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**A STAGE 1A ARCHAEOLOGICAL SURVEY**

**for the**

**KEYSPAN JAMAICA BAY GAS TRANSMISSION PROJECT**

**BOROUGHs of BROOKLYN and QUEENS, NEW YORK CITY**

**KINGS and QUEENS COUNTY, NEW YORK**

**PROJECT ARCHAEOLOGISTS:**

**David J. Bernstein, Ph.D.  
Daria E. Merwin, M.A., R.P.A.**

**The Institute for Long Island Archaeology  
Department of Anthropology  
State University of New York at Stony Brook  
Stony Brook, New York 11794-4364**

**March 2008  
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1142

## MANAGEMENT SUMMARY

<b>SHPO Project Review Number</b>	N/A
<b>Involved State and Federal Agencies</b>	N/A
<b>Phase of Survey</b>	Stage 1A; literature search and archaeological sensitivity assessment.
<b>Location</b>	Location: mostly along Flatbush Avenue, Brooklyn Minor Civil Divisions: 04701 and 08101 County: Kings (Borough of Brooklyn) and Queens
<b>Survey Area</b>	Two phases of proposed work: Phase I consists of a gas pipeline across Rockaway Inlet, from the west side of Flatbush Avenue opposite Floyd Bennett Drive to the intersection of State Road and Beach 169 <sup>th</sup> Street in Jacob Riis Park, a distance of approximately 5800 feet (1768 meters). Phase II involves the construction of a gas pipeline from the northern terminus of Phase I along the west side of Flatbush Avenue to Avenue U, approximately 13,400 feet (4084 meters).
<b>USGS 7.5 minute Quadrangle Maps</b>	<i>Coney Island, New York-New Jersey</i> (1966/1979)
<b>Recommendation</b>	A Stage 1B archaeological survey is recommended for relatively undisturbed portions of the project area along Flatbush Avenue. It is estimated that approximately 30 to 45 shovel test pits will be required for the subsurface survey. In addition, it is recommended that an archaeologist review the marine remote sensing data collected by Ocean Surveys Inc. for the portion of the gas pipeline route in Rockaway Inlet due to the potential for shipwrecks.
<b>Report Authors</b>	David J. Bernstein, Ph.D. Daria E. Merwin, M.A., R.P.A.
<b>Date of Report</b>	March 2008, revised February 2009

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## INTRODUCTION

This report presents the results of a Stage 1A archaeological survey (literature search and sensitivity assessment) for the proposed KeySpan Jamaica Bay gas transmission project, located in the New York City Boroughs of Brooklyn (Kings County) and Queens, New York (Minor Civil Divisions [MCDs] 04701 and 08101; Figures 1 and 2). The survey was conducted by the Institute for Long Island Archaeology at Stony Brook University in March 2008.

The KeySpan Corporation is proposing to install a new gas transmission line near southwest Jamaica Bay in two phases (Figure 3). Phase I consists of two parallel gas mains (12 and 26 inch diameter) to be installed via directional drilling from the west side of Flatbush Avenue opposite Floyd Bennett Drive, across Rockaway Inlet, to the intersection of State Road and Beach 169<sup>th</sup> Street in Jacob Riis Park. Phase II consists of one 26 inch gas main from the northern terminus of Phase I along Flatbush Avenue to Avenue U. The purpose of this study is to determine the archaeological sensitivity of each of the proposed Phases and to provide recommendations for subsurface testing and/or additional archaeological investigations in the Area of Potential Effect (APE).

This survey was conducted in accordance with the guidelines outlined in the *Phase I Archaeological Report Format Requirements* issued by the New York State Historic Preservation Office (2005) and the *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections* issued by the New York Archaeological Council and the New York State Office of Parks, Recreation, and Historic Preservation (1995).

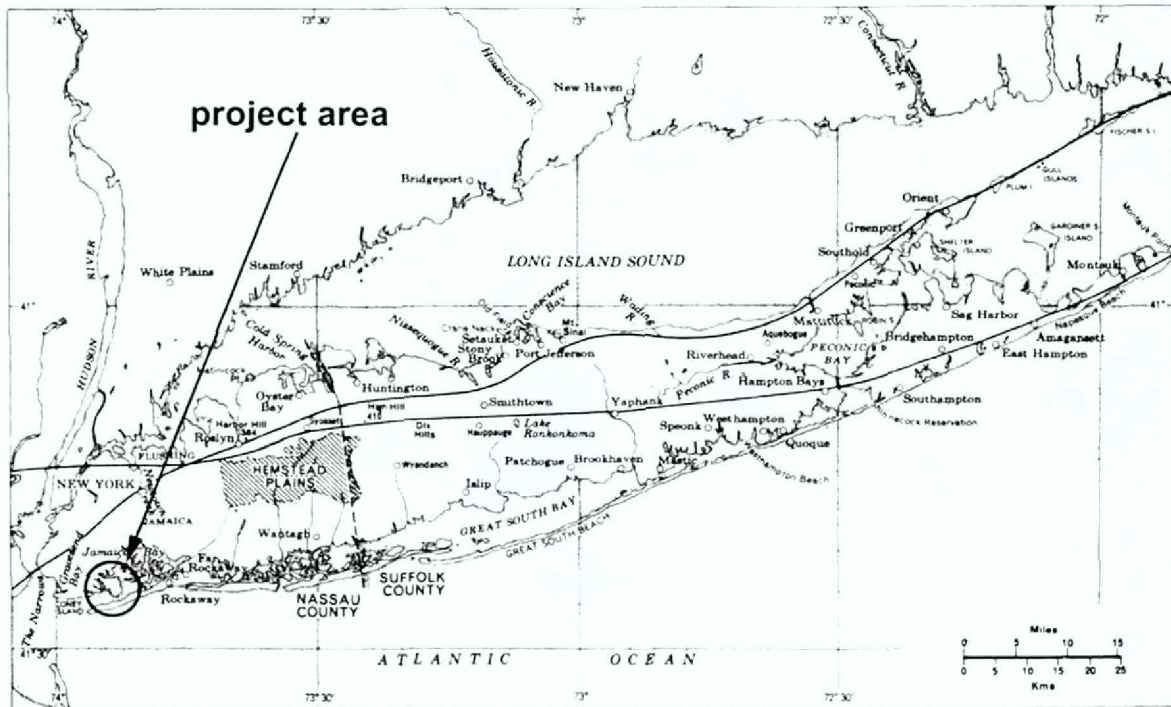


Figure 1. Map of Long Island showing the location of the project area.





