CONTAINS PRIVILEGED INFORMATION - DO NOT RELEASE

TECHNICAL REPORT

PHASE IB ARCHAEOLOGICAL IDENTIFICATION SURVEY
TRACT NO. RCH-4:
PORT AUTHORITY OF NEW YORK AND NEW JERSEY PROPERTY
NEW JERSEY-NEW YORK EXPANSION PROJECT
STATEN ISLAND, RICHMOND COUNTY, NEW YORK

TEXAS EASTERN TRANSMISSION, LP
New Jersey-New York Expansion Project
FERC Docket #CP11-56-000

Ora Elquist
Erin Timms
Suzanne Cherau

Submitted to:

Spectra Energy Transmission, LLC
150 Warren Street
Jersey City, New Jersey 07304

Submitted by:

The Public Archaeology Laboratory, Inc.
26 Main Street
Pawtucket, Rhode Island 02860

PAL Report No. 2367.04 October 2012

PAL Publications

CARTOGRAPHERS
Dana M. Richardi/Jane Miller

GIS SPECIALIST
Jane Miller

GRAPHIC DESIGN/PAGE LAYOUT SPECIALISTS
Alytheia M. Laughlin/Gail M. Van Dyke

MANAGEMENT SUMMARY

SHPO Project Review Number: OPRHP File No. 09PR05949

Involved State and Federal Agencies: FERC

Phase of Survey: IB (subsurface machine-assisted testing)

LOCATION INFORMATION

Location: Port Authority of New York and New Jersey property along Western Avenue
Minor Civil Division: New York City – Borough of Staten Island
County: Richmond

SURVEY AREA

Length: 46 meters (m) (150 feet (ft)
Depth: maximum 460 cm (15.1 ft)
Width: 15 meters (m) (50 ft)
Number of Acres Surveyed: Approximately .07 hectares (.17 acres)
Number of Square Meters & Feet Excavated (Phase II, Phase III only): N/A
Percentage of the Site Excavated (Phase II, Phase III only): N/A

USGS 7.5 Minute Quadrangle Map: Elizabeth, NJ

Archaeological Survey Overview

Number & Interval of Shovel Tests:
Number & Size of Units:
Number & Size of Machine Trenches: 2 (ca. 2.5-x-4.5-m [8-x-15-ft.])
Width of Plowed Strips: N/A
Surface Survey Transect Interval: N/A

Results of Archaeological Survey

Number & name of prehistoric sites identified: 0
Number & name of historic sites identified: 0
Number & name of sites recommended for Phase II/Avoidance: 0

Report Authors: Ora Elquist, Erin Timms, Suzanne Cherau

Date of Report: October 2012

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER ONE

INTRODUCTION

Spectra Energy Corp (Spectra Energy) is proposing to expand its pipeline systems in the New Jersey-New York region to meet the immediate and future demand for natural gas in the largest United States metropolitan area. The New Jersey-New York Expansion Project (NJ-NY Project) will create a new transportation path for 800,000 decatherms per day (Dth/d) of natural gas from multiple receipt points on the Spectra Energy systems to new delivery points in New Jersey and New York. The Project consists of approximately 19.8 miles of multi-diameter pipeline, associated pipeline support facilities, and six new metering and regulating (M&R) stations. The proposed facilities are located in New Jersey, New York, and Connecticut (Figure 1-1).

The Public Archaeology Laboratory, Inc. (PAL) performed Phase IB archaeological identification investigations (machine-assisted deep testing) along a section of the Project pipeline route in Staten Island, New York, on property owned by the Port Authority of New York and New Jersey (PANYNJ) (Tract No. RCH-4) (Figure 1-2). This report presents the results of the Phase IB investigations.

Scope and Authority

The Spectra Energy NJ-NY Project requires approvals and permits from federal, state, and local entities. One of the primary Project approval requirements at the federal level is a Certificate of Public Convenience and Necessity under Section 7(c) of the Natural Gas Act issued by the Federal Energy Regulatory Commission (FERC). Consequently, the Project is being reviewed under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. Prior to authorizing an undertaking (e.g., the issuance of a FERC approval or Certificate), Section 106 of the NHPA requires federal agencies, including the FERC, to take into account the effect of that undertaking on cultural resources listed or eligible for listing in the National Register of Historic Places (36 CFR §60). The agency must also afford the Advisory Council on Historic Preservation (ACHP) the opportunity to comment on the undertaking. The Section 106 process is coordinated at the state level by the State Historic Preservation Officer (SHPO), represented in New York by the Office of Parks, Recreation, and Historic Preservation (OPRHP). The issuance of a federal agency certificate or approval depends, in part, on obtaining comments from the New York SHPO. In accordance with Section 106, FERC, as the lead federal agency for the Project, must consult with the SHPO regarding the effects of the Project on historic properties.

The primary goals of cultural resource investigations conducted as part of the Section 106 review process are to:

- locate, document, and evaluate buildings, structures, objects, landscapes, and archaeological sites that are listed, or eligible for listing, in the National Register of Historic Places (National Register);
- assess potential impacts of the project on those resources; and
- provide recommendations for subsequent treatment, if necessary, to assist with compliance with Section 106.

In addition to Section 106, the additional cultural resources investigation will be conducted for this portion of the Project in accordance with FERC's Office of Energy Project's *Guidelines for Reporting on Cultural Resources Investigations* (2002); the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation* (NPS, 48 Fed. Reg. 44716-42, Sept. 29, 1983); the standards and guidelines set forth in *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State* (New York Archaeological Council [NYAC] 1994) adopted by the OPRHP; and the standards and guidelines set forth in *Landmarks Preservation Commission Guidelines for Archaeological Work in New York City* (LPC 2002). Because of the sensitive nature of some of the material contained in this report, the covers and any applicable pages are

labeled "CONTAINS PRIVILEGED INFORMATION – DO NOT RELEASE" in accordance with FERC guidelines and 36 CFR 800.11(c)(1).

Project Area of Potential Effect

The area of potential effect (APE) is the "geographic area or areas within which an undertaking may directly or indirectly cause changes in the character of or use of historical properties, if any such properties exist" (36 CFR 800.16[d]). The APE is defined based upon the *potential* for effect, which may differ for aboveground resources (historic structures and landscapes) and subsurface resources (archaeological sites). The APE includes all areas where ground disturbances are proposed, where land use (i.e., traffic patterns, drainages, etc.) may change, or any locations from which the undertaking may be visible. For archaeological resources associated with the pipeline component of the Project, the APE consists of any areas of ground disturbance for the proposed pipeline trench and associated temporary workspace.

The portion of the Project pipeline route subjected to Phase IB archaeological survey consists of an approximately 150-foot (ft) long section of proposed pipeline in Staten Island, New York on property (Tract No. RCH-4) owned by the PANYNJ. The PANYNJ property lies along the east side of Western Avenue between Richmond Terrace to the north and Goethals Road North to the south. Proposed facilities in this portion of the Project area consists of open-cut construction of new 30-inch diameter pipeline between approximately Station Number (STA) 252+50 and 254+00 (Figure 1-3). The Project's APE for this area includes a pipeline trench temporary workspace corridor measuring 50 ft wide and two bore pits for railroad crossings. The APE also includes two bore pits for the Conrail railroad crossings, one that measures 80 by 20 ft and the other that measures 60 by 20 ft (Figure 1-4). In general, the horizontal APE for the proposed pipeline trench is anticipated to be a maximum of 4.5 m (15 ft) at the top and 3 m (10 ft) wide at the bottom. The vertical APE in this segment of the pipeline trench route ranges from 12-14 ft at the locations of the two bore pits for the railroad crossings (STA 252+75 and STA 254+00) to 7 ft in the grassy area between the railroad crossings (see Figure 1-3).

Project History

The previous Phase IA level archaeological overview survey for the New York portion of the Project area (December 2010 Filing) assessed the vicinity present Project area as containing high sensitivity for pre-contact resources given the presence of the previously documented Mariner's Harbor Site area (Boesch 1994: No. 105; STD-MH), Old Place Site (A08501.0134 and A08501.2366), Site 8505 (NYSM site files). Skinner additionally noted finds of projectile points (possibly related to Site 8505) along Western Avenue (Skinner 1898-1909). The area was also assessed as possessing low sensitivity for post-contact resources (Elquist et al. 2010:79-82). Additional investigations in the form of geoarchaeological soil borings were recommended (Elquist et al. 2010:82). In comment letters regarding the December 2010 filing technical report, the New York SHPO (Letter dated April 25, 2011) and the LPC (Letter dated Jan. 7, 2011) concurred with the December 2010 report assessment and recommendations for this area (Appendix A).

Subsequent to the December 2010 report, a reroute, designated Route Variation 58, resulted in moving the pipeline route about 200 ft to the east of the December 2010 FERC filing route. This route variation extends from approximately STA 248+50 to STA 255+50, although only the northern portion from STA 252+75 to STA 255+50 is on the Port Authority Property and included in this report. In an addendum to the December 2010 FERC filing report, this portion of Route Variation 58 was assessed as containing high sensitivity for pre-contact resources, and low sensitivity for post-contact resources, and PAL continued to recommend additional investigations in the form of geoarchaeological soil borings (Elquist and Cherau 2011a). Both the New York SHPO (Letter dated December 13, 2011) and LPC (Letter dated January 12, 2012) concurred with the addendum assessment and recommendations for Route Variation 58 (see Appendix A).

In April of 2012 two geoarchaeological soil borings (RCH-4-ARC-13 and RCH-4-ARC-14) were completed in the present Project area as part of a series of nine borings conducted along Western Avenue. The soil borings analysis and review indicated that sensitive pre-contact period strata were present in the vertical pipeline APE for the bore pits beginning at 320 centimeters below ground surface (cmbs) (10.5 ft) (GRA 2012). Since the bore pits will extend to depths of 366-427 cmbs (12-14 ft), Phase IB subsurface testing in the form of machine

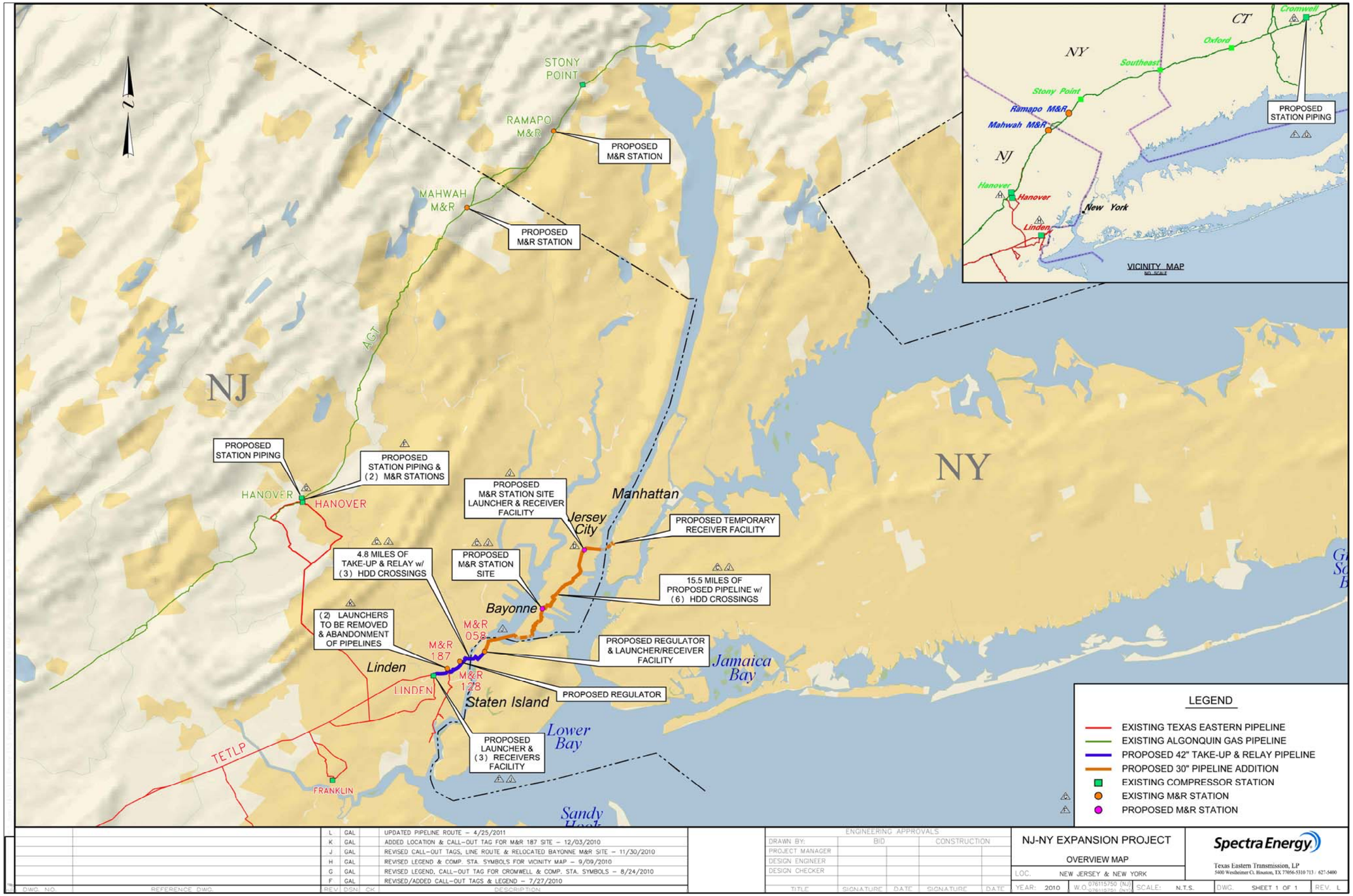


Figure 1-1. Overview map showing the various locations of the NJ-NY Project.

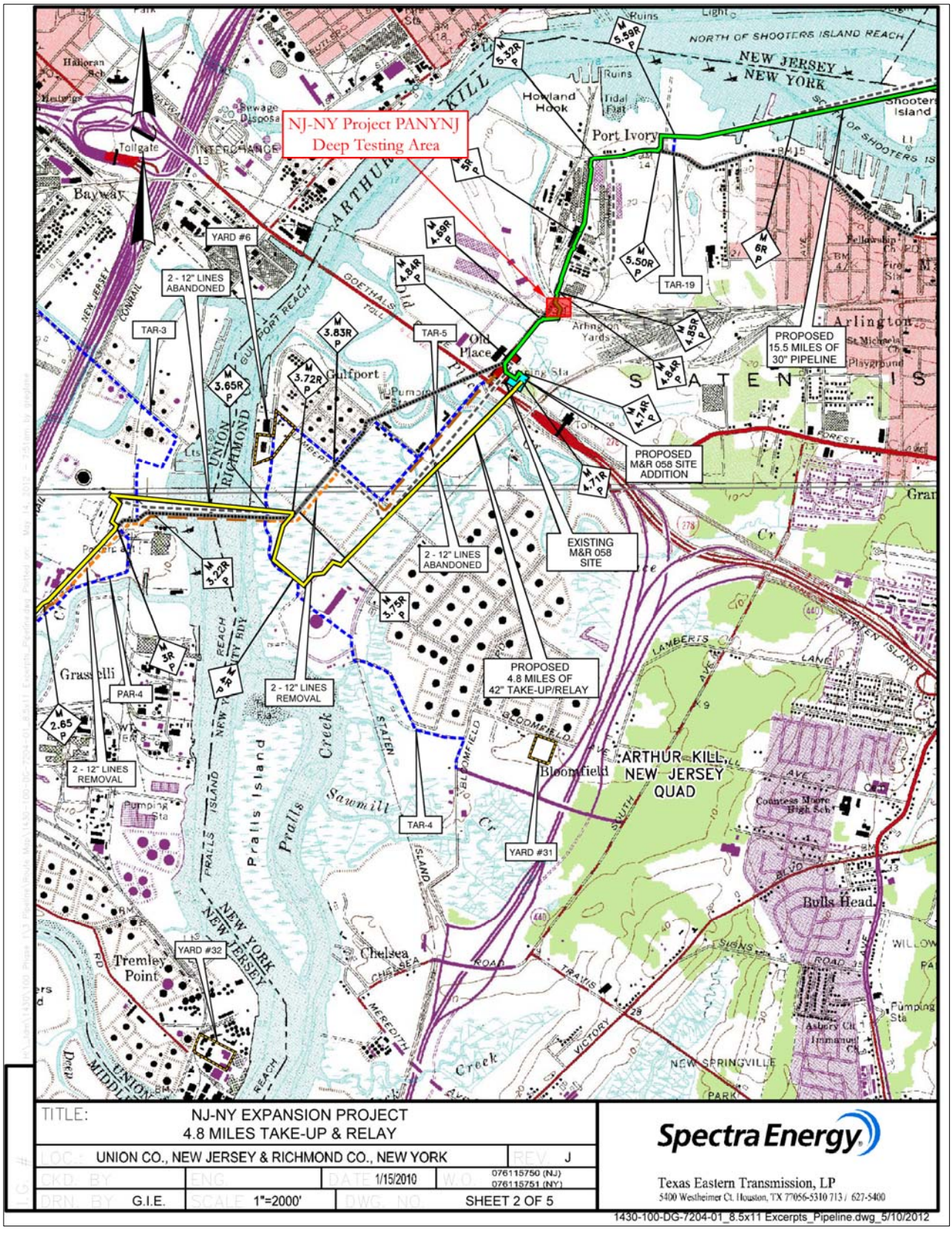


Figure 1-2. Location of the Phase IB archaeological testing on the Elizabeth, New Jersey USGS topographic quadrangle.

trenches was recommended. No subsurface testing was recommended in the open grassy area between the bore pits since archaeologically sensitive strata are situated below the 213 cm (7 ft) vertical APE in this portion of the pipeline route (Cherau 2012). Both the New York SHPO (Letter dated June 21, 2012) and LPC (Letter dated June 1, 2012) concurred with the assessment and recommendations made by PAL in the geoarchaeological boring report (see Appendix A).

Project Personnel

PAL personnel involved in the Phase IB investigations include Deborah C. Cox and Gregory R. Dubell (project managers), and Suzanne Cherau (principal investigator). Erin Timms and Ora Elquist (project archaeologists) supervised the field investigations, and Mellissa Wales, Amelia Bidwell, Sarah Sportman and Caitlin Lackett (archaeologists) assisted with archaeological field investigations. All PAL Project personnel meet the qualifications set by the National Park Service (36 CFR Part 66, Appendix C). Laboratory processing and analysis was performed under the supervision of Heather Olsen, laboratory supervisor.

Disposition of Project Materials

All Project materials (e.g. artifacts, field notes, maps, photographs and copies of the report) are currently on file at PAL, 210 Lonsdale Avenue, Pawtucket, Rhode Island. PAL will consult with the New York SHPO and LPC to determine a final location for disposition of Project materials.

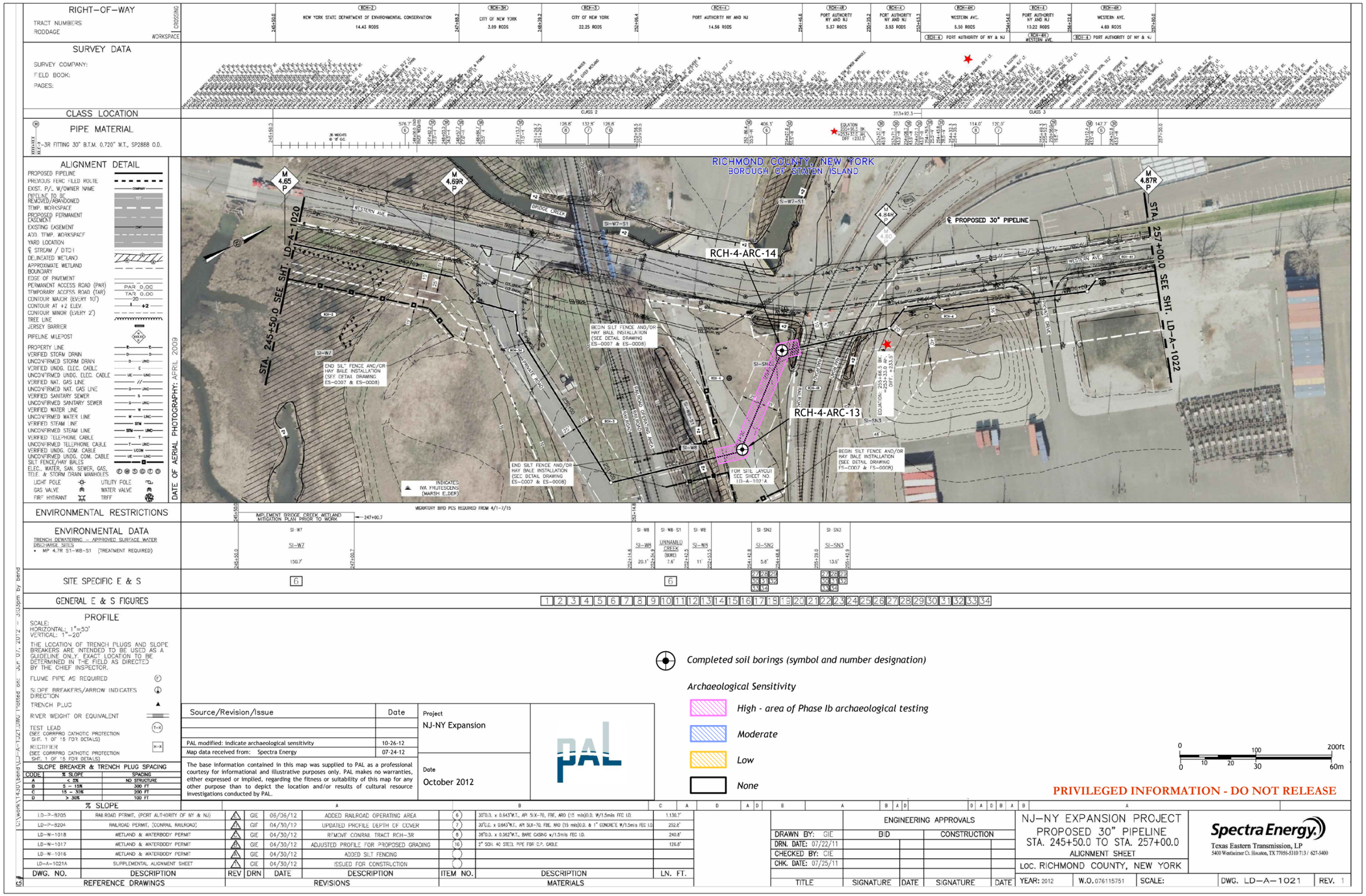


Figure 1-3. Alignment sheet (LD-A-1021) showing the area of Phase IB testing along the PANYNJ Project area (Tract No. RCH-4).

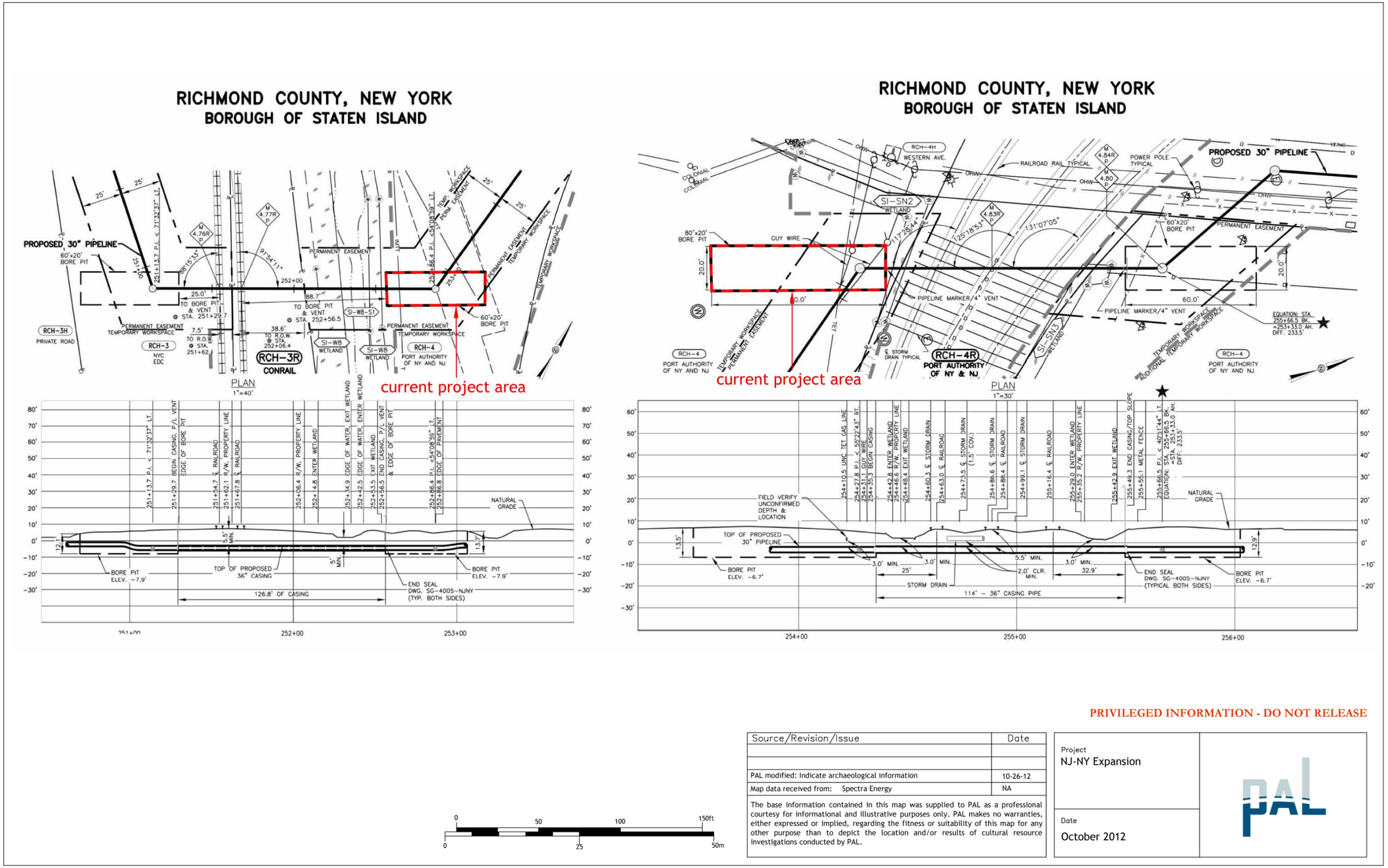


Figure 1-4. Project Railroad Permits sheets (LD-P-8200A and LD-P-8200B) showing the proposed pipeline bore pits in the area of Phase IB testing along the PANYNJ Project area.

