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TECHNICAL REPORT

PHASE IB 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

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

Ora Elquist
Suzanne Cherau

Submitted to:

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

Submitted by:

The Public Archaeology Laboratory, Inc.
210 Lonsdale Avenue
Pawtucket, Rhode Island 02860

PAL Report No. 2367.04 May 2012

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: NYC EDC Property north of Richmond Terrace
Minor Civil Division: New York City – Borough of Staten Island
County: Richmond

Survey Area

Length: 280 meters (m) (920 feet(ft))
Depth: maximum 280 cm (9.2 ft)
Width: 27.4 meters (m) (90 ft)
Number of Acres Surveyed: Approximately 0.81 hectares (2 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: 8 (ca. 2.3-x-4.4-m [7.5-x-14.5-ft.])
Width of Plowed Strips: N/A
Surface Survey Transect Interval: N/A

Results of Archaeological Survey

Number & name of prehistoric sites identified: None
Number & name of historic sites identified: None
Number & name of sites recommended for Phase II/Avoidance: None

Report Authors: Ora Elquist and Suzanne Cherau

Date of Report: May 2012

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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).

On behalf of Spectra Energy, 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 designated the New York City Economic Development Corporation (NYCEDC) Project area (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 proposal, 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 920 foot section of proposed pipeline in Staten Island, New York on property (Tract No. RCH-6) owned by the New York City Economic Development Corporation (NYCEDC). The NYCEDC property lies along the north side of Richmond Terrace between Western Avenue to the west and Holland Avenue to the east. 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) 290+80 and 300+00 (Figures 1-3 and 1-4). The Project’s APE for this area includes a temporary workspace ranging from approximately 90 feet to 130 feet in width, a 70-x-80-ft area of additional temporary workspace located south of STA 294+00, and a bore pit for the Kill Van Kull Horizontal Directional Drill (HDD) entry point at STA 299+89.3. 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 of the pipeline trench within the NYCEDC Project area is approximately five to seven feet in depth (see Figures 1-3 and 1-4).

Project History

The previous Phase IA level archaeological overview survey for the New York portion of the Project area (December 2010 Filing) assessed the present Project area as containing high sensitivity for pre-contact resources possibly associated with the Bowman’s Brook and Bowman’s Brook North sites, and also moderate sensitivity for Revolutionary War period human remains (Elquist et al. 2010:90). Given the moderate to high sensitivity for both pre-contact and post-contact resources, additional investigations in the form of geoarchaeological soil borings were recommended (Elquist et al. 2010:90). 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 Filing report, a portion of the workspace at Mile Post (MP) 5.54 was reconfigured in order to reduce wetland impacts within Arlington marsh. The reconfigured additional temporary workspace (see Figure 1-4) is contiguous to the area previously assessed in the 2010 December Filing report. In an addendum report, PAL continued to this assess this area as containing high sensitivity for pre-contact resources and moderate sensitivity for post-contact burials (Elquist and Cherau 2011a). In a letter dated December 13, 2011, the New York SHPO concurred with the recommendations in the addendum report. The New York City Landmarks Preservation Commission (LPC) also concurred (Letter dated January 12, 2012) with the recommendations in the addendum report for this area (see Appendix A).

Five geoarchaeological soil borings for the NYCEDC Project area were conducted in July and October of 2011 (Universal Tracking Nos. RCH-6-ARC-1 through RCH-6-ARC-5). The soil borings revealed fill deposits ranging in depth from 181 to 391 cmbs (5.9 to 12.8 ft) (Cherau 2011:8). Holocene soils were only possibly present within the vertical APE in the soil boring closest to Richmond Terrace (RCH-6-ARC-1), and fill strata potentially sensitive for post-contact archaeological resources were present in several of the borings (Cherau 2011:8; GRA 2011:35, 45). As a result Phase IB testing was recommended for the archaeologically sensitive strata on the NYCEDC property in the form of machine-assisted testing. Both the New York SHPO (Letter dated January 5, 2012) and LPC (Letter dated January 12, 2012) concurred with the recommendations for this area, although the LPC stipulated that a protocol detailing what to do should human remains be encountered be developed prior to testing (see Appendix A). Such

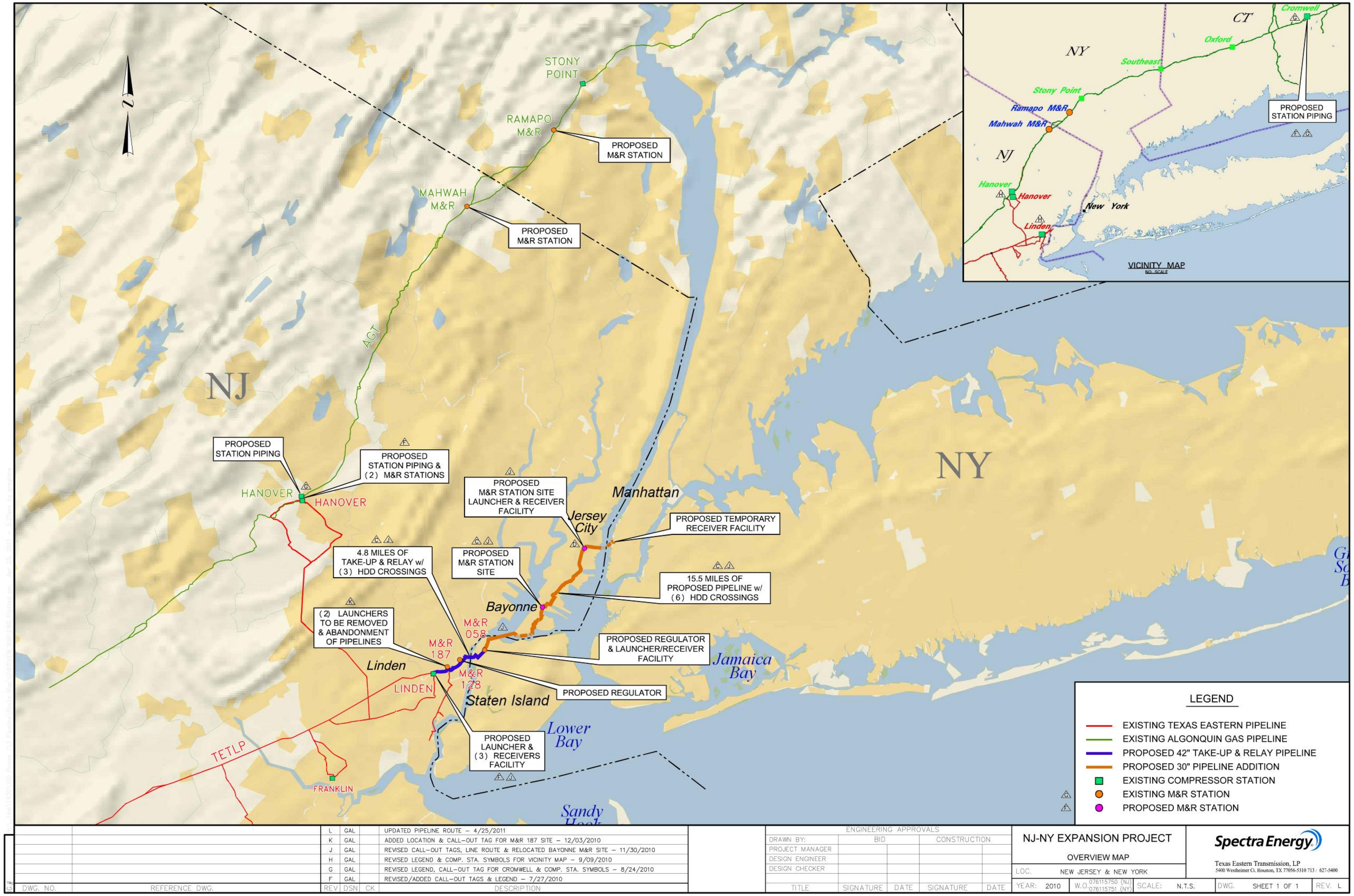

Figure 1-1. Overview map showing the various locations of the NJ-NY Project.

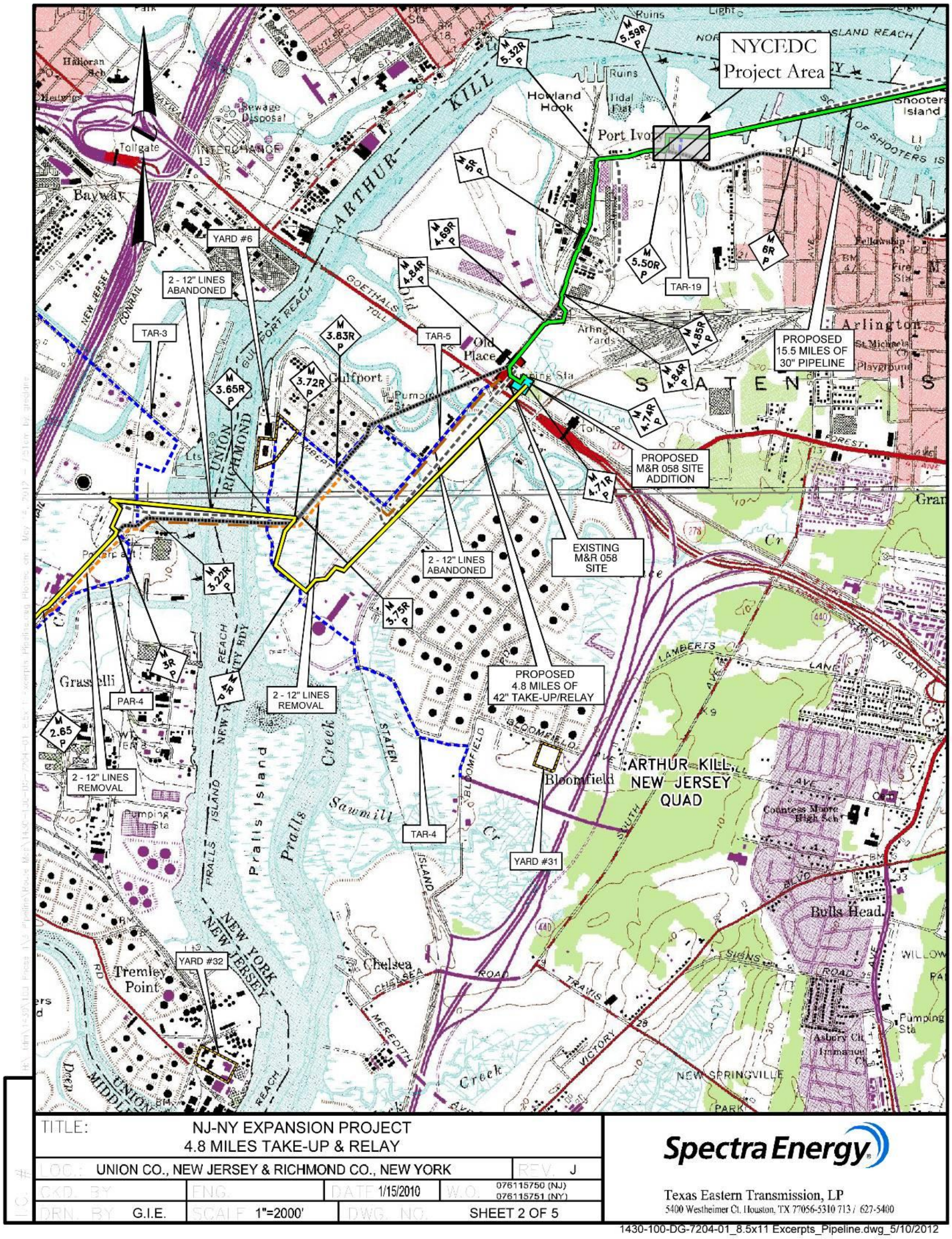

Figure 1-2. Location of the Phase IB archaeological testing on the Elizabeth, New Jersey USGS topographic quadrangle

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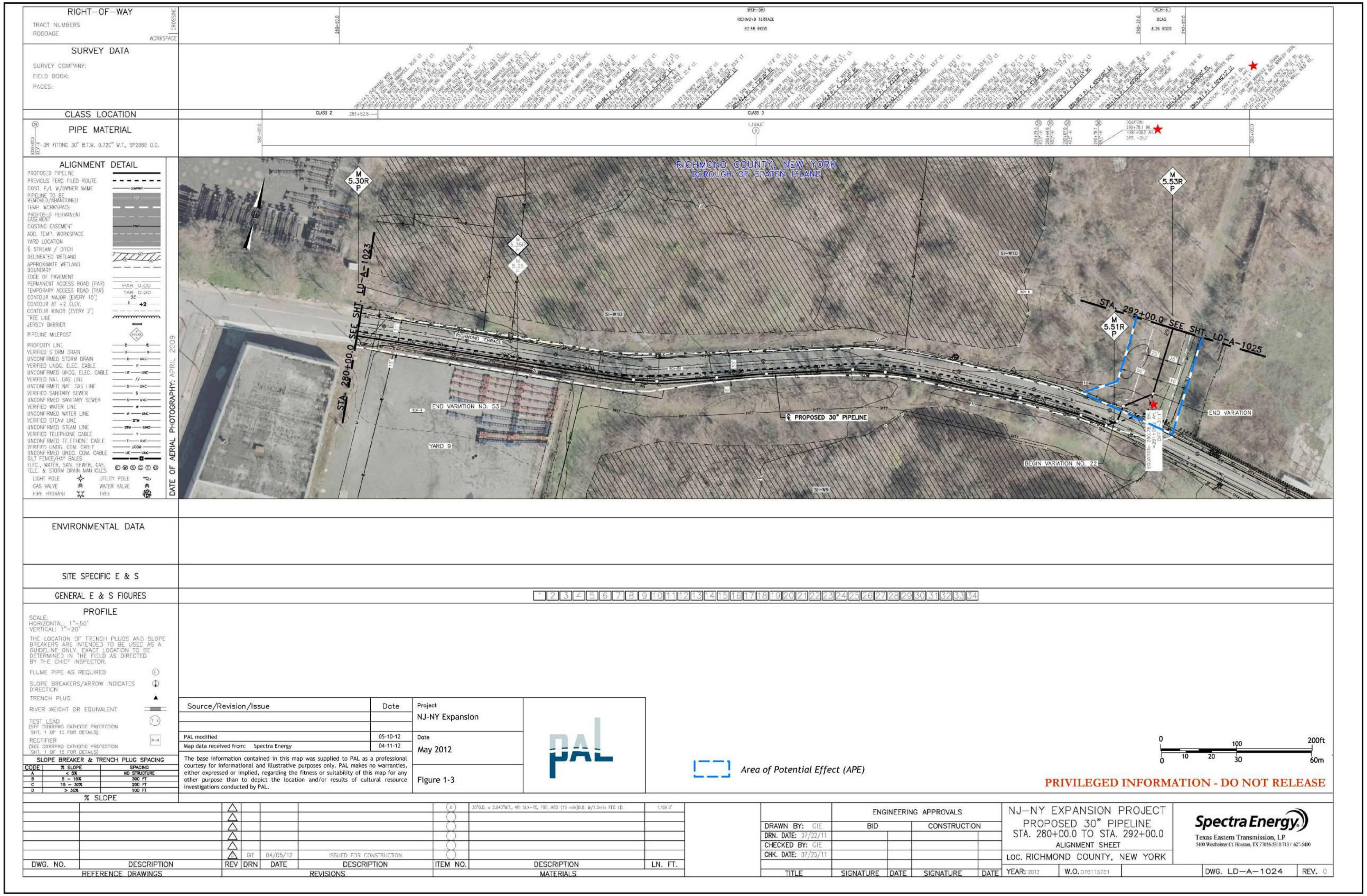

Figure 1-3. Map showing the area of Phase IB testing along the NYCEDC Project area.

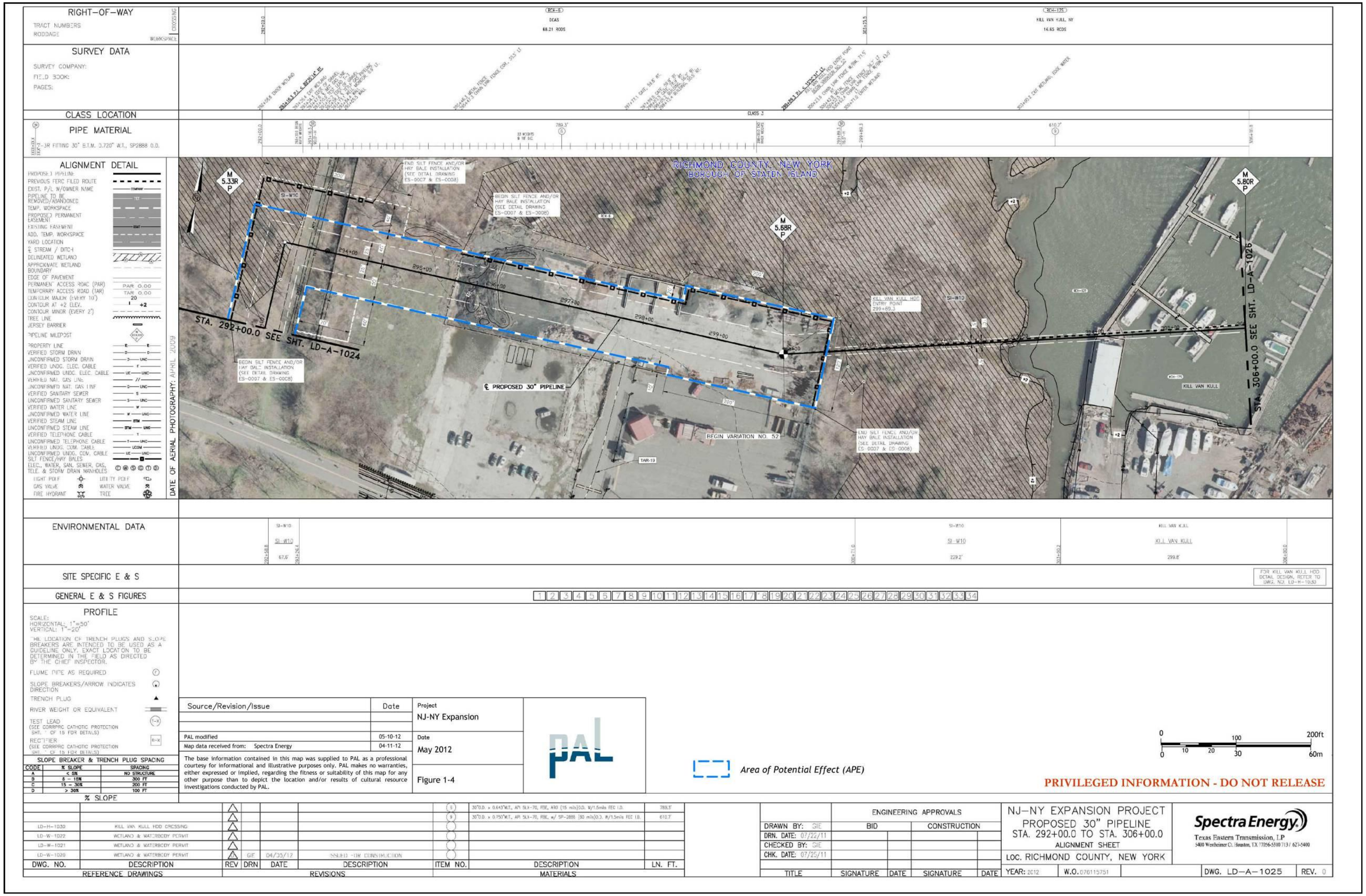

Figure 1-4. Map showing the area of Phase IB testing along the NYCEDC Project area.

protocols were developed for the Unanticipated Discoveries Plan which PAL submitted for review on March 16, 2012. The LPC (Letter dated March 29, 2012) and New York SHPO (Letter dated April 20, 2012) have concurred with the protocols regarding the discovery of human remains in the Unanticipated Discoveries Plan (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). Ora Elquist (project archaeologist) supervised the field investigations, and Erin Timms and Jesse Daubert (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.

CHAPTER TWO

METHODOLOGY

The goal of the archaeological investigations of the NYCEDC Project area was to locate and identify any Native American pre-contact and/or EuroAmerican post-contact 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 and evaluated 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 NYCEDC 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 NYCEDC 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 675	Flagg 1991a	Cultural Resource Evaluation, Newark Bay Site, Staten Island, NY
LPC 676	Flagg 1991b	Cultural Resource Survey, Newark Bay Site: Main Parcel and Pier Parcel, Staten Island, NY. New York City Long Range Sludge Management Plan GEIS III
LPC 677	Flagg, et al., 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
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 734	Kearns, et al. 1991a	The New York City Long Range Sludge Management Plan, Generic Environmental Impact Statement III, Newark Bay, Staten Island, Phase 1A Archaeological Assessment
LPC 735	Kearns, et al. 1991b	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

Table 2-2. Cartographic Sources Reviewed for the NYCEDC 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

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

Year	Author	Title	Publisher or Location
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, F.W.	Map 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
1910	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro	Sanborn Map Co., New York
1917	Bromley, G.W.	Atlas of Richmond County, New York	G.W. Bromley & Co., New York
1917	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro, Vol. 2	Sanborn Map Co., New York
1988	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro, Vol. 2	Sanborn Map Co., New York
1989	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro, Vol. 2	Sanborn Map Co., New York
1990	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro, Vol. 2	Sanborn Map Co., New York
1992	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro, Vol. 2	Sanborn Map Co., New York
1993	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro, Vol. 2	Sanborn Map Co., New York
1995	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro, Vol. 2	Sanborn Map Co., New York
1996	Sanborn Insurance Co.	Insurance Maps of New York, Richmond Boro, Vol. 2	Sanborn Map Co., New York

Phase IB Subsurface Archaeological Testing

Based on the results of the geoarchaeological (soil boring) investigations, PAL initially proposed approximately 12 machine-assisted trenches, each measuring 2.5 m (8 ft) wide by 4.5 m (15 ft) long (to accommodate the shoring box) at 15-m (49 ft) intervals in the high sensitivity area that measures approximately 290 m (950 ft) long (see

Cherau 2011: Figures 8 and 9) (Figures 2-1 and 2-2). All of the trenches were proposed to extend to at least 214 cm (7.0 ft) through the sensitive archaeological strata within the vertical pipeline trench APE as conditions allowed, although the eastern most trench was expected to possibly be deeper depending on the soil stratigraphy in the area of the proposed HDD entry point.

