6, within disturbed soils between 10 and 20 cmbs (Table 6-1). Array 1, consisting of four test pits, was placed at a 5-m interval in cardinal directions around O-6. Two pieces of rhyolite chipping debris were recovered from Array 1-90º from 10–20 cmbs in disturbed soils. One piece of the same type of rhyolite chipping debris was recovered from Array 1-90º at 20–30 cmbs from intact B_1 subsoils.

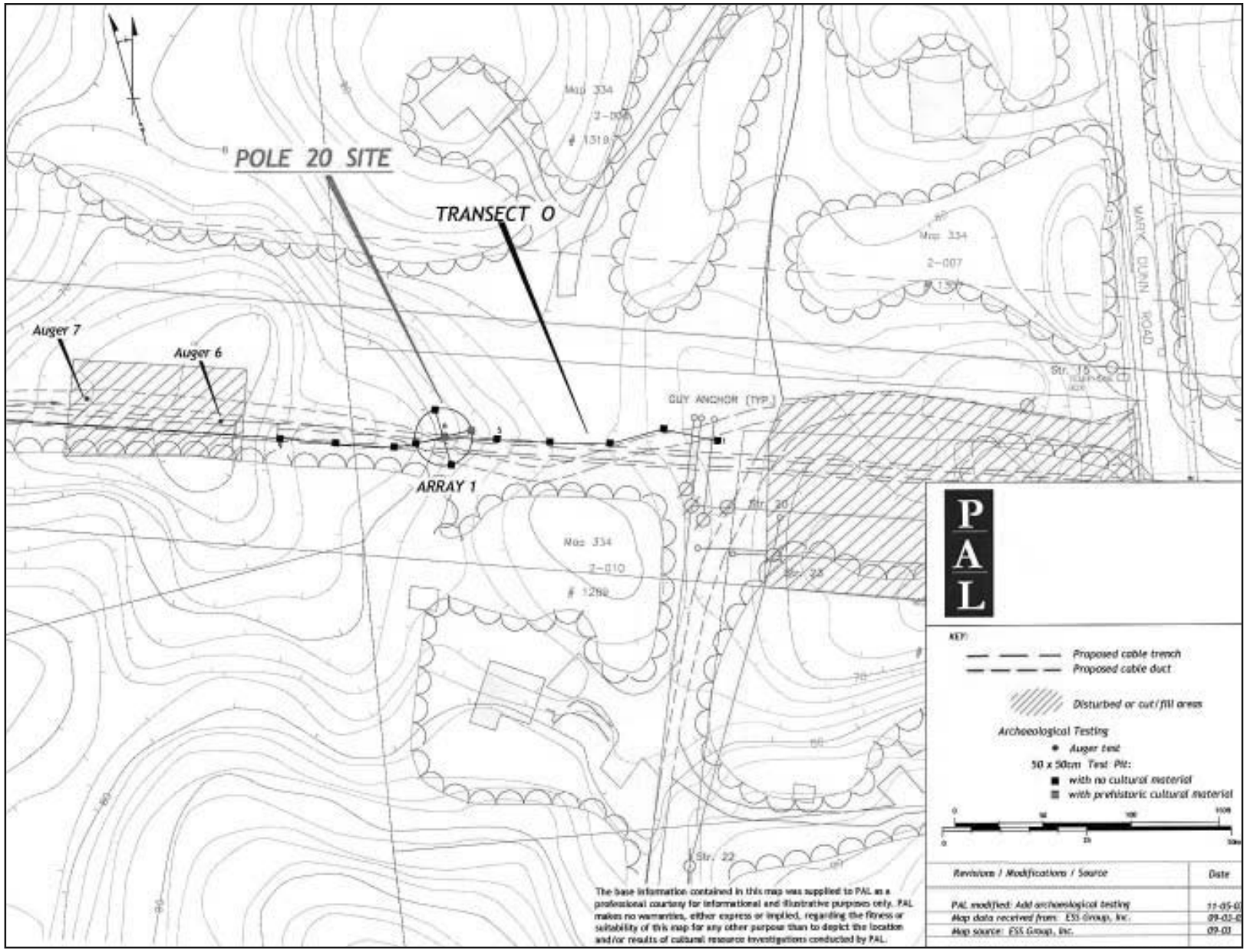

Figure 6-8. Detail map of the Pole #20 Site, with subsurface testing locations.

