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CULTURAL RESOURCE ASSESSMENT, NEW CROTON AQUEDUCT REHABILITATION SHAFT SITES WESTCHESTER, BRONX AND NEW YORK COUNTY, NEW YORK

CEQR: 04DEP134X

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Prepared For:

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EXECUTIVE SUMMARY

The New York City Department of Environmental Protection (NYCDEP) proposes to inspect and rehabilitate the New Croton Aqueduct (NCA) from its beginning at the New Croton Reservoir in Yorktown, Westchester County, to the distribution system connections in the Bronx and Manhattan. The 31-mile long NCA is a 110-year old facility that delivers up to 290 million gallons of water per day to New York City and other municipalities served by the Croton Water Supply System.

The proposed rehabilitation of the New Croton Aqueduct involves 35 separate shaft sites in Westchester, Bronx, and New York Counties. The locations and proposed work effort at each site varies. Some shafts are completely buried below grade, while others have associated structures such as pumping stations, above or adjacent to them. Some will undergo inspection, while others will be utilized as ventilation shafts for the duration of the project. Stage 1A documentary research was undertaken for each of the 35 shaft sites to determine their archaeological and historic resource potential.

Archeological Resources

Minimal ground disturbance would be required around most NCA structure locations to remove shaft covers for purposes of construction access, ventilation and inspection. In several locations the shaft is located within an existing building. At some locations, it would be necessary to create temporary construction staging areas ranging from 0.1 acre to approximately 0.75 acre in size, as described by specific shaft location later in this section. In such locations, in general, the activities involved would include construction of an access track and staging area, covering both with a geomembrane and temporary artificial hard surface of graded gravel, maintenance, and the subsequent removal of the gravel surface and geomembrane. Excavation of up to three feet around shaft covers may be required. Soil disturbance would also be required for the preparation of the access tracks and staging areas at Shaft Nos. 1, 2, 13 and 15½.

Significant archeological resources would not likely be located above the shaft covers as severe disturbance of the sites' soil strata occurred during the construction of the NCA and shafts in the late 1800s. The measures undertaken to ensure that the existing surface is not disturbed, through the introduction of a geomembrane and graded gravel surface, would also ensure that potential archeological deposits are not disturbed. However, it may be that disturbance can not be avoided at four sites determined to be potentially sensitive for archaeological deposits: Shafts Nos. 1, 2, 13 and 15½. Therefore, further archaeological investigations in the form of Stage 1B field testing is recommended for the potential impact area at each of these four shaft sites.

If Stage 1B field testing determines that precontact and/or historical period archaeological deposits are located at any of these four shaft sites, then additional Stage 2 testing – to establish the age, integrity, extent, and potential significance of deposits – may be warranted. If potentially significant deposits are encountered, mitigation would be undertaken. The

NYCDEP would implement all necessary procedures, in consultation with the NYSOPRHP, to avoid significant adverse impacts to archeological resources.

Architectural Resources

The NCA and associated structures are eligible for listing on the National and State Registers of Historic Places. At shaft locations, proposed activity within the NCA and associated structures is for in-tunnel and shaft inspection and minor rehabilitation only. Existing shaft covers would be removed, and equipment necessary for construction access, ventilation or shaft inspection would be temporarily placed, and subsequently removed, from the shaft site. Placement of a new shaft cover would be required at many locations and is the only action that would represent a minor alteration to the character or appearance of the structures, except at Shaft No. 9 where reconstruction and waterproofing of walls and floor of the shaft chamber are proposed.

Due to the eligible listing of the NCA and associated structures, NYCDEP would coordinate its plans for all NCA work with the NYSOPRHP. Prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties may also be consulted to assist in the retention of the historic character of the structures. By following the recommendations and implementing the requirements of the NYSOPRHP, NYCDEP would avoid significant adverse impacts to the historic character of the NCA and associated structures.

I. INTRODUCTION

The New York City Department of Environmental Protection (NYCDEP) proposes to inspect and rehabilitate the New Croton Aqueduct (NCA) from its beginning at the New Croton Reservoir in Yorktown, Westchester County, to the distribution system connections in the Bronx and Manhattan. The 31-mile long NCA is a 110-year old facility that delivers up to 290 million gallons of water per day to New York City and other municipalities served by the Croton Water Supply System.

The age and importance of the NCA require that it be inspected, and rehabilitated where the inspection reveals that such work is necessary. Accordingly, the interior tunnel portion of the first 24 miles of the NCA, the "gravity flow" portion of the NCA that begins at the New Croton Reservoir on the north, was inspected in 1993 and 1996.

The initial phase of the NCA Rehabilitation and Inspection program for which an Environmental Assessment Form (EAF) has been prepared includes:

a. The in-tunnel structural rehabilitation work that was identified as necessary as a result of the 1993 and 1996 inspections; and,

b. Inspection of the interior of the remaining 7-mile "pressurized-flow" portion of the NCA, as well as the shafts (openings or access points) and other above-ground facilities along the entire 31-mile length of the NCA.