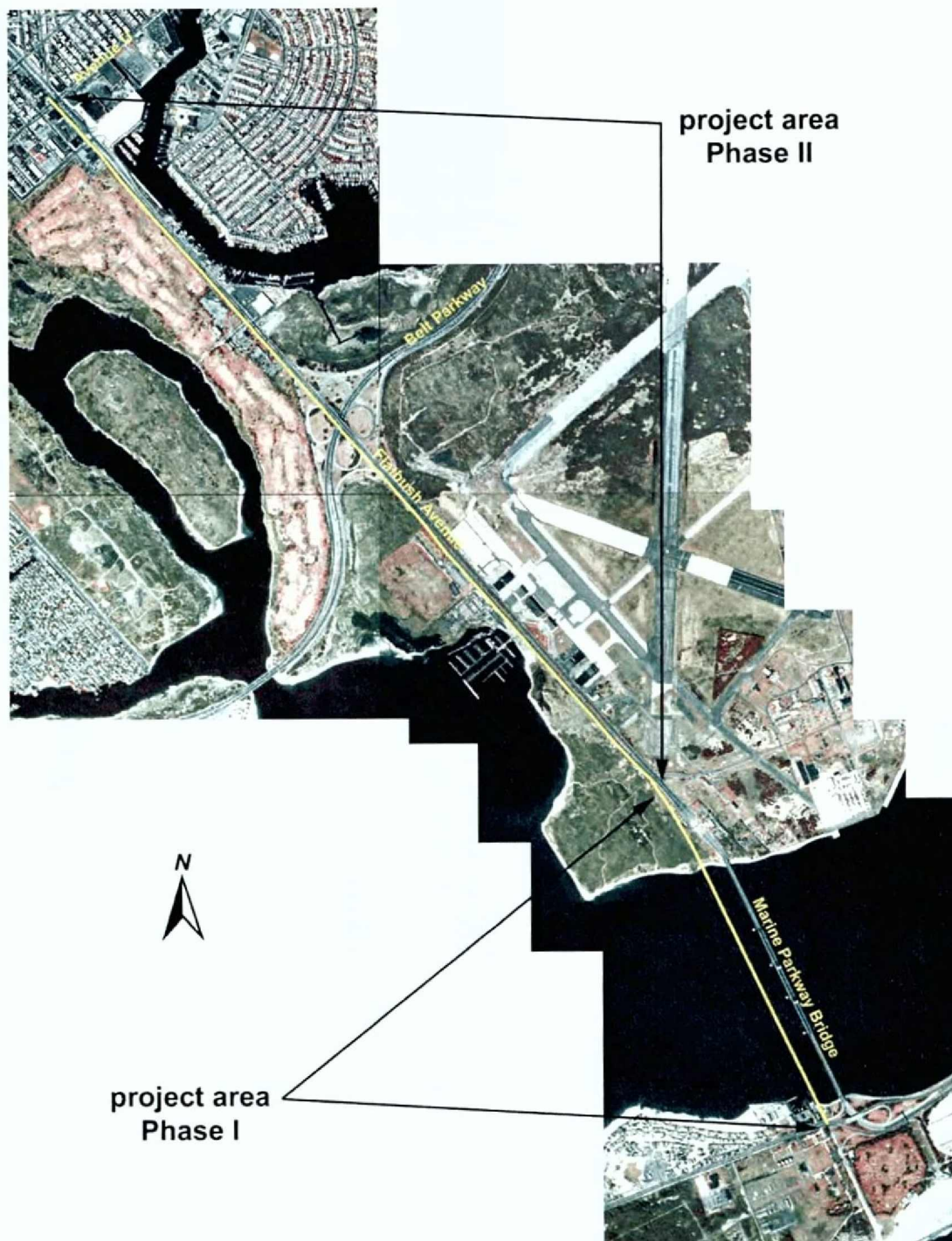


Figure 3. Aerial photograph showing the location of the two proposed phases of the KeySpan Jamaica Bay gas transmission project.

## ARCHAEOLOGICAL LITERATURE SEARCH AND SENSITIVITY ASSESSMENT

### Project Description

The proposed KeySpan Jamaica Bay gas transmission project consists of two phases of work (Figure 3). Phase I consists of two parallel gas mains (12 and 26 inch diameter) to be installed via directional drilling across Rockaway Inlet from the west side of Flatbush Avenue opposite Floyd Bennett Drive to the intersection of State Road and Beach 169<sup>th</sup> Street in Jacob Riis Park, a distance of approximately 5800 feet (1768 meters). The proposed depth beneath the bottom of Rockaway Inlet is approximately 30 feet (9.1 meters). Phase II involves the construction of one 26 inch gas main from the northern terminus of Phase I along the west side of Flatbush Avenue to Avenue U, approximately 13,400 feet (4084 meters). The depth required for the proposed gas main trench along Flatbush Avenue is approximately six feet (1.8 meters).

### Background Research

**Environmental Setting.** The project area is located near the south shore of western Long Island, southwest of Jamaica Bay (Figures 1 and 2). Much of the project area is within and adjacent to the Jamaica Bay Unit of Gateway National Recreation Area, National Park Service, and Mill Island, New York City Parks. The northern terminus of the proposed gas main is at the intersection of Flatbush Avenue and Avenue U, an urban area southeast of the locality of Flatlands. The majority of the terrestrial portion of the project corridor runs along Flatbush Avenue adjacent to open space and recreational facilities (e.g., a golf course and marina) (Figures 2 and 3; Photograph 1).

The project area is situated on the broad sandy Hempstead outwash plain, a landscape feature created more than 15,000 years ago by meltwater runoff from the Wisconsin ice sheet (Sirkin 1996). Topography in the project area is generally relatively level, with an average elevation of 4.6 meters (15 feet) above mean sea level. The nearest modern mapped sources of fresh water consist of streams, including Gerritsen Creek, that empty into Jamaica Bay. There are also tidal wetlands in the vicinity. It is likely that more creeks and streams were located near the project area prior to extensive land filling along Flatbush Avenue and elsewhere on the shores of Jamaica Bay during the twentieth century.