CHAPTER TWO

METHODOLOGY

The goal of the archaeological investigations of the PANYNJ Project area was to locate and identify any cultural resources potentially eligible for listing in the State or National Registers of Historic Places (National Register). The archival research and field inspection performed during the Phase IA level archaeological overview survey provided the information necessary to develop environmental and historic contexts for the project area and develop a predictive model for archaeological sensitivity of this portion of the Project pipeline APE. Archaeological sensitivity is defined as the likelihood for belowground cultural resources to be present and is based on various categories of information. These categories include:

- locational, functional, and temporal characteristics of previously identified cultural resources in the project area or vicinity; and

- local and regional environmental data reviewed in conjunction with existing project area conditions documented during the walkover survey, and archival research about the project area's land use history.

This chapter also includes a description of the methods used during field activities. The results of the Phase IB field investigations are discussed in Chapter 5.

Evaluating Significance and Historic Contexts

The different phases of archaeological investigation reflect preservation planning standards for the identification, evaluation, registration, and treatment of cultural resources (National Park Service [NPS] 1983). This planning structure is based on the eligibility of cultural resources for inclusion in the National Register. The National Register is the official federal list of properties that meet the criteria for historic significance. The results of a Phase IB survey and Phase II site examination are used to make recommendations about the significance and National Register eligibility of any resource.

The standards used to determine the significance of cultural resources, a task required of federal agencies, have been 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, archaeology, 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;

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

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 (36 CFR 60.4).

Most archaeological sites listed in the National Register 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 1990:14–15). 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 1990:15).

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

> A historic context is a body of thematically, geographically, and temporally linked information. For an archaeological property, the historic context is the analytical framework within which the property's importance can be understood and to which an archaeological study is likely to contribute important information (Little et al. 2000).

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 developed during the Phase IA level archaeological overview survey for the Project to organize the data relating to the pre- and post-contact period cultural resources identified within the present project area in Staten Island, New York:

1. Pre-contact land use and settlement within the Lower Hudson River valley region and drainage, circa (ca.) 12,500 to 300 years before present (B.P.); and

2. Historic land use and settlement patterns in Staten Island, ca. A.D. 1650 to present.

The historic contexts are discussed in detail in Chapter 4. The potential research value of the known and expected archaeological resources identified within the Project APE is evaluated in terms of these historic contexts.

Archaeological Sensitivity

Archival research and a walkover survey conducted as part of the Phase IA level archaeological overview survey (Elquist et al. 2010) were used to develop a sensitivity assessment and predictive model of potential cultural resources for the NJ-NY Expansion Project area that includes the PANYNJ Project area. Archival research included an examination of primary and secondary documentary sources. These sources include written and cartographic documents relating both to past and present environmental conditions as well as documented/recorded sites in the

general project vicinity. Specific sources reviewed as part of the archival research include New York SHPO State Site Files (which includes sites listed in the inventories maintained by the New York State Museum and the American Museum of Natural History as well as resources listed in or eligible for listing in the National Register of Historic Places), cultural resource management (CRM) reports, regional archaeological studies, environmental studies, primary and secondary histories, and historical maps and atlases. Reviewed reports for CRM investigations conducted in the general vicinity of the PANYNJ Project area are summarized in Table 2-1. A list of historical maps consulted that include the project area is provided in Table 2-2.

Table 2-1. List of Cultural Resource Management Reports Consulted as Part of Archival Research.

SHPO # or other Designation	Author/Year	Title
LPC 665	Boesch 1994	Archaeological Evaluation and Sensitivity Assessment of Staten Island, New York
LPC 684	Geoarcheology Research Associates 1997	Staten Island Bridges Program- Modernization and Capacity Enhancement Project, Goethals Bridge Phase 1B/3 Geomorphological Analysis Report on Coring and Additional Radiocarbon Dating.
LPC 721	Hartgen Archeological Associates, Inc. 1995	Report of Archaeological Potential, Goethals Bridge Expansion, Staten Island Bridges Program, Richmond County, New York and Union County, New Jersey.
LPC 722	Hartgen Archeological Associates, Inc. 2002	Phase IA Literature Review and Archeological Sensitivity Assessment, Cross Harbor Freight Movement Project, Port Ivory Yard, Arlington Yard, Eleven Railroad Crossings and Proposed Tunnel, Staten Island, Richmond County, New York
LPC 728	Kardas and Larrabee 1982	Archaeological Field Survey of the Foreign Trade Zone Project at Howland Hook, Staten Island, New York
LPC 735	Kearns, et al. 1991	The New York City Long Range Sludge Management Plan, Generic Environmental Impact Statement III, Proctor and Gamble, Staten Island, Phase 1A Archaeological Assessment
MAAR 1986	Payne and Baumgardt 1986	Howland Hook Marine Terminal Expansion Cultural Resources Reconnaissance
Goethals Bridge EIS	The Louis Berger Group 2007, and others	Goethals Bridge Replacement, Richmond County, New York and The City of Elizabeth, Union County, New Jersey.
Cross Harbor EIS	New York City Economic Development Corporations (NYCEDC) 2004	Cross Harbor Freight Movement Project, Draft Environmental Impact Statement

Phase IB Archaeological Testing

Two machine-assisted trenches, each measuring 2.5 meters (m) (8 ft) wide by 4.5 m (15 ft) long, were placed at the boring pit locations for railroad crossings where the vertical APE extends to archaeologically sensitive sediments as identified in the geoarchaeological soil borings. The trenches were proposed to extend to at least 320 cmbs (10.5 ft) to the extent possible (safety and ground water considerations) through the sensitive archaeological strata within the vertical bore pit APEs. MT-1 extended to 460 cmbs (15 ft) and MT-2 extended to 285 cmbs (9.4 ft); the latter was shallower because of the presence of an (unmarked) 12-inch diameter gas pipeline in the east part of the trench that posed safety considerations.

All trenches were excavated in accordance with Occupational Health and Safety Administration (OSHA) regulations for benching, sloping, and/or mechanical shoring devices at depths that exceed 3-4 ft. Dewatering of the trenches

Table 2-2. Cartographic Sources Reviewed for the PANYNJ Project Area.

Year	Author	Title	Publisher or Location
1776-1783	McMillen, Loring	A Map of Staten Island During the Revolution	Unknown, published 1933
1781	Taylor and Skinner	Map of New York and Staten Island and Part of Long Island	Staten Island Historical Society
1845	Hassler, F.R.	Map of New York Bay and Harbor and the environs	U.S. Coast Survey, Washington, DC
1850	Dripps, Matthew	Map of Staten Island or Richmond County	M. Dripps, New York
1853	Butler, James	Map of Staten Island or Richmond County, New York	James Butler
1860	Walling, H.F.	Map of the City of New-York and its Environs	S.D. Tilden, New York
1872	Dripps, M.	Map of Staten Island (Richmond County), New York	M. Dripps, New York
1874	Beers, J.B.	Map of Staten Island, Richmond County, New York	J.B. Beers & Co., New York
1887	Beers, J.B.	Atlas of Staten Island, Richmond County, New York	J.B. Beers & Co., New York
1891	Bien, Julius and C.C. Vermeule	Atlas of the Metropolitan District and Adjacent Country, engraved in 1890, based on U.S. Coast and Geoditic Survey	Julius Bien & Co., New York
1891	United States Geological Survey	Staten Island, New York quadrangle sheet	United States Geological Survey, Washington, D.C.
1896	Leng and Davis	Map of Staten Island, Ye Olde Names and Nicknames	Staten Island Museum
1907	Skene, Frederick	Map of Staten Island, Richmond County, New York Showing the Colonial Land Patents from 1668 to 1712.	Staten Island Museum, New York
1937	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro, Vol. 3	Sanborn Map Co., New York
1917	Bromley, G.W.	Atlas of Richmond County, New York	G.W. Bromley & Co., New York
1962	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro	Sanborn Map Co., New York
1981	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro	Sanborn Map Co., New York
1983	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro	Sanborn Map Co., New York
1986	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro	Sanborn Map Co., New York
1987	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro	Sanborn Map Co., New York
1988	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro	Sanborn Map Co., New York
1989	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro	Sanborn Map Co., New York
1990	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro	Sanborn Map Co., New York
1992	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro	Sanborn Map Co., New York
1993	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro	Sanborn Map Co., New York
1995	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro	Sanborn Map Co., New York
1996	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro	Sanborn Map Co., New York

was conducted as necessary. A combination of machine-assisted and shovel scraping techniques was used to investigate the nature and integrity of identified structural remains and cultural strata encountered in the trenches. All machine-excavated soils were examined for cultural materials and a 30 percent sample of these soils was hand screened through ¼-inch hardware mesh. Any cultural material (or a representative sample) remaining in the screen and collected from the excavated unscreened soils was bagged and tagged by trench and level. Soil stratigraphy was recorded for each machine trench that included measured plan and profile drawings. Cultural material and samples were bagged and labeled with provenience information. Digital photographs were taken of all trenching locations and any identified belowground cultural remains. All cultural remains were mapped in plan using compass and tape measure onto current existing conditions topographic site plans. Measured detailed drawings (plans, cross sections) were completed for any identified structural remains or features in the trenches. Coordinates of each trench location were taken using a Trimble submeter GPS unit.

Laboratory Processing and Analyses

Processing

Recovered cultural materials were brought back to the PAL laboratory facilities in Rhode Island on a weekly basis for processing and analyses. Cultural materials were first organized by provenience and then recorded and logged into the laboratory. Artifacts were the sorted by type and either dry brushed or cleaned with water depending on the material type and condition.

Cataloging

All cultural materials were cataloged using a customized computer program designed in Microsoft Access 2007. The program is a relational database, which provides the flexibility that is needed when cataloging archaeological collections that often contain disparate cultural materials such as stone, ceramics, and/or glass. Artifacts with similar morphological attributes are grouped into lots, which allows for faster and more efficient cataloging. The artifacts are stored in 2-millimeter thick polyethylene resealable bags with acid-free tags containing provenience identification information. The artifacts are placed in acid-free boxes that are labeled and temporarily stored in PAL's curatorial facility in accordance with current NPS standards.

No pre-contact lithic artifacts were recovered during the survey. Post-contact period artifacts were cataloged by material (e.g., ceramic, glass, coal, synthetic) and functional (e.g., plate, bowl, bottle, building material) categories. Artifacts having known dates of manufacture such as ceramics were also identified in terms of type (e.g., redware, pearlware, 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. Tentative dating of post-contact archaeological resources was performed using ceramic indices according to Hume (1969), Miller (1990, 1991), Miller and Hurry (1983), and South (1977). An analysis of the different nail and bottle types was used to refine the tentative date ranges of historic occupation generated by the ceramic assemblages.

Curation

All recovered cultural materials and related documentation (e.g., field forms and notes, maps, photographs, report) are organized and stored in acid-free Hollinger boxes with box content lists and labels printed on acid-free paper. These boxes will be temporarily stored at PAL according to curation guidelines established by the Secretary of Interior standards 36 CFR 79, as well as in accordance with *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State* (NYAC 1994) and LPC guidelines (2002) until such time as permanent repository can be determined in consultation with the New York SHPO and LPC.

CHAPTER THREE

ENVIRONMENTAL CONTEXT

The environmental context of a given area, including its geology, topography, hydrology, and natural resources, played an important role in influencing the settlement and land use of human populations in the past. This chapter presents an overview of the environmental setting of the lower Hudson Valley and New York Bay, with specific reference to the PANYNJ Project area. The overview focuses on local physiography, bedrock and surficial geology, soils, and hydrology.

Geology and Geomorphology

The Project area is situated in the northwest part of Staten Island within the Piedmont Lowland physiographic province, just west of the Atlantic Coastal Plain province (Figure 3-1). The area also lies along the eastern edge of the broad lowland known as the Newark basin that extends from Watchung Mountain on the west to the Hudson River on the east. The final Pleistocene glaciation, known as the Wisconsin Stage, occurred about 22,000 years ago. The glacier was largely confined to Canada and northern New York, but one lobe (the Hudson-Champlain Lobe of the Woodfordian ice sheet) expanded to New York Harbor at its maximum (Sirken and Bokuniewicz 2006). Over the next several thousand years, the slow advancing and rapid melting of the ice sheets depressed and shaped the land while scouring its surface and depositing debris. The most recent glacial advance scoured the Hudson valley to a depth of approximately 488–650 feet and glacial retreat yielded the deep U-shape trough characteristic of the Hudson River valley (Levinton and Waldman 2006).

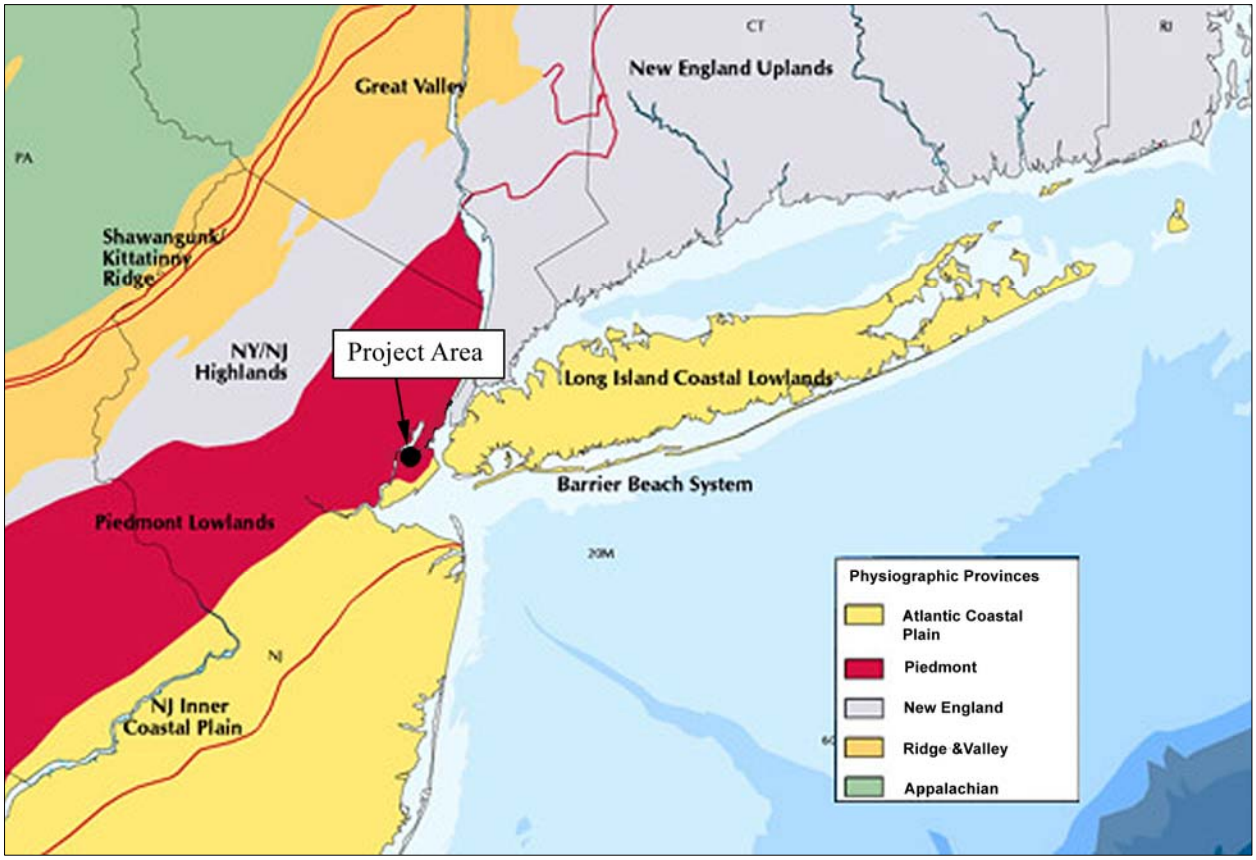


Figure 3-1. Map of physiographic provinces with the Project area (source: U.S. Fish and Wildlife Service [USFWS] 1997).

The maximum extent of the Hudson-Champlain Lobe is marked by the Harbor Hill terminal moraine, which traversed from near Perth Amboy across the New York Harbor area/Staten Island to the northern portion of western Long Island. By around 19,000 years ago, glacial meltwater lakes began to form behind the natural dams created by the Watchung Mountains, the Palisades, and the terminal moraines. The principal proglacial lakes in the region include the Hudson, Passaic, Hackensack, and Bayonne. The freshwater lakes covered much of the area for a period of approximately 2,500 years and deposited varved clay layers (Sanders 1974:24–25). The lakes appear to have rapidly drained toward the end of the glaciation. Catastrophic drainage of Lake Hackensack, which occupied the Hackensack Valley west of the Project area, breached the Harbor Hill moraine and established the Arthur Kill fluvial valley along the west side of Staten Island.

With the retreat of the massive ice sheet, land formerly covered by ice began to undergo isostatic rebound, accompanied by a rising sea level (Lewis 1997). It is estimated that at the glacial maximum, about 19,000 years ago, the world sea level was 400 to 460 ft lower than at present and the shoreline was about 100 to 120 miles from the Lower Hudson Harbor. As the glaciers melted, sea levels rose faster than the rate of glacial rebound, resulting in a marine transgression over time of the Hudson River valley.

The bedrock formation underlying the Project area consists of Early Jurassic period Palisades Diabase Sill (Trp) comprised of plagioclase feldspar, augite, and quartz (Pagano 1994). It occurs in a belt that stretches northeast to southwest in the northwest portion of western Staten Island, NY, adjacent to a belt of Lockatong Formation (Figure 3-2). Surficial geologic outcrops of limestone and other formations (e.g., Jacksonburg, Kittatinny, and Onandaga) located some 25 miles west of Staten Island are potential local sources of chert materials utilized by the former Native American inhabitants of the region as well as chert from farther up the Hudson Valley. Known sources of argillite also occur to the west in New Jersey. Small amounts of locally available brown jasper are also available on Staten Island (Rutsch 1970). Glacial moraine deposits in the form of cobbles and pebbles are also possible sources of lithic raw materials (Marshall 1982).

Figure 3-2. Bedrock geology map of Staten Island with the Project area (source: Dicken et al. 2008).

Hydrology

Staten Island is located along New York Bay, a tidal estuary at the mouth of the Hudson River. The Hudson River is a 315 mile river that flows from its headwaters in the Adirondack Mountains to its mouth in Upper New York Bay. The Hudson River is fed by 25 tributary rivers and creeks, its principal tributary being the Mohawk River. The lower half (more than 150 miles) of the river, south of Troy NY, is a tidally influenced estuary that flows through the Hudson Highlands, the Hudson lowlands, and the terminal moraine of the last glaciation at the narrows before reaching the Atlantic Ocean (Sirken and Bokuniewicz 2006).

The Hudson has been known by many names including *Muh-he-kun-ne-tuk*, (meaning "great waters in constant motion" or "the river that flows both ways") by the Iroquois, *Muhheakantuck* by the Lenape, the *Manhatees* by Henry Hudson, and officially *the River of Prince Mauritius* (of Nassau) by the Dutch (NYDEC 2009). The Hudson River was also named the North River by the Dutch in the 1700s, a name that continued to be used by inhabitants of New York until the early 1900s, and continues to be used by mariners. In 1664, the English applied the name Hudson, after the Englishman who explored the river in 1609 for the Dutch East India Company.

Geologically, the Hudson is sometimes referred to as a drowned river. During maximum draw-down at around 16,000 years ago, sea level was approximately 400 feet lower than present day and the mouth of the Hudson River was about 120 miles east of its present site extending to near the edge of the continental shelf (Boyle 1979). As the glaciers melted, waters filled the valley trough, dammed by glacial moraines (Geyer and Chant 2006). Rising sea levels that followed moraine collapse resulted in a marine incursion that drowned the coastal plain, including portions that contained the Hudson River channel. Estuarine conditions began to develop in the Hudson by approximately 12,000 years ago, reaching Manhattan by approximately 10,000 years ago (Sirken and Bokuniewicz 2006). At that time, currently submerged shoreline areas along Staten Island and the oyster ridge along the eastern coast of New Jersey would have been exposed land. By about 5,000–4,000 years ago, rising sea levels would have reached the edges of the shallow shoreline ridges and small salt marshes would have gradually formed in lowland areas. As rising sea levels gradually inundated the bay, between approximately 2,000 and 4,000 years ago, these ridges became first meadow and then marsh. This sequence was followed by the development of oyster bay habitat that typified the area in the early post-contact period. These oyster beds likely formed within the past 2,000 to 2,500 years (HRI 1993; Kardas and Larrabee 1976; Pousson 1986; Wolfe 1977).

Staten Island is bounded to the north and west by major stream channels (Arthur Kill and Kill Van Kull). Historically, the major stream channels of Upper New York Bay, including the Hudson have played an important role in New York City area commerce and transportation. The Kill Van Kull and the Arthur Kill are tidal straights. The name *kill* comes from the Dutch word *kille*, meaning riverbed or water channel. The Arthur Kill channel is approximately 10 miles long and connects Raritan Bay on its south end with Newark Bay at its north end. The Staten Island shoreline along the Arthur Kill is lined with salt marshes. The Arthur Kill channel was created when glacial Lake Hackensack breached the terminal moraine and catastrophically drained. The channel may have been the primary drainage in the region for a short period, during a time when the main channel of the Hudson was still blocked at the narrows by the moraine. The Kill Van Kull is an approximately 3-mile long channel that separates Staten Island from Bayonne, New Jersey. The channel connects Newark Bay with Upper New York Bay and, as passage for marine traffic between Manhattan and the industrial towns of New Jersey, is historically one of the most important channels for commerce in the region.

The PANYNJ Project area is lies north of Bridge Creek and associated wetlands. Bridge Creek drains to the northwest into the Kill Van Kull/ south end of Newark Bay near its juncture with the Arthur Kill. Other drainages include Old Place Creek south of the Project area which drains into the Arthur Kill to the west.

Soils

Soils at the PANYNJ Project area are mapped as Pavement &buildings-Windsor-Verrazano complex (Figure 3-3). This soils complex (Map unit 304) is typically found on 0-8 percent slopes, and consists of sandy outwash plains and dunes that have been partially filled for commercial and residential use. This soil contains a mixture of sandy outwash soils and loamy-capped anthropogenic soils with up to 80 percent of mapped area covered in pavement and buildings (NRCS 2005).

Vegetation and Fauna

Climate and vegetation in the northeast United States has exhibited significant variability since the last glacial maximum. Prior to 9,000 years ago, vegetation regimes are difficult to reconstruct as no modern analogs exist. However, based on the persistence of an abundance of sedges and grasses in paleoenvironmental records dating to between ca. 14,000 and 11,600 with tree pollen assemblages dominated by boreal species, the environment is interpreted as reflecting more open spruce-dominated parkland than that seen in modern, closed boreal forests (Davis 1969; Overpeck et al. 1992). Following the retreat of glaciers and attendant warming, pine began to increase

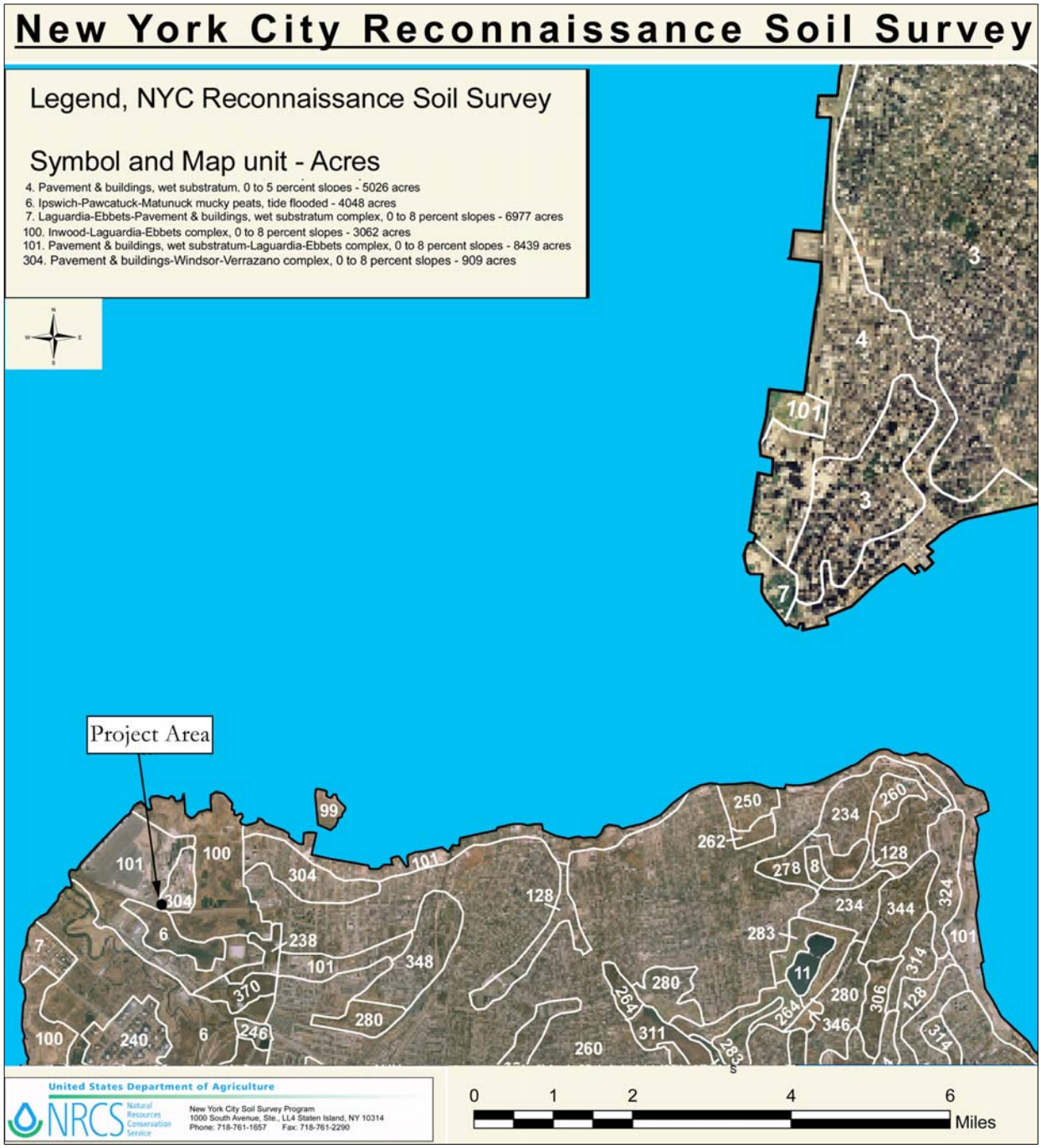


Figure 3-3. Soils map of Staten Island with the Project area (source: NRCS 2005).

at the expense of more cold tolerant species like spruce in the region, though the warming trend was temporarily reversed during two cooling periods between 13,000 and 8,000 years ago known as the Younger Dryas and "8.2kyr" events (Broecker et al. 1985, Shuman et al. 2002).

