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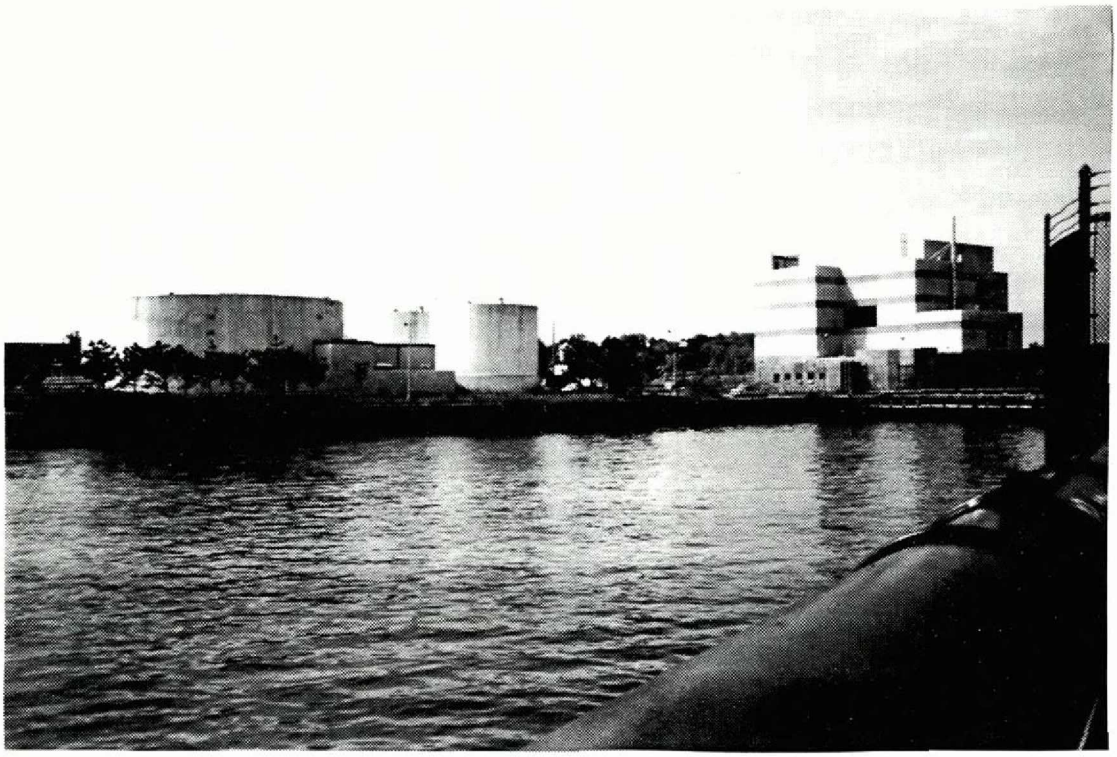
SUPPLEMENTAL PHASE 1A ARCHAEOLOGICAL DOCUMENTARY RESEARCH IN ADVANCE OF DOCKWORK AT SIX NEW YORK CITY WATER POLLUTION CONTROL PLANTS

Capital Project No. WP-284/Contract No. 104

Bronx: Hunts Point
Brooklyn: Red Hook and 26th Ward
Manhattan: Wards Island
Queens: Bowery Bay and Tallman Island



Tallman Island W.P.C.P.

Prepared for: Stone & Webster Engineering Corporation
One Penn Plaza
250 West 34th Street
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Submitted by: Linda Stone, MA, SOPA
249 East 48th Street, #2B
New York, New York 10017

June 22, 1994

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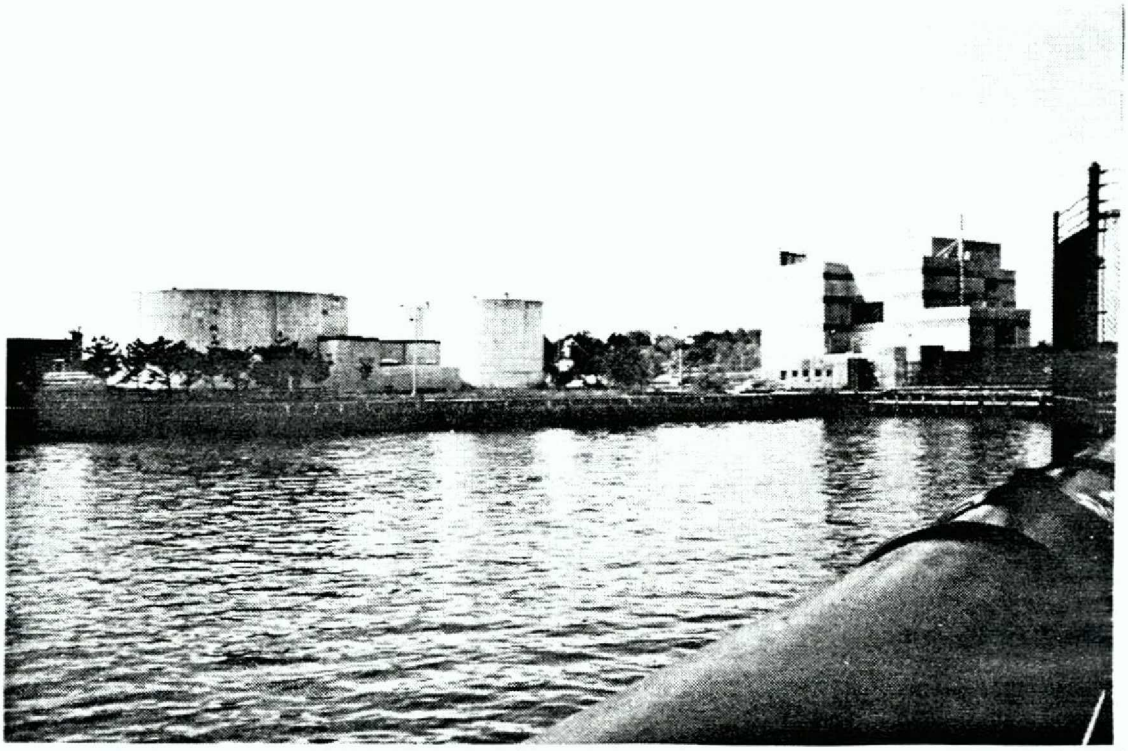

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EXECUTIVE SUMMARY

A supplemental Phase 1A evaluation of archaeological resources was done in advance of dockwork at six New York City Water Pollution Control Plants. This study augments a preliminary report done in 1990 in advance of the construction of the dewatering buildings at these plants. This report on the analysis of the potential for the dockwork contract to adversely impact archaeological resources was done through the use of historic maps and data, aerial photographs, soil boring logs and dredging data. The potential for the preservation of archaeological resources within the areas of planned impacts was evaluated on a site by site basis by plant.

HUNTS POINT The possibility for prehistoric resources to be preserved at Hunts Point was evaluated. Marine work and road widening are planned for this plant. Excavations for the road widening will be dug into modern fill deposits and will therefore not disturb any potential archaeological resources. However the new pier planned for Hunts Point will impact a possible earlier land surface. This work could potentially encounter submerged prehistoric archaeological deposits. Archaeological documentation of soil borings is recommended in the area of the planned marine work at the Hunts Point W.P.C.P. NA

RED HOOK Impacts from the dockwork contract will affect the decking area of the Red Hook W.P.C.P. Three types of archaeological resources were identified at the Red Hook plant; prehistoric resources, 19th century fill and Revolutionary War human remains. The potential for the recovery of prehistoric resources is low. It seems likely that late nineteenth century fill exists buried beneath the silt under the planned impact area. The potential for finding human remains at the Red Hook W.P.C.P. is high within or below the silt or fill layers underneath the decking in the project impact area if the project impact area has not been dredged. Archaeological documentation of soil borings is recommended in the area of the planned impact at the Red Hook W.P.C.P. NA 19th c Rev War burials

26TH WARD The planned dockwork at the 26th Ward W.P.C.P. will involve the widening of the dock access road, creation of a container staging area and marine work will be done in the pier area. Both the access road and the container staging area go through the Pennsylvania Avenue Landfill Hazardous Waste Site. Boring data confirms that the impact from these land-based aspects of the dockwork contract will not penetrate below the depth of the fill. The potential for the marine work to impact submerged prehistoric archaeological resources is low because that area of Jamaica Bay has been previously dredged, thereby removing any submerged prehistoric land surface which may have exited. No further archaeological work is recommended in the areas of planned impact at the 26th Ward W.P.C.P. NI

WARDS ISLAND No marine work is anticipated at the Wards Island W.P.C.P. under the dockwork contract. The only impact will be from the expansion of a concrete pad near the docking area in the eastern corner of the plant. The research proved that two historic docks were not located within the project impact. Additionally, boring data revealed that the project impact area is all modern fill. No further archaeological work is recommended for the planned dockwork Wards Island W.P.C.P. NI

BOWERY BAY The potential for the recovery of prehistoric archaeological remains within areas of planned road widening and concrete pad construction was evaluated for the Bowery Bay plant. The research concluded that all of the impacts will not penetrate below the depth of fill. No further archaeological work is recommended for the dockwork contract at the Bowery Bay W.P.C.P. NI

TALLMAN ISLAND The analysis of historic maps and boring logs proved that most of the land-based planned impacts at the Tallman Island W.P.C.P. will not reach below the depth of modern fill. The only possible exception is in the southwestern corner of the proposed container staging area where the depth of fill has not been established. This area has a high potential for yielding prehistoric archaeological resources unless it can be demonstrated this area is covered in fill. Archaeological testing is recommended in this area of planned work. The planned marine work will not affect any potential archaeological remains of the Point View pier and has low potential to impact prehistoric archaeological resources since it is likely that the East River has been previously dredged in the project area vicinity. NE

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INTRODUCTION

In conjunction with New York City's sludge management program, a dockwork contract has been issued. This supplemental Phase 1A archaeological evaluation is being conducted to comply with environmental review regulations and to meet the standards of the New York City Landmarks Preservation Commission. The report has been prepared for Stone & Webster Environmental Engineering Corporation, consulting engineers.

The dockwork contract will result in subsurface impacts at six water pollution control plants; Hunts Point, Red Hook, 26th Ward, Wards Island, Bowery Bay and Tallman Island. Figure 1 depicts the locations of the six plants within the city and Figures 3, 9, 17, 23, 33 and 41 depict the areas of planned impacts at each plant (in shading). The impacts will result from road widenings, concrete pads and docks. Impacts from the road widenings and from concrete pads will reach a maximum depth of two feet. Marine work will entail the construction of new or expanded structures on non-clustered piles. No dredging will be conducted. The depth of impacts due to marine work will be evaluated at a later point in the contract, however it is possible that the impacts could extend to the depth of bedrock at one or more of the sites.

Potential for the preservation of archaeological resources at each of the six sites was identified in the report on the archeological sensitivity (Greenhouse Consultants Incorporated 1990a). According to that report, resources which the dockwork may impact are:

Hunts Point - Prehistoric resources
Red Hook - Prehistoric resources and 19th century fill
26th Ward - Prehistoric resources
Wards Island - Two historic docks, pre-1857
Bowery Bay - Prehistoric resources
Tallman Island - Prehistoric resources and pre-1897 pier

The 1990 archaeological sensitivity evaluation report was prepared to address specific impact areas, mainly related to the dewatering buildings, and did not look at the areas of the plants which are affected by the current contract. Therefore this report has been prepared to address the potential for preservation of archaeological resources within the planned impact areas to be affected by the dockwork contract. As the contract name implies, most of this work will be done at or near the docks at the six sites. Table 1 summarizes the planned impacts and the potential archaeological resources at each site.

The potential for preservation of prehistoric archaeological resources was identified for five of the six water pollution control plants under study. Furthermore, marine work has the potential for affecting prehistoric archaeological resources under water at the four plants where the work is planned; Hunts Point, Red Hook, 26th Ward and Tallman Island. This is because the sea level has risen dramatically since the end of the last ice age, about 12,000 years ago. Current sea level in the New York Metropolitan area is about 100 feet higher than it was at that time and about 50 feet higher than the sea level of 6,000 years ago when some of the earliest prehistoric use of the area has been documented. The rise in sea level continued at this rapid rate until about 3,000 years ago when the rate decreased (Newman 1977:559, Salwen 1965:33).

With the significant change in the sea level came an even greater change in the submerged shoreline. Figure 2, reprinted from Edwards and Emery (1977:247), shows the approximate regional shorelines during three different periods of prehistory when early populations may have been on what is now the continental shelf. "Although Early Man could not live close to the ice front or within the submerged area, he could have made a living in the littoral environment of the emerged shelf" (Newman 1977:567)

Very little archaeological data exists for the earliest prehistoric cultural periods in the New York City area, the Paleo-Indian through Middle Archaic periods prior to about 5,000 years ago. One possible explanation is that these early sites were buried under water as the sea level rose. Funk (1991) summarizes what little is known of these periods.

> Although habitation sites of the Paleo-Indians have not yet been discovered on the continental shelf, probable late Paleo-Indian artifacts have been found in deep water off the coast of Maine (Sanger 1988). In the case of the Port Mobil site, located on the western shore of Staten Island near the Arthur Kill, evidence suggests that Paleo-Indians lived at the site when sea level was considerably lower than at present and the Arthur Kill was an upland creek (Kraft 1977). Similarly, Early Archaic sites on Staten Island close to the present shore lines and elevated slightly above sea level, such as Ward's Point, Hollowell, and Old Place (Ritchie and Funk 1971), would have been inland and upland locations at the time of occupation. No Paleo-Indian sites, as such, are known along the Lower Hudson north of Staten Island. (Funk 1991:51).

The marine work to be conducted at four of the New York City Water Pollution Control Plants might provide an opportunity to evaluate submerged prehistoric archaeological resources from these earliest time periods.

Data from soil borings was evaluated to determine the possible presence of buried archaeological resources within the depths of the planned dockwork contract impacts. Both the fill and organic soil layers were of particular interest. Filling, by its nature, implies deliberate human activity. In some cases the act of filling is of interest because it buries, and therefore preserves, archaeological resources. In other cases the fill and fill retention structures may be of certain historic value. Organic soils are of interest in coastal studies because they could potentially be the buried earlier land surfaces from a time when the sea level was lower, or prior to filling activities. The review of boring logs by the archaeologist can only provide tenuous clues to the possible prehistoric use of a buried surface. This is because the geologists who record the borings are generally untrained in the identification of, or are not looking for or recording, types of cultural materials which may be associated with prehistoric use, made from stone and clay. Therefore the archaeologist, without viewing the soil boring cores directly, must look for other indicators of possible prehistoric cultural presence. The indicator used in this report is the recorded presence of shells within the organic soil layers. Shell middens, associated with prehistoric food procurement, processing and disposal, are one prehistoric site type which could be identified at a coastal site. Prehistoric shell midden sites have been found associated with other artifacts and sometimes evidence of fire, not generally recorded in boring logs. However the presence of shell recorded in a boring within an organic silt layer does not mean the deposit was definitely a prehistoric shell midden. Shell beds occur naturally near the shoreline as well. Therefore, in this report, when soil borings have shown a submerged deposit of organic soil containing shell in a planned impact area, that knowledge is combined with information on known prehistoric resources and dredging data to arrive at a conclusion regarding the level of potential for identifying a submerged prehistoric archaeological deposit. In general, at the water pollution control plant (W.P.C.P.) sites, this potential is low to moderate because of the nature of the expected resources and the likelihood they may have been dredged. Even in cases where the combined evidence suggests a stronger potential for the preservation of prehistoric cultural resources, the chance of actually identifying a site through further testing is not great.

Data on past dredging in the area of the planned marine work impacts was sought to evaluate the likelihood that submerged potential archaeological resources were previously removed. While the DEP knows that dredging was done as part of contracts to build the plants, records showing the location and depth of dredging have not yet been identified. Previous contracts which included dredging were identified by the DEP. Unfortunately, these records have either been inadvertently discarded or misplaced (Dennis Rizzo & Frank Gallo, DEP, personal communication). Furthermore, the U. S. Army Corps of Engineers dredging permit records corresponding to the DEP contracts were destroyed by

flooding at the storage facility two years ago (Herman Wine, US Army Corps, personal communication). Therefore, while it is likely dredging has taken place within the planned impact areas at certain W.P.C.P.s, there is no documented record of it. However, the conclusions in the following report were made based only on the data presented herein.

The New York State Museum site file correspondence and standard prehistoric site references were used to evaluate the likelihood that prehistoric sites could have existed within each project area. Historic maps and other research materials were used to evaluate the existence of historic resources as well as to evaluate the possibility for the preservation of or the identification of archaeological resources.

The current research has been conducted to further elucidate data on the potential archaeological resources identified in the Greenhouse Consultants Incorporated (GCI) report and to identify any other resources which may exist within the project areas' planned impacts. Requests were made to the New York State Museum and the New York State Office of Parks, Recreation and Historic Preservation for prehistoric site file information. Historic references to the docks and piers at Wards Island and Tallman Island were taken from the New York Public Library, the Borough Presidents' Topographic Bureaus, the Department of General Services Subsurface Exploration Section and the Long Island Division of the Queens Public Library. Resources relating to landfilling and shoreline changes were identified through reports and records on file with Stone & Webster Engineering Corporation, the Department of General Services Subsurface Exploration Bureau, the New York City Landmarks Preservation Commission, the Borough Presidents' Topographic Bureaus and the New York Public Library.

The following contains a site by site evaluation of the potential for the preservation of archaeological resources at each water pollution control plant (W.P.C.P.) affected by the dockwork contract. The specific impacts and potential resources are considered using archival materials, maps and records reviewed during the coarse of research. The research was conducted and the report prepared by Linda Stone with the assistance of Patience Freeman.

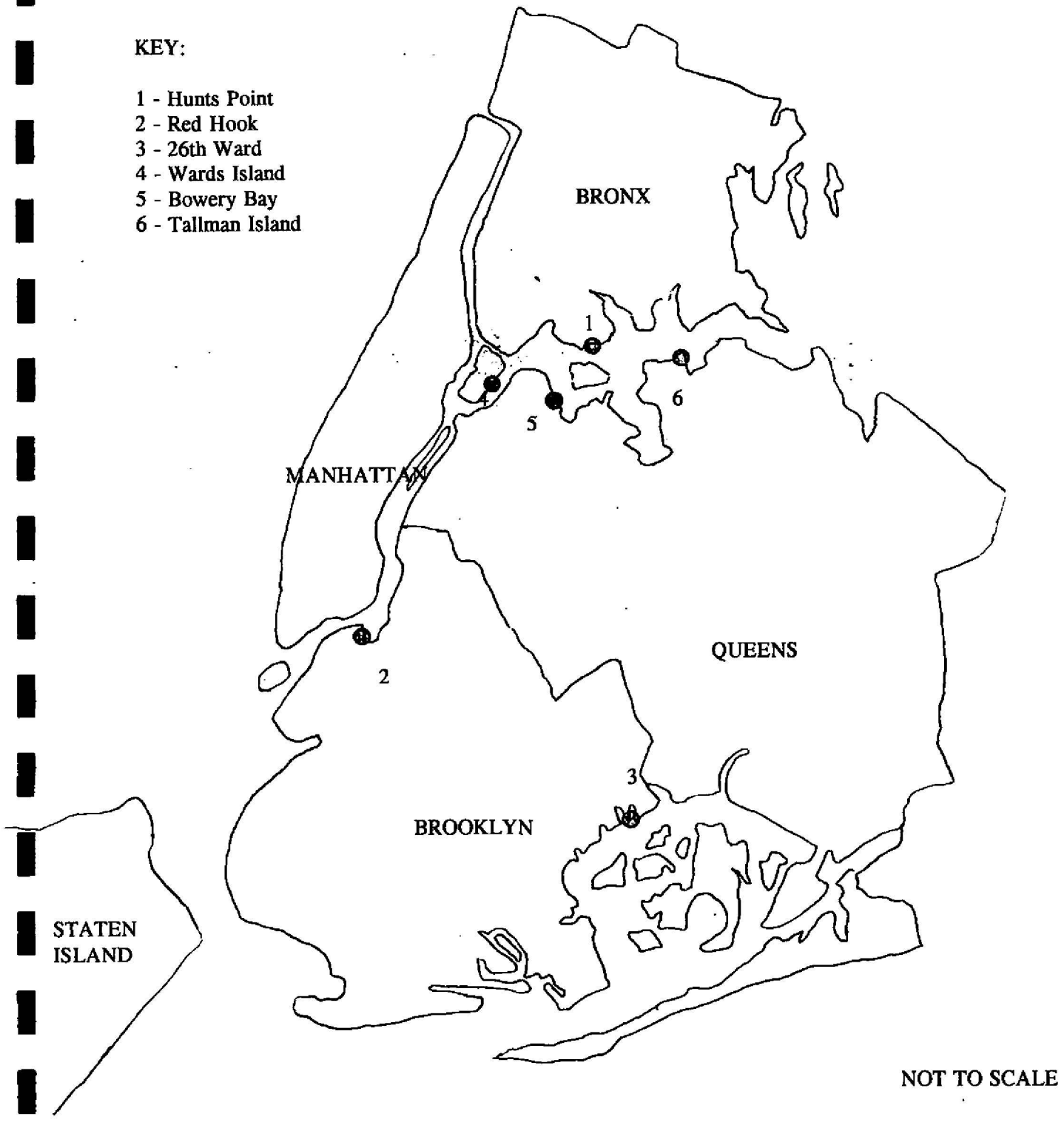


Figure 1 The location of six of the New York City Water Pollution Control Plants on a schematic map of New York City.

TABLE 1
PLANNED SUBSURFACE IMPACTS AND POTENTIAL ARCHAEOLOGICAL RESOURCES AT DOCKWORK SITES

	IMPACTS			RESOURCES		
PLANT	MARINE WORK	ROAD WIDENING	CONCRETE PADS	PREHISTORIC	HISTORIC DOCK/PIER	HISTORIC FILL
HUNTS POINT	Y	Y	N	Y	N	N
RED HOOK	Y	N	N	Y	N	Y
26TH WARD	Y	Y	Y	Y	N	N
WARDS ISLAND	N	N	Y	N	Y	N
BOWERY BAY	N	Y	Y	Y	N	N
TALLMAN ISLAND	Y	Y	Y	Y	Y	N

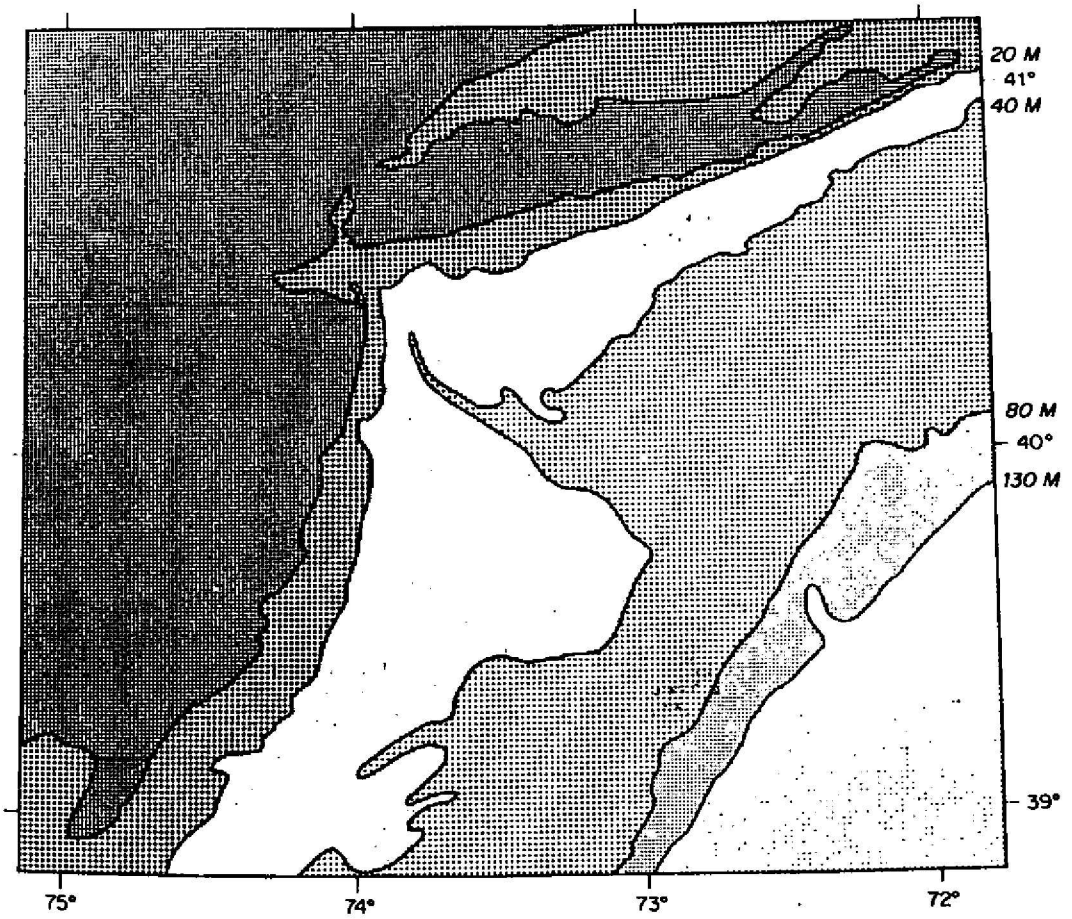


Figure 2 The relative position of the 20, 40, and 80 m isobaths, which represent the approximate shorelines 6,000, 8,000, and 11,000 years ago. Transgression proceeded across various parts of the continental shelf at quite different rates. South of the Hudson Channel was a prominent highland that remained above water for an extended period of time (Newman 1977:Figure 3).

HUNTS POINT

The main planned impact at the Hunts Point W.P.C.P. will be from the creation of a new pier to be constructed on non-clustered piles. There will also be a minimal amount of road widening (see Figure 3). The areas of planned road widening are currently covered with manicured grass. Potential archaeological resources may date to prehistory. The potential for the dockwork contract to adversely impact these archaeological resources was evaluated through a review of historic maps and boring data.

Prehistoric Resources

Although the New York State Museum has no record of any prehistoric sites recorded within one mile of the Hunts Point W.P.C.P., they still consider the plant as having "high probability of producing prehistoric archaeological data". The museum bases its probability rating on the plant's physiography, the fact that intact deposits may be buried beneath fill or below the water table and the project area has similar terrain to other prehistoric sites in the area.

Several prehistoric archaeological sites have been reported in the area of Clasons Point, to the east of the Hunts Point W.P.C.P. In fact, the State Museum shows one of these sites in its old records, but no other information is available. Reginald P. Bolton's review of Native American sites identified five within the vicinity of the project area. Three of these are mapped on Figure 4. Bolton also listed a site on Clasons Point, called "Snakapins", possibly meaning "river-land-water-place" (Bolton 1934:56). This major site was a "native village on Sound View Avenue, at Leland Avenue and Lacombe Avenue, where about sixty food-pits were uncovered, with human burials and many other indications of native occupation" (ibid.:138). Smith reported seven flexed burials for this site (Smith 1950:169). Bolton also identified four sites on Hunts Point. Two of the sites are described as shell deposits. Such deposits are now regularly identified as middens associated with the disposal of food remains of prehistoric coastal populations. Bolton infers that these were sites of prehistoric fishing camps.

Historic Maps and Research

A number of historic maps examined at the Bronx Borough President's Office Topographic Bureau were evaluated to determine the location of earlier shorelines and the extent of filling operations in the area of planned impacts at the Hunts Point W.P.C.P. Figure 5 is a composite of these earlier maps onto the conceptual design drawing of the plant. It shows the high and low water lines as of 1892, the shoreline as of 1915 and the early high water line as interpreted in 1965. The 1892 information was taken from

the Topographical Bureau's maps of the 23rd and 24th Wards and the 1915 shoreline was taken from Sanborn's updated 1915 map and the 1965 interpretation was taken from Bromley's Land Book. The historic maps clearly show that the land-based area of the planned pier impacts at the Hunts Point plant has been filled since 1892, as has all but the northwest corner of the construction trailer area. Figure 6 is a current photograph of the future pier area. It clearly shows the elevation of that area in relation to East River. The current elevation in that area is between 6.65 and 8.80 feet above sea level. (Stone & Webster and Hazen & Sawyer 1990a:HP-GC-124, Warren George HP-2). The area of road widening in the eastern part of the plant, north of the dewatering building, appears to have been tidally submerged in 1892. The road in that part of the plant has a current elevation of about ten feet (Stone & Webster and Hazen & Sawyer 1989). It is located between the high and low water lines on the 1892 map. Only the small area of road widening located northeast of the digesters completely falls within footprint of the original land surface.

Boring Data

Two series of soil borings were examined for the Hunts Point W.P.C.P.; borings taken in 1969, in conjunction with the plant expansion, and those taken in 1989 in conjunction with the dewatering building construction. Marine borings were taken in 1969 in proximity to the planned pier and the 1989 borings were near the planned construction trailer area and the road widening in the northeastern corner of the plant. Figure 7 shows the location of the borings in relation to the planned impacts from the pier and road widening. For simplicity's sake, this figure shows only the impact areas. Figure 7 may be compared with Figure 3 to see where within the plant the impact areas are located. The stratigraphy of the marine borings was projected into a continuum. This profile is attached as Figure 8.

The borings taken in 1969 were one and a half foot samples taken at five foot intervals. Figure 8 shows that the water was between eight and thirty feet deep in the three marine borings taken near the planned pier. It also shows that the western most boring had a small amount of fill before the sample reached the depth of the decaying mica schist. The description of the fill on the boring log read "Fill = gravel, boulders etc." (Department of Public Works 1969b:Sheet 8). This description does not instill confidence in its evaluation. It seems possible that the gravel and boulders occurred naturally in that stratum. Alternatively this fill could have been placed in that area during the construction of the nearby mooring dolphin. The two borings taken in the eastern part of the planned pier contained between thirty-six and seventeen feet of organic silt below the water level. This stratum contained a trace amount of shell and

could have been part of an early prehistoric land surface.

The closest borings taken to the small area of planned road widening in the northwestern part of the plant were also taken in 1969. Two adjacent borings were taken in the area of the current road to the northwest of the digesters, west of the planned impact. Both borings contained over eighteen feet of fill or "probable fill". Given the proximity of these borings to the planned impact area, as well as their relative proximity to the earlier shoreline, it may be inferred that the planned impact area is also covered with a substantial amount of fill.

The borings taken in 1989 were continuously sampled to a maximum depth of ten feet. The two borings taken in the area of the future construction trailer were both sampled to a depth of 8.5 feet because they each hit granite, interpreted as "shore protection?" (Warren George 1989:HP-2, HP-3). The soil above that level in each boring was fill containing gravel and brick. It extended down to an elevation of about one foot or was about six feet thick. Because the planned construction trailer area will only impact two feet below surface, it will not penetrate below the depth of the fill.

The two borings taken in the area of the planned road widening in the northeastern part of the Hunts Point W.P.C.P. were also continuously sampled. The boring located to the east of this planned impact was taken to a depth of five feet. The entire sample was fill with some coal fragments found near the surface. The western most of the two borings was taken to a depth of ten feet. It also contained fill throughout. Assuming that the road widening contains similar stratigraphy, its two foot impact will not penetrate below the depth of fill.