Soils in Brooklyn and Queens have not yet been completely surveyed and mapped, but it appears that the project area is dominated by Bigapple-Fortress complex soils, 0 to 8 percent slopes. There are smaller areas of Pavement and buildings-Flatbush-Riverhead complex, 0 to 8 percent slopes (at the northern terminus), Gravesend and Oldmill coarse sands, 0 to 8 percent slopes, Pavement and buildings, wet substratum, 0 to 5 percent slopes, and Hooksan-Dune land complex, 0 to 25 percent slopes (near Floyd Bennett Field), and Hooksan-Verrazano-Pavement and buildings complex, 0 to 8 percent slopes (at the southern terminus) (New York City Soil Survey 2005). Only the Hooksan series consists of natural sediments, while all of the remaining series are based on sandy fill of anthropogenic origin. Bigapple-Fortress complex soils are found on fill mounds and plains near coastal waterways in New York City. They are deep and well drained, with parent material composed of sandy dredge deposits, usually more than 102 centimeters (40 inches) thick. A typical profile includes a surface layer (A horizon) of dark grayish brown sand to an average depth of eight centimeters (three inches). It is underlain by a leaching zone (E horizon) of brown sand to 20 centimeters (8 inches), followed by the subsoil (B horizon) of yellowish brown stratified sand to 51 centimeters (20 inches) and the parent material (fill, C horizon) of yellow to grayish brown stratified sand to a depth greater than 71 centimeters (28 inches) (New York City Soil Survey 2005:22-23, 29). Bedrock on the southwest shore of Long Island is typically located more than one hundred meters below the ground surface. In addition to filling, other disturbances within and adjacent to the project area consist of cutting and grading associated with road construction and installation of underground utilities (e.g., electrical service to light poles; Photograph 1). As the soil survey indicates, much of the project area has witnessed substantial filling, mostly done in the early twentieth century. The extent of this land filling can be discerned through a comparison of nineteenth century and modern maps (see Historic Maps section, below). Based on a comparison of historic maps and modern topographic surveys, the depth of fill appears to exceed ten feet (three meters) for much of the project area.





Photograph 1. Looking north along Flatbush Avenue near the entrance to Floyd Bennett Field.

**Site File Search.** The files of the New York State Museum (NYSM), and the Office of Parks, Recreation, and Historic Preservation (OPRHP) document four prehistoric Native American and nine historic period Euro-American archaeological site within 1.6 kilometers (one mile) of the project area (Table 1). There are two National Register of Historic Places listed districts adjacent to the project area, the Floyd Bennett Field Historic District (90NR01268) and the Jacob Riis Park Historic District (90NR01579). These districts are described in the Historic Context section, below. In addition, the Marine Parkway Bridge (built in 1936-1937 and also known as the Gil Hodges Bridge; 04701.014797, 08101.007322) has been determined by OPRHP to be National Register eligible.

**Historic Maps.** A survey of nineteenth and early twentieth century maps indicates that the project area along Flatbush Avenue consisted mainly of tidal marsh islands until land filling in the 1920s. Although early nineteenth century maps are not as accurate as those drawn later in the century, they suggest that the general outlines of the marshy islands in Jamaica Bay changed relatively slowly compared to the dynamic movement of the barrier beaches facing the Atlantic Ocean. For example, the 1812 *Eddy Map of the Country Thirty Miles Round the City of New York* (Figure 4) and the 1829 *Burr Map of the Counties of New York* (Figure 5) depict similarly-shaped marshy islands in the bay compared with later maps, but the barrier beaches (including what is now Manhattan Beach and the Rockaway Peninsula) changed significantly on subsequent maps. Note that while its configuration shifts, Barren Island is illustrated as dry land on the 1812 and 1829 maps, earlier than the start of land filling with refuse from Manhattan (see Historic Context section, below). The closest buildings depicted on these maps include the mills on Gerritsen Creek and Mill Island, and farmsteads in the hamlet of Flatlands (near the intersection of modern Flatlands Avenue and Flatbush Avenue). No buildings are shown within or adjacent to the project area.





Figure 4. 1812 Eddy Map of the Country Thirty Miles Round the City of New York showing the approximate location of the project area. The modern configuration of Rockaway Inlet is considerably different from that of the early nineteenth century. Part of the proposed KeySpan Jamaica Bay gas main corridor was marsh and water at the time, but note that Barren Island is depicted as dry land.

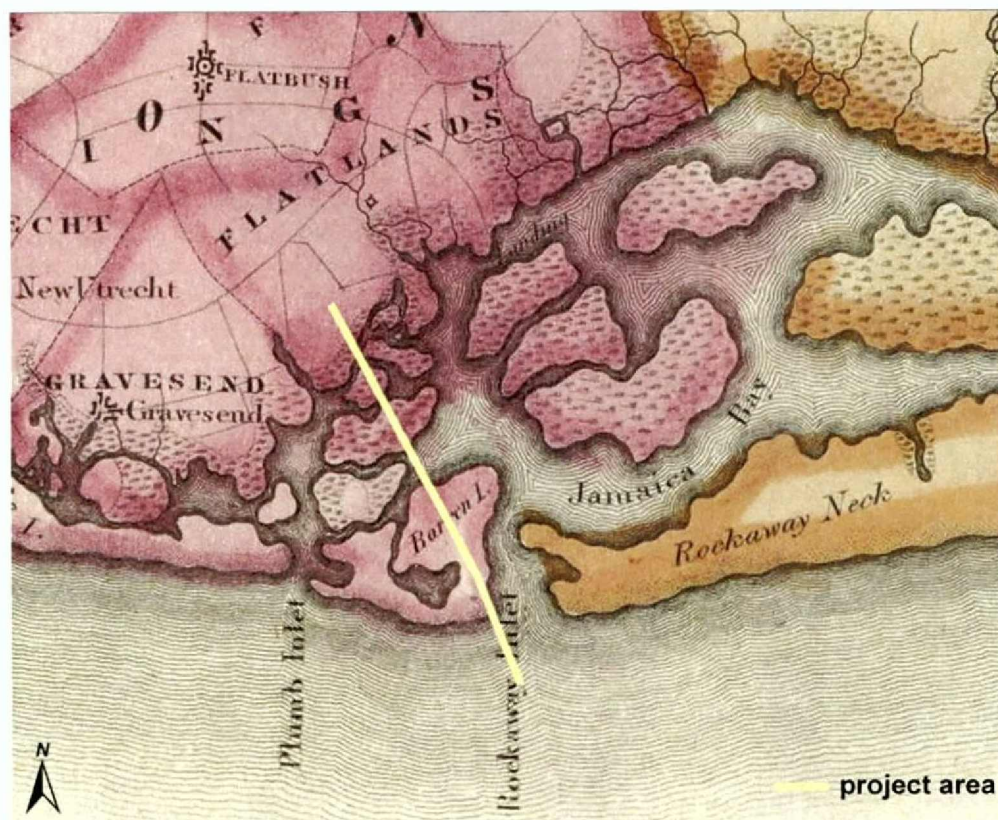


Figure 5. 1829 Burr Map of the Counties of New York showing the approximate location of the project area along the west side of Jamaica Bay. Most of the project area is illustrated as marsh, but note that Barren Island is shown as dry land.