The inspection of the pressurized-flow portion of the tunnel will become the basis for a later second phase of the rehabilitation work, but since that second phase work cannot be defined until the inspections are complete, the NCA Rehabilitation and Inspection Program is being reviewed under State Environmental Quality Review Act (SEQRA) and the City Environmental Quality Review (CEQR) in two separate EAFs. The second EAF will evaluate the available means of providing rehabilitation of deficiencies that are identified during the inspection phase described in the first EAF.

Inspection of facilities is typically classified as Type II under SEQRA. However, NYCDEP has recognized that in many instances, the surface access points for tunnel shafts, which were established more than 100 years ago, are located in environmentally sensitive areas that may be disturbed by inspection activity. Accordingly, NYCDEP determined that the initial phase inspection work is an "unlisted" action pursuant to SEQRA/CEQR and must be evaluated in an EAF to determine whether significant impacts may occur.

II. PROPOSED PROJECT

The proposed rehabilitation of the New Croton Aqueduct involves 35 separate shaft sites in Westchester, Bronx, and New York Counties. The locations and proposed work effort at each site varies. Some shafts are completely buried below grade, while others have associated structures such as pumping stations, above or adjacent to them. Some will undergo inspection, while others will be utilized as ventilation shafts for the duration of the project.

The following table describes the shaft sites, the proposed work effort, and the area of impact around each site:

Shaft No.	Access Category	Work Performed at Shafts	Land Use	Area of Ground Disturbance
Croton Lake Gate House	Ventilation - Fan	Lift and store existing cover and reinstall, IF, RC.	Forest/ Reservoir	N/A
1	Inspection Only	AT, G&C, ED, RC, improve access road, RS, IF	Forest	<0.25 Acres
2	Inspection Only	AT, G&C, RC, CV, RS, IF Plus repair shaft walls of protruding section, backfill surrounding depression area.	Forest	<0.25 Acres
3 New Castle supply	Inspection Only	Remove covers and gratings to allow access for video camera and cradle.	Municipal Building	N/A
4 Ossining supply	Inspection Only	Remove covers and gratings to allow access for video camera and cradle.	Municipal Building	N/A
5	Inspection Only	G&C, RC, RS, (AT over 6 foot high berm), Lift and store existing cover and reinstall.	Vacant Lot	<0.25 Acres
6 Briarcliff Manor supply	Inspection Only	Remove covers and gratings to allow access for video camera and cradle.	Municipal Building	N/A
8	Inspection Only	AT, G&C, ED, RC, CR, CV, RS, IF	Forest	N/A
9	CAS	Lift and store existing covers and reinstall, CAS. See Construction Staging Drawing.	Headhouse Structure	~ 1 Acre
10 Municipal offtake	Inspection Only	Remove covers and gratings to allow access for video camera and cradle.	Municipal Lot	N/A

Shaft No.	Access Category	Work Performed at Shafts	Land Use	Area of Ground Disturbance
11A	Inspection/ Ventilation Exhaust	Lift and store existing cover and reinstall, RC.	Headhouse Structure	N/A
11B	Inspection Only	Lift and store existing cover and reinstall, RC, G&C.	Corporate Park	<0.25 Acres
11C	Inspection/ Debris Removal / Ventilation Exhaust	Lift and store existing cover and install new cover, RC, G&C.	Corporate Park	Combined with 11B
12A Village of Irvington offtake	Inspection Only	Remove covers and gratings to allow access for video camera and cradle.	Municipal Lot	N/A
13	Inspection Only	AT, G&C, RC, CR, IF, RS	Vacant Lot	<0.25 Acres
14	CAS Engineer's Office location	Lift and store existing covers and reinstall. See Construction Staging Drawing.	Library Parking Lot	<0.25 Acres
14A	Inspection Only	RC, TR, check pump vault below and remove grates/plates from around uptakes to allow access for video camera and cradle.	Nursery Playground	<1000 ft^2
15½ (Mount Hope Cemetery)	Inspection Only	AT, RC, IF, RS	Cemetery	<0.25 Acres
16	Inspection Only	Remove covers and gratings to allow access for video camera and cradle, AT, G&C, RS, CR.	Vacant Lot	N/A
17½	Inspection Only	Location unknown. AT, G&C, RC, CR, RS, IF	Vacant Lot	<0.25 Acres
18	CAS	Lift and store existing covers and reinstall. See Construction Staging Drawing.	Headhouse Structure	~0.75 Acres
Old Croton Aqueduct Connection	For plug construction	Location unknown. Locate, AT, G&C, RC, IF, RS, TR	N/A	N/A
18¼	Inspection Only	Lift and store existing covers and reinstall.	Vacant Lot	N/A
19	Inspection Only	AT, G&C, RC, IF, RS, TR	Park	<0.25 Acres
19⅝	Inspection Only	AT, G&C, RC, RS, IF, TR. See Construction Staging Drawing.	NYC Park	<0.25 Acres