In southeastern New York, pine, spruce and sedges dominated an open landscape ca. 12,600 years ago after which a mixed boreal-temperate forest developed containing pine and spruce mixed with oak, ash, hornbeam and fir moving into the area (Maenza-Gmelch 1997). Pine and oak became increasingly abundant in the general region after 11,600 years ago and an aridity maximum was reached by 9,000 years ago (Shuman et al. 2004; Webb et al. 1993). Over time as conditions become warmer, vegetation changes on a regional scale reflect less abundant pine and increases

in oak, beech, and hemlock, though pine likely remained abundant on well-drained soils. Vegetation development after this time reflects the establishment of oak-dominated woods mixed with hickory, chestnut, beech and other deciduous trees that moved into the region from the south in successive expansions until forest composition resembled that of today ca. 2,000 years ago (Davis 1969; Webb et al. 1993). Subsequent climate and vegetation changes include the Medieval Warm period characterized by warm drought-like conditions in southeast New York where pollen records indicate an increase in pine and hickory at the expense of oak (Pederson et al. 2005). This was followed by a return to cooler and moister conditions known as the Little Ice Age reflected in the regional pollen data by increases in spruce and hemlock (Pederson et al. 2005). Fossil pollen records indicate declines in tree pollen throughout the region after European settlement due to impacts from logging, wood cutting, and agriculture.

Terrestrial faunal resources available for exploitation by pre-contact inhabitants of the region prior to the Holocene could have included big game such as caribou and elk, and megafauna species such as giant beaver, mammoth, and mastodon. Remains of both of these latter megafauna have been found on both Staten Island and nearby New Jersey (Boesch 1994). Finds from the Shawnee-Minisink Site in Pennsylvania suggest that people during this time could also have been utilizing other types of resources other than big game, such as waterfowl, fish, and plants (Kauffman and Dent 1982). Following the onset of warming after the glacial period, the "modern" suite of Holocene fauna was present in the area including deer, elk, bear, and turkey.

Habitats within the Hudson estuary, including mudflats and tidal marshes, support an enormous diversity of resources including waterfowl, fish, and shellfish (NYDEC 2009). Salt marshes were also an important source of salt hay collected by early Euro-American settlers for animal fodder. More than 200 species of fish are found in the Hudson River and its tributaries including striped bass, largemouth bass, sea sturgeon, bluefish, white perch, shad, and blue crab (Boyle 1979). Historically, the river supported immense populations of herring and sturgeon. Natural resources in the river and estuary were negatively affected by pollution; however, preservation efforts beginning in the late nineteenth century have helped to restore and protect the estuaries natural resources. Today, the Hudson River estuary is reportedly one of the healthiest in the world (NYDEC 2009).

The large underwater reef on the Jersey side of the Harbor was historically one of the largest oyster beds in the world and was a staple of Native American diet as well as the Dutch and other European groups that followed, until the end of the nineteenth century. The area was called Oyster Bay in the early post-contact period because of the large population of oysters (*Crassostrea virginica*) that grew in the waters of the shallow bay. Hard clams, blue mussel and other mollusks were also likely to be present in the area (Pousson 1986:10). The oyster beds were finally closed in the early twentieth century due to over-harvesting and pollution (Kardas and Larabee 1978).

Existing Conditions

The project area consists of an existing right-of-way for multiple underground utilities including Colonial and Texas Eastern Transmission, LP (TETLP) pipelines. The area is devoid of mature vegetation with two small grassy sections to the south and north and a paved road surface that transverses the project area from west to east (Figure 3-4). The project area is bound by Western Avenue to the west and two sections of converging Conrail rail lines and spurs to the north, east, and south (Figure 3-5). Nearby wetlands include Bridge Creek to the southwest, Goethals Pond to the south, and Mariners Marsh to the east.

Figure 3-4. Project area looking west (Note: MT-1's location in the middle ground of the photograph).

Figure 3-5. Project area looking north/northwest (Note: rail lines and Western Ave. and Port Authority in middle and background).

CHAPTER FOUR

CULTURAL CONTEXT

The following review provides details about the general history, settlement and subsistence patterns, and other historical developments of the Northeast with specific reference to the lower Hudson Valley and New York Bay, and to the PANYNJ Project area on Staten Island in particular. In addition to a regional overview, it also provides a site specific framework within which to interpret deposits identified within the study area. The information for this context has been drawn from the results of professional CRM surveys, pre-contact and post-contact period culture histories, and site-specific histories.

Pre-Contact Period

PaleoIndian Period (12,500-10,000 B.P.)

The earliest evidence for human occupation of the Northeast region dates from the PaleoIndian Period, which is closely associated with the northward retreat of the final Wisconsin glaciers and the moderation of climatic conditions. By 12,000 B.P., the spruce forest vegetation and glacial lakes of the postglacial environment supported emergent floral and faunal resources, which may have attracted pre-contact groups (Nicholas 1988). Sea levels were much lower during this period, and the study area was located well-inland from the Atlantic coastline.

The PaleoIndian Period is not well understood due to the scarcity of sites dating to this time period. Traditional interpretations of PaleoIndian subsistence patterns include a primary reliance on hunting large game. More recent investigations in the Northeast have determined that a broader subsistence base that included small mammals, birds, and plants, is a more likely possibility (Kauffman and Dent 1982). In New York, it is thought that these people did exploit a wider array of resources, which included smaller game and seasonal plant foods (Ritchie and Funk 1973). For example, remains of large birds and fish as well as caribou have been found associated with PaleoIndian levels at the Dutchess Quarry Cave Site (Guilday 1969:26; Kopper et al. 1980:133). PaleoIndian groups may also have operated within more restricted territories than traditionally assumed (Eisenberg 1978). High, well-drained areas near streams or wetlands were preferred locations in the Northeast for highly mobile PaleoIndian groups, though rock shelters near lithic sources and lower river terraces were also subject to occupation and use (Funk 1976; Marshall 1982; Moeller 1980; Ritchie 1980).

PaleoIndian Period sites are typified by the presence of fluted, lanceolate projectile points in an isolated context. Occasionally, large flake scrapers, bifaces, unifaces, and fragments of esquilles and knives are also found (Funk 1978; Ritchie and Funk 1973). These stone tools were often fashioned from non-local cherts originating in eastern New York and jasper from Pennsylvania and New Jersey.

A number of PaleoIndian sites are known from the southern portion of Staten Island. The Port Mobil Site on the southwestern shore of Staten Island yielded more than 100 tools that included fluted points, drills, gravers, spokeshaves, knives, scrapers, and cores, indicating a more extensive occupation (Kraft 1977; Ritchie 1980). Isolated finds of fluted points have also been found on the southwest part of Staten Island (Wagner and Siegel 1996). Fluted points were also recovered from the Cutting Site and at Kreischerville, and lithics thought to be PaleoIndian in age were found at Smoking Point and Charleston beach (Boesch 1994). Lastly, a possible fluted biface resembling a PaleoIndian point was also reportedly recovered from the Old Place Site in close proximity to the project area (Payne and Baumgardt 1986:II-13).

Archaic Period (10,000-3000 B.P.)

The Archaic Period in the Northeast is characterized by more generalized hunter-gatherer strategies than the PaleoIndian Period. It is subdivided into Early, Middle, and Late periods on the basis of changes in environment, projectile point styles, and settlement patterning (Lavin and Mozzi 1996; McBride 1984; Snow 1980).

Early Archaic Period (10,000-8000 B.P.)

The Early Archaic Period was characterized by a warming climate following the cold period associated with the Younger Dryas. By the end of the period the environment was dominated by a mixed pine-hardwood forest, and megafauna populations were replaced by smaller game such as deer and bear. The lithic technology of the Early Archaic in the Northeast reflects a more diversified subsistence strategy, including beaked unifacial edge tools, cores, flakes, hammerstones, milling slabs, and notched pebble sinkers, indicating an increased utilization of plant and fish resources (Robinson 1992). Diagnostic projectile points consist of bifurcate-base (e.g., Kanawha, LeCroy, MacCorckle), Kirk variant and Palmer point types, among others. Characteristic of assemblages is the predominance of expedient tools made from local lithic sources.

Early Archaic settlement remains somewhat speculative in the Northeast, but evidence indicates that a complex multisite settlement system may have been established, with different site locations indicating exploitation of varied resources and environmental settings (Johnson 1993; Ritchie 1984). The nearly exclusive use of local stone for tool production also suggests a less mobile lifestyle. Site locations include tidal inlets, coves, and bays, and on freshwater ponds (Ritchie 1980), and some finds have been associated with shell middens in the Lower Hudson region (Kraft and Mounier 1982a). On Staten Island, Early Archaic components have been identified from several sites including the Hollowell, Old Place, Charleston Beach, Ward's Point, Travis, and Richmond Hill sites (Boesch 1994; Ritchie and Funk 1971; Platt 1997).

Middle Archaic Period (8000-5000 B.P.)

Middle Archaic Period activity in southern New York State reflects adaptations to more diversified subsistence strategies, particularly along major rivers and streams, in response to changing environments. Pine dominated forest was eventually replaced by mixed hardwoods dominated by oak and hickory as well as mast trees like beech. This was part of an ideal environment for wild game, birds, and edible roots, berries, and nuts. Groups tended to operate within a system of planned seasonal movement with a multi-site settlement system firmly established by that time. The types of subsistence activities employed included hunting along with the regular harvesting of anadromous fish and plant resources. Shellfishing stations also begin to appear in the lower Hudson estuary during this period (Brennan 1981). Middle Archaic sites occur in a variety of setting including floodplains, benches overlooking waterways, uplands flats near streams, and rockshelters (Funk 1991).

Typical Middle Archaic point types in the Northeast include Neville/Stanly, Stark/Morrow Mountain, Otter Creek, and Guilford varieties, as well as points similar to Vosburg and Brewerton types (Custer 1996; Snow 1980). Ground-stone technology introduced a variety of tool types into the lithic assemblage including net sinkers, plummets, grooved adzes, axes, gouges, and atlatl weights (Dincauze 1976). On Staten Island, sites with Middle Archaic components have been identified at the Wards Point and Old Place sites, and possible Middle Archaic components have been identified at Chemical Lane and Harik's Sand Ground. Middle Archaic finds at the Old Place site consist of Stanly Stemmed points associated with charcoal from a hearth that produced a date of 7260 ± 140 B.P. (Funk 1991; Ritchie and Funk 1971).

Late and Transitional Archaic Period (5000-2700 B.P.)

The cultural traditions of the Late Archaic Period are better documented and understood than earlier periods. The period is traditionally considered to be a time of cultural fluorescence, as reflected in burial ceremonialism, population increases, and evidence for the establishment of long-distance exchange networks (Ritchie 1980; Snow 1980).

The period was marked by a climatic shift to drier and warmer conditions. Oak, pine, and beech trees reached their full extent, and wetlands became more abundant along river margins. Wetland and estuarine areas appear to have been used extensively based on site distribution. The increase in density of sites and artifacts from this period coincides with this climatic warming (Funk 1972). The archaeological evidence demonstrates an increased use of shellfish, nuts, and plant resources. Perhaps in response to an increasingly resource-rich natural environment, Late Archaic populations expanded and diversified. Sites in general appear to be larger than the preceding periods, and group territories may have become established. Ritchie (1980) and others have postulated that river valleys provided abundant resource bases for pre-contact populations, who in turn heavily utilized these areas for habitation as well as

special purpose activities. This shift from mixed forest uplands to riverine lowlands may help to explain the abundance of sites dating to this period in proximity to the major river drainages of eastern New York. Intensification of coastal-oriented economies is represented by vast shell middens in the Northeast including the lower Hudson Valley area (Brennan 1974).

The Late Archaic Period has been divided into three major cultural traditions (Laurentian, Narrow-stemmed, Susquehanna), all of which are represented to some degree at sites in southern New York State. The Laurentian tradition (6000–4200 B.P.) was first identified in New York (Ritchie 1980). The earliest site assigned to this tradition in the Northeast is the Schafer Site, located in the Mohawk Valley of upstate New York. This site yielded cultural deposits radiocarbon dated to 6290 ± 100 B.P. (Wellman 1975). The tradition is characterized by an artifact complex containing wide-bladed points with side or corner notches such as Otter Creek, Vosburg, and a variety of Brewerton subtypes. These points often are manufactured from cherts found in parts of New York and New Jersey.

The Narrow-Stemmed tradition (4300–3500 B.P.), analogous to contracting-stemmed Piedmont tradition points, is characterized by small, thick, narrow-bladed, stemmed or notched projectile points such as Sylvan Lake, Wading River, Bare Island, Poplar Island, Lackawaxen and Taconic Stemmed, and Lamoka points. They are usually produced from locally available shale, argillite, quartz, quartzite, and rhyolite. Sites from this tradition also often contain gouges, plummets, scrapers, drills, adzes, paint stones, and pitted stones. Settlement patterns differ from the Laurentian tradition in the Northeast with larger, seasonally occupied base camps situated along major rivers, and smaller special-purpose camps located in a variety of environmental zones including terraces and uplands (McBride 1984). The nature and distribution of sites suggest a less-mobile population with communities gathering during summer months and dispersing into smaller groups during the cold weather (McBride 1984; McBride and Soulsby 1989).

At the terminal end of the Late Archaic, the Transitional Archaic Susquehanna tradition (3800–2700 B.P.) is characterized by broad spear points such as Susquehanna, Snook Kill, Koens-Crispin, and Perkiomen varieties. Narrower Orient Fishtail points are present in the latter part of the Transitional Archaic Period and their use may extend into the subsequent Early Woodland Period. Other Susquehanna assemblage artifacts consist of steatite vessels, ground axes and adzes, wing-shaped atlatl weights, and toward the end of the period, occasional steatite- or grit-tempered ceramics. Another characteristic of the Susquehanna tradition consists of increasingly complex burial ceremonialism the hallmark of which are cremation burials containing “killed” artifacts. The composition and chronological distinction of these assemblages, as well as the variety of settlement types, vary throughout the Northeast. Susquehanna tradition settlement patterns differ with those of the preceding Narrow Stemmed tradition. The pattern is similar to the Laurentian tradition, in that there are more temporary camps and specialized use of the uplands consisting of temporary occupations established near streams and swamps. Less frequent group movements and more specialized procurement strategies are inferred. In the Northeast, it is thought that communities came together near major rivers during certain parts of the year, possibly coinciding with either burial ceremonies or the harvesting of floodplain plant resources (Pagoulatos 1986).

In general, sites dating to this period are often very large and contain dense quantities and diverse materials. The Bare Island point has been identified as major component of Late Archaic sites in the vicinity, while the Orient Phase is perhaps the most common component recognized in the Transitional Archaic (Snow 1980). Artifacts and features associated with the Orient Phase of the Transitional Archaic include Orient Fishtail projectile points, knives and drills, ground-stone tools and ornaments, soapstone vessels, ceremonial grave goods, and shell middens. Numerous argillite Narrow-stemmed points and a Transitional Archaic Nyack side-notched point were recently recovered from the Old Place Neck Site on Staten Island (Elquist and Cherau 2011b). Other sites with Late or Transitional Archaic components on Staten Island include the Pottery Farm, Bowman’s Brook, Smoking Point, Goodrich, Sandy Brook, Wort Farm, Arlington Avenue, Wards Point, Old Place, and Travis sites (Boesch 1994; Lavin 1980).

Woodland Period (3000-450 B.P.)

The Woodland Period in the Northeast is characterized by a shift in subsistence and habitation strategies including the introduction of cultigens (maize, beans, and squash) and the use of ceramic vessels. These cultigens were adopted in the region not as a package, but in a piecemeal fashion during the Woodland period (Hart and Brumbach 2005; Thompson et al. 2004). Evidence of a substantial reliance on horticulture has not been clearly documented in

the immediate region surrounding the Project area, and it is likely that native peoples would have continued to rely heavily on coastal resources (shellfish and marine species), as well as terrestrial game and gathered foods (Ritchie and Funk 1973; Gray and Pape Inc. 2005). Site size and complexity also increased, suggesting increased sedentism and social complexity (Dragoo 1976). The Woodland Period is usually subdivided into Early, Middle, and Late periods on the basis of ceramic types and political and social developments (Lavin and Mozzi 1996; Ritchie 1980; Snow 1980).

Woodland Period characteristics of the lower Hudson region appear to have increasingly shifted settlement to riverine, and sheltered bay and estuary locations, included burial traditions that included both cremations and inhumations, and the establishment or elaboration of long-distance trade or exchange networks (Ritchie 1980; Snow 1980). The shift to coastal resources has been observed elsewhere in the Northeast including most of New England (Snow 1980). Settlement became more sedentary, and larger groups of individuals aggregated at preferred coastal/major riverine village sites.

Early Woodland Period (3000-1600 B.P.)

Sites dating to the Early Woodland Period are relatively scarce compared to the preceding Late Archaic, particularly in interior areas. The notable decrease in site frequency has been attributed to a population decline related to any number of causal factors including the onset of colder climate and unknown epidemics, as well as a lack of recognition of Early Woodland cultural materials because of overlapping and/or poorly documented tool assemblages (Dincauze 1974; Fiedel 2001; Lavin 1988; Snow 1980; Wendland and Bryson 1974). Despite the paucity of sites, intensive settlement of coastal areas in general may not have occurred until the Transitional Archaic/Early Woodland. This change in settlement pattern may be related to cooler climatic conditions resulting in the stabilization of sea level rise and coastlines that allowed more extensive development of resource-rich marshlands and estuaries (Lavin 1988).

The identification of Early Woodland Period sites usually relies on the presence of diagnostic stemmed and side-notched Adena, Lagoon, Rossville, and Meadowood projectile points. Tools like net sinkers, bone awls, anvil stones and abraders are also artifacts characteristic of the period. The Early Woodland Period is also marked by the clear emergence of ceramic technology, replacing the soapstone vessels that had been used during the Late/Transitional Archaic periods. These ceramics consist of coarse grit-tempered (and occasionally shell-tempered), conoidal, and cord-wrapped vessels known as Vinette I. In coastal areas, Vinette I pottery has often been associated with Orient Fishtail and Susquehanna broad points. A more sophisticated ceramic type known as Vinette 2 developed slightly later. Artifact assemblages for this period comprise a high percentage of exotic lithic materials and speak to an expansion and elaboration of long-distance trade networks. Evidence of Early Woodland occupation on Staten Island includes several multicomponent sites on the north shore of Staten Island such as the Old Place, Arlington Avenue, Arlington Place, and Bowman's Brook sites (Boesch 1994).

Middle Woodland Period (1600-1000 B.P.)

The Middle Woodland Period in the Northeast is characterized by increased diversity in ceramic style and form, the use of tropical cultigens (though evidence for this is scarce in coastal regions), and long-distance exchange networks (Dragoo 1976; Snow 1980). Much of our knowledge of this period is extrapolated from work done by Ritchie (1980) in New York State. Ritchie noted an increased use of plant foods such as goosefoot (*Chenopodium sp*.) in the Canoe Phase in New York, which he suggests had a substantial impact upon social and settlement patterns. Ritchie further noted an increase in the frequency and size of storage facilities (Ritchie 1980; Snow 1980). The changes in subsistence strategies led to an increasing sedentism manifested by larger and more diverse sites created through semipermanent village settlement. Year-round access to resources brought about increased settlement in coastal areas and around marshlands (Lavin 1988).

Increased sedentism led to augmented horticulture and harvested nuts, grains, and seeds became more important to the daily diet. The Middle Woodland Period is also documented by an increased diversification in ceramic vessel production as forms began to adapt for increased efficiency in cooking the changing diet (Lavin 1988). Pottery also becomes more stylistically diverse, including grit-tempered coil built vessels with stamped, incised, and dentate decoration of varying quality. Fox Creek stemmed and lanceolate points and Jack's Reef points are additionally diagnostic of the Middle Woodland Period in the area. Several Middle Woodland Period occupations have also been

identified on Staten Island at the Huguenot Site, the Cutting Site, Pottery Farm, Page Avenue North, and at the Van Deventer/Fountain House (Boesch 1994).

Late Woodland Period (1000-450 B.P.)

The Late Woodland Period in the Northeast is characterized by intensification of horticulture; changes in ceramic technology, form, style, and function; and an increase in the use of exotic (non-local) lithic materials. This period is also associated with the emergence of year-round village-type sedentism; villages tended to be situated along major rivers, estuaries, and tidal marshes, while smaller temporary camps utilized by smaller, domestic units and organized task groups were situated along upland streams and inland wetlands. Overall, people appear to have aggregated in villages during much of the year.

Settlement patterns suggest a trend toward fewer and larger villages reflecting a continued reduction in residential mobility and increased sedentism. It has been hypothesized that these changes can be attributed to the introduction of maize, beans, and squash, but it is unclear how important cultigens were in the aboriginal diet in much of the northeast including the lower Hudson area (Ceci 1980; Chilton 1996; McBride 1984; Ritchie 1980). Domesticated plants from site in the Northeast have included maize, beans, and sunflower (Bendremer and Dewar 1993; McBride 1984). However, isotopic and other physical evidence of Middle and Late Woodland period skeletal remains from Tottenville, Staten Island indicate that marine resources were the basis of their diet and maize was likely not consumed (Bridges 1994). This suggests that populations in the New York Bay and coastal areas were not relying on horticulture. Preserved subsistence remains from Late Woodland occupations have included white-tailed deer, woodchuck, fish, birds, and small mammals. Plant remains include berries, hickory nuts, lambs-quarters, hazelnuts, and acorns.

Late Woodland Period artifact assemblages are characterized by Levanna projectile points and finely made collared and collarless vessels with geometric designs, and brushed, stamped, incised, and cord-marked ceramics (Lavin and Mozzi 1996; Ritchie 1980; Snow 1980). Defined territories may have been firmly established in the region by the onset of the Late Woodland. For example, during the later contact period, the area of New Jersey north of the Raritan River was considered the "territory" of Munsee speaking Lenape groups. This territorial division may be reflected in the Late Woodland Period archaeological record by differing ceramic types and burial orientations (Kraft and Mounier 1982b).

On Staten Island, Levanna points and ceramics diagnostic to the period have been recovered from the Old Place Site. In addition, the Bowman's Brook Site is located in the vicinity of the Project area and is the type site for the Bowman's Brook phase of the period. Initially reported by Skinner, his descriptions and notes indicate that Bowman's Brook consists of a village site that contained 50 to 100 pit features, burials, clay pipes, pottery, charred hickory nuts, artifacts of antler and bone, and fragments of shell, turtle remains and sting ray spines (Skinner 1898-1909, 1909).

Contact Period (ca. A.D. 1525-1650)

The contact period represents an era of cataclysmic socioeconomic, political, and cultural change in the face of Native American and European interaction. Euro-American utilization of the study area could have begun as early as the sixteenth-century, when European explorers reached the eastern coast and began to interact with the Native inhabitants. The earliest accounts date to 1524, when Giovanni da Verrazano, commissioned by King Francis I of France and a silk merchant syndicate, passed through New York Bay in his navigation of the Eastern Seaboard in an attempt to find a passage to the "Indies" (Burrows and Wallace 1999:11). Sixteenth century European exploration did not result in trade or extensive contact with the native inhabitants, and though mariners, fisherman, and merchants visited the East Coast sporadically over the next century or so, there was no permanent settlement in the region.

In 1609, Henry Hudson was hired by the Dutch East India Company to locate the elusive Northeast Passage. Although he did not locate the passage, he did travel up the river that bears his name and had several contacts with the Native populations (Brasser 1978). The Dutch began trading with native groups in the area in 1610. Although there was a fair amount of trade early on, Hudson's accounts of the Native population in the Hudson Valley region indicate that relations between the two groups were not always peaceful. At the time of European contact, native

groups were referred to by numerous names, including the Delaware, by European colonists, though they generally referred to themselves as Lenape. The local indigenous peoples spoke a dialect of an Eastern Algonquian language called Munsee (Goddard 1978; Salwen 1978). The Lenape maintained autonomous, loosely structured bands that resided in small dispersed settlements (Kraft 1975).

Politically, the Munsee-speaking Lenape groups were divided into a number of main groups, who were further divided into numerous smaller political and dialectic subgroups (Ruttenber 1872). Subgroups in the project vicinity include the Hackensacks in the present Newark and Jersey City areas, Monatons, or Raritans, and Tappans, who traditionally occupied areas of New Jersey along the western shore of the Arthur Kill and/or Staten Island; the Nayacks who sold their homeland in Brooklyn and later moved to Staten Island; the Wickquaesgecks or Wiechquaesgeck who occupied upper Manhattan Island; the Reckgawawanck who occupied lower Manhattan Island; and the Canarse who occupied present-day Brooklyn and Queens. The exact territories of these bands are somewhat elusive, due in part to the lack of fixed tribal boundaries (Boesch 1994; Skinner and Schrabisch 1913).

Dutch traders benefitted greatly from the fur trade and their prosperity did not go unnoticed. In 1613 or 1614, the English sent a military compliment to expel the Dutch from Manhattan and the Hudson River (PanAmerican 2003). Several repeated efforts by both the English and French failed, with the Dutch steadfastly holding their claim to the land. Realizing their tenure was under scrutiny, Dutch colonization was seen as a way to hold onto control. In 1621, the States General of the United Netherlands granted a 21-year charter for the establishment of the Dutch West India Company, with exclusive rights to trade and settlement in what they termed New Netherlands. The West India Company charter allowed qualifying individuals (usually wealthy merchants or company officials) to purchase tracts of land from the Native Americans, and Dutch settlements in Albany and New Amsterdam (New York) became established communities by 1623 (Whitcomb 1904). Trading posts were established and merchants were encouraged to begin long-term trade for furs and animal skins in the new territory. Within 10 years, European competition was so intense that Native inhabitants were offered up to three times the usual trade for a pelt by Dutch traders.

Epidemic disease, competition for trade between Native American groups, and hostilities between Natives and Europeans had substantial impacts almost immediately after the Dutch became a sustained presence in the area. In response to European aggression and increasing intratribal hostilities over trade privileges, palisaded villages began to emerge along the New York coast. A series of major and minor skirmishes among the various competing interests eventually led to local Native Americans suing the Dutch for peace in 1644. Despite this accommodation, friction persisted between the Dutch and Native Americans culminating in two more major armed conflicts over the next 20 years. The incessant violence coupled with "virgin soil" epidemics effectively decimated the native groups living in the present New York City area. On the island of Manhattan for example, the once thriving population of its original Lenape, or "Manhatan" inhabitants were reduced to 200–300 individuals by 1628 due to death by disease, or having been driven out by a competing group (Burrows and Wallace 1999:23).