Beginning in the nineteenth century, the United States Coastal Survey (USCS) published a series of nautical charts, including several for the New York Harbor area. Although land ownership is not indicated on the USCS maps, they are remarkably accurate and detailed in their depiction of natural and man-made features along the coast. The 1844 USCS *Map of New-York Bay* (Figure 6) depicts most of the project area as running through marsh islands. The north end of the project corridor (now Avenue U) is adjacent to farm fields, while the portion on Barren Island is near an ecotone where beach, marsh, and woods meet. This is one of the last maps published before Barren Island became the site of garbage processing facilities in the 1850s (see Historic Context, below). The vegetation depicted on the island is mixed deciduous and coniferous trees, possibly indicating scrub oak and pine that was native to much of southern Brooklyn when the Dutch arrived in the seventeenth century, and for which nearby Flatbush is named. By the time of the 1866 USCS *Chart Number 20* (Figure 7), the amount of wooded area on Barren Island had been greatly reduced. Four buildings (two near the project corridor, one of which may be the Rendering Plant [see below], and two on the east side on Jamaica Bay) and roads are illustrated on Barren Island on the 1866 map.

By the end of the nineteenth century the industrial facilities on Barren Island, along with a community of workers and their families, had grown to include numerous buildings, wharves, and roads as depicted on the 1898 topographic map of *Brooklyn, New York* (15 minute series; Figure 8). The 1898 map shows the northern terminus of the KeySpan project area near the boundary of dry land and marsh (Flatbush Avenue had been extended as far south as the project area by the end of the nineteenth century, though Avenue U had not yet been constructed). The 1898 topographic map is also among the earliest to illustrate the westward extent of Rockaway Peninsula as far as the southern terminus of the project area. Previous maps had the southern terminus landing in water.

Major land filling operations around Jamaica Bay were undertaken during the first three decades of the twentieth century. The start of this process within the project area is illustrated on the 1906 Hyde *Map of Long Island* (Figure 9), where filling and bulkheading is evident near the northern terminus around Avenue U. Although no buildings are depicted on the 1906 map, the garbage processing facilities and associated community were still active on Barren Island. Land filling to support features such as Flatbush Avenue, Belt Parkway, and Floyd Bennett Field was done in the 1920s and 1930s.

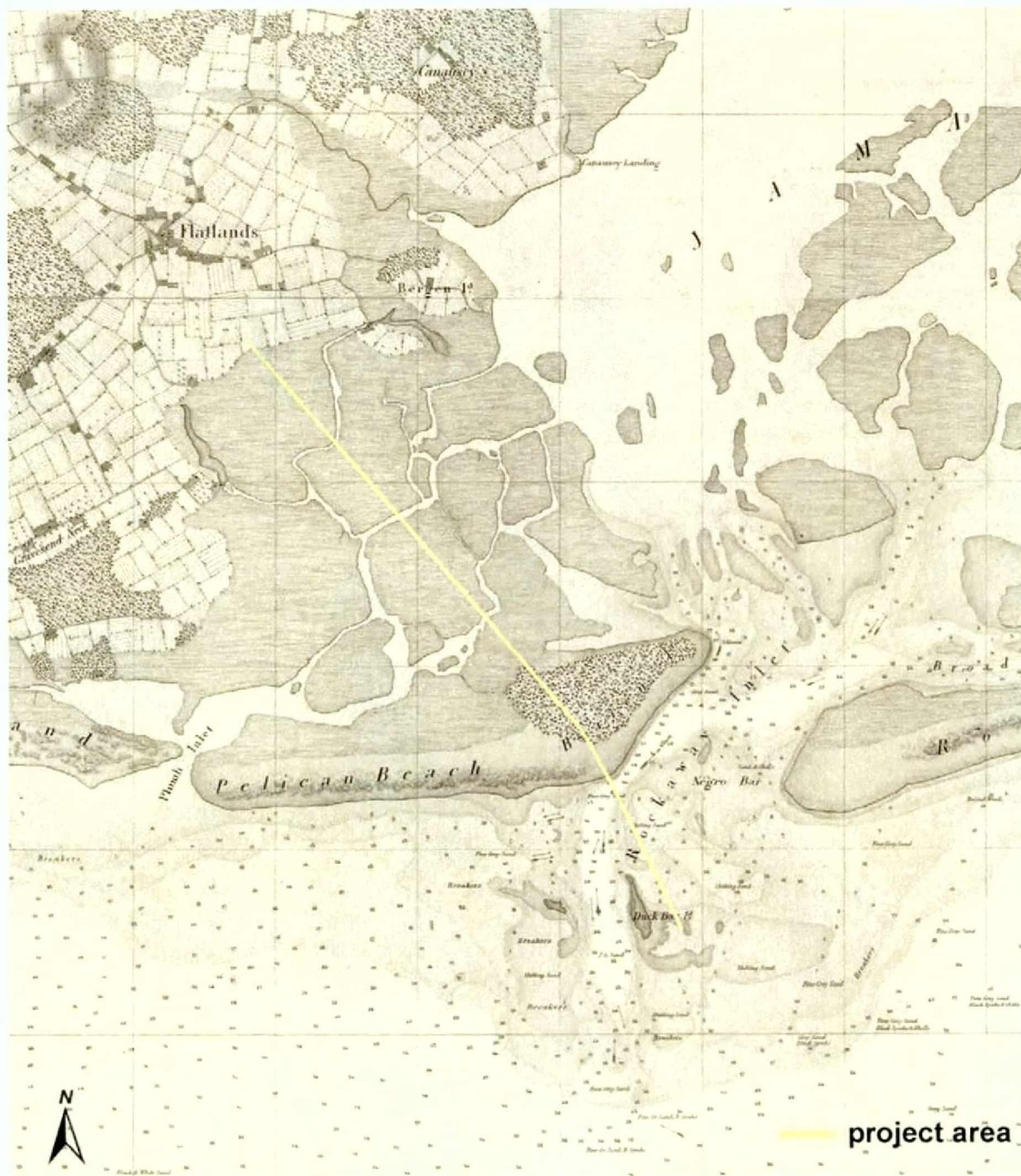


Figure 6. 1844 USCS *Map of New-York Bay*. The northern terminus of the proposed gas main is located adjacent to farm fields, while most of the corridor runs through marsh. Note the woods depicted on Barren Island near the south end of the project area.