A total of eight machine-assisted trenches were actually excavated along the NYCEDC Project area. The number of trenches was reduced when it became apparent that the fill deposits (e.g. coal ash) were not archaeologically sensitive. This resulted in expanding the interval between the trenches in order to confirm the horizontal and vertical extent of the non-archaeologically sensitive fill deposits. Nevertheless, where archaeologically sensitive strata were encountered, trenches were placed at a 15 m maximum interval.

A combination of machine-assisted and shovel scraping techniques were used to investigate the nature and integrity of any identified remains and cultural strata encountered in the trenches. A minimum thirty percent sample of all machine-excavated archaeologically sensitive soils (e.g. intact subsoils) was hand screened through ¼-inch hardware mesh. Any cultural materials remaining in the screen were bagged and tagged by trench and level. Detailed notes and photographs were taken of materials from non-archaeologically sensitive fill strata prior to their discard in the field. Soil stratigraphy was recorded for each machine trench on standardized forms, and plans and profiles were measured and drawn. All recovered cultural materials and samples were bagged and labeled with provenience information. Digital photographs were taken of the trenching locations and Project area, and any identified belowground cultural remains such as features. In addition, measured detailed drawings (plans, profiles) were done for all features identified in the trenches.

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 exceeded 3-4 ft.

Laboratory Processing and Analysis

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.

Culturally modified lithic materials, such as stone tools and chipping debris when present, were identified in terms of material, size (0–1 cm, 1–3 cm, 3–5 cm, etc.), and color. A lithic-type collection, maintained at PAL and containing materials from various source areas in New York and Pennsylvania and nearby regions such as New England, was utilized in the identification of all lithic materials. Chipping debris was classified as either flakes or shatter. Pieces of debitage showing evidence of a striking platform, bulbs of percussion, or identifiable dorsal or ventral surfaces were called flakes. Debitage without these attributes, and exhibiting angular or blocky forms, were classified as shatter. Lithic debris was examined for edges that had been modified by use wear or intentional retouch.

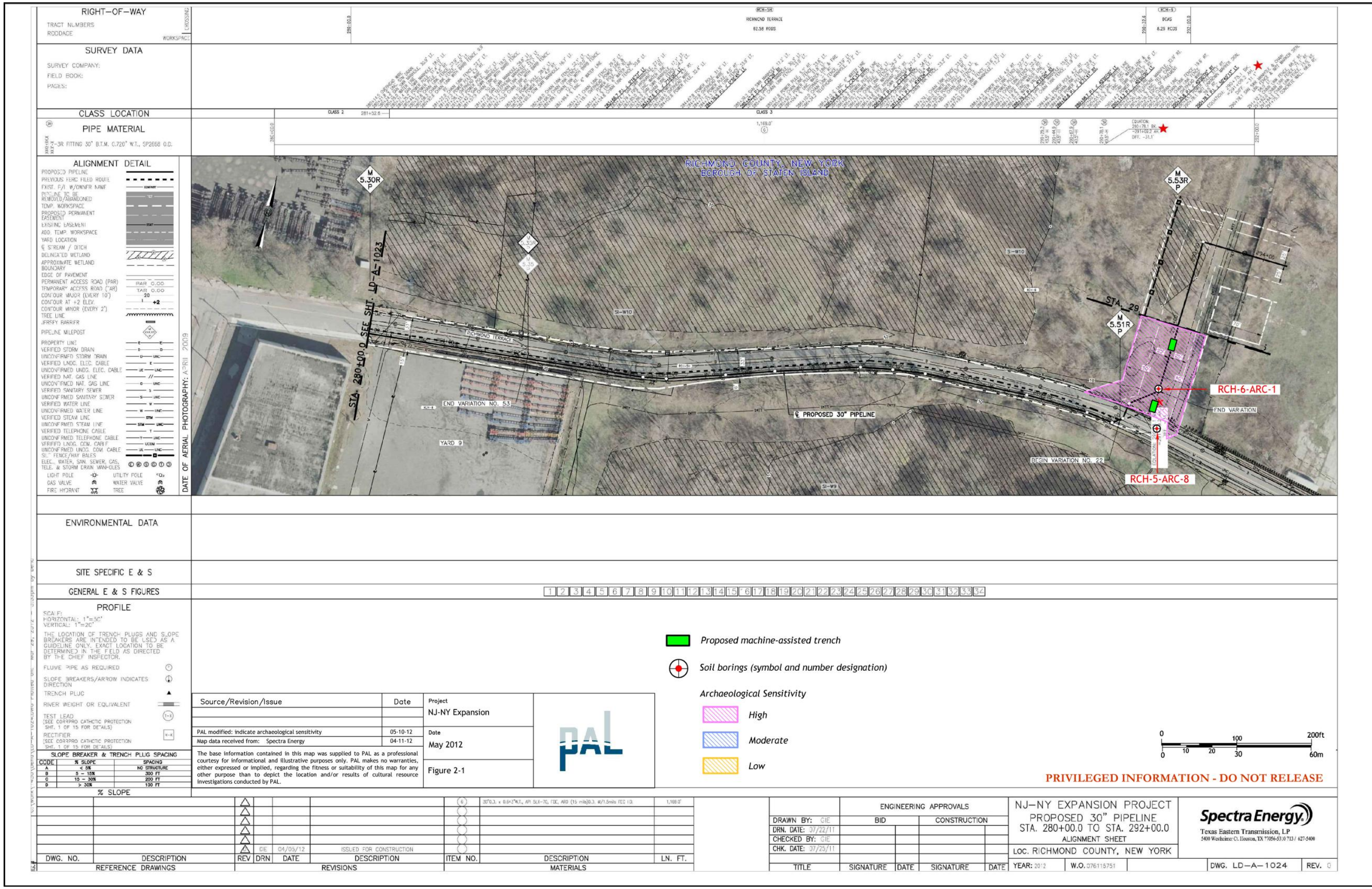

Figure 2-1. Originally proposed locations of machine-assisted trenches and location of geoarchaeological soil borings along the NYCEDC Project area (source: Cherau 2011).

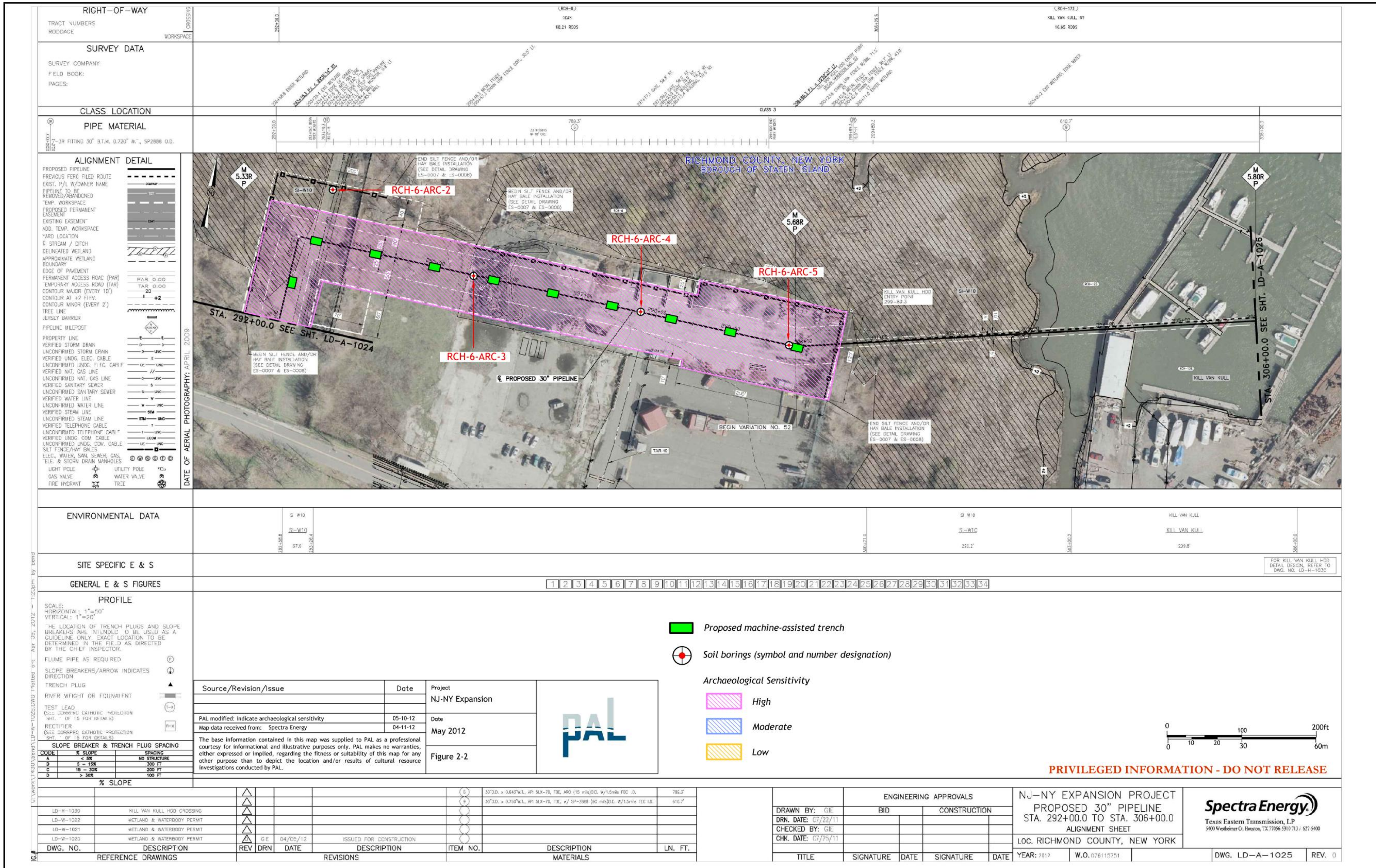

Figure 2-2. Originally proposed locations of machine-assisted trenches and location of geoarchaeological soil borings along the NYCEDC Project area (source: Cherau 2011).

Non-lithic 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 NYCEDC study 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).

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. Glacial moraine deposits in the form of cobbles and pebbles are also possible sources of lithic raw materials (Marshall 1982).

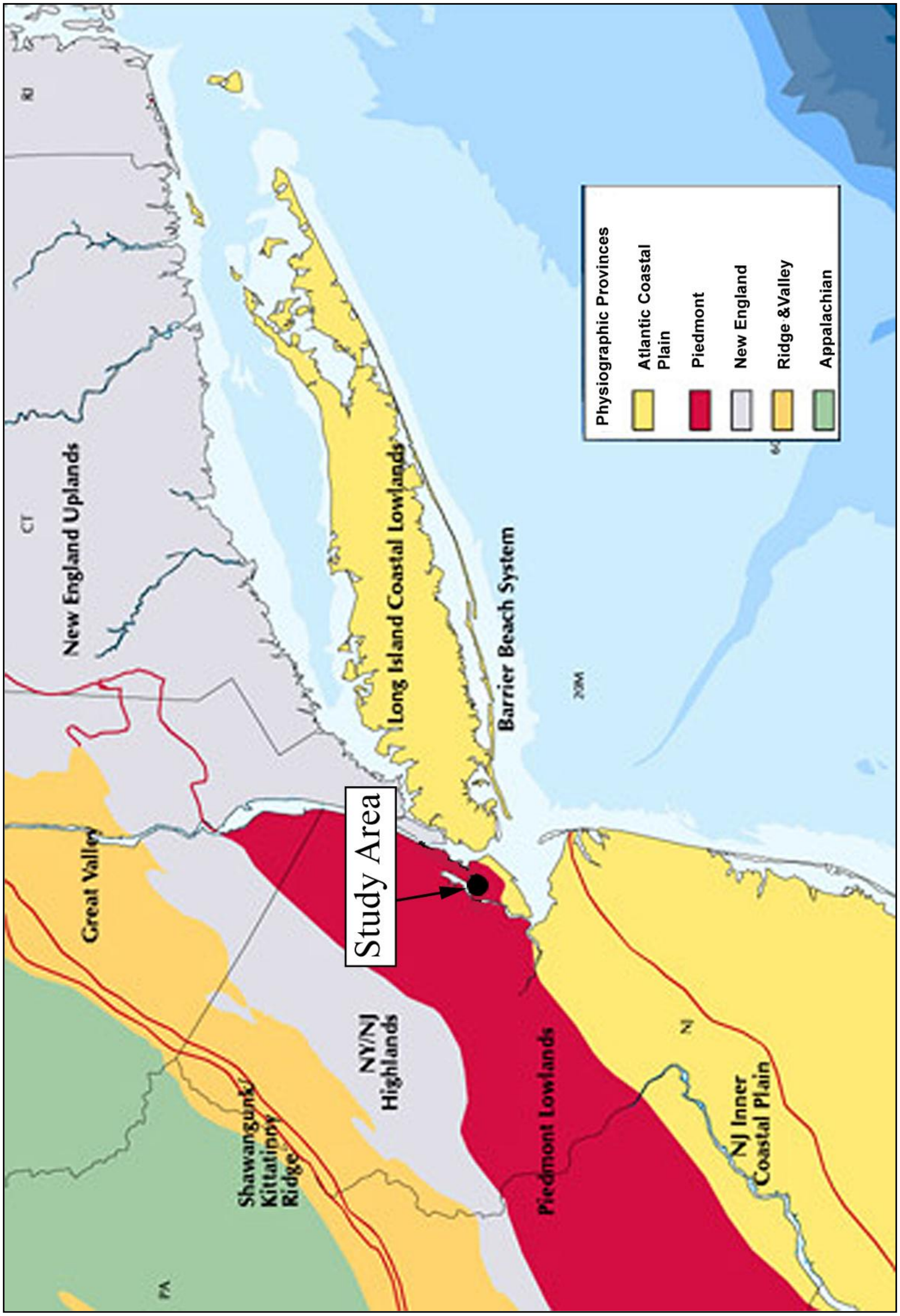

Figure 3-1. Map of physiographic provinces with the Project area (source: U.S. Fish and Wildlife Service [USFWS] 1997).

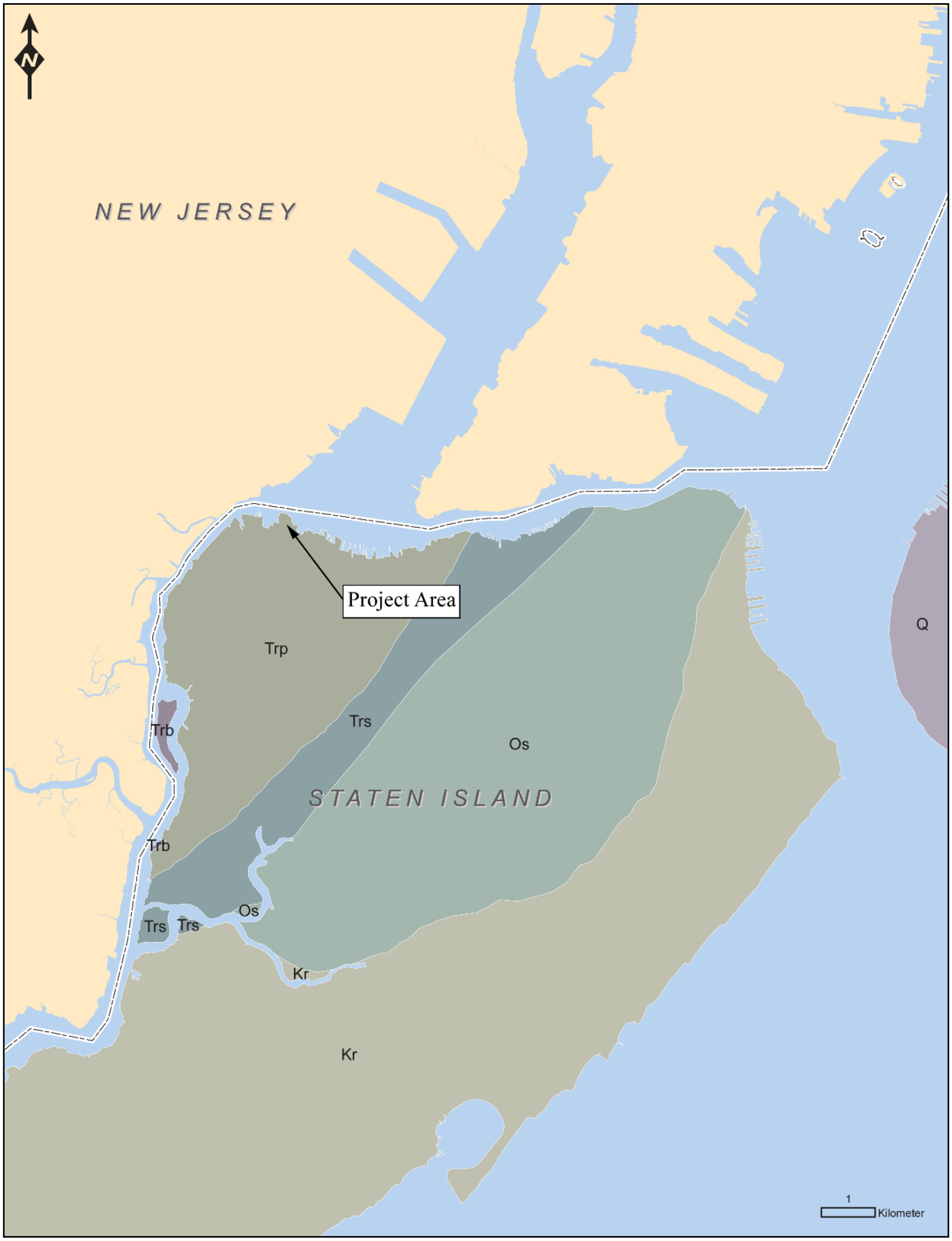

Figure 3-2. Bedrock geology map of Staten Island with the Project area (source: Dicken et al. 2008).

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 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 NYCEDC Project area is lies adjacent to the Kill Van Kull shoreline to the north. The Project area is fringed to the north and west by tidal marsh. Associated with the wetlands in the vicinity of the Project area is Bowman’s Brook or DeHart’s Creek which drains into the Kill Van Kull.

Soils

Soils at the NYCEDC Project area are mapped as Inwood-Laguardia-Ebbets complex (Figure 3-3). This soils complex (Map unit 100) is typically found on 0-8 percent slopes, is well-drained, and consists of a mixture of natural soils materials and construction debris. This soil unit is anthropogenic in origin, varies in coarse content, and is associated with anthropogenic urban fill plains (NRCS 2005).

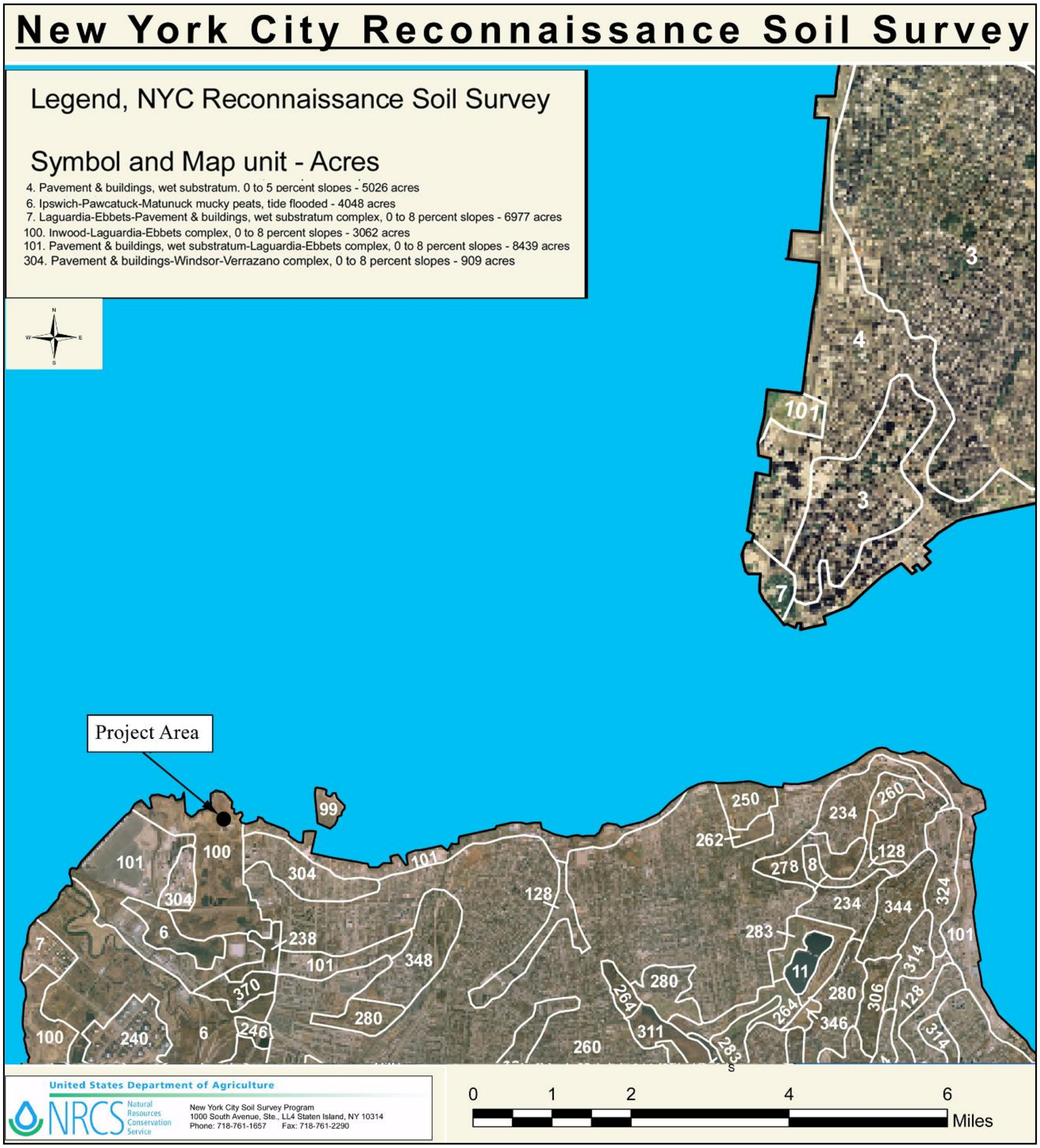

Figure 3-3. Soils map of Staten Island with the Project area (source: NRCS 2005).