Table 6-1. Cultural Material by Stratum Pole #20 Site, Cape Wind Terrestrial Project.

Material	Soil		Total
	B1	Disturbed A	
Rhyolite	1	3	4
Total	1	3	4

Examination of the soil profiles in the area revealed that the first 20–25 cm of soil has been disturbed. Partially intact B_1 and B_2 subsoils remain beneath the disturbed upper soil levels (see Figure 6-4). The soils at this site belong to the Plymouth-Barnstable soil complex, consisting of silty sands with stones and boulders that cover approximately 1–3 percent of the ground surface (USDA 1993). Several test pits were terminated at a shallow depth when large rocks and boulders were encountered below the ground surface. No additional cultural material was recovered from the Pole #20 Site. No belowground cultural features were identified during the fieldwork.

Conclusions/Recommendations - Intensive Survey

The intensive (locational) survey of the proposed Terrestrial Route Alternative #1 APE resulted in the identification of archaeological deposits documenting the use of portions of the project area from the prehistoric to the modern period. No evidence of structures in the project area was identified through the documentary research or subsurface testing. The tested portion of the project corridor appears to have functioned historically as open or wooded house lots, and most recently as a NSTAR electrical line easement. The limited historic cultural materials collected during the testing represent field trash and/or refuse deposited in low to moderate densities over the past century.

The Pole #20 Site represents a low-density prehistoric site that appears to have been heavily disturbed by grading and stripping of the soils in the area. Three of the four pieces of chipping debris were recovered from these disturbed soils. Modern period land use, including stripping, clearing, and grading has contributed to the mixing of soil strata and artifacts, as evidenced by the variation in test pit profiles. While the recovered materials provide documentation of the prehistoric use of the general area, the archaeological deposits do not represent potentially significant cultural resources.

Based on the compromised integrity of the site, the low-artifact density and absence of datable, cultural features, it is unlikely that further testing in the Pole #20 Site area will yield any additional information regarding the time period and use of this site. Therefore, this site is not considered significant and eligible for listing in the National Register of Historic Places (36 CFR 60.4).

No further archaeological investigation was recommended for the Cape Wind Terrestrial Route Alternative #1 project area. The MHC concurred with this recommendation in a letter dated to the USACOE dated December 15, 2003 (see Appendix D). As part of the project, a MHC prehistoric site form has been completed for filing at the state archaeologist's office (see Appendix C).

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Appendix A

MAPS OF THE CAPE WIND ALTERNATIVE #1 PROPOSED IMPACT AREAS, INCLUDING SUBSURFACE TESTING

Appendix A Figures - Locational Data Omitted From Publicly Distributed Copies.

Appendix B

CATALOG OF CULTURAL MATERIAL RECOVERED FROM THE CAPE WIND TERRESTRIAL ALTERNATIVE #1 ROUTE

Appendix B. Catalog of Cultural Materials from Cape Wind – Alternative #1 Project Area.

Site	Unit	Depth	Stratum	Material	Function	Type	Count
Non-site	TB-05	0-10	Apz	Glass Molded	Bottle		1
	TD-02	0-10	A1	Redware	Ceramic Sherd		1
	TE-06	0-10	Disturbed	Porcelain	Electrical Item	Insulator	3
	TG-03	10-20	Disturbed	Porcelain	Electrical Item	Insulator	1
	TI-08	10-20	Disturbed	Redware	Food/drink storage	Crock	1
Site subtotal							*7*
Pole #20	A02-90	10-20	Disturbed	Rhyolite	Chipping Debris	Flake	2
		20-30	B1	Rhyolite	Chipping Debris	Flake	1
	TO-06	10-20	Disturbed	Rhyolite	Chipping Debris	Flake	1
Site subtotal							*4*
Total							**11**

Appendix C

ARCHAEOLOGICAL SITE FORM FOR THE POLE #20 SITE

FORM D ARCHAEOLOGICAL SURVEY
PREHISTORIC ARCHAEOLOGICAL SITES

Massachusetts Historical Commission
Office of the Secretary
State House, Boston

FOR MHC OFFICE USE ONLY

Town
UTM
QUAD

MHC NO.