Figure 7. 1866 USCS Chart Number 20: New York Bay and Harbor showing the location of the project area. By this time, garbage processing facilities had been established on Barren Island near the south end of the study corridor.





Figure 8. 1898 USGS topographic map of *Brooklyn, New York* (15 minute series). By the end of the nineteenth century, the garbage processing facilities on Barren Island had grown to include several buildings, wharves, and roads, though significant land filling had not yet occurred. Note also this is the first map to show the southern terminus of the project area landing on Rockaway Peninsula.

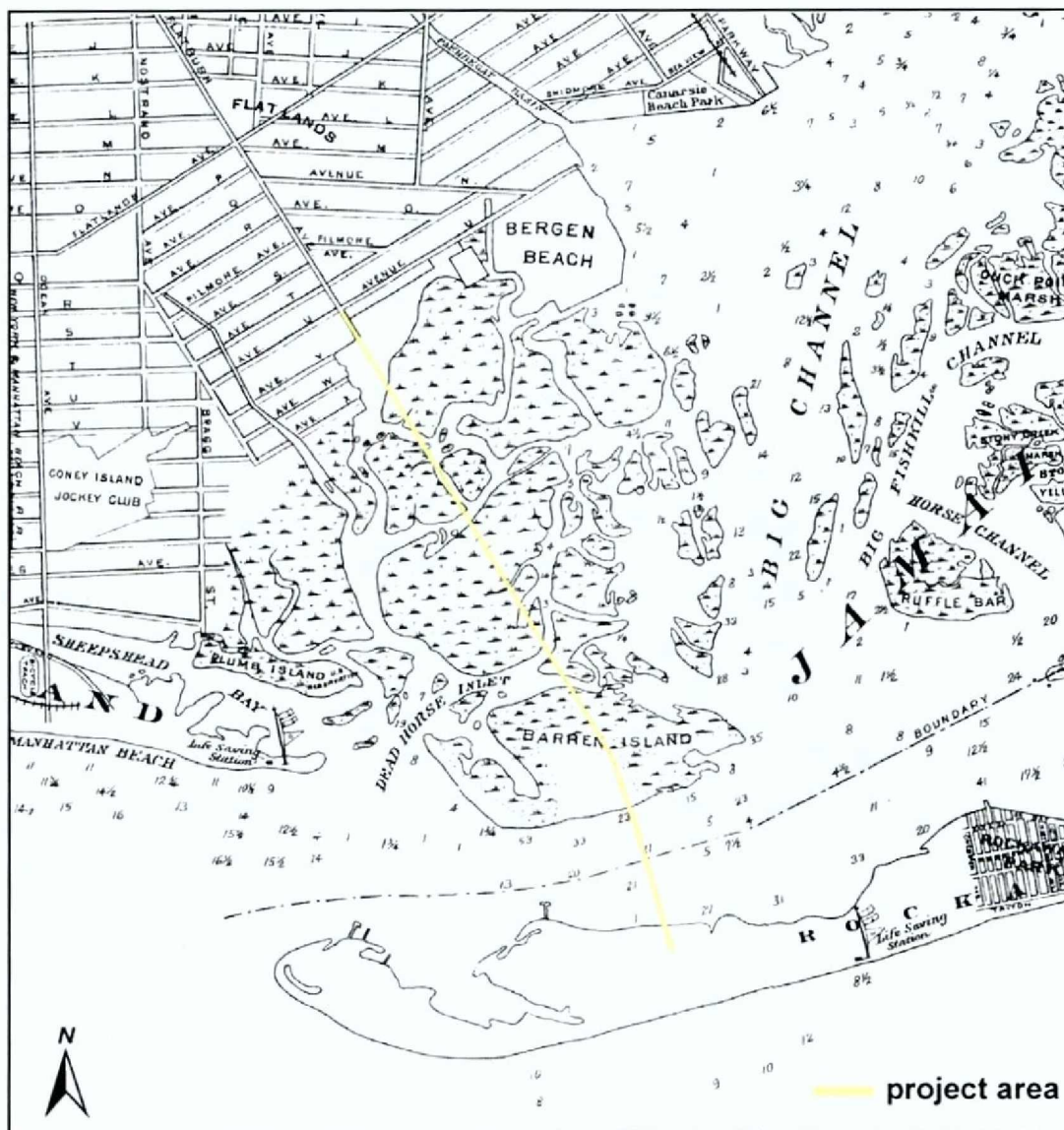


Figure 9. 1906 Hyde Map of Long Island showing the location of the project area. Although land filling and channelization had been started near the northern terminus of the project area (near Avenue U, shown here), most of the remainder of the corridor remained relatively unchanged until the 1920s and 1930s.



Table 1. Known archaeological sites within 1.6 kilometers (one mile) of the project area.

<i>Site Identifier</i>	<i>Site Name</i>	<i>Age</i>	<i>Comments</i>
NYSM 3608	ACP KNGS 4	prehistoric	human burials and oyster shell midden found on Avenue U near Ryders Pond (may be part of Ryders Pond site) (Parker 1920); approx. 1 km west of the north end of the APE
NYSM 7391	ACP KNGS 3B	prehistoric	immense shell middens on Bergen Island (Parker 1920); 1 to 2 km east of the north end of the APE
NYSM 7459, A04701.000112	Ryders Pond	prehistoric	Native American village or large camp site with shell middens and human burials northwest of Jamaica Bay; artifacts date from Early Archaic through Late Woodland periods, now Marine Park; 1 km west of the north end of the APE
A04701.000114	Equendito site	late prehistoric- early historic	reported Native American village site formerly on Barren Island, now part of Floyd Bennett Field; approx. 1 km east of the APE
A04701.000117	JB-70, Bennett House site	historic; probably 19 <sup>th</sup> century	house on former Mill Island, likely destroyed by landfill operations in Jamaica Bay during the early twentieth century; approx. 1.2 km east of the north end of the APE
A04701.000120	JB-73, Schenck-Crooke House and Mill site	historic; 17 <sup>th</sup> century	1659 or earlier house and mill built by Jan Martense Schenck on Crooke's Island (later Mill Island, now connected to mainland by landfill); structures moved from site after 1940; no evidence of site documented; approx. 1.1 km northeast of the north end of the APE
A04701.000121	JB-74, John Eldert House site	historic; 18 <sup>th</sup> -19 <sup>th</sup> centuries	1772 house built by John Eldert just north of Mill Island (near Belmont Road and Mill Road); no evidence of site documented; approx. 1.7 km northeast of the north end of the APE
A04701.000122	JB-75, Gerritsen Homestead and Mill site	historic; mid-17 <sup>th</sup> century	1656 house and mill built by Hugh Gerritsen on the west side of Strome Kill (now Gerritsen Creek); no evidence of site documented; approx. 1.3 km west of the APE
A04701.000124	JB-77, Rendering Plant site	historic; 19 <sup>th</sup> century	industrial rendering plant/glue factory (Products Manufacturing Company) on Barren Island (now Floyd Bennett Field) along Dead Horse Bay; structure destroyed in 1930s by land filling; approx. 250 m west of the APE
A04701.000126	JB-79, Voorhees House site	historic, late 17 <sup>th</sup> century	late seventeenth century house built by Albert Voorhees that once stood on the west side of Mill Creek; approx. 250 m west of the north end of the APE
A08101.000088	Fort Tilden	historic, 20 <sup>th</sup> century	US Army fort, established 1917; approx. 500 m southwest of the south end of the APE on Rockaway Peninsula
A08101.000106	BP-30	historic, late 19 <sup>th</sup> - early 20 <sup>th</sup> centuries	circa 1890-1920 refuse deposit (dated by bottle glass and ceramic fragments) on Breezy Point (Fort Tilden); approx. 850 m west of the south end of the APE
A08101.000107	BP-63, Breezy Point Life Saving Station	historic; mid-19 <sup>th</sup> century	formerly stood on the east side of Fort Tilden; approx. 600 m south of the south end of the APE