Shaft No.	Access Category	Work Performed at Shafts	Land Use	Area of Ground Disturbance
Gate House No.1	CAS	Lift and store existing cover(s) and reinstall. AT, G&C, RC, RS, IF. See Construction Staging Drawing.	NYC Park	~0.5 Acres
20	CAS	AT, G&C, RC, RS, IF, TR See Construction Staging Drawing.	NYC Park	<0.25 Acres
21 and Jerome Park Reservoir	Ventilation - Fan Engineer's Office location	Lift and store existing cover and reinstall.	Reservoir	N/A
22	Inspection Only	MDFDI upper pressure cover, MDFDI lower pressure cover, TR, ED	Sidewalk	~1200 ft^2
23	Inspection Only	RC upper and lower pressure covers, Install new upper pressure cover and MDFDI lower pressure cover.	Headhouse Structure	N/A
24	Inspection Only	RC both, Install upper pressure cover supplied by City, and MDFDI lower pressure cover, RS, IF, TR.	Highway	N/A
24A	Inspection Only	TBD	Structure	N/A
25 Aqueduct Shaft	Inspection Only + ROV	G&C, RC, MDFDI upper pressure cover, and lower pressure cover.	NYC Park	<0.25 Acres
25 Pump Shaft	Inspection Only + ROV	AT (clear boulders and grade existing track), G&C, IF, TR, RS, pump out water from above pressure covers, RC surface cover and both sets of upper and lower pressure covers only, MDFDI surface and pressure covers.	Combined W/ 25 Aqueduct Shaft	Combined W/ 25 Aqueduct Shaft
25 Gate Shaft	Inspection Only + ROV	AT (clear boulders and grade existing track), G&C, IF, RS, TR, RC, MDFDI pressure cover	Combined W/ 25 Aqueduct Shaft	Combined W/ 25 Aqueduct Shaft
26	Inspection / Ventilation - Fan	Lift and store existing cover and reinstall, TR.	Building	N/A
28	Inspection Only	Lift and store existing cover and reinstall, TR.	City Street	~3500 ft^2

Shaft No.	Access Category	Work Performed at Shafts	Land Use	Area of Ground Disturbance
29	Inspection Only	Lift and store existing cover and reinstall, TR.	City Street	~3500 ft^2
33	CAS Ventilation Exhaust	Lift and store existing cover and reinstall. See Construction Staging Drawing.	City Street	<0.25 Acres

Key for table:

CAS	Construction Access Shaft.
G&C	Grub and Clear area around shaft, within area for fenced compound and 20-feet around compound, and as needed for access track.
RC	Remove Cover
CR	Clear obstructions for temporary access track to shaft (trees >8" diameter, boulders, etc.)
AT	Construct temporary access track to shaft
ED	Excavate and/or demolish old headhouse foundation
CV	Culvert needed for access track
MDFDI	Measure, Design, Fabricate, Deliver and Install Engineer Approved Cover
TR	Traffic barricades needed around work area
IF	Install fencing
TBD	To Be Determined
MI	Measure and Inspect but do not remove cover
RS	Topsoil cleared and grubbed area and re-seed
NA	Not Applicable

Shaft Locations:

Croton Lake Gate House to Shaft No. 19	Westchester County, NY
Shaft No. 19 ⅝ to Shaft No. 24A	Bronx, NY
Shaft No. 25 to Shaft No. 33	Manhattan, NY

III. RESEARCH GOALS AND METHODS

Phase 1A background research was designed to address two major questions. What is the specific level of potential for prehistoric and historical archaeological resources of significance to exist within the proposed impact area for each of the shaft site; and, what is the likelihood that such resources have survived historical subsurface disturbances, particularly since each shaft site was previously disturbed by its construction. Sufficient information was gathered to compare, both horizontally and vertically, the prehistoric past, the historical past, and the subsurface disturbance record. In order to address potential sensitivity research included a review of primary and secondary sources, cartographic analysis, site files review, informant interviews, and field visits. Each of these tasks is discussed below.

Review of Primary and Secondary Sources

Primary and secondary source material was researched in order to document the prior usage of the project site. These resources included pertinent archaeological reports prepared for adjacent parcels as well as local and regional source material for data on prehistoric and historical settlements. Particularly valuable were local historians' accounts, and prehistoric archaeological works by both professional and amateur archaeologists. Manuscripts and newspaper clippings held by the Westchester County Historical Society, the Bronx Historical Society, and the New York Historical Society proved invaluable. Historical photographs were sought to document the extent of prior disturbance around each shaft site.

Cartographic Analysis

Historical maps were obtained from local repositories. These were studied for early land use, topography, and historical events; atlases were studied for more modern land use, topography, and subsurface disturbance episodes. Early maps helped to provide an account of land-use modifications and episodes of use and construction through the last two centuries.

Site Files Review

Site file reviews were conducted at the New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP), and the New York State Museum (NYSM), to determine if prehistoric or historical materials had previously been reported in the vicinity of, or within, the project site. The NYSM also provided a prediction of archaeological sensitivity.

Informant Interviews

Long-term residents were sought and questioned regarding personal knowledge of land-use history. Local historians and archaeologists were able to provide information regarding construction activities which may have impacted archaeologically sensitive areas, and also reported areas where cultural resources had been previously identified and/or collected.

Field Visit

A field visit was conducted in April, 2004 at which time photographs were taken of the current conditions of the each of the shaft sites. Standing structures were noted and obvious signs of disturbance were recorded. Historical features were also noted, and prehistorically sensitive areas were identified. Some of the shafts are currently buried, so their precise location was difficult to ascertain in the field.