Dredging Data

The DEP has no record of any dredging at the Hunts Point W.P.C.P. (Dennis Rizzo, DEP, personal communication).

Summary

The analysis of the historic maps and boring data clearly demonstrates that the planned land-based impacts from the dockwork contract in the Hunts Point W.P.C.P. will not reach below the depth of fill. In the absence of any dredging data indicating the removal of soils in the area of planned marine work, it must be assumed that the marine work for the new Hunts Point pier will impact into a possible earlier land surface. Therefore there is a moderate potential for encountering prehistoric archaeological deposits.

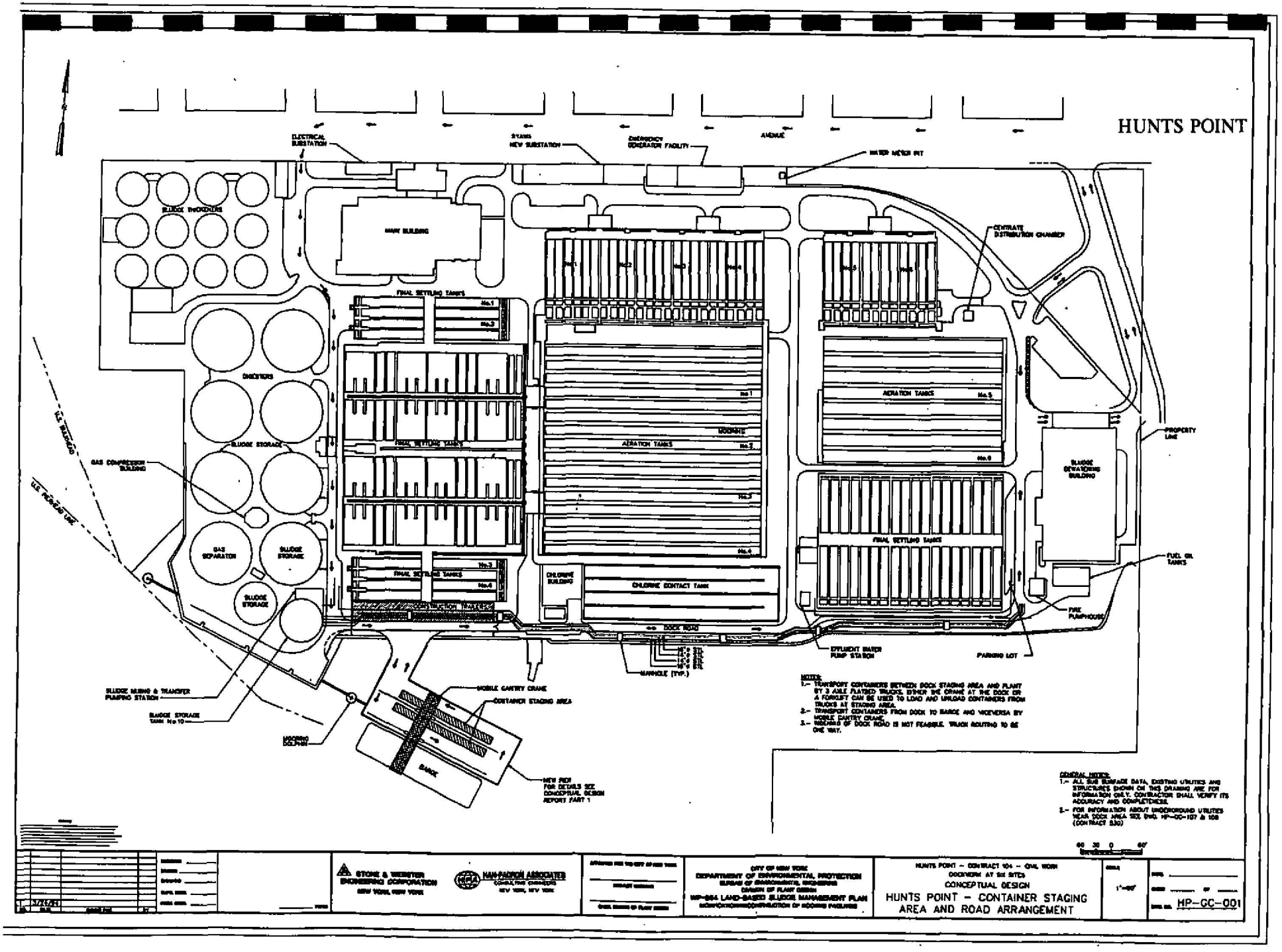


Figure 3 Conceptual design plan for the Hunts Point W.P.C.P..

Figure 4 Prehistoric sites within one mile of the Hunts Point W.P.C.P. on the U.S.G.S. 7.5 minute quadrangles for Central Park, New York - New Jersey and Flushing, New York.

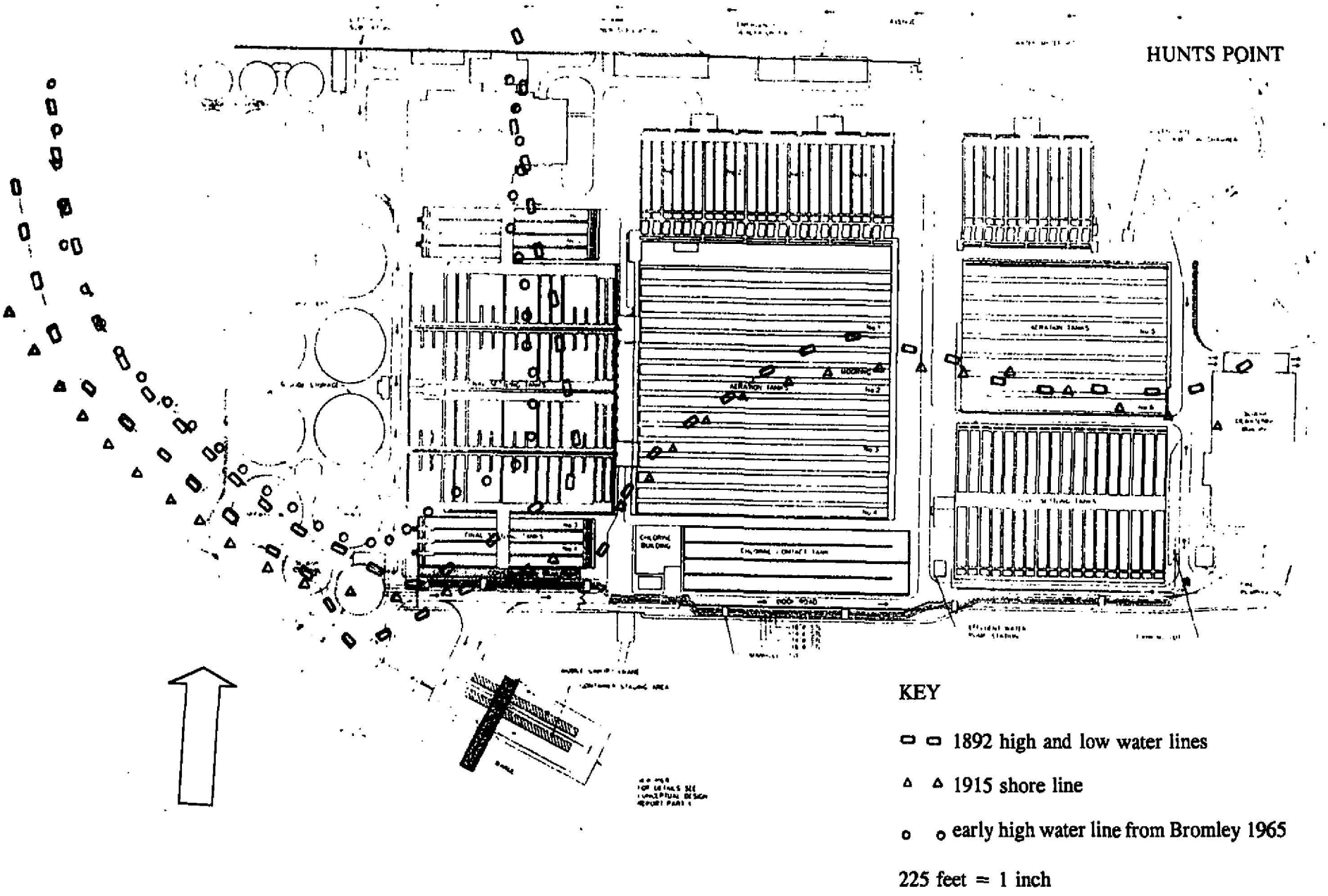


Figure 5 Composite of historic shorelines onto the conceptual design drawing of the Hunts Point W.P.C.P.

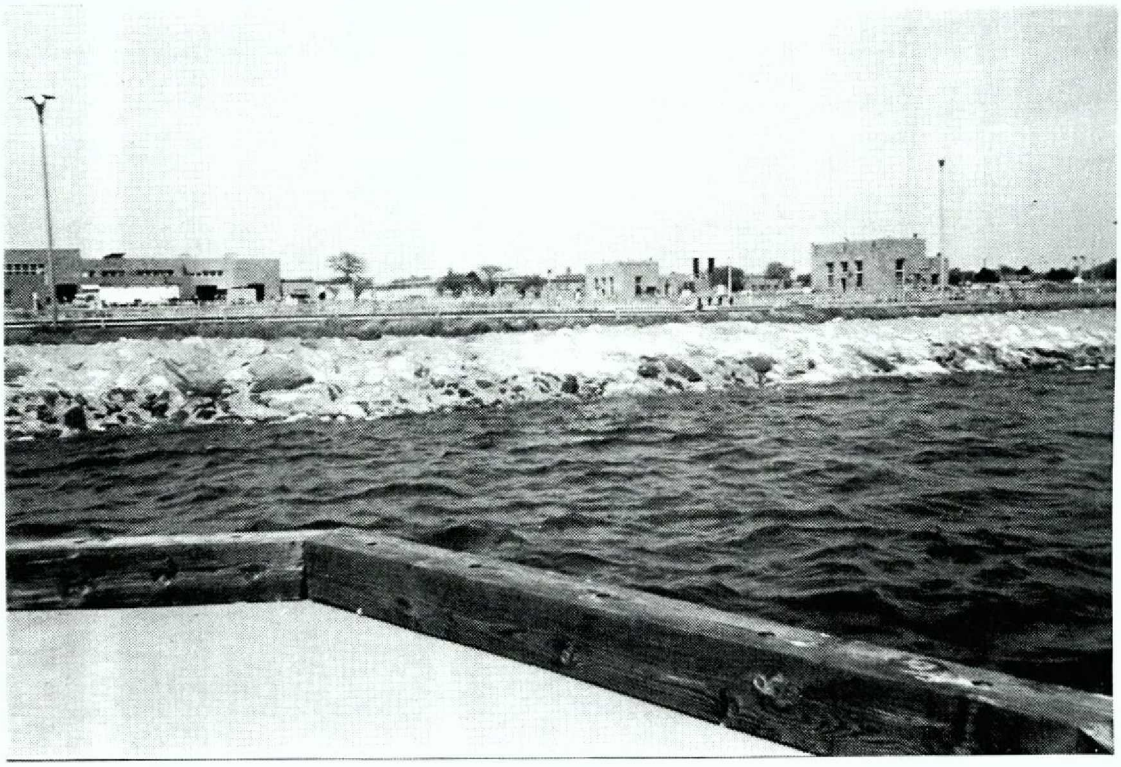


Figure 6 Photograph of the future location of the new pier and construction trailers at the Hunts Point W.P.C.P. taken from the mooring dolphin facing north.

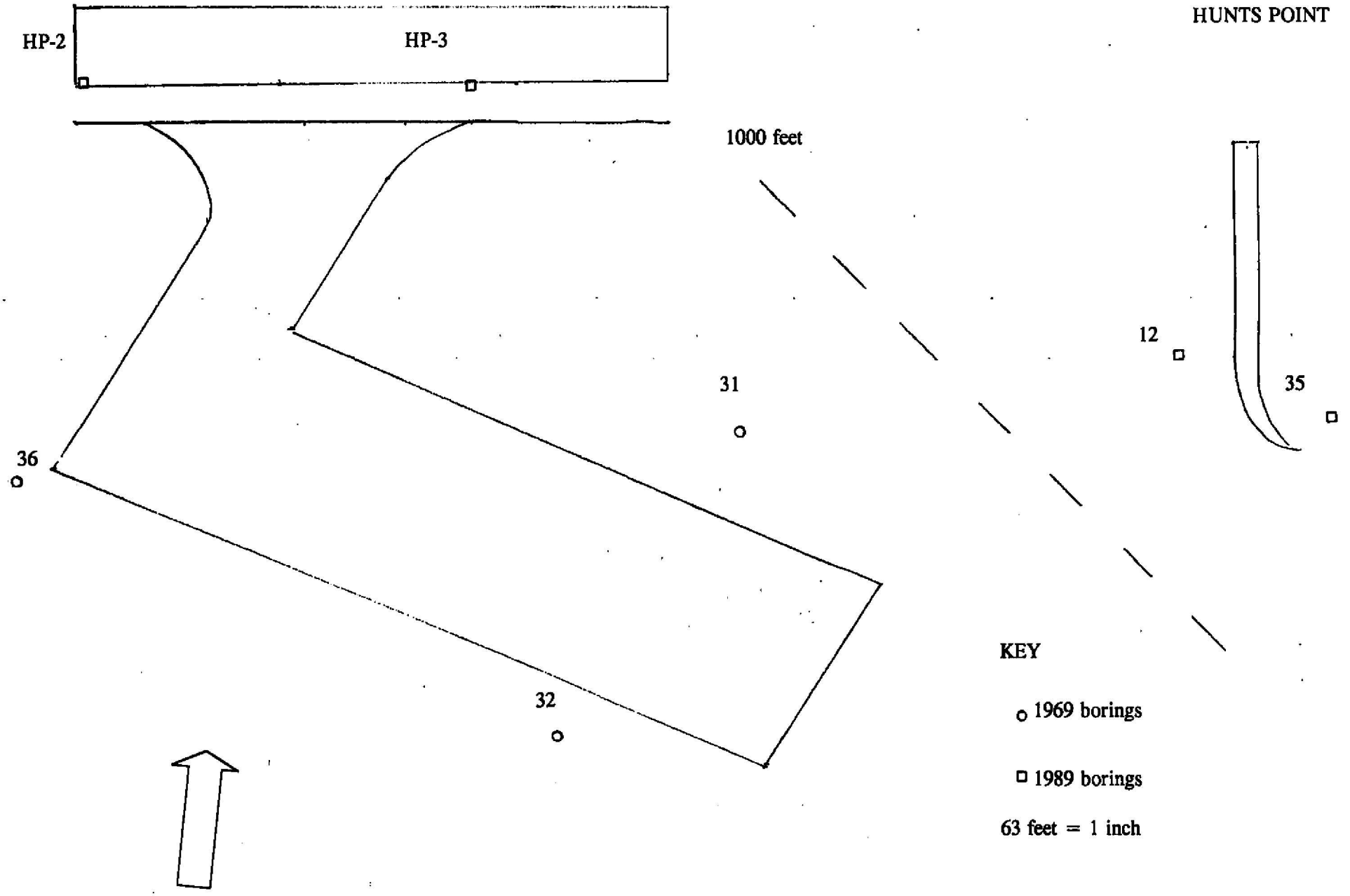


Figure 7 Location of borings in relation to the planned impacts at the Hunts Point W.P.C.P.

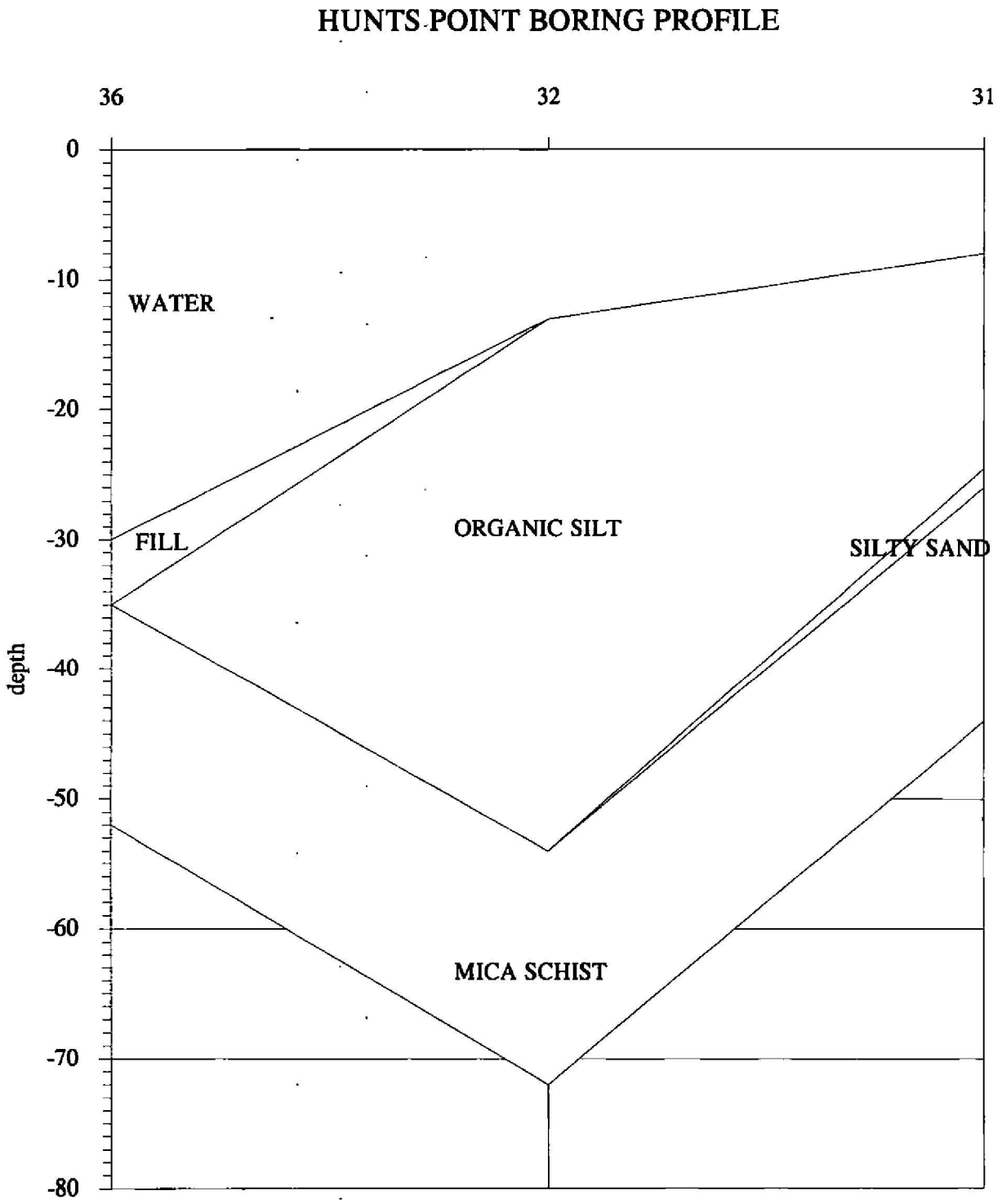


Figure 8 Generalized stratigraphy from selected 1969 borings around the dock area of planned impacts at the Hunts Point W.P.C.P.

RED HOOK

The work currently planned at the Red Hook W.P.C.P. will be on the deck area (see Figure 9). The deck area is pile construction built partially over water. The planned work will involve rehabilitating the decking support structure and possibly replacing or adding piles. Figure 10 depicts the current conditions in that area. Potential archaeological resources identified in the 1990 GCI report include prehistoric resources and 19th century fill. Research to evaluate this potential was conducted using historic maps, available boring data and the data from previous archaeological excavations at the plant.

Prehistoric Resources

The New York State Museum gives the Red Hook W.P.C.P. a "high probability of providing prehistoric archaeological data". The museum bases its probability rating on the plant's physiography, the fact that intact deposits may be buried beneath fill or below the water table and the project area has similar terrain to other prehistoric sites in the area. However the New York State Museum does not have any record of prehistoric sites in Brooklyn within one mile of the Red Hook plant. Little is known of the prehistory of Brooklyn due to the early development of the area (Parker 1922:582). However three nearby sites were reported by Bolton (1934:145). See Figure 11 for their reported locations. A possible camp site, as evidenced by "waste materials, fire pits and implements" was found to the southwest of the project area (Bolton 1934:145). During the time of European contact, the Manhattan Native American population reportedly moved to a "refuge" in Brooklyn, not far from the project area location during colonial times (ibid.). Additionally the State Museum lists a nearby Manhattan site located just across the East River near the Manhattan Bridge. This site was originally recorded as an unnumbered site depicted as a village on Arthur C. Parker's 1922 map.

While prehistoric archaeological sites were not generally recorded during the historic development of the Wallabout area of Brooklyn, prehistoric populations would have undoubtedly found this area desirable, with its nearby land and water resources. The Red Hook W.P.C.P. was probably tidal marsh during early historic times. The GCI 1990 report uses the often quoted description of the area as "mud flats and swamps" (GCI 1990:13). This being the case, it seems unlikely that any type of major prehistoric settlement would have existed within the project area. However the project area would have undoubtedly been visited on a temporary or intermittent basis during prehistory. In fact, Grumet documents a group called "Marechkawick" living in the Wallabout Bay area of Brooklyn during the European contact period (Grumet 1981:27). The known existence of this population leads one to the conclusion that the Wallabout

area was quite likely an important resource during prehistory.

Historic Maps and Research

Because both prehistoric resources and historic period fill are of potential archaeological interest at the Red Hook W.P.C.P., the historic maps were used for the identification of submerged or filled historic land surfaces. Analysis of historic shorelines was previously done in this area of the plant prior to construction of the dewatering building (GCI 1991). That line of cartographic research has been extended to cover the currently planned impacts. Two early shorelines were identified within the plant, to the south of the project impact area; 1) an "early water line" as depicted in the 1886 Robinson's Atlas and 2) the bulkhead line as of 1819 from the 1911 Brooklyn Topographical Bureau's Map of the Closing of Little Street (see Figure 12). Both of these early shorelines were obviously additions to these later maps. The 1911 street closing plan depicts all of the streets, or former streets in the project impact area vicinity at that time. The locations of these streets were overlaid on a series of historic maps to provide a cartographic composite of the shore and bulkhead lines from several time periods (see Figure 13).

Figure 13 depicts the historic shore lines overlaying the conceptual design plan of the impact area at the Red Hook W.P.C.P. These include the two early shorelines outside of the project impact area (discussed above) as well as two late nineteenth and two early twentieth century shorelines dating from 1857, 1886, 1911 and 1926. The 1857 data is from the Harbor Commissioner's series (Kurth & Rosa). The 1886 and 1911 maps are those referred to in the previous paragraph. The 1926 shoreline was taken from the War Department Port Series.

Both the 1857 and the 1886 shorelines fall on the corner of the dockwork contract project area as depicted in Figure 13. These are therefore just outside of the project impact area. Therefore the planned dockwork at the Red Hook plant will not likely impact these earlier shorelines. However some of the bulkheading which was added between 1886 and 1911 may be affected by the planned dockwork, as will the changes made between 1911 and 1926.

There is no data on the bulkhead structure depicted on the Topographic Bureau 1911 street closing map. However evaluation of that shoreline retention structure could be made based on certain assumptions using available data from 1872 and 1926. In 1872, city surveyor Richard Butt drew a plan of the bulkhead and profile of Little Street, north of Marshall Street (see Figure 14). The plan shows the

overhead view of Little Street, north of Marshall Street. There is a pier shown at the end of Little Street. The profile view on Figure 14 shows this pier constructed on piles. Although there is no interpretation or key to the profile under Little Street, it appears that there were two or three layers of fill, raising the elevation of Little Street to meet the pier at ten feet above the low water line. The end of Little Street at that time was identical, in plan, to its 1886 location, as shown on Robinson's Atlas. Therefore the assumption is made that no changes to Little Street or its pier were made between 1872 and 1886. The War Department Port Series of 1926 provides details of bulkheads and piers. It reports that the deck at the Brooklyn Edison Company (now the Con Edison substation adjacent to the project impact area) bulkhead was ten feet above mean low water. Therefore it seems likely that Little Street pier was simply extended and improved in that part of the Red Hook W.P.C.P. project area between 1886 and 1926.

The former Brooklyn Edison Company bulkhead was a concrete bulkhead and deck which extended for a length of 425 feet around the north and east sides of their plant (War Department 1926:527). The eastern side of the plant corresponds with the current area of planned impact. It is depicted on Figure 13 with a line of squares. One may assume that the bulkhead line was actually to the west of where it is depicted and that it was the decking only which extended into the current project area. This assumption is based on the fact that the Brooklyn Edison Company would have built their plant up to the bulkhead line and then extended decking from there into the East River. Additionally, the property boundary has not changed over time. The fact that the 1911 and 1926 shorelines are shown within the Red Hook W.P.C.P. property implies these were not actual land-based shorelines, but rather decking or piers constructed out from the bulkhead. Figure 13 also shows another 1926 structure within the southeast corner of the current Red Hook W.P.C.P. project impact area. It was a Brooklyn Navy Yard Coal Pier, one of two built on open piles (see Figure 13). This pier extended seventy feet from the Navy Yard into the East River (War Department 1926:526). These 1926 structures are not of archaeological concern. Possible remains of earlier decking, piers or bulkheads dating from 1886-1926 would have been incorporated into further construction by 1926. Therefore there is little likelihood that any remains from these time periods would be found during the planned dockwork contract.

Research has shown that there is no potential for the dockwork contract to adversely impact historic structures related to bulkheading or piers at the Red Hook W.P.C.P. However during the course of research another potentially important archaeological resource was identified; humans remains dating to the Revolutionary War. Wallabout Bay was the well known anchorage for British prison and hospital

ships during the Revolutionary War. Conditions on these crowded vessels were such that thousands of soldiers died during imprisonment rather than from the bullets of war. Bodies were taken to shore and buried in the sand in shallow graves. As the sand eroded, skeletons would become exposed and many would wash into Wallabout Bay. One account from 1803 reported "twenty hogsheads" of bones were collected and later buried in thirteen "capacious coffins" (Munsell 1882:39-40). Other research has found that human remains were found within the western portion of the Navy Yard, directly to the south of the Red Hook plant, as recently as 1939 (Geismar and Oberon 1993:30). It seems likely that bones of Revolutionary War prisoners could now still be buried under fill or water within Wallabout Bay. This conclusion extends to the Red Hook W.P.C.P. project impact area.

Boring Data

A series of borings were taken at the Red Hook W.P.C.P. in 1971 prior to the development of the plant. They were one and a half foot samples taken at five foot intervals. Figure 15 shows that location of the borings in relation to the planned impact and barge slip. Figure 15 may be compared with Figure 9 to better see where within the plant the impact area is located. The stratigraphy from three borings was projected onto a continuum. The profile is attached as Figure 16.

Paving, sand, wood and concrete overlaid water in the eastern two borings; numbers 74 and 105. Boring number 73 had a void between the wood and organic silt layer. The organic layer was found in all three borings. Pieces of wood and shell were noted inclusions only in boring 73. The central boring had a layer of fill with brick fragments below the organic silt layer. This was underlain by culturally sterile soil. This sterile sand layer began at depths of 43 and 45 feet in borings 73 and 74, respectively. None of the soils found below the water level in boring 105 were noted as have inclusions of possible cultural material. However it may be inferred that the organic silt layer which was found in all three borings, containing wood and shell in the western most boring, is potentially an artifact bearing stratum of archaeological interest, as is the fill layer found beneath it in boring 74.

In assessing whether or not the fill in these borings was of nineteenth century origin, the stratigraphy can be compared with the cartographic data. The 1872 Butt profile shows water under the Little Street pier (see Figure 14). This would have been located to the south of the current project impact area within the footprint of the truck loading building. However boring 73 did not hit water. Therefore at least the top of, if not the entire, organic silt layer encountered in boring 73 would have been deposited after 1872.

Furthermore, the silt deposition probably occurred after 1886, based on the above discussion of the historic map data.

The presence of a fill layer in boring 74 indicates that fill could have been placed after 1886 and that the organic silt may have washed in after that fill episode. Other research has surmised that fill may have been dredged from one part of the Navy Yard and deposited in another (Church and Rutsch 1982:9). The nature and source of the fill layer in the borings taken within the Red Hook W.P.C.P. is unknown. However it was not deposited earlier than 1886.

Dredging Data

One possible explanation for the complex stratigraphy found in the boring logs examined above is dredging. If the East River had been dredged to a depth of about forty feet in the area of planned impact, the fill found in boring 74 could have been deposited on top of that submerged surface. The organic silt may have then washed in with the tides, covering the fill and exposed sand.

During the 1930s, the East River in the vicinity of the Brooklyn Navy Yard was dredged every two years. This practice may have gone on longer. Later records were not examined because the map of the area dredged indicated that dredging stopped to the east of the coal piers, outside of the Red Hook W.P.C.P. project impact area. However it may be of interest to note that the navy recorded a silting rate in the Navy Yard Basin of about two feet per year and that the 1941 permit allowed dredging to depths of 51 feet (National Archives 1938-41).

Figure 16 depicts the organic silt layer in boring 74 at fifteen feet thick. Therefore, using the two foot per year silting rate, this stratum may have washed in over a period of only seven and a half years. Assuming the silt layers in the other two borings shown on Figure 16 were also redeposited, it would have taken three to fourteen years to silt in this area. Documentation on dredging for the vicinity of planned impacts at the Red Hook W.P.C.P. has not yet been identified (Dennis Rizzo, DEP, personal communication). However it stands to reason that the silt has built up in the project impact area over the past fourteen years and that dredging may have taken place at that time. Nevertheless, DEP records dating from the plant construction in 1977 indicate it is unlikely that any dredging in the vicinity of the decking area has been done since that time.

Summary

Analysis has been presented on potential for the preservation of archaeological resources for the Red Hook W.P.C.P. planned project impact area. Three types of resources have been discussed; prehistoric resources, 19th century fill and Revolutionary War human remains. The potential for the recovery of prehistoric resources is low. However there is the possibility that the area was utilized during that time on a temporary or intermittent basis. It seems possible that late nineteenth century fill (post-1886) exists buried beneath the silt under the planned impact area. Bulkheading and fill retention structures are unlikely to be found within the planned impact area. Historic structural changes were related to additions and removals of piers and decking and would have been subsumed within more recent constructions within the decking of the plant. The potential for disturbing redeposited human remains at the Red Hook W.P.C.P. is high within, or below, the silt or fill layers underneath the decking in the project impact area only if the area had not been dredged deeper than the eighteenth century surface.