NR ☐ ACT ☐ ELIG. ☐ NO DISTRICT ☐ YES ☐ NO

IDENTIFICATION

1. SITE NAME(S) Pole #20 Site — MAS NO. — OTHER NO.

2. TOWN/CITY Barnstable — COUNTY

3. STREET AND NUMBER (IF NOT AVAILABLE, GIVE DETAILED DESCRIPTION OF HOW TO REACH SITE)
On NSTAR easement, west of Mary Dunn Road

4. OWNER(S) AND ADDRESS(ES) NSTAR
☐ Public ☑ Private

5. SITE LOCATED BY
☑ CRM Survey ☐ Avocational Collector ☐ Field Schoo ☐ Other (Specify)
Describe Sampling Strategy used to Locate Site Linear test pit transect at 10 meter intervals

DESCRIPTION

6a. PERIOD(S) (Check all applicable boxes
☐ Paleo ☐ Early Woodland ☐ Contact
☐ Early Archaic ☐ Middle Woodland ☑ Unknown
☐ Middle Archaic ☐ Late Woodland ☐ Other (Specify)
☐ Late Archaic

☐ Single Component ☐ Multi-Component
Specify All Components

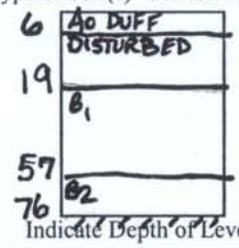
6b. Estimated Occupation Range

7. DATING METHODS
C-14 ☐ Intuition ☐ Other (specify)
Comparative Materials

8. DESCRIBE SITE TYPE / FUNCTION Unknown

9. DESCRIBE SIZE AND HORIZONTAL AND VERTICAL BOUNDARIES
Unknown

10. GENERALIZED SITE PROFILE
Type of Soil(s) Cultural Material



0-10 NCM
10-20 (2) Rhyolite cd
20-30 (1) Rhyolite cd
30-76 NCM

Indicate Depth of Levels

ENVIRONMENT

11. SOIL
USDA Soil Serie: Plymouth-Barnstable complex
Contour Elevation: 75 ft asl
% Slope of Ground: ☑ 0 - 5 ☐ 5 - 15 ☐ 15 - 25 ☐ Over 25
Acidity: 1 —— 7 —— 14 (Acid) (Base)

12. TOPOGRAPHY
☐ Flat ☐ Gentle undulation ☐ Other
☑ Rolling Hill ☐ Mountains

13. WATER
NEAREST WATER SOURCE: Flax Pond
SIZE AND SPEED: Pond
DISTANCE FROM SITE: 1930 ft
SEASONAL AVAILABILITY: year round

14. VEGETATION
PRESENT: Low scrub, in electrical easement
PAST: Unknown

CONDITION

15. SITE INTEGRITY
☐ Undisturbed ☐ Good ☑ Fair ☐ Destroyed

IF DISTURBED, DESCRIBE DISTURBANCE
Top 20-30 cm heavily disturbed, sometimes overburden above intact soils

16. SURROUNDING ENVIRONMENT
☑ Open Land ☑ Woodland ☐ Eroded Soil ☑ Residential ☐ Scattered Buildings Visible from Site
☐ Commercial ☐ Industrial ☐ Rural
☐ Coastal ☐ Isolated

17. ANY THREATS TO SITE DESCRIBE POTENTIAL THREATS
☐ Yes ☐ No

18. ACCESSIBILITY TO PUBLIC
☐ Free Access ☑ Need Owner Permission ☐ Restricted ☐ No Access

RESEARCH STATUS

19. PREVIOUS WORK		
☐ Surface Collecte	By Whom / Affiliation	Date
☐ "Pot hunted"	By Whom / Affiliation	Date
☑ Tested	By Whom / Affiliation PAL	Date Oct. 2003
☐ Excavation	By Whom / Affiliation	Date