IV. PRECONTACT BACKGROUND

Much of the knowledge and understanding of Native Americans in northern New York City and the lower Hudson Valley is derived from three sources: ethnographic reports, Native American artifact collections, and archaeological investigations. Archaeologists have devised a cultural chronology for North America in which the Precontact era is divided into four main periods, the Paleo-Indian (c. 12,000-10,000 years ago), Archaic (c. 10,000-2,700 years ago), Woodland (c. 2,700-500 years ago), and Contact (500-300 years ago). Settlement types, subsistence, cultural systems and characteristic artifacts changed during each of these stages. In order to present a comprehensive overview of the precontact era and to fully evaluate the potential of recovering precontact cultural remains, each period will be reviewed with regard to 1) the environment during the time period, 2) the characteristics illustrative of the phase, and 3) any recovered archaeological sites within the region. This examination was completed in order to assess the potential that indigenous groups would have had for exploiting the project locale in general as well as the actual project sites.

Precontact sites are characterized by their proximity to a water source, fresh game, and exploitable natural resources (i.e., plants, raw materials for stone tools, clay veins, etc.). These sites are often divided into three types, primary (campsites or villages), secondary (food processing, tool manufacturing), and isolated finds (a single recovery of artifacts either lost or discarded). The examination of primary habitation sites indicates that they are often situated in locales that are surrounded by a number of exploitable resources. In addition, these sites are located in areas easily defended against both nature (weather) and enemies. Secondary sites are often found at the location of an exploitable resource (e.g., lithic quarry site).

Paleo-Indian Period

Archaeological data strongly indicates that Native Americans arrived in the Northeast following the last glacial period, although conflicting data suggests arrival may in fact pre-date glaciation. The exact date of entry remains uncertain, although the post-glacial theory is more widely accepted. During the Wisconsin Glaciation of the Pleistocene in the Northeast, ice reached its maximum advance between 18,000 and 16,000 years ago. After this period glaciers slowly retreated north, with glacial gravel deposited along the melting margin forming moraines. By 13,000 years ago, ice had receded north exposing the surface of the lower Hudson Valley and Westchester County for repopulation by flora and fauna. As ice melted, glacial lakes formed, eventually filling with sediments and forming swamps.

Following the final retreat of glacial ice, the lower Hudson Valley flourished with plants suited to arctic and tundra conditions. Eventually, the locale became a forest composed of deciduous trees and conifers. The fluctuating floral and faunal communities eventually stabilized over the last 12,000 years, resulting in an environment often characterized as a climax forest, comprised of oak, hemlock, beech and chestnut trees.

Between 14,000 and 12,000 years ago the Northeast was generally characterized as open woodland, rich in spruce. Pollen analysis shows that the southeastern New York region was

comprised of a mixed coniferous-hardwood forest following deglaciation (Salwen 1975:43). The Paleo-Indian period represents the earliest documented human occupation in the Northeast, dating approximately between 12,000 to 9,500 years B.P. (Before Present). Artifacts attributed to this period from sites throughout the Northeast include diagnostic Clovis-type fluted projectile points. Research has lead to the postulation that small bands of hunters nomadically roamed large territories, relying predominantly on post-pleistocene mega-fauna such as mammoth, mastodon, bison and horse.

Alternative hypotheses based on research in eastern New York suggest that Paleo-Indians inhabiting the area utilized a wide array of resources and had a restricted territory in which they operated (Eisenberg 1978:139). Additional research continues to assist in developing and refining models of subsistence and settlement. Sites that have been identified tend to be located in three specific geographic locales: on lowland waterside camps near coniferous swamps and near larger rivers; on upland bluffs and on ridge tops in areas dominated by deciduous trees (Ibid.:138).

With the exception of stone tools, artifactual material from this early period has not survived well in the archaeological record. Extensive research indicates that the diagnostic artifact of the nomadic Paleo-Indian hunters was the fluted point. By the late Paleo-Indian Period, however, small leaf shaped or bifacial knives, scrapers, and borers had become part of the hunter's tool kit. As the climate became warmer, the environment in the Northeast became more advantageous to native peoples. In addition, small game animals more suited to the temperate environment replaced the larger fauna that were rapidly becoming extinct.

Paleo-Indian sites, consisting of sporadic finds of fluted points, have been found in the Croton Point area in Westchester County (Crichton 1986). A number of archaeological investigations in Westchester County during the mid-1980s noted a distinct level of Paleo-Indian occupation (Crichton 1986). To the south, a small campsite (Port Mobil) was recovered on Staten Island (Ritchie 1994: 1, 3, 7).

Archaic Period

The Archaic period, spanning approximately 6,500 years, has been subdivided into the Early, Middle, Late, and Transitional - or Terminal - sub-periods. Data regarding the Archaic period indicate that the quantity of recorded archaeological sites is much larger then those dating to the Paleo-Indian Period, thus suggesting a significant increase in the population of native peoples. The Archaic period is also characterized by an overall shift in the environment, an expansion of the lithic tool kit, and the exploitation of defined territorial boundaries.