Ritchie and Funk generally note that the fur trade led to a concentration of villages near colonial settlements (Ritchie and Funk 1973:368). Unfortunately, records dating to the early contact period are vague and Native settlements and encampments were not clearly mapped or identified in the area, and professionally identified and documented sites are exceedingly rare. Nonetheless, it appears there were a number of important settlements on the north shore of Staten Island that were connected by a path that paralleled the Kill van Kull between West New Brighton and Howlands Hook (Bolton 1922). According to early colonial land records, Native Americans referred to Staten Island as "Aqeuhonga Manacknong", or "Eghquaous", which may have meant "Place of the Bad Woods" or "high sandy banks", and Motanucke which may have meant "land of periwinkles" (Leng and Davis 1930:79a; Morris 1898:2; Seymann 1939). Archaeological deposits dating to the contact period have been identified at a number of sites on Staten Island including Ward's Point, Old Place, Corsons's Brook, Travis, New Springfield, and the Walton-Stillwell House (Boesch 1994).

Post-Contact Period (ca. A.D. 1610-present)

European Colonization and Settlement (ca. 1610-1800)

The earliest documented presence of Europeans on Staten Island consisted of a Dutch trading post established in 1614 (Morris 1900:35). The first attempt at permanent settlement was made in 1624 by a few Dutch Walloons and their families (Morris 1898:25–26). The attempt was unsuccessful and they retreated to New Amsterdam on present-

day Manhattan (Wilson 1893). Then Director General Peter Minuit and five others subsequently purchased Staten Island from local sachems in 1626 (Burrows and Wallace 1999:24). It was subsequently part of a large grant of land made to Michael Pauw extending south from Hoboken, New Jersey and including Staten Island in 1630, though he does not appear to have made any effort to establish a settlement on the island portion of the grant, and later sold his land rights to the West India Company in 1637 (Brodhead 1853; Burrows and Wallace 1999:28; Morris 1898). Six years later, after arranging with then Director General Twiller to establish a colony on Staten Island, it was purchased again in part by David Pietersen de Vries from Native Americans (Brodhead 1853:265). A few settlers were brought by de Vries to the island by the end of 1638 (Morris 1898:28–29). Cabins were built at what later became known as Oude Dorp (or Old Town), and the settlers apparently prospered as tobacco planters until destroyed by Native Americans referred to as the Raritans in 1641. This destruction of the settlement was in retaliation for the murder and torture of Raritans ordered by Kieft who had wrongly assumed they were responsible for stealing pigs from de Vries "bouwerie" or plantation (Brodhead 1853). Kieft was blamed for angering the Raritans, and the incident, known as the "Pig War" set the stage for later widespread hostilities (Burrows and Wallace 1999).

An attempt was made to resettle at Old Town, but it was short lived as new hostilities between the Dutch and Native Americans broke out in 1642 (Morris 1898). The following year saw the start of the first of the Dutch-Indian Wars (1643–1645), which resulted in the widespread destruction and abandonment of Dutch settlements throughout most of New Netherland. After a decade or so of peace, a second war (the "Peach War") broke out between the Dutch and Natives of the area in 1655, and Old Town was destroyed for a third time. No attempt was made to resettle Staten Island following this war until 1658 when a village known as Niuew Dorp (New Town) or Stony Brook was established. Other early settlements included Cucklestown, which later became known as Richmond in 1710 (Morris 1900:439).

One of the few settlements in New Netherland that may have weathered the early hostilities was on Staten Island under the patroonship of Cornelius Melyn, a Dutch merchant (Morris 1898:37). Despite de Vries claims, Melyn had been authorized to take control of all of Staten Island and establish a colony in 1640, though he only brought a handful of settlers. He once again purchased Staten Island from the Native Americans in 1641 and obtained a letter patent (excepting deVries bouwerie), appointing him patroon of the territory (Brodhead 1853:314; Morris 1898). A decade later he was accused in court documents of smuggling contraband onto Staten Island and of tricking or bribing local Native Americans into trying to kill the then Director of New Netherland, Peter Stuysevant who was widely considered too authoritarian (Fernow 1883:159–161). Despite these and other accusations and a later arrest, Melyn kept the favor of the States General back in Holland and continued to be a thorn in Stuyvesant's side, even going so far as to independently grant land on the island for colonial settlement, and set up his own government and judiciary. Correspondence between Stuysevant and the Directors in Holland dating to 1660 indicate that Melyn had maintained his position as patroon of Staten Island, much to Stuysevant's dismay (Fernow 1883:468). Melyn's patroonship only ended when he opted to sell his holdings to the West India Company in 1661.

Settlers of Staten Island during this period included the Dutch, French Huguenots and a few British colonists. Prior to the construction of the first church at Stony Brook in 1665, worshippers on Staten Island had to content themselves with services provided on a monthly basis by ministers from New Amsterdam. Congregants gathered for services in private homes or barns, or even outdoors (Clute 1877). Many churches for decades after the first ones were built still had their pastors supplied to them from New Jersey, New York, and Long Island. Prior to the Revolutionary War, the area known as Old Place was reportedly where a house along a road (approximating the present-day Goethals Bridge roadways) was used for religious services. The house was built around 1680 by John Tunissen, a Dutch settler near the intersection of present day Washington and Western avenues (Payne and Baumgardt 1986:35). When the building became dilapidated, a new place was selected for worship, but due to its inconvenience, the previous building was repaired and religious services resumed at the "Old Place" (Morris 1898:409). The area of Old Place was also reportedly a place of safe retreat for the Native American inhabitants and the location of the last known Indian settlement on the island (Morris 1900:162).

In 1664, Charles II determined to take control of Dutch holdings in the New World granted the territory of New Netherland including Staten Island to his brother James, the Duke of York. Soon after British ships set sail to New Netherland. The Dutch quickly capitulated to the British and land on Staten Island was immediately granted by the new British Governor, Richard Nichols to several of the officers and crew of one of the ships that had set forth to take control of the area from the Dutch (Morris 1898:64). These grantees all returned to England and never

attempted to establish settlements. It was just as well, because independent of Nichols, the Duke of York had granted territory west of the Hudson River, including Staten Island to George Carteret and William Berkley. This in fact may be why settlements were not established by Nichols' grantees. Much confusion over the conflicting grants ensued. Ultimately, Carteret made no formal claim for Staten Island, but did accept a conveyance for a tract of land there from Governor Nichols (Morris 1898:136).

Staten Island was once again and for the final time purchased from Native Americans by the British in 1670 under the direction of Governor Lovelace (Morris 1898:30; Wilson 1893). There were around 100 families living on Staten Island by 1676, of predominantly Dutch and French origin. Though there were seven houses at Old Town, most people on Staten Island lived in dispersed farmsteads (Morris 1898). Richmond County (or "shire"), which contained all of Staten Island, was established in 1683 and the central settlement of Stony Brook became the County seat (Morris 1898:93). By 1688, Staten Island had been divided into the four towns of Westfield, Southfield, Castletown, and Northfield, the latter of which contains the present-day Project area.

The county seat of Richmond was transferred to the village of Richmond in 1729 (Morris 1898). Transportation links at this time consisted of roads that largely followed Native American trails, and ferries connecting Staten Island to New Jersey and New York. For example, the Old Shore Road (present-day Richmond Terrace) laid out ca. 1705 followed the course of a Native trail along the North Shore of Staten Island that ran between Howland Hook and Tompkinsville Landing. Early Euro-American settlers were known to use ferries maintained by Native Americans at various points along the Staten Island shoreline, but the earliest documented Euro-American ferry connecting the island to New York City was present by 1681 (Morris 1900:260). Several other ferry crossings were present along the north shore by the eighteenth century including Decker's, Dacostas' and Hillecker's ferries at and around Port Richmond, and Schuyler's ferry crossing at what is now Howland Hook that connected Staten Island to Elizabethtown. Additionally, important ferry crossings at Tompkinsville and Billop's Ferry to Perth Amboy were located at each end of one of the Staten Island stage routes between New York and Philadelphia during this period. Other stage route connections included the ferry between Bergen Point in New Jersey and Port Richmond established in 1764 and the Blazing Star ferry at Rossville.

The economy of the earliest settlers was largely agricultural, though a tannery and a distillery had been established on the island by the 1640s (Brodhead 1853:313). The distillery was the first in New Netherland established by then Director General William Kieft who no doubt sought to benefit from the lucrative local market for alcohol. At that time one in four houses at New Amsterdam were "grog-shops," or only sold tobacco and beer, and profits from liquor sales for company officials back in the Netherlands were second only to those from the fur trade (Burrows and Wallace 1999:33). Additionally, correspondence between directors in Holland and New Netherland indicate that by the time Peter Stuyvesant was governing New Netherland in 1647, an iron mine had been established somewhere on Staten Island (Fernow 1883:77).

By 1720, a significant portion of commerce in New York City was driven by the sugar trade with the West Indies. Carribean plantations devoted as much land as possible to sugar cane, and thus did not grow much of their own food. This resulted in a substantial increase in commercial farming on Staten Island, and in other rural communities surrounding Manhattan who supplied foodstuffs for the Caribbean market (Burrows and Wallace 1999:122). African slaves were the source of labor that fueled the increasingly commercial nature of farming.

At the onset of the Revolutionary War, the occupants of Staten Island were divided in their loyalties (Morris 1898). The divisions fell largely along ethnic lines with English colonists loyal to British rule, while the Dutch and French preferred independence. The British closed or burned all but one English church during the War (Clute 1877), and one could expect these actions did not endear the Dutch and French inhabitants to the loyalist cause. Nevertheless, Staten Island was generally viewed as a bastion of British support by the American Congress. In June 1776, a British fleet of over a hundred vessels containing 9,000 troops led by General Howe landed at Staten Island, as New York and Long Island were heavily fortified by American defenders (Burrows and Wallace 1999:231; Morris 1898:204). The British were reportedly warmly received and they immediately established headquarters at New Dorp, while they waited for reinforcements from General Clifton and England that included Hessian as well as English troops.

An additional 9,000 Hessian mercenaries had arrived by August (Burrows and Wallace 1999:234). Defensive redoubts were immediately built by British troops at Holland's (now Howland) Hook near the ferry crossing there.

These were the first of many defensive works built by the British along the Staten Island shoreline (Morris 1898:206). Several other fortifications were built during the occupation including one at Old Place.

The large numbers of British regular and Hessian troops occupying Staten Island during the initial period of the War caused the more outspoken proponents of the American opposition to flee the island. The British used the island as a staging area for raiding expeditions into New Jersey and for launching attacks on New York and Long Island. Prior to the fall of New York, General Howe met with a congressional delegation consisting of Benjamin Franklin, John Adams and Edmund Rutledge at Tottenville to persuade the Americans to surrender and revoke the Declaration of Independence in exchange for all being pardoned for taking up arms against the king (Burrows and Wallace 1999:240). The meeting was brief and Howe's terms were briskly refused. Once Manhattan was taken, many of the British troops were removed from Staten Island to maintain their gains while Skinner's Brigade of American Loyalists and a large contingency of Hessian troops remained under the command of General Knyphausen (Morris 1898).

A number of raids were undertaken and attempts made by the Americans to recapture Staten Island across the kills from New Jersey. A series of skirmishes between the Americans and British were known to have occurred at British fortifications set up at Old Place in 1777 (Payne and Baumgardt 1986:35), and burials of the casualties of these clashes were later discovered in the early twentieth century on the former Reverend James Kinney property along what is now Western Avenue (Skinner 1909). In all, the raids were largely unsuccessful, though they did manage to continuously harass the British occupiers. American military efforts were more successful elsewhere however, resulting ultimately in the surrender of Cornwallis and end of the war in 1782. By 1783, British troops had departed from New York and Staten Island. However, a number of British and Hessian soldiers, many deserters from the army, remained and settled in Staten Island (Morris 1900:2). By the end of the eighteenth century, the population had grown to more than 4,000 inhabitants (Morris 1898:120).

Industrial and Urban Development (A.D. 1800-1920)

As in earlier times, the predominant economic pursuits on Staten Island were agriculture and oystering. Many areas of Staten Island such as Howland Hook continued to reflect a rural agricultural character with farmsteads lining Shore Road (present-day Richmond Terrace) and Old Place Road during the mid-nineteenth century (Figure 4-1).

Unlike Manhattan, the economy would not be driven by other large-scale industries until well into the nineteenth-century. Flax regained importance as an agricultural crop into the early half of the nineteenth century, and shipbuilding continued to be important. Other early-nineteenth-century industries included various mills, including grist and carding mills. One mill of note was a mill constructed at Old Place south of the Project area. It was built at the former location of a small colonial tidal mill (Payne and Baumgardt 1986:135). The mill, or Old Place Mill was first constructed in 1803 by John Hillecker for David Mersereau, and Native Americans and African slaves were employed to build the mill and work in it. The mill was apparently the site of a dispute between the Native American and slave workers resulting in the use of the mill by the slaves as a "fort" in siege by Native Americans (Morris 1900:163). The ultimate result was the arrest and punishment of all parties in the dispute. By 1870, the mill had been added onto and was used to grind mineral ore for use in mineral paint. It subsequently became a feed mill until it fell into disuse and was destroyed by fire ca. 1898.

Fears of a British landing at Staten Island during the War of 1812 resulted in the repair of remaining Revolutionary War period British forts and the construction of two new stone forts at the Narrows (Morris 1900:31). In spite of these preparations, Staten Island saw very little action during the war, and the construction of forts became a financial embarrassment for the then-governor of New York, Daniel Tompkins.

Significant population growth did not begin until relatively late in the nineteenth-century. Then, the establishment of numerous factories and mills fueled the immigration of predominantly Irish immigrants (Morris 1900). One of the larger employers of these immigrants was the Crabtree and Wilkinson silk factory at New Brighton. Other notable nineteenth-century industries included dye works at West New Brighton and Castleton, granite and trap rock quarries near Port Richmond, brick manufacturing at Elm Park, the Consolidated Fire Works Company of America at Graniteville, shipbuilding at Port Richmond, West New Brighton, Tottenville and Mariner's Harbor, the Jewett white lead mills and linseed oil factory at Port Richmond, and various breweries mainly concentrated in Stapleton.

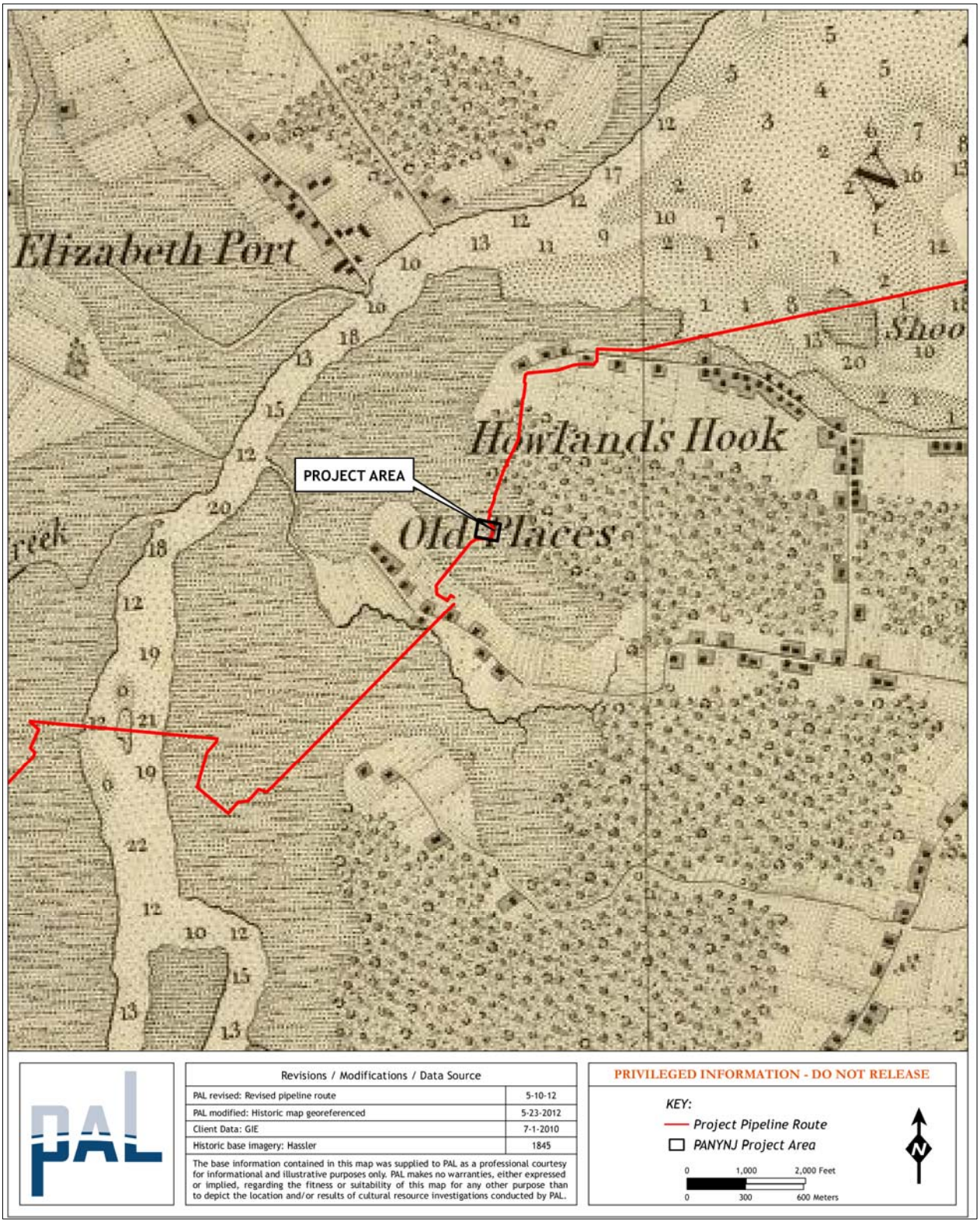


Figure 4-1. 1845 map with the approximate location of the PANYNJ Project area (source: Hassler 1845).

The success of breweries was due to Staten Island's reputation for having numerous spring sources of excellent water (Clute 1877:332). Oystering also continued to be an important economic mainstay for Staten Island into the nineteenth century. Ships from Staten Island would transport seed oysters north from sources as far away as Virginia to the metropolitan market, and transfer them to planting beds mainly concentrated at Mariner's Harbor (Clute 1877:330).

One dye works, the New York Dyeing and Printing Company, was the largest manufacturer of dyed and printed silk and other goods of its kind in the United States by the 1870s (Clute 1877). Another important manufacturer was the New York Fire-Brick, and Staten Island Clay Retort Works located at Kreischerville, which was founded in 1845 after the discovery of high quality kaolin clay deposits between Tottenville and Rossville (Clute 1877:326). Additionally, the S.S. White Dental Manufacturing Company at Prince's Bay was the first to commercially produce liquid nitrous oxide, and the first linoleum manufacturer in the country, the American Linoleum Manufacturing Company, was established at Linoleumville in the 1870s (Clute 1877; Morris 1900).

Transportation networks expanded on Staten Island after the turn of the century that improved connections between New York and Philadelphia. The Richmond Turnpike was laid out by 1816 which followed the old post and stage route to Philadelphia (Morris 1898:396-397). Other nineteenth-century roadways laid down in the area included the Port Richmond and Fresh Kills plank roads at Port Richmond, Harbor Road, and Thompson's or South Avenue. Western Road or Avenue connecting present-day Goethals Bridge Road and Richmond Terrace was also laid out just west of the Project area by 1860 (Figure 4-2). Despite these improvements, roads in general on Staten Island were universally viewed as awful, and no serious efforts were made to improve them until the passage of a "Road Bill" in 1890 and the incorporation of Staten Island into the greater municipality of the City of New York (Morris 1900). It was generally felt that the lack of proper roads had been a serious impediment to Staten Island's fair share of the commercial and industrial development that had been taking place in other neighboring areas during the nineteenth century.

The first steamboat ferry, the "Nautilus" began service between Staten Island and New York City in 1817, and within a decade a second steamboat was in service (Morris 1900:264; Wilson 1893:34). By the 1860s the Huguenot Line was providing ferry service between Manhattan and Mariner's Harbor, and the North Shore Ferry Company had been established. The expansion in transportation and industry in the early half of the nineteenth century resulted in new residential development and even the establishment of new villages, such as that of Tompkinsville in 1815.

The question of whether Staten Island was under the jurisdiction of New Jersey or New York had been a point of contention for over a century. The dispute was finally resolved in 1833 when New York formally obtained rights to Staten Island (Morris 1898:90). Shortly thereafter, the village of Richmond became the social and economic center of the island. In 1896, after several years of formal inquiry, debate, public hearings and a series of votes, Staten Island was consolidated into the greater City of New York (Morris 1900:490).

A village was established at Howland Hook (formerly Holland's Hook) by the early nineteenth century (Morris 1898:409). Howland Hook was likely named for Lieutenant Henry Holland of the Staten Island militia who owned land in this part of Northfield during the early 1700s (Morris 1900:15). In 1833, Sailor's Snug Harbor, the United States first hospital for retired mariners was established along the north shore of Staten Island. Subsequently, numerous sailors retired to and built homes on Staten Island along Richmond Terrace (see Figures 4-1and 4-2). Other plans for developing the area were made in 1828 to establish a summer resort known as Jacksonville at Howland Hook, but the development never happened due to the financial panic of the 1830s (Morris 1898:409). But the plans generally mirrored the increasing use of Staten Island as a summer getaway by the wealthy.

The presence of railroads transformed or expanded the commercial and residential importance of several communities, including those at Richmond, Tottenville, Rossville, Concord, and Garretsons (Morris 1900). At the prompting of prominent farmers, construction of the first railroad in Staten Island commenced in 1851 connecting Tottenville to Vanderbilt's Landing east of Stapleton (Clute 1877:331; Morris 1900:461). Construction was completed in 1860 and the Staten Island Railroad came under the control of William Vanderbilt. The holdings of the Staten Island Railroad company were later expanded with the acquisition of the East Shore ferries and Jacob Vanderbilt became president of the consolidated company. After a series of ownership changes, the company

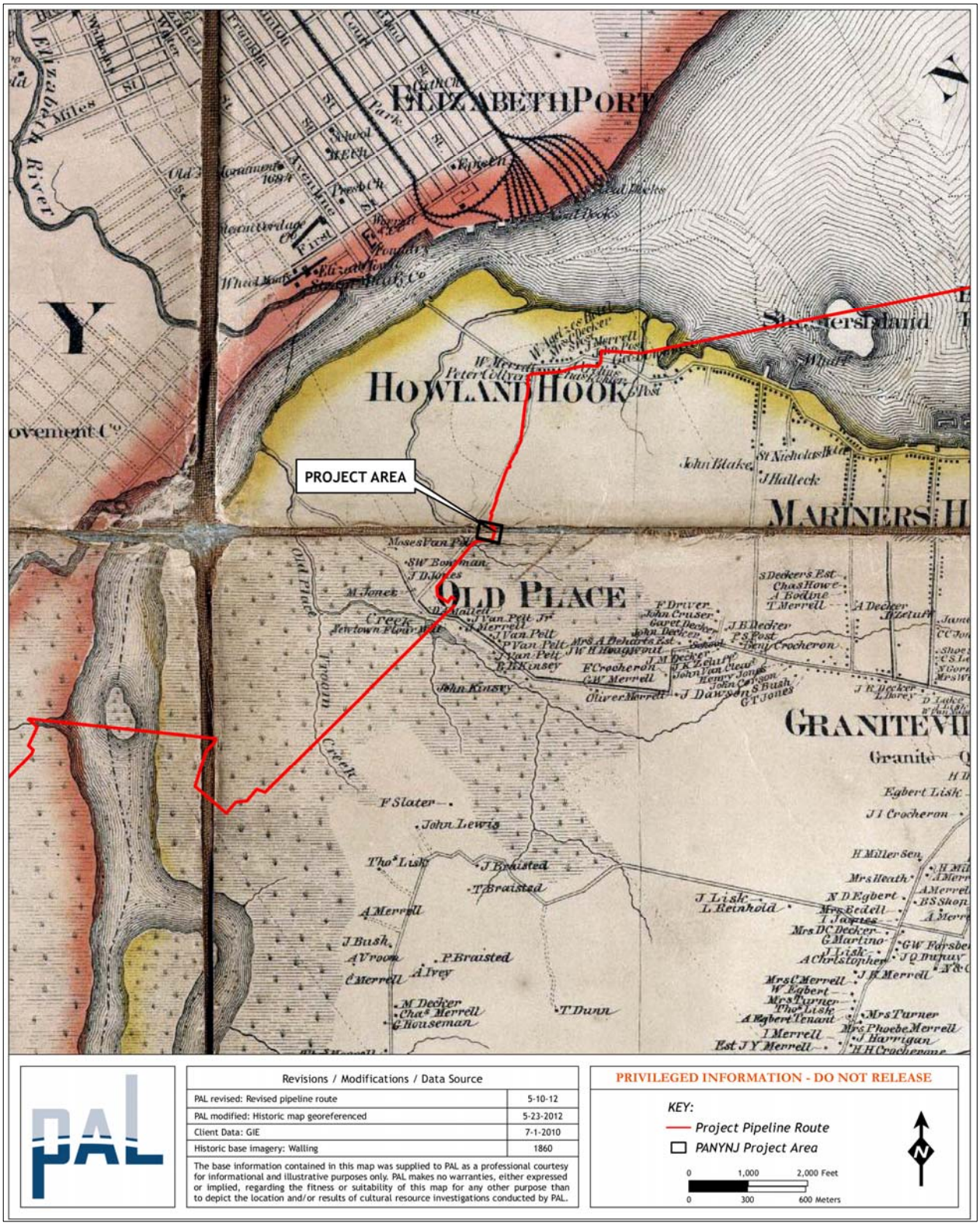


Figure 4-2. 1860 map with the approximate location of the PANYNJ Project area (source: Walling 1860).

eventually took the name of Staten Island Railway. In 1863, the Staten Island Shore Railroad proposed the construction of a horse rail line between Fort Wadsworth on the Narrows and Howland Hook. Opposition was fierce literally resulting in the laying of tracks in the middle of the night. The route was completed as far west as Port Richmond, though cars never ran past West New Brighton (Morris 1900:465). About the same time, similar though unsuccessful efforts were undertaken by a banker to start a railway connecting West New Brighton and Tottenville. Though construction of the railbed started, it was never completed.