20. PRESENT LOCATION OF MATERIALS (INCLUDE ADDRESS)

PAL, 210 Lonsdale Avenue, Pawtucket, RI 02860

21. REFERENCES / REPORT

SIGNIFICANCE

22. RECOVERED DATA (identify in DETAIL, including features, pits, burials, faunal material, etc.)

One piece of rhyolite chipping debris was recovered in test pit O-7, within disturbed soils at 10-20 centimeters below surface (cmbs). Two pieces of rhyolite chipping debris were recovered from Array 1-90° from 10-20 cmbs in disturbed soils. One piece of the same type of rhyolite chipping debris was recovered from Array 1-90° at 20-30 cmbs from intact B1 subsoils.

23. ARCHAEOLOGICAL OR HISTORICAL SIGNIFICANCE

The Pole #20 Site is located within a small flat area between a gentle slope up to the east and a steep slope up to the west. Examination of the soil profiles in the area revealed that the first 20-25 cm of soil has been disturbed. Partially intact B1 and B2 subsoils remain beneath the disturbed upper soil levels. A total of seven test pits was excavated within a ten-foot radius of the Pole #20 Site. No additional cultural material was recovered from the Pole #20 Site. No below-ground cultural features were identified during the fieldwork.

SITE PLAN

24. ATTACH PORTION OF USGS QUAD WITH SITE AREA MARKED TO THIS FORM

25. SKETCH PLAN OF SITE

See Attached Map

Scale:

26. PHOTOS: Attach if available
Label each with: Date of photo, photographer, view shown, name of site

REPORTED BY:	NAME Anna Graves	ADDRESS 210 Lonsdale Ave, Pawtucket, RI 02860	
	ORGANIZATION PAL		DATE 10/28/2003

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FIELD EVALUATION

COMMENTS

Figure 1. Location of the Pole #20 Site Terrestrial Alternative #1 Route, Barnstable, Ma.