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 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 western portion of the NYCEDC Project area is characterized by an existing open IMTT pipeline easement fringed by woods and brush (Figure 3-4; Photograph 3-1). The eastern portion of the project area consists of the paved facilities utilized by the New York City Department of Transportation (NYCDOT) bounded to the north and east by marsh. The proposed pipeline passes through the footprint of a large pile of asphalt in the fenced-in western portion of the NYCDOT facilities (Photograph 3-2). Between the IMTT pipeline and NYCDOT facilities is a vacant vegetated area where refuse dumps were noted on the surface (Photograph 3-3). Concrete wall ruins running in a north-south direction and largely overgrown with vegetation are also present just east of the IMTT pipeline easement (see Photograph 3-3).

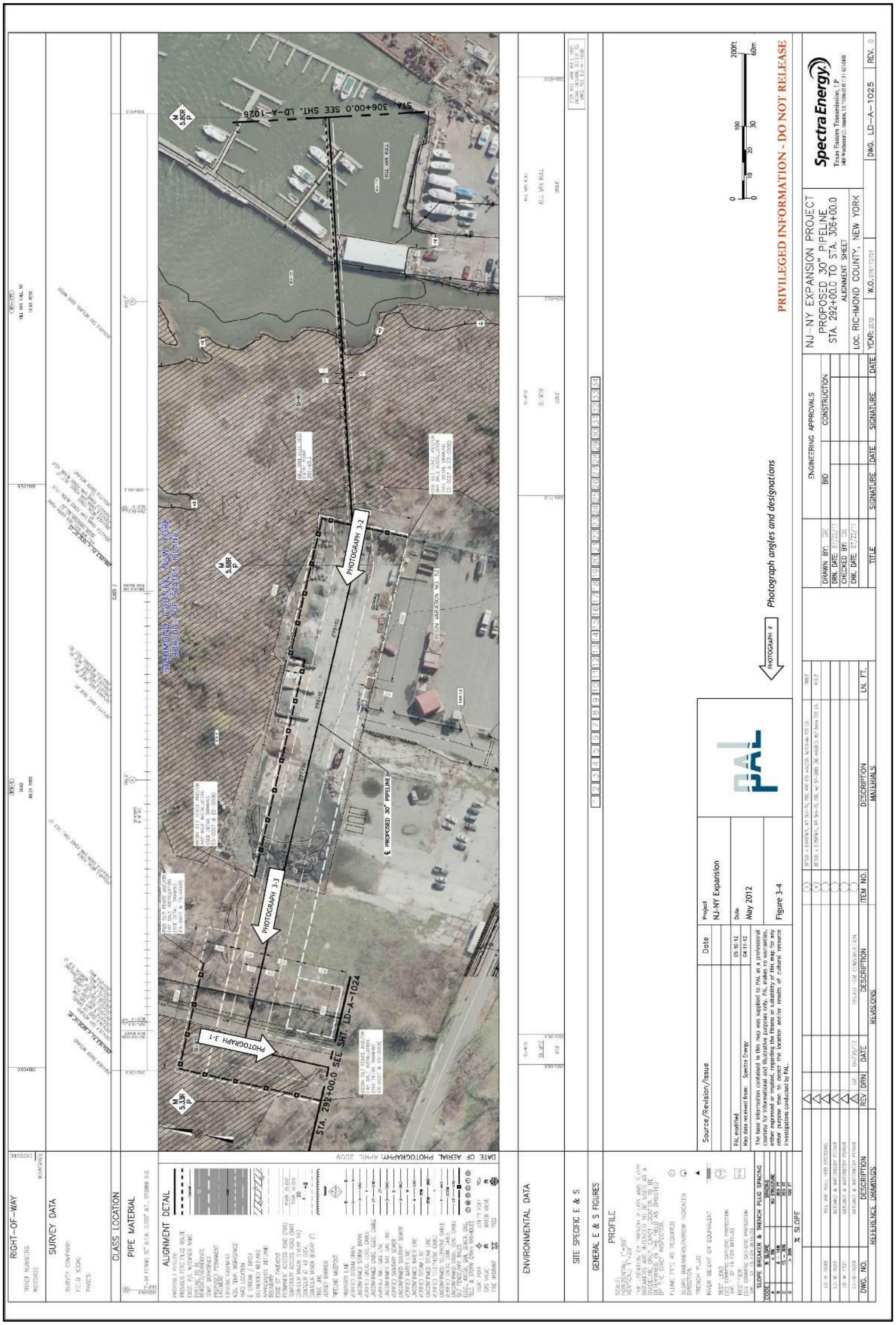

Figure 3-4. Location and orientation of photos referred to in the text.

Photograph 3-1. Overview of the existing IMTT pipeline easement and proposed NJ-NY Expansion pipeline route in the western portion of the Project area with MT-5 in the foreground, view south.

Photograph 3-2. Overview of the paved NYCDOT facilities in the eastern portion of the Project area with the large asphalt pile to the west, view west.

Photograph 3-3. Overview of vacant vegetated area between the NYCDOT facilities to the east and the existing IMTT pipeline corridor to the west, view west. Note the concrete wall remains in the 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 NYCEDC 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, that 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 a 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, 1909a).

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

European Colonization and Settlement (ca. A.D. 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. At this time the Project area appears to traverse parcels owned by Thomas Wandall and/or Jane Berryman. Berryman received a patent for this tract in 1693 (Figure 4-1).

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.

Figure 4-1. 1907 Skene colonial land patent map overlain on aerial with the approximate location of the NYCEDC Project area (source: Skene 1907).

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) (Figure 4-2). 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 southwest 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.

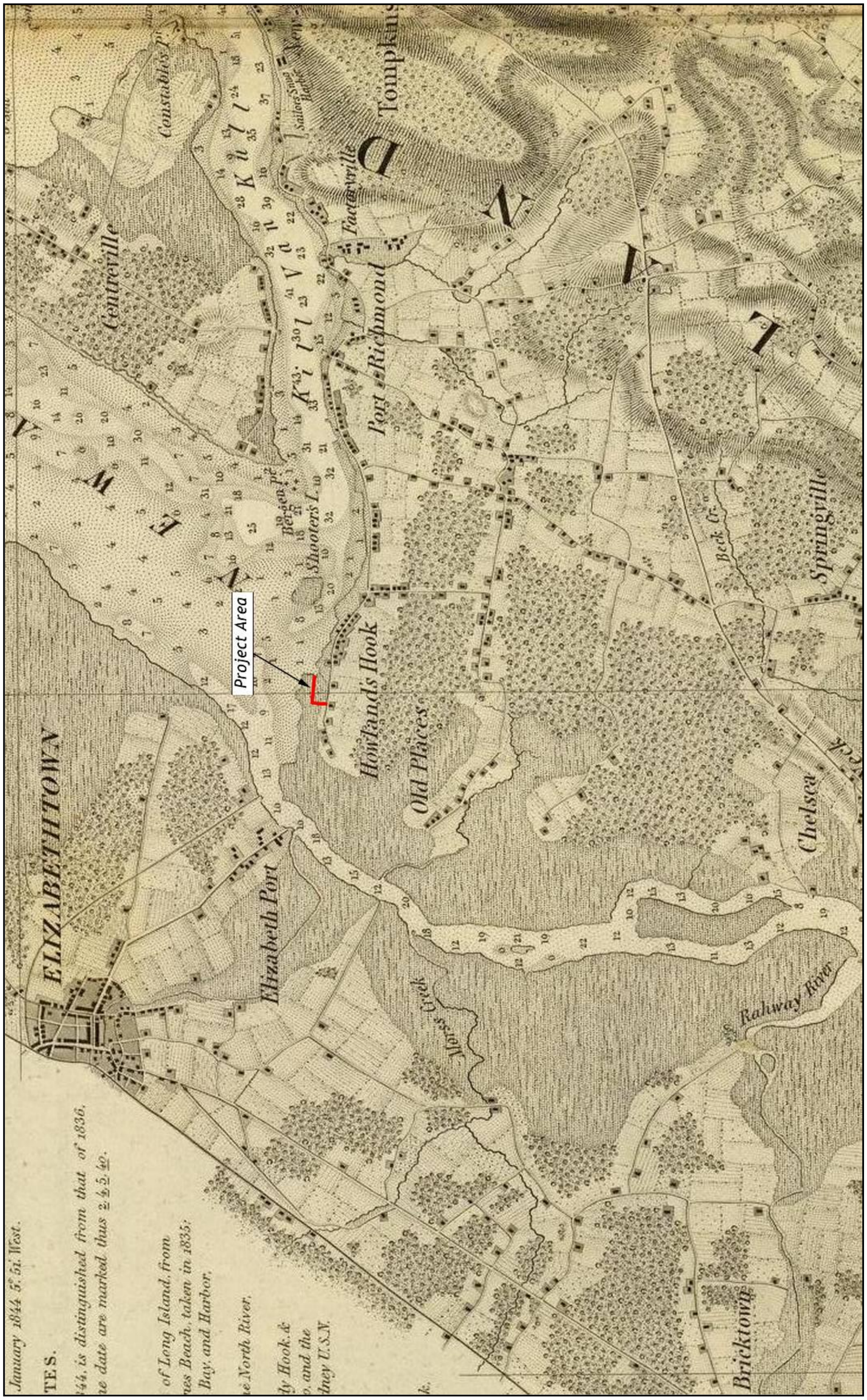

Figure 4-2. 1845 map with the approximate location of the NYCEDC Project area (source: Hassler 1845).

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, Western Road connecting present-day Washington Avenue and Richmond Terrace, Harbor Road, and Thompson's or South Avenue. 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 (Figure 4-3). 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 eventually took the name of Staten Island Railway. In 1863, the Staten Island Shore Railroad proposed the

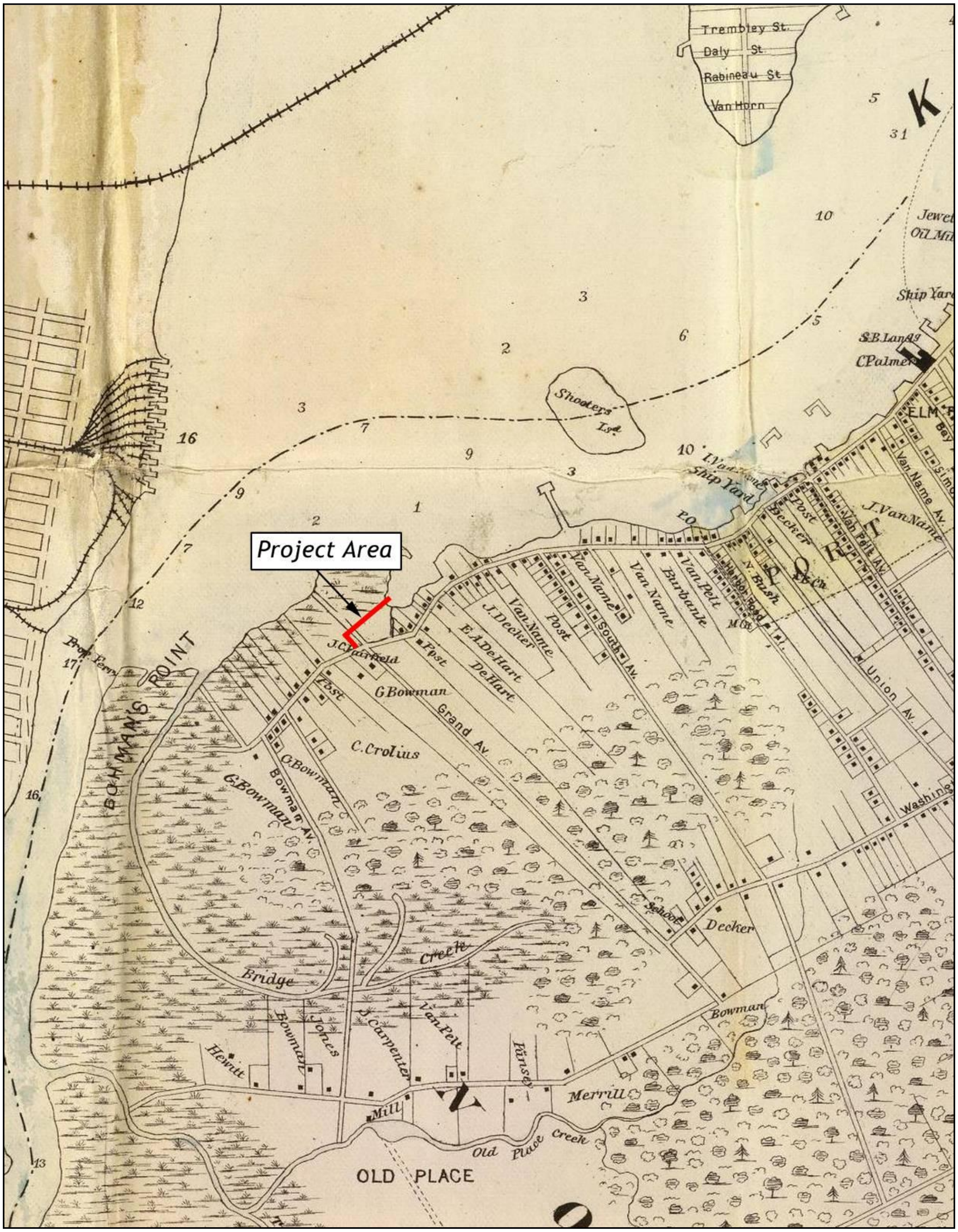

Figure 4-3. 1872 map with the approximate location of the NYCEDC Project area (source: Dripps 1872).

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. 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). Construction at the Milliken complex that included a steel and rolling mill began in 1903, and the complex ultimately occupied both sides of Richmond Terrace (Figure 4-4). 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 1991a: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. 1991a:7).

Modern Period (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 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

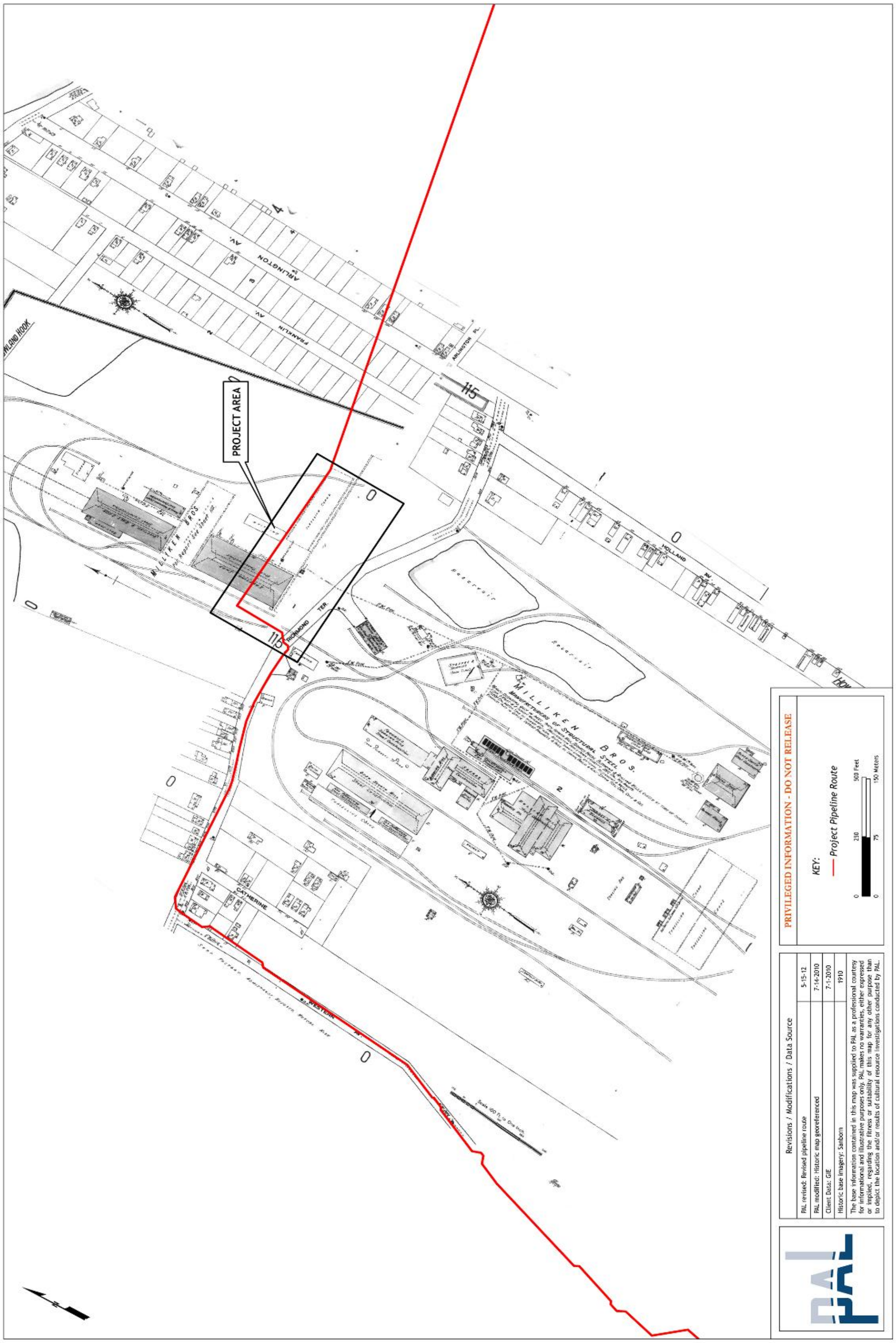

Figure 4-4. 1910 map with the (georeferenced) approximate location of the NYCEDC Project area (source: Sanborn 1910).

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. The area of Staten Island occupied by the Project area currently contains areas of vacant land, an existing IMTT pipeline easement, and facilities operated by the New York City Department of Transportation.

Land Use History and Soil Borings Sensitivity Assessment of the Pipeline Project APE

Historic maps indicate the presence of numerous mid- to late-nineteenth century dwellings along the north side of Richmond Terrace likely associated with "Sailor's Row", or the residences of retired sailors (see Figures 4-3; Figure 4-5). However, the landscape along the pipeline route remained unimproved until the construction of the early-twentieth-century Milliken Bros. iron and steel foundry (Beers 1874; Dripps 1872; Hassler 1845; Sanborn 1910; USGS 1891; Walling 1960). The route traverses the northern parcel of this former complex (see Figure 4-4).

As noted above, construction at the Milliken complex began in 1903, but 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 1991a:3). The 1910 Sanborn insurance map depicts a large complex that occupied parcels on both sides of Richmond Terrace, including outdoor traveling cranes that looped close to the Newark Bay (Kill Van Kull) shoreline to the north (see Figure 4-4). The pipeline route passes through the footprint of an erecting shop and a smaller workshop to the east that was present at that time (Sanborn 1910 and 1917; see Figure 4-3). The complex also contained a number of rail lines (spur tracks), two of which crossed Richmond Terrace. This same configuration is depicted on the 1917 Sanborn insurance map (Figure 4-6); however that same year, the 1917 (Bromley) atlas depicts the entire Milliken complex as having been taken over by the Downey Ship Building Corporation (Figure 4-7). According to Kearns et al. (1991a:7), 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). Historic 1924, 1931 and 1951 aerial photographs reveal that the erecting building and a riveting and bolt shop to the north were still present by 1931, but were razed at some point between that year and 1951 (Figure 4-8). The parcel containing the former Milliken/Downey complex was subsequently vacant until construction of the NYC DOT maintenance facility (Sanborn 1988, 1989, 1990, 1992, 1993, 1996).

Previous cultural resource reports note the remains of numerous concrete pedestals (walls and pads) associated with the Milliken industrial complex north of Richmond Terrace and a variety of foundations south of the road (Flagg 1991a:4, 1991b). The concrete walls and pads north of the road consist of a common foundation type used for large shed-type steel industrial structures (Flagg 1991a:4). The remnants north of Richmond Terrace were not considered to have any historical significance, while the foundations south of the road were considered to have potential historic significance (Flagg 1991a, 1991b).

Pre-contact sites in proximity to the pipeline route include the previously described Bowman's Brook (NYSM 4594 and 7321), Bowman's Brook North (A085-01-2364), and Mariner's Harbor site areas (Figure 4-9). The above-noted human burials from the Bowman's Brook Site found during rail track construction are most likely located on the south side of Richmond Terrace as this is where Skinner in general conducted his investigations. However, it is possible they were found north of the road in proximity to the pipeline route, which is located near rail spurs north of Richmond Terrace (see Figure 4-4). In addition, the Revolutionary War period burials reportedly present in the area (Kardas and Larrabee 1982:7, citing Skinner 1926) may be on either side of Richmond Terrace.

Disturbance along the route includes filling of former marsh areas, construction of the Milliken/Downey complex, development of the NYC DOT facility, existing pipeline installation and excavation of former underground storage tanks (USTs). The existing pipeline consists of a below-ground gas or petroleum pipeline paralleled by the proposed pipeline in the western portion of the NYC EDC Project area north of Richmond Terrace. Summary files of environmental sites and remediation activities provided to PAL by TRC indicate that USTs were removed from the NYC DOT parcel, but the locations of the excavations is unknown (TRC 2010: File No. 12).