## Sensitivity Assessment

**Prehistoric Context.** As discussed above, the site files contain information on four prehistoric Native American archaeological sites within 1.6 kilometers (one mile) of the project area (Table 1). Two of these sites (NYSM 3608 and 7391) were documented by Arthur Parker (1920), and consist of shell middens and other features along the shore. The Equendito site (A04701.000114) was possibly a Contact period Native American village on Barren Island, now the southern part of Floyd Bennett Field.

The best known prehistoric site in the area is the Ryders Pond site (NYSM 7459 and A04701.000112). It is the largest known Native American site in Brooklyn (Cantwell and Wall 2001:130). The Ryders Pond site was located at the northern end of Gerritsen Creek, roughly one kilometer west of the northern terminus of the KeySpan Jamaica Bay project area. The area in and around the pond was subsequently filled, and it is now part of Brooklyn Marine Park. The site was excavated around the turn of the twentieth century by D.B. Austin, an avocational archaeologist (Lopez and Wisniewski 1971, 1972). A number of Native American skeletons were discovered when Avenue U was constructed, and exploration of the site yielded thousands of artifacts, mostly lithics and pottery fragments dating to the Late Woodland period (circa A.D. 1000 to 1500). However, among the projectile point assemblage are a few specimens dating to the Early and Middle Archaic periods (8000 to 6000 B.C. and 6000 to 4000 B.C.), with greater numbers dating to following periods. Lithic artifacts were made from chert, quartz, jasper, argillite, and other materials (Lopez and Wisniewski 1971). There are also several artifacts in the collection from Ryders Pond that suggest the site was occupied during the Contact period. Evidence for interaction between the Canarsee Indians and seventeenth century Dutch settlers includes triangular arrow points made from European metal (Cantwell and Wall 2001). Although the excavators left few records, it is clear that the Ryders Pond site reflects a diverse array of activities that were carried out over several millennia (Lopez and Wisniewski 1972).

Jamaica Bay and surrounding marshes and uplands would have been attractive to prehistoric peoples as a rich source of water, food (aquatic and terrestrial flora and fauna), and raw material (such as marsh reeds and clay). It is expected that larger sites like Ryders Pond with a diverse assemblage of artifacts and features (suggestive of residential bases and other repeated-use site types) would be located on the shores of the bay, especially near streams, while more interior regions would yield evidence of short-term and possibly specialized occupations.

Based on the results of the site file search and an assessment of environmental conditions, undisturbed portions of the project area, if they exist, would have a moderate to high sensitivity for the presence of prehistoric resources. However, it is likely that any prehistoric deposits are now very deeply buried beneath landfill. Most of the proposed construction will be contained entirely within the fill deposits (the upper six feet [1.8 meters] of sediment). Therefore, the potential for impact to any prehistoric resources is relatively low.

**Historic Context.** The site files contain information on nine historic period Euro-American archaeological sites within 1.6 kilometers (one mile) of the project area (Table 1). Most of these sites were inventoried during a cultural resources study performed for the Gateway National Recreation Area by John Milner Associates in 1978, and in many cases the site is known through the documentary record only, with no evidence found in the field. The historic period sites closest to the KeySpan project corridor are JB-77, the Rendering Plant site (A04701.000124) located adjacent to the west side of Flatbush Avenue near Dead Horse Bay and JB-79, the late seventeenth century Voorhees House site (A04701.000126) adjacent to the west side of Flatbush Avenue near Mill Creek (now a golf course) (Table 1). In addition, there are two National Register of Historic Places listed districts adjacent to the project area, the Floyd Bennett Field Historic District (90NR01268) and the Jacob Riis Park Historic District (90NR01579) (see below).

Permanent settlement by Europeans did not occur in southern Brooklyn and Queens until the middle of the seventeenth century. At this time the area around Jamaica Bay was inhabited by Canarsee and Rockaway Indians, Munsee-speaking Delaware groups who probably had stronger cultural ties to Delaware peoples on mainland New York and New Jersey than with the Eastern Algonquian groups of central and eastern Long Island (Goddard 1978). Sporadic armed conflicts between the European and Native Americans as well as devastating epidemics dramatically



reduced the Native American population on western Long Island, and prime land and local power quickly passed to the white settlers.

The land surrounding the project area was ceded from the Native Americans in a series of deeds dating from the mid-seventeenth century. Early Dutch settlements were established at Midwout (Flatbush) and Amersfoot (Flatlands) in 1654, nearly two decades after the first Dutch purchase was made by Wouter van Twiller at Flatbush (Manbeck 2005:218). Most of the KeySpan project area was part of a pre-1645 deed to Hugh Gerritsen that included Barren Island, what is today Marine Park, and Gerritsen Creek (Bankoff et al. n.d.). The house and mill built by Gerritsen in 1656 less than a kilometer west of the north end of the project area were among the earliest documented Euro-American buildings in the region. The Dutch ceded control of New Amsterdam to England in 1664, and the area surrounding Jamaica Bay was settled by both Dutch and English farmers in the 1660s (Hazelton 1925). The economy of southwestern Long Island was principally agricultural, supplemented by fishing and other maritime trades in communities along the shore.