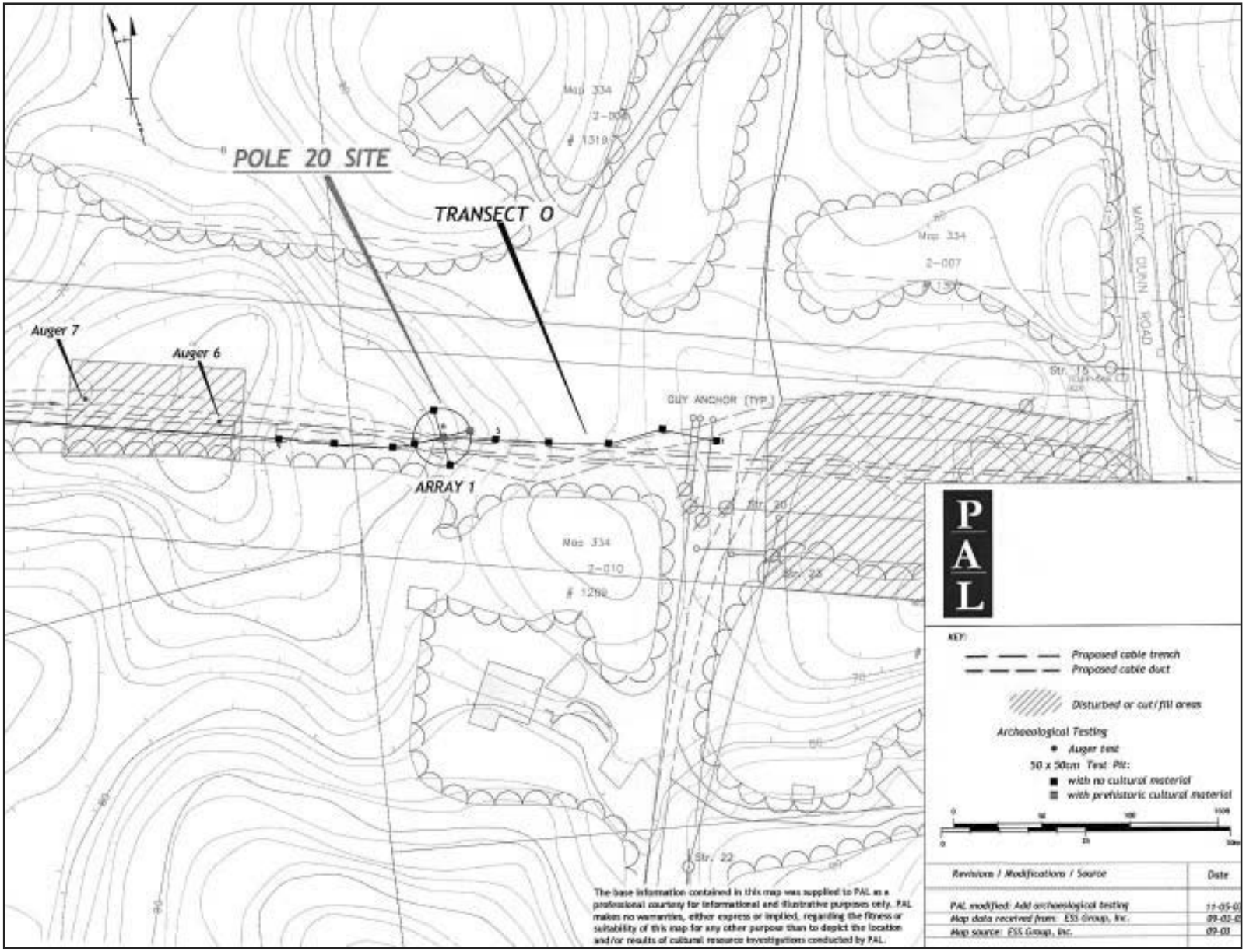

Figure 2. Detail map of the Pole #20 Site, with subsurface testing locations.

Appendix D

PROJECT CORRESPONDENCE

AP

RECEIVED
DEC 28 2001
MEPA

The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

December 24, 2001

12-28-01 A09:50 IN

Secretary Bob Durand
Attn.: MEPA Office
Executive Office of Environmental Affairs
251 Causeway Street, 9th Floor
Boston, MA 02114-2150

ATTN: Arthur Pugsley

RE: Cape Wind, Yarmouth, MA. MHC #RC.29785. EOEA #12643. ACOE File #199902477.

Dear Secretary Durand:

Staff of the Massachusetts Historical Commission have reviewed the expanded Environmental Notification Form (ENF) for the proposed project referenced above and have the following comments.

MHC understands that this project entails the installation of an array of 170 wind turbine generators on Horseshoe Shoal in Nantucket Sound, which will transmit electricity to the mainland via a submarine cable system that will interconnect with existing NSTAR electric transmission lines in Yarmouth, or alternatively in Barnstable or Mashpee. MHC also understands that prior to the construction of the wind park that the project proponent intends to build a pile-supported scientific measuring tower on Horseshoe Shoal.

Undisturbed portions of the preferred project area and project area alternatives are archaeologically sensitive and are likely to contain historic and archaeological sites associated with the ancient Native American and historic-period occupation of Yarmouth, Barnstable, and Mashpee. The areas' archaeological sensitivities are determined by their favorable environmental characteristics including areas of well-drained soils and relatively level terrain, proximity to natural features such as water bodies (e.g. Lewis Bay, Nantucket Sound, Popponsset Bay), and cultural features such as known archaeological sites.

Underwater portions of the project area are also considered archaeologically sensitive. Both heretofore unknown shipwrecks and drowned ancient Native American sites may exist within the wind park and along the underwater cable routes. The Massachusetts Board of Underwater Archaeological Resources (MBUAR) has identified several shipwrecks in the general area, however the exact locations of shipwrecks are difficult to pinpoint without conducting underwater surveys. MHC understands that a marine geophysical survey was conducted within the turbine array location and along the proposed cable route during the summer of 2001. The project proponent should be aware that this data may not be sufficient as an underwater survey designed to locate archaeological resources. Such surveys are usually designed in consultation with a marine

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archaeologist before data is collected in order to ensure that adequate coverage is provided to discover any potentially significant archaeological resources.