During the early part of the period, the climate continued to warm causing a continued rise in sea level, which eventually stabilized by the Late Archaic. Schuldenrein suggests that the reduction in the rise of sea levels during the latter part of the period provided native peoples with additional exploitable environments near water courses (1995). He states "the diversity of habitats and microenvironments would have promoted widespread exploitation of both upland and valley/estuarine environments" (1995: 60).

By the Early Archaic the environment in the Northeast had developed into a deciduous woodland forest. A gradual warming trend allowed new resources to establish themselves in the river valley. The Archaic people's subsistence was "based on hunting, fishing and gathering of wild vegetables" (Ritchie 1994:31). They hunted smaller game animals (deer, rabbit, beaver, and wild turkey) and gathered a variety of wild plants, as well as exploited the marine environment (fish and shellfish gathering). Artifacts attesting to the expanded subsistence economy include fishing implements and the mortar and pestle.

During the period, the expanding exploitable resource base may have initiated the significant increase in population. The Archaic hunters also began exploiting a well-defined territory, often reoccupying favored sites. Because of the repeated occupation of these Archaic sites as well as the seasonal rounds made within specific territories, archaeologists have been able to recognize several identifiable cultural traditions in New York State (Ritchie 1994). The change in the number of sites recovered also indicates that Archaic peoples had a greater impact upon the landscape. Typical with all precontact sites, river valleys and coastal areas were the preferred locale for primary camp sites. This environment supported the game, plants, and marine resources desired by Archaic peoples.

The narrow bladed projectile point (Neville and Stark), grooved axe, and beveled adz were some of the additions to the tool kit of the Middle Archaic hunter. Along the shores of the Hudson River, Neville-like points have been recovered from both the Sylvan Lake Rockshelter site in Dutchess County and the Muddy Brook Rockshelter site in Putnam County (Funk 1976:168; Tompkins and DiMaria 1979:58). Archaeologist Robert Funk has suggested that the Laurentian, Susquehanna, and small-stemmed cultural traditions persisted in the Hudson River Valley during the Terminal Archaic period, ca. 4,000-3,000 years B.P. (Funk 1976: 250). Although Funk defines these three separate traditions as persisting in the Hudson River Valley, Snow suggests that the Susquehanna tradition dominated the first half of the period, marked by Snook Kill, Perkiomen and Susquehanna Broad points, while the latter half of the period was dominated by the Orient complex characterized by the Orient Fishtail Point (Snow 1980:237). At present, the exact sequence of cultural traditions and representative complexes for the Archaic period is still undefined and a constant source of debate among scholars.

The Native American population had increased significantly in the Hudson River Valley region by the Late Archaic period. The variety of recovered sites from this period include rockshelters, open woodland camps, and secondary processing locations overlooking the various water sources. In a section of the Bronx's Riverdale Park excavations were conducted on a series of precontact sites (DeCarlo 1990: 5). Archaeologists recovered a Late Archaic assemblage of oyster shells, fire cracked rocks, scrapers, bifaces, lithic debitage and diagnostic projectile points suggesting that this location may have been used for hunting and shellfish procurement from the Hudson River (Lenik 1992: 24).

Woodland Period

The Woodland period persisted in the Northeast from approximately 3,000 to 500 years ago. Again divided into three sub-categories, this period consists of the Early, Middle and Late

periods. The first use of ceramics marks the beginning of this cultural period. Crude, undecorated pottery, called Vinette 1, was often tempered with steatite. Simply designed pottery of this type has largely been recovered from sites on major waterways and tributaries. Early Woodland, Middlesex phase sites are commonly discovered during sand and gravel mining operations near a lake or river, as sites tend to be located on well drained knolls adjacent to fresh water (Ritchie 1980:201). Fish runs in rivers provided a stable and reliable resource, and fish weirs were utilized in the Hudson and smaller tributary rivers for the recovery of large quantities of anadramous fish (Brumbach 1986:35). As this period progressed, regional variations in ceramic styles became common. Subsistence and settlement patterns appear to have included semi-permanent settlements with task-specific locations utilized for the purpose of exploiting target resources. Ritchie and Funk (1973:349) identify several settlement types including recurringly-occupied small and semi-permanent large camps, small temporary camps, cemeteries, burial mounds, and workshops.

The Woodland Period also is characterized by the introduction of pottery and horticulture, the appearance of large semi- permanent or permanent villages, and the establishment of clearly defined trade networks which marked the transition to a more settled culture. As with the earlier precontact periods, archaeological evidence suggests a marked preference for large-scale primary habitation sites within the vicinity of a fresh water source (e.g., rivers, lakes, streams, and ponds). In the majority of cases, secondary sites, where specific activities occurred (e.g., shellfish collecting and/or processing, butchering, and stone tool-making), were situated near the location of the exploited resource.

The first appearance of pottery was during the Early Woodland in New York State (c. 1000 B.C.) when crude, undecorated Vinette 1 pottery was first produced. This type of pottery has been recovered from sites on major New York waterways and tributaries. As the Woodland period progressed, regional variations in ceramic styles became common. Other innovations during the Woodland period reflect different cultural styles that archaeologists have been able to identify with specific native groups. A few of these include the introduction of the bow and arrow, pipe-smoking, and mortuary ceremonialism.