The rural economy was disrupted by the American Revolution. The Battle of Long Island took place in nearby central Brooklyn during August 1776, and despite the efforts of George Washington, New York City quickly came under British control. Queens was largely Loyalist in political sentiment, but both Patriot and Loyalist families that remained in the region following the Battle of Long Island suffered hardships as British garrisons were provisioned with crops, wood, and livestock, seriously depleting local resources (Luke and Venables 1976). Families that had actively aided the British during the Revolution were forced to surrender property to the returning Patriots during the 1780s and 1790s. Pre-war economic patterns were gradually resumed during the early nineteenth century, facilitated by waterborne trade.

Much of Brooklyn remained rural agricultural land well into the nineteenth century, with most population concentrated in the northern portion of the county. Over the course of the century, the City of Brooklyn (established in 1834 near Brooklyn Heights) gradually expanded to encompass the old Dutch towns. Flatlands, near the northern terminus of the KeySpan project area, was among the last of the towns to be annexed in 1896 (Manbeck 2005:219).

Development in the Jamaica Bay area was spurred by the coming of the railroad. The Brooklyn and Rockaway Beach Railroad started operations in 1865, while the New York, Woodhaven, and Rockaway Railroad opened a line across Jamaica Bay in 1880, connecting mainland Queens with the Rockaway Peninsula, and transforming small fishing villages into thriving summer resorts (Manbeck 2005; Seitz and Miller 1996). Jacob Riis Park on the Rockaway Peninsula was developed between 1932 and 1937 as one such resort area, with Art Deco style recreational buildings built under the auspices of the Federal Work Progress Administration. Now part of Gateway National Recreation Area, Jacob Riis Park is listed on the National Register of Historic Places (90NR01579). None of the contributing elements are adjacent to the project area. Similarly, Marine Park was completed in 1934 just west of the project area. Although plans to turn Jamaica Bay into a harbor to rival the Port of New York were never realized (Seitz and Miller 1996), southern Brooklyn and Queens witnessed a housing boom that did not abate until the latter part of the twentieth century. Brooklyn today is the most populated county in New York State (Manbeck 2005:221).

The history of Barren Island differs from other areas around coastal Brooklyn where recreational attractions like race tracks, amusement parks, and bathing beaches were created during the second half of the nineteenth century. Instead, the island became the destination of garbage from New York City starting in the 1850s. Industrial facilities were developed to process the waste, and a small impoverished community of workers and garbage pickers was established on Barren Island. The Rendering Plant was operated by the Products Manufacturing Company during the nineteenth century on the shore of Dead Horse Bay, just south of the current marina (John Milner Associates 1978:119). Dead Horse Bay gets its name from the animal carcasses from the Rendering Plant, which processed dead animals (mostly from the streets of New York City) into glue and other products. A fish processing factory was opened in the 1860s, and garbage scows brought refuse to the island daily. The colony of workers was comprised mostly of Polish, Italian, and Irish immigrants, with some African-Americans also working. Social status was reflected in the type of waste sorted: bone, metal, paper, rags (Johnson 2000). In the early years of the twentieth century, the buildings on Barren Island included five factories, four saloons, one store, a one-room schoolhouse, and



several cottages (Figure 10). Garbage processing operations reached their peak during World War I, when boiled down refuse was used to make nitroglycerin, but in 1918 New York City stopped shipping waste to Barren Island. The glue factory closed in the early 1930s, and in 1936 the remaining workers were evicted to pave the way for the Marine Parkway Bridge (Johnson 2000).

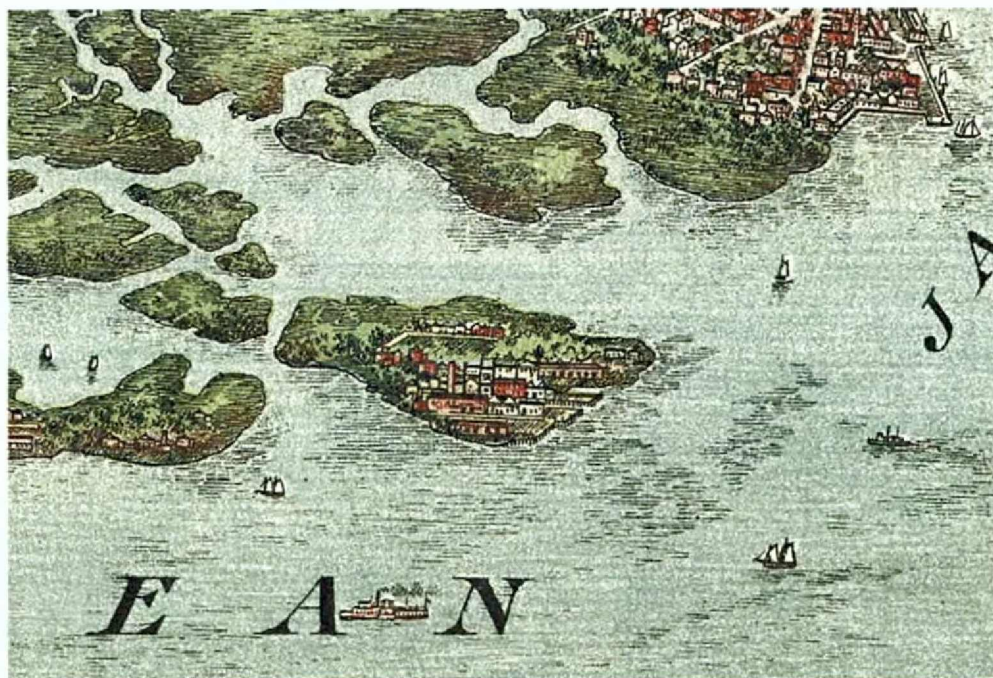


Figure 10. Circa 1908 Ohman *Birds' Eye View of Brooklyn* illustrating the garbage processing facilities and associated community on Barren Island.

Construction at Floyd Bennett Field, the first municipal airport in New York City, began in 1928 at a time when Jamaica Bay was still under consideration for development as a major port. Land filling operations along the shore of the bay that began in the early twentieth century were intensified to create a large expanse around Barren Island that was five meters (16 feet) above mean low water; most of the fill at Floyd Bennett Field came from channels dredged in Jamaica Bay (John Milner Associates 1978:121-122). According to the National Register nomination form, by 1933 the airport was the second busiest in the country in terms of numbers of takeoffs and landings, and it was the site of several early flights that set speed and distance records. However, Floyd Bennett Field was eclipsed by Idlewild Airport (now John F. Kennedy International Airport) which opened in 1939 on the northeast shore of Jamaica Bay. Floyd Bennett Field was closed to commercial use, and the U.S. Navy acquired the property in 1941. It was the Brooklyn Naval Air Station until it was transferred to the National Park Service as part of Gateway National Recreation Area in 1972. The Floyd Bennett Field Historic District is listed on the National Register (90NR01268). None of the contributing components in the historic district are adjacent to the KeySpan project area.