MHC requests that an archaeological reconnaissance survey be conducted for the terrestrial and underwater portions of the project areas. The purpose of the reconnaissance survey is to identify archaeologically sensitive areas within the project area that will require further testing to locate and identify any important archaeological resources that they may contain. The archaeological sensitivity of these areas is assessed on the basis of an in-depth study of land and water-use history, current conditions, proposed plans, and proximity to favorable environmental characteristics and known archaeological sites. Specific portions of the project area may be recommended for archaeological testing. MHC additionally recommends that the project proponent consult with a marine archaeologist, MBUAR, and the MHC to plan additional underwater survey if the current data are determined to be insufficient for the purposes of identifying significant underwater archaeological sites. We look forward to seeing the results of the underwater survey in the reconnaissance report.

If they have not already done so, the project proponents should also contact the Wampanoag Tribe of Gay Head (Aquinnah), and the Mashpee Wampanoag Tribal Council, Inc.

The proposed project location is also within close proximity to the following historic resources that are listed in the State and National Registers of Historic Places: Cotuit, Wianno, Centerville, Craigville, Hyannis Port historic districts in Barnstable; South Yarmouth / Bass River Historic District in Yarmouth; Monomy Point Light in Chatham; Edgartown Village Historic District, Cape Pogue Light, and Edgartown Harbor Lighthouse in Edgartown, Martha's Vineyard; Martha's Vineyard Campground Historic District and East Chop Light in Oak Bluffs, Martha's Vineyard; Nantucket Island National Historic Landmark, including Nantucket Village, Crooked Record, Monomy and Wocuwinet areas and properties along the Nantucket Cliffs. In addition Tuckernuck Island is included in MHC's Inventory of Historic and Archaeological Assets of the Commonwealth and listed in the State Register of Historic Places.

The preferred overland cable route falls within close proximity to three clusters of buildings that are included in MHC's Inventory of Historic and Archaeological Assets of the Commonwealth and near the Yarmouth Campground Historic District, a district that is listed in the State and National Registers of Historic Places. The Hyannis alternate overland route is partially within the Hyannis Main Street Waterfront Historic District, a district that is listed in the State Register of Historic Places. The Cotuit alternate overland route follows Main Street within the Cotuit Historic District, a district listed in the State and National Registers of Historic Places.

The MHC requests that a visual assessment study be conducted in order to evaluate the visual effects of the project on the character and setting of the historic resources referenced above. At a minimum, the visual assessment study should include: a map that clearly indicates the location of the above listed historic resources relative to the proposed project area, including the distances from the project area to these historic resources. The MHC also requests that additional photographic simulations be taken from multiple locations within and at the edges of the above listed historic resources, showing both day and night and lighting conditions. Please also submit photographic simulations looking from within the project area to these land areas.

In addition, the MHC requests the opportunity to review current original photographs of the three clusters of buildings identified along the preferred overland cable route in order to determine National Register eligibility (36 CFR 60). Photographs should include images of the buildings themselves and context

views of the buildings in their surroundings. Please label and key the photographs to sketch maps indicating the direction of the photographs.

These comments are offered to assist in compliance with Section 106 of the National Historic Preservation Act of 1966 as amended (36 CFR 800), Massachusetts General Laws, Chapter 9, Sections 26-27C as amended by Chapter 254 of the Acts of 1988 (950 CMR 71), and MEPA (301 CMR 11). If you have any questions, please feel free to contact Stacey Wetstein, Preservation Planner, or Margo Muhl Davis, Archaeologist/Preservation Planer, at this office.