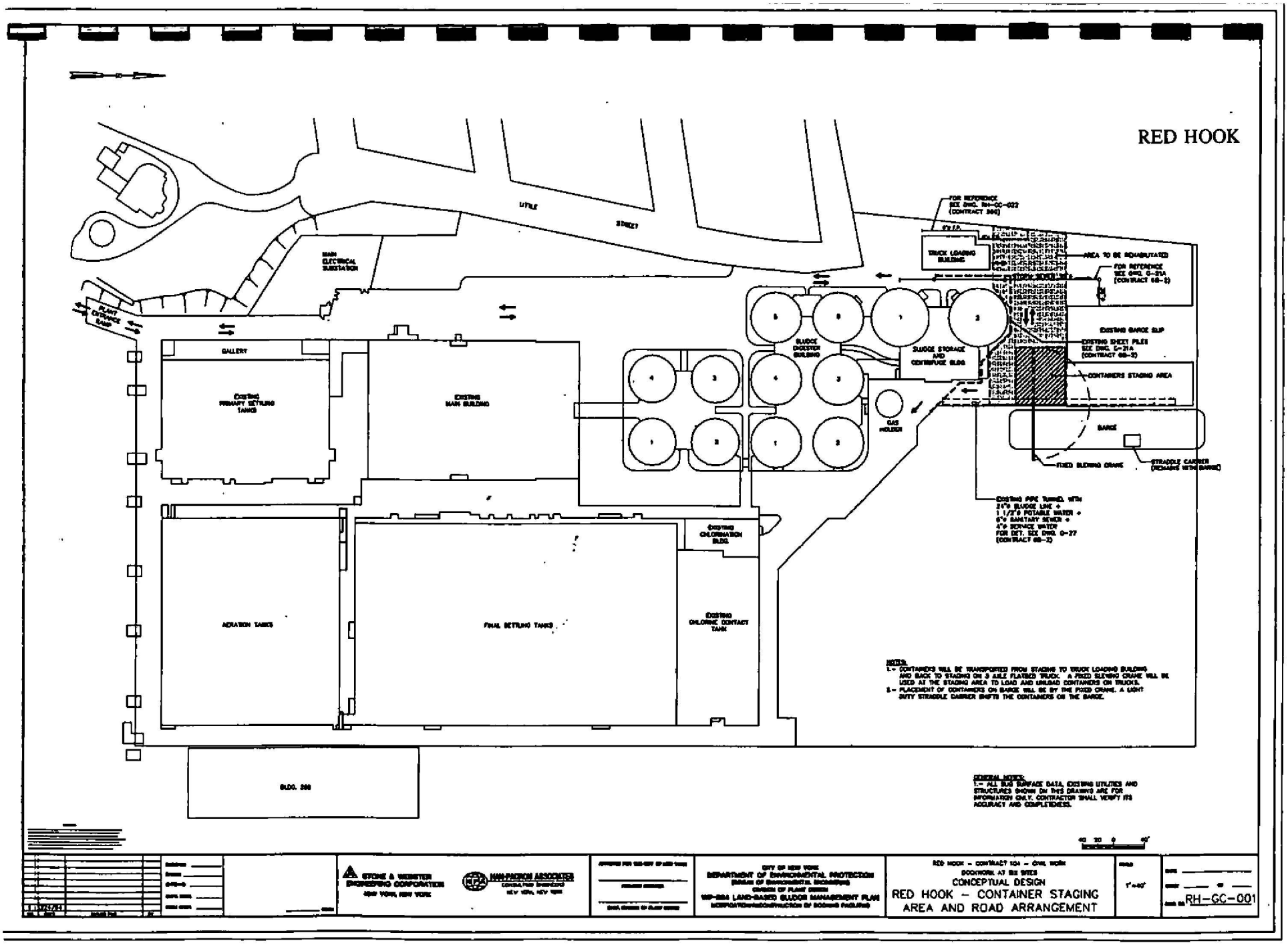


Figure 9 Conceptual design plan for the Red Hook W.P.C.P..

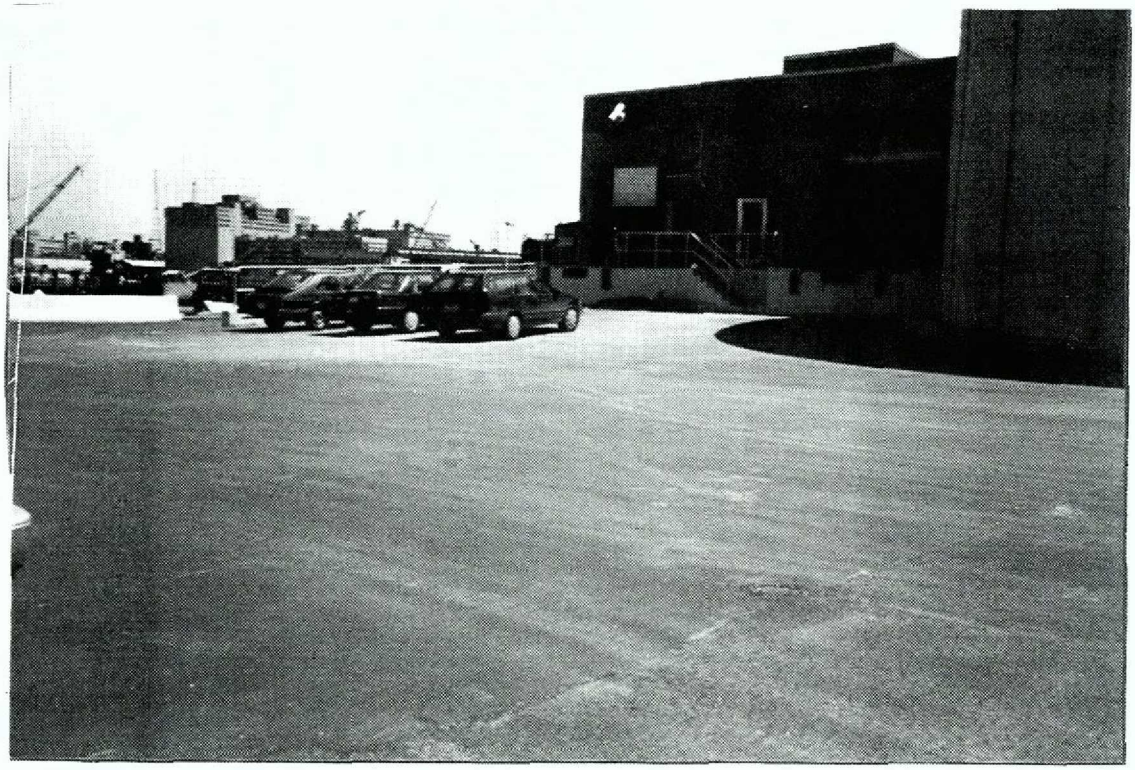


Figure 10 Photograph of the area of planned impact at the Red Hook W.P.C.P. taken from the western barge slip facing southeast.

Figure 11 Prehistoric sites within one mile of the Red Hook W.P.C.P. on the U.S.G.S. 7.5 minute quadrangle for Brooklyn, New York.

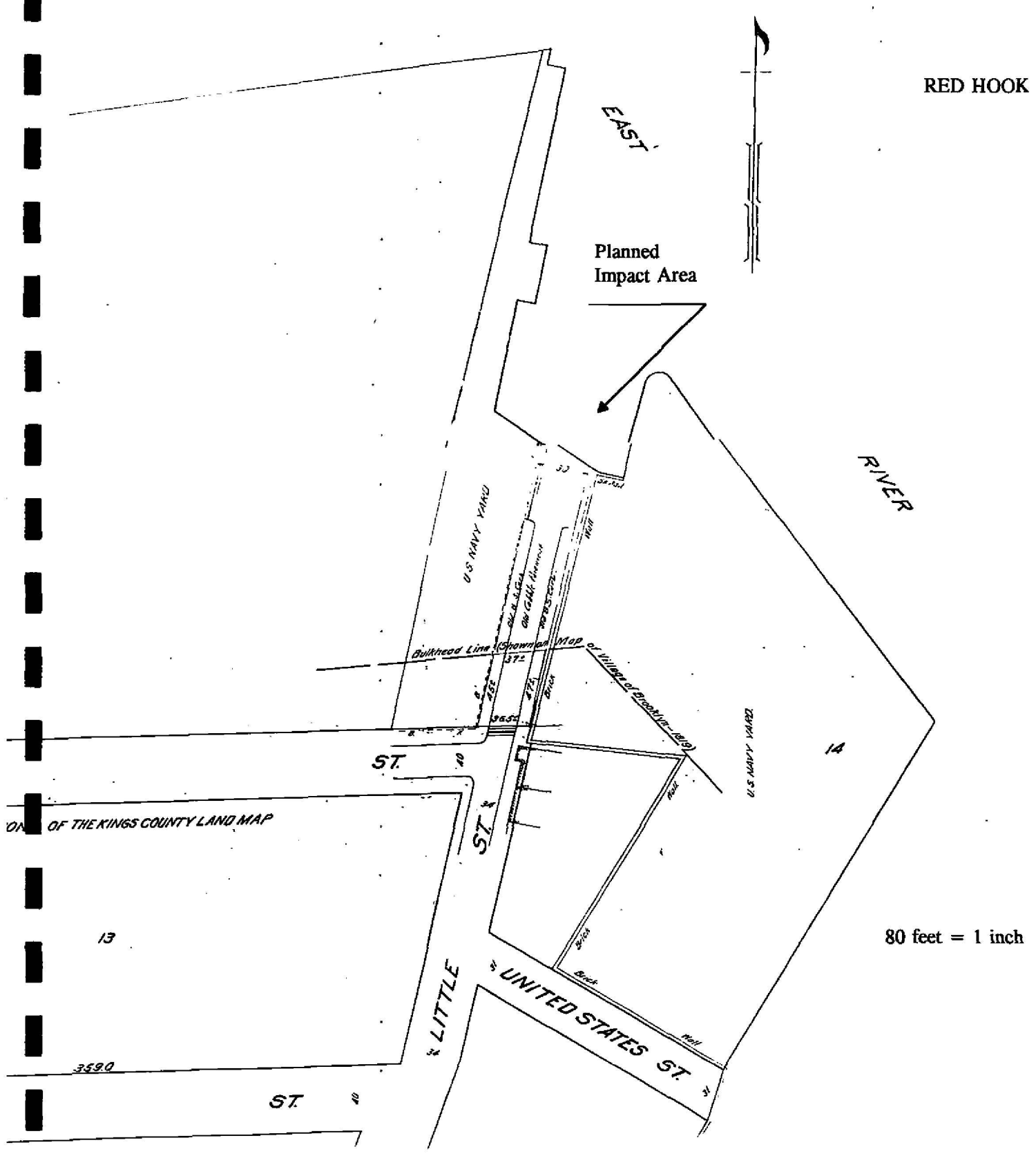


Figure 12 Map of the closing of Little Street in 1911 showing the location of planned impact area.

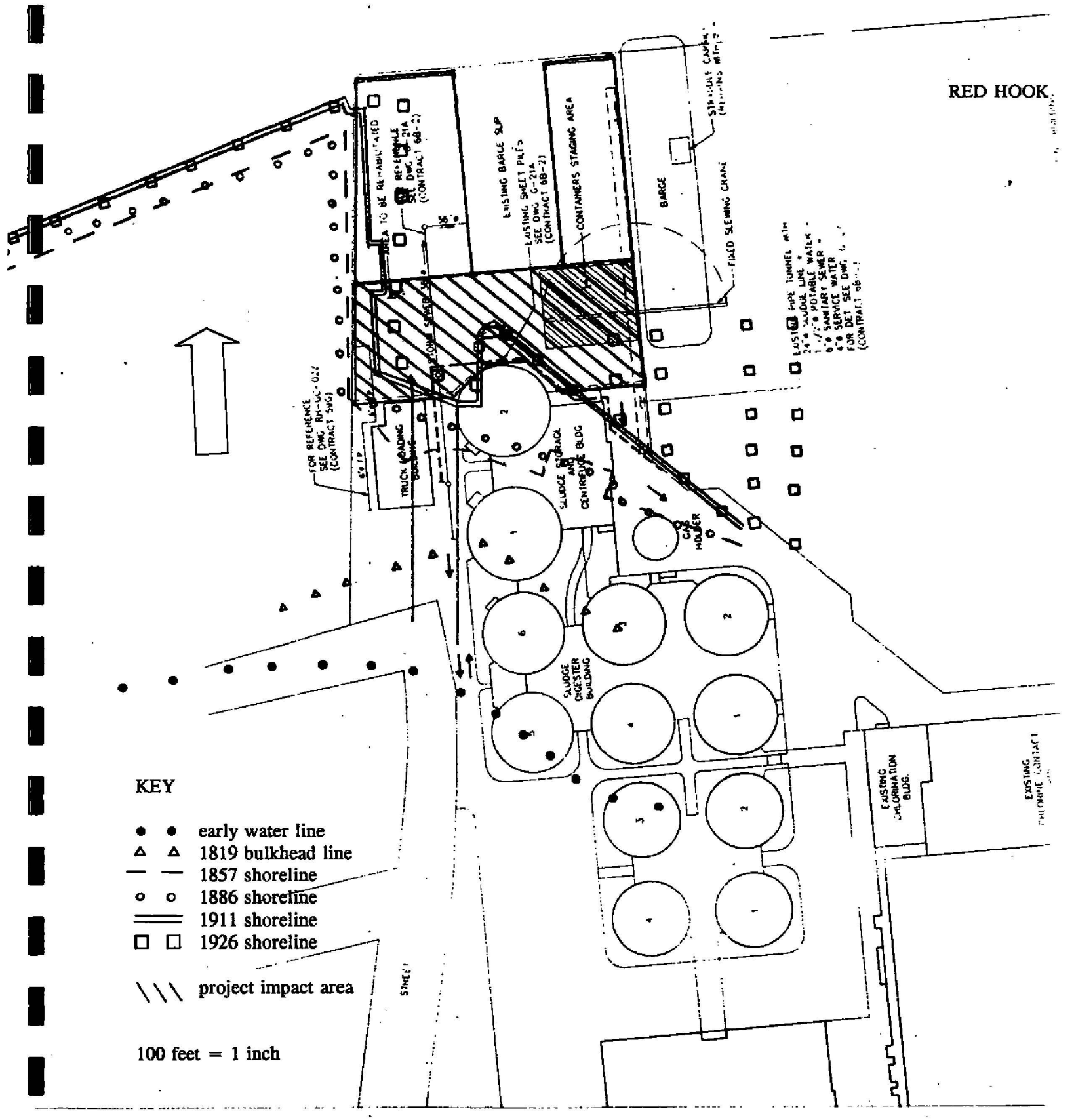
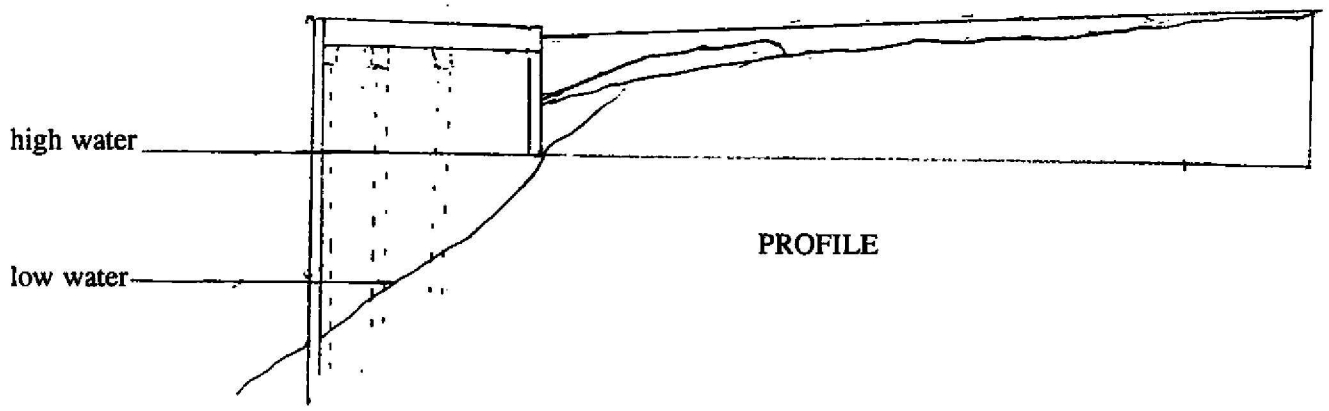
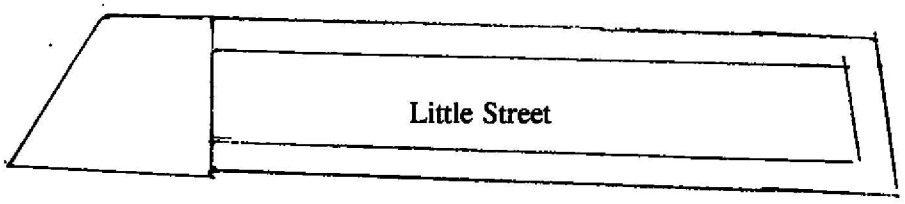


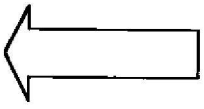
Figure 13 Composite of historic shorelines onto the conceptual design drawing for the planned impact area at the Red Hook W.P.C.P.



PROFILE



PLAN



SCALE

40 feet = 1 inch horizontal
8 feet = 1 inch vertical

Figure 14 From a tracing of part of Richard Butt's 1872 Plan of Bulkhead and profile of Little Street Between Marshall Street and the River.

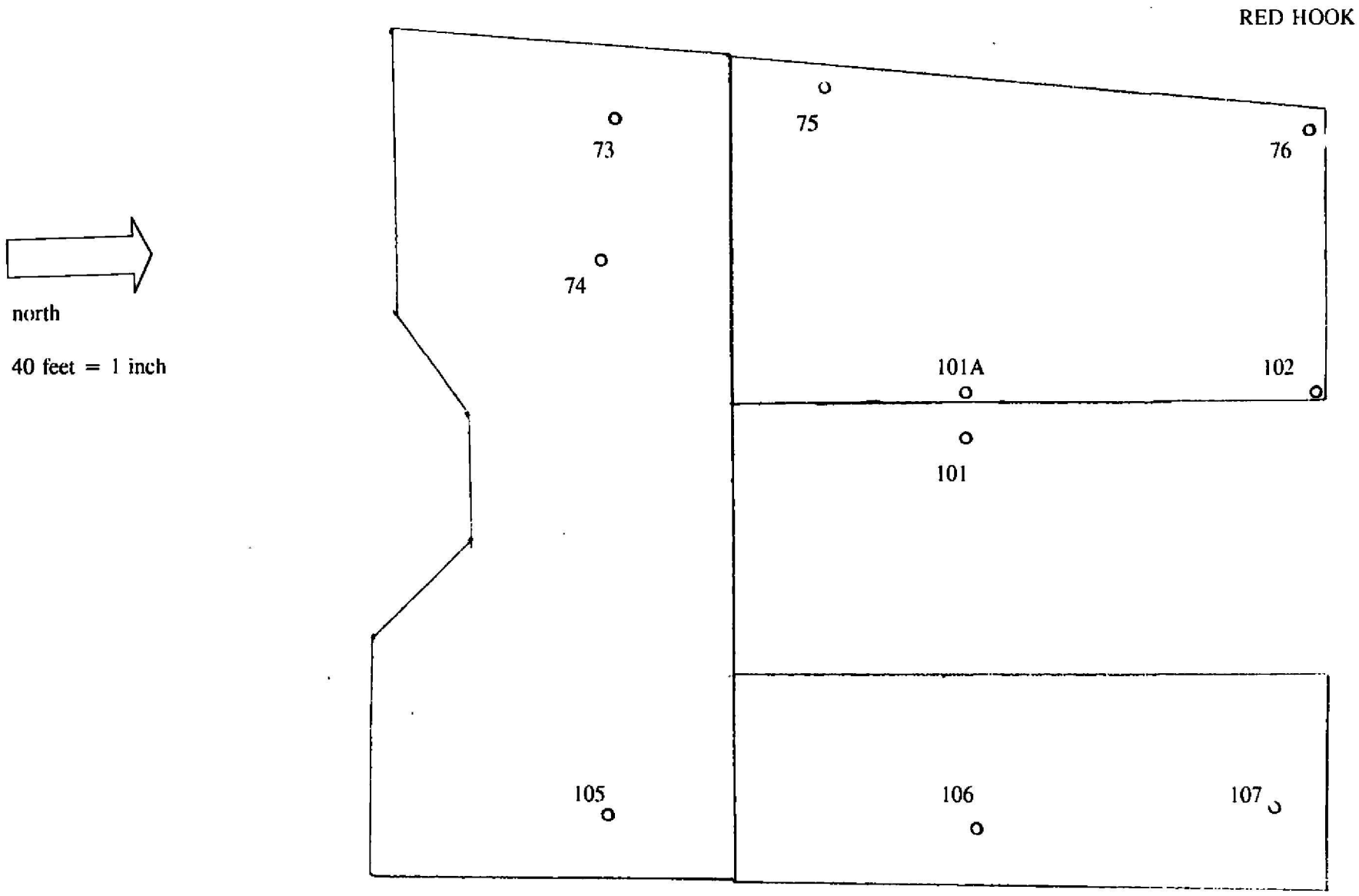


Figure 15 Location of borings in relation to planned impacts and barge slip at the Red Hook W.P.C.P.

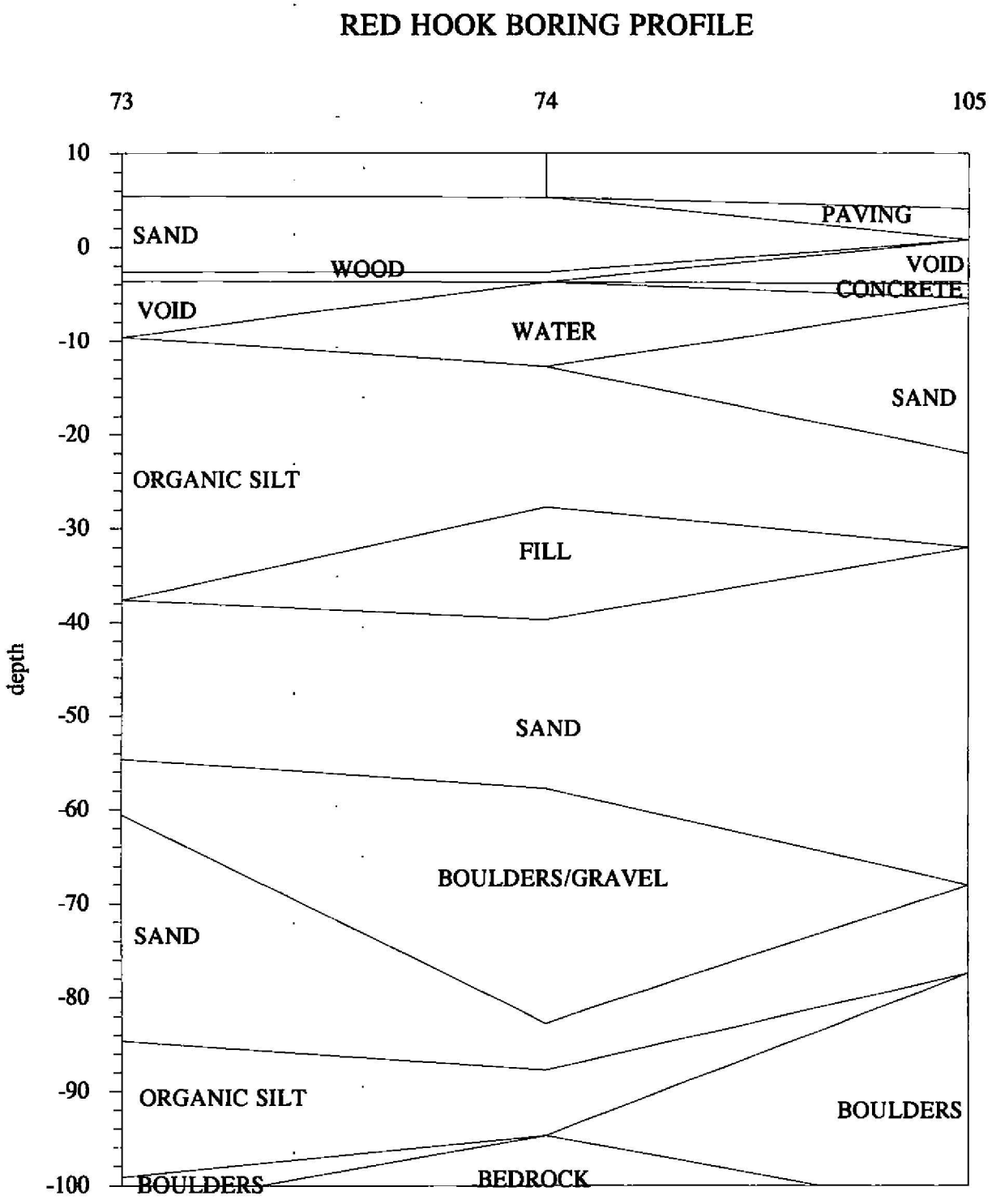


Figure 16 Generalized stratigraphy from selected 1971 borings in the area of planned impact at the Red Hook W.P.C.P.

26TH WARD

The planned dockwork at the 26th Ward W.P.C.P. poses a special problem. This is because the dock access road, which is scheduled to be widened, goes through the Pennsylvania Avenue Landfill Hazardous Waste Site, as does the concrete pad staging area. In addition, the contract will include impacts from marine work including the construction of a trestle on piles (see Figure 17). Figure 18 is a photograph of part of the project area depicting the current conditions. Potential archaeological resources could date to prehistory.

The Department of Sanitation opened the Pennsylvania Avenue Landfill in 1956 to receive "residential, commercial, incinerator, street cleaning, construction and demolition wastes and waste oil" (URS Consultants 1994:1-2). Legal dumping was suspended several times for a total of about ten years, however evidence was found that illegal dumping of hazardous wastes was still taking place. The draft of the remedial investigation report is quoted.

> In 1982, the New York Senate Select Committee on Crime received testimony that between 1974 and 1980 waste oil, sludges and plating materials were deposited in New York City landfills, including Pennsylvania Avenue Landfill...The exact quantities and locations of hazardous wastes disposed are unknown (ibid.)

This testimony led to the development of a plan for remediation.

A series of borings and soil samples were taken in conjunction with the remediation report. Four of them were from the vicinity of the 26th Ward W.P.C.P. dock access road. Additionally, a series of twenty borings were taken in 1969 in advance of the construction of the road and dock. These borings, as well as aerial photographs and historic maps, were evaluated to determine the potential for the preservation of archaeological resources.

Prehistoric Resources

The New York State Museum gives the 26th Ward W.P.C.P. a "high probability of producing prehistoric archaeological data". The museum bases its probability rating on the plant's physiography, the fact that intact deposits may be buried below fill or below the water table, similar terrain to other sites in the area and the fact that there have been previously reported prehistoric sites within one mile of the project area. They further feel that the margin of error in site location of their recorded data is great enough to believe that a site actually "exists in or immediately adjacent to" the project area location and that they believe a prehistoric archaeological site could be impacted by the dockwork contract.

The State Museum has recorded four sites within one mile of the 26th Ward plant. Figure 19 depicts the general location of each of the known prehistoric sites in the vicinity of the 26th Ward W.P.C.P. Four sites were reported by Arthur C. Parker for the New York State Museum in 1922. The western most of his sites was earlier reported by Thompson, as credited by Parker in his description of the site: "There are immense shell heaps at Canarsie or Flatlands, and on Bergen island (Thompson, p.66)" (Parker 1922:582). Solecki also found shell middens in that area during the World War II era. He recorded them in association with Native American artifacts dating from the Woodland period through European contact. Also in that general vicinity, Bolton reports a village site , mapped at the western edge of Figure 19 (Bolton 1934:146).

Parker's work was vague with regard to specific locations and it is possible that the site he mapped as a shell heap, located by the State Museum within the 26th Ward W.P.C.P. plant, is the same as the shell heap site reported earlier by Thompson. The museum cross-references the two sites although they map the sites as two distinct circles (see Figure 19). The other two sites identified by the State Museum were unnumbered by Parker and depicted on his map with the symbols denoting a camp site and a village site.

Historic Maps and Research

All of the pre-1950s historic maps and aerial photographs examined, including those in the GCI 1990 report, depict the project area as marsh and partially submerged under the waters of Jamaica Bay. The 26th Ward W.P.C.P. dock access road, built on top of the Pennsylvania Avenue landfill, was formerly marsh prior to the creation of the landfill. The pre-landfill conditions are easily seen in Figure 20, the 1940 U.S. Coast and Geodetic from the GCI 1990 report.

Boring Data

Figure 21 depicts the locations of earlier borings taken from the 26th Ward W.P.C.P. Both the 1969 and the 1994 series taken as part of the remediation report are shown. The draft remediation report identified two types of fill in the soil samples taken for their report, dredged sand fill and fill from waste dumping. "The method of filling included dumping wastes into tidal wetlands which had been enclosed by dredged sand berms" (URS 1994:1-2, 3-12, 13). The combined depth of the fill layers found in the four samples taken in proximity to the dock access road ranges from 13 to 32 feet.

Twenty-five years ago, in 1969, a series of twenty borings were taken in advance of the pier construction.

They were spaced at 200 feet or less and were sampled at five foot intervals. The stratigraphy from these borings was projected onto a continuum. The boring profile is attached as Figure 22. These borings contained only one fill layer and it was considerably shallower than the fill found in the URS borings. This is not surprising since all four URS borings were taken slightly to the west where the elevation of the landfill rises. The 1969 fill ranged from 0.0 to 13.6 feet thick, getting shallower to the south toward Jamaica Bay. Only two of the ten borings with the sand or fill layer were noted to have any inclusions which may have been of cultural origin. Boring 48 had a trace of shells and boring 45 contained metal. The fill layer was underlain by an organic silt deposit, ranging in depth from 3.0 to 17.5 feet, slightly thicker than the URS borings. The proposed depths of impact for the dockwork contract road widening and staging area are only two feet. Therefore the planned impacts will not penetrate the fill layer and will not disturb potential prehistoric archaeological resources in the area of the land-based work.

Dredging Data

Until the early twentieth century, the Jamaica Bay was composed of marshland surrounded, west through east, by a moat and protected to the south by the Rockaway peninsula. In the first decade of the twentieth century, the City of New York developed a master plan which would forever change Jamaica Bay. The City would begin to develop the bay as a major seaport (National Academy of Science 1971:43). Initial plans called for dredging a channel twelve feet deep between the pierhead and bulkhead lines and twenty feet deep for a distance of one thousand feet beyond the pierhead line (Jamaica Bay Improvement Commission 1907:map). "In the western and northern part of the moat, a channel was dredged that ultimately became 1,000 to 1,500 feet wide and 30 to 40 feet deep" (National Academy of Science 1971:43). The location of the pierhead line has not changed since the Jamaica Bay Improvement Commission plans were prepared. Soundings depicted on the current U.S.G.S. quadrangle show the area outside the pierhead line of the 26th Ward W.P.C.P. at 35 to 40 feet deep (see Figure 19). However, without actual records showing how much was dredged from where, one cannot be certain that the proposed marine work will be done in a location which has been dredged. Dredging was presumably also conducted in the project area during the 1950s prior to the creation of the Pennsylvania Avenue Landfill. The construction of the Landfill involved creating berms of dredged sand to enclose the former wetlands prior to the waste dumping, as stated above. This methodology begs the question, where was the dredging done?