Due in large part to its proximity to New York City, the project area also has a rich maritime history. Despite frequently updated nautical charts (e.g., Figures 6 and 7), the shifting barrier islands along the south shore of Long Island acted as ship traps on the approach to New York, resulting in numerous wrecks. In 1849, a life saving station was built near what was then the west tip of Rockaway Peninsula (the tip had migrated considerably westward by the time of the 1906 Hyde *Map of Long Island* [Figure 9]). Originally known as the Barren Island Station, by 1872 it was identified as the Rockaway Beach Station, and in 1928 it became the first land-based radio station for the U.S. Coast Guard (Field 1997:144-147).

Part of the impetus for opening the Barren Island life saving station was the tragic loss of two ships nearby in the late 1830s. In November 1836 the bark *Bristol* went aground on the shoals near Far Rockaway, resulting in the loss of 84 lives, mostly Irish immigrants on their way to New York City. A similar fate befell the bark *Mexico* in January 1837, when the ship ran aground and about 120 people drowned, again mostly Irish immigrants (Field 1997:144). Two other well-known shipwrecks off the Rockaway Peninsula are the *Black Warrior* (lost February 1859 off Jacob Riis Park) and *Ajace* (lost March 1881) (Field 1997:147). The closest known shipwrecks to the KeySpan project area in the files of the OPRHP are the scow *Franklin* (wrecked near Rockaway Inlet in August 1897), the motorboat *Martha J.* (struck by lightning and burned in October 1913 in Jamaica Bay), and the sloop *J.R. Brown* (sunk at Barren Island in March 1881). There may be other undocumented shipwrecks in or adjacent to the project area.

Based on the archaeological site file search, historic maps, local history, and an assessment of environmental conditions, undisturbed portions of the project area, if they exist, would have a moderate to high sensitivity for the presence of historic period resources, especially for deposits associated with the Rendering Plant site on Dead Horse Bay. However, as is the case with prehistoric sites, it is likely that any historic deposits are now very deeply buried beneath landfill (Figure 11). Most of the proposed construction will be contained entirely within the fill deposits (the upper six feet [1.8 meters] of sediment). Therefore, the potential for impact to any historic resources is generally low except for areas with minimal landfill (should they exist). In addition, there are three historically-known shipwrecks near the project area in Rockaway Inlet, and there may be additional undocumented wrecks in the vicinity.





Figure 11. 1898 land features over the 1966/1979 USGS topographic map of Coney Island, New York. Land that was dry on the 1898 topographic map of Brooklyn, New York is shown in dark green with solid boundaries, while land that was illustrated as marsh on the 1898 map is light green with dotted boundaries. Note that much of the KeySpan project area was formerly marsh.

## **Disturbance**

As discussed above, a substantial portion of the project area along Flatbush Avenue (proposed Phase II) has witnessed extensive land filling, most dating to the 1920s. The depth of fill is likely variable along the survey corridor, but probably more than six feet (1.8 meters, the proposed gas main trench depth) in most locations, especially where fill was placed to create land in formerly wet and marshy areas. A comparison of topographic maps dating from 1898 and 1966/1979 (Figure 11) indicates that the depth of fill likely exceeds ten feet (three meters) in most places. In addition, much of the west side of Flatbush Avenue between Avenue U and the entrance to Floyd Bennett Field has been disturbed by road, building, and utility construction. Disturbed areas have a very low potential for the presence of intact archaeological deposits. The southern terminus of the project area in Jacob Riis Park was not dry land until late in the nineteenth century, when the westward growth of Rockaway Peninsula passed what is now the location of the Marine Parkway (Gil Hodges Memorial) Bridge.

## **Testing Recommendations**

It is recommended that all relatively undisturbed portions of the KeySpan Jamaica Bay gas main project area be subject to a surface survey and subsurface testing. Such relatively undisturbed portions are mostly limited to the southern end of proposed Phase II, near the entrance to Floyd Bennett Field, where historical maps indicate former Barren Island was dry land (shown as blue dotted line in Figure 11). Subsurface testing should consist of the excavation of shovel test pits (STPs) at 15 meter (49 foot) intervals in areas of minimal disturbance to ascertain if archaeological resources are present beneath the ground surface. Areas of suspected disturbance may be examined using a wider interval (e.g., 30 meters [98 feet]) between shovel tests. It is estimated that the proposed gas main along Flatbush Avenue will require approximately 30 to 45 shovel test pits. In addition, because of the potential for shipwrecks in Rockaway Inlet (Phase I of the project area), it is recommended that once final project plans become available, the remote sensing data collected in 2007 by Ocean Surveys Inc. for the gas pipeline route be examined by an archaeologist familiar with sonar and magnetometer data.

## CONCLUSIONS AND RECOMMENDATIONS

Based on a search of archaeological site files, a consideration of environmental characteristics, and a field inspection, the proposed KeySpan Jamaica Bay gas transmission project has an overall low sensitivity for intact prehistoric and historic period archaeological deposits within the length, width, and especially depth of the APE. Much of the project corridor consisted of marshy islands until land filling in the early twentieth century. The depth of fill along most of Flatbush Avenue exceeds the proposed gas main trench depth of six feet (1.8 meters). The area of highest sensitivity for archaeological sites is near the southern end of proposed Phase II (the west side of Flatbush Avenue near the entrance to Floyd Bennett Field), where historic maps indicate that former Barren Island was dry land and fill may not be as deep as elsewhere in the APE. Documented sites in this vicinity include the Equendito Native American village site and the nineteenth century Rendering Plant on Dead Horse Bay.

A Stage 1B subsurface archaeological survey is recommended for relatively undisturbed portions of the proposed transmission gas main along Flatbush Avenue. The Stage 1B survey will entail a surface survey and the excavation of shovel test pits to determine if archaeological materials are present. Approximately 30 to 45 shovel test pits will be required. In addition, because of the potential for shipwrecks in Rockaway Inlet (Phase I of the project area), it is recommended that the remote sensing data collected in 2007 by Ocean Surveys Inc. for the gas pipeline route be examined by an archaeologist familiar with sonar and magnetometer data once final project plans become available.



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