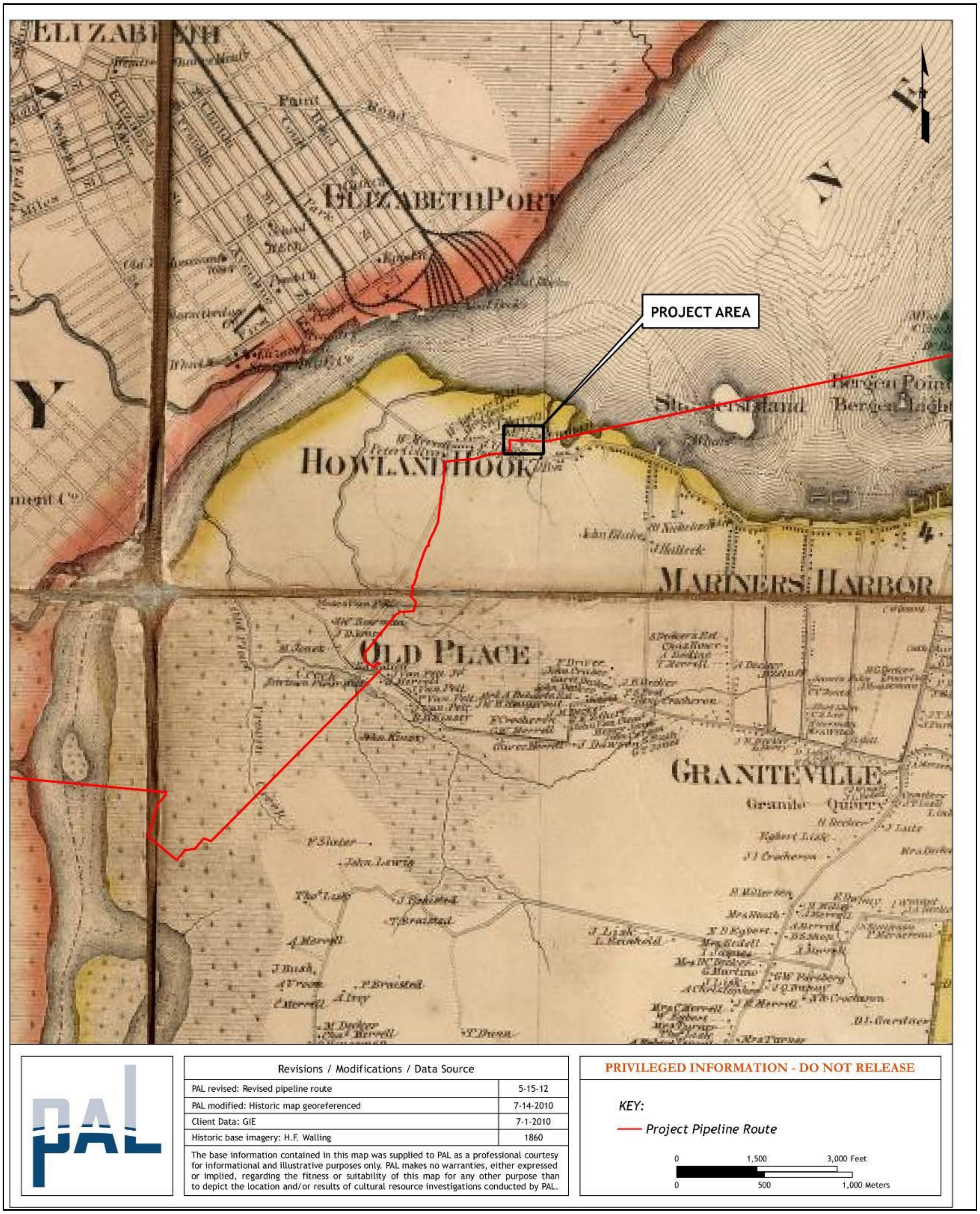

Figure 4-5. 1860 map with the approximate location of the NYCEDC project area (source: Walling 1860).

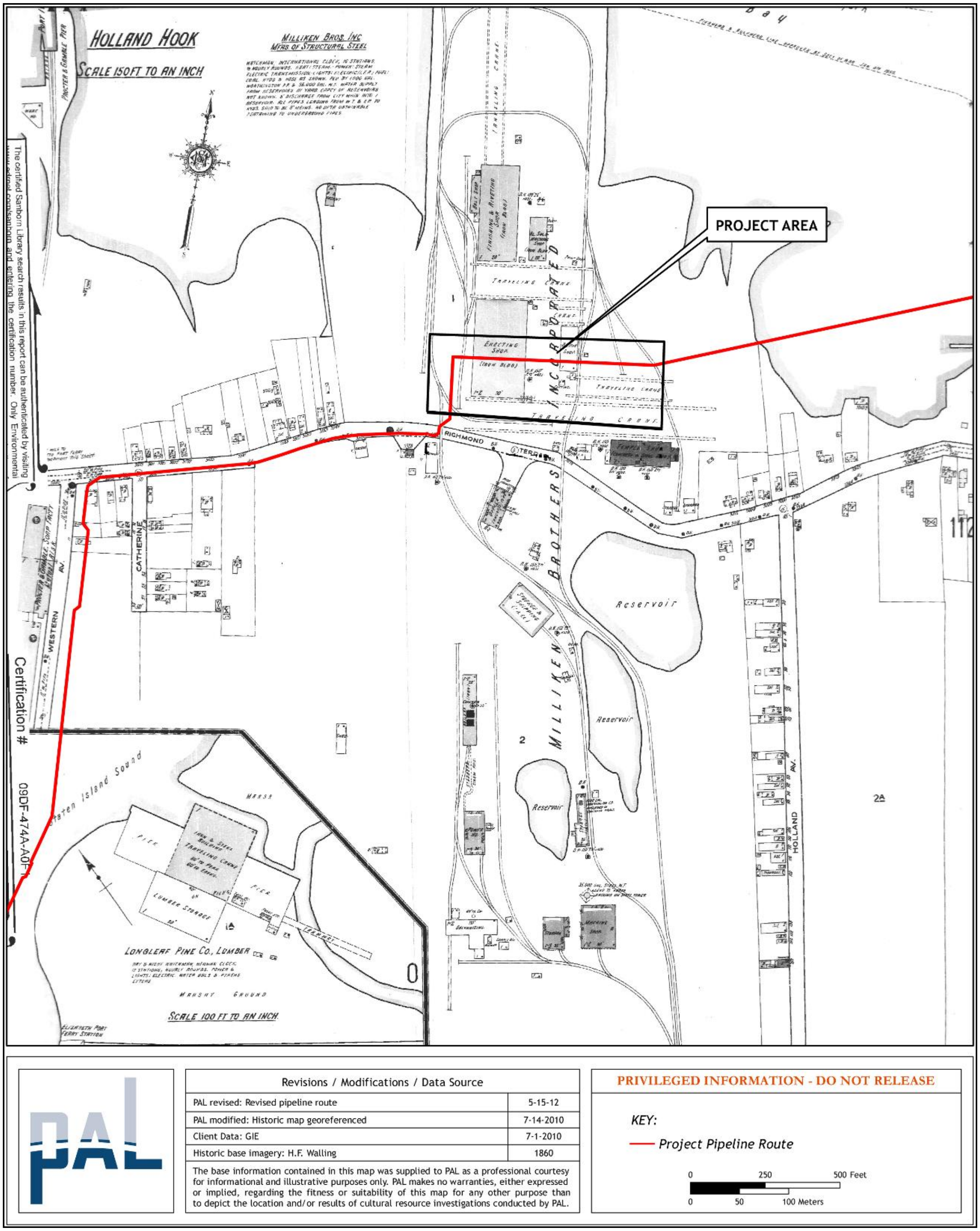

Figure 4-6. 1917 map with the (georeferenced) approximate location of the NYCEDC Project area (source: Sanborn 1917).

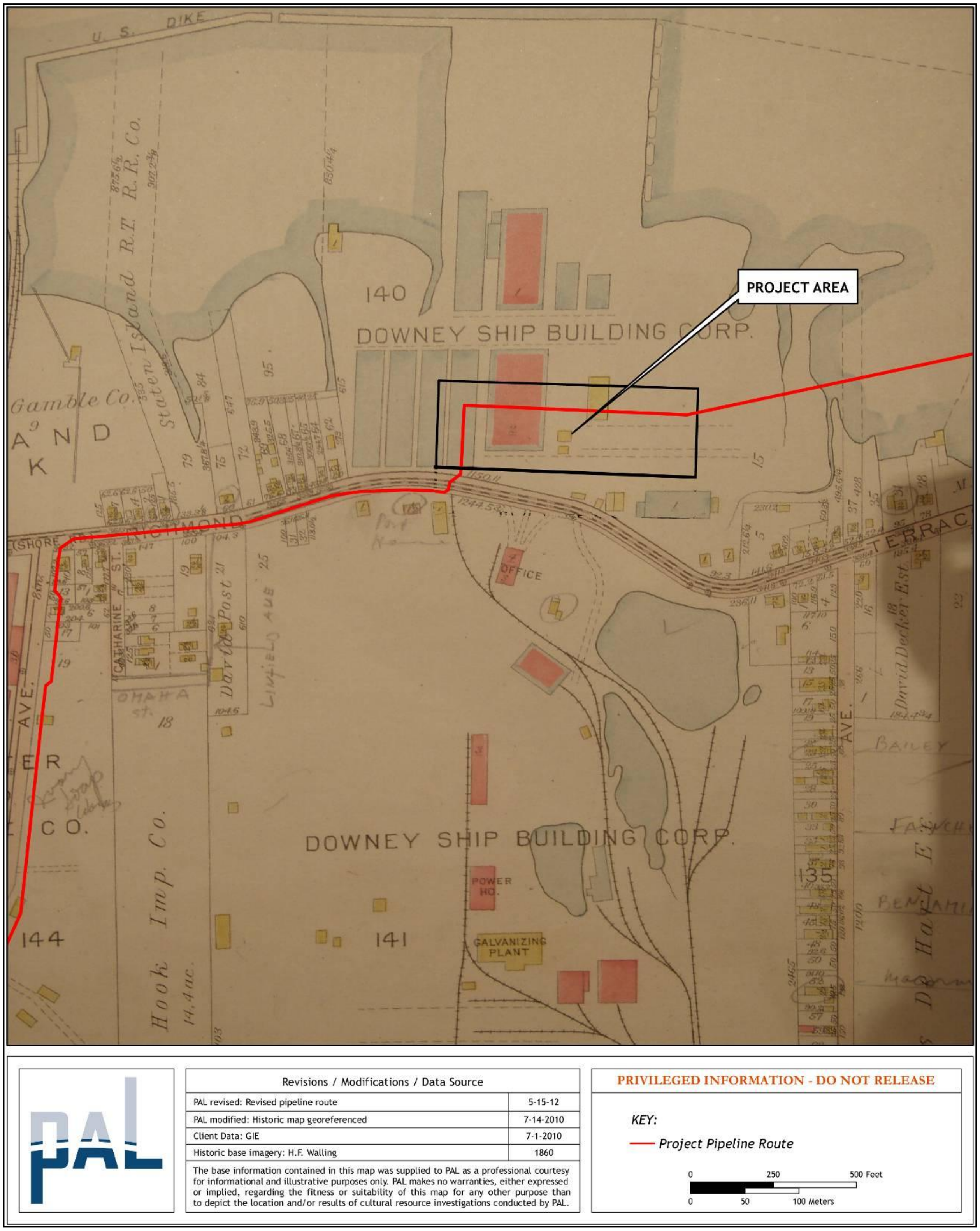

Figure 4-7. 1917 map with the approximate location of the NYCEDC Project area (source: Bromley 1917).

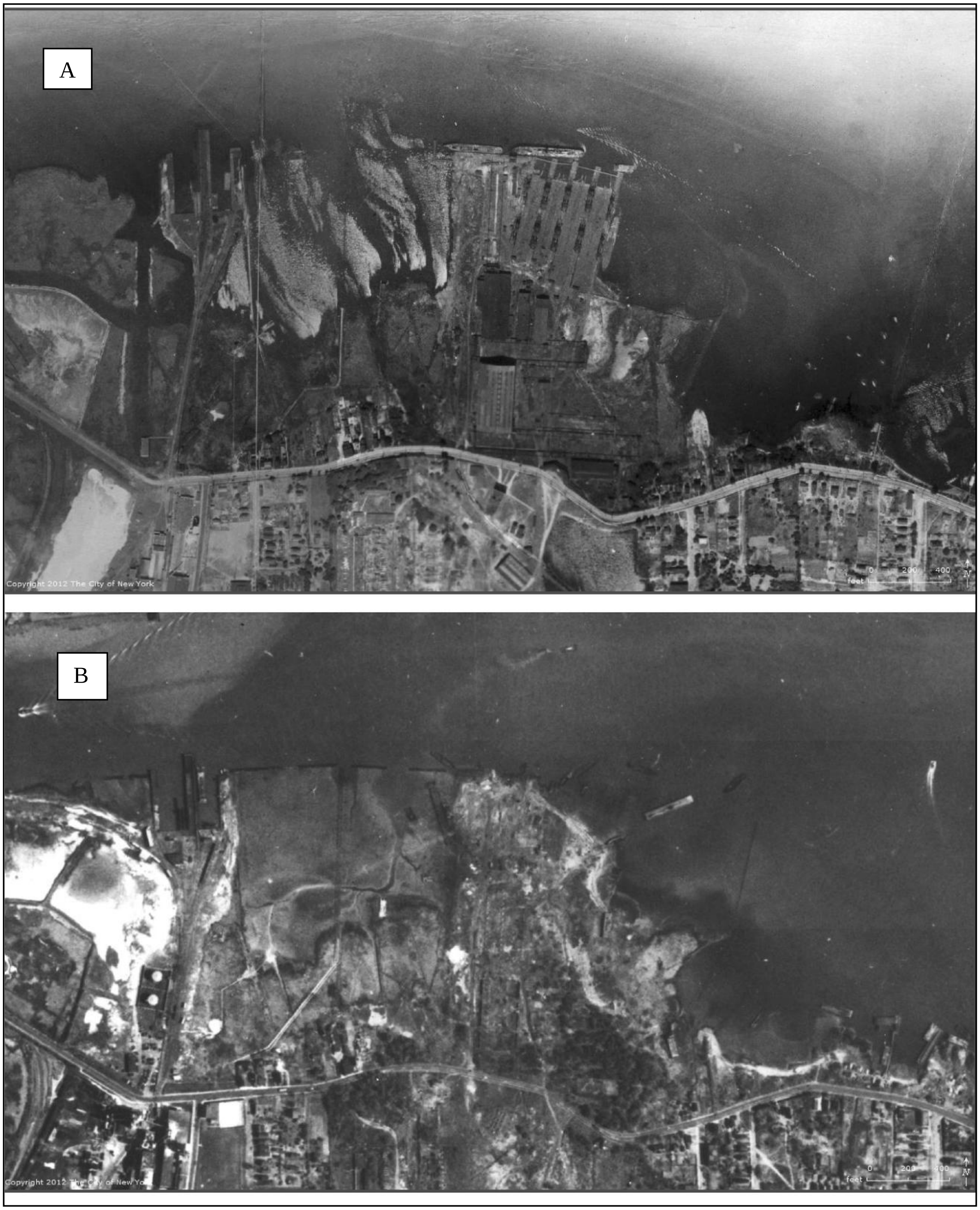

Figure 4-8. Historic aerial photographs dating to a) 1924, and b) 1951 (source: NY City Map 2012).

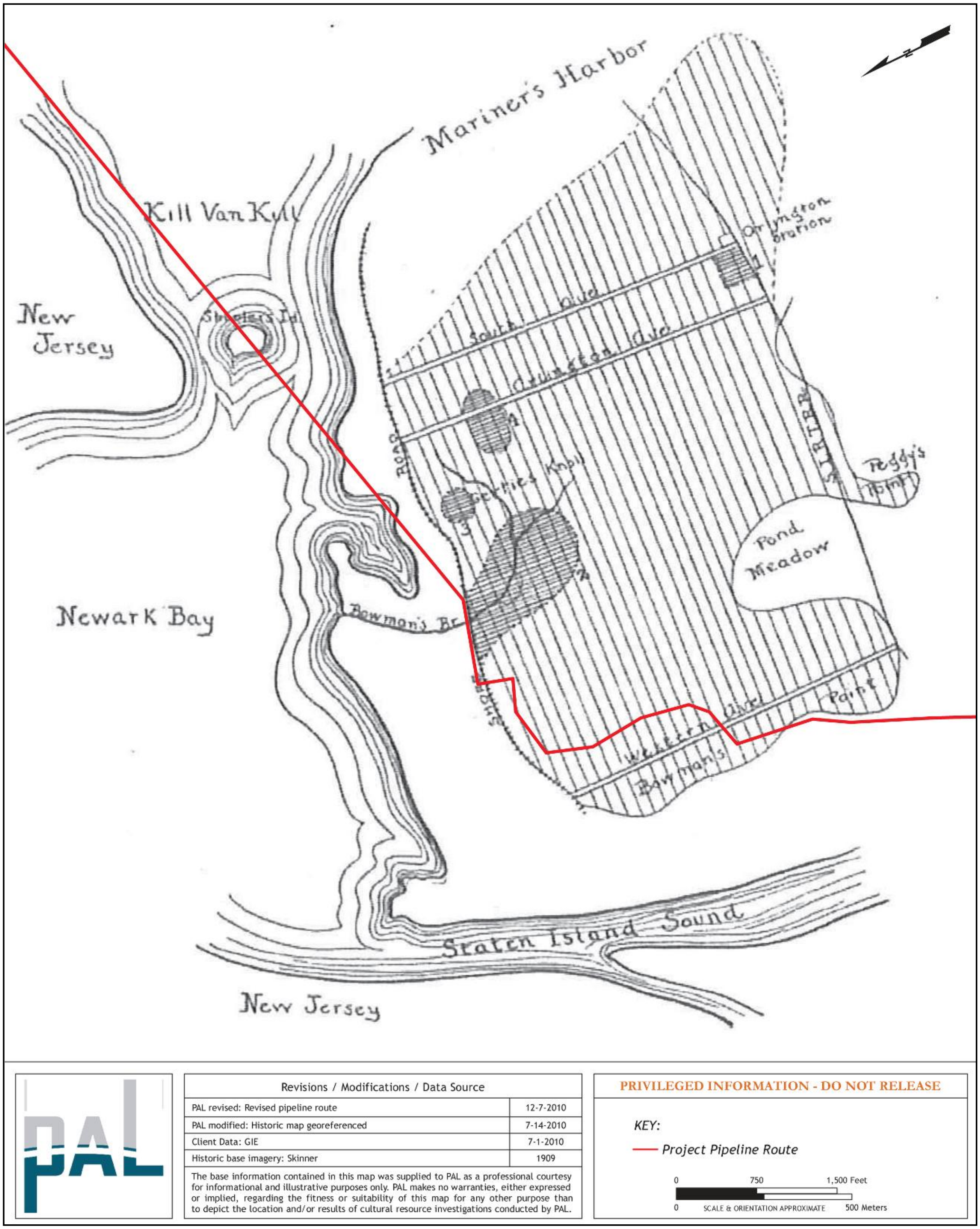

Figure 4-9. 1909 map of archaeological sites identified at Mariner's Harbor, with the location of the Project pipeline route on Staten Island (source: Skinner 1909a).

The area containing this section of the pipeline route has been previously characterized as sensitive for pre-contact archaeological resources (Boesch 1994; Kearns et al. 1991a). Based on this and the presence of documented sites in the vicinity, the Project route was considered to have high sensitivity for Archaic and Woodland period materials associated with the Bowman's Brook and Bowman's Brook North sites. The area may also have the potential to contain human remains.

The general area along Richmond Terrace was considered sensitive for pre-twentieth-century farmstead or domestic site remains, and twentieth-century industrial remains south of Richmond Terrace (Flagg 1991a, 1991b; Kearns et al. 1991a; Payne and Baumgardt 1986). However, historic maps do not indicate any presence of farmsteads or domestic structures along the pipeline route itself. Additionally, previous investigations concluded that industrial remains associated with the portion of the Milliken/Downey complex north of Richmond Terrace do not possess any historical significance (Flagg 1991a, 1991b; Kearns et al. 1991a). Though not considered sensitive for post-contact farmstead, domestic site, or industrial archaeological resources, the portion of the route between STA 290+65.2 and 300+50 was assigned potential to contain Revolutionary War period human remains based on the information contained in a 1926 report by Skinner (Kardas and Larrabee 1982:7). This section of pipeline was therefore assessed as having moderate sensitivity for post-contact period burials. The remaining portion of the pipeline route between STA 300+50 and 303+01.6 was assigned low sensitivity for post-contact resources as activity in this area has been limited to infilling of the shoreline (Elquist et al. 2010).

Soil borings were recommended for the pipeline route between STA 290+65.2 and 303+01.6 to determine the presence and depth of ground disturbances, fill, or marsh deposits, and of any sediments that have the potential to contain archaeological resources below these deposits. In July and October 2011 five geoarchaeological borings were completed on NYCEDC Property north of Richmond Terrace and southwest of the shoreline of the Kill Van Kull (see Figures 2-1 and 2-2). RCH-6-ARC-1 contained fill soils from ground surface to 181 cmbs (5.9 ft). The fill was underlain by an intact 200 cm (6.6 ft) thick basal soil that appears to have formed on top of shoreline sands and may be of terminal Pleistocene or Early Holocene age (GRA 2011:31). RCH-6-ARC-2 contained fill soils from ground surface to 279 cmbs (9.1 ft), underlain by mixed fill and estuarine and fluvial deposits that extend well below the vertical pipeline APE to 600 cm (19.7 ft). Cinders and iron concretions were present in the fill from 250-279 cmbs (8.2-9.1 ft). RCH-6-ARC-3 contained fill from just under pavement to 391 cmbs (12.8 ft), underlain by estuarine sediments well below the vertical pipeline APE to 600 cmbs (19.7 ft). The fill contained brick, wood, glass, ceramics, and cinders. RCH-6-ARC-4 contained fill from just under pavement to 372 cmbs (12.2 ft), underlain by estuarine and shoreline sediments well below the vertical pipeline APE to 600 cmbs (19.7 ft). The fill from 40-116 cmbs (1.3-3.8 ft) yielded brick fragments and cinders. RCH-6-ARC-5 contained fill from just under pavement to 290 cmbs (9.5 ft), underlain by estuarine, shoreline, and fluvial sediments that extend below the limit of the soil boring at 600 cmbs (19.7 ft). Cinders were present in the fill from 265-290 cmbs (8.7-9.5 ft) (GRA 2011).

The soil borings suggested the presence of intact Holocene soils that could contain pre-contact period cultural deposits, although these soils are for the most part deeply buried below the project pipeline vertical APE at 214 cmbs (7 ft). In one area, RCH-6-ARC-1, the Holocene soils possibly begin within the vertical APE beginning at 181 cmbs (5.9 ft) (see Figure 2-1). No Holocene soils, however, were identified at the far eastern end of the pipeline trench, closest to the river shoreline (RCH-6-ARC-5), where the proposed HDD entry point near STA 300+00 will extend from 0 to 60 ft below surface. In all cases, the soil borings indicated the presence of historic fill deposits within the vertical APE, some of which contained artifact assemblages including ceramics, glass, brick, and wood. This area north of Richmond Terrace is documented as having contained numerous nineteenth-century dwellings likely associated with "Sailors Row", as well as the potential for Revolutionary War burials.