While there is no current data available on the exact location and quantity of dredging, it seems likely

that the planned impacts from the marine work at the 26th Ward W.P.C.P. lie within parts of Jamaica Bay which were previously dredged, most likely in the early twentieth century as part of the improvements to establish a major seaport in the bay and possibly later as part of the creation of the landfill. Figures 19 and 20 may be compared to show the change in the depth of Jamaica Bay in the area of planned impact from 1940 to 1966. All of the depths depicted in the area of planned impacts on Figure 20, dating to 1940, are less than 30 feet. Figure 19, dating to 1966, shows that the depths have increased to greater than 35 feet. The change is presumably due to the dredging which occurred in the 1950s. Additionally, the DEP issued a contract in 1969 for construction of the pier which included dredging (Dennis Rizzo, DEP, personal communication). Although the documentation has not been found, the details of this work should show that the area of the planned marine work at the 26th Ward W.P.C.P. has been dredged to its current depth. In either case, there is a low potential for the preservation of submerged prehistoric archaeological resources due to previous dredging.

Summary

It has been shown that the planned dockwork at the 26th Ward W.P.C.P. will be conducted in a landfill which was built over a tidal marsh into Jamaica Bay. The planned land-based work will not create impacts below the depth of the fill and will therefore not disturb any potential archaeological resources. The potential for the marine work to impact submerged prehistoric archaeological resources is low because that area of Jamaica has been previously dredged, thereby removing any submerged prehistoric land surface which may have exited.

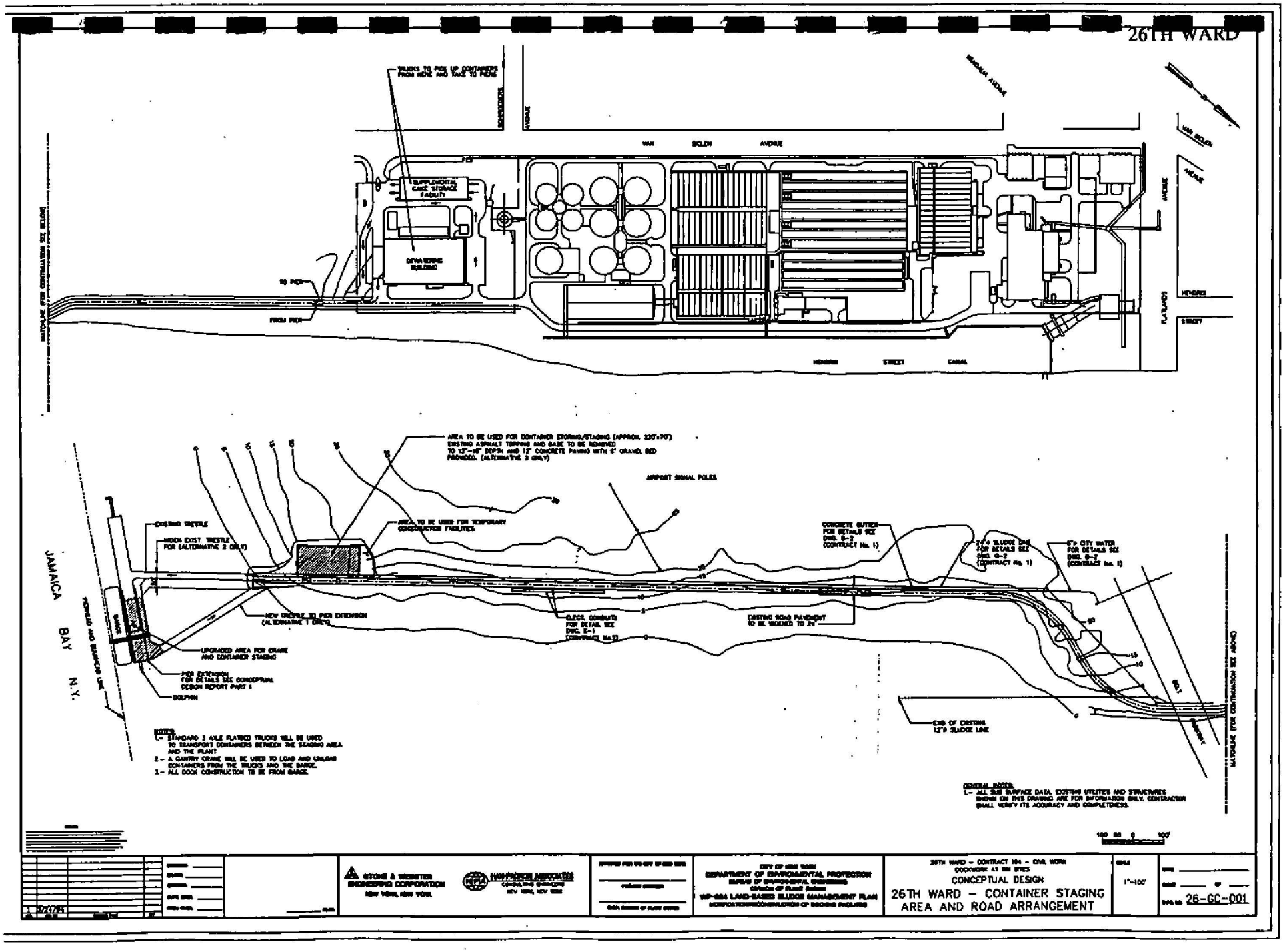


Figure 17 Conceptual design plan for the 26th Ward W.P.C.P..

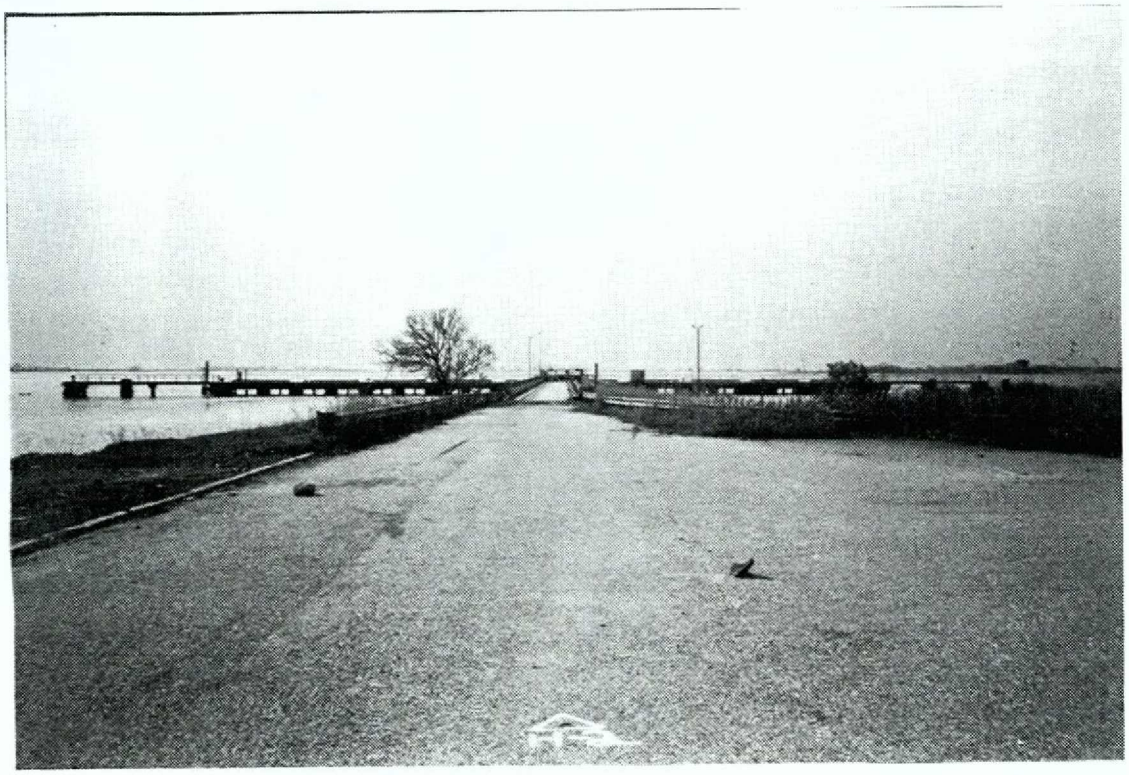


Figure 18 Photograph of the 26th Ward W.P.C.P. planned impacts from the future container staging area facing south toward the pier.

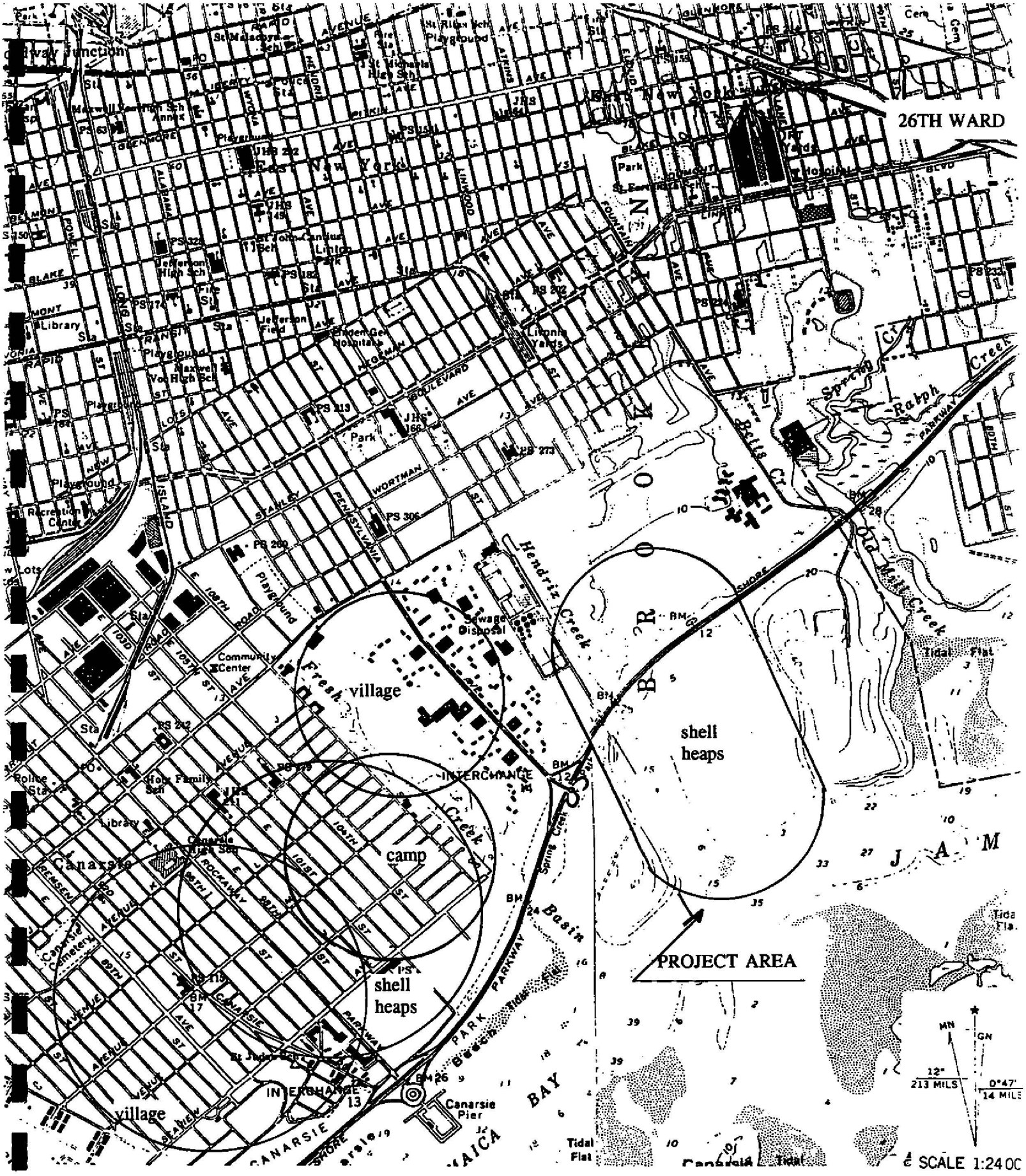


Figure 19 Prehistoric sites within one mile of the 26th Ward W.P.C.P. on the U.S.G.S. 7.5 minute quadrangles for Brooklyn and Jamaica, New York.

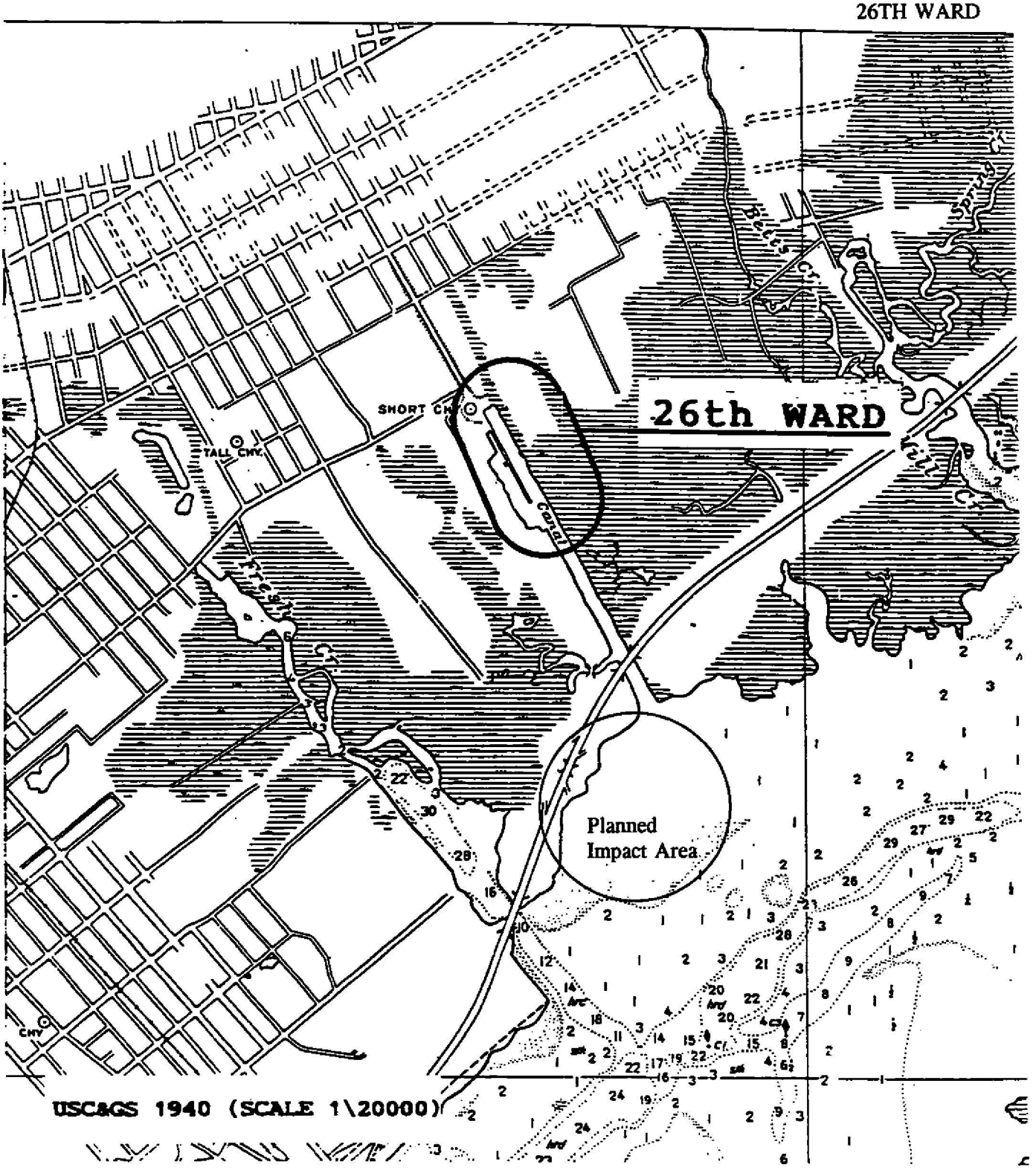


Figure 20 The 1940 U.S. Coast and Geodetic Survey showing the location of planned impacts at the 26th Ward W.P.C.P.

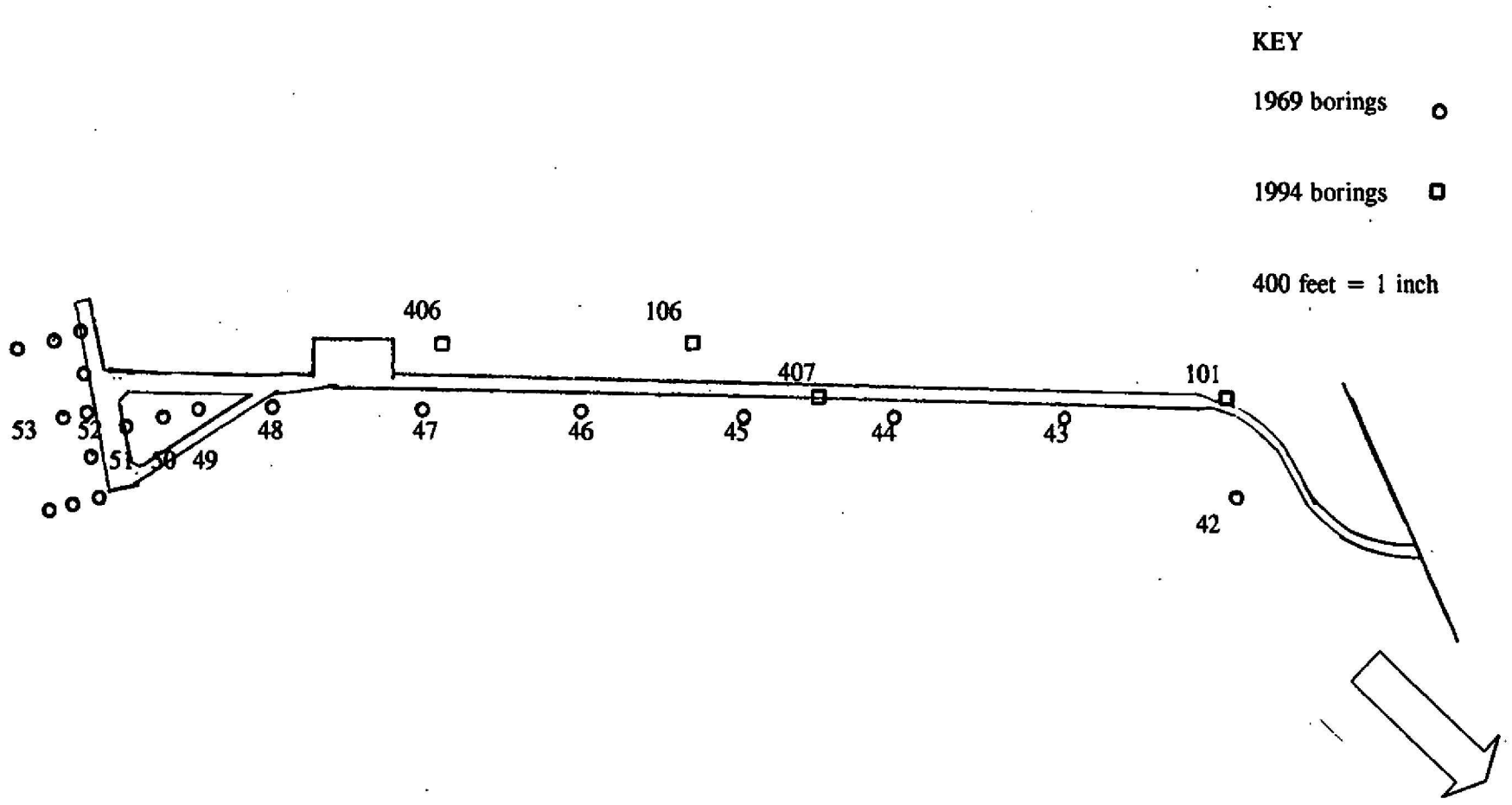


Figure 21 Locations of borings in relation to planned impacts at the 26th Ward W.P.C.P.

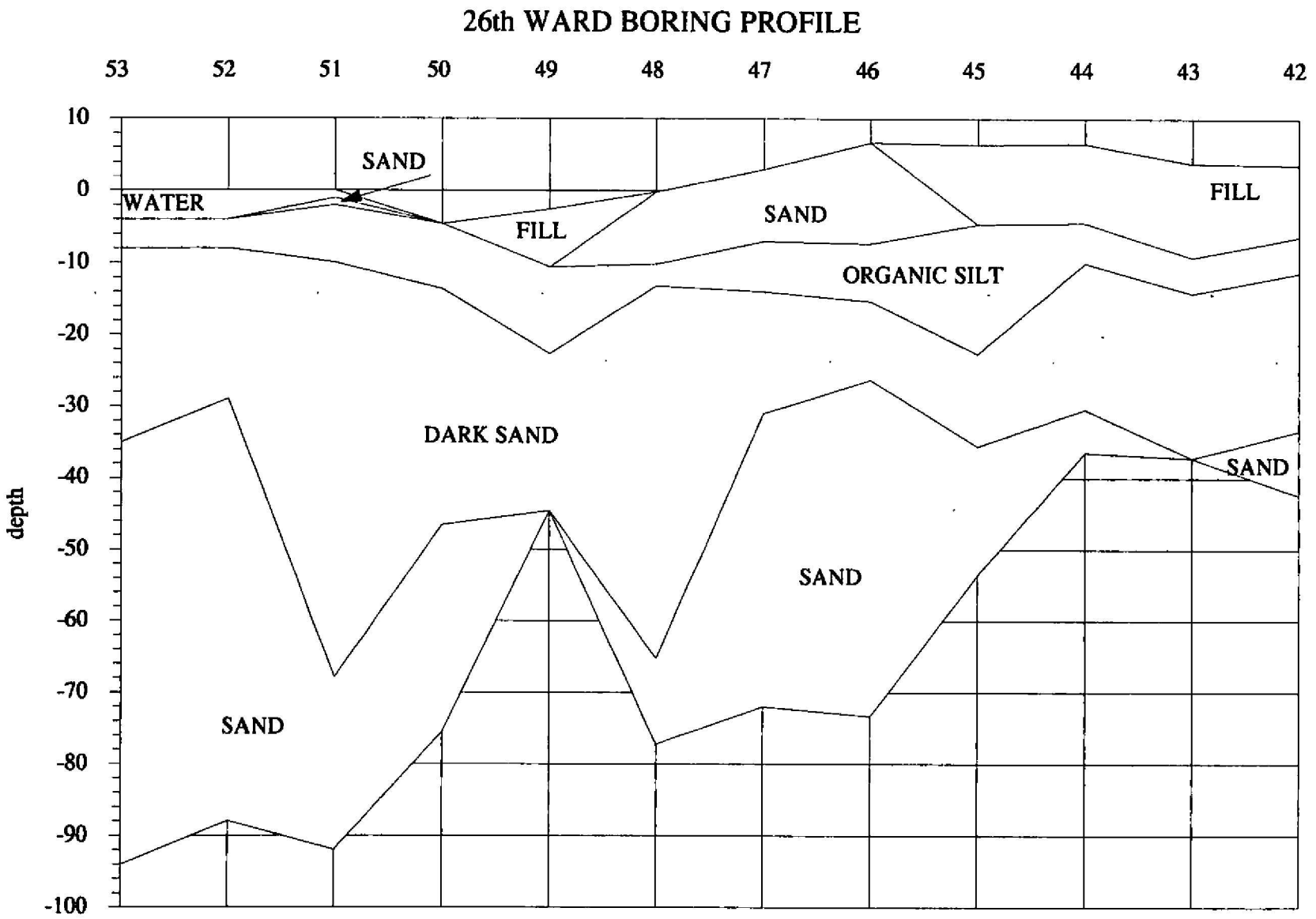


Figure 22 Generalized stratigraphy from selected 1969 borings in the vicinity of the 26th Ward W.P.C.P. planned impact areas.

WARDS ISLAND

No marine work is anticipated at the Wards Island W.P.C.P. under the current contract. The only impact will be from a concrete pad near the docking area in the eastern corner of the plant (see Figure 23). This area is currently unpaved and unplanted. Parts of it are used as a parking area. Figure 24 provides a general view facing the direction of the East River. Potential archaeological resources include two historic docks. Evaluation of the location of the historic docks in relation to the project area was conducted using historic maps.

Prehistoric Resources

While the GCI 1990 report said there was a low potential for preservation of prehistoric archaeological resources, the New York State Museum gives the Wards Island W.P.C.P. a "high probability of providing prehistoric archaeological data", although it has no record of prehistoric sites on the island. The museum bases its probability rating on the plant's physiography, the fact that intact deposits may be buried beneath fill or below the water table and the project area has similar terrain to other prehistoric sites in the area. While the New York State Museum does not have any record of prehistoric sites on Wards Island, they do list six nearby sites in Manhattan, Bronx and Queens (see Figure 25). With the vicinity of Wards Island being utilized during prehistory to the extent depicted in Figure 25, it seems logical to conclude that prehistoric populations would also have been visiting, exploiting resources and camping on Wards Island. Robert Grumet's study of Native American place names shows that this population had given Wards Island the name "Tenkenas" (Grumet 1981:56). The existence of this name implies that the Native American population had a reason to discuss Wards Island, presumably from their having at least visited the island.

Historic Maps and Research

The initial evaluation of the potential impacts to archaeological resources was done using the historic maps included in the GCI 1990 report. The earliest historic map found depicting Lyon's Dock is the 1851 U.S. Coast Survey. It is included in this report as Figure 26. The survey also shows another dock or pier to the south, adjacent to a structure labeled "White Building". The 1909 U.S. Coast and Geodetic Survey also depicts both docks, however the White Building is no longer there and the adjacent dock was expanded. The 1937 US Coast and Geodetic Survey depicts parts of the Wards Island W.P.C.P. and neither historic dock is visible. It is assumed that the construction of the plant obliterated or buried these docks. Unfortunately the earlier maps are not scaled, making the comparison to the 1937 or later maps

difficult. With the current placement of the concrete pad in the dockwork contract located to the north of the tanks and the 1937 survey showing the tanks at the northeastern most corner of Wards Island, one can infer the planned impact is within what was the Little Hell Gate in 1937, the channel between Wards and Randalls Islands.

Rutsch and Porter conducted a Phase 1 study in 1980 at the Wards Island W.P.C.P. in advance of an access road and proposed sludge storage lagoon. The report includes a figure of the plant overlaid on a map of geological features. Their Figure 3 (see Figure 27) clearly shows the area of proposed dockwork within Little Hell Gate. It is the eastern portion of the parcel marked "proposed".

The most conclusive map evidence is depicted in Figure 28, a plan filed with the application for filling operations in 1938. It shows the then existing sewage treatment facilities which are the current primary settling, aeration and final tanks. The application also shows the limit of Wards Island under the extant 1938 permit as well as the former shoreline prior to filling. The earlier shoreline is a dotted line on Figure 28 showing what appears to be Lyons Dock. It is clearly depicted to the south of the current project area. Figure 29 is a copy of a photograph from the dedication of the plant in 1937. Comparing Figures 28 and 29, it can be seen that Lyons Dock was either obliterated by or is buried underneath the current chlorination building or perhaps slightly to its south.

Boring Data

In 1990 a series of borings were conducted in conjunction with the dewatering facilities work. Three borings (B11, B12, and B36) were within or near the footprint of the planned dockwork. Figure 30 shows the location of these and earlier borings and tests in relation to the planned impacts at the Wards Island W.P.C.P. Figure 30 may be compared with Figure 23 to see where within the plant this impact area is located. The report on the 1990 boring results with the actual boring logs is on file with the New York City Landmarks Preservation Commission (Greenhouse Consultants 1990b). The data from earlier tests is on file with Stone & Webster Engineering Corporation and the Department of General Services.

All three 1990 borings were continuously sampled to a depth of fourteen feet. All three borings show fill within the entire depth. Inclusions found in the samples included brick, slag, concrete, creosoted wood, cinders, plastic and other debris. An earlier series of borings, from 1981, included two within the central area of planned impact. These borings were 1.5 foot samples taken every five feet. Figure

31 summarizes their stratigraphy, showing that each had 23-24 feet of fill containing a little brick and asphalt. Borings filed in 1972 were also evaluated. They were taken along the eastern edge of the planned impact ares. As depicted in Figure 32, this area of the Wards Island W.P.C.P. had not yet been filled at that time. However the impacts planned in this area will not penetrate to that depth.

Summary

It has been demonstrated that Lyons Dock was historically located outside of the dockwork project area at the Wards Island W.P.C.P. and the other historic dock, located to the south, was therefore also outside of the project area. Additionally, the three continuously sampled borings taken within or near the footprint of the project area all contained fill throughout their entire depth of fourteen feet. The potential archaeological resources at the Wards Island W.P.C.P. , two historic docks and prehistoric resources, will not be impacted by the dockwork contracts. The impacts from the dockwork contract will only penetrate into modern fill and not below it.

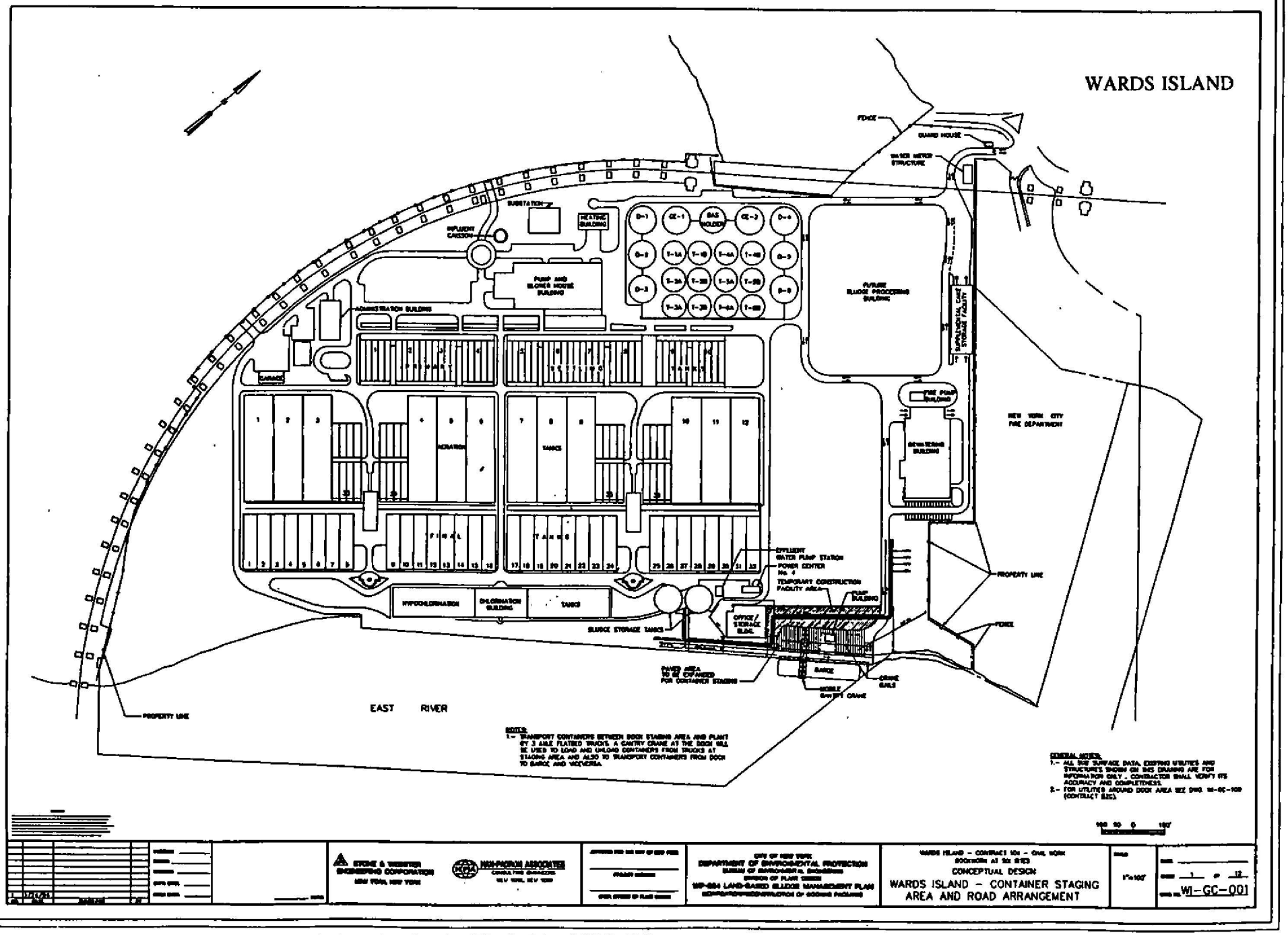


Figure 23 Conceptual design plan for the Wards Island W.P.C.P..