During the Woodland Period, fish and shellfish continued to provide a stable and reliable resource. In the smaller tributary rivers fish weirs were used for the recovery of large quantities of anadramous fish (Brumbach 1986:35). The introduction of horticulture in the New York area also signaled the advent of larger and more permanent settlements. Large tracts of land were cleared in locations nearby the primary settlements. Some of the native villages settled during this period were fortified and situated on "high ground." By the Late Woodland Period, Native paths were established connecting permanent villages, creating a trail to exploitable resources, and providing a link for the distribution of trade goods.

Contact Period

Documentary and archaeological sources have provided much of what is known about the Contact Period. Archaeologists and historians have carefully examined historic documents in order to understand the native cultures that were living along the Hudson River when Europeans first arrived. Legal documents and ethnohistorical accounts and have provided

valuable details about the past lifeways of native peoples. Because information about the settlements, appearance, and behavior of ancient peoples cannot be reconstructed from the recovery of a few artifacts, these additional resources have provided the means by which archaeologists can assemble more complete data about past cultures.

The Contact Period between 500 to 300 years B.P. is characterized by initial interactions between Native Americans and Europeans. Native settlement patterns at the beginning of this period incorporated seasonal hunting and gathering. Semi-permanent villages or hamlets, situated near planting fields, possessed oval and round, bark and mat-covered structures. Large subsurface pits were located nearby for storing dried meat, fish, and corn, and eventually were filled with trash. Fields were commonly burned at the end of the planting season to encourage floral and faunal repopulating. Villages centered on horticultural land were moved every ten or twenty years as soil fertility, firewood, and nearby game resources were depleted (Salwen 1975:57). Although early historic accounts suggest the presence of stockaded villages or forts in southern New York, archaeological data indicate they did not exist before the middle of the eighteenth century (Ritchie and Funk 1973:368).

When the first Europeans arrived it was noted that Native American groups living along the shores of the Hudson River had developed complex group dynamics. The first contact between Europeans and Native Americans occurred when Henry Hudson docked his vessel near present day Yonkers in Westchester County. Initial trade between the two cultures began along the Hudson River before moving inland. Furs and wampum were used as a medium of exchange for European goods. In 1625, Johannes de Laet, one of the early travelers to the area wrote that the natives he encountered were "divided into many nations and languages" (Bolton 1972: 16). Descriptions like this were often repeated by many describe many of the diverse groups encountered. While initial contact was primarily peaceful, large scale conflicts erupted following the arrival of Governor Willem Kieft in 1638. Kieft was notorious for his harsh policies against the local tribes. By the mid- to late seventeenth century, many of these peoples were subsequently decimated by local hostilities and European-introduced diseases.

Historic documents indicate that when the first Europeans arrived there were a large number of native peoples occupying the locale along the Hudson River in the northwest Bronx. Early historical records (deeds, treaties, and maps) identify the indigenous people that inhabited this section of New York City. One early document, the Hendricks Map of 1616, depicted a group called the Wikagyl, subsequently identified as the Wiechquaesgeek, as the inhabitants of the northern Bronx and lower Westchester County (Bolton 1934: 128; Grumet 1981: 59-60). According to early reports, Native Americans hunted the local hills extensively, and possibly planted corn in the Saw Mill River Valley - then known as the Neparan River (Bolton 1881: Map of Westchester Under the Mohegan Indians). Shell beds along the Hudson River in Tarrytown attest to the extensive use of the area (Bolton 1848:164).

Tension between Native Americans and Europeans escalated throughout the seventeenth century. In the 1640s the Mohawks from the north descended upon local groups which in turn fled to the Dutch in New Jersey for protection. Soldiers of a Dutch fort rose up against

these fleeing groups, killing over 100 people. Thirty more were murdered in Corlears Hook to the south. This incited eleven local tribes to declare war in which the Dutch settlements around Fort Amsterdam were laid waste. A peace treaty was signed in 1643 but was not fully established for years. Although tensions diminished, skirmishes ensued for years.

V. HISTORICAL BACKGROUND

The earliest transfers of land within northern Manhattan, the Bronx, and Westchester County were from the Indian sachems to the Dutch West India Company from the 1620s through the early 1640s. In 1623 the Dutch West India Company received from the Dutch States General, a grant for all lands within Manhattan (Hoag 1905:32). Later, in 1626 Peter Minuit, the Director General, purchased Manhattan Island from the local Indians for what amounted to less than 25 dollars (Jones 1978:10). Other early individual landowners under Dutch rule included Jonas Bronk, who purchased 500 acres between the Bronx and Harlem Rivers (known at the time as the Keskeskeck patent), and Adriaen van der Donck, who purchased 24,000 acres of land from the Wiechquaesgeek Indians along the Hudson River in what is now the Bronx and Westchester County (Jenkins 1912:25; Anderson 1991: 12; Pons 1994: 2

After the English took over the Dutch colony of New Amsterdam in 1644, the first purchase of land in the area from local Native Americans transpired in 1649. In 1662 Connecticut bought all the lands west to the Hudson River and the area was divided between a few wealthy landowners who formed six manorial estates (French 1860:700). Frederick Philipse, a manorial lord, purchased much of what is now Westchester County in 1681, and the county was officially formed in 1683. In 1684 Philipse built a mill and manor house near the Hudson River and proceeded to purchase approximately 22 miles of land along the east bank of the Hudson River. The Philipsburgh patent, granting manorial rights, was bestowed to Frederick Philipse in 1693 by King William and Queen Mary of England (Scharf 1886:174). He then deeded the tract to his son Adolph, and the parcel was subsequently inherited by his grandson Frederick who became the third Lord of the Manor of Philipsburgh.