CHAPTER FIVE

RESULTS

Eight machine-assisted trenches (MTs) measuring 2.5-x-5-m (8.2-x-16.4-ft) to 2.3-x-4.4-m (7.5-x-14.5-ft) were excavated within NYCEDC Project area (Figure 5-1 and 5-2). Though 12 trenches were originally proposed, after excavation of the first two trenches, it became apparent that the fill deposits (e.g. coal ash) contained in these trenches were not archaeologically sensitive. It was therefore decided to expand the interval, which was sufficient to confirm that these deep fill deposits were present across much of the Project area. This resulted in a reduced number of trenches excavated (see Chapter 2 discussion). However, where archaeologically sensitive strata were encountered, trenches were placed at a 15 m maximum interval. The depth of the trenches ranged from 165 to 280 centimeters below the surface (cmbs) (5.4 to 9.2 ft). Trenches were numbered, and are described below in the order in which they were excavated. Trench wall collapse, slumping and rapid water intrusion was an issue in most of the trenches due to the sandy nature of the deeper soil deposits and/or the presence of unconsolidated coal ash. In two cases (MT-1 and MT-2), this resulted in ceasing trench excavation for safety reasons. Nevertheless, in all cases where archaeologically sensitive soils consisting of intact A and B horizon soils were exposed, these soils were sampled and screened for cultural materials.

MT-1 (RCH-6-ARC/MT-12)

MT-1 was located at the eastern end of the NYCEDC Project area at the location of the Kill Van Kull Horizontal Directional Drill (HDD) entry point at STA 299+89.3 (see Figure 5-2). Groundwater was encountered in the trench at approximately 2 ft in depth, at which point pumping of water during excavation began. MT-1 contained five fill deposits extending to 165 cmbs (5.4 ft) below the concrete paved surface (Figure 5-3). Immediately below the paved surface was a mix of gravel and asphalt (Fill 1) that overlay a strong brown (7.5YR 5/6) compact silty clay deposit (Fill 2) with few gravel inclusions. This in turn overlay a series of coal ash deposits, the first of which consisted of black (10YR 2/1) coal ash (Fill3) overlying a dark gray (2.5Y 4/1) coal ash with silt, below which a small portion of a black (10YR 2/1) coal ash mixed with silt and gravel was exposed in the east end of the unit (see Figure 5-3). Excavations ceased at a maximum depth of 165 cmbs (5.4 ft) as rapid water intrusion and the loose nature of the coal ash deposits made continued excavation unsafe. Though the vertical APE at this location extends below the depth of the trench, the geoarchaeological boring (RCH-6-ARC -5) undertaken at this location indicates that deposits containing “cinders” (i.e. the coal ash fill deposits observed in the trench) continues to a depth of 290 cmbs (9.5 ft) (Cherau 2011; GRA 2011).

MT-2 (RCH-6-ARC/MT-11)

Trench MT-2 was located in the vicinity of STA 299+00 (see Figure 5-2). Five fill deposits extending to 210 cmbs (6.9 ft) were contained within the trench below the concrete paved surface. Groundwater was encountered in MT-2 at 2.6 ft after which pumping was required to continue excavation. As in MT-1 a gravel and asphalt mix (Fill1) was situated below the pavement. Fill 1 overlay a brown (10YR 4/3) sandy fill with razor clam fragments (Fill 2) that was unique to MT-2. The sandy layer was underlain by the same strong brown (7.5YR 5/6) compact silty clay (designated Fill 3) seen in MT-1. Underlying these upper fill deposits were deep coal ash deposits similar to those seen in MT-1 consisting of a black (10YR 2/1) coal ash (Fill 4) overlying a gray (10YR 5/1) coal ash deposit with silt (Fill 5) (Figure 5-4). Excavations were halted at 210 cmbs (6.9 ft) as rapid water intrusion and loose nature of the coal ash deposits made continued excavation unsafe. Geoarchaeological borings RCH-6-ARC-4 and RCH-6-ARC-5 indicating that fill deposits continue to 12.2 ft (Cherau 2011; GRA 2011)

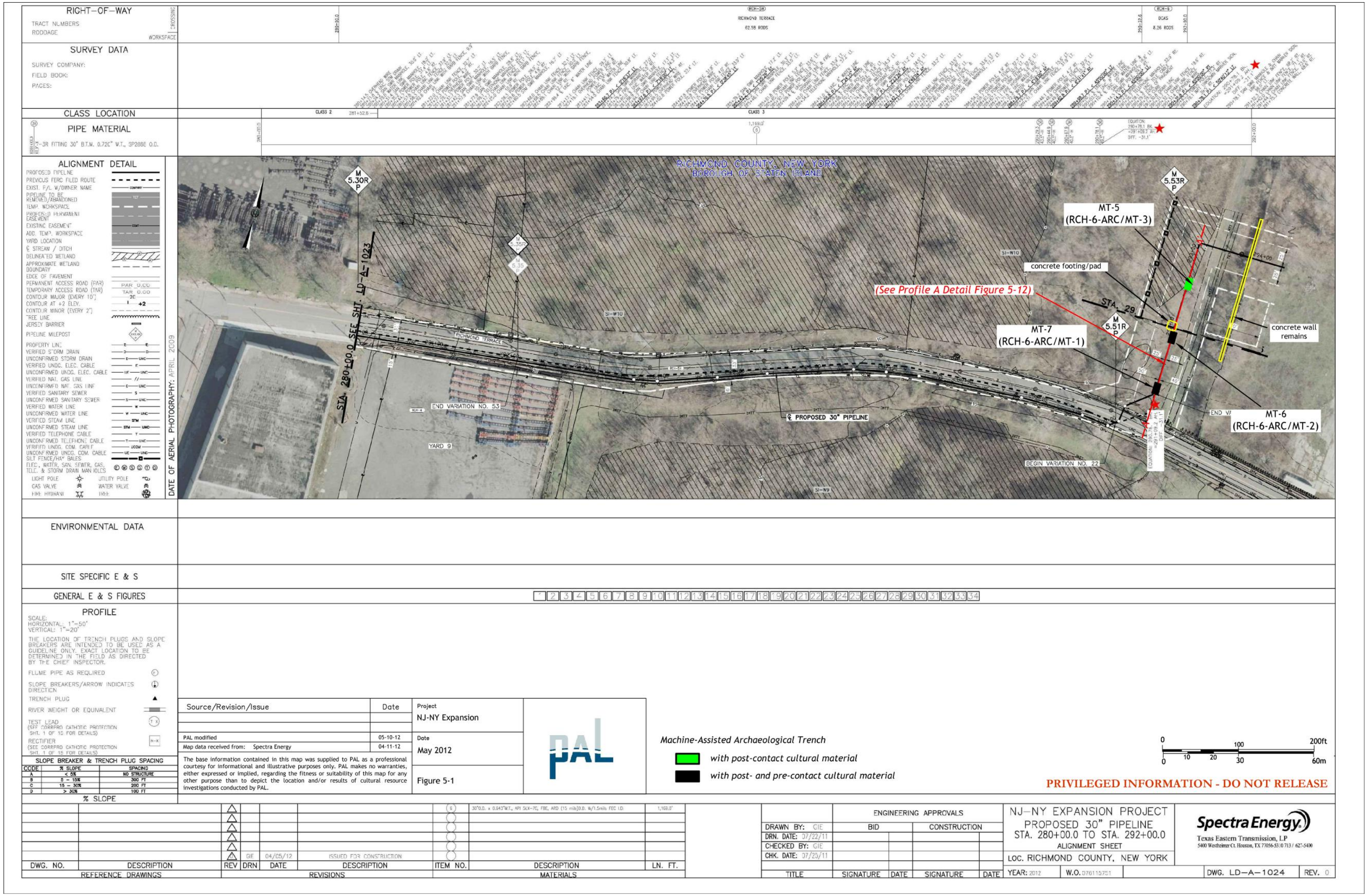

Figure 5-1. Location of Phase IB archaeological testing in the NYCEDC Project Area, Staten Island, New York (Sheet LD-A-1024).

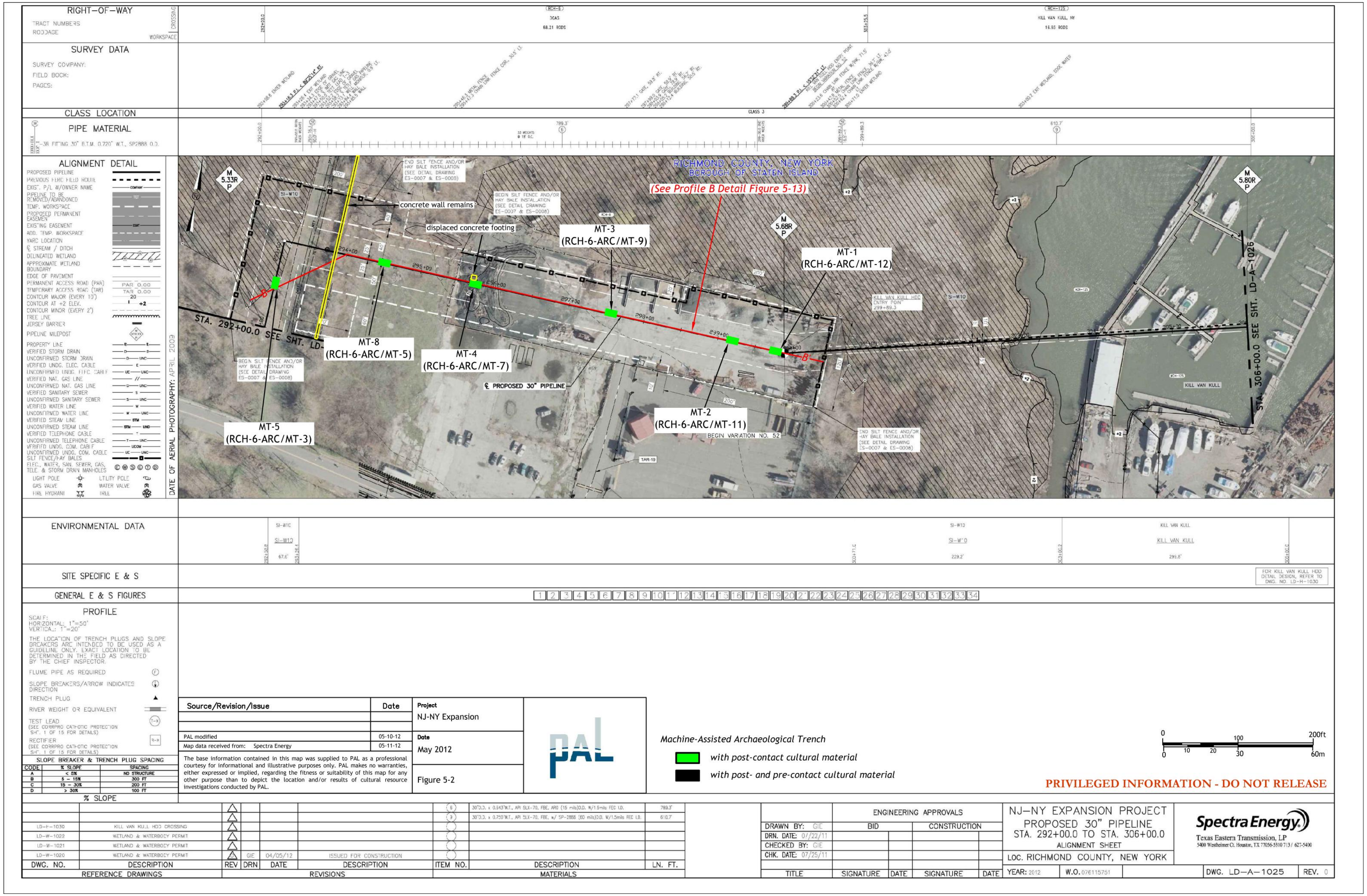

Figure 5-2. Location of Phase IB archaeological testing in the NYCEDC Project Area, Staten Island, New York (Sheet LD-A-1025).

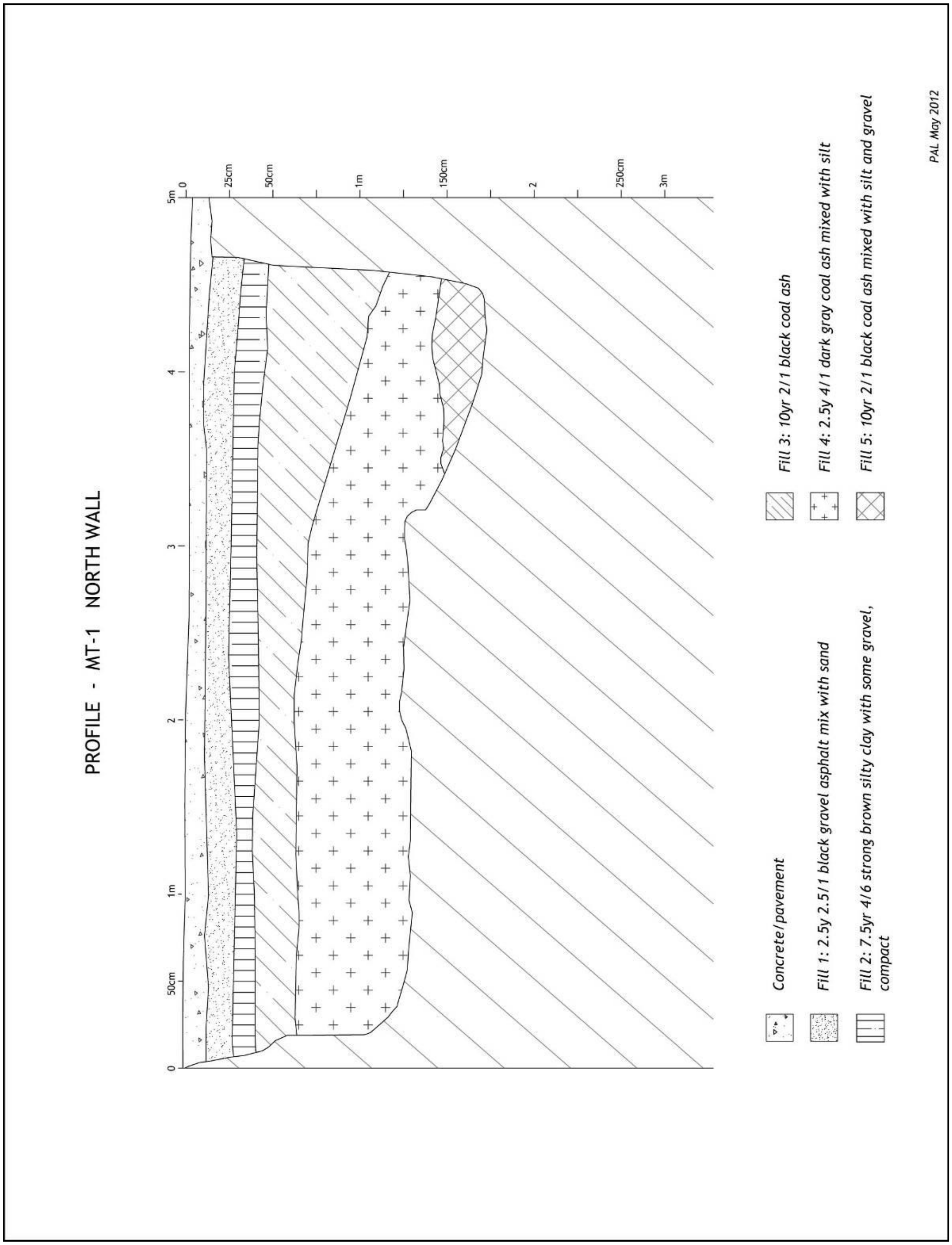

Figure 5-3. MT-1 (RCH-6-ARC/MT-12), north wall profile.

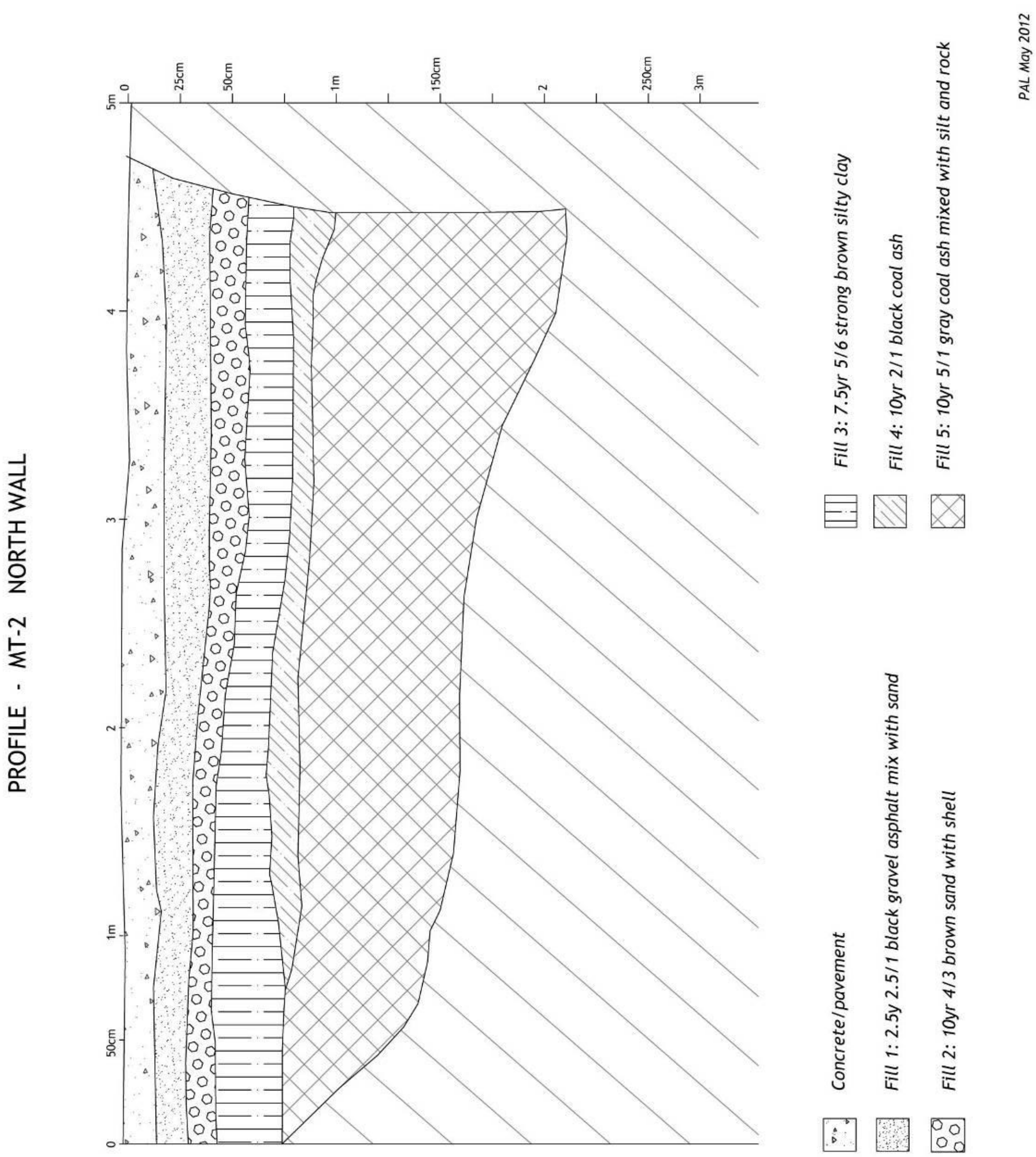

Figure 5-4. **MT-2 (RCH-6-ARC/MT-11), north wall profile.**

MT-3 (RCH-ARC/MT-9)

MT-3 was placed in the vicinity of STA 297+50 at the eastern end of where the NYC DOT maintains a large asphalt pile (see Figure 5-2). The asphalt at this location was milled out by Napp-Grecco construction staff to allow trench excavation. Unsurprisingly, MT-3 exhibited a layer of asphalt overlying the concrete pavement. Five fill deposits were present in the trench to a depth of 240 cmbs (7.9 ft). Groundwater was present in the trench at 3 ft after which pumping was necessary to continue excavation. As with the previous two trenches, Fill 1 underlying the pavement consisted of a black (10YR 2/1) asphalt and gravel mix. Below this was a second fill unique to MT-3 consisting of a deposit of large gravel with gray (10YR 5/1) silty sand. The deposit of large gravel was not continuous in profile being absent from the easternmost end (Figure 5-5). Below this was a yellowish-red (5YR 4/6) compact silty clay deposit designated Fill 3 believed to be the same silty clay deposit seen in MT-1 and MT-2, though in MT-3 it was thicker and contained pockets of brown (7.5YR 4/3) silty sand. This was underlain by the same coal ash deposits present in previous trenches consisting of a black (10YR 2/1) coal ash deposit (Fill 4), underlain by a dark gray (2.5Y 4/1) coal ash with silt that extended to the bottom of the unit.

MT-4 (RCH-6-ARC/MT-7)

MT-4 was located at the western end of the large asphalt pile in the vicinity of STA 296+00 (see Figure 5-2). Milling out of the deep asphalt deposits and removal of a fragmented concrete surface was required at this location to allow for trench excavation. Groundwater was encountered at this location at 3 ft after which pumping was required to continue excavation. MT-4 was excavated to a maximum depth of 260 cmbs (8.5 ft) and contained three fill deposits. In contrast to the previous trenches, the uppermost deposit (Fill 1) consisted of a thick layer of dark brown (10YR 3/3) silt sand with concrete chunks near the surface. What appeared to be a large, displaced concrete footing was also present along the north wall in the western portion of the trench (Figure 5-6). The footing is described in further detail below. Fill 1 was underlain by the same coal ash deposits present in previous trenches consisting of a black (10YR 2/1) coal ash deposit (designated Fill 2) overlying a dark gray (10YR 4/1) coal ash with silt deposit (Fill 3) that extended to the bottom of the trench.