Sincerely,

Brona Simon

Brona Simon
State Archaeologist
Deputy State Historic Preservation Officer
Massachusetts Historical Commission

xc: Karen Kirk Adams, Chief, USACOE–NED–Regulatory
Kate Atwood, USACOE
John Silva, FAA
USCG, Rhode Island Office
DEP–SERO
MCZM
MHD–District 5
Phil Dascom, Cape Cod Commission
Victor Mastone, EOEA, Board of Underwater Archaeological Resources
Glen Marshall, Mashpee Wampanoag Tribal Council Inc.
Matthew Vanderhoop, THPO, WTGHA
Yarmouth Historical Commission
Mashpee Historical Commission
Barnstable Historical Commission
Nantucket Historical Commission
Edgartown Historical Commission
Oak Bluffs Historical Commission
Chatham Historical Commission

The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

June 20, 2002

Heather Rafferty Heater
Environmental Science Services, Inc.
888 Worcester Street, Suite 240
Wellesley, MA 02482

RE: Cape Wind, Yarmouth, MA. MHC #RC.29785. EOEA #12643. ACOE File #199902477.

Dear Ms. Heater:

Thank you for your inquiry regarding the proposed project referenced above. Staff of the Massachusetts Historical Commission have reviewed the information and have the following comments.

The preferred overland cable route (New Hampshire Avenue route) falls within close proximity to three clusters of buildings that are included in MHC's Inventory of Historic and Archaeological Assets of the Commonwealth and near the Yarmouth Campground Historic District, a district that is listed in the State and National Registers of Historic Places.

The MHC requests the opportunity to review current original photographs of the three clusters of buildings identified along the preferred overland cable route in order to determine National Register eligibility (36 CFR 60). Photographs should include images of the buildings themselves and context views of the buildings in their surroundings. Please label and key the photographs to sketch maps indicating the direction of the photographs. The MHC also requests more detailed drawings an plans of the proposed route.

Please note that in previous correspondence, MHC has also requested the following information, which is subject to compliance with Section 106 of the National Historic Preservation Act of 1966 as amended (36 CFR 800).

The MHC requested a visual assessment study be conducted in order to evaluate the visual effects of the project on the character and setting of the historic resources referenced in our December 24, 2001 letter to Secretary Durand. At a minimum, the visual assessment study should include: a map that clearly indicates the location of the above listed historic resources relative to the proposed project area, including the distances from the project area to these historic resources. The MHC also requested that additional photographic simulations be taken from multiple locations within and at the edges of the above listed historic resources, showing both day and night and lighting conditions. Please also submit photographic simulations looking from within the project area to these land areas.

With regard to archaeology, the MHC also requested that an archaeological reconnaissance survey be conducted for the underwater portions of the project area. The purpose of the reconnaissance survey is to identify archaeologically sensitive areas within the project area that will require further testing to locate and identify any important archaeological resources that they may contain. The archaeological sensitivity of these areas are assessed on the basis of an in-depth study of land and water-use history, current conditions,

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proposed plans, and proximity to favorable environmental characteristics and known archaeological sites. Specific portions of the project area may be recommended for additional archaeological evaluation. MHC additionally recommended that the project proponent consult with a marine archaeologist, Massachusetts Board of Underwater Archaeological Resources, and the MHC to evaluate the underwater data already collected, determine if it is sufficient for the purposes of identifying significant underwater archaeological sensitivity, and conduct additional survey if necessary. We look forward to reviewing the proposed research deign and methodology for the archaeological reconnaissance survey.

These comments are offered to assist in compliance with Section 106 of the National Historic Preservation Act of 1966 as amended (36 CFR 800), Massachusetts General Laws, Chapter 9, Sections 26-27C as amended by Chapter 254 of the Acts of 1988 (950 CMR 71), and MEPA (301 CMR 11). If you have any questions, please feel free to contact Margo Muhl Davis, Archaeologist/Preservation Planner, or Stacey Wetstein, Preservation Planner, at this office.