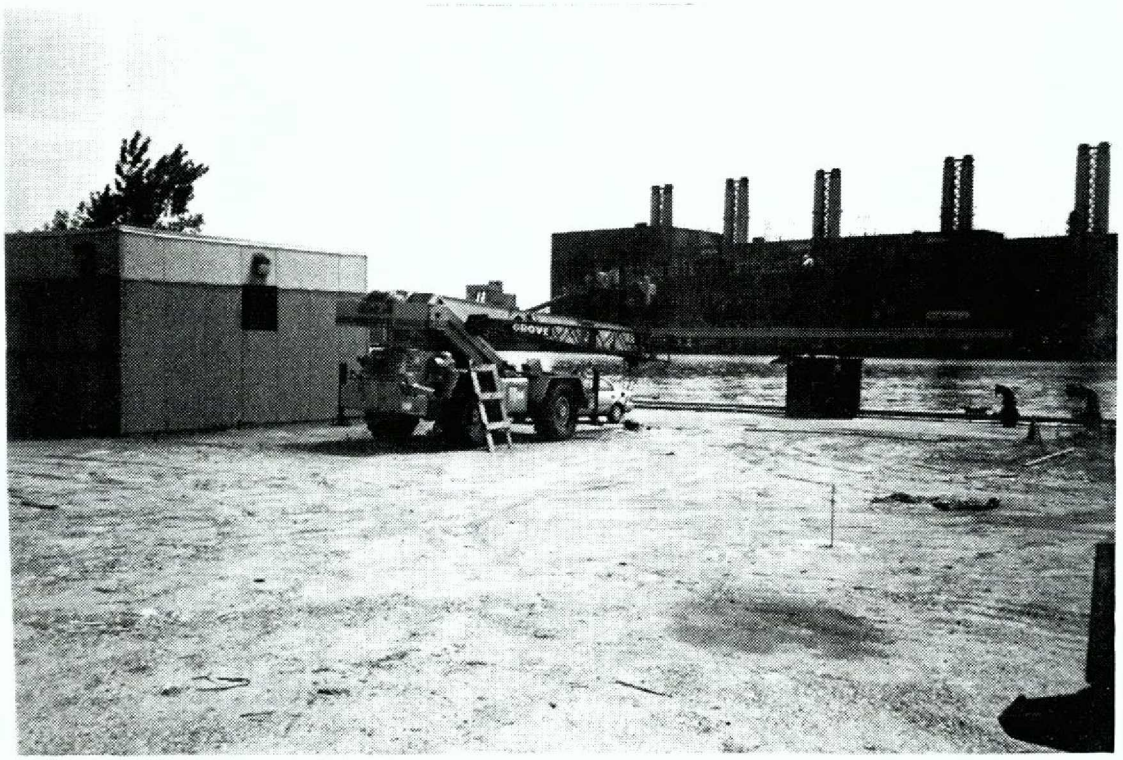


Figure 24 Photograph of the future location of the container staging area and temporary construction facilities at the Wards Island W.P.C.P. taken west of the pump building facing east.

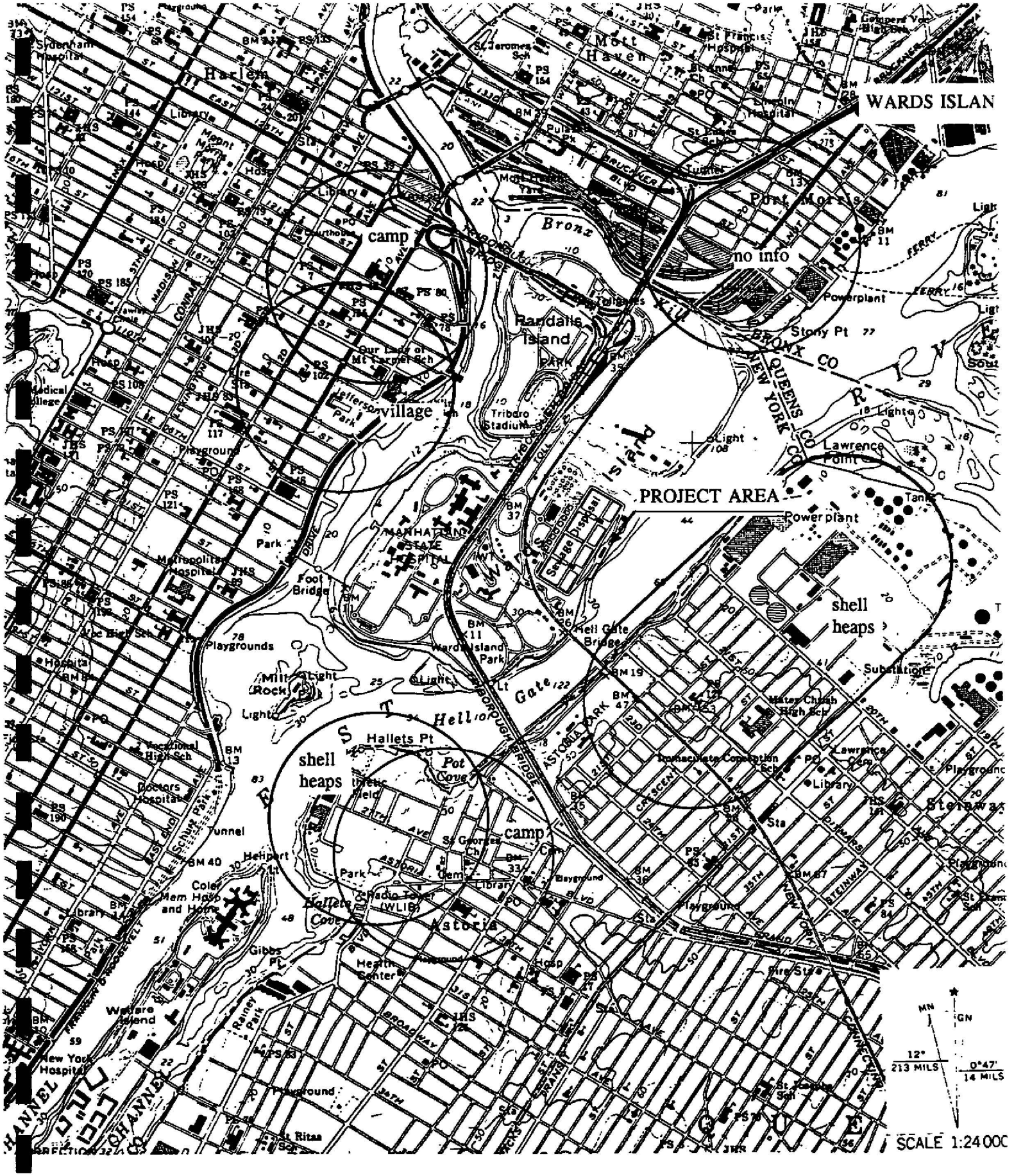


Figure 25 Prehistoric sites within one mile of the Wards Island W.P.C.P. on the U.S.G.S. 7.5 minute quadrangle for Central Park, New York.

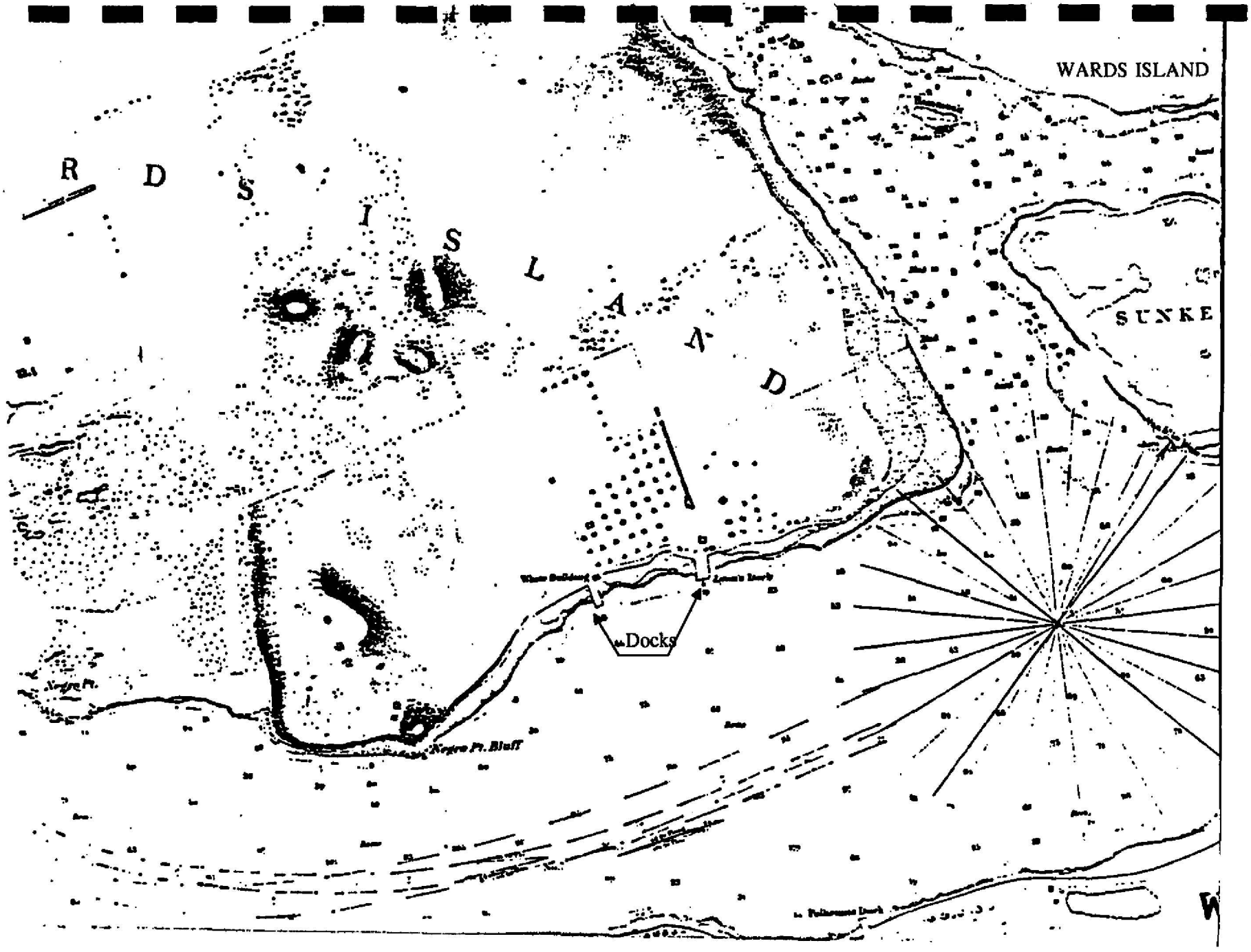


Figure 26 The 1857 U.S. Coast Survey showing Lyons dock and second dock to the south.

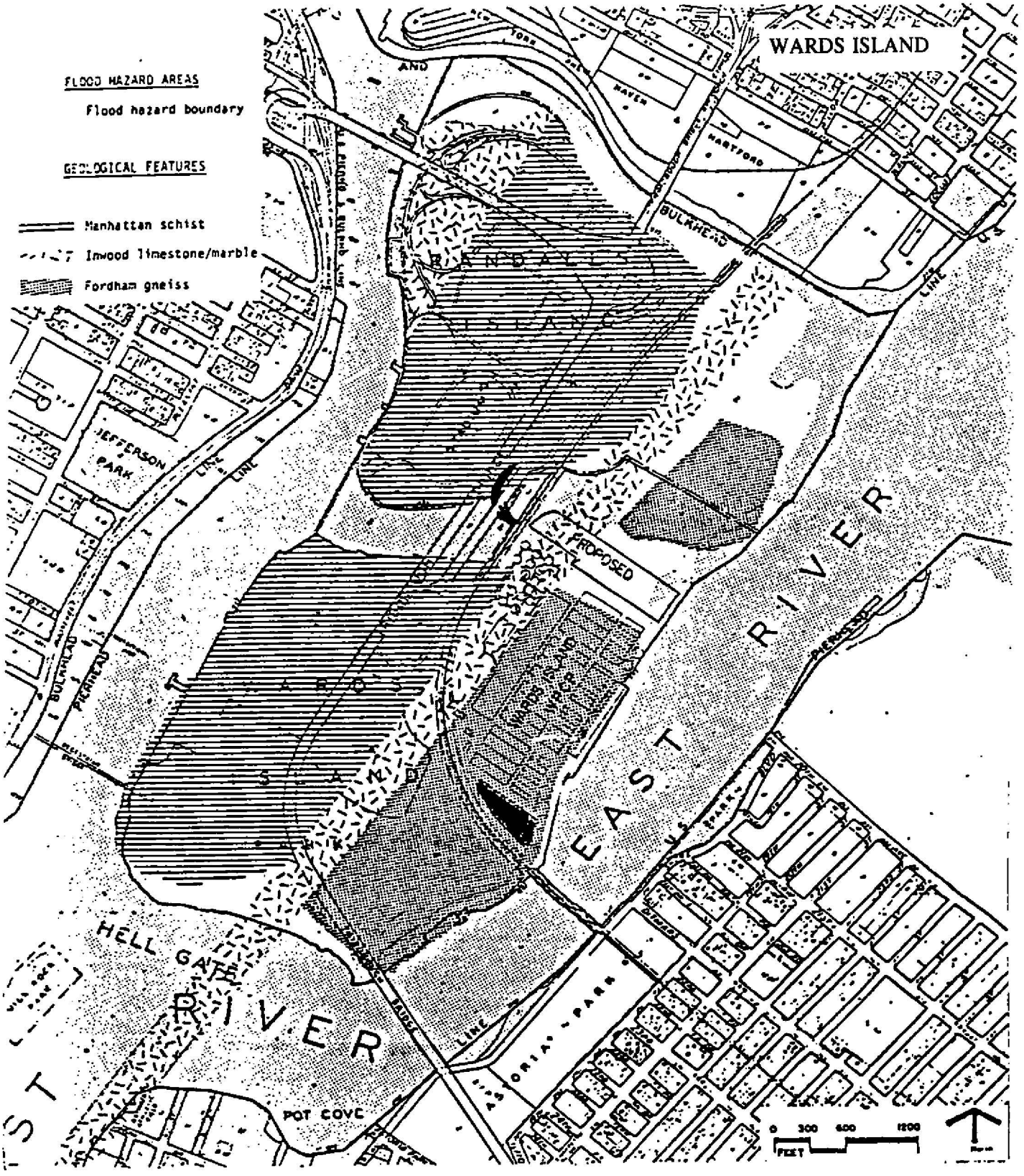


Figure 27 Rutsch and Porter Figure 3 showing geologic features of present-day Wards and Randalls Islands.

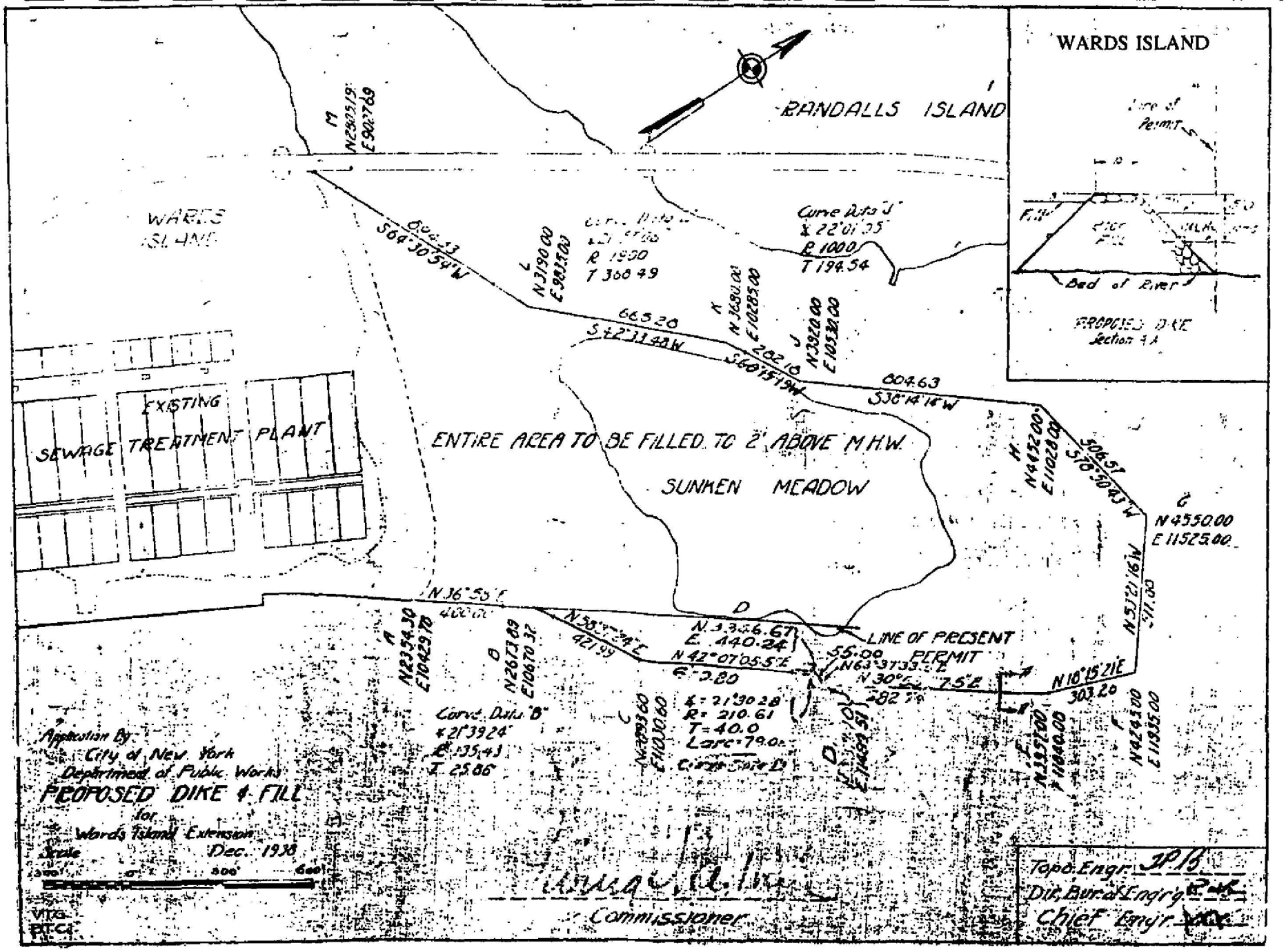


Figure 28 Map filed with the application for filling operations at the Wards Island W.P.C.P.

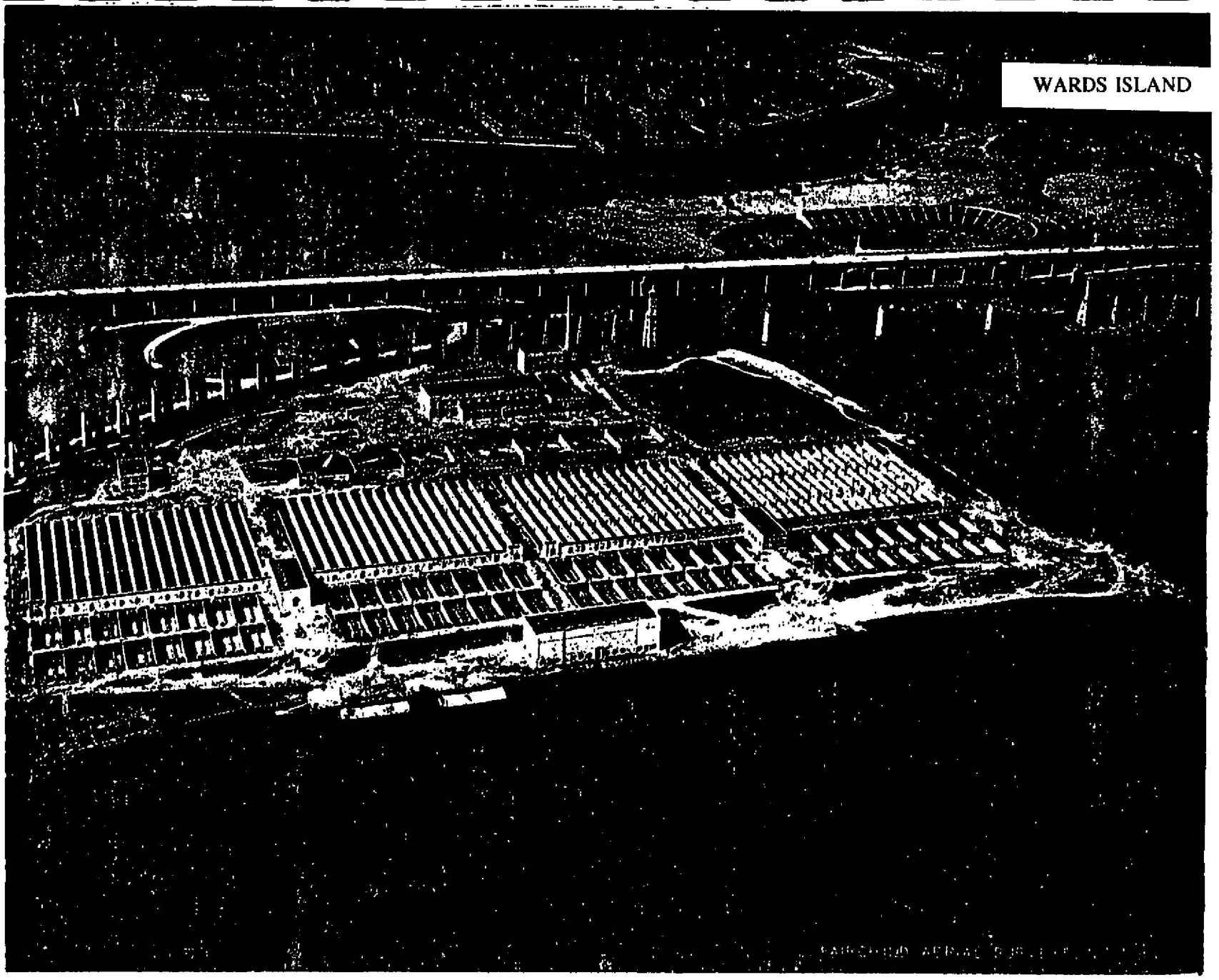


Figure 29 Photograph taken at the dedication of the Wards Island W.P.C.P in 1937.

KEY

● 1990 borings

□ 1980 test pits

Δ 1981 borings

○ 1972 borings

67 feet = 1 inch

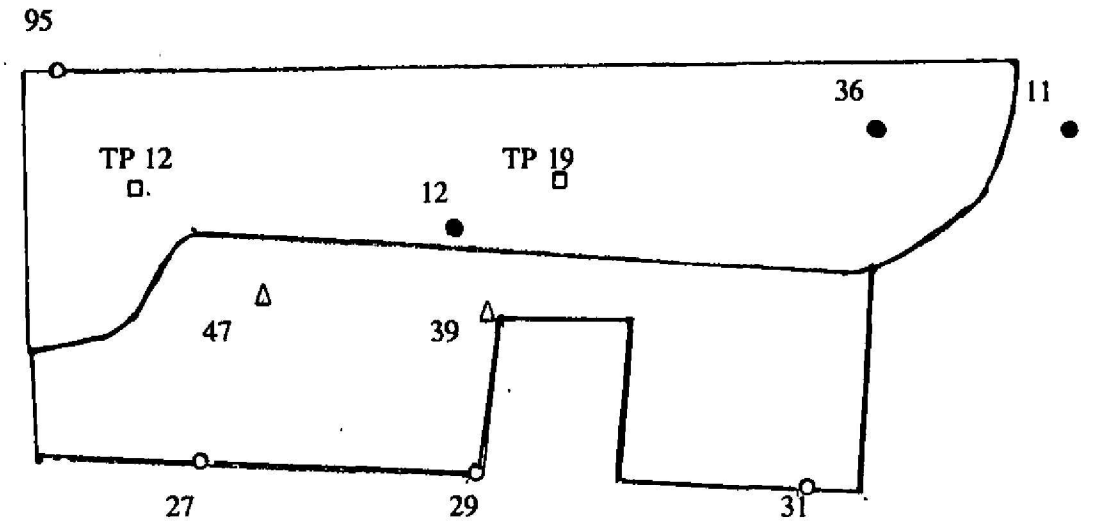


Figure 30 Location of borings in relation to the planned impacts at the Wards Island W.P.C.P.

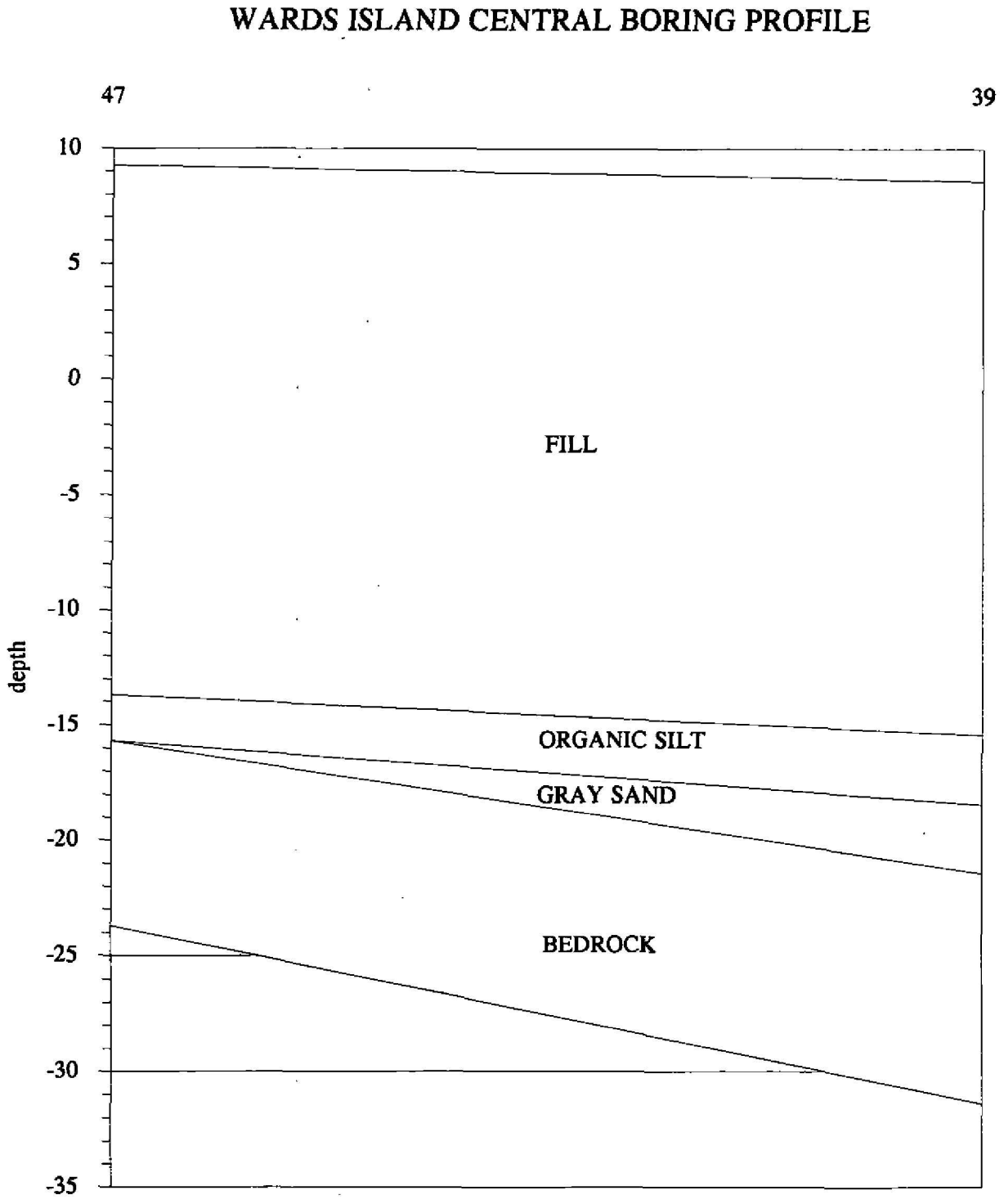


Figure 31 Generalized stratigraphy from selected 1981 borings through the center of the planned impacts at the Wards Island W.P.C.P.