MT-5 (RCH-6-ARC/MT-3)

Trench MT-5 was placed in the vicinity of 292+50 along the west side of an existing IMTT pipeline corridor (see Figure 5-2). Groundwater was first encountered in MT-5 at 3.4 ft after which pumping occurred, and the trench was excavated to a total depth of 250 cmbs (8.2 ft). Water intrusion was less rapid than in the previous trenches and did not require continuous pumping. MT-5 contained six fill deposits overlying intact natural soils (Figure 5-7). The surface layer consisted of a very dark grayish-brown (10YR 3/2) silt sand designated Fill 1/Developing A horizon that overlay a yellowish-red (5YR 5/6) compact silty clay deposit (Fill 2). This latter deposit is likely the same reddish compact silty clay deposit seen in trenches MT-1, 2 and 3. Underlying Fill 2 was a thin brown (7.5YR 4/4) silty sand mottled with coal ash that was very similar to the brown sandy fill present in MT-4 (designated Fill 1). This was underlain by the same coal ash deposits seen in all the previous units that consisted of a black (10YR 2/1) coal ash (Fill 4), overlying a thin gray (2.5Y 5/1) coal ash and silt deposit (Fill 5) that was underlain by a very dark gray (2.5Y 3/1) coal ash mixed with silt (Fill 6). The coal ash deposits were underlain by a thick very dark grayish-brown (10YR 3/2) silty intact peat mat (comprised of 90 percent vegetal matter) that extended to the base of the trench.

MT-6 (RCH-6-ARC/MT-2)

MT-6 was also placed west of the existing IMTT pipeline corridor just south of STA 292+00 (see Figure 1). An irregular, round concrete footing/pad was present on the surface immediately north of MT-6 which is described below. As with MT-5, this trench also contained fill deposits that overlay intact soils (Figures 5-8 and 5-9). MT-6 was excavated to a maximum depth of 280 cmbs (9.2 ft). Groundwater was first encountered at 4 ft, after which pumping occurred though continuous pumping was not necessary. A very dark grayish-brown (10YR 3/2) silty sand developing A horizon was also present in MT-6. The developing A horizon was underlain by yellowish-red (5YR 5/6) compact silty clay (Fill 2) largely confined to the northwest portion of the trench (see Figure 5-8), and a very dark grey (10YR 3/1) coal ash deposit (Fill 3) confined to the eastern half of the trench (see Figure 5-9). Fill 3 also exhibited mottles and pockets of yellowish-red (5YR 5/6) sandy clay and light brownish-gray (10YR 6/2) coal ash.

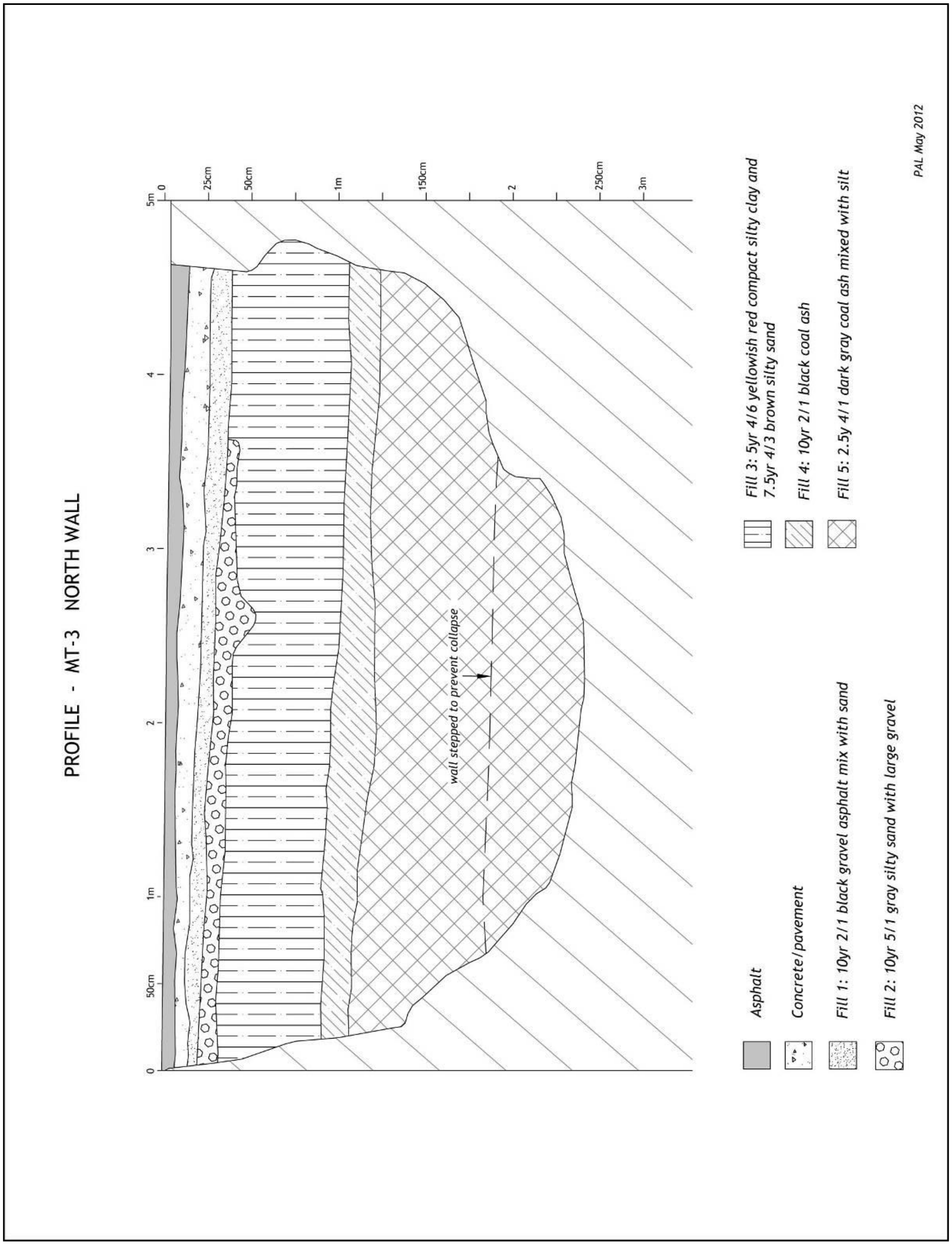

Figure 5-5. MT-3 (RCH-6-ARC/MT-9), north wall profile.

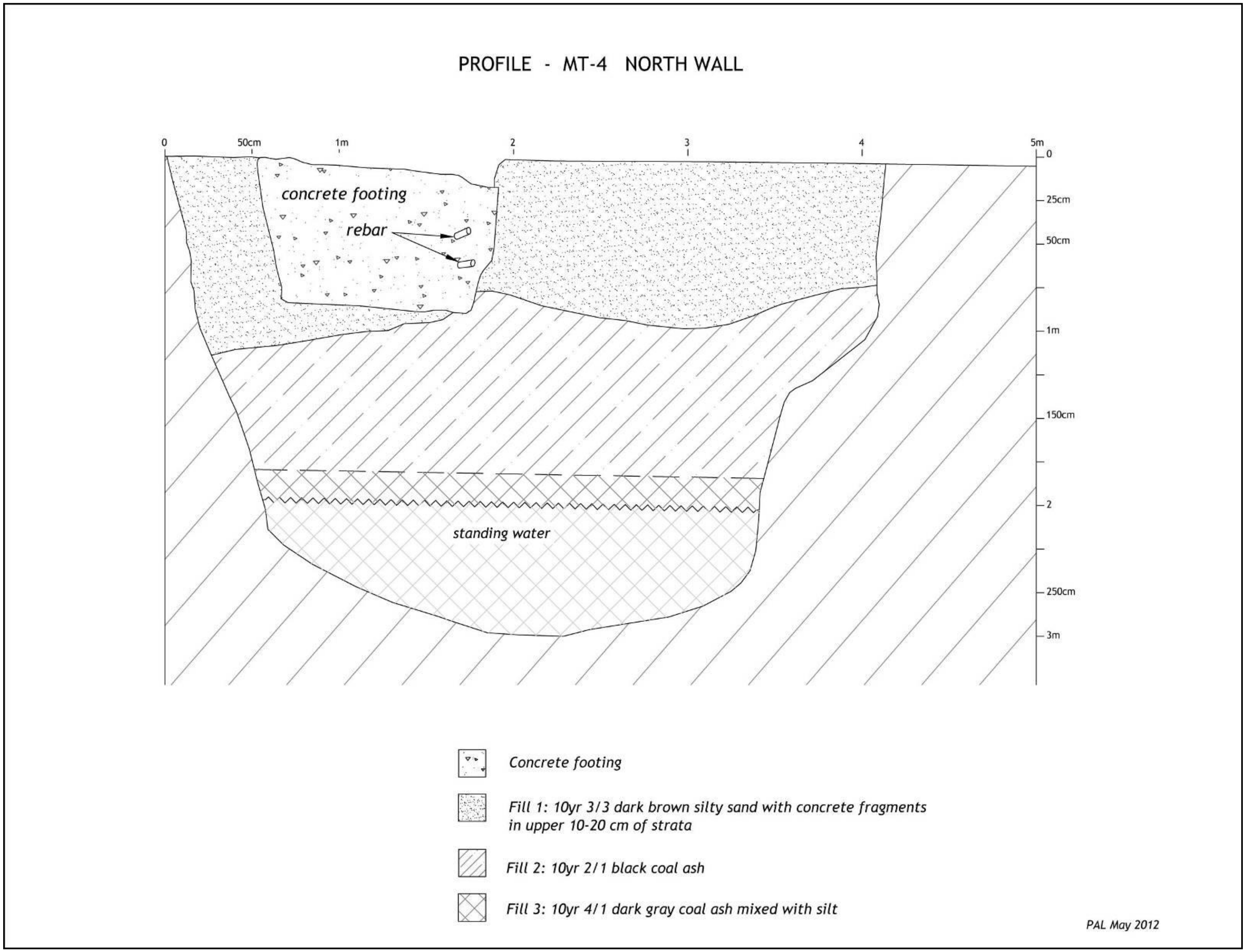

Figure 5-6. **MT-4 (RCH-6-ARC/MT-7), north wall profile.**

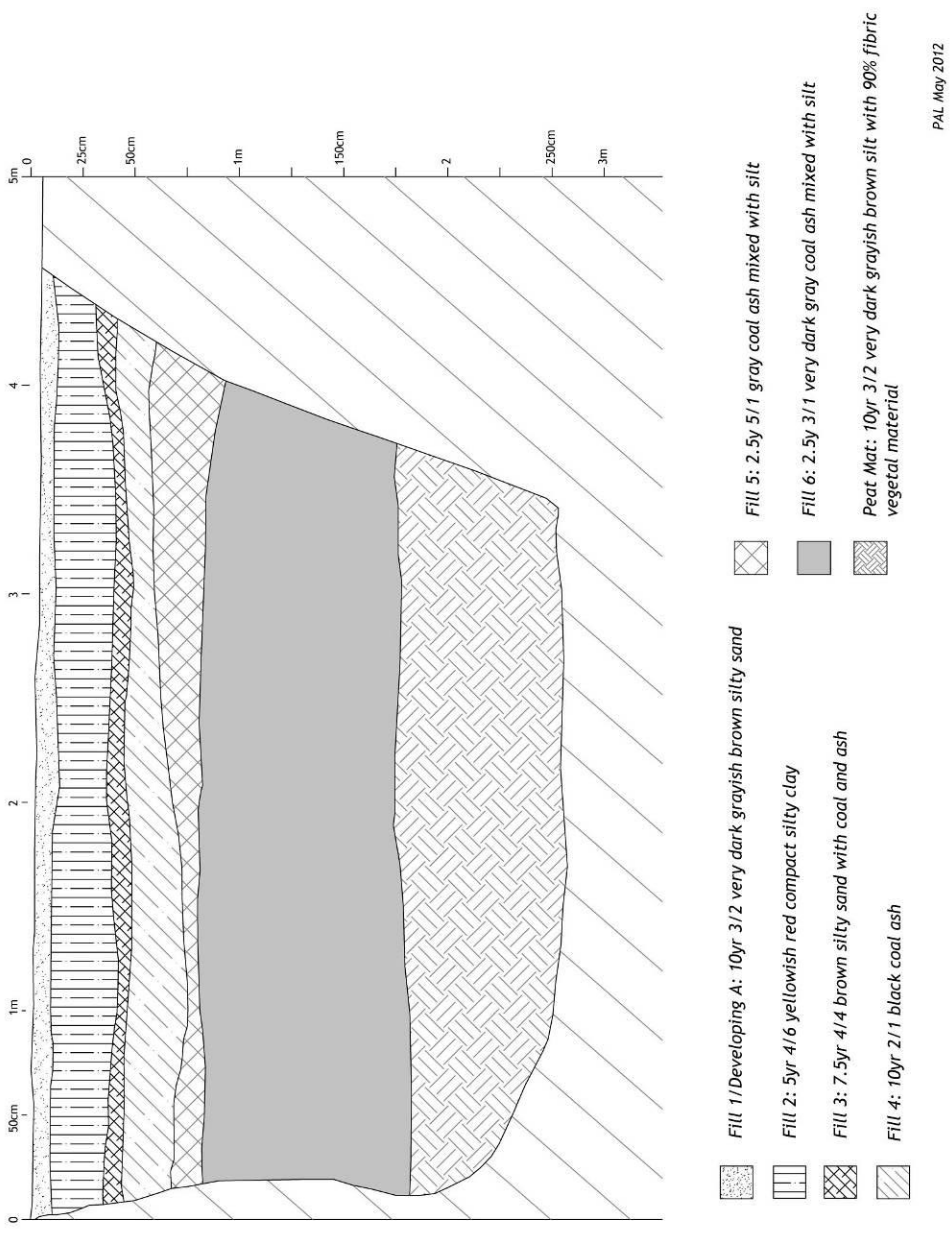

Figure 5-7. MT-5 (RCH-6-ARC/MT-3), west wall profile.

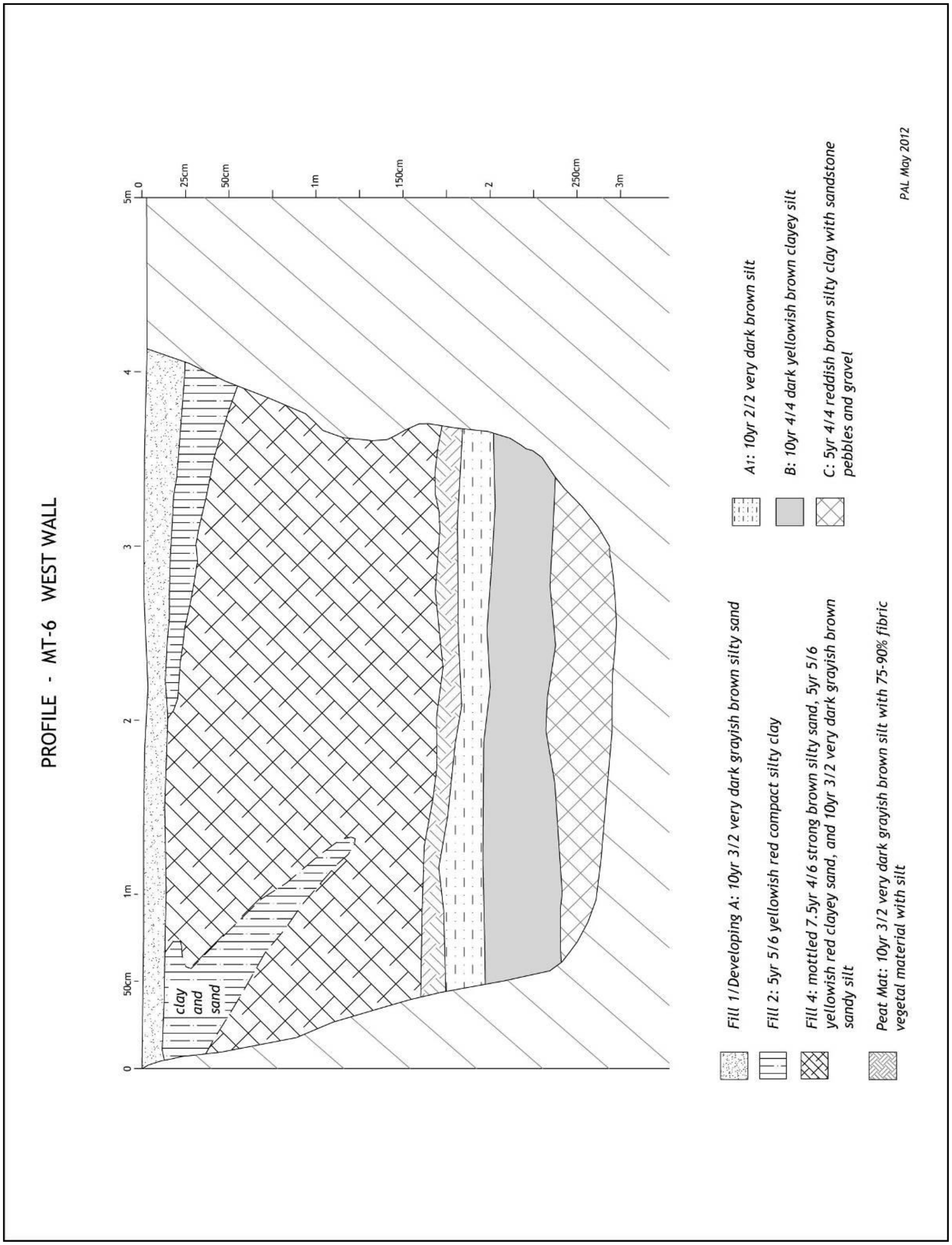

Figure 5-8. MT-6 (RCH-6-ARC/MT-2), west wall profile.

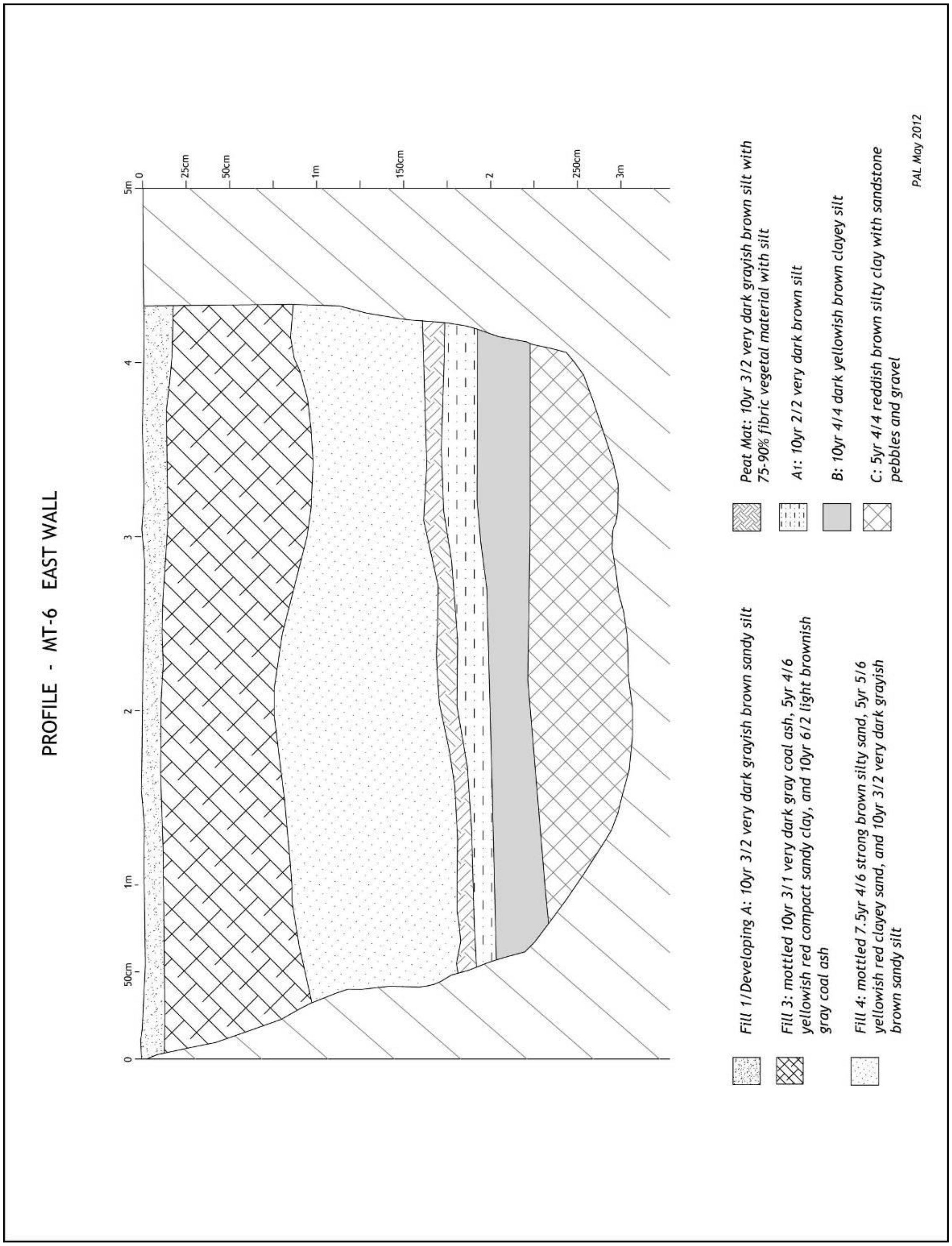

Figure 5-9. MT-6 (RCH-6-ARC/MT-2), east wall profile.

Most of the western portion of the trench was taken up by redeposited topsoils and subsoils (designated Fill 4) comprised of strong brown (7.5YR 4/6) silty sand mixed and mottled with very dark grayish-brown (10YR 3/2) silty sand and yellowish-red (5YR 5/6) clayey sand that continued below Fill 3 in the eastern portion of the trench (see Figures 5-8 and 5-9). These fill deposits overlay an intact soil column that began at 160 cmbs (5.2 ft). The uppermost intact soil below the fill deposits consisted of a very dark grayish-brown (10YR 3/2) silty peat mat (75 to 90 percent vegetal matter) underlain by a very dark brown (10YR 2/2) A horizon of silt. Intact subsoils below the A horizon consisted of a dark yellowish-brown (10 YR 4/4) clayey silt B horizon overlying a C horizon of reddish-brown (5YR 4/4) silty clay with few pebbles and gravel (see Figures 5-8 and 5-9).