By the 1750s over a thousand people were living in Philipsburgh Manor farming the land and clearing forests to support the demand for lumber. Most of these residents were tenant farmers who leased land use rights from the Philipses, built small houses, and worked the land. Although Philipse owned the land, civil affairs were run by the tenants of the manor and thus meeting houses, taverns, mills and industries were quickly established within the manor's lands. Philipsburgh remained intact for over eighty years and was finally dissolved following the American Revolution when the Philipse family, who sided with the British, lost their land rights. Tenant farmers eagerly subdivided and purchased their holdings.

Under the English, the section of the Keskeskeck patent that was adjacent to the Harlem River became the Manor of Fordham. In 1671 Governor Lovelace granted the manor to Jan (John) Archer (Arcer), a Dutchman, who was "so skilled in acquiring land from the Indians that he was nicknamed Koopall (Buy all) by his neighbors" (Bolton 1848: 319-321; WPA1982). Archer's manor, named for the ford at Spuyten Duyvil Creek, extended north and east from what is now 165th Street at the Harlem River. Archer leased 20-acre lots to tenants who cleared and cultivated the land. Each tenant had a house and lot in the village of Fordham, which he established on his property near the Harlem River. Archer mortgaged the Manor in 1684 to Cornelis Steinwyck, a New York merchant (Ibid: 324). After both Archer's and Steinwyck's deaths that same year, the lands were inherited by Steinwyck's wife. After remarrying, Margaretta Steinwyck Selyns and her husband granted the property to the elders and overseers of the Nether Dutch Church of New York in 1694 (Ibid: 326-

327). In 1753 the Lieutenant Governor of New York granted the church elders permission to sell these lands (Ibid 327-328).

The first official land purchase from Native Americans in the area was made by the Dutch West India Company in 1639. In 1641, Jonas Bronk acquired 500 acres between the Harlem and Bronx Rivers and became the first white settler in the area when he built his house in what is now Yonkers (Allison 1896:44). Although he was the first European settler, Adriaen Van der Donck was the first substantial landowner in the vicinity of what is now Southern Westchester County.

Donck named his estate the Colon Donck, or colony Donck. In it, he laid out a farm and plantation, and established corn fields near what is now the Van Cortlandt Mansion in Van Cortlandt Park (Bolton 1848:408; Allison 1896: 47). Following Donck's death, the estate passed through several hands and individual tracts were sold off. The estate was eventually recombined under the ownership of Frederick Philipse, one of the wealthiest landowners in New York by the 1670s. In 1693 his estate was designated the hereditary Manor of Philipsburgh.

By 1673 the Albany Post Road had been laid out through the Bronx, crossing the Harlem River at Kingsbridge near its intersection with the Boston Post Road. The settlement near the Harlem River in this location was named after the first bridge built by Frederick Philipse, linking Manhattan to what is now the Bronx. Local farmers resented paying toll to Philipse and reacted by erecting the free Farmers' Bridge for their own use. The Albany Post Road connected Manhattan with the vast trading post at Fort Orange, now Albany. Stagecoach service was established on it in 1785 (Jenkins 1912:215).

By the 1750s, over one thousand people were living in Philipsburgh Manor, farming the land and clearing forests to fill the heavy demand for lumber. Most of these residents were tenant farmers. Philipsburgh remained intact for over eighty years and was finally dissolved following the American Revolution.

From 1776 to 1782 Westchester County, including what is now Yonkers, was situated between the main lines of the British army, stationed in New York City, and the American lines posted north of the Croton River. Because of its location, the Yonkers area, including the project site neighborhood, experienced extensive Revolutionary War activity.

In the early fall of 1776 Washington held a council of war in Yonkers. At that time he commanded Major General Spencer to occupy Valentine Hill, the present site of St. Joseph's Seminary and only two-tenths of a mile southeast of the project site. Valentine Hill, approximately 40 acres at an elevation of 300 feet above mean sea level, became Washington's headquarters for a brief time that fall before his retreat to New Jersey.

Skirmishes ensued for years in the Bronx and Westchester, with control of the nearby forts going back and forth. During this time, it was possible that raiding parties traveled over the project parcel as they moved to and from Valentine Hill and the Hudson (Westchester County Historical Society 1978).