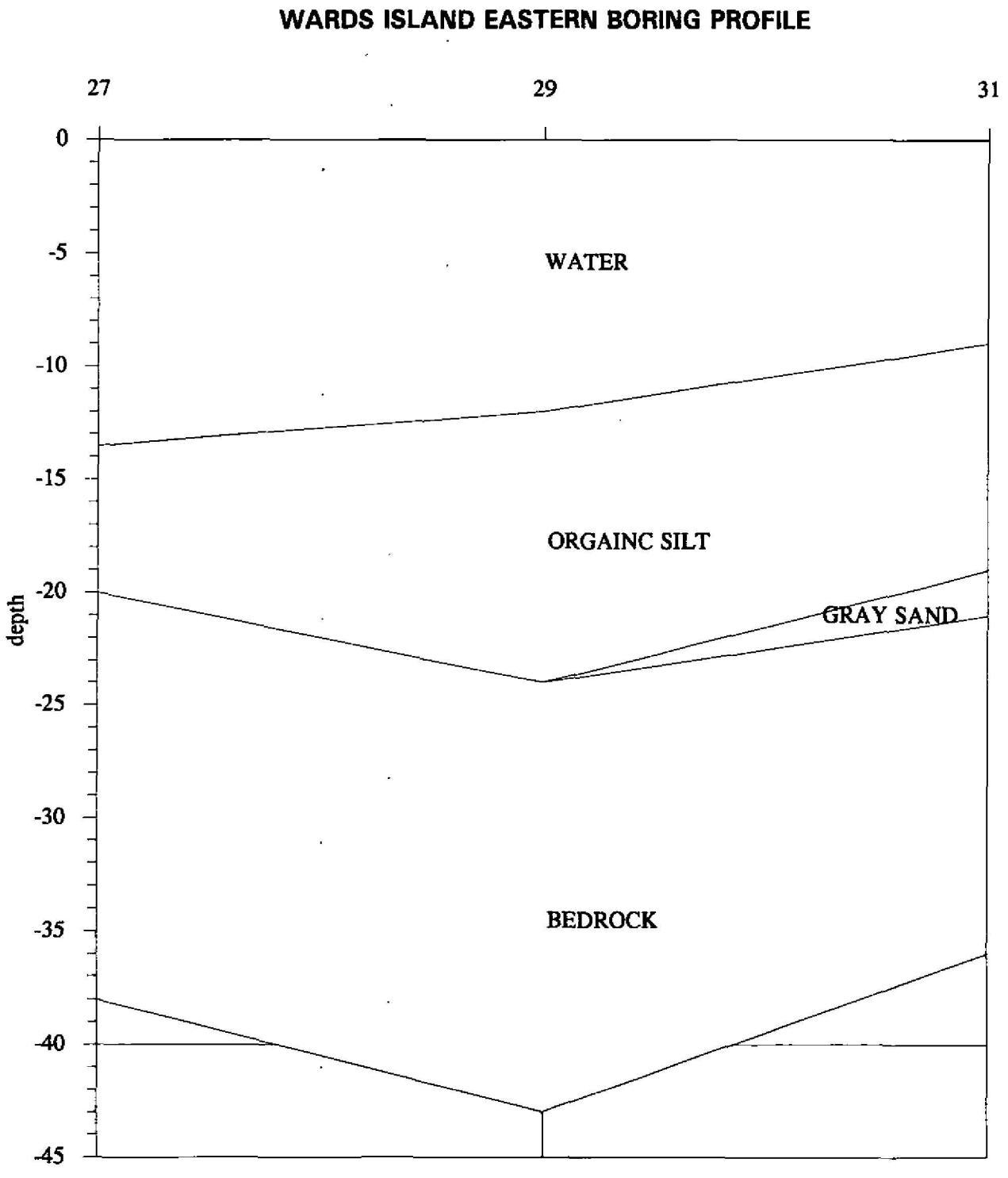


Figure 32 Generalized stratigraphy from selected 1972 borings along the eastern edge of planned impacts at the Wards Island W.P.C.P.

BOWERY BAY

The Bowery Bay W.P.C.P. is scheduled to have road widening done in four areas of the plant and to have three concrete pads installed, one for temporary construction facilities (located in the eastern central portion of the plant) and the other two for container staging (in the northern part of the plant, east of the pier) (see Figure 33). No marine work will be required. Most of the impact areas are currently planted with grass and trees. The one exception is the temporary construction facilities area which is a mix of overgrown vegetation, accumulated trash and paved parking. Figure 34 is a photograph showing the current conditions in this area. The GCI 1990 report concluded that the Bowery Bay plant may have potential for the preservation of prehistoric archaeological resources. Aerial photographs and boring logs were examined to evaluate this potential.

Prehistoric Resources

The New York State Museum gives the Bowery Bay W.P.C.P. a "high probability of producing prehistoric archaeological data". The museum bases its probability rating on the plant's physiography, the fact that intact deposits may be buried below fill or below the water table, similar terrain to other sites in the area and the fact that three prehistoric sites have been reported within one mile of the project area. They further feel that the margin of error in site location of their recorded data is great enough to believe that a site actually "exists in or immediately adjacent to" the project area location. Figure 35 depicts the general location of each of the three known prehistoric sites in the vicinity of the Bowery Bay W.P.C.P. All three sites were reported by Arthur C. Parker for the New York State Museum in 1922.

Parker did not assign a site number for the western most of the three sites. He mapped it with a symbol signifying a shell heap or kitchen midden. The center of the three sites was numbered and described by Parker as "Burial site on the Riker and Titus estates on the Bowery road to Steinway and North Beach" (Parker 1922:672). The eastern most prehistoric archaeological site in the vicinity of the Bowery Bay W.P.C.P. was numbered and described by Parker as "Shell heap on the Jackson property on Poor Bowery at North Beach" (ibid.).

Aerial Photography

Aerial photographs on file with the Topographic Bureau of the Queens Borough President's Office were evaluated. Three series were on file; 1924, 1938-40 and 1951. Tracings were done of the shoreline from all three periods and made into one composite showing the changes in the shoreline around the Bowery

Bay plant through time. This composite is attached as Figure 36. The figure includes Steinway Creek to the west of the plant and the two major roads bounding the plant, Steinway Street to the west and Berrian Boulevard to the south. It also includes the first four storage tanks, for ease of alignment and orientation within the plant. The 1924 shoreline roughly followed what is now Berrian Boulevard. Most of the fill within the plant was placed for its construction in 1938/39. All of the dockwork contract planned impacts will fall within this filled area, with the possible exception of the road widening to be done south of the storage tanks.

Boring Data

The evaluation of Bowery Bay boring logs was done from three different time periods; 1938, 1969 and 1970. Figure 37 shows the locations of the borings in relations to the planned impacts. For simplicity's sake, the figure shows only the impacts, and not the entire plant. Figure 37 may be compared to Figure 33 to see where each impact location falls within the plant. When borings from more than one time period were available for evaluation, the most recent were selected. The stratigraphy was projected into a continuum along three profiles paralleling the shoreline. These profiles are attached as Figures 38-40. Figure 38 generalizes the stratigraphy in the northern portion of the plant based on 1970 borings. Figure 39 represents the central area of planned impacts using 1969 borings. Figure 40, showing the southern part of the plant, is based on 1938 borings. The 1969 and 1970 borings were 1.5 foot samples taken at five foot intervals. The 1938 borings were also sampled every five feet but the sample size was not noted on the boring logs.

The 1970 borings taken in the northern part of the Bowery Bay plant were taken before that portion of the plant had been filled. They reveal that the water was at least five feet deep at that time (see Figure 38). Therefore the fill must necessarily be at least five feet deep to bring the ground up to water level. In fact the fill is even deeper. The current elevation is about ten feet, meaning the fill would be about fifteen feet thick in that area. The borings taken in the central portion of the plant in 1969 show that the entire length was covered with fill which was at least sixteen feet thick (see Figure 39). The fill is described as sand, silt and rip-rap (DPW 1969a:B101,102,123,124). Therefore the planned container staging areas and road widening in the northern part of the plant and the planned road widenings and construction staging area in the central portion of the plant will not penetrate below the depth of the fill. Figure 34 is a photograph of the planned area of the temporary construction facilities. The view provides a visual depiction of the current elevation above the Bowery Bay.

The analysis of the 1938 borings is not as straightforward. This is not surprising given the data presented in Figure 36 showing that the early shoreline ran along the location of the planned road widening in the southern part of the Bowery Bay W.P.C.P. The two borings were taken at the center of the storage tanks prior to their construction. The water was about 3.5 to 4.5 feet deep in that location (see Figure 40). Since these borings were taken to the north of the planned impact, toward the East River, it would be expected the water level within the footprint of the planned road widening would have been shallower than in the two borings. In fact, boring data taken from the next tanks to the north shows deeper water in that direction. It is possible that the project impact area may have even been the original ground surface in 1938. However the current elevation in that vicinity is now about ten to twelve feet (Stone & Webster and Hazen & Sawyer 1990:BB-GC-003). It seems probable that with the substantial change in elevation so close to the planned impact that the impact area is also covered with fill. Therefore it seems unlikely that significant prehistoric archaeological resources would be preserved within this impact area.

Summary

The analysis of aerial photographs and previously taken boring logs clearly demonstrates that the impacts planned for the central and northern areas of the Bowery Bay W.P.C.P. as part of the dockwork contract will not impact potential prehistoric archaeological resources. The depth of the fill in those parts of the plant extends to a depth greater than that of the planned impacts. The evaluation of the impact from planned road widening in the southern portion of the plant was not as simple. However it is likely that this impact will also not penetrate the depth of fill.

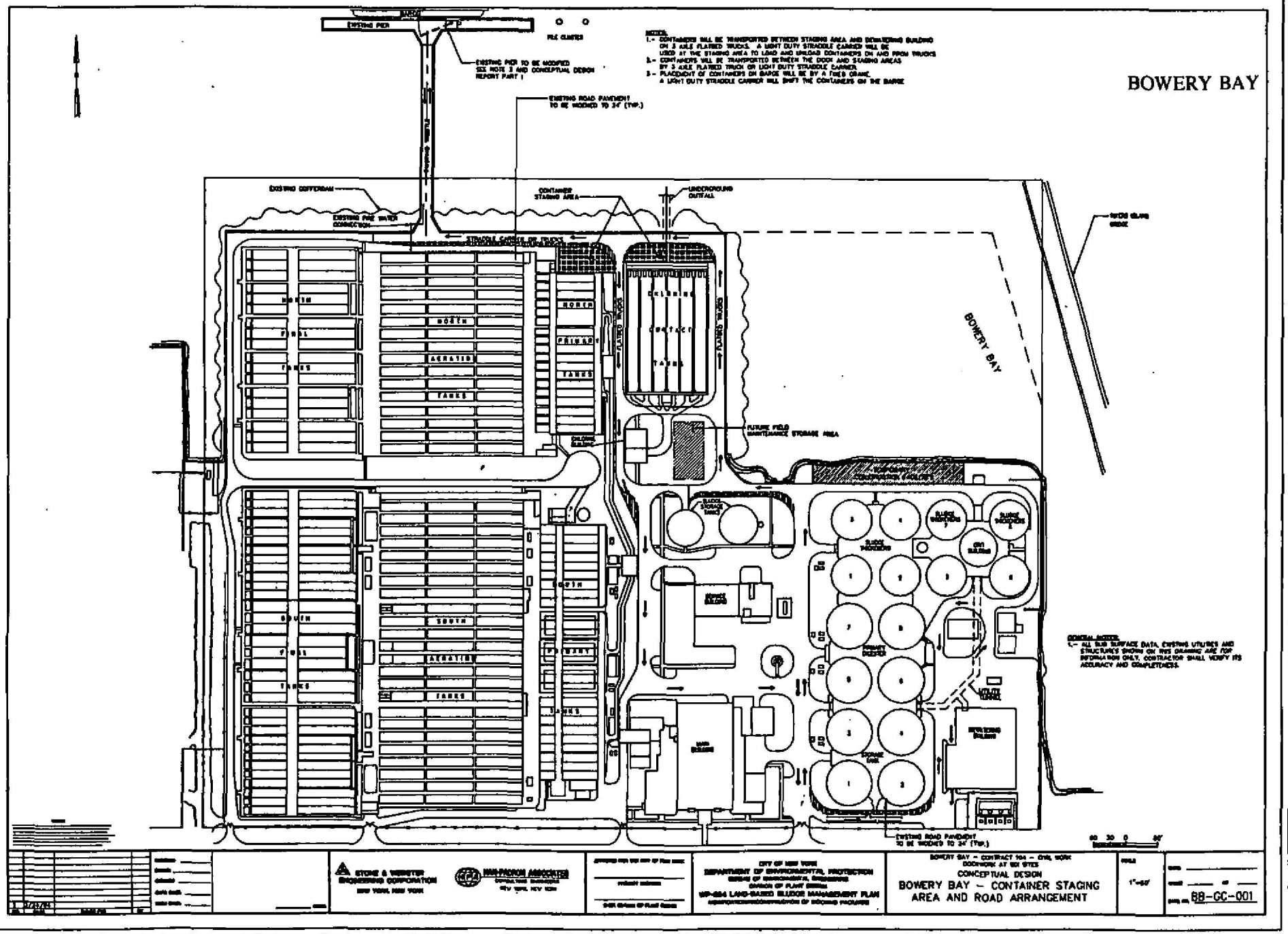


Figure 33 Conceptual design plan for the Bowery Bay W.P.C.P..

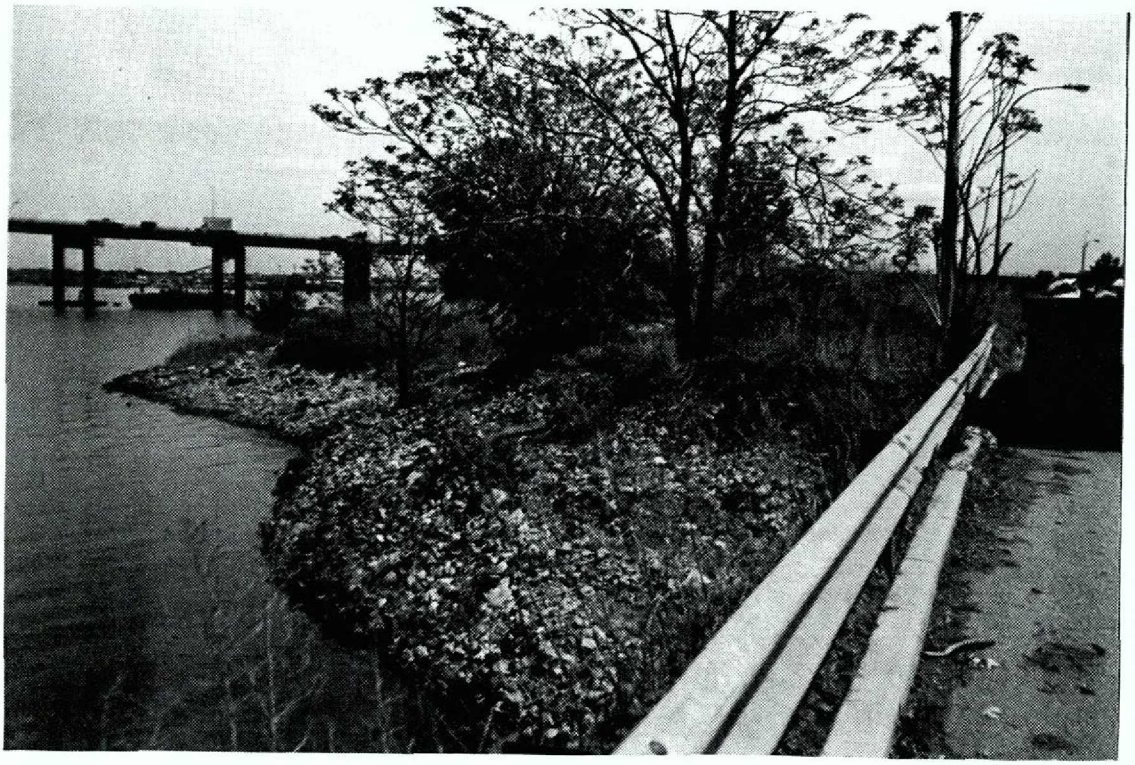


Figure 34 Photograph of the future location of the temporary construction facilities at the Bowery Bay W.P.C.P. from its western limit facing east.

Figure 35 Prehistoric sites within one mile of the Bowery Bay W.P.C.P. on the U.S.G.S. 7.5 minute quadrangle for Central Park, New York.

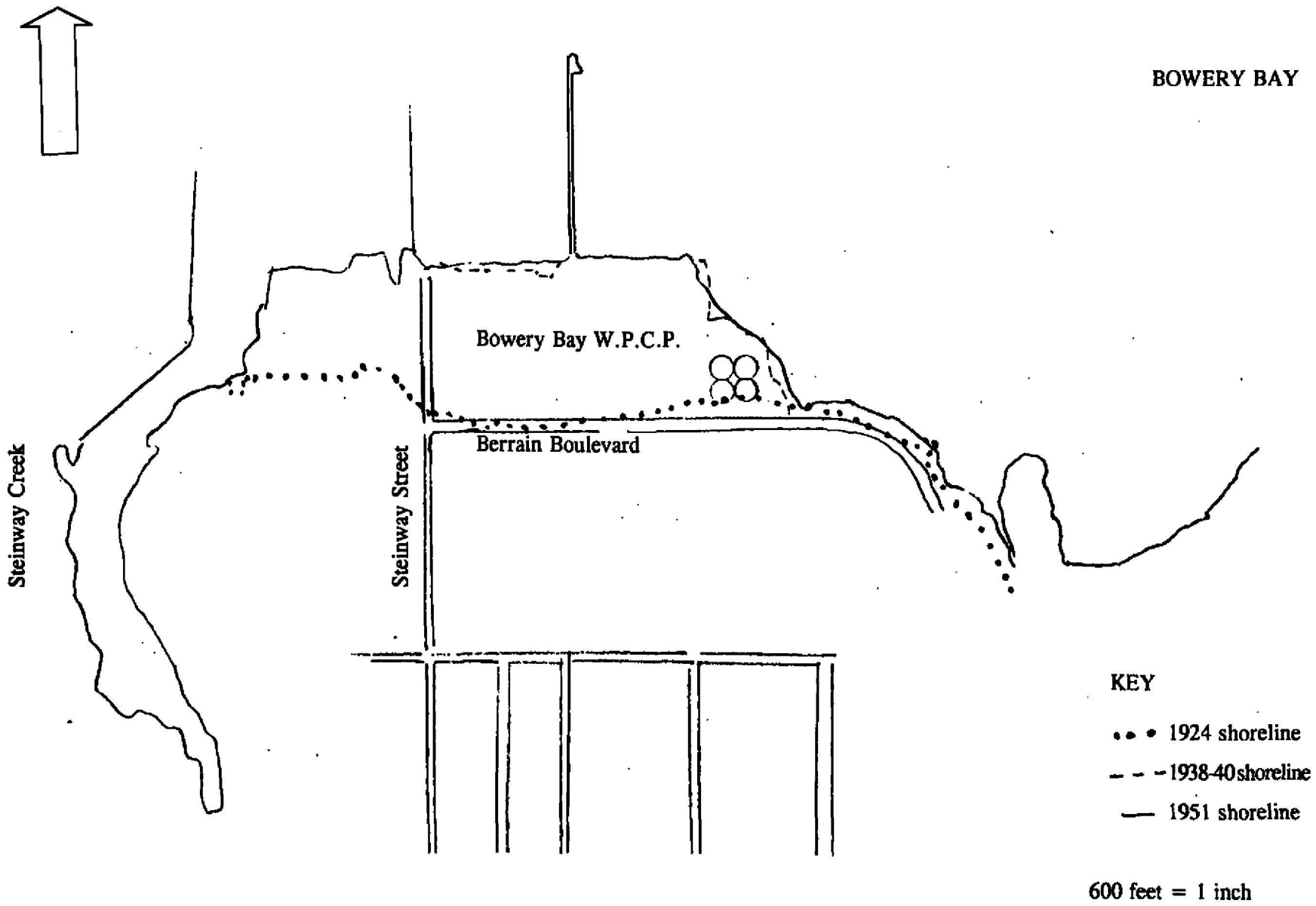


Figure 36 Composite of aerial photographs showing the shoreline around the Bowery Bay W.P.C.P. in 1924, 1938-40 and 1951.

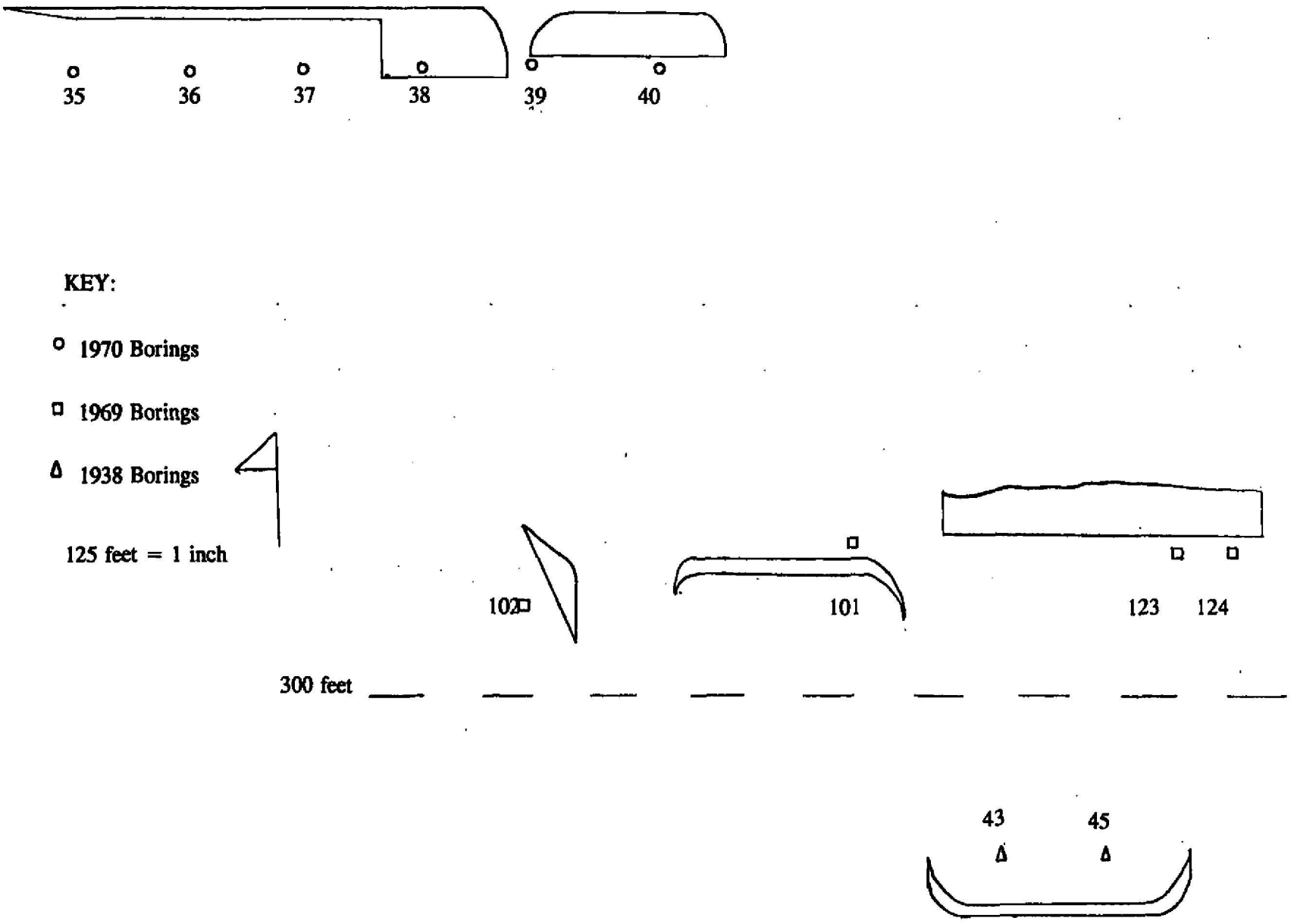


Figure 37 Location of borings in relation to the planned impacts at the Bowery Bay W.P.C.P.

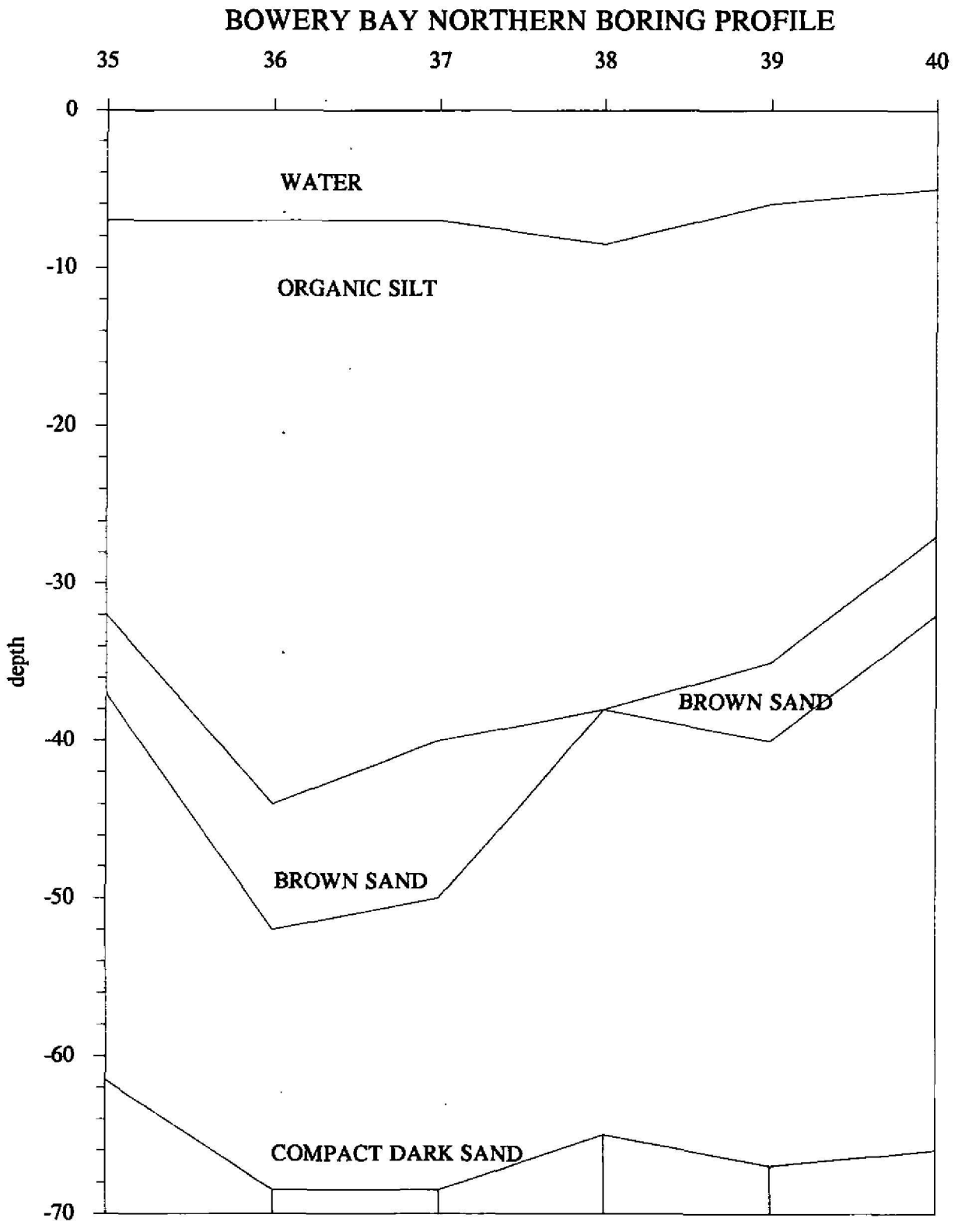


Figure 38 Generalized stratigraphy from selected 1970 borings along the northern edge of the Bowery Bay W.P.C.P.

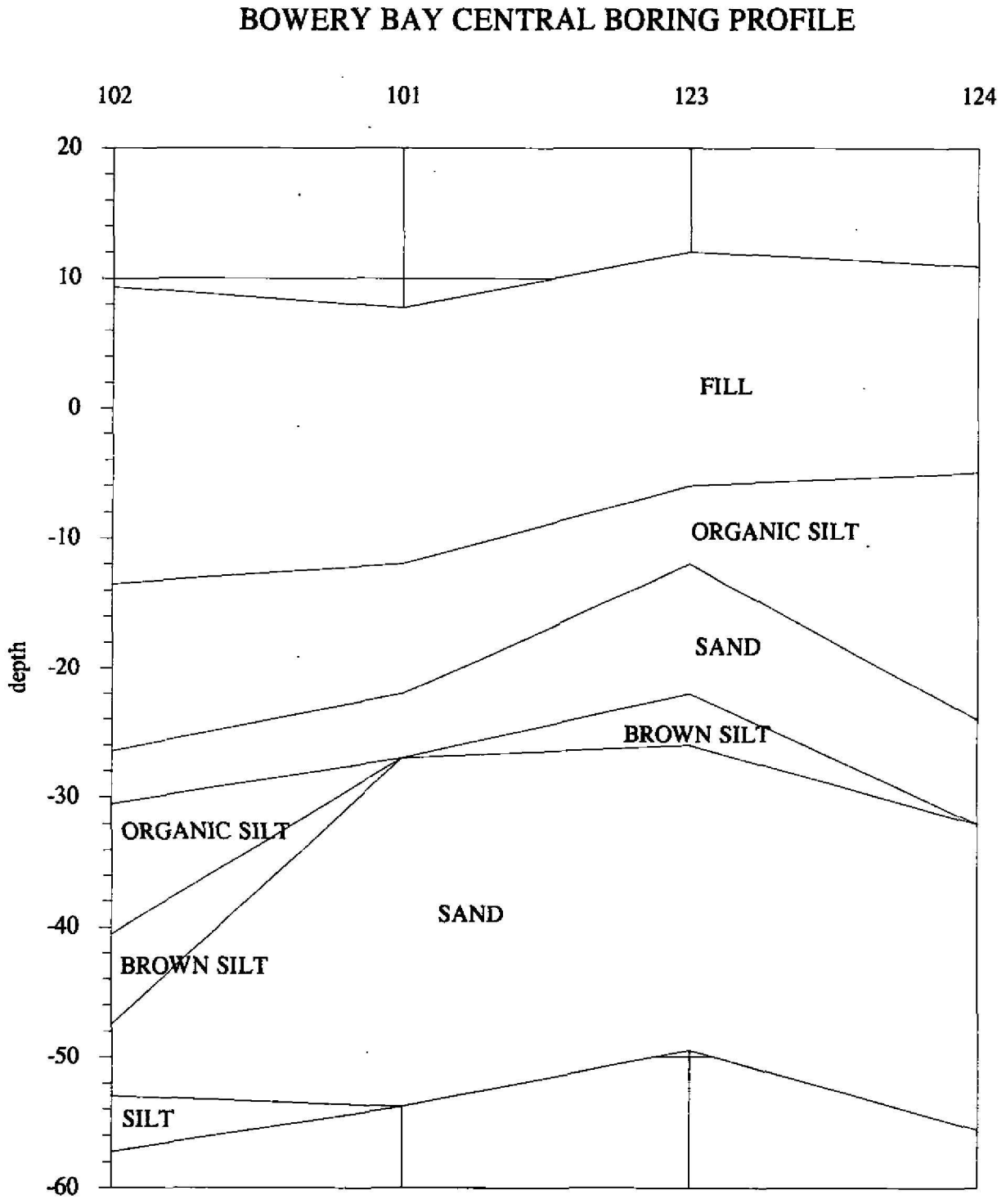


Figure 39 Generalized stratigraphy from selected 1969 borings along the center of the Bowery Bay W.P.C.P.