MT-7 (RCH-6-ARC/MT-1)

Trench MT-7 was situated south of MT-6 in the vicinity of STA 291+00 a short distance north of Richmond Terrace road (see Figure 5-1). MT-7 was excavated to a depth of 240 cmbs (7.9 ft). The depth at which water was encountered (4.5 ft) was the deepest of any trenches excavated. MT-7 also contained a Fill 1/developing A horizon below which were layers of redeposited topsoils and subsoils designated Fill 2 and Fill 3 (Figure 5-10). Fill 2 consisted of a strong brown (7.5YR 5/6) silty sand mixed and mottled with dark brown (7.5YR 3/4) and very dark grayish-brown (10YR 3/2) silty sands. Fill 3 was distinguished from Fill 2 by its higher organic soil content consisting of very dark grayish-brown (10YR 3/2) silty sand mixed and mottled with strong brown (7.5YR 5/6) silty sand and yellowish-red (5YR 4/6) clayey sand. Fill 2 and 3 overlay an intact soil column that lacked the peat mat layer present in trenches MT-5 and MT-6. Intact soils began at 140 cmbs (4.6 ft) and consisted of a black (10YR 2/1) medium to coarse sandy silt A horizon overlying a dark grayish-brown (10YR 4/2) Ae horizon of medium to coarse sandy silt. Subsoils below the A horizon soils consisted of a strong brown (7.5YR 5/6) clayey silt B horizon with a trace of sand that overlay a reddish brown (5YR 4/4) C horizon of silty clay with gravel and mottles of light greenish-gray (GLEY2 7/10BG) clay.

MT-8 (RCH-6-ARC/MT-5)

Trench MT-8 was located in the vicinity of STA 294+50 in a vacant vegetated area between the large asphalt pile to the east, and the IMTT pipeline corridor to the west (see Figure 5-2). A late twentieth-century trash dump was noted in the immediate vicinity of the trench. MT-7 was excavated to a total depth of 260 cmbs (8.5 ft). Groundwater was encountered at 3.75 ft after which continuous pumping was required for excavation to continue. As encountered in MTs 5 through 7, a Fill 1/developing A of dark grey (10YR 3/1) was present at the surface, which was underlain by brown silty sand deposits designated Fill 2 and 3. Fill 2 consisted of brown (7.5YR 4/4) silty sand with rare brick inclusions, while the underlying Fill 3 had the same color and texture, but in contrast to Fill 2 was extremely compacted with common (ca. 30 to 40 percent) brick fragment inclusions. Fills 2 and 3 were underlain by the same coal ash deposits present in most of the other trenches. The uppermost coal ash deposit (Fill 4) consisted of black (10YR 2/1) coal ash with a pocket of light olive-brown (2.5Y 5/4) coal ash and sand. This was underlain by a dark gray (2.5Y 4/1) coal ash with silt deposit (Fill 5) situated over a very dark gray (2.5Y 3/1) coal ash with silt that extended to the bottom of the trench (Figure 5-11).

Site Stratigraphy

Schematic cross-section profiles were created based on trench profiles in order to more effectively compare deposits between trenches and evaluate the Project area stratigraphy (see Figures 5-1 and 5-2; Figures 5-12 and 5-13). Deep deposits of fill and/or redeposited topsoils and subsoils were present in all the trenches extending between 155 and 260 cmbs (5 to 8.5 ft). In most cases the fill deposits extended to the base of the trenches and vertical APE, though these deposits overlay intact sediments consisting of peat mat and/or A, B and C horizon soils in three of the trenches (see Figures 5-7 through 5-10, 5-12). The intact soils were confined to the trenches in the westernmost portion of the Project area where the pipeline route trends in a north-south direction between Richmond Terrace road to the south and STA 293+00 (see Figures 5-1 and 5-12). The intact sediments slope downward to the north towards the Kill Van Kull shoreline and transition into increasingly thick peat deposits indicating that this portion of the Project area spans the boundary between what was a former land surface and salt marsh (see Figure 5-12).

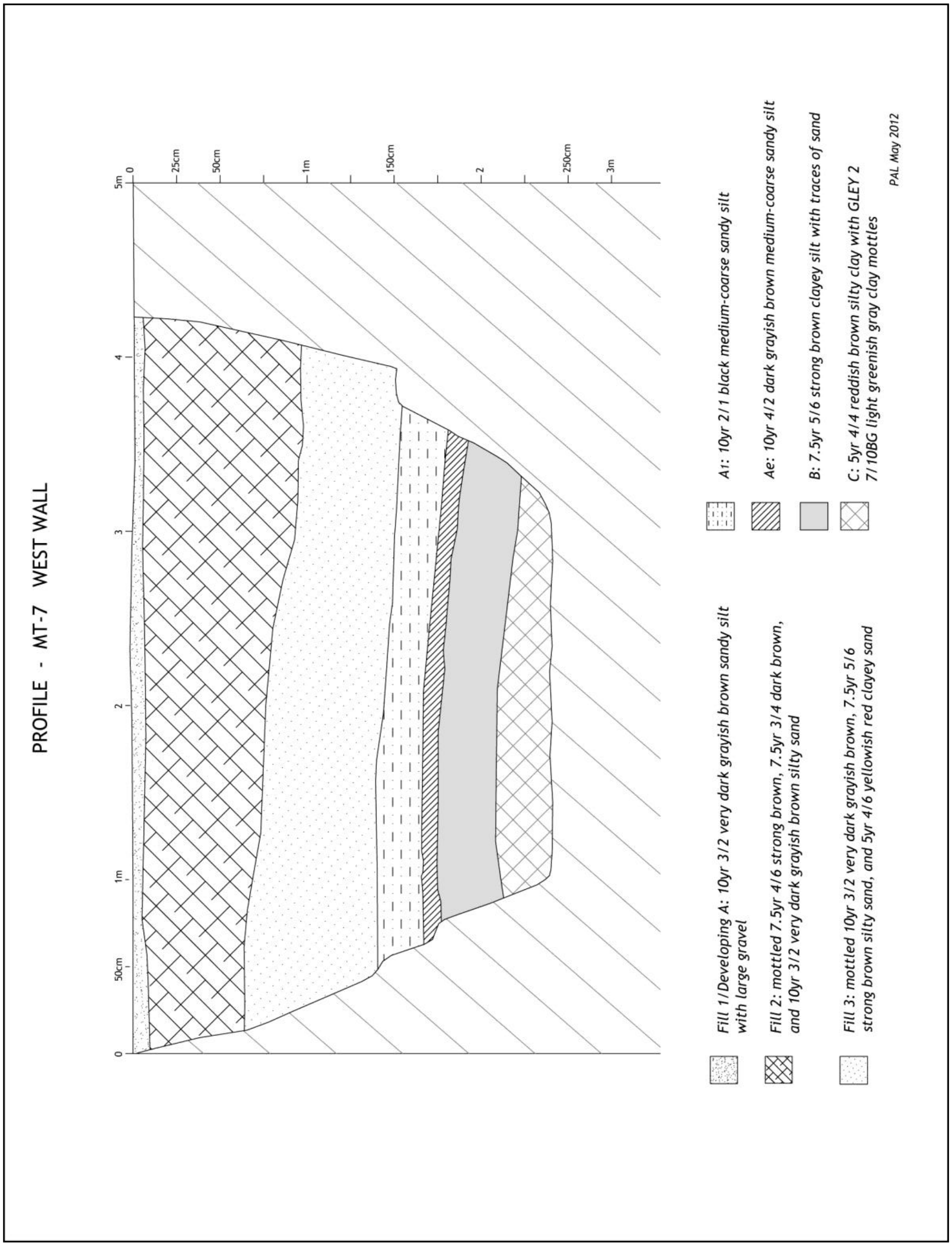

Figure 5-10. MT-7 (RCH-6-ARC/MT-1), west wall profile.

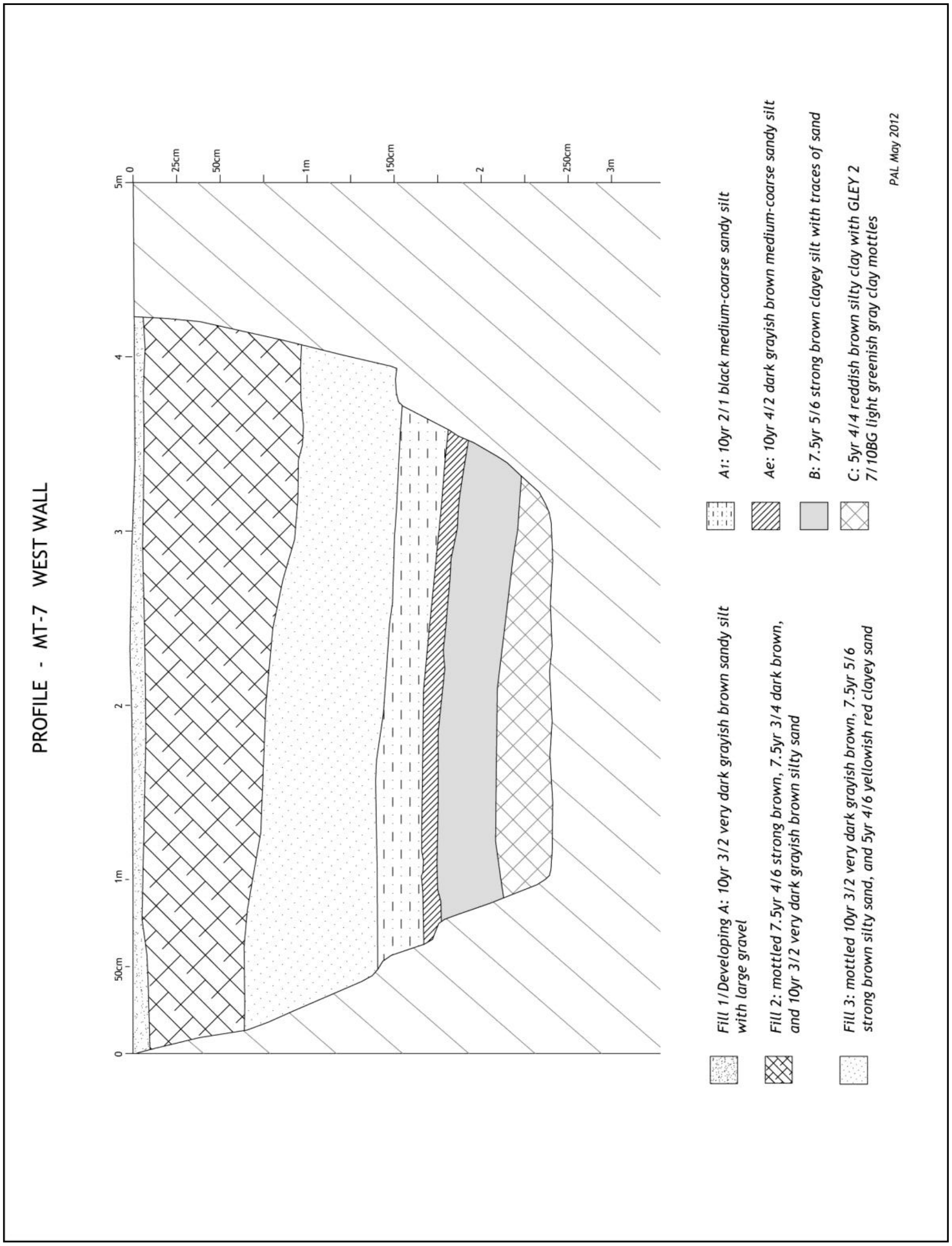

Figure 5-11. MT-8 (RCH-6-ARC/MT-5), north wall profile.

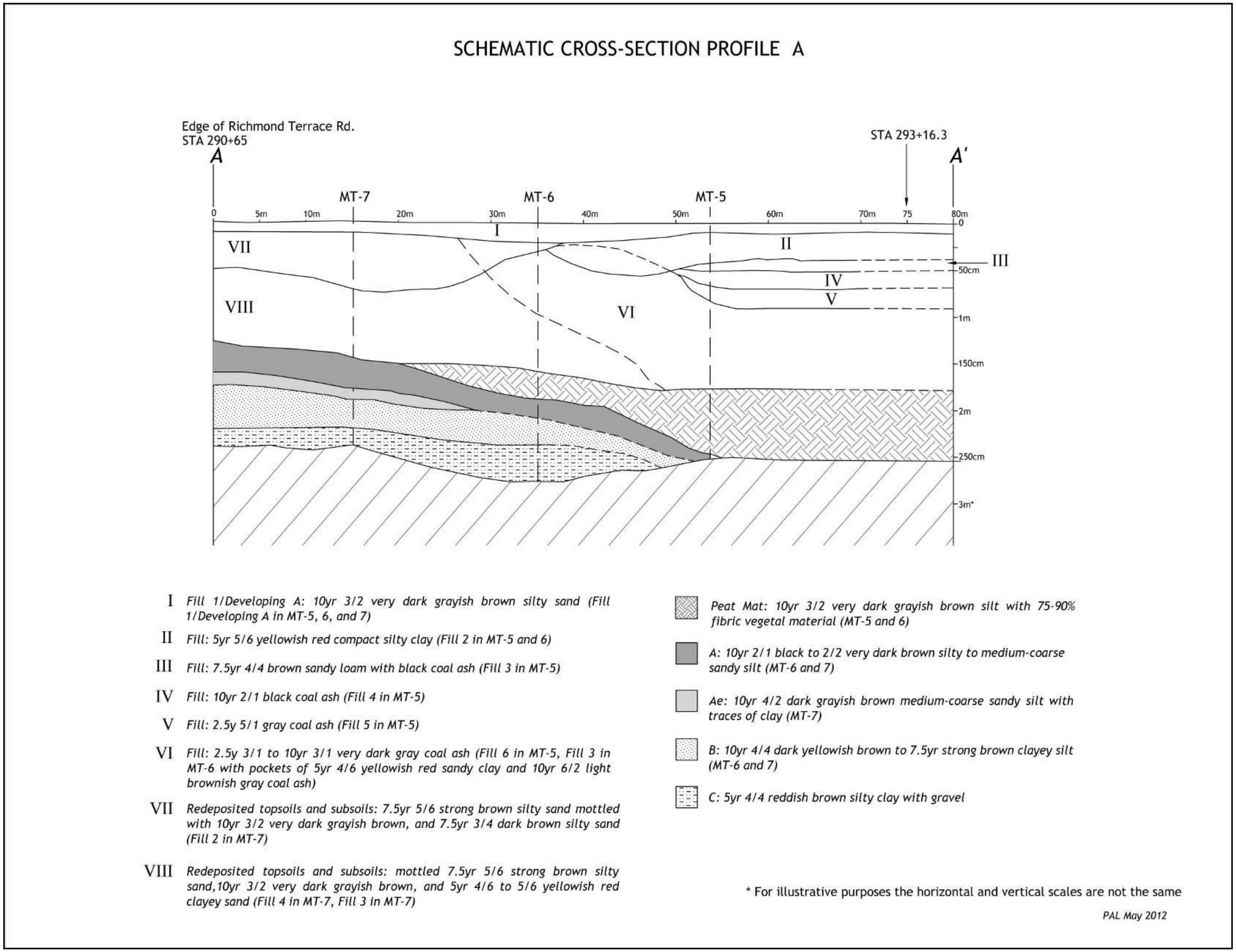

Figure 5-12. Cross-section profile A, NYC EDC Project area.

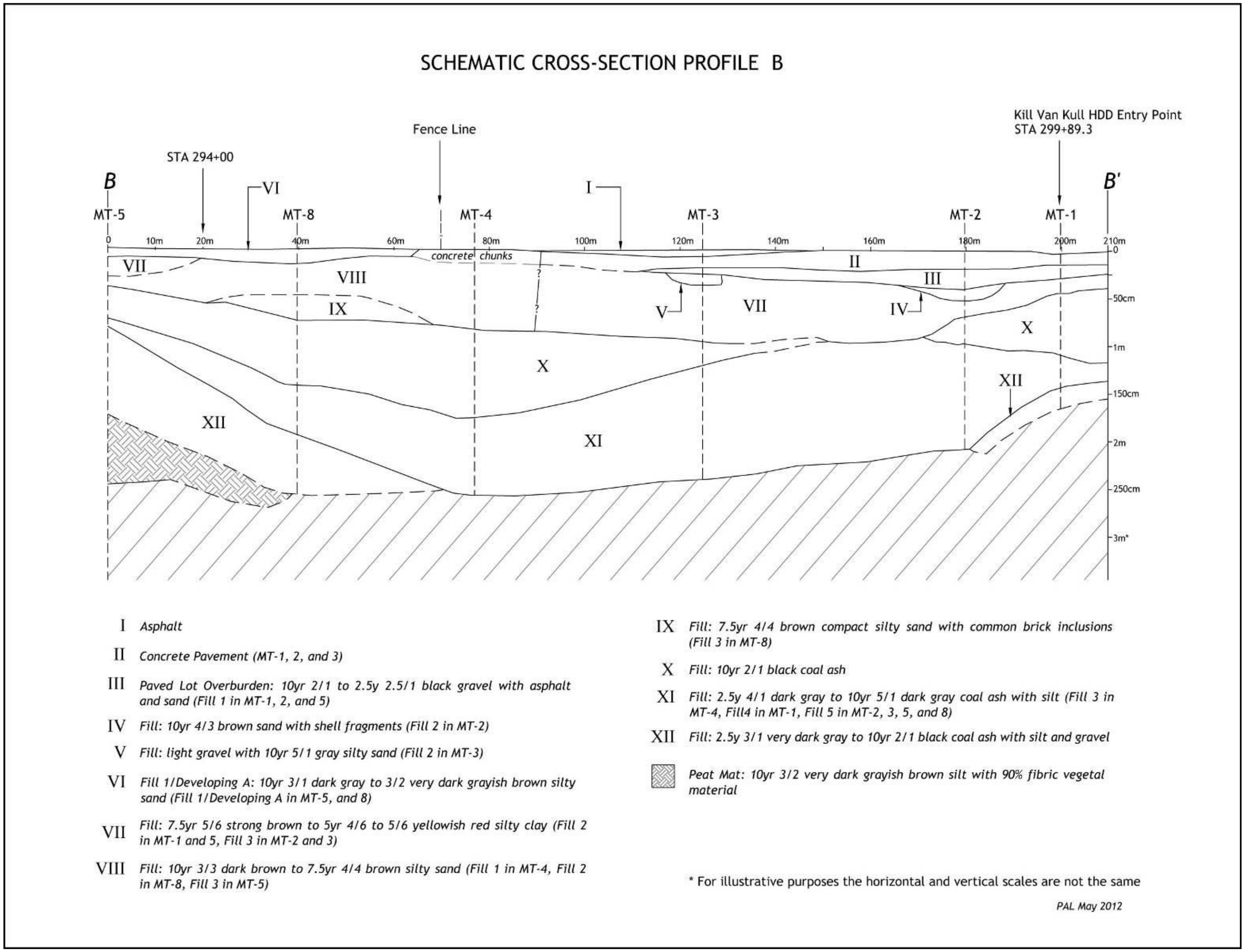

Figure 5-13. Cross-section profile B, NYC EDC Project area.

The upper fill deposits in the trenches varied horizontally exhibiting three main patterns. At the southwestern-most end of the Project area (see Figure 5-1), fill deposits consisted of redeposited topsoils and subsoils that directly overlay the intact soils (see Figure 5-12: Strata VII and VIII). The upper fill deposits in the portion of the Project area containing MT-4, 5 and 8 (see Figure 5-2) were comprised of brown sandy materials (see Figure 5-12: Stratum III; Figure 5-13: Stratum VIII). The presence of concrete chunks in the uppermost portion of this fill in MT-4 indicates that the concrete paving to the east continues west under the asphalt pile.

The upper fill deposits in the eastern portion of the Project area containing MT-1, 2 and 3 were generally characterized by a gravel and asphalt deposit (see Figure 5-13: Stratum III) overlying a reddish compact silty clay deposit (see Figure 5-13: Stratum VII). The gravelly deposit just under the concrete paving present in this area likely represents a surface preparation for paving the lot in this area. A similar material was also observed within MT-5 at the western end of the Project area overlying the above noted sandy fill deposit near the location of rail spurs in the former Milliken/Downey complex (see Figure 5-12: Stratum II; Figure 5-13: Stratum VII).

In contrast, the deeper fill layers did not vary across the Project area. These consisted of coal ash deposits that were present in all the trenches except MT-7 located closest to Richmond Terrace road (see Figure 5-12: Strata IV, V, and VI; Figure 5-13: Strata X, XI, and XII).

Cultural Materials

Both pre- and post-contact cultural materials were found during trenching, as well as features that appeared to be structural in nature. No human remains or evidence of burials were encountered during the Phase IB machine trench excavations. Pre-contact materials were identified in two of the eight machine trenches, and post-contact materials were identified in all trenches excavated during the Phase IB investigations.

Structural Remains

The first structural feature consists of a reinforced concrete footing located along the north wall near the western end of MT-4 (see Figure 5-6; Photograph 5-1). The footing continued west beyond the north wall of MT-4 and canted downward in a northward direction suggesting that it has been displaced. MT-4 was located near the former footprint of the documented traveling crane and what appears to be a drilling shed associated with the Milliken/Downey complex (see Figure 4-4). Though likely displaced when these structures were razed, the concrete footing may be associated with one of these former structures.

A second concrete footing or pad was also located just north of MT-6 (see Figure 5-1; Photograph 5-2). It had an irregular round appearance, and may represent the remnants of a footing for a siding or platform associated with rail spurs in this area of the former Milliken/Downey complex (see Figure 4-4). The remains of an above-ground concrete wall are also present between MT-5 and MT-8 just east of the existing IMTT pipeline corridor (see Figures 5-1, 5-2, and Photograph 3-3). The wall is extremely overgrown and obscured by vegetation with only the uppermost aspect clearly visible. The wall remains most likely represent the western wall of the documented erecting building associated with the former Milliken/Downey complex.