Despite the false starts at developing rail lines in previous decades, railways were expanded along the northern and eastern shores of Staten Island in the 1880s and 1890s (Figure 4-3). These included rail lines operated by the Staten Island Rapid Transit Company, the Richmond County Railroad (later the Midland Railroad), the Midland Railroad Company and New York and Staten Island Electric Railroad. Efforts to consolidate the railways and ferries with connections to Manhattan resulted in the establishment of the Staten Island Rapid Transit Railroad Company in 1884 (Morris 1900:463). The Staten Island Shore Railroad was quickly subsumed by the success of the Rapid Transit Company, and its holdings were eventually taken over by the Staten Island Electric Railroad Company. To accommodate the increase in commercial and passenger traffic, terminal facilities including ferry slips and piers were constructed at St. George on several acres of made land extending beyond the original shoreline. By 1895, trolleys were in service competing with the Rapid Transit Company for passenger traffic, and by 1899, the Baltimore and Ohio (B&O) Railroad Company had bought the Rapid Transit Company (Morris 1900:464). The B&O Railroad had by then already invested heavily in Staten Island railroad interests as witnessed by their financing the construction of a rail bridge across the Arthur Kill at Howland Hook completed in 1884. Rail expansion along the north shore continued in the 1890s with a charter granted to the New York and Staten Island Electric Railroad Company to connect South Beach to Howland Hook via St. George. The result was the expansion of company holdings by acquisition of the Electric Power Company, the Port Richmond Electric Light Company, the old Belt Line Railroad and the reopening the ferry at Howland Hook (Morris 1900:466–467).

Inevitably, railroads brought additional industrial development to Staten Island. The New York Terminal and Transit Company owned large tracts of land at Howland Hook portions of which were bought and developed by the Milliken Bros. Steel Corporation and Proctor and Gamble after the turn of the century (Payne and Baumgardt 1986:27). First opened in 1907, the Proctor and Gamble plant became known for its production of Ivory soap, detergents, Crisco vegetable oil and shortening, as well as later-twentieth-century products including Duncan Hines baking goods, Tide detergent, and orange juice. By the 1920s, the plant occupied both sides of Western Avenue between the Staten Island Rail Road and Richmond Terrace, and included piers along Kill Van Kull (Figure 4-4). Construction at the Milliken complex northeast of the Project area included a steel and rolling mill begun in 1903, and the complex ultimately occupied both sides of Richmond Terrace. The foundry reportedly failed in 1907. The steel furnaces were shut down, but the fabricating plant portion of the complex remained in operation until 1912 (Flagg 1991:3). The portion of the mill complex that occupied the parcel south of the road is now the site of Mariner's Marsh Park. The Milliken complex was taken over by the Downey Ship Building Corporation by 1917. The shipbuilding operation was shut down shortly after World War I and the portion of the complex north of Richmond Terrace was subsequently used, possibly illegally, during the 1950s and 1960s for scrapping and burning of wooden barges (Flagg et al. 1992:2; Kearns et al. 1991:7).

Modern Period (A.D. 1920 to present)

By the end of the nineteenth-century, the population of Staten Island was nearly 52,000 people, and improvements in rail and ferry transportation had allowed Staten Island to become a "bedroom" community for New York businessmen (Wilson 1893). The subsequent introduction of the automobile in particular had a widespread effect on transportation throughout the United States, and Staten Island was no exception. Road networks were extensively improved and expanded during the twentieth century at the expense of railways and ferries in the area as trucks, buses and cars became the predominant means of personal and commercial transport.

One innovative example of a new roadway brought about by the presence of the automobile was the Bayonne Bridge, one of three related bridges planned by the Port Authority of New York (later the Port Authority of New York and New Jersey) to create a circumferential highway system for the greater New York metropolitan region (PANYNJ 2010). Construction of the bridge spanning the Kill Van Kull between Staten Island and Bayonne began in 1928 and was completed ahead of schedule and under budget in 1931. As the Kill Van Kull is a major shipping

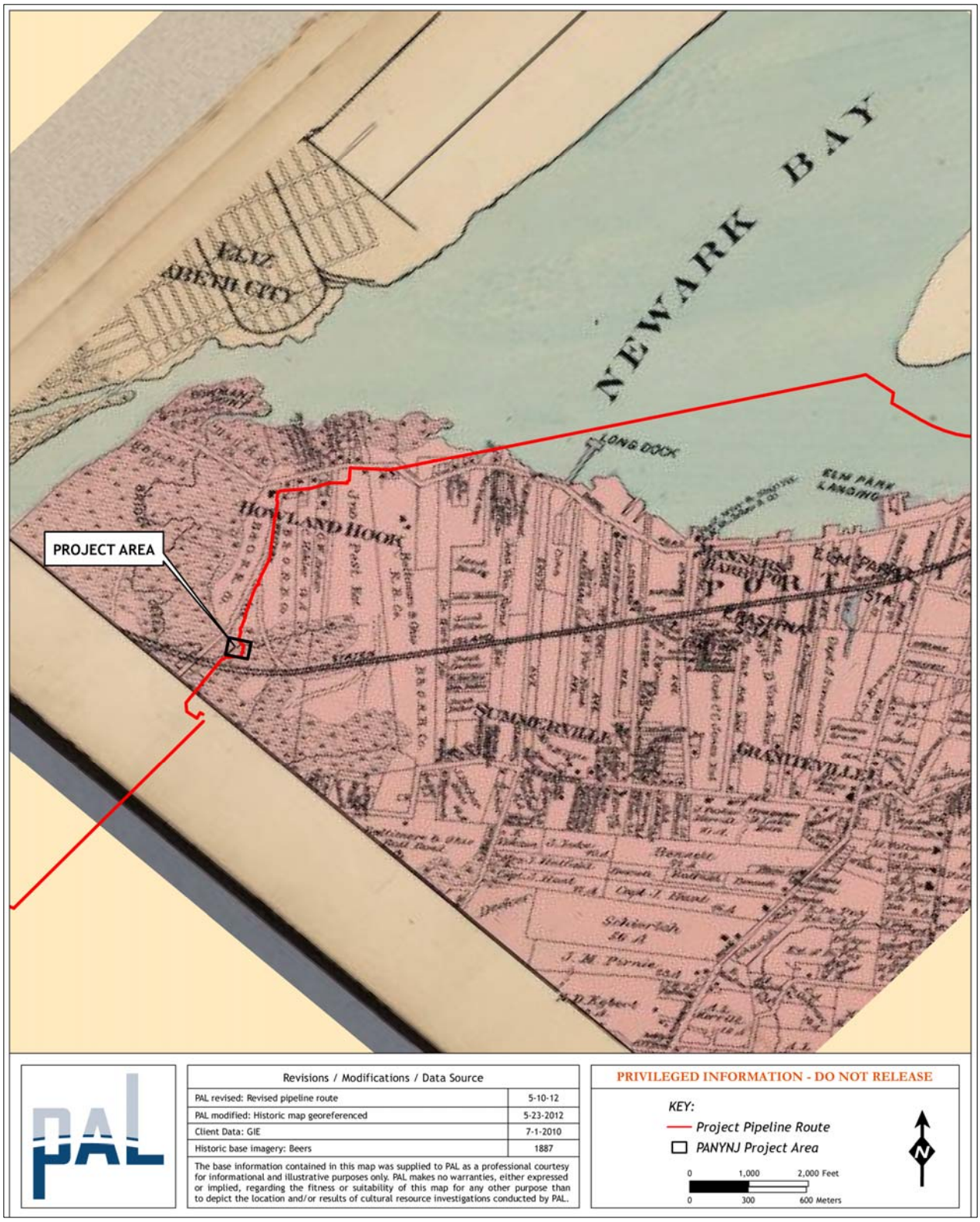


Figure 4-3. 1887 map with the approximate location of the PANYNJ Project area (source: Beers 1887).

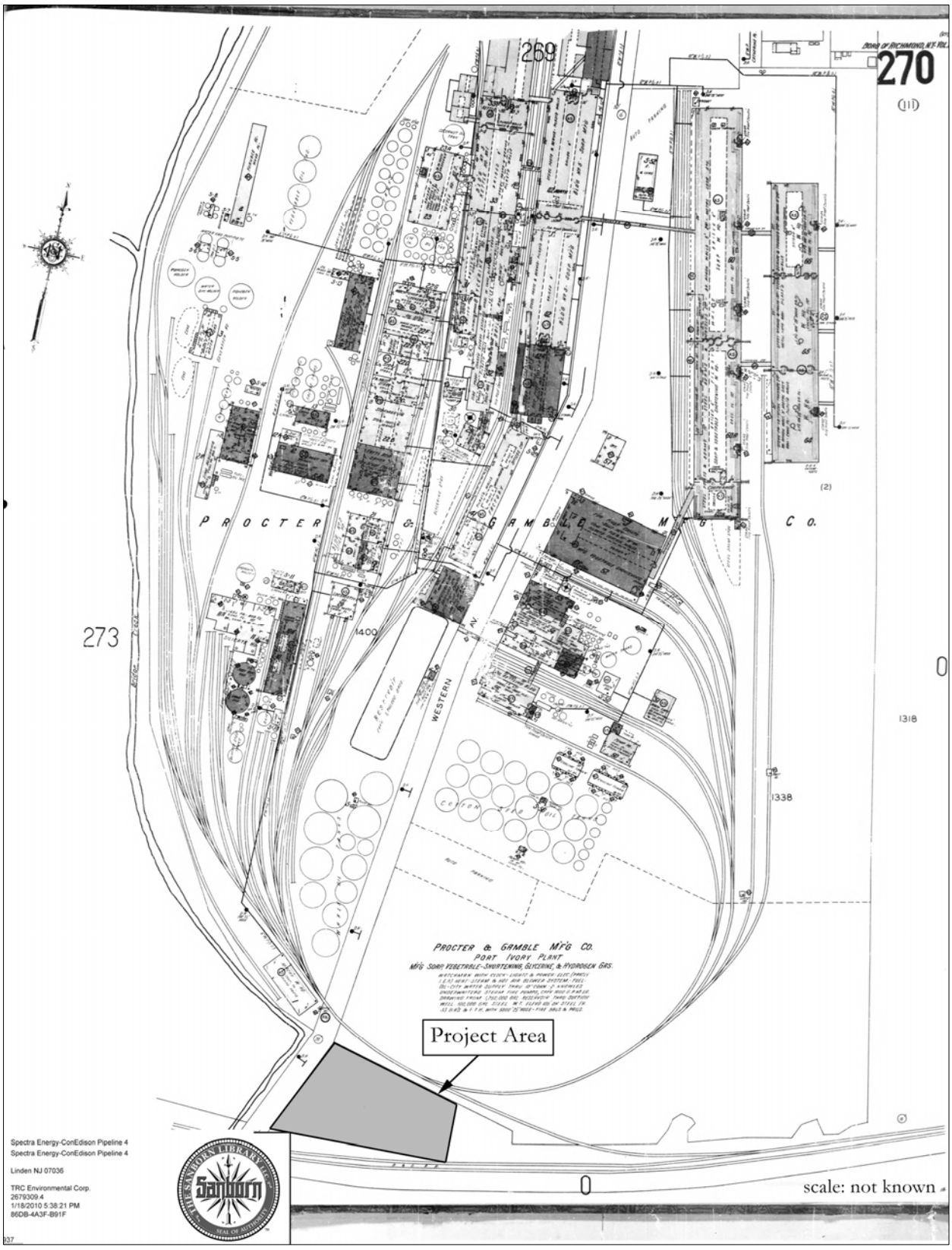


Figure 4-4. 1937 map with the location of the PANYNJ Project area (source: Sanborn 1937).

channel, constructing the bridge created special challenges. The bridge needed to be a continuous arch constructed without temporary supports in the channel, be able to support rail lines, and be elevated 150 feet over the water level to allow clearance for the U.S. Navy's tallest ships of the 1930s. This also required the construction of extensive elevated roadway viaducts at the bridge's landing points. The resulting construction consisted of what would become the world's longest single arch, steel truss bridge for the next 45 years. The two other planned bridges constructed were the Outerbridge Crossing and Goethal's Bridge. The presence of these bridges expanded commercial transportation, attracted industry and spurred the development of bedroom communities on Staten Island whose residents commuted to Manhattan and New Jersey for work. Staten Island at present is an industrial center for New York City and suburban outlier of Manhattan and neighboring New Jersey communities.

Land Use History and Archaeological Sensitivity Assessment of the Project Area

Previously documented archaeological sites at or in the vicinity of the Project area include the Mariner's Harbor Site area (Boesch 1994: No. 105; STD-MH), Site 8505 (NYSM site files), and the Old Place Site (A085-01-0134 and A085-01-2366). North of the Staten Island Rail Road line, the Project area overlaps with the Mariner's Harbor site area first reported by Alan Skinner. The Mariner's Harbor Site is a large area from which artifacts were collected by Skinner (Skinner 1909), and depicted as a hatched area on his map (Figure 4-5). Regarding this area, Skinner noted "At Mariner's Harbor, beginning about half a mile south of the station and running north to Bowman's Point, in every field are traces of prolonged occupation, fire-cracked stones, flint chips, potsherds and the like" (Skinner 1909:5). Skinner's map shows the Mariner's Harbor area as generally situated between the Staten Island Rail Road to the south and Shore Road (present-day Richmond Terrace) to the north. The area extends a little west of Western Avenue and east and southeast of South Avenue (see Figure 4-5).

A review of Skinner's notes cataloging his artifact finds on Staten Island, including those in the Mariner's Harbor area, reveal that numerous artifacts were collected along or in the vicinity of Western Avenue north of the Staten Island Rail Road (Skinner 1898–1909). Finds in this area included a grooved axe, knives of argillite and "flint," a celt, scrapers, fragments of steatite and pottery, a bannerstone, a pewter kettle fragment, jasper and argillite blades, a fragment of a gorget or semi-lunar knife and projectile points of argillite, quartz, and "flint". Some of the finds are suggestive of deposits typically affiliated with the Archaic, Transitional Archaic, Woodland and possible Contact periods. Skinner additionally notes finds of projectile points, including one of argillite, at the "Proctor and Gamble Soap Works" located along Western Avenue (Skinner 1898–1909). These finds may be related to previously recorded Site 8505 (NYSM site files), a pre-contact site located somewhere in the vicinity of Western Avenue and the proposed pipeline, most likely between Richmond Terrace to the north, and the Staten Island Rail Road line to the south along the east side of Western Avenue. No information was available in the site file concerning who found the site or its contents.

Initially reported by Skinner (1909), the Old Place Site has yielded evidence of Archaic, Woodland and Contact period components. Finds from the site include features (fire pits and refuse pits), a variety of diagnostic points (e.g., Stanly/Neville, Snook Kill, Bare Island, Poplar Island, bifurcate, Kirk, Levanna, broad spears), Early and Late Woodland ceramics, and contact period items (brass kettle fragments, brass arrowhead, gun flints, kaolin pipes, pewter ring, lead bullets). One radiocarbon date of 5310 ± 140 years B.C. (uncalib.) from hearth charcoal has been reported from the site (Ritchie and Funk 1971:49). A possible fluted biface resembling a PaleoIndian projectile point was also reportedly recovered from the site (Payne and Baumgardt 1986:II-13). The site and surrounding areas have undergone subsequent investigations since Skinner first reported it by both avocational and professional archaeologists in the 1960s and 1980s (Anderson 1964, 1967; HAA 2002; Payne and Baumgardt 1986; Ritchie and Funk 1971).

The exact boundaries of the Old Place Site are uncertain, located between Old Place Creek to the south and the Staten Island Rail Road to the north. The Old Place Site was first reported by Skinner as a village site located at the western end of the Old Place neck landform (Skinner 1909:8-9). Subsequent excavations at the site were undertaken in eight "areas" by amateur archaeologists Albert J. Anderson and Robert Anderson in the 1960s (Anderson 1964). The map in Anderson's site report indicates their excavations took place along the Arthur Kill shoreline at the northwest corner of Staten Island. A map of the individual excavation areas was not included in Anderson's site report. Ritchie, who consulted with the Andersons about the site, later provided a more specific description. He described the location of the Old Place Site as being situated in what is now a wetland area along the east bank of

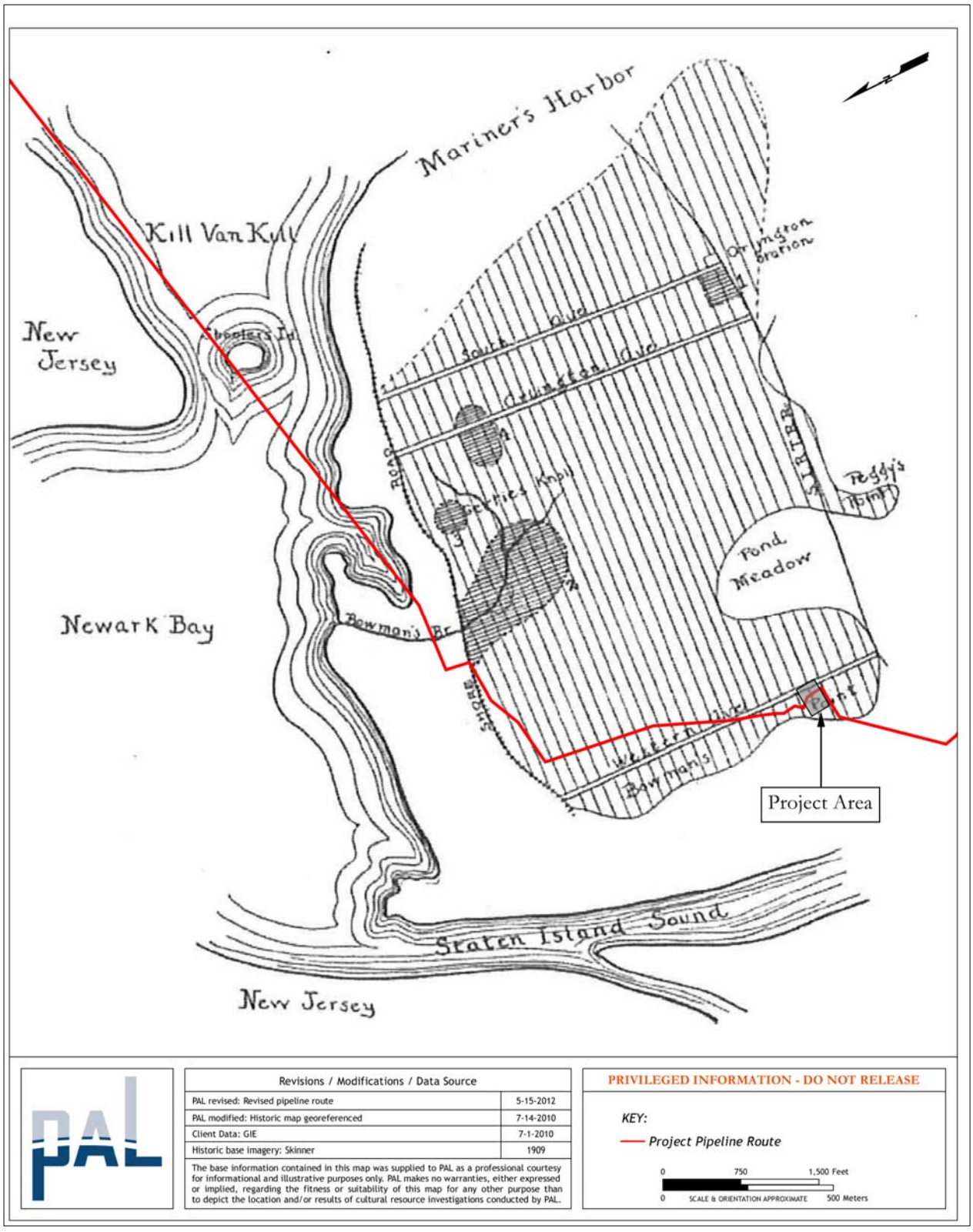


Figure 4-5. 1909 map of archaeological sites identified at Mariner's Harbor, with the location of the Project pipeline route on Staten Island (source: Skinner 1909).

the Arthur Kill just north of the Goethals Bridge abutment (Ritchie 1969:147; and 1971:49). However, Skinner's artifact collection notes also variably refer to finds in the vicinity as being from "Old Place," "Old Place Neck," or "Tunissen's Neck" (Skinner 1898–1909), suggesting that finds from the Old Place Site, or related deposits could be present along the whole length of the neck landform south of Bridge Creek and the Project area.

In his report on the Old Place Site, Skinner also noted that Euro-American burials had been found near the former residence of the Reverend James Kinney along Western Avenue (Skinner 1909:9). A previous cultural resource investigation for the Howland Hook Marine Terminal Expansion indicates the former Kinney residence (documented as Site A085-01-2375), dating to 1885, was located on the west side of Western Avenue between the Staten Island Rail Road to the north and the Coca-Cola property to the south placing it south of the Project area (Payne and Baumgardt 1986).

The vicinity of the Kinney house (no longer standing), was also the location of a series of Revolutionary War period skirmishes in 1777 and a British fortification or picket line. The picket line was located near the "Burnt House" thought to refer to the old John Tunissen House located near the intersection of what is now Western Avenue and Goethals Bridge Road North, and earthworks were reportedly constructed on the Kinney property (Payne and Baumgardt 1986:I-35 and III-4). It is believed that the burials on the former Kinney property may represent Hessian casualties from the Revolutionary War skirmish that took place here, though Payne and Baumgardt conclude that Skinner's report implies that there were "non-white" human remains as well (1986:III-3). However, Skinner (1909:9) does not specifically mention that Native American burials were encountered.

A review of nineteenth century maps indicates that the PANYNJ Project area was historically situated along the northern edge of wetlands associated with Bridge Creek (Beers 1874, 1887; Butler 1853; Dripps 1872; Hassler 1845; Walling 1860; USGS 1891). The Project area remained undeveloped throughout the nineteenth century except for the establishment of Western Avenue along the west side of the project area by 1860 (see Figures 4-1 and 4-2). A cart path or secondary road was also present to the east of the Project area/pipeline route by the 1870s (Figure 4-6), but no other developments occur in this wetland environment until the twentieth century.

The major twentieth-century development in proximity to the Project area, north of the rail line, is associated with the Proctor and Gamble Port Ivory Plant (see Figure 4-4). The Project area is located along the southernmost limit of the sprawling industrial complex, which extended north from the railroad tracks to Richmond Terrace and west to the Arthur Kill marshlands. First opened in 1907, the plant became known for its production of Ivory soap, detergents, Crisco vegetable oil and shortening, as well as later-twentieth-century products including Duncan Hines baking goods, Tide detergent, and orange juice. By the 1920s, the plant occupied both sides of Western Avenue between the Staten Island Rail Road and Richmond Terrace, and included piers along Kill Van Kull (see Figure 4-4). According to a previous cultural resources assessment, the portion of the plant on the west side of Western Avenue including many of the early plant buildings have been determined eligible for listing in the State and National Registers, for its association with American industrial and commercial history (HAA 2002:9). The 1907 Robinson map also indicates that there was a "Milliken Station" along a rail spur north of the Staten Island Rail Road line and Project area. The station is still present on the 1917 Bromley map (Figure 4-7), but appears to have been torn down by 1937 (see Figure 4-4). By 1962 a manufactory building of the Proctor and Gamble complex for cake mixes was present near the former location of the rail station according to the 1962 Sanborn insurance map (Figure 4-8). This building appears on Sanborn maps as late as 1996, but is no longer extant (Sanborn 1962, 1977, 1981, 1983, 1986, 1987, 1988, 1989, 1990, 1992, 1993, 1994, 1995, 1996).

Known or observed sources of disturbance and landscape alterations in this general area include construction of the elevated rail bed, graded and paved areas containing rail spurs at the south end of the former Proctor and Gamble complex, and the Western Avenue road bed and utility lines (see Figure 1-3). The existing utilities include pipelines operated by Texas Eastern, IMTT, and Colonial pipelines.

On the west side of Western Avenue, and north of the Staten Island railroad crossing, a cross-section profile constructed from soil borings was created for an environmental remediation report for the Port Ivory facility on PANYNJ property. The cross-section profile, situated 100 to 400 ft west of the Project pipeline route, indicates that red-brown sandy soils are present below approximately 17 to 30 ft of fill deposits (Hatch Mott MacDonald 2008). The sandy soils may indicate that natural soils protected by a cap of fill are present in the general area (Elquist et al. 2010:81).

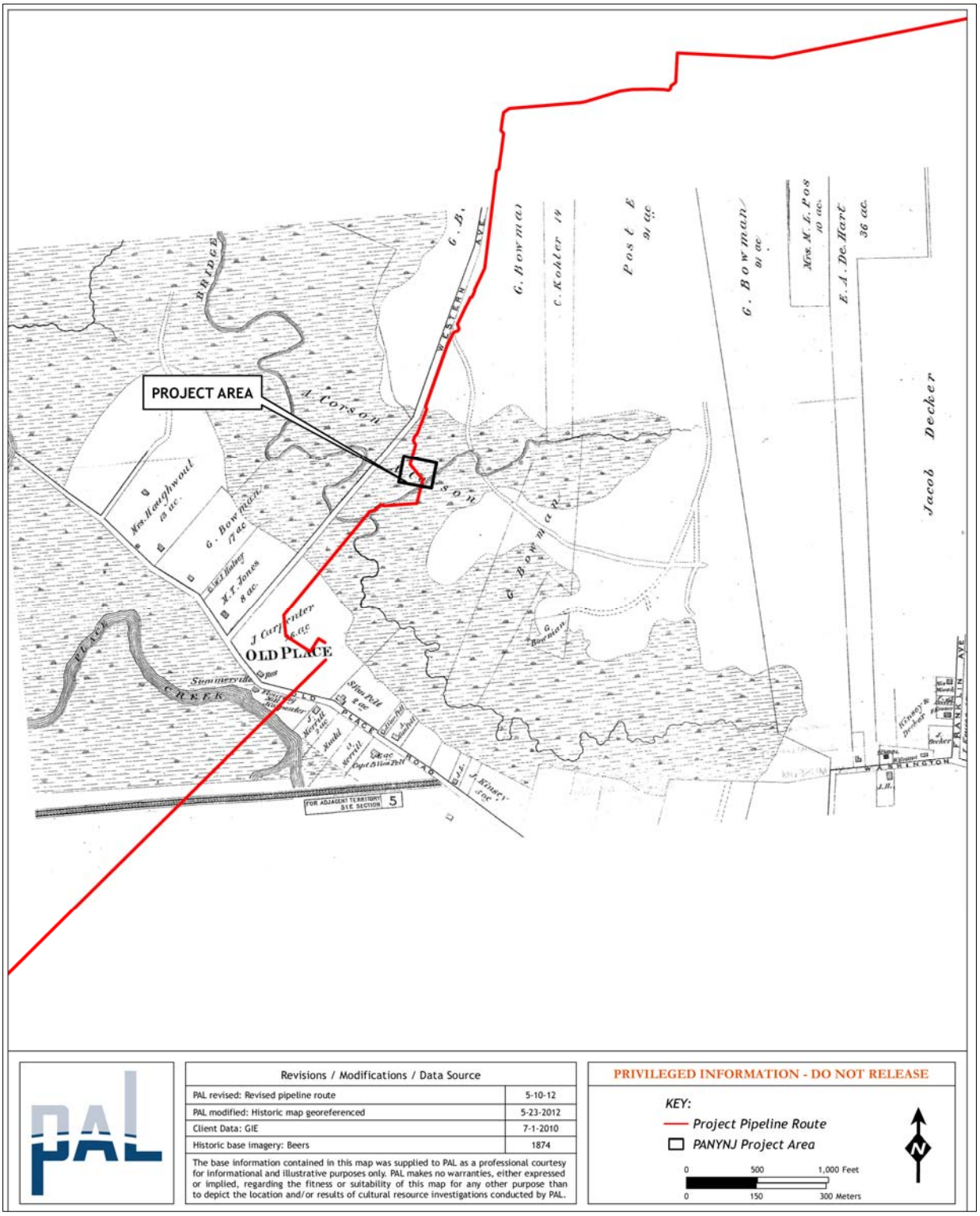


Figure 4-6. 1874 map with the location of the PANYNJ Project area (source: Beers 1874).