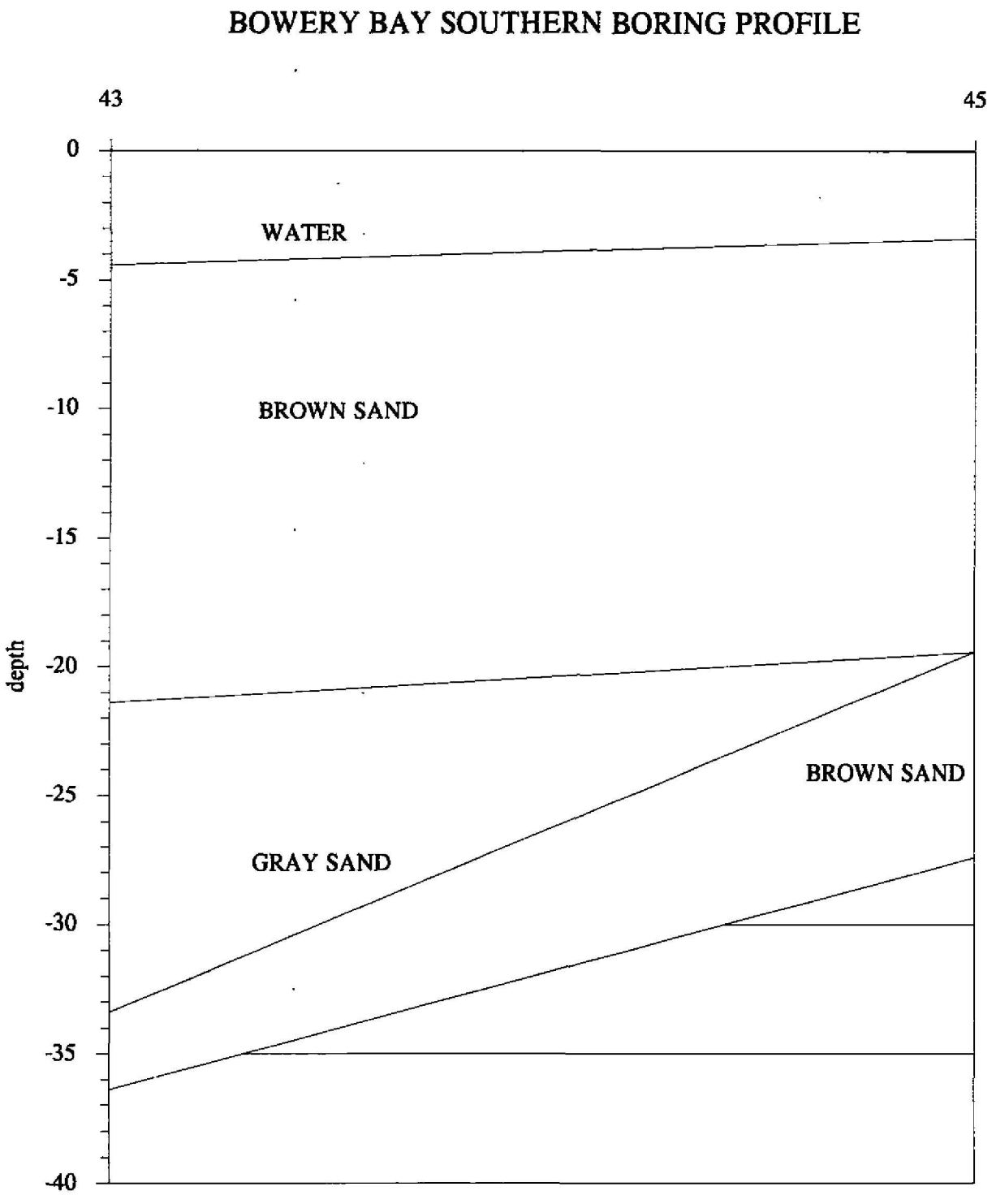


Figure 40 Generalized stratigraphy from selected 1938 borings along the southern edge of the Bowery Bay W.P.C.P.

TALLMAN ISLAND

The northern part of the Tallman Island W.P.C.P. is scheduled to have both marine and land-based work under the dockwork contract. A new pier to be built on non-clustered piles is planned to cut through the existing pier. A container staging area is planned in the northeastern corner of the plant and there will be road widening between that location and the new pier (see Figure 41). All of these areas are now covered with grass and trees. Figure 42 shows a portion of it, indicative of the conditions throughout the planned impact areas. The potential archaeological concerns are related to prehistoric resources and a pre-1897 pier. The evaluation of these resources was conducted using historic maps, aerial photographs and boring data.

Prehistoric Resources

The New York State Museum gives the Tallman Island W.P.C.P. a "high probability of producing prehistoric archaeological data". The museum bases its probability rating on the plant's physiography, the fact that intact deposits may be buried below fill or below the water table, similar terrain to other sites in the area and the fact that there have been previously reported prehistoric sites within one mile of the project area. They further feel that the margin of error in site location of their recorded data is great enough to believe that a site actually "exists in or immediately adjacent to" the project area location. The State Museum has recorded six sites within one mile of the Tallman Island plant, three in Queens and three in the Bronx. Figure 43 depicts the general location of each of the known prehistoric sites in the vicinity of the Tallman Island W.P.C.P. All three sites located by the State Museum in Queens near the plant were reported by Arthur C. Parker for the New York State Museum in 1922. Bolton also identified a nearby site. Solecki also worked nearby and two of his sites are shown in the lower part of Figure 43.

Parker describes the western most site as "Village and burial site at College Point on the E. Platt Stratton estate. Skeletons were found in 1861, when excavating for the foundation of Knickerbocker hall." (Parker 1922:672). The central site, located due south of the Tallman Island W.P.C.P., was unnumbered by Parker and depicted on his map with a burial site symbol. Parker also did not assign a number to the eastern most of his sites. He mapped it with a symbol signifying traces of occupation. This is also the general area of a site where shell and refuse pits were excavated in the late 1930s (Smith 1950:177). Bolton identified a fishing camp, as indicated by shell deposits, in Whitestone, east of the Tallman Island plant. Smith reported on Solecki's excavations around Flushing Bay, shown on the southern part of Figure 43. The North Beach site near the present LaGuardia Airport was the site of excavated refuse deposits and a former salt marsh site near the southern part of College Point was also excavated (Smith

1950:173,186).

Historic Maps and Research

The initial evaluation of the potential impacts to the historic pier at Tallman Island was done using the U.S. Coast and Geodetic Survey maps included in the GCI 1990 report. The 1914 map depicts a pier off the north end of Tallman Island. The next map in chronological order was from 1937. This map depicts a series of unconnected piles off Tallman Island's north shore. The next series, from 1941, no longer depicts these piles, but it does show a new pier located slightly to the west. This later became part of the pier which exists today, as shown on the 1969 U.S. Coast and Geodetic Survey from the GCI 1990 report. The 1937 map showing the piles was overlaid the 1969 map showing the location of the modern pier. This revealed that the historic pre-1914 pier was located to the east, where it seems to match the planned impact area of the new pier.

Beers 1873 atlas clearly depicts Tallman Island (see Figure 44). The property is listed under the ownership of A. Morris. Two buildings were located within Morris' property at that time, but no pier was shown on the island. Wolverton's 1891 Atlas shows that the Tallman Island property had changed hands (see Figure 45). The northern three-quarters of the island was then owned by H. Funke. Once again two buildings are depicted, however at least one of them appears to be a different building than shown in the 1873 atlas. If the second is the same structure, it was significantly altered to change the shape of the building footprint. This larger building is labeled "Point View" in 1891. Still there is no pier shown on the northern part of Tallman Island in 1891.

The earliest map found which showed a pier in the north of Tallman Island was the 1903 Sanborn Map (see Figure 46). The pier is 400 feet long and at its base is a bath house. Tallman Island is referred to as Point View Island, Joseph Witzell, Proprietor. Point View Island was a resort or beach club. The Sanborn Map identifies the major building as a dining hall. Other structures are labelled as wagon shed, wagon house, coop, tool shed, bar rooms, bowling alley, dancing pavilion and rifle range. All of these structures are clustered in the northern part of the island. There is virtually no change between the Sanborn Map of 1903 and that of 1916. Therefore the Point View pier is the same pier which was identified from the 1914 U.S. Coast and Geodetic Survey in the GCI 1990 report.

Point View was the largest and one of the most famous summer resorts in Queens around the turn of the

century. Joseph Witzell began by leasing the property in 1892 and successfully developed it as a local resort. The establishment prospered. Notable visitors to Point View included Woodrow Wilson, Grover Cleveland and Theodore Roosevelt. The record single day attendance at Point View was over 16,000 people. On busy days it was reported that the kitchen could turn out "a dozen steers, cook 300 dozen eggs, bake fifty hams..." or cook "thousands of eels" and "a half a ton of baking clams" (Hecht 1976:67). Hecht described the pier.

> A private dock juts out from the front of the establishment. An excursion steamer is tied up to the dock, and the surrounding waters are filled with small boats out for a day's sail (Hecht 1967:66).

In 1912, Charles E. Trout, assistant engineer for the Borough of Queens, approved a plan of Tallman Island made from a 1908 survey. This plan was later augmented with the revised 1923 bulkhead and pierhead lines. A copy is attached as Figure 47, also showing the location of the planned impacts from the dockwork contract. The plan depicts a pier and buildings in similar configurations as the Sanborn Maps, however the detail and accuracy are much improved. Although it cannot be read in Figure 47, the original plan measures the pier at 339.32 feet and says that the pier is on cribs and piles. Figure 47 also provides the detail of the relationship between the earlier shoreline and the current shoreline, as seen in the 1923 bulkhead line. Without this depiction it would have been extremely difficult to place the location of the Point View pier in relation to the current project impact area.

Figure 47 provides clear evidence that most of the area of planned impact at the Tallman Island W.P.C.P. falls outside of the earlier edge of the island. The planned new pier is not going to impact the former location of the Point View pier. The road widening planned in the area of the former Point View pier only briefly crosses its path. A small part of the temporary construction facilities area extends into the former bank of the island, but it does not reach the top of the bank. The planned container staging area falls mainly in what was once part of Powells Cove and only the western part extends into the former bank of Tallman Island as does a very small bit of road widening in that area. However none of the historic maps or aerial photographs depict any buildings in that part of Tallman Island. Only the 1924 aerial photograph shows any building along the eastern edge. There are a series of eight small structures, perhaps cabanas, along the top of the eastern bank of the island, however these structures all appear to be to the south of the planned dockwork impacts.

Boring Data

Evaluation of two sets of boring logs taken in the vicinity of the planned impacts at the Tallman Island W.P.C.P. was conducted. A series of marine borings were taken in 1961 in advance of the construction of the existing pier. In 1969 a series of borings were made in conjunction with the plant expansion and upgrade. Several of these borings were located in or near parts of the road widening in the central portion of the plant. Figure 48 shows the relationship between these borings and the planned impacts at Tallman Island. This figure may be compared with Figure 41 to see where the impacts are located within the plant. The stratigraphy for each set of these borings was projected onto a continuum. These boring profiles are attached as Figures 49 and 50.

The marine borings taken for the existing pier were one foot samples taken every five or six feet. The water was 11.5 to 25 feet deep. In the one boring closest to the planned pier, the water was 20 feet deep. The first soil layer in these borings contained organic silt, in all but one boring. A trace amount of shell was noted in this stratum in the boring closest to the impact area. The organic silt was underlain by a thick stratum of compact culturally sterile sand.

Six borings were taken in 1969 and fall within the footprint of the currently planned road widening at the Tallman Island W.P.C.P. (see Figures 48 and 50). The top layer of soil in all of these borings was characterized as possible or probable fill, although no inclusions of possible cultural origin were listed in the logs. This fill layer ranged in depth from eight to twenty feet. Therefore the fill in this area is deeper than the proposed depth of impacts.

Dredging Data

A 1961 permit application for dredging the East River in advance of pier construction at the Tallman Island W.P.C.P. was filed. The request was for an area of about 82,000 square feet dredged to a maximum depth of sixteen feet below mean low water (Long Island Star Journal 1961). Dredging was conducted to a depth of 18.5 feet north of the existing Tallman Island pier between 1941 and 1969 as evidenced in the U.S. Coast and Geodetic Surveys provided in the GCI 1990 report. The DEP reports that dredging was done as part of a 1980 contract at the Tallman Island W.P.C.P., however the documentation of this no longer exists (Dennis Rizzo & Frank Gallo, DEP; Herman Wine, US Army Corps, personal communication).

Summary

The analysis of historic maps and boring logs proved that most of the land-based planned impacts at the

Tallman Island W.P.C.P. will not reach below the depth of modern fill. The only possible exception is in the southwestern corner of the proposed container staging area location where the depth of fill has not been established. However evidence shows no historic resources ever located in this part of the Tallman Island. Nevertheless, a high potential for prehistoric archaeological resources exists unless it can be demonstrated this area is covered in fill. The planned marine work will not affect any potential archaeological remains of the Point View pier. Additionally, the planned new pier construction has low potential to impact prehistoric archaeological resources within the organic silt layer under the waters of the East River since it likely has been previously dredged in the project area vicinity.

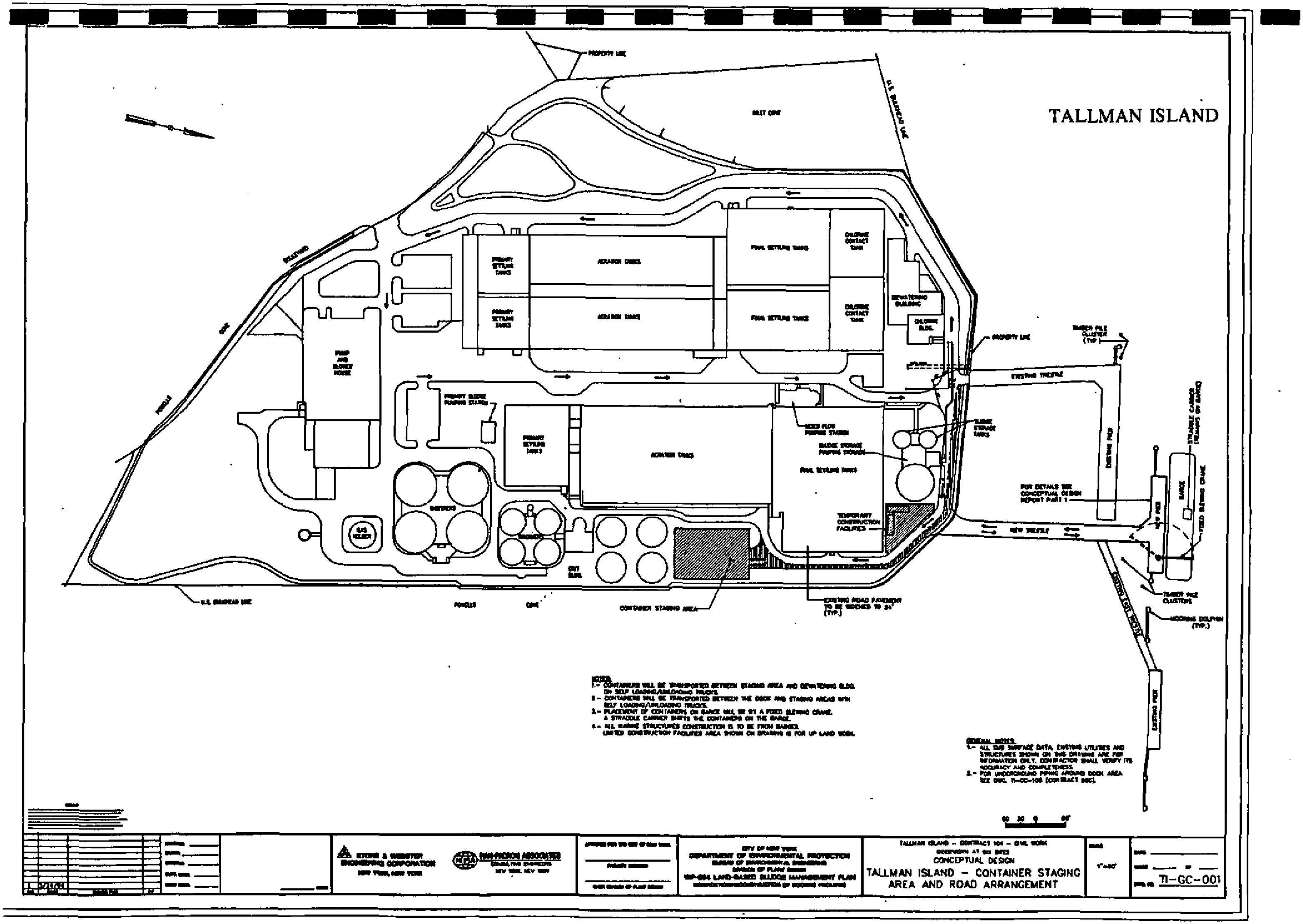


Figure 41 Conceptual design plan for the Tallman Island W.P.C.P..

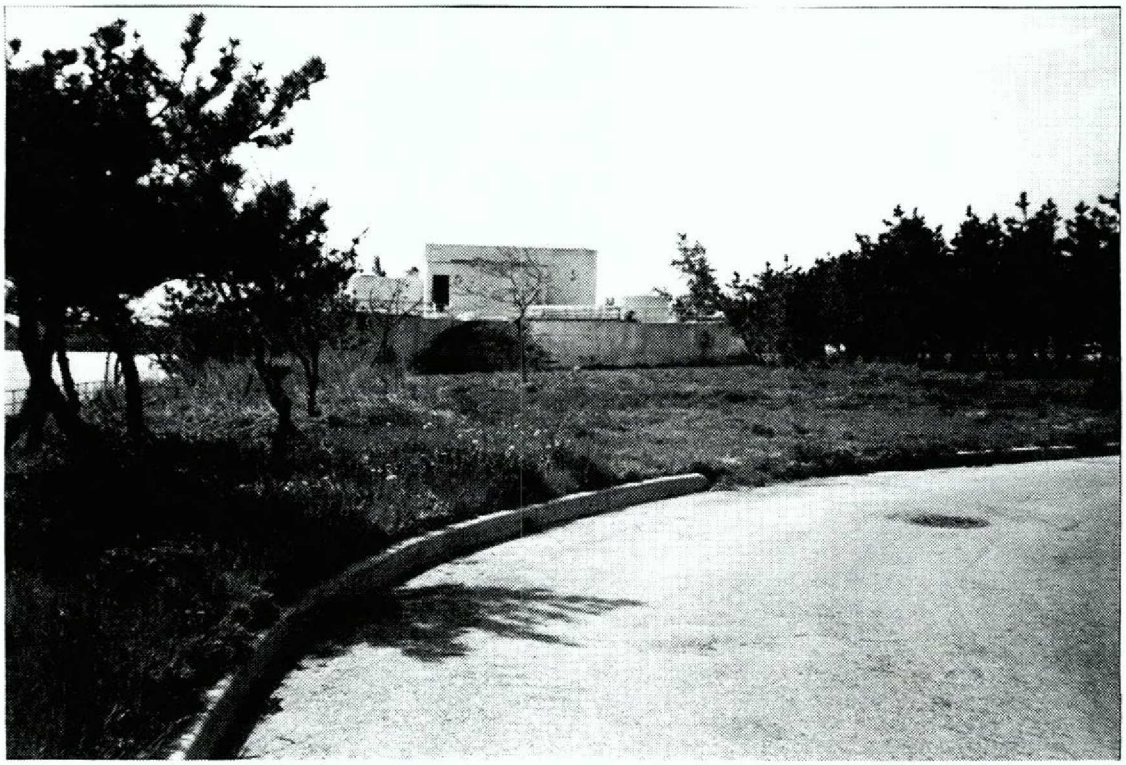


Figure 42 Photograph of the future location of the container staging area at the Tallman Island W.P.C.P. taken from the southeast corner of the final settling tanks facing south.

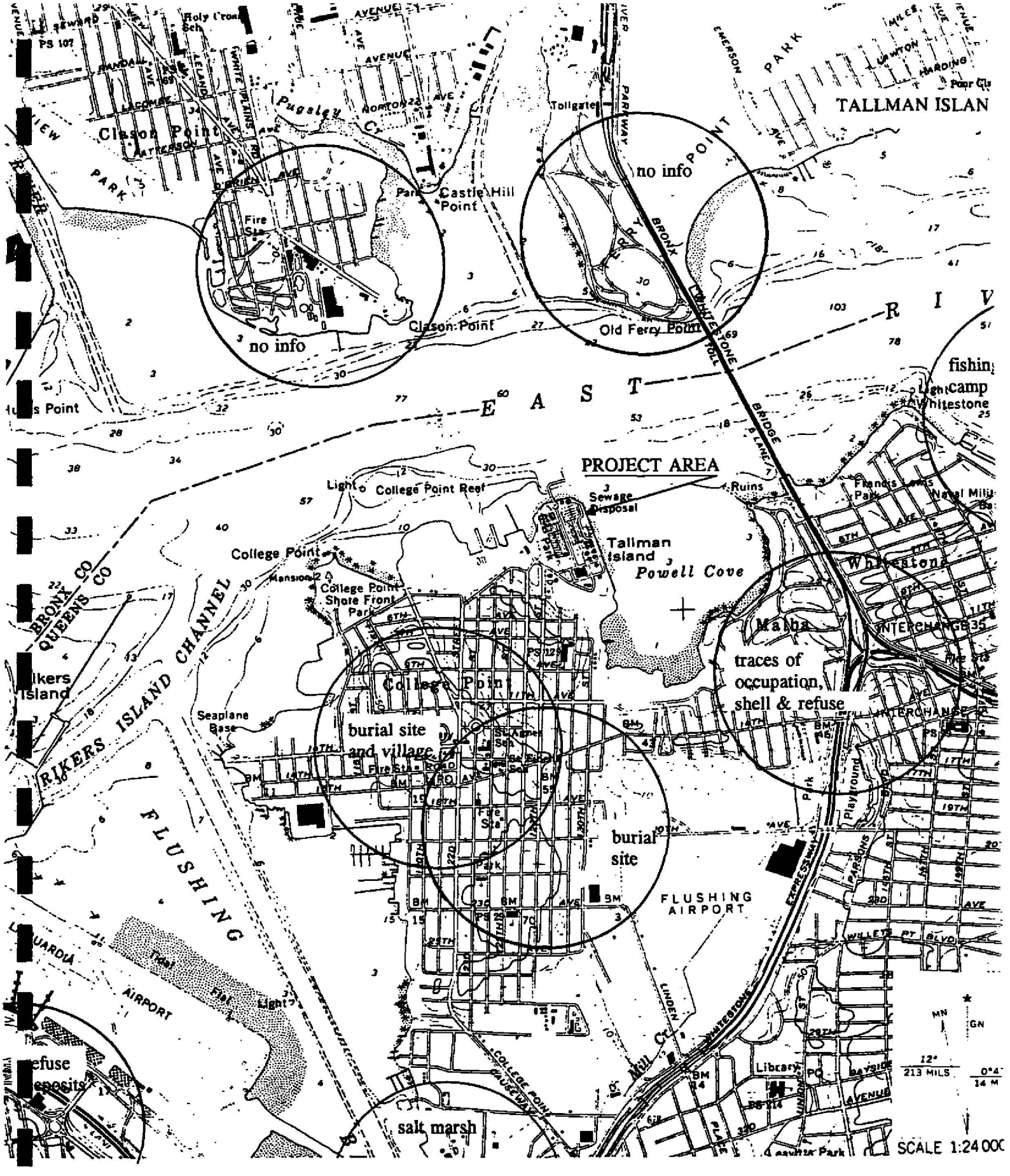


Figure 43 Prehistoric sites within one mile of the Tallman Island W.P.C.P. on the U.S.G.S. 7.5 minute quadrangle for Flushing, New York.

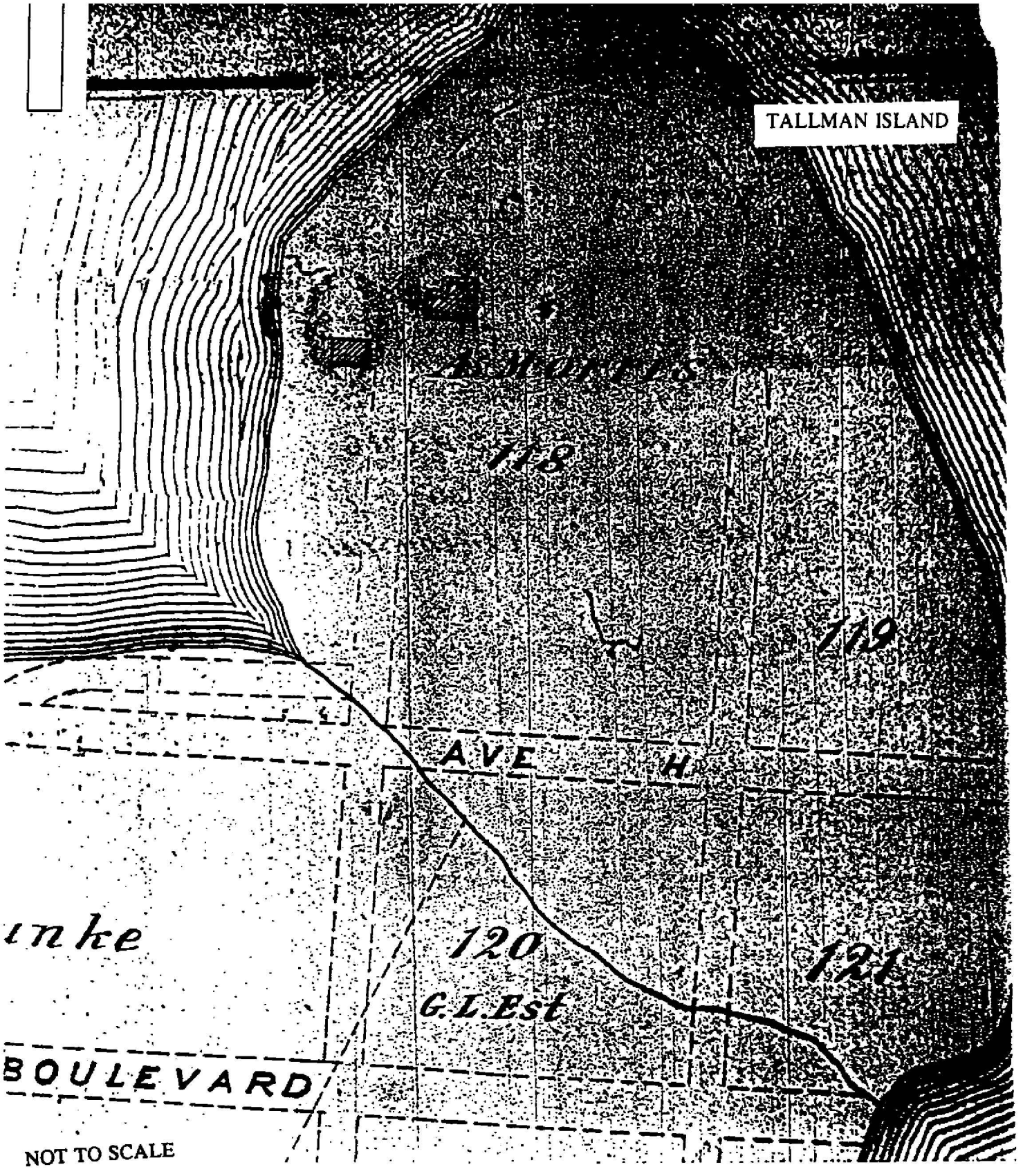


Figure 44 Beers' 1873 Atlas showing Tallman Island.

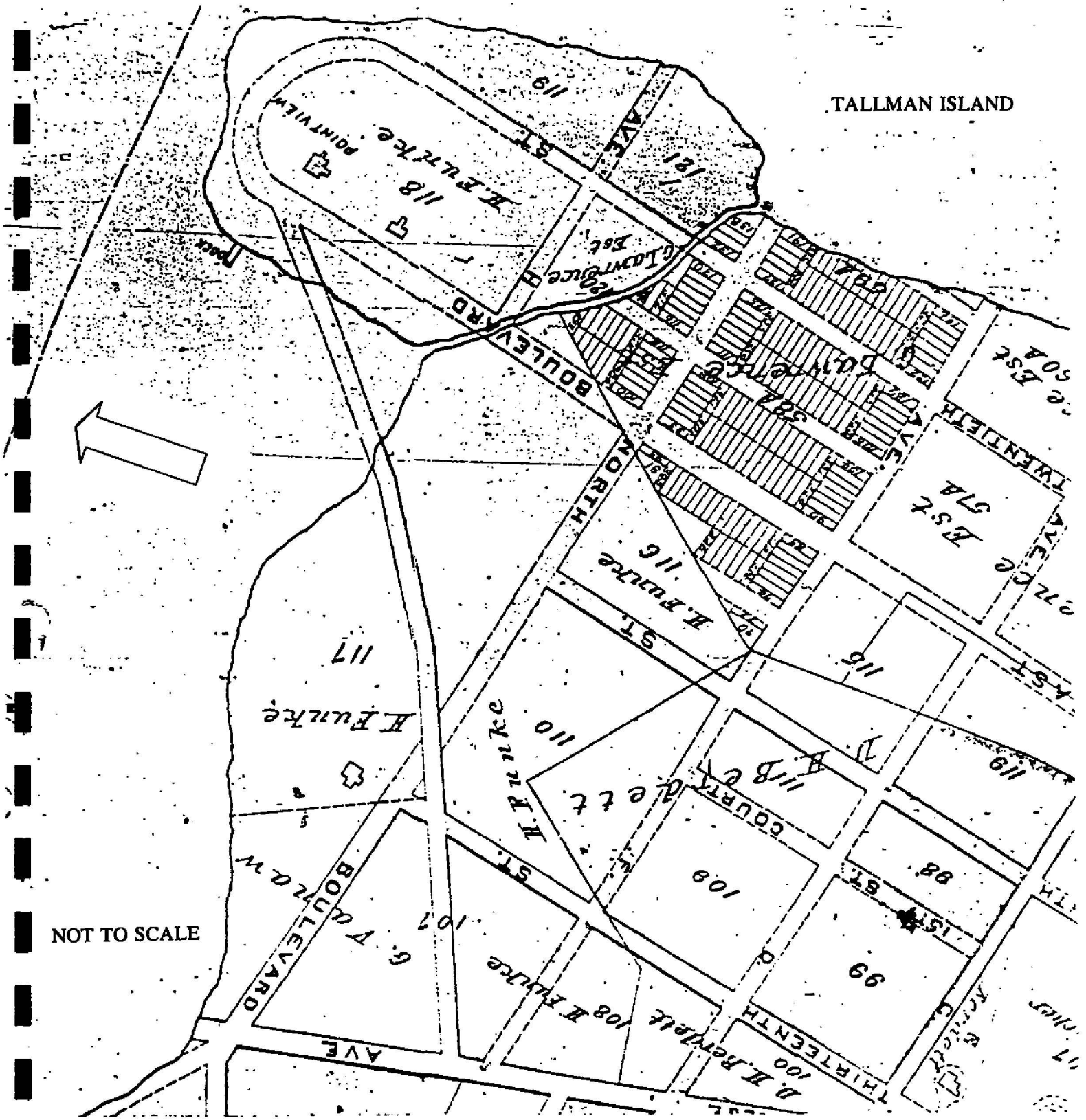


Figure 45 Wolverton's 1891 Atlas showing Tallman Island.