Pre-Contact Materials

Finds of pre-contact cultural materials were limited to trenches MT-6 and MT-7. Pre-contact artifacts consist of 10 pieces of debitage and a chert biface fragment (Appendix B). Debitage raw material types include flakes of chert (N=6), and one flake each of quartz, siltstone, jasper and hornfels. All of the pre-contact artifacts were recovered from disturbed fill contexts consisting of redeposited topsoils and subsoils that also contained post-contact materials (see Appendix B). The redeposited soils could be locally derived, and could be associated with the nearby Bowman's Brook (NYSM 4594, 7321) and/or Bowman's Brook North (NY SHPO A085-01-2364) sites. However, the disturbed contexts from which the artifacts were found make any such associations hypothetical at best. No pre-contact artifacts were recovered from any of the intact sediments (peat mat, A, B and C horizon soils) identified in MT-5 through MT-8.

Photograph 5-1. Concrete footing with rebar located along north wall of MT-4, view north.

Photograph 5-2. Concrete footing/pad on surface just north of MT-6.

Post-Contact Materials

Post-contact materials were present in all trenches excavated during the Phase IB investigations. Post-contact material types included ceramics, glass, metal, brick, shell, animal bone, wood, coal and coal by-products, building materials, as well as more recent modern debris such as plastic and asphalt. For most trenches, materials were photographed and underwent detailed documentation in the field prior to discard due to 1) known hazardous contaminants present the fill deposits, and 2) a recognizable lack of archaeological sensitivity and meaningful stratigraphic context. The exceptions were MT-6 and MT-7 where potentially intact soil strata were initially identified, but were later determined to be redeposited soils. The following discussion provides a summary of the post-contact materials by stratigraphic association.

As noted above, the upper fill deposits above the deeper coal ash deposits in the eastern portion of the Project area (MT-1 through MT-3) consisted of a gravelly parking lot overburden (Figure 5-13: Stratum III), a reddish silty clay deposit (Figure 5-13: Stratum VII), as well as a brown sandy deposit with shell unique to MT-2 (Figure 5-13: Stratum IV) and a deposit of large gravel unique to MT-3 (Figure 5-13: Stratum V). Materials from the gravelly parking lot overburden included pieces of asphalt, concrete, metal wire, a piece of galvanized metal, a wood stake and wood chunk, fragments from a terra cotta flower pot, plastic, brick, flat and bottle glass, ceramic sherds (porcelain, whiteware), and a metal bar. The ceramics included transfer-print and gilt-edge whiteware, and a whiteware plate fragment with a maker's mark of "Grindley Hote.., Vitr…o, Shandon".

The brown sandy fill unique to MT-2 contained blue transfer-print whiteware, glass and razor clam shell fragments, while the deposit of large gravel unique to MT-3 contained whiteware ceramic sherds, wood chunks, rubber, flat metal, brick, plywood, a bolt and a plastic bottle. The underlying compact silty clay fill in MT-1 through 3 contained thick curved glass, a builder's block fragment, brick, rope, shell, coal, aluminum sheet metal, a metal spike and bolt, glass, plastic, a chunk of lead, other metal scrap, and a ceramic sewer pipe fragment. Types of glass included depression-era tableware, window glass, cobalt glass, and bottle glass. A reddish compact silty clay deposit was also noted in MT-5 and MT-6 in the western portion of the Project area that is highly similar to that seen in MT-1 through 3 (Figure 5-12: Stratum II; Figure 5-13: StratumVII). Finds from this deposit in MT-5 and MT-6 include bottle, jar and plate glass, a fragment of a composite material sign with fluorescent orange paint, asphalt, slag, shell, miscellaneous metal scrap, pieces of concrete, mortar, and whiteware ceramic sherds. The reddish silty clay deposit was notable for the rarity or total absence of ceramics relative to the other fill deposits.

In the central and part of the western portion of the Project area (MTs 4, 5, and 8) the upper fill deposits above the coal ash consisted of a brown sandy fill (Figure 5-12: Stratum III; Figure 5-13: Strata VIII). Underlying this fill stratum in MT-8 was a second brown sandy fill (Figure 5-13: Stratum IX) unique to MT-8 that was distinguishable only from the overlying fill deposit by its extremely compact nature and high frequency of brick fragments. The upper brown sandy fill in MTs 4, 5 and 8 contained plastic wrappers, a plastic soda bottle and cap, a piece of electrical conduit, corkscrewed wire, aluminum scrap metal with plastic attached, bottle glass, brick, chunks of wood, wire, bedspring, a rubber belt, a ball clay smoking pipe heel and stem fragments, a bracket of an unidentified composite material, shell, asphalt, a ceramic sewer pipe fragment, an octagonal bath tile, wood chunks, ribbed plate glass, rubber conduit sheathing/hose, a metal spoon, and ceramic sherds (whiteware, stoneware, and yelloware). The compact brown sandy fill with brick in MT-8 (Figure 5-13; Stratum IX) included pieces of a clear plastic wrapper, a blue plastic fragment, bottle glass, aqua glass insulator fragments, window glass, ribbed plate glass, fire brick as well as numerous other brick fragments, fragments of a porcelain electrical insulator and tableware, and plain and blue transfer-print whiteware ceramic sherds.

The uppermost Fill1/developing A deposits in MT-8 (Figure 5-13: StratumVI) contained plastic, styrofoam, a square carbon composite electrical insulator, plate glass, a metal chain and other metal scrap, whiteware ceramic sherds and mortar. The uppermost Fill1/developing A deposit in MT-5 through MT-7 (Figure 5-12; Stratum I) contained concrete chunks, whiteware ceramic sherds, plastic, glass, brick, metal scrap, plate glass, shell, and coal.

The deeper coal ash deposits were nearly ubiquitous across the Project area absent only from MT-7 (Figure 5-12; Strata IV, V and VI; Figure 5-13; Strata x, XI and XII). The coal ash strata contained a relatively higher frequency of post-contact materials relative to the other strata observed at the site. Materials contained within the coal ash strata included plastic wrappers, a plastic red tail light fragment, plastic comb and other plastic fragments, a car battery anode, rubber, shell (including clam and oyster), cut/sawn large mammal bone (c.f. cattle and pig), Belgian blocks, concrete chunks, brick and fire brick, ceramic sherds, glass bottles, jars and vials, a cobalt glass inkwell, window glass, plate glass, depression era glass tablewares and vase, glass beer steins and goblet, glass insulator fragments, wooden boards and plywood, a wooden handle and lid, a wooden furniture leg, a wooden dowel and thread spool, metal, numerous shoes (slippers and lace-up uppers), pieces of leather and tack, wallpaper, cloth, fabric hat, and stone grinding wheel fragment.

Ceramic sherds in the coal ash deposits included ball clay smoking pipe fragments, marbles, utility pipe fragments, porcelain electrical and bath fixture fragments, porcelain tile, whiteware (plain, painted, transfer-print, flow-blue, gilt-edged), porcelain, ironstone, yellowware, earthenware, stoneware crock and tea pot fragments, and terra cotta flower pot fragments. The glass bottles included numerous liquor, beer, medicine and condiment bottles the bulk of which date to the late nineteenth and early to mid-twentieth centuries. A handful of dark olive wine bottles with pontil bases were also present. Numerous bottle necks were also present that included applied lip, screw-top and blob top varieties. Objects of metal included a coil, rods, rebar, aluminum can fragments, wire, an electrical connector/lead, a baby carriage or small cart wheel, barrel hoops, a pipe, blue and white enameled strips, wire mesh, slag, a shelf part, a lid, machine parts, bedsprings, cook stove parts, a pot, a blue and white enameled cup, an aluminum ladle, and miscellaneous pieces of unidentifiable scrap.

The redeposited topsoils and subsoils in MT-6 and MT-7 (Figure 5-12; Strata VII and VIII) contained plastic lighting fixture fragments, styrofoam, coal, window and bottle/jar glass, ceramic tableware fragments, a ball clay smoking pipe bowl fragment and nails (wire and unidentified) (Appendix B). The ceramics ranged in date from the late eighteenth- through twentieth-centuries and included yellowware, whiteware (transfer-print and Mocha varieties), American Albany slip stoneware, creamware, ironstone, pearlware, porcelain, and redware. Post-contact materials were also recovered from the buried A horizon underlying the redeposited topsoils and subsoils that included two clinkers and a piece of transfer-print whiteware (see Appendix B).

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Both pre-contact Native American and post-contact EuroAmerican cultural materials were encountered in trenches during the Phase IB machine-assisted deep testing on the NYCEDC Project area. The vast majority of the materials were associated with fill contexts that are not considered to be archaeologically sensitive. None of the pre-contact materials were recovered from intact sediments. The pre-contact items consisting of 10 pieces of debitage and a chert biface fragment were collected together with post-contact materials from mixed, redeposited soils in MT-6 and MT-7 at the western end of the Project area. The biface fragment and debitage could be associated with the nearby Bowman's Brook and Bowman's Brook North sites, but the lack of contextual integrity makes any such association speculative at best. The intact soils in one trench (MT-7) did contain post-contact materials limited to two clinkers and a sherd of whiteware. No human remains or evidence of burials was encountered during the Phase IB investigations.

In addition to the documented finds of cultural materials from the trenches, structural remains were also noted in the Project area consisting of concrete footings/pads, and concrete wall remains likely representing the west wall of the erecting shop associated with the former Milliken/Downey complex (see Figures 4-4, 4-7, 5-1, and 5-2). These structural remains had been previously determined to be ineligible for listing in the National Register (Flagg 1991a, 1991b; Kearns et al. 1991).

Trench profiles revealed contrasting patterning of stratigraphic deposits in the Project area. The western end of the Project area (containing MT-5 through 7) contained fill and/or redeposited topsoils and subsoils ranging from 155 to 180 cm (ca. 5 to 6 ft) that directly overlay buried A and B soil horizons (see Figure 5-12). In contrast, the eastern portion of the Project area (containing trenches MT-1 through 4, and MT-8) exclusively contained deep fill deposits consisting of variable upper fill strata overlying thick deposits of coal ash (see Figure 5-13) that extended as deep as 260 cm (ca. 8.5 ft) beyond the vertical limits of the APE. The coal ash deposits were also present in MT-5 and MT-6 at the western end of the Project area overlying intact sediments, but were comparatively less thick.

Examination of the Project area stratigraphy initially suggested that the coal ash deposits in the eastern portion were laid down to fill in the low-lying landscape, while the upper fill strata or mixed soil deposits generally appeared to correspond to portions of the former Milliken/Downey complex that were either open or contained structures. However, the presence of more recent material such as the plastic and plywood intermixed with the earlier late-nineteenth to early- to mid-twentieth century items in all of the fill deposits including all of the deeper coal ash deposits indicates these soils were deposited in the Project area during the mid-to late- twentieth century after the construction and abandonment of the former industrial complex. The fill strata may be related to the removal and razing of the complex and grading/filling for NYCDOT uses that based on examination of historic aerial photographs had occurred by 1951 (see Figure 4-8). As such, none of the fill deposits or redeposited topsoils and subsoils are considered to have any meaningful archaeological or stratigraphic contextual integrity. Intact sediments (A and B soil horizons) were identified in the western portion of the Project area that contained a small amount of post-contact cultural material. The two clinkers and piece of whiteware recovered from the intact A soils have limited informational value, and could be associated with one or more of the documented EuroAmerican farmsteads that lined Richmond Terrace road.

Recommendations

The pre-contact lithic and post-contact cultural materials found in twentieth-century fill and mixed soils lack meaningful archaeological or stratigraphic contextual integrity. The low density of post-contact materials from the deeply buried A horizon in MT-7 may be associated with former nineteenth-century residences along Richmond

Terrace; however, these materials have limited informational value and only attest to a nineteenth-century presence in the area. They were not found in association with any structural remains or features. As such, the identified cultural deposits are not recommended as significant, National Register-eligible archaeological resources and no further investigations are recommended for the NYCEDC Project area.

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APPENDIX A

CORRESPONDENCE

NEW YORK STATE · OFFICE OF PARKS · RECREATION · HISTORIC PRESERVATION

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

January 5, 2012

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

Re: FERC
Response to Geoarchaeological Soil Borings - Report #3
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 and Proposed Phase IB Archaeological Surveys, Report #3, New Jersey-New York Expansion Project, Staten Island, New York,*", dated December 21, 2011. Based on our review of this document, NY-SHPO concurs with the Phase 1B testing recommendations presented in the report.

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

Douglas P. Mackey
Historic Preservation Program Analyst
Archaeology

Cc: Amanda Sutphin, NYCLPC

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Andrew M. Cuomo
Governor

Rose Harvey
Commissioner

April 20, 2012

Suzanne Cherau
Public Archaeology Laboratory
210 Lonsdale Ave
Pawtucket, Rhode Isla 02860

Re: FERC
Response to Unatnicipated Discovery Plan and
Data Recover Plan for the Old Place Neck Site
Texas Eastern NJ-NY Expansion Project
Richmond and New York Counties, NY
09PR05949

Dear Ms. Cherau:

Thank you for seeking the comments of the New York State Historic Preservation Office (NYSHPO) with regard to the submitted documents. After review SHPO can concur with the Unanticipated Discovery Plan, however we have a few concerns regarding the Data Recovery Plan that we recommend be addressed:

1. **Curation.** The document indicates that no advance effort to identify a permanent home for the collection will be made until the work is completed. SHPO recommends that you make inquiries and establish where the collection will go as soon as possible. This action has two important effects on the project. It insures that a reputable facility is prepared to take the collection before you proceed, addressing the issue of collections not being placed in a facility for extended periods. Also, many facilities have specific cataloging/accessioning procedures that need to be completed before they accept a collection. If you are able to utilize these measures and incorporate them into your cleaning/cataloging efforts, it will remove the need to reprocess the collection before it can be curated and reduce the overall cost of the project.

2. **Public Dissemination of Results.** SHPO encourages looking toward internet distribution of the results. While brochures and pamphlets have served this purpose for years, and still play an important role, their distribution is limited to the number printed and we have often found that after a few years the information is no longer in wide circulation. In contrast, creating internet accessible formats can allow the results to be distributed to a much wider audience at any particular time, and allow the information to be printable by anyone interested in having paper copies if it is prepared in the proper formats. Material can be also prepared in non-static formats (videos) that can provide a more intimate experience of the site for the audience. Therefore, SHPO encourages you to consider this

potential and to insure that efforts to capture usable data are utilized during excavation (i.e. video footage, crew interviews etc.).

3. **Reporting.** As written, the document indicates that our office and LPC will each receive 4 printed copies (2 bound and one unbound – which makes only 3 copies) as well as a PDF copy on CD. We recommend that multiple copies be prepared on CD as many libraries would rather receive digital formats of such reports. Therefore, SHPO recommends that 5 copies of the report be provided in CD format.

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

Douglas P. Mackey
Historic Preservation Program Analyst
Archaeology

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

Amanda Sutphin 1/12/2012

SIGNATURE DATE
Amanda Sutphin, Director of Archaeology

File Name: 26346_FSO_ALS_01112012.doc

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ARCHAEOLOGY

Project number: FEDERAL ENERGY REGULATORY COMM / 106-Y
Project: NJ/NY EXPANSION PROJECT GAS PIPELINE (SPECTRA)
Date received: 3/21/2012

Comments:

The LPC is in receipt of the, "Procedures Guiding the Discovery of Unanticipated Historic Properties and Human Remains: Post-Review Discoveries (36 CFR 800.13)," prepared by PAL, Inc and dated March 16, 2012. The LPC notes that the changes LPC requested have been made and concurs with the revised document.

The LPC is also in receipt of the, "Old Place Neck Site Phase III Archaeological Data Recovery Proposal OPRHP #09PR05949; FERC Docket #CP11-56-000," prepared by PAL and dated March 16, 2012. The LPC concurs with the proposal and notes that it includes suggestions for public outreach but that such methodology will be determined after this phase of work is completed.

Cc: NYSHPO

Amanda Sutphin

3/29/2012

SIGNATURE DATE
Amanda Sutphin, Director of Archaeology

File Name: 26346_FSO_ALS_03292012.doc

APPENDIX B

ARTIFACT CATALOG

Appendix B. Catalog of Cultural Materials, NJ-NY Expansion 2012, Phase Ib Machine Trenching.

Provenience	Material	Object	Size	Attributes	Color(s)	Manufacture Date	Makers Mark	Count
Non-Site, NYC EDC Project Area								
MT-06 12-180, Fill 4	Bone	Mammal		Fragment Cut	Green		☐	1
	Chert	Chipping Debris Flake	0-1cm	Complete	Dk Gray		☐	1
	Coal	Coal					☐	1
	Glass	Curved Glass		Fragment	Aqua Tint		☐	1
	Jasper	Chipping Debris Flake	1-3cm	Complete	Brown		☐	1
	Quartz	Chipping Debris Flake	1-3cm	Complete	White		☐	1
	Siltstone	Chipping Debris Flake	1-3cm	Complete	Dk Gray		☐	1
	Yellowware	Ceramic Sherd		Fragment		1830 1940	☐	1
MT-07 0-10, Fill 1/Dev. A	Coal	Coal					☐	1
	Glass	Curved Glass		Fragment	Clear		☐	3
	Shell	Bivalve Hard Clam		Fragment			☐	1
MT-07 140-181, Buried A	Clinker	Clinker/Coke					☐	2
	Whiteware Transfer Print	Ceramic Sherd		Fragment	Blue	1820 Present	☐	1
MT-07 64-155, Fill 3	American Stoneware Albany Slip	Ceramic Sherd		Fragment	Brown, Gray	1805 1920	☐	2
	Ball Clay	Smoking Pipe		Bowl Fragment			☐	1
	Chert	Biface	1.58x0.67x0.53	Fragment	Dk Gray		☐	1
	Chert	Chipping Debris Flake	1-3cm	Complete	Dk Gray		☐	5
	Coal	Coal					☐	6
	Coarse Earthenware	Brick		Fragment	Red		☐	4
	Creamware	Ceramic Sherd		Fragment		1762 1820	☐	1
	Glass	Flat Glass Window Glass		Fragment	Aqua Tint		☐	17
	Glass	Curved Glass		Fragment	Clear		☐	4
	Hornfels	Chipping Debris Flake	1-3cm	Complete	Dk Gray, Speckled, White		☐	1
	Iron	Nail Unidentified Nail		Fragment			☐	2
	Ironstone	Holloware		Rim/Body		1840 Present	☐	1
	Molded Glass	Miscellaneous Household		Fragment	Clear		☐	1
	Pearlware	Ceramic Sherd		Fragment		1779 1830	☐	3
	Pearlware	Ceramic Sherd		Base		1779 1830	☐	2
	Pearlware	Ceramic Sherd		Rim	Blue	1779 1830	☐	1
	Pearlware	Ceramic Sherd		Fragment		1779 1830	☐	1

Appendix B. Catalog of Cultural Materials, NJ-NY Expansion 2012, Phase Ib Machine Trenching.

Provenience	Material	Object	Size	Attributes	Color(s)	Manufacture Date	Makers Mark	Count
Non-Site, NYC EDC Project Area								
MT-07 64-155, Fill 3	Pearlware Molded Rim	Flatware		Rim	Blue	1820 1835	☐	1
	Pearlware Shell-Edged Rim	Flatware		Rim	Blue	1780 1835	☐	1
	Porcelain	Ceramic Sherd		Fragment			☐	1
	Redware	Flower Pot		Base		1600 Present	☐	1
	Redware	Ceramic Sherd		Fragment		1600 Present	☐	1
	Redware Lead Glaze	Ceramic Sherd		Fragment	Brown	1600 Present	☐	3
	Shell	Bivalve Oyster		Fragment			☐	1
	Whiteware	Holloware		Body		1820 Present	☐	1
	Whiteware	Ceramic Sherd		Fragment		1820 Present	☐	9
	Whiteware	Ceramic Sherd		Base		1820 Present	☐	3
	Whiteware	Ceramic Sherd		Rim		1820 Present	☐	1
	Whiteware Annular	Holloware		Body	Blue	1830 1962	☐	1
	Whiteware Mocha	Ceramic Sherd		Fragment	Brown, Yellow	1820 1900	☐	2
	Whiteware Transfer Print	Ceramic Sherd		Fragment	Black	1820 Present	☐	1
	Whiteware Transfer Print	Flatware		Rim	Blue	1820 Present	☐	1
	Whiteware Transfer Print	Holloware		Body	Blue	1820 Present	☐	1
	Yellowware Mocha	Ceramic Sherd		Fragment	Blue, White, Yellow	1830 1940	☐	3
MT-07 6-96, Fill 2	Coarse Earthenware	Utility Pipe		Fragment	Red		☐	1
	Glass	Flat Glass		Fragment	Black		☐	1
	Glass	Curved Glass		Fragment	White		☐	1
	Glass	Flat Glass Window Glass		Fragment	Aqua Tint		☐	1
	Glass	Bottle/Jar		Base	Clear		☐	1
	Glass	Bottle/Jar		Fragment	Brown		☐	1
	Glass	Curved Glass		Fragment	Clear		☐	1
	Iron	Unidentified		Fragment			☐	1
	Iron	Nail Wire Nail		Complete		1890 Present	☐	1
	Pearlware Transfer Print, Underglaze Blue	Holloware		Base	Blue	1783 1830	☐	1
	Plastic	Lighting Fixture		Fragment	Orange		☐	2
	Porcelain	Insulator		Fragment	Brown		☐	1
	Shell	Bivalve Oyster		Fragment			☐	19

Appendix B. Catalog of Cultural Materials, NJ-NY Expansion 2012, Phase Ib Machine Trenching.

Provenience	Material	Object	Size	Attributes	Color(s)	Manufacture Date	Makers Mark	Count
Non-Site, NYC EDC Project Area								
MT-07 6-96, Fill 2	Styrofoam	Unidentified		Fragment	Brown		☐	1
	Whiteware	Ceramic Sherd		Rim		1820 Present	☐	2
	Whiteware	Ceramic Sherd		Fragment		1820 Present	☐	2
	Whiteware	Holloware		Base		1820 Present	☐	2
	Whiteware Flowing Colors	Ceramic Sherd		Rim	Blue	1845 1920	☐	1
	Whiteware Transfer Print	Holloware		Rim	Blue	1820 Present	☐	1
	Yellowware Mocha	Holloware		Body	Blue, Brown	1830 1940	☐	1
							Total:	**143**