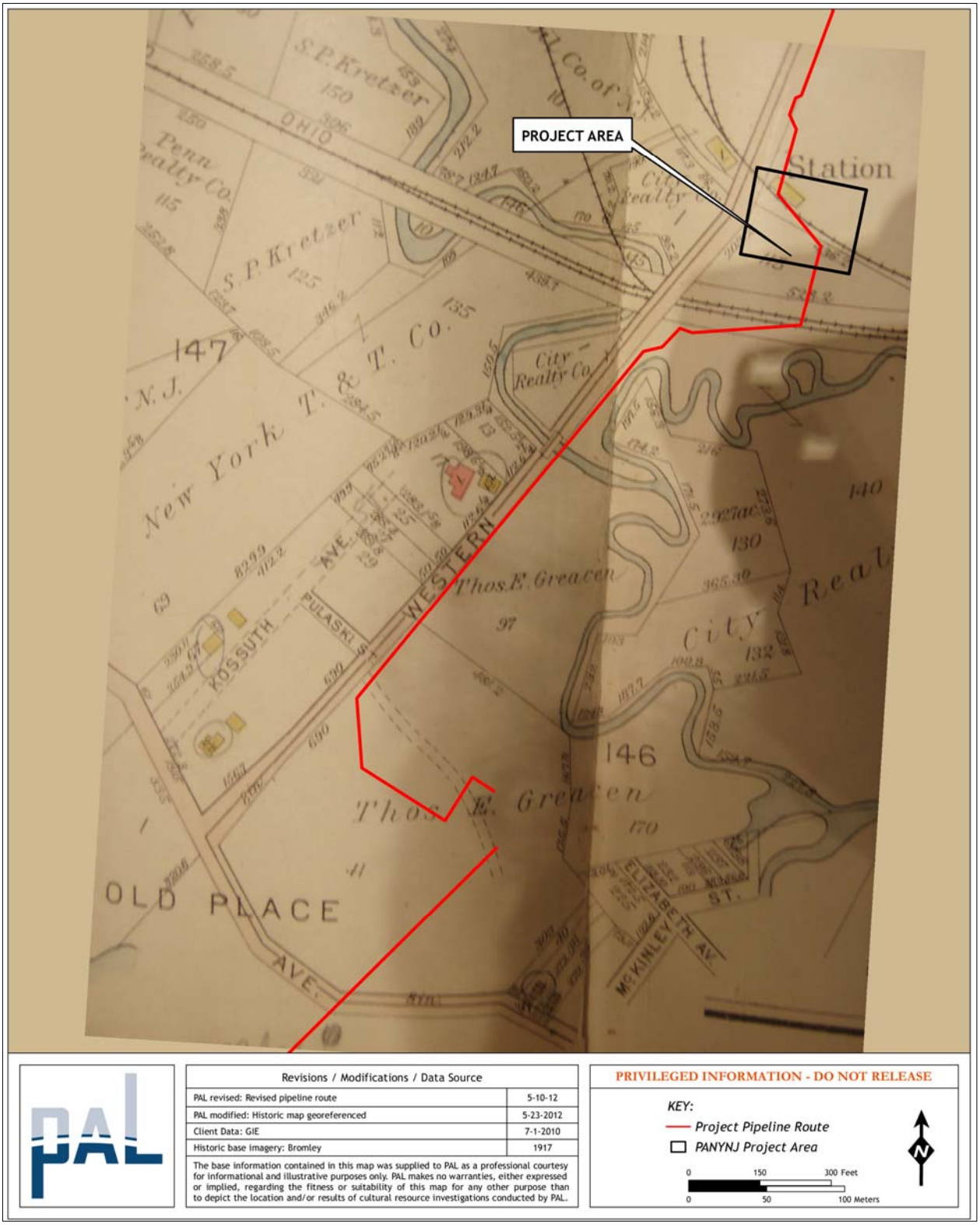


Figure 4-7. 1917 map with the location of the PANYNJ Project area (source: Bromley 1917).

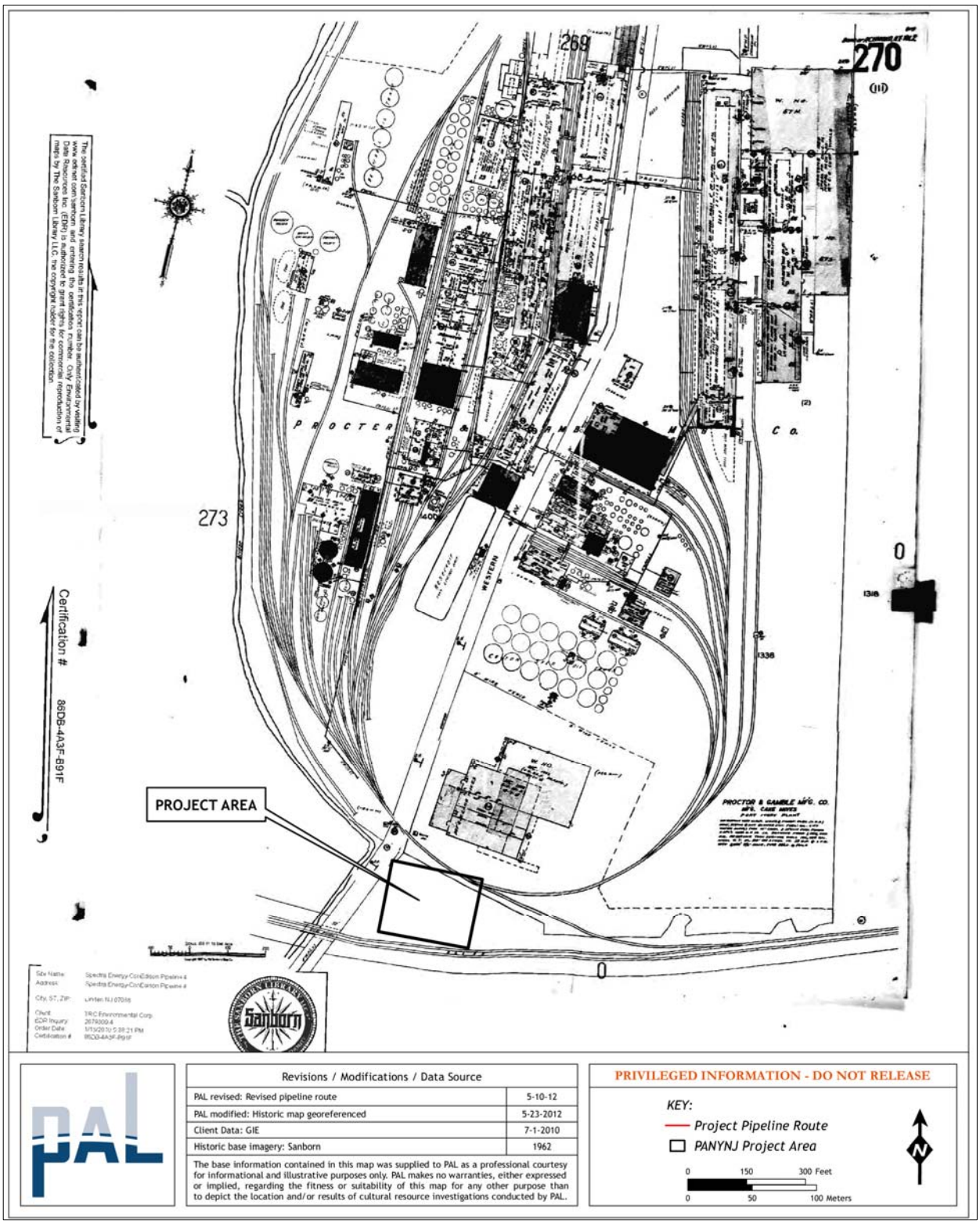


Figure 4-8. 1962 map with the location of the PANYNJ Project area (source: Sanborn 1962).

A previous cultural resources assessment and draft Environmental Impact Statement (EIS) for the Cross Harbor Freight Movement Project concluded that the Arlington Yard area east of Western Avenue was sensitive for pre-contact resources and the Port Ivory area containing the former Proctor and Gamble plant on the west side of Western Avenue was highly sensitive for both pre-contact resources and twentieth-century resources associated with the former Proctor and Gamble plant (NYCEDC 2004; HAA 2002:23–24). This Port Ivory area was also considered to have low to moderate sensitivity for early post-contact period resources (HAA 2002:23–24).

The presence of the previously recorded archaeological sites and artifact finds along Western Avenue indicated that this section of the route had high sensitivity for pre-contact resources present in intact sediments below deposits of fill or disturbed soils. Expected pre-contact resource types could have consisted of campsite or village components potentially dating to the Archaic through contact periods. The area containing this section of the pipeline route between STA 252+50 and 254+00 was therefore assessed as having high sensitivity for pre-contact resources, and low sensitivity for post-contact resources (Elquist et al. 2010:82; Elquist and Cherau 2011a).

Soil borings were recommended to determine the presence and depth of ground disturbance, fill, or marsh deposits, and of any sediments that have the potential to contain archaeological resources within or below these deposits. In April of 2012 a total of nine geoarchaeological soil borings (the RCH-4-ARC series) attributed to three groupings were excavated along PANYNJ property. The Group 3 borings consisted of two cores (RCH-4-ARC-13 and RCH-4-ARC-14) both situated within the present Project area. These borings contain differentiated Holocene age-sequences with fill overlying peat, which in turn seals in a shore facies. The peats in Group 3 were radiocarbon dated since these contain elements of intact pre-contact period environments. Drainage ditches adjacent to the railroad tracks indicate that the pristine and early post-contact period terrain was a wetland area. The former wetland landscape was confirmed in the stratigraphy of the two cores placed in this area. The cores both contain an upper stratum of artificial fill over intact peat and matted anaerobic vegetation complexes. Peats and sediments recovered from depths of 270-610 cm (9-20 ft) produced radiocarbon dates between 13,700 and 160 B.P. (years before present) (GRA 2012:21).

Specifically, RCH-4-ARC-13 contained a sandy loam fill with brick and metal fragments from ground surface to a depth of 150 cm (4.9 ft). A lower fill is present from 150-210 cm (4.9-6.9 ft) below surface. At 210 cm (6.9 ft) the fill tapers to a silty loam preserving matted marsh vegetative structures. An intact, black peat horizon with visible vegetation structures and leaves was present between 230-300 cm (7.5-9.8 ft). Peat from 290 m (9.5 ft) produced a radiocarbon date of 630±30 B.P. (Beta-320523), and sediment from the same sample was dated to 3910±50 B.P. (Beta-320840). The bottom of this peat layer at 305 cm (10 ft) produced an anomalous date of 160±30 (Beta-320525). That peat was underlain by another organic matted layer at 390 cm (12.8 ft), dated to 1730±30 B.P. (Beta-320524) at 335 cm (11 ft) below surface. The bottom of the core to 610 cm (20 ft) contained loose, gray well-sorted sands. An organic sample obtained at 549 cm (18 ft) was cross-dated at 6530±40 B.P. (Beta-320526) for plant remains and at 13,700±60 B.P. (Beta-320841) for organic sediment (GRA 2012:22).

RCH-4-ARC-14 contained sandy loam fill with gravel from ground surface to 180 cm (5.9 ft), underlain by silty clay that transitioned abruptly to a black peat at 270 cm (8.9 ft). A peat sample at this depth produced a radiocarbon date of 1310±30 B.P. (Beta-320527). The peat layer covered a reddish-brown organic-rich sandy clay with organics, which yielded a radiocarbon date of 720±30 B.P. (Beata-320528). Plant material from the bottom of the clay layer at 320 cm (10.5 ft) was dated to 1340±30 B.P. (Beta-320529). A reddish-brown sand extended to the bottom of the boring at 610 cm (20 ft) where it interfaces with a brown matted peat, which produced a radiocarbon date of 11,760±50 B.P. (Beta-320530) (GRA 2012:22).

In sum, the two cores (RCH-4-ARC-13 and RCH-4-ARC-14) document the development of the wetland in this area beginning in the mid-Holocene period. Between the surface and 320 cm (10.5 ft) the radiocarbon date inversions suggest that there appears to have been post-contact period disturbances to the natural wetlands development sequence. However, the record of peat formation appears intact below that depth based on the peat and sediment radiocarbon dates obtained from both borings. The dated peat strata reflect an intact sequence of peat deposition from ca. 6500 to 1350 B.P. spanning the Middle Archaic to Woodland periods (GRA 2012:23-24; 30-31). The borings confirmed the expected high sensitivity for intact pre-contact period deposits at depths beginning at 320 cmbs (10.5 ft) that could contain significant archaeological deposits.

CHAPTER FIVE

RESULTS OF THE FIELDWORK

The Phase IB investigations included the excavation of two machine-assisted trenches (MTs) within the Port Authority Project area, west of the former Proctor and Gamble Complex (Figure 5-1). The two excavated trenches contained modern and historic fill deposits that included disturbed or re-deposited A and/or B horizons including peat mats, organic, and wetland soils extending vertically to 460 cmbs (15 ft) in the project pipeline APE for the bore pits. A total of 40 cultural materials was recovered in the underlying peat and subsoils in MT-1 and in the lower fill deposit ($Fill_6$) in MT-2 (Appendix B). Twenty-six of the 40 artifacts are post-contact materials recovered from disturbed (natural) sediments in MT-1, while MT-2 yielded 14 pieces of flint ballast from fill deposits. The soil stratigraphy and cultural material assemblage identified in the two trenches is described in detail below.

Machine Trench-1 (MT-1)

MT-1 was located in a paved access road southeast of Western Avenue in-between two sections of converging Conrail rail lines and spurs. MT-1 contained eleven fill deposits that included redeposited/disturbed natural sediments, underlain by two peat deposits followed by a redeposited B horizon that reached a maximum depth of 460 cmbs (15 ft) at the limit of excavation (Figure 5-2). MT-1 filled with groundwater after 1.2 m (4 ft) and had to be pumped continuously to allow for the excavations and construction of wood plank shoring devices to prevent wall collapse.

$Fill_1$ consisted of a dark gray brown (2.5Y 4/2) gravel with silty sand from 14 to 24 cmbs. $Fill_2$ underlay $Fill_1$ and was comprised of a black (10YR 2/1) sandy silt with cinder and brick inclusions and small common pebbles that extended from 20 to 58 cmbs. $Fill_3$ was a heavily mottled deposit of dark yellowish brown (10YR 3/4), yellowish brown (10YR 5/6), very dark gray brown (10YR 3/2) silty medium sand with pockets of yellowish red (5YR 4/6) clay. The mottled deposit underlay $Fill_2$ from 32 to 230 cmbs. $Fill_4$ was a pocket of black (10YR 2/1) coal cinders within $Fill_3$; it was encountered between 110 to 150 cmbs. $Fill_5$ consisted of a strong brown (7.5YR 4/6) silty medium sand with clay pockets from 182 to 280 cmbs. $Fill_6$ was a black (10YR 2/1) mottled with gray (10YR 5/1) silty medium sand from 240 to 310 cmbs. $Fill_7$ was a dark gray brown (10YR 4/2) silty medium sand that extended from 310 to 320 cmbs. The uppermost peat stratum extended from 320 to 350 cmbs and was a black (10YR 2/1) silty clay with 30 to 60 percent decaying vegetation. The lower organic deposit, $Peat_2$, was found between 350 to 410 cmbs and was a very dark gray silty clay with 10-20 percent vegetable matter. Two redeposited strata, initially believed to be part of an intact B subsoil horizon, were present below the lower peat deposit. From 410 to 430 cmbs was a gray brown (2.5Y 5/2) silty medium to course sand that became more mottled with a yellowish brown (10YR 5/8) medium to course sand from 430 to 460 cmbs.

Post-contact/modern cultural materials were noted throughout the upper fill deposits, and a total of 26 items were collected from the suspected underlying native sediments (see Appendix B). Recovered items include ceramics, glass, metal, brick, coal and coal by-products. The screened soils from 320-350 cmbs in the uppermost peat deposit ($Peat_1$) contained two cultural materials: one piece of coal and one pearlware bowl base sherd. Five cultural materials were recovered from 365-380 cm in the screened soil sample from the lower peat stratum ($Peat_2$): two aqua tinted flat window glass fragments, two pieces of clear hollowware, and one embossed molded glass fragment. Ferrous metals recovered from the $Peat_2$ include one spike, one nail, and one unidentified fragment. Other materials include one brick fragment, one piece of coal, and an unidentified synthetic material. The redeposited B_1 from 410-430 cmbs yielded an amber molded bottle glass fragment, one machine made clear bottle glass fragment, and one piece of coal. The redeposited or disturbed B_1/B_2 from 430-460 cmbs contained one lead glazed earthenware sherd, two machine made clear bottle glass fragments, two clear curved glass fragments, one piece of coal, and one clinker. Diagnostic materials were limited to the two ceramic sherds found within the trench. The pearlware bowl fragment from the $Peat_1$ has a general manufacture date from 1779 to 1830, while the lead glazed redware from the redeposited B_1/B_2 has a broader manufacture date range of 1600 to the present.

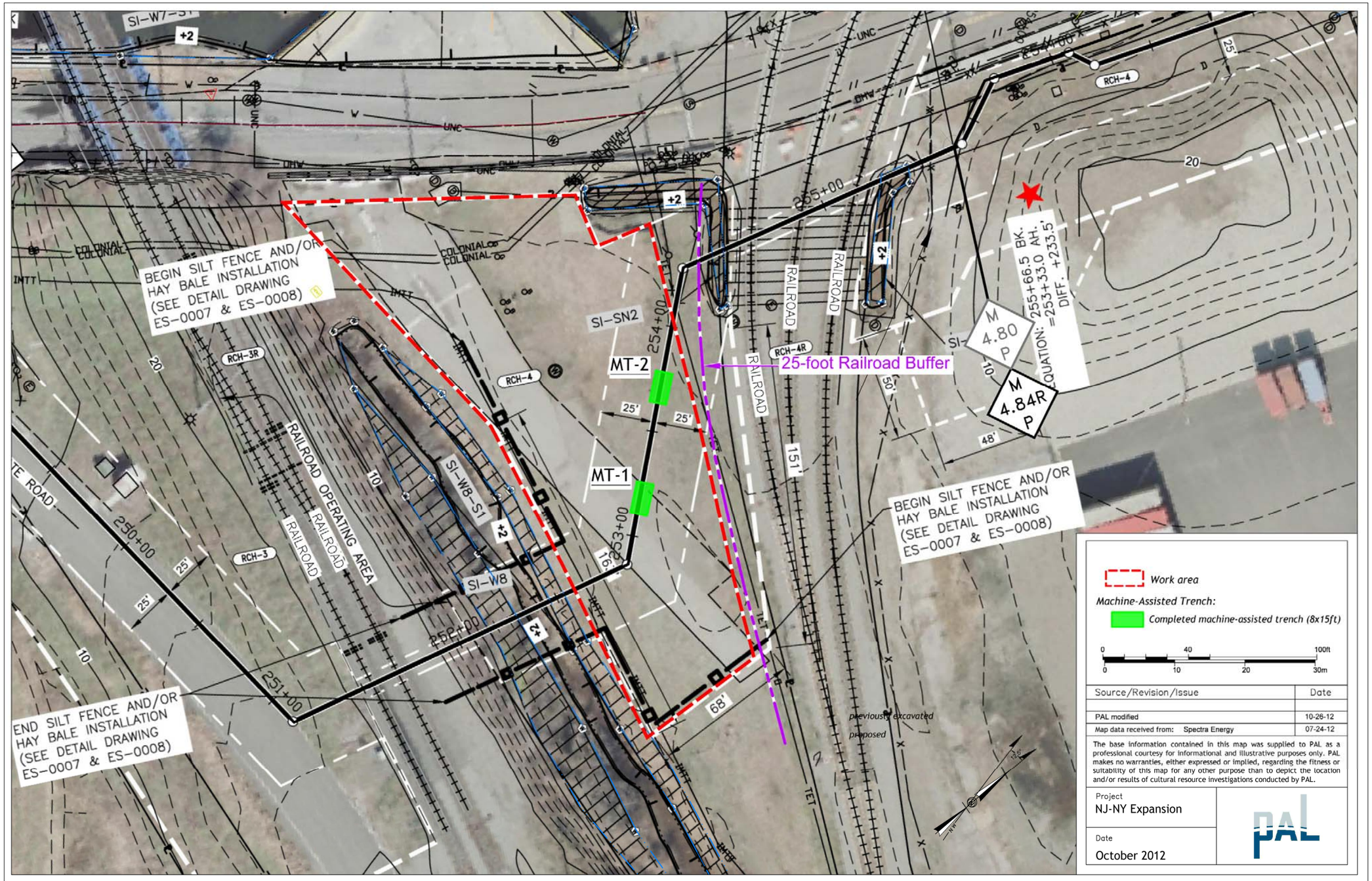
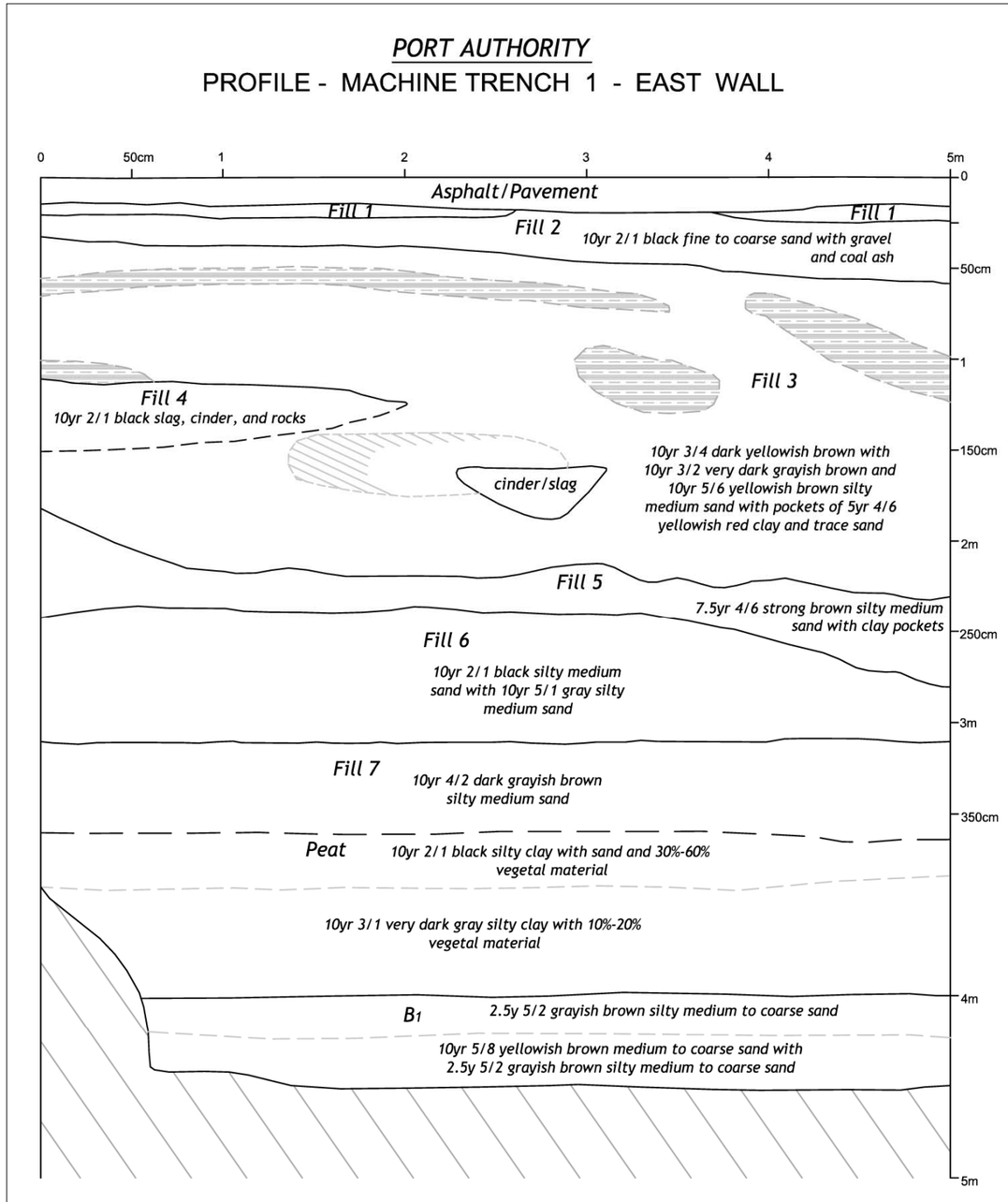


Figure 5-1. Locations of the machine-assisted trenches excavated within the Port Authority Project area (Tract # RCH-4) in Staten Island, New York.



recessed wall collapse

clay pocket

Figure 5-2. East wall profile of MT-1, 0-460 cmbs (0-15 ft); photo inset a: 0-130 cmbs (4.3 ft) fill deposits.

Cultural materials were noted in the upper fill deposits, but not collected. These materials included modern debris such as plastic and asphalt. $Fill_2$ contained a moderate amount of cultural material that included wood, brick, fire brick, plastic, concrete, shell, whiteware ceramic sherds, asphalt, plate glass, and refined earthenware bathroom fixture sherds. $Fill_3$ contained large boulders with only a low density of material that included plate glass, a glass bottle base, firebrick, a wood plank, milk glass, whiteware ceramic sherds, and wire nails. $Fill_4$ only contained coal cinders. $Fill_5$ contained ironstone sherds, wire, firebrick, brick, asphalt, railroad ties, and concrete curbing.

Machine Trench-2 (MT-2)

MT-2 was placed 10 m northeast of MT-1, along the proposed pipe-line corridor. Trench excavation revealed modern disturbance and earth building episodes. Along the northeast side of the trench, eight fill deposits were encountered as well as a redeposited or disturbed peat horizon to a depth of 285 cmbs (9.4 ft) at the limit of excavation (Figures 5-3). The southwest side of the machine trench contained a modern builder's trench. The builder's trench was associated with an unmarked 12-inch diameter gas pipeline exposed through collapse of the western trench wall (Figure 5-4). The pipe was located at approximately 170 cmbs (5.6 ft) and was oriented 330 degrees cutting through the trench from the southwest corner to the north-northwest side.