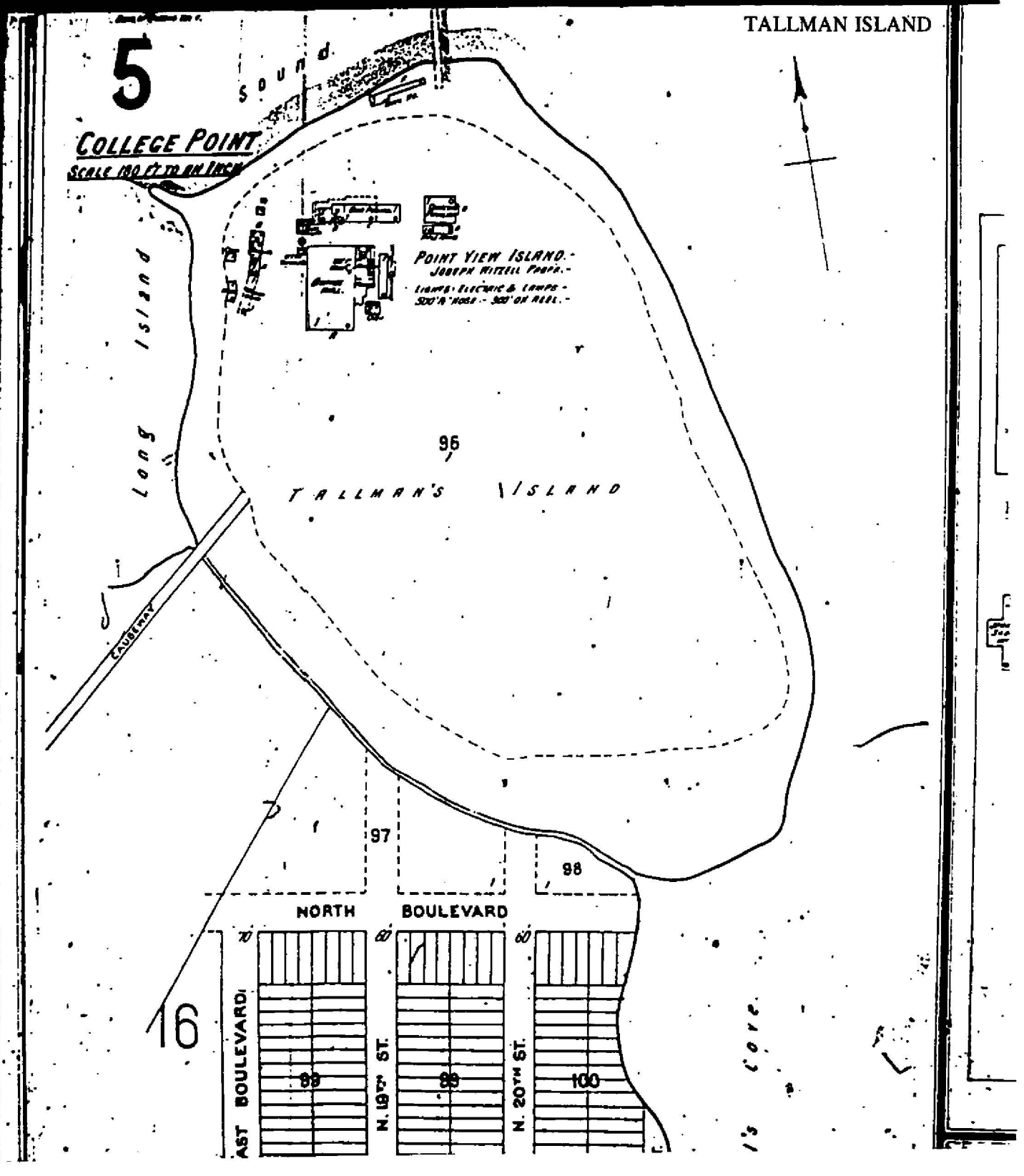


Figure 46 Sanborn 1903 Insurance Map showing Tallman Island.

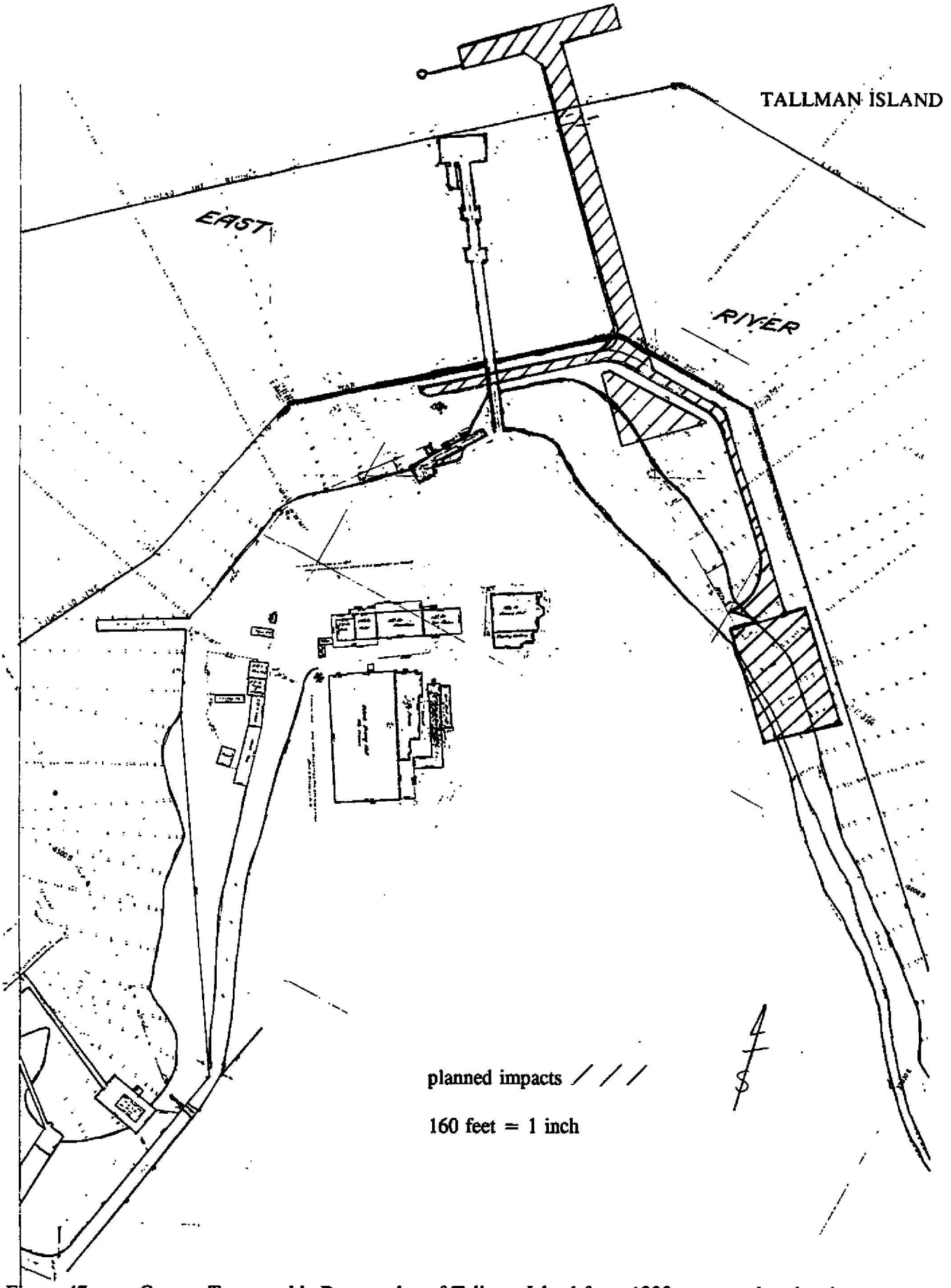


Figure 47 Queens Topographic Bureau plan of Tallman Island from 1908 survey, also showing 1923 bulkhead and pierhead lines and the current planned impact locations.

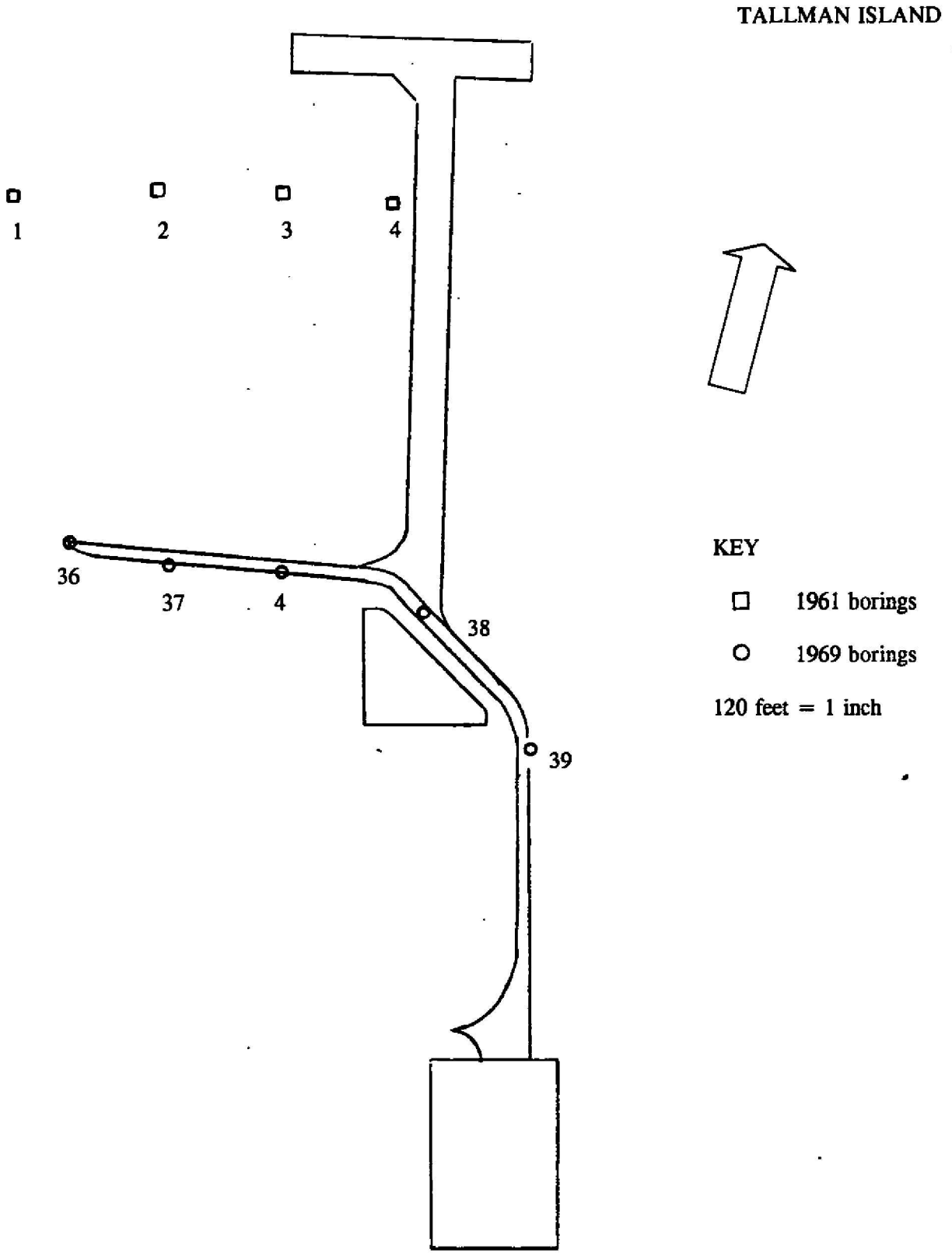


Figure 48 Location of borings in relation to the planned impacts at the Tallman Island W.P.C.P.

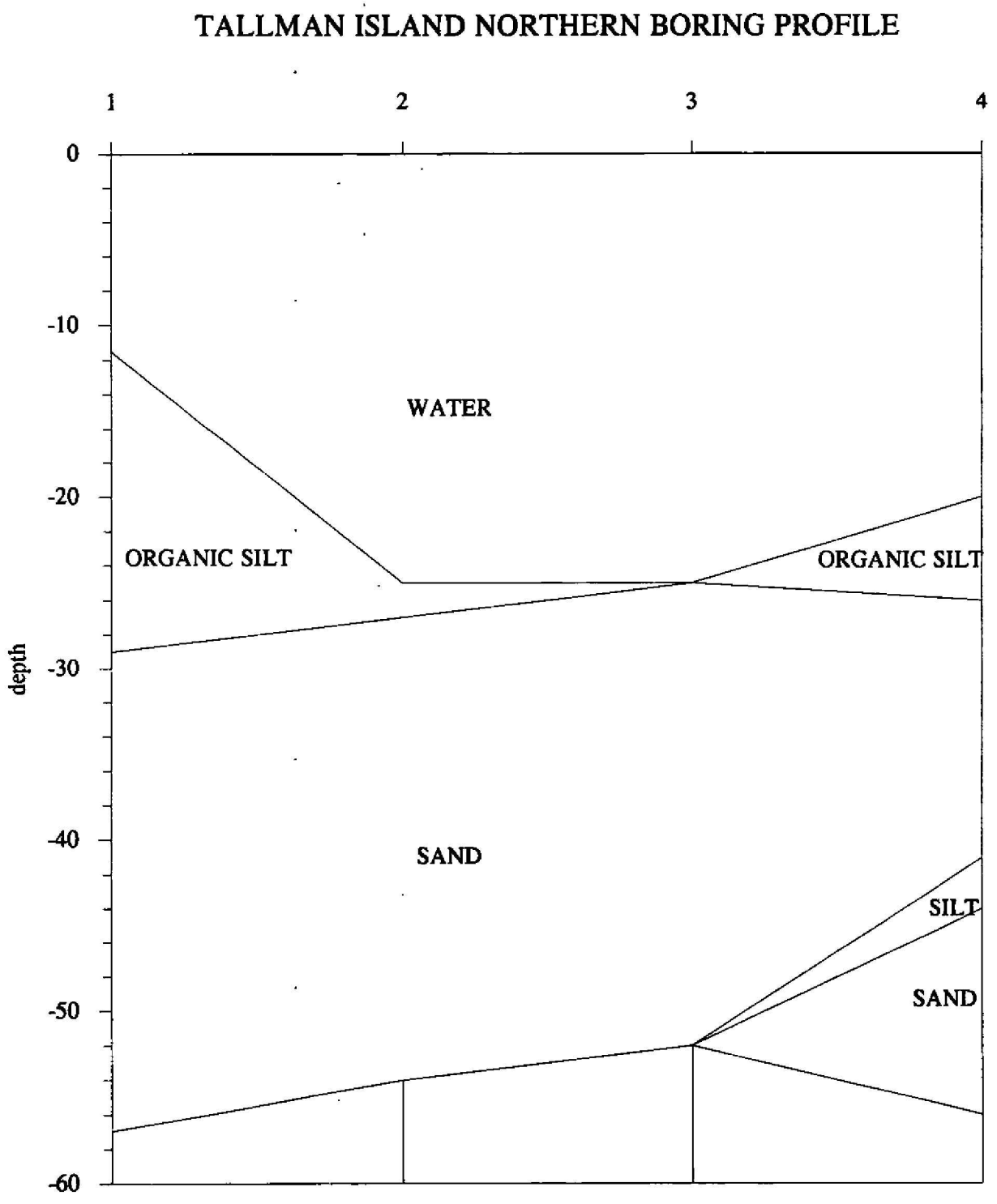


Figure 49 Generalized stratigraphy from selected borings taken in 1961 north of the Tallman Island W.P.C.P.

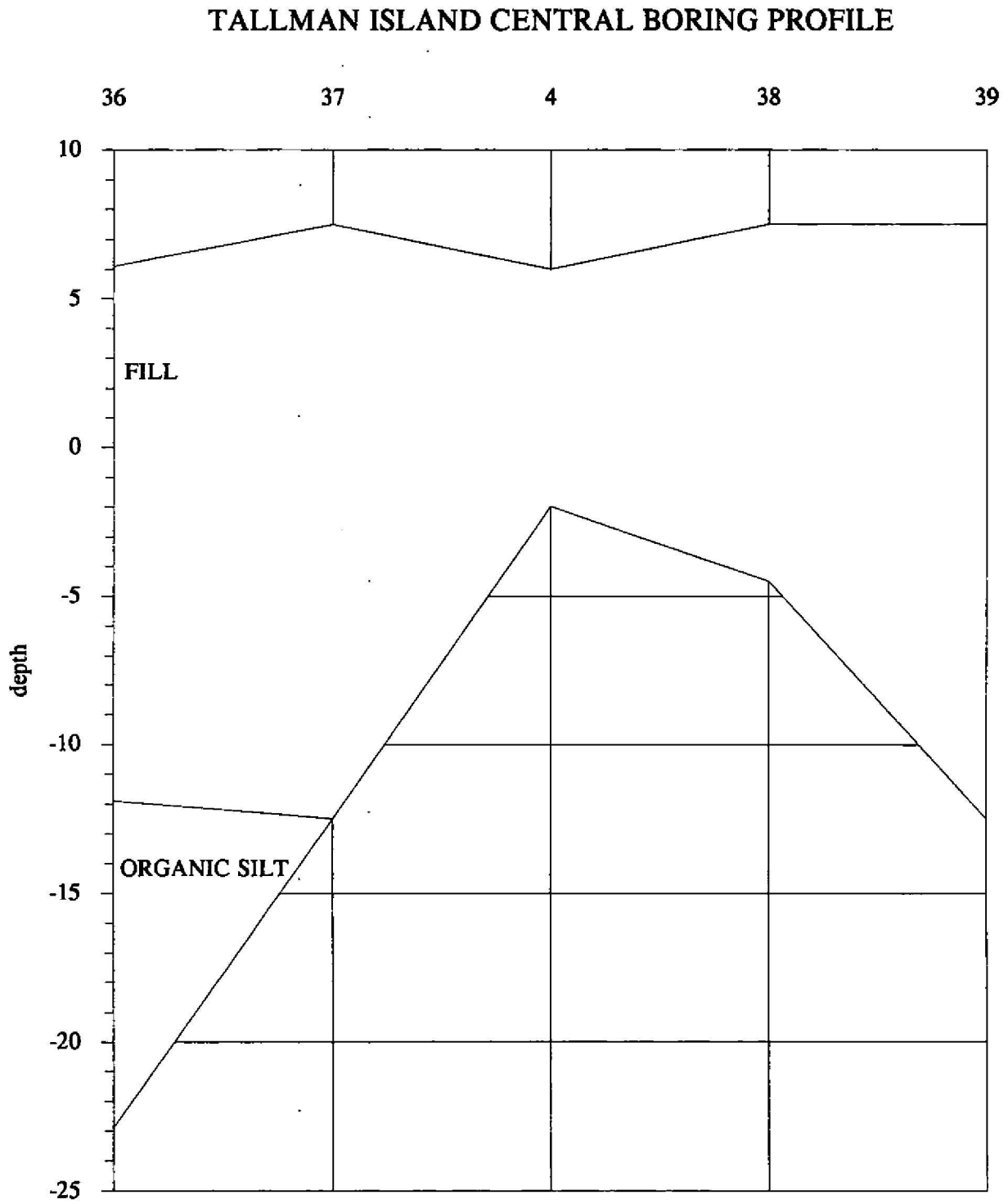


Figure 50 Generalized stratigraphy from selected borings taken in 1969 in the central part of the planned impacts at the Tallman Island W.P.C.P.

CONCLUSIONS AND RECOMMENDATIONS

Analysis for the potential of the dockwork contract to adversely impact archaeological resources at six of the New York City Water Pollution Control Plants was done through the use of historic maps and data, aerial photographs, soil boring logs and dredging data. Table 2 provides a summary of the potential for the preservation of expected archaeological resources by plant site. Prehistoric and historic resources are given either high, moderate or low ratings. High and moderate potential ratings are given to three of the plants. These ratings are on a relative basis. Even those archaeological resources considered here to have a high potential for preservation actually have a lower potential because of the likelihood there has been undocumented filling and dredging.

There is a high potential for the recovery of information on historic resources in the form of submerged, redeposited human remains, dating to the Revolutionary War period, in the area of planned impact at the Red Hook plant unless dredging records prove otherwise. The Red Hook plant also has a moderate potential for the preservation of archaeological resources within late nineteenth century fill. There is a high potential for the identification of prehistoric resources at the Tallman Island plant in the southwestern part of the planned container staging area although these resources may be buried beneath a twentieth century fill deposit. Moderate potential for the preservation of submerged prehistoric resources exists at the Hunts Point W.P.C.P.

All other potential archaeological resources in the planned impact areas of the dockwork contract discussed in this report have a low potential to yield archaeological information. No additional archaeological research or fieldwork is recommended for these sites within the areas of planned impacts.

Archaeological testing is recommended at the four locations identified within three of the plants in this report as having moderate to high potential for the preservation of archaeological resources. Testing at the Hunts Point and Red Hook plants should take the form of archaeological analysis of soil boring data. Field testing at Tallman Island may be conducted with shovel testing methodology.

It is recommended that the archaeological testing at the Hunts Point and Red Hook plants be done in conjunction with planned borings. The Hunts Point plan calls for five marine borings spaced between seventy and one hundred seventy feet apart within the area of the planned pier (see Figure 51). The number and placement of these borings should be adequate to determine the presence or absence of

prehistoric deposits based on archaeological evaluation of the previously recorded shell-containing organic silt stratum. The Red Hook boring plan calls for only one boring (see Figure 52). This small sample may not be adequate to determine the presence or absence of archaeological resources. Therefore a change in the number of borings at the Red Hook W.P.C.P. is recommended at this time. Two parallel rows of four borings each, spaced at fifty foot intervals, is recommended to evaluate for the presence of archaeological remains at the Red Hook W.P.C.P.

The boring methodology should include continuous sampling through the depth of planned impact. The archaeologist should be present to inspect the soil cores soon after they are made or the soils should be retained with their integrity intact until the archaeologist can evaluate them. The archaeologist will record soil stratigraphy in both written and graphical form. Soils will be evaluated for the presence of any potential archaeological remains which they may contain.

Shovel testing methodology is recommended in an area of the planned location of the Tallman Island container staging area measuring about twenty by one hundred twenty feet. One row of three shovel tests spaced at forty-five foot intervals is recommended along the western side of the project impact area. The shovel tests will be excavated to at least two feet, the depth of planned impact, to evaluate the nature of the soils and the presence or absence of prehistoric archaeological remains. Research has demonstrated that the area to the east of this proposed testing has been filled during the construction of the plant. It seems possible that shovel testing may show the area of fill extends throughout the planned container staging area. All soils excavated from the shovel tests will be screened through 1/4 inch mesh for the recovery of artifacts. Stratigraphy and artifact inclusions will be recorded on forms. Photodocumentation and drawings will be done as appropriate.

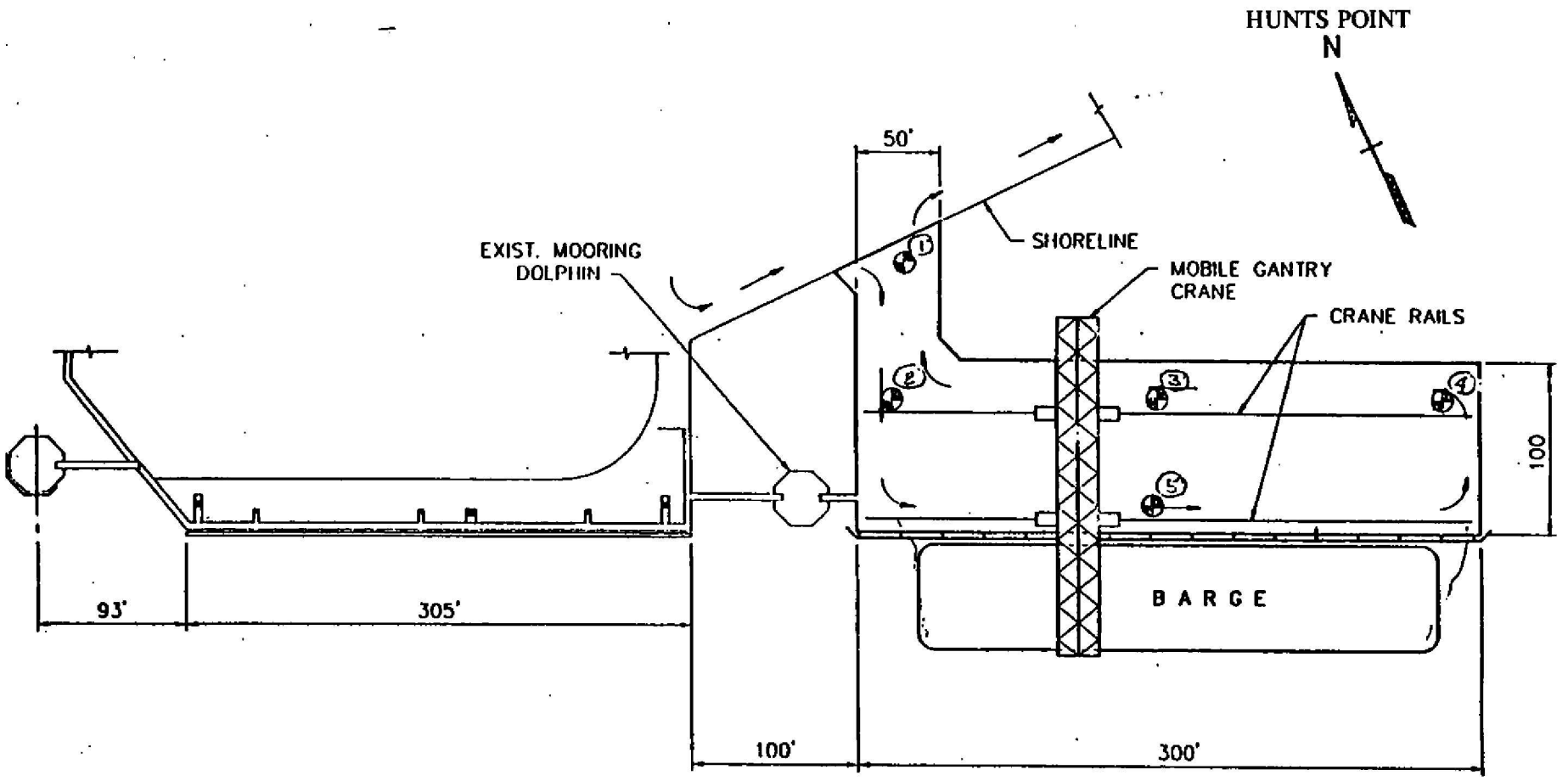
Standard methods of artifact processing and documentation will be done. A report of the findings at each site will be prepared to New York City Landmarks Preservation Commission standards.

Should the planned impact locations change, those areas of dockwork should also be evaluated for their potential to contain important archaeological resources.

TABLE 2

POTENTIAL FOR THE PRESERVATION OF EXPECTED ARCHAEOLOGICAL RESOURCES IN THE AREAS OF PLANNED IMPACTS AT THE SIX DOCKWORK SITES

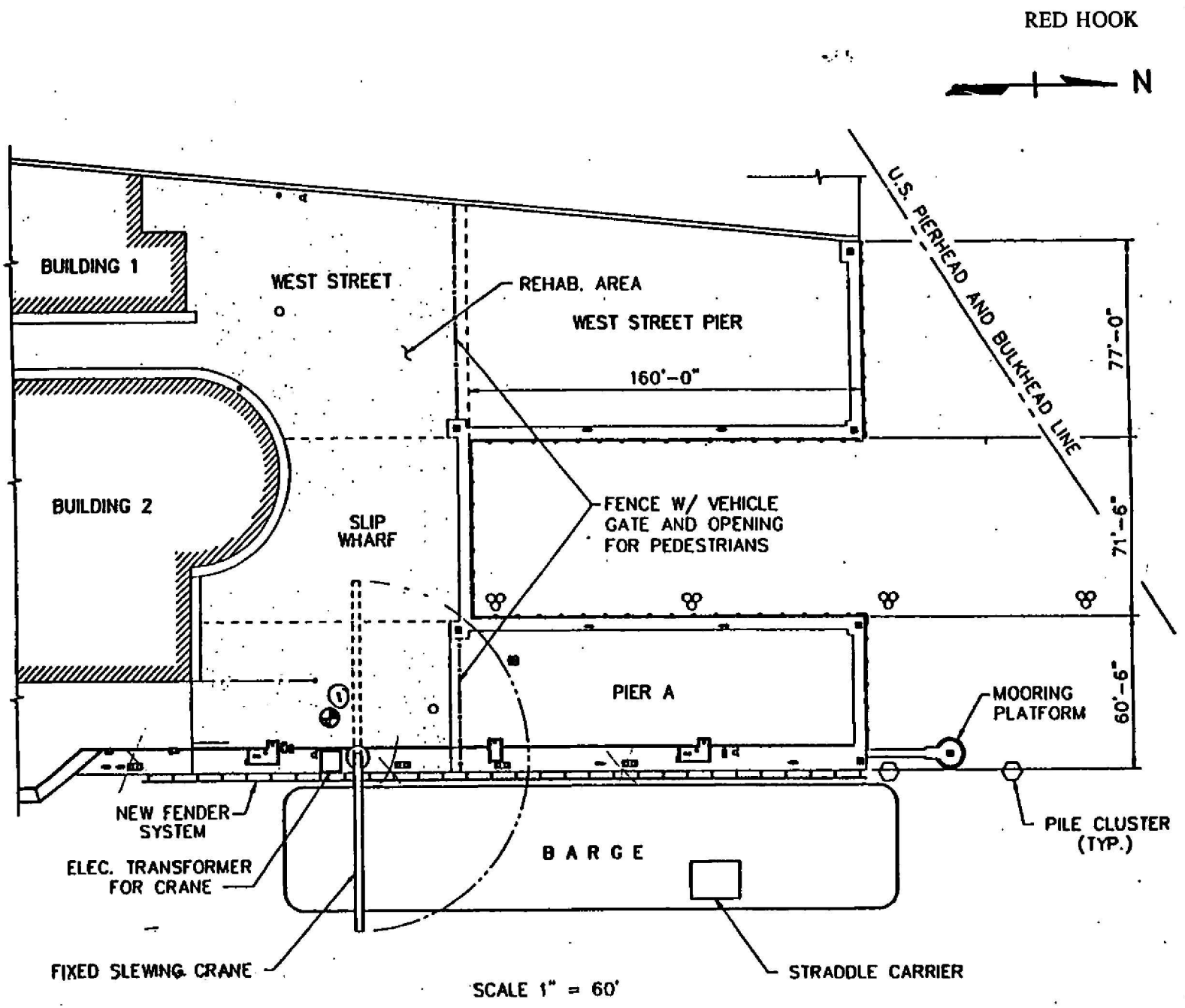
	PREHISTORIC			HISTORIC		
PLANT	High	Moderate	Low	High	Moderate	Low
HUNTS POINT		Marine work area				
RED HOOK			Y	Human remains	19th century fill	
26TH WARD			Y			
WARDS ISLAND			Y			Y
BOWERY BAY			Y			
TALLMAN ISLAND	Container staging area		Y			Y



NOT TO SCALE ~~1"=80'~~

Figure 51 Hunts Point W.P.C.P. boring plan.

CITY OF NEW YORK
DEPARTMENT OF ENVIROMENTAL PROTECTION
MARINE FACILITIES
HUNTS POINT WPCP
ALTERNATIVE 1



CITY OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL PROTECTION
MARINE FACILITIES
RED HOOK WPCP
ALTERNATIVE 1
ANTICIPATED BORING PROGRAM
(1 BORING)

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Figure 52 Red Hook W.P.C.P. boring plan.

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