Sincerely,

Brona Simon

Brona Simon
State Archaeologist
Deputy State Historic Preservation Officer
Massachusetts Historical Commission

xc: Crystal Gardner, Chief, USACOE–NED–Regulatory
Kate Atwood, USACOE
John Silva, FAA
USCG, Rhode Island Office
Secretary Bob Durand, EOEA, Attn.: Arthur Pugsley, MEPA Unit
DEP–SERO
MCZM
MHD–District 5
Phil Dascom, Cape Cod Commission
Victor Mastone, EOEA, Board of Underwater Archaeological Resources
Glen Marshall, Mashpee Wampanoag Tribal Council Inc.
Laurie Perry, Interim THPO, WTGHA
Yarmouth Historical Commission
Mashpee Historical Commission
Barnstable Historical Commission
Nantucket Historical Commission
Edgartown Historical Commission
Oak Bluffs Historical Commission
Chatham Historical Commission

The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

PERMIT TO CONDUCT ARCHAEOLOGICAL FIELD INVESTIGATION

Permit Number 2246 Date of Issue March 28, 2003
Expiration Date March 28, 2004

PAL is hereby authorized to conduct an archaeological field investigation pursuant to Section 27C of Chapter 9 of General Laws and according to the regulations outlined in 950 CMR 70.00.

Cape Wind Terrestrial Alternatives #1 & #2, Barnstable, Mashpee, Yarmouth
Project Location

Brona Simon

Brona Simon, State Archaeologist
Massachusetts Historical Commission

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The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

PERMIT TO CONDUCT ARCHAEOLOGICAL FIELD INVESTIGATION

Permit Number 2595 Date of Issue September 23, 2003
Expiration Date September 23, 2004

PAL is hereby authorized to conduct an archaeological field investigation pursuant to Section 27C of Chapter 9 of General Laws and according to the regulations outlined in 950 CMR 70.00.

Cape Wind Energy Alternative #1, Barnstable & Yarmouth
Project Location

Brona Simon

Brona Simon, State Archaeologist
Massachusetts Historical Commission

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The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

December 15, 2003

Christine A. Godfrey
Chief, Regulatory Division
US Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

ATTN.: Karen Kirk Adams

RE: Cape Wind Energy Project, Barnstable and Yarmouth, MA. PAL #1485.01. MHC #RC.29785. COE #199902477.

Dear Ms. Godfrey:

Staff of the Massachusetts Historical Commission have reviewed the technical management memorandum prepared by the PAL, reporting on the results of the intensive (locational) archaeological survey of the terrestrial (overland) Cape Wind Alternative #1 route for the construction of underground utilities. Cape Wind Alternative #1 begins at Lewis Bay in Yarmouth, and then continues north and then west to the NSTAR Barnstable Switching Station in Barnstable. MHC looks forward to receiving from the PAL two (2) copies of the final report, an original MHC site form (D-PHST), and a diskette with the report bibliographic data and archaeological abstract.

The archaeological investigations located one ancient Native American archaeological site called the Pole #20 Site. The site consists of a low-density deposit of rhyolite chipping debris (the byproduct of stone tool manufacture or maintenance). Three of the four pieces of chipping debris were located in disturbed soils. These artifacts are not diagnostic of any particular time period or archaeological tradition. Because the archaeological site does not have integrity and lacks research value, it does not meet the Criteria of Eligibility (36 CFR 60) for listing in the National Register of Historic Places.

MHC concurs with the report recommendations that no further archaeological investigations of the terrestrial Cape Wind Alternative #1utilities route, as it is presently planned, is required. If the project route changes, scaled project plans with the changes to the impact area highlighted should be submitted to the MHC for review and comment.

These comments are offered to assist in compliance with Section 106 of the National Historic Preservation Act of 1966 as amended (36 CFR 800), the Secretary of Interior's Standards and Guidelines for Archeology and Historic Preservation (48 Fed. Reg. 190 (1983)), MGL c. 9, ss. 26-27C (950 CMR 70-71), and MEPA (301 CMR 11). Please contact Edward L. Bell of my staff if you have any questions.

Sincerely,

Brona Simon

Brona Simon
State Archaeologist
Deputy State Historic Preservation Officer
Massachusetts Historical Commission

xc:
Kathleen Atwood, USACOE
Terry Orr, ESS Group Inc.
Deborah Cox, PAL

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