Fill deposits along the northeast side of the trench are described as follows. $Fill_1$ was encountered from 0 to 22 cmbs, characterized as a dark grayish fine to medium sand with gravel. $Fill_2$ was a strong brown (7.5YR 4/6) fine sand mottled with very dark gray (10YR 3/1) fine sand and red (2.5YR 5/8) silty clay found from 14 to 53cmbs. $Fill_3$ consisted of a very dark gray brown (10YR 3/2) fine to coarse sand with gravel and coal cinders from 28 to 56 cmbs. $Fill_4$ extended from 48 to 93 cmbs, and consisted of a dark reddish brown (5YR 3/3) clayey fine sand mottled with strong brown (7.5YR 5/8) fine sand and a yellowish red fine sandy clay. $Fill_5$ consisted of a black (10YR 2/1) coal cinder and gravel deposit that extended from 82 to 107 cmbs. A thin lens of dark gray brown fine sandy clay was found between $Fill_5$ and $Fill_6$. $Fill_6$ was a mottled dark gray (10YR 4/2) and a very dark gray brown (10YR 3/2) fine sand and gravel encountered between 109 and 145 cmbs. $Fill_7$ consisted of a dark reddish brown (5YR 3/3) fine sand mottled with a strong brown (7.5YR 5/8) fine sand and a yellowish red (5YR 4/6 yellowish red fine sandy clay from 142 to 207 cmbs. The lowest sediment encountered in the trench was a re-deposited or disturbed peat stratum present from 207 to 285 cmbs at the limit of excavation. The peat stratum consisted of about 20 percent dense organic mat and 80 percent very dark gray brown (10YR 3/2) silty clay.

Cultural material collected from MT-2 included a concentration of European (English grey) flint ballast (N=14) recovered from 108-144 cmbs in $Fill_6$. They were exposed in the fill as part of the wall collapse associated with the unmarked gas pipeline. The flint nodules may have been originally part of a larger cobble(s), but they showed no evidence of being intentionally worked or otherwise modified for use other than historic ship ballast. Other cultural materials noted during excavation in all strata including the peat, but not collected, consisted of building/structural materials (i.e., railroad ties, Belgian block pavers, brick, and window glass) and a low density of domestic items (i.e., whiteware ceramic sherds, bottle glass fragments, and coal and coal waste). Robert Clark, one of the Napp-Greco machine contractor staff and a longtime Staten Island resident, indicated that the entire parcel had been used by Proctor and Gamble as a dump until the early 1960s.

No pre-contact Native American cultural materials or features were identified during the machine-assisted subsurface testing within the Port Authority Project area.

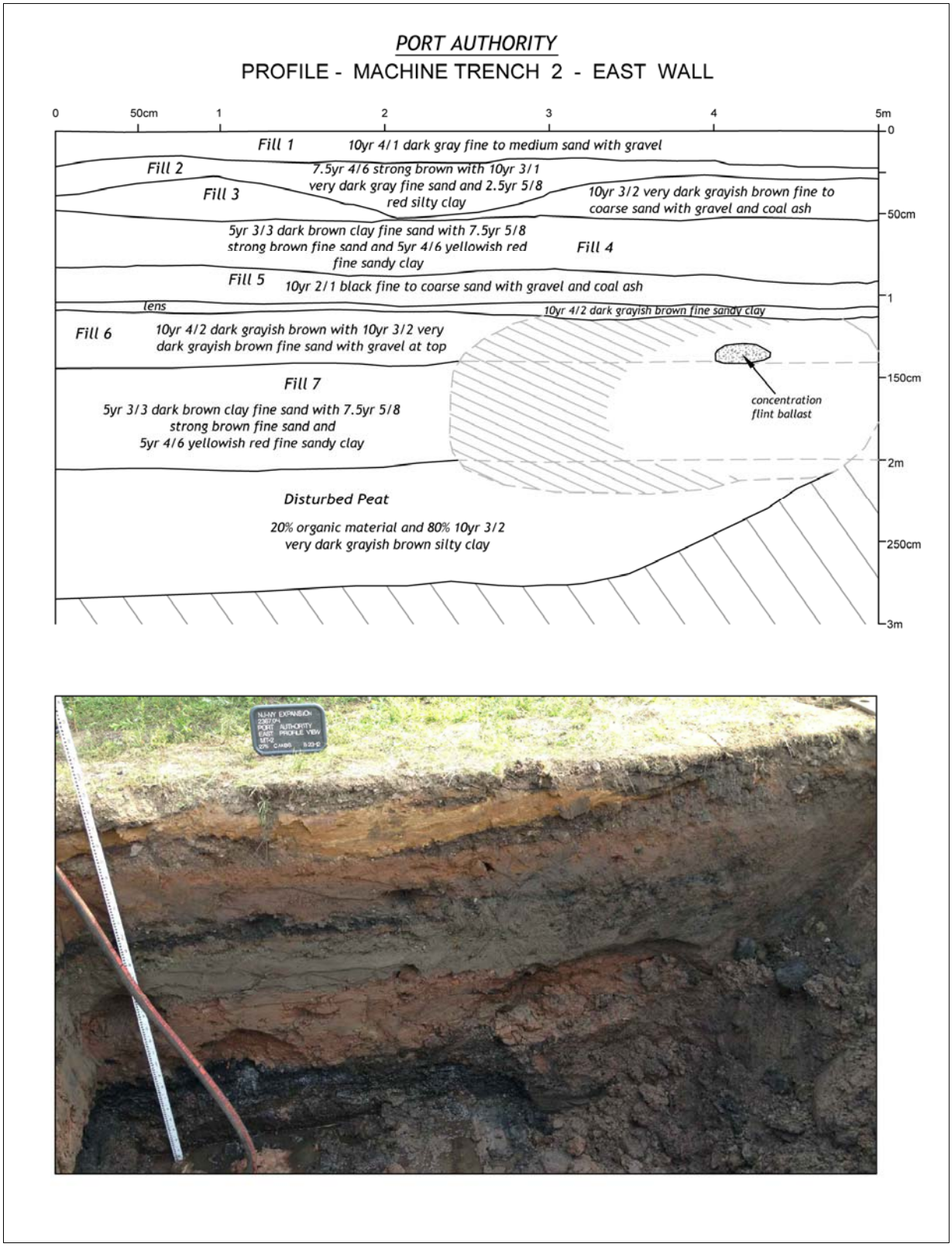


Figure 5-3. East wall profile of MT-2, 0-285 cmbs (0-9.4 ft); photo inset a: 0-285 cmbs (0-9.4 ft) fill and disturbed peat deposits.

Figure 5-4. Photo of MT-2 southwest wall and exposed (unmarked) gas pipeline.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The Phase IB archaeological survey consisted of the excavation of two machine-assisted trenches within the Port Authority property (Tract No. RCH-4). The two excavated trenches contained modern and historic fill or disturbed deposits that extended vertically from the ground surface reaching a maximum depth of 460 cmbs (15 ft) in MT-1 and 285 cmbs (9.4 ft) in MT-2. The fill deposits varied in sand, silt, clay, and gravel composition, and included redeposited/disturbed B horizons including peat mats, organic, and wetland soils extending vertically to a depth of 206-285 cmbs (6.8-9.4 ft) within MT-2 and from 320-460 cm (10.5-15.1 ft) in MT-1. The fill deposits and disturbed soil contexts extended to the bottom of the bore pits APE for the project pipeline trench under the Conrail track ROWs.

The soil stratigraphy encountered in the two archaeological machine trenches was consistent with the historical documentation of the area and USDA soil classifications. Soils at this location have been mapped as Pavement & Buildings-Windsor-Verrazano Complex (NRCS 2005). This anthropogenic soil unit is found in urbanized areas and is characterized as relatively level to gently sloping outwash plains and dunes partially filled in for residential and commercial development, with typically 50 to 80 percent of the areas covered by impervious surface such as pavement, concrete or buildings or structures. The Project area was likely filled in during the 1950s and 1960s in association with the Proctor and Gamble property and other industrial/commercial uses, based on local informant accounts. Other modern disturbance was evident through utilities that traverse the property. A builder's trench was identified in MT-2 that was associated with a 12" unmarked gas line.

The results of the Phase IB subsurface testing are consistent with the soil boring findings of fill deposits to depths of at least 207 cmbs (6.8 ft) associated with the railroad track constructions and twentieth-century refusal disposal (dumping) by the nearby industrial complexes. The preliminary soil borings analysis suggested that the modern fill capped a natural wetlands development sequence that began in the mid-Holocene Period. The record of peat formation appeared intact below 320 cm (10.5 ft) based on the peat and sediment radiocarbon dates obtained from geoarchaeological borings RCH-4-ARC-13 and RCH-4-ARC-14. The dated peat strata appeared to reflect an intact sequence of peat deposition from ca. 6500 to 1350 B.P. spanning the Middle Archaic to Woodland periods (GRA 2012:23-24; 30-31). However, the Phase IB trenches determined that the peat and underlying subsoil strata had been disturbed and/or redeposited, probably during the twentieth-century dumping and soil manipulations for the railroad ROWs and nearby industrial uses. A 30 percent sample of the peat and subsoil sediments screened and examined in MT-1 and MT-2 revealed the presence of post-contact cultural materials including brick, wood, nails, ceramics, and bottle glass. The presence of post-contact materials indicates a disturbed and/or possible infilling episode(s) that impacted at least the upper portions of the deeply buried peat and subsoil horizons. It is uncertain if these subsoil horizons were in situ or had been redeposited (at least in part) as a result of the landmaking activities in this area between the railroad track easements. In any case, no pre-contact period (Native American) lithic cultural materials or features were identified during the subsurface testing in the Project bore pits APE.

Recommendations

No significant archaeological deposits were identified during the Phase IB subsurface testing on the Port Authority (Tract No. RCH-4) property on Staten Island, New York. No further archaeological investigations are recommend for the Project pipeline route between MP 4.69R to MP 4.84R (STA 252+50 to STA 254+00).

REFERENCES

Published Sources

Anderson, Albert J.
1964 Old Place and the Old Place Complex. *The Chesopian*, 2:13–14.

1967 Stanley Points from the Old Place Site. *The Chesopian*, 5:89.

Bendremer, Jeffrey C.M., and R. Dewar
1993 The Advent of Maize Horticulture in New England. In *Corn and Culture in the Prehistoric New World*, edited by C. Hastorf and S. Johannssen. Westview Press, Boulder, CO.

Boesch, Eugene J.
1994 *Archaeological Evaluation and Sensitivity Assessment of Staten Island, New York.* Prepared for the New York City Landmarks Preservation Commission, New York, NY. Report on File at NY State Historic Preservation Office, Waterford, NY.

Bolton, Reginald
1922 *Indian Paths in the Great Metropolis*. New York: Indian Notes and Monographs, Museum of the American Indian, Miscellaneous Papers 23.

Boyle, Robert H.
1979 *The Hudson River: A Material and Unnatural History*. W.W. Norton and Co., New York, NY.

Brasser, T.J.
1978 Early Indian-European Contacts. In *Handbook of North American Indians*, Vol. 15, edited by B.G. Trigger, pp. 78–88. Smithsonian Institution, Washington, D.C.

Brennan, Louis A.
1974 The Lower Hudson: A Decade of Shell Middens. In *Archaeology of Eastern North America* 2(1): 81–93.

1981 The Lower Hudson: The Archaic. In *The Archeology and Ethnohistory of the Lower Hudson Valley and Neighboring Regions: Essays in Honor of Louis A. Brennan*. Herbert C. Kraft (ed.), pp. 11021. Occasional Publications in Northeastern Anthropology No. 11.

Bridges, Patricia S.
1994 Prehistoric Diet and Health in a Coastal New York Skeletal Sample. *Northeast Anthropology.* 48:13-23.

Brodhead, John Romeyn
1853 *History of the State of New York, First Period, 1609-1664*. Harper and Brothers Publishers, New York, NY.

Broecker, W.S., D. Peteet and D. Rind
1985 Does the Ocean-Atmosphere System Have More than One Stable Mode of operation? *Nature*. 315:21–25.

Burrows, Edwin G., and Mike Wallace
1999 *Gotham*: *A History of New York City to 1898*. Oxford University Press, Inc. New York, NY.

Ceci, Lynn
1980 Maize Cultivation in Coastal New York: The Archaeological, Agronomical and Documentary Evidence. *North American Archaeologist* 1(1):45–74.

Cherau, Suzanne
2012 *Results of Geoarchaeological Soil Borings and Proposed Phase IB Archaeological Surveys, Report #7, New Jersey-New York Expansion Project, Route Variations 58 and 76, Port Authority Property, Staten Island, New York*. Submitted to Spectra Energy Transmission, LLC, Jersey City, NJ.

Chilton, Elizabeth S.
1996 *Embodiments of Choice: Native American Ceramic Diversity in the New England Interior.* Unpublished Ph.D. dissertation, Department of Anthropology, University of Massachusetts, Amherst, MA.

Clute, J.J.
1877 *Annals of Staten Island, From its Discovery to the Present Time*. Press of Chas. Vogt, New York, NY.

Custer, Jay F.
1996 *Prehistoric Cultures of Eastern Pennsylvania*. Pennsylvania Historical Museum Commission, Harrisburg, PA.

Davis, Margaret B.
1969 Climatic Changes in Southern Connecticut Recorded by Pollen Deposition at Rogers Lake. *Ecology*. 50:409–422.

Dicken, Connie L., Suzanne W. Nicholson, John D. Horton, Scott A. Kinney, Gregory Gunther, Michael P. Foose, and Julia A.L. Mueller
2008 *Preliminary Integrated Geologic Map Databases for the United States: Delaware, Maryland, New York, Pennsylvania and Virginia.* Retrieved June 15, 2010 from the world wide web: http://pubs.usgs.gov/of/2005/1325/index.htm.

Dincauze, Dena F.
1974 An Introduction to the Archaeology of the Greater Boston Area. *Archaeology of Eastern North America* 2(1):39–67.

1976 *The Neville Site: 8,000 Years at Amoskeag, Manchester, New Hampshire.* Peabody Museum Monographs 4. Harvard University, Cambridge, MA.

Dragoo, Don W.
1976 Some Aspects of Eastern North American Prehistory: A Review 1975. *American Antiquity* 41:3–27.

Eisenberg, Leonard
1978 Paleo-Indian Settlement Patterns in the Hudson-Delaware Drainages. *Occasional Publications in Northeastern Anthropology*, No. 4.

Elquist, Ora, Suzanne Cherau, Nichole Gillis, and Gregory R. Dubell
2010 Archaeological Overview Survey, Texas Eastern Transmission, LP, New Jersey-New York Expansion Project, FERC Docket No. CP11-56-000, Staten Island, Manhattan, and Ramapo, New York. PAL Inc. Report No. 2367.01B. Submitted to Spectra Energy Transmission, LLC, Jersey City, NJ.

Elquist, Ora and Suzanne Cherau

2011a *Archaeological Overview Survey, Addendum #3 to Technical Report, New Jersey-New York Expansion Project, Staten Island and Manhattan, New York.* Submitted by PAL, Inc. to Spectra Energy Transmission, LLC, Jersey City, NJ.

2011b *Phase IB Archaeological Identification Survey, M&R 058 Additional Temporary Workspace, and Phase II Archaeological Site Evaluation, Old Place Neck Site (OPRHP #A08501.002971), Goethals Bridge HDD Workspace, Staten Island, Richmond County, New York.* PAL, Inc. Report No. 2367.03. Submitted to Spectra Energy Transmission, LLC, Jersey City, NJ.

Federal Energy Regulatory Commission (FERC)

2002 *Guidelines for Reporting on Cultural Resources Investigations for Pipeline Projects.* Office of Energy Projects, Washington, D.C.

Fernow, B.

1883 *Documents Relating to the History of the Early Colonial Settlements, Principally on Long Island, with a Map of its Western Part, Made in 1666.* Translated, compiled, and edited by B. Fernow from the original records in the Office of the Secretary of State, and the State Library. Weed, Parsons and Company, Albany, NY.

Fiedel, Stuart J.

2001 What Happened in the Early Woodland? *Archaeology of Eastern North America* 29:101–142.

Flagg, Thomas R.

1991 *Cultural Resource Survey, Newark Bay Site: Main Parcel and Pier Parcel, Staten Island, NY. New York City Long Range Sludge Management Plan GEIS III.* Prepared for the New York City Department of Environmental Protection, Roosevelt Island, NY.

1991b *Cultural Resource Evaluation, Newark Bay Site, Staten Island, NY.* Prepared by Historical Documentation Services. Report on File at NY State Historic Preservation Office, Waterford, NY.

Flagg, Thomas R., Gerry Weinstein, and Norman Brouwer

1992 *Reconnaissance of Marine Cultural Resources at the Newark Bay Site, Staten Island, New York. New York City Long Range Sludge Management Plan GEIS III. New York City Department of Environmental Protection.* Prepared for Allee King Rosen and Fleming, Inc., New York, NY.

Funk, Robert E.

1972 Early Man in the Northeast and the Late Glacial Environment. *Man in the Northeast* 4:7–39.

1976 Recent Contributions to Hudson Valley Prehistory. *New York State Museum and Science Service Memoir* No. 22, Albany, NY.

1978 Post-Pleistocene Adaptations. In *Handbook of North American Indians*, Vol. 15, edited by B.G. Trigger, pp. 16–27. Smithsonian Institution, Washington, D.C.

1991 The Middle Archaic in New York. *Journal of Middle Atlantic Archaeology*. 7:7-18.

Geoarcheology Research Associates (GRA)

1997 *Staten Island Bridges Program- Modernization and Capacity Enhancement Project, Goethals Bridge Phase 1B/3 Geomorphological Analysis Report on Coring and Additional Radiocarbon Dating.* Prepared by Geoarcheology Research Associates, Riverdale, NY. Prepared for Parsons Brinckerhoff Quade & Douglas, Inc., New York, NY.

2012 *Preliminary Report: "Pre-Analysis" Results of Geoarchaeological Investigations, Phase IA, NJ-NY Expansion Project, Round 7, April 2012, Staten Island, Richmond County, New York.* Prepared for Public Archaeology Laboratory, Pawtucket, RI.

Geyer, Rockwell W., and Robert Chant
2006 The Physical Oceanography Processes in the Hudson River Estuary. In *The Hudson River Estuary*. Edited by Jeffery S. Levinton and John R. Waldman. Cambridge University Press, Cambridge, MA.

Goddard, Ives
1978 Delaware. In *Handbook of North American Indians*, Vol. 15, edited by B.G. Trigger, pp. 213–239. Smithsonian Institution, Washington, D.C.

Gray and Pape, Inc.
2005 Final Report Archaeological Overview and Assessment of the Fire Island National Seashore, Suffolk County, New York. Prepared for Vector Resources, Inc., Annandale, VA.

Guilday, John
1969 A Possible Caribou-Paleo-Indian Association from Dutchess Quarry Cave, Orange County, New York. *The Bulletin*. 45:24-29.

Hart, John P. and Hetty Jo Brumbach
2005 Cooking Residues, AMS Dates, and the Middle-to Late Woodland Transition in Central New York. *Northeast Anthropology*. 69:1-34.

Hartgen Archaeological Associates, Inc. (HAA)
1995 *Report of Archaeological Potential, Goethals Bridge Expansion, Staten Island Bridges Program, Richmond County, New York and Union County, New Jersey.* Prepared by Hartgen Archaeological Associates, Inc., Troy, NY. Submitted to Parsons Brinckerhoff, New York, NY.

2002 *Phase IA Literature Review and Archeological Sensitivity Assessment, Cross Harbor Freight Movement Project, Port Ivory Yard, Arlington Yard, Eleven Railroad Crossings and Proposed Tunnel, Staten Island, Richmond County, New York.* Prepared by Hartgen Associates, Inc., Rensselaer, NY. Prepared for Allee King Rosen and Fleming, Inc., New York, NY.

Hatch Mott MacDonald
2008 *The Port Authority of New York and new Jersey, Comprehensive Remedial Investigation Report, Site 2 (VCP Site V00674-2), HHMT – Port Ivory Facility, April 2008, 40 Western Avenue, Staten Island, New York*. Prepared for the Port Authority of New York and New Jersey.

Hunter Research, Inc. (HRI)
1993 *Archeological Investigations in Connection with the New Wall of Honor, Ellis Island, City of New York, New York County, New York.* Prepared for the Statue of Liberty-Ellis Island Foundation, New York, NY.

Johnson, Eric S.
1993 Bifurcate Base Projectile Points in Eastern and Central Massachusetts: Distribution and Raw Materials. *Bulletin of the Massachusetts Archaeological Society* 54(2):46–55.

Kardas, Susan, and Edward Larrabee
1976 *Report of Archeological Resources Probability and Significance and Recommendations for Protection, Ferry Slip and Approach Channel, Ellis Island*. Denver Service Center, NPS, U.S. Department of the Interior.

1978 Cul*tural Resource Reconnaissance, Jersey City Reach, New York Harbor Collection & Removal of Drift Project*. Prepared for New York District, US Army Corps of Engineers.

1982 *Archaeological Field Survey of the Foreign Trade Zone Project at Howland Hook, Staten Island, New York.* Prepared by Historic Sites Research, Princeton, NJ. Report on File at NY State Historic Preservation Office, Waterford, NY.

Kauffman, Barbara E., and Richard J. Dent
1982 Preliminary Floral and Faunal Recovery and Analysis at the Shawnee-Minisink Site (36 MR 43). In *Practicing Environmental Archaeology: Methods and Interpretation.* American Indian Archaeological Institute, Occasional Paper 3: pp. 7–12.

Kearns, Betsy, Cece Kirkorian, and Faline Schneiderman-Fox
1991 *The New York City Long Range Sludge Management Plan, Generic Environmental Impact Statement III, Proctor and Gamble, Staten Island, Phase 1A Archaeological Assessment.* Prepared by Historical Perspectives, Inc., Riverside, CT. Prepared for Allee King Rosen and Fleming, Inc., New York, NY.

Kopper, J.S., R.E. Funk, and Lewis Dumont
1980 Additional Paleo-Indian and Archaic Materials from the Dutchess Quarry Cave Area, Orange County, New York. *Archaeology of Eastern North America.* 8:125-137.

Kraft, Herbert C.
1975 *The Archaeology of the Tocks Island Area*. Archaeological Research Center, Seton Hall University Museum, South Orange, NJ.

1977 The Paleo-Indian Sites at Port Mobil, Staten Island. In *Current Perspectives in Northeastern Archeology*, edited by R.E. Funk, and C. Hayes, pp 1–19. Researches and Transactions of the New York State Archeological Association, Volume 17.

Kraft Herbert C., and R. Alan Mounier
1982a The Archaic Period in New Jersey: ca. A.D. 1000 – 1600. In (Olga Chesler, ed.) *New Jersey's Archaeological Resources, A Review of Research Problems and Survey Priorities, The Paleo-Indian Period to the Present*. Office of New Jersey Heritage, New Jersey Department of Environmental Protection, Division of Parks and Forestry, Trenton, NJ, pp. 139–184.

1982b The Woodland Period in New Jersey: ca. A.D. 1000 – 1600. In (Olga Chesler, ed.) *New Jersey's Archaeological Resources, A Review of Research Problems and Survey Priorities, The Paleo-Indian Period to the Present*. Office of New Jersey Heritage, New Jersey Department of Environmental Protection, Division of Parks and Forestry, Trenton, NJ, pp. 139–184.

Landmarks Preservation Commission (LPC)
2002 *Landmarks Preservation Commission Guidelines for Archaeological Work in New York City.* Landmarks Preservation Commission, New York, NY.

Lavin, Lucianne
1980 Harik's Sandy Ground/A Report of the 1967 Salvage Excavations. *The Bulletin and Journal of The Archaeology of New York State.* 78:17-30.

1988 Coastal Adaptation in Southern New England and Southern New York. *Archaeology of Eastern North America* 16:101–120.

Lavin, Lucianne, and Marina Mozzi
1996 *The Historic Preservation in Connecticut, Volume I, Western Coastal Slope: Overview of Prehistoric and Historic Archaeology and Management Guide*. Prepared for the Connecticut Historic Commission, Hartford, CT.

Leng, Charles W. and William T. Davis
1930 *Staten Island and Its People. A History 1609-1929.* Volume I. Lewis Historical Publishing Company, Inc., New York.

Levinton, Jeffery S., and John R. Waldman
2006 The Hudson River Estuary: Executive Summary. In *The Hudson River Estuary*. Edited by Jeffery S. Levinton and John R. Waldman. Cambridge University Press, Cambridge, MA.

Lewis, Ralph
1997 *Geologic History of Long Island Sound*. Electronic document, http://www.conncoll.edu/ccrec/greennet/arbo/publications/34/CHP1.HTM, accessed June 6, 2003.

Little, Barbara, Erika Martin Seibert, Jan Townsend, John H. Sprinkle Jr., and John Knoerl
2000 *Guidelines for Evaluating and Registering Archeological Properties*. National Register Bulletin No. 36. U.S. Department of the Interior, National Park Service, National Register, History and Education, Washington, D.C.

The Louis Berger Group, Inc.
2007 *Goethals Bridge Replacement, Richmond County, New York and The City of Elizabeth, Union County, New Jersey, Phase I Archaeological Report.* Prepared by The Louis Berger Group, Inc., East Orange, NJ. Prepared for The United States Coast Guard. Report on File at NY State Historic Preservation Office, Waterford, NY.

Maenza-Gmelch, Terryanne E.
1997 Late-glacial – early Holocene vegetation, climate, and fire at Sutherland Pond, Hudson Highlands, southeastern New York, U.S.A. *Canadian Journal of Botany*. 75:431–439. Submitted to Algomquin Gas Transmission, LLC, Waltham, MA.

Marshall, Sydne
1982 Aboriginal Settlement in New Jersey during the Paleo-Indian Cultural Period: ca. 10,000 B.C.-6,000 B.C. In *A Review of Research Problems and Survey Priorities, the Paleo-Indian Period to the Present*. Office of New Jersey Heritage, New Jersey Department of Environmental Protection, Trenton, NJ.

McBride, Kevin A.
1984 *Prehistory of the Lower Connecticut River Valley*. Unpublished Ph.D. dissertation, Department of Anthropology, University of Connecticut, Storrs, CT.

McBride, Kevin A., and Mary G. Soulsby
1989 *Prehistory of Eastern Connecticut Phase I, II and III Archaeological Surveys - Relocation of Route 6/I-84 Project.* The Public Archaeology Survey Team, Inc. Report. Submitted to the Connecticut Department of Transportation, Wethersfield, CT.

McManamon, Francis P.
1990 A Regional Perspective on Assessing the Significance of Historic Period Sites. *Historical Archaeology* 24(2):14–22.

Moeller, Roger
1980 *6LF21: A Paleo-Indian Site in Western Connecticut*. American Indian Archaeological Institute Occasional Paper No. 2.

Morris, Ira K.
1898 *Morris's Memorial History of Staten Island, New York*. Vol I. Memorial Publishing Co., NY

1900 *Morris's Memorial History of Staten Island, New York*. Vol. II. The Winthrop Press, New York, NY.

National Park Service (NPS)
1983 Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines. *Federal Register* 48(190). National Park Service, Department of the Interior, Washington, D.C.

Natural Resources Conservation Service (NRCS)
2005 *New York City Reconnaissance Soil Survey*. United States Department of Agriculture, Natural Resources Conservation Service, Staten Island, NY.

New York Archaeological Council (NYAC)
1994 *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State.* Adopted by the New York State Office of Parks, Recreation and Historic Preservation. New York Archaeological Council, NY.

New York City Economic Development Corporation (NYCEDC)
2004 *Cross Harbor Freight Movement Project, Draft Environmental Impact Statement.* Prepared by the New York City Economic Development Corporation, New York, NY in cooperation with the United States Department of Transportation, Federal Highway Administration and Federal Railroad Administration. Copy on file at NY SHPO.

NY City Map
2012 Aerial photograph files: 1924 and 1951. Electronic document, http://gis.nyc.gov/doitt/nycitymap/, accessed April 24, 2012.

New York State Department of Environmental Conservation (NYDEC)
2009 "Hudson River Estuary." Electronic document, http://www.dec.ny.gov/lands/4923.html, accessed March 27, 2009.

Nicholas, George P.
1988 Ecological Leveling: The Archaeology and Environmental Dynamics of Early Postglacial Land Use. In *Holocene Human Ecology in Northeastern North America*, edited by George P. Nicholas, pp. 257–296. Plenum Press, New York, NY.

Overpeck, Jonathan T., Robert S. Webb and Thompson Webb III
1992 Mapping Eastern North American Vegetation Change of the Past 18 ka: No-analogs and the Future. *Geology.* 20:1071–1074.

Pagano, T.S.
1994 The geology of western Staten Island, New York, north and south of the Fall Line. In Benimoff, A.L., ed., *Geology of Staten Island, New York; field guide and proceedings.* Geological Association of New Jersey Annual Field Conference, 11th Annual Meeting, October 14–15, 1994, v. 11, p. 61–84.

Pagoulatos, Peter
1986 *Terminal Archaic Settlement and Subsistence in the Connecticut River Valley*. Unpublished Ph.D. dissertation, Department of Anthropology, University of Connecticut, Storrs, CT.

Panamerican Consultants, Inc.
2003 *Phase IA Cultural Resources Investigation of the Hudson-Raritan Estuary Ecosystem Restoration Project, Liberty State Park, Jersey City, Hudson County, New Jersey*. Prepared for Northern Ecological Associates, Inc., Portland, ME.

Payne, Ted M., and Kenneth Baumgardt
1986 *Howland Hook Marine Terminal Expansion Cultural Resources Reconnaissance.* Prepared by MAAR Associates, Inc., Newark, DE. Prepared for International Technologies, Edison, NJ.

Pederson, Dee Cabaniss, Dorothy M. Peteet, Dorothy Kurdyla, and Tom Guilderson
2005 Medieval Warming, Little Ice Age, and European impact on the environment during the last millennium in the lower Hudson Valley, New York, USA. *Quaternary Research*. 63:238-249.

Platt, Edward J.
1997 Reconstructing Prehistoric American Indian Cultures *on Western Long Island, New York.* New York Institute of Anthropology. Retrieved June 17, 2003 from the world wide web: www.hoflink.com/~bayside/nyia/archaic.html.

Port Authority of New Jersey and New York (PANYNJ)
2010 *History-Bayonne Bridge*. From: *Bayonne Bridge: A Landmark by Land, Sea, and Air* written by Darl Rastorfer and commissioned by the PANYNJ. Electronic document, http://www.panynj.gov/bridges-tunnels/bayonne-bridge-history.html, accessed April 23, 2010.

Pousson, John F.
1986 *An Overview and Assessment of Archeological Resources on Ellis Island, Statue of Liberty National Monument, New York*. United States Department of the Interior, National Park Service, Denver Service Center, Eastern Team, Rockville, MD. Report on file, Statue of Liberty National Monument, Liberty Island, New York, NY.

Ritchie, Duncan
1984 Musketaquid, 8000 B.P.: Early Archaic Settlement and Resource Use in the Sudbury/Concord River Drainage. Paper presented at the 24th Annual Meeting of the Northeastern Anthropological Association, Hartford, CT.

Ritchie, William A.
1980 *The Archaeology of New York State*. Revised edition. Harbor Hill Books, New York, NY.

Ritchie, William A., and Robert E. Funk
1971 Evidence for Early Archaic Occupations on Staten Island. *Pennsylvania Archaeologist.* 41:45–59.

1973 Aboriginal Settlement Patterns in the Northeast. *New York State Museum and Science.*

Robinson, Brian S.
1992 Early and Middle Archaic Period Occupation in the Gulf of Maine Region: Mortuary and Technological Patterning. In *Early Holocene Occupation in Northern New England,* edited by Brian S. Robinson, James B. Petersen, and Ann K. Robinson, pp. 63–116. Occasional Publications in Maine Archaeology No. 9, Augusta, ME.

Rutsch, Edward S.
1970 An Analysis of the Lithic Materials Used in the Manufacture of Projectile Points in Coastal New York. *The Bulletin.* New York State Archaeological Association. 49:1-9.

Ruttenber, E.M.
1872 *History of the Indian Tribes of Hudson's River*. Kennikat Press, Port Washington, NY.

Salwen, B.
1978 Indians of Southern New England and Long Island: Early Period. In *Handbook of North American Indians, Volume 15*, edited by B.G. Trigger, pp. 160–176. Smithsonian Institution, Washington, D.C.

Sanders, John E.
1974 Geomorphology of the Hudson Estuary. In *Hudson River Colloquium*, ed. by A. Roels, Annals of the New York Academy of Sciences, Vol. 250, May, pp. 5–38.

Seymann, Jerrold
1939 *Colonial Charters, Patents and Grants to the Communities Comprising the City of New York.* Board of Statutory Consolidation of the City of New York, NY.

Shuman, Bryan, Thompson Webb III, Patrick Bartlein, and John W. Williams
2002 The Anatomy of a Climatic Oscillation: Vegetation Change in Eastern North America during the Younger Dryas Chronozone. *Quaternary Science Reviews.* 21:1777–1791.

Shuman, Bryan, Paige Newby, Yongsong Huang, and Thompson Webb III
2004 Evidence for the Close Climatic Control of New England Vegetation History. *Ecology.* 85:1297–1310.

Sirken, Lew, and Henry Bokuniewicz
2006 The Hudson River Valley: Geological History, Landforms, and Resources. In *The Hudson River Estuary*. Edited by Jeffery S. Levinton and John R. Waldman. Cambridge University Press, Cambridge, MA.

Skinner, Alanson
1898–1909 *Catalogue of the Skinner Collection of Staten Island*. Compilation of original notes by Alanson Skinner. Division of Anthropology Archives, American Museum of Natural History, New York, NY.

1909 The Lenape Indians of Staten Island. In *The Indians of Greater New York and the Lower Hudson*. Anthropological Papers of the American Museum of Natural History, Vol. III (Clark Wissler, ed.). Hudson-Fulton Publication, New York, NY.

Skinner, Alanson, and Max Schrabisch
1913 A Preliminary Report of the Archaeological Survey of the State of New Jersey. *Geological Survey of New Jersey Bulletin 9*.

Snow, Dean
1980 *The Archaeology of New England*. Academic Press, New York, NY.

Thompson, Robert G. John P. Hart, Hetty Jo Brumbach, and Robert Lusteck
2004 Phytolith Evidence for Twentieth-Century B.P. Maize in Northern Iroquoia. *Northeast Anthropology*. 68:25-40.

TRC Companies, Inc. (TRC)
2010 Site Review Summary Tables: TRC ID No. 12. Prepared by TRC Companies, Inc. Copies on file at The Public Archaeology Laboratory, Inc., Pawtucket, RI

U.S. Fish and Wildlife Service (USFWS)
1997 *Significant Habitats and Habitat Complexes of the New York Bight Region*. Retrieved June 14, 2010 from the world wide web: http://library.fws.gov/pubs5/web_link/images/fig03a.jpg.

Wagner, Daniel Ph.D., and Peter E. Siegel, Ph.D.
1996 *A Geomorphological and Archeological Analysis of the Arthur Kill-Howland Hook Marine Terminal Channel, Richmond County, New York and Union County, New Jersey.* Prepared by John Milner Associates, West Chester, PA. Prepared for The Greeley-Polhemus Group, West Chester, PA. and The U.S. Army Corps of Engineers, New York District, New York, NY.

Webb, Thompson, III, Patrick J. Bartlein, Sandy P. Harrison and Katherine H. Anderson
1993 Vegetation, Lake Levels, and Climate in Eastern North America for the Past 18,000 years. In *Global Climates Since the Last Glacial Maximum* (H.E. Wright, J.E. Kutzbach, T. Webb III, W.F. Ruddiman, F.A. Street-Perrot and P.J. Bartlein, eds.). University of Minnesota Press, Minneapolis, MN.

Wellman, B.
1975 Prehistoric Site Survey and Salvage in the Upper Schoharie Valley, New York. *Eastern States Archaeological Federation Bulletin*, 34:15.

Wendland, W.M., and Reid A. Bryson
1974 Dating Climatic Episodes of the Holocene. In *Quaternary Research* 4(1):9–24.

Whitcomb, Royden Page
1904 *First History of Bayonne, New Jersey*. R.P. Whitcomb, Bayonne, N.J.

Wilson, Walter S.
1893 Staten Island. In *The Memorial History of the City of New York, From its Earliest Settlement to the Year 1892, Vol IV* (edited by James Grant Wilson). Pp. 33–38. New York History Company, NY.

Wolfe, Peter E.
1977 *The Geology and Landscapes of New Jersey.* Crane Russak, New York, NY.

Maps and Plans

Beers, J.B.
1874 *Atlas of Staten Island, Richmond County, New York.* J.B. Beers and Company, New York, NY.

1887 *Atlas of Staten Island, Richmond County, New York.* J.B. Beers and Company, New York, NY.

Bien, Julius and C.C. Vermeule
1891 *Atlas of the Metropolitan District and Adjacent Country, engraved in 1890, based on U.S. Coast and Geoditic Survey.* Julius Bien & Co., New York.

Bromley, G.W.
1917 *Atlas of Richmond County, New York.* G.W. Bromley and Company, New York, NY.

Butler, James
1853 *Map of Staten Island or Richmond County, New York.* Surveyed, drawn and published by James Butler, C.E. & Surveyor. On file at the Staten Island Museum, Staten Island, NY.

Dripps, Matthew
1850 *Map of Staten Island or Richmond County.* M. Dripps, New York.

1872 *Map of Staten Island (Richmond County), New York*. M. Dripps, New York, NY.

Hassler, F.R.
1845 *Map of New York Bay and Harbor and the environs*. U.S. Coast Survey, Washington, D.C.

Leng, Charles W. and William T. Davis
1896 *Map of Staten Island, Ye Olde Names and Nicknames.* On file at the Staten Island Museum.

McMillen, Loring
1933 *A Map of Staten Island During the Revolution 1776-1783, compiled from the following maps and from other sources: The Taylor and Kinner Map 1781; the Hessian Map ca. 1777; Plan No. 31 du Camp Anglo-Hessois dans Staten Island de 1780 a 1783.* Electronic Document, http://www.bklyn-genealogy-info.com/Map/S.I.Revolution.html, accessed July 1, 2010.

Sanborn Map Company
1937 *Insurance Maps of New York, Richmond Boro*., Volume 3 Sanborn Map Co., New York.

1950-1996 *Insurance Maps of New York, Richmond Boro*. Updated to 1996. Sanborn Map Co., New York, NY.

Skene, Frederick
1907 *Map of Staten Island, Richmond Co., N.Y. Showing the Colonial Land Patents from 1668 to 1712.* On file at the Staten Island Museum, Staten Island, NY.

Taylor, George and Andrew Skinner
1781 *Map of New York & Staten Island And Parts of Long Island.* Copy on File at the Staten Island Historical Society, Staten Island, NY.

United States Geological Survey (USGS)
1891 *Staten Island, New York quadrangle sheet.* United States Geological Survey, Washington, D.C.

Walling, H.F.
1860 *Map of the City of New-York and its Environs.* S.D. Tilden, New York, NY.

APPENDIX A

CORRESPONDENCE

THE CITY OF NEW YORK LANDMARKS PRESERVATION COMMISSION
1 Centre Street, 9N, New York, NY 10007 (212) 669-7700 www.nyc.gov/landmarks

ENVIRONMENTAL REVIEW

FEDERAL ENERGY REGULATORY COMM/106-Y 12/29/2010

Project number **Date received**

Project: NJ/NY Expansion Project Gas Pipeline

Comments:

For Archaeology only: the LPC is in receipt of the, "Archaeological Overview Survey Texas Eastern Transmission, LP New jersey-New York Expansion Project FERC Docket No. CP110___-000, Staten Island, Manhattan, and Ramapo, New York," prepared by Public Archaeology Laboratory and dated December 2010. The LPC concurs with the findings. Please submit another bound copy of the report to the LPC.

1/7/2011

SIGNATURE DATE

26346_FSO_ALS_01072011.doc

Andrew M. Cuomo
Governor

Rose Harvey
Commissioner

New York State Office of Parks,
Recreation and Historic Preservation
Historic Preservation Field Services Bureau • Peebles Island, PO Box 189, Waterford, New York 12188-0189
518-237-8643
www.nysparks.com

April 25, 2011

Gregory Dubell
Public Archaeology Facility
210 Lonsdale Ave
Pawtucket, Rhode Isla 02860

Re: FERC
Revised Archaeology and Historic Architecture Report;
And information on proposed Route Variation #50
Texas Eastern NJ-NY Expansion Project
Richmond and New York Counties, NY
09PR05949

Dear Mr. Dubell:

Thank your for requesting the comments of the New York State Historic Preservation Office (NY-SHPO) with regard to the potential for this project to affect significant historical/cultural resources. SHPO applauds your efforts to prepare documentation associated with the proposed project as early as possible. We have received and reviewed the documents "*Historic Architectural /Industrial Properties Overview and Identification Survey, Texas Eastern Transmission, LPO New Jersey-New York Expansion Project, Staten Island, Manhattan and Ramapo, New York*" Dated December 2010; "*Archaeological Overview Survey Texas Eastern Transmission, LPO New Jersey-New York Expansion Project, Staten Island, Manhattan and Ramapo, New York*" also dated December 2010; "*Archaeological Overview Survey, Addendum #1 to Technical Report, New Jersey-New York Expansion project, Staten Island, New York*", dated Febrauru 9, 2011;and a Phase 1B Archaeological Survey Proposal for Variation 50, dated March 16, 2011. Based on our review of these documents, NY-SHPO offers the following comments.

With regard to the December Reports – Our National Register Staff notes that the United Shipyard's Historic District was determined National Register Eligible in Ocotber 2010, and this is noted in the overview. All other structural related comments remain the same as we previously communicated. Likewise, we have no archaeological concerns for terrestrial portions of the project. We also note that the proposed HDD drilling as proposed in this submission is sufficient to avoid potential underwater archaeological resources and therefore we believe that no further investigation is warranted along the HDD route(s).

With regard to route Variation #50. SHPO concurs with your assessment of the sensitivity along that route, the assessment of testing needs and with the proposed testing methodology as presented in the March 16 document.

As you are aware, these comments have been shared with you previously by phone, but this letter should serve to document all discussion which have occurred to this point. In addition, we recognize that we received a preliminary description of your field work and findings at the Variation 50 testing area. We look forward to receiving the full description of that work which we understand is currently being prepared.

Please contact me at extension 3291, or by e-mail at douglas.mackey@oprhp.state.ny.us, if you have any questions regarding these comments.

Sincerely

Douglas P. Mackey

Douglas P. Mackey
Historic Preservation Program Analyst
Archaeology

Andrew M. Cuomo
Governor

Rose Harvey
Commissioner

New York State Office of Parks, Recreation and Historic Preservation

Historic Preservation Field Services Bureau • Peebles Island, PO Box 189, Waterford, New York 12188-0189
518-237-8643
www.nysparks.com

December 13, 2011

Gregory Dubell
Public Archaeology Facility
210 Lonsdale Ave
Pawtucket, Rhode Isla 02860

Re: FERC
Response to Archaeology Reports submitted November 2011
Phase II for the Old Place Neck Site/Addendum #3 Phase 1B
Texas Eastern NJ-NY Expansion Project
Richmond and New York Counties, NY
09PR05949

Dear Mr. Dubell:

Thank your for requesting the comments of the New York State Historic Preservation Office (NY-SHPO) with regard to the potential for this project to affect significant historical/cultural resources. We have received and reviewed the documents: "*Archaeological Overview Survey Addendum #3 to Technical Report, New Jersey-New York Expansion Project, Staten Island and Manhattan, New York*" dated November 9, 2011 and "*Phase IB Archaeological Identification Survey, M & R 058 Addition/Temporary Workspace and Phase II Archaeological Site Evaluation, Old Place Neck Site, Goethals Bridge HDD Workspace, Staten Island, Richmond County, New York,*", dated November 2011. Based on our review of these documents, NY-SHPO offers the following comments regarding the archaeological resources. A separate letter responding to above ground resources is being prepared by our technical review staff

1. We concur with the findings and recommendations of Addendum #3 regrading areas in need of additional investigation and those area for which no further work is recommended .

2. SHPO concurs with the findings of the second report as well for the most part, and we look forward to reviewing and incorporating the result of the planned geomorphological testing. However, whereas the report indicates that the historic component at the Old Place Neck Site (USN) A08501.002971) should not be considered eligible for the National Register, we continue to have a concern that there may be shaft features present which have not yet been identified, and which may contain intact deposits which could have the potential to provide significant information. Therefore, SHPO recommends that as plans are moved forward and mitigation/ avoidance measures are developed, you keep this potential in mind and design any future research accordingly.

Please contact me at extension 3291, or by e-mail at douglas.mackey@parks.ny.gov, if you have any questions regarding these comments.

Sincerely

Douglas P. Mackey
Historic Preservation Program Analyst
Archaeology

Cc: Amanda Sutphin, NYCLPC

NYC Landmarks Preservation Commission

1 Centre Street
9th Floor North
New York, NY 10007

Voice (212)-669-7700
Fax (212)-669-7960
http://nyc.gov/landmarks

ARCHAEOLOGY

Project number: FEDERAL ENERGY REGULATORY COMM / 106-Y
Project: NJ/NY EXPANSION PROJECT GAS PIPELINE(SPECTRA)
Date received: 1/3/2012

Comments:

The LPC is in receipt of the, "Results of Geoarchaeological Soil Borings and Proposed Phase 1B Archaeological Surveys Report #3, New Jersey-New York Expansion Project," prepared by PAL and dated December 21, 2011. The LPC concurs with most of the recommendations for further work. We note though that a protocol detailing what to do if any human remains are found must be developed before testing proceeds in areas with such potential. We are unconvinced by the testing methodology and rationale for further work in the area called, "NYCDOT Property-Richmond Terrace (RCH-5H-ARC-1-ARC 8)." It is unclear to us how the proximity of the Richmond Hill Historic Site is relevant (page 39) and would appreciate more supporting information for this recommendation before we can make a determination.

In addition, the LPC now concurs that if the project cannot be redesigned to avoid impacting the Old Place Site, mitigation must occur as is recommended in the, "Phase 1B Archaeological Identification Survey M & R 058 Additional Temporary Workspace and Phase II Archaeological Evaluation Old Place Neck Site, Goethals Bridge HDD Workspace, Staten Island, New York," prepared by PAL and dated November 2011. We also concur with the recommendations made in the "Archaeological Overview Survey- Addendum #3 to Technical Report New Jersey-New York Expansion Project," prepared by PAL and dated November 9, 2011 which includes an assessment of the archaeological potential of the areas called "Route Variations: 80, 74, 58, 76, 64/79, 75, and MP 5.54 Workspace."

Cc: NYSHPO

1/12/2012

SIGNATURE DATE
Amanda Sutphin, Director of Archaeology

File Name: 26346_FSO_ALS_01112012.doc

NYC Landmarks Preservation Commission

1 Centre Street
9th Floor North
New York, NY 10007

Voice (212)-669-7700
Fax (212)-669-7960
http://nyc.gov/landmarks

ARCHAEOLOGY

Project number: FEDERAL ENERGY REGULATORY COMM / 106-Y
Project: NJ/NY EXPANSION PROJECT GAS PIPELINE(SPECTRA)
Date received: 5/23/2012

Comments:

The LPC is in receipt of the, "Phase 1B Archaeological Identification Survey Tract No. RCH-6: New York City Economic Development Corporation Property New Jersey-New York Expansion Project, Staten Island, Richmond County, New York," prepared by PAL and dated May 2012. We concur that no further investigation is needed of the area but note that construction within this area should include the unanticipated discovery plan. Please submit another bound copy of the report and a pdf of it to the LPC.

The LPC is also in receipt of the, "Results of Soil Borings and Proposed Phase 1B Archaeological Survey Report #7, New Jersey-New York Expansion Project Route Variations 58 and 76, Port Authority Property, Staten Island, New York," prepared by PAL and dated May 18, 2012. The LPC concurs with the recommendations about the locations where further archaeological testing is needed. Please submit another bound copy of the report and a pdf of it to the LPC.

6/1/2012

SIGNATURE DATE
Amanda Sutphin, Director of Archaeology

File Name: 26346_FSO_ALS_06012012.doc

Andrew M. Cuomo
Governor

Rose Harvey
Commissioner

New York State Office of Parks, Recreation and Historic Preservation

Historic Preservation Field Services Bureau • Peebles Island, PO Box 189, Waterford, New York 12188-0189
518-237-8643
www.nysparks.com

June 21, 2012

Gregory Dubell
Public Archaeology Facility
210 Lonsdale Ave
Pawtucket, Rhode Isla 02860

Re: FERC
Response to Various Archaeology
Reports/documents submitted in May 2012
Texas Eastern NJ-NY Expansion Project
Richmond and New York Counties, NY
09PR05949

Dear Mr. Dubell:

Thank your for requesting the comments of the New York State Historic Preservation Office (NY-SHPO) with regard to the potential for this project to affect significant historical/cultural resources. We have received and reviewed the documents:

Results of Geoarchaeological Soil Borings, Report #6, New Jersey-New York Expansion Project, Route Variation 87, 380 Development Property, Staten Island, New York;

Results of Geoarchaeological Soil Borings, Report #7, NJ-NY Expansion Project, Port Authority of New York and New Jersey Property (Tract # RCH-4), Staten Island New York; and

Phase IB Archaeological Identifiaction survey, Tract No. RCH-6: New York City Economic Development Corporation Property, NJ-NY Expansion Project, Staten Island, New York.; and

Revised Technical Proposal, New Jersey-New York Expansion Project, Phase III Data Recovery, Old Place Neck Site (Revised May 16, 2012).

Based on our review of these documents, NY-SHPO offers the following comments. In each case the NY-SHPO concurs with the findings of the reports. Specifically – we have no further concerns for the area covered by The Phase ***1B study for Survey Tract RCH-6.*** For ***Soil Borings Report #6*** – although there does seem to be potential for intact landforms in some areas, they are all located at depths greater than the APE for this project will extend and therefore will not be impacted. For ***Soil Borings Report #7*** – That area of Group 3 appears to have potential for intact soils, and the elevation of those deposits fall within the depth of the APE, therefore we recommend Phase 1B deep testing as outlined in the report.

In reviewing the ***Data Recovery Plan,*** NY-SHPO concurs with the NYC LPC that the plan is methodologically acceptable, however it would be important to expand on the public dissemination aspects of the plan. NY-SHPO full supports the use of all the methods identified (website, brochure, papers), however given the rarity of sites such as the Old Place Neck site in New York City, we can also understand the LPC's concern for the targeted methods they recommend.

Finally, SHPO has also received your recent submission of various tables and plans which provide overviews of the project and the studies that have been completed. These were very helpful and we commend you for providing them. There is no specific response needed for that submission, however NY-SHPO has found the material useful.

Please contact me at extension 3291, or by e-mail at douglas.mackey@oprhp.state.ny.us, if you have any questions regarding these comments.

Sincerely

Douglas P. Mackey
Historic Preservation Program Analyst
Archaeology

Ecc: Amanda Sutphin, NYCLPC
Ellen Armbruster, FERC

APPENDIX B

CATALOG OF CULTURAL MATERIALS, PHASE IB ARCHAEOLOGICAL SURVEY, PORT AUTHORITY PROPERTY (TRACT NO. RCH-4), STATEN ISLAND, NEW YORK, NJ-NY EXPANSION PROJECT 2012.

Appendix B. Catalog of Cultural Materials, Phase IB Archaeological Survey, Port Authority Property (Tract No. RCH-4), Staten Island, New York, NJ-NY Expansion Project 2012.

Provenience	Material	Object	Attributes	Color(s)	Manufacture Date	Makers Mark	Count
Non-Site, Port Authority							
MT-01 320-350, Disturbed Peat	Coal	Coal	Complete			☐	1
	Pearlware	Holloware Bowl	Base		1779 1830	☐	1
MT-01 365-380, Disturbed Peat	Coal	Coal	Complete			☐	4
	Earthenware	Brick				☐	1
	Ferrous	Spike	Complete			☐	1
	Ferrous	Unidentified	Fragment			☐	1
	Ferrous	Nail Unidentified Nail	Fragment			☐	1
	Glass	Holloware	Body	Colorless		☐	2
	Glass	Flat Glass Window Glass	Fragment	Aqua Tint		☐	2
	Molded Glass	Bottle/Jar	Body Embossed Script	Colorless		☐	1
	Unidentified Synthetic	Unidentified	Fragment			☐	1
MT-01 410-430, Disturbed B1	Coal	Coal	Complete			☐	1
	Machine Made Glass	Bottle/Jar	Body	Colorless		☐	1
	Molded Glass	Bottle/Jar	Body	Amber		☐	1
MT-01 430-460, Disturbed B1/B2	Clinker	Clinker/Coke	Complete			☐	1
	Coal	Coal	Complete			☐	1
	Glass	Curved Glass	Fragment	Colorless		☐	1
	Glass	Curved Glass	Fragment Melted	Colorless		☐	1
	Machine Made Glass	Bottle/Jar	Body	Colorless		☐	2
	Redware Lead Glaze	Ceramic Sherd	Body	Ginger	1600 Present	☐	1
MT-02 108-144, Fill 6	Flint Ballast	Ballast	Fragment	Brown, Gray		☐	14
					Total: Non-Site, Port Authority		40
						Total:	**40**