The project area environs were heavily affected by the Revolutionary War. After 1776, when major battles occurred in Harlem Heights, Fort Washington, Pelham, and White Plains, the main American headquarters were established just north of Peekskill, in upper Westchester County, while the British headquarters remained in New York City. Although the land in between these two camps, primarily northern Manhattan and Westchester County, became a "neutral ground," residents were subjected to raiding, pillaging, and other forms of property destruction by both the British and the Americans, there was constant travel of troops through the area, and a number of skirmishes occurred. Both British and American militia recognized the strategic importance of safe passage over the Harlem River at Kingsbridge. As a result, Kingsbridge witnessed extensive Revolutionary War activity with several fortifications built nearby. Under the command of Major-General Charles Lee, a total of seven sites were selected for redoubts, two on the northern end of Manhattan, and five in the Kingsbridge area of the Bronx. These were captured by the English in November of 1776, and were subsequently abandoned by 1779. By the war's end, the area was devastated and the population decreased due to heavy casualties and the exodus of many local Loyalists to Canada or England (Swanson and Fuller 1982).

It was not until 1782 that the British evacuated Westchester County. Lands held by loyalists, such as the Philipse family and George Tippet, were confiscated and forfeited (Allison 1896: 55). As a result, many small farmers were able to purchase their previously tenanted lands.

Following the Revolution, the increasing population led to refinements in political boundaries. In 1788, Westchester County took in all lands between the Hutchinson River, Bronx River, Hudson River, and Long Island Sound. At the beginning of the nineteenth century, agriculture was still the principal industry. The Bronx, Yonkers, and Westchester County were comprised of large farms centered around small hamlets (Ibid: 140). The 1790 federal census indicated that the large majority of residents were subsistence farmers. New York City provided the chief market for crops and livestock raised by local farmers (Swanson and Fuller 1982).

As the population of New York City and Westchester County rose during the nineteenth century, two important concerns became transportation and infrastructure. Residents needed to travel back and forth to Manhattan, and farmers required means to get their products to market. Transportation networks during the nineteenth century at first consisted of turnpikes and other roadways, supplemented by river travel along the Hudson's eastern shore. In 1831 the first steamboat landing was made at Yonkers; it was followed by the introduction of the railroads which became a preferred mode of travel.

The first and most important railroad linking New York City with Westchester County was the New York and Harlem Railroad, incorporated in 1831 and opened through Westchester in 1842 (Fitzpatrick 1927; Jenkins 1912; 228-232). This line ran through Melrose, Morrisania, and Fordham on the same route as the present Conrail tracks along Park Avenue (Shonnard and Spooner 1900). By 1851 a branch line was built to the south at Port Morris along the Harlem River. Additionally, in 1846 a railroad line had been completed from New York City past Unionville to Pleasantville. With the formation of the railroads, local

residents could be gainfully employed in New York City and return to their country homes at the end of a long day. Concurrent with the established rail service, manufacturing industries grew, mostly along the Hudson River in North Tarrytown. County-wide farming changed from small subsistence operations to large dairy and truck farms which provided goods to New York City. The introduction of the railroads caused a shift in population towards those areas now serviced by transportation, specifically the southern part of Westchester County, where settlement previously had not been as dense (Swanson and Fuller 1982).

Population in the western Bronx rose as a result of the railroads as well. In 1846 the Town of West Farms was created. West Farms was originally a village on the Bronx River, which had become an important manufacturing center, due to its water-powered mills. The new township consisted of all the present Bronx west of the Bronx River (Shonnard and Spooner 1900). The new residents clamored for improved roads and other municipal amenities. The eastern side of the Harlem River became the focus for a new railroad corridor. On April 24, 1867, the Spuyten Duyvil and Port Morris Railroad was chartered (Jenkins 1912: 233). In 1872, the New York Central and Hudson Railroad Company built the Spuyten Duyvil and Port Morris Line, linking the Harlem Line in the south Bronx to the Hudson Line proper at Spuyten Duyvil. This line passed along the shore of the Harlem River and looped northwestward around Marble Hill. The Putnam Line was opened in 1881 and ran north from Harlem alongside, and to the east of, the Spuyten Duyvil and Port Morris Line to Putnam County. The two lines separated north of E. 230th St. with the Hudson Line branching westward and the Putnam Line continuing north.

Annexation of what is now the Bronx by New York City had been discussed as early as 1864. It is significant that the streets laid out near the Harlem River continued the numbers of Manhattan streets (Shonnard and Spooner 1900). When a referendum on annexation was finally held in 1873, Morrisania, West Farms and Kingsbridge voted overwhelmingly to become part of New York City, and officially became the 23rd and 24th Wards in 1874. Under the New York charter in 1898 the two wards were officially designated the Borough of the Bronx (Jenkins 1912:7).

As New York City continued to grow, so did the Yonkers area. By 1855 it was clear that the main hamlet of Yonkers had grown large enough to be incorporated as a town (Ibid: 169). Most of the population was still located adjacent to the Hudson River. The introduction of new businesses and industry encouraged the influx of a large workforce and by 1865 the population of Yonkers had reached 12,756 (Ibid: 181). In 1872, the city of Yonkers had been incorporated and separated from the township of Kingsbridge to the south by a line between the Hudson River and the Bronx River; this became the southern boundary for Westchester County (Jenkins 1912:2-8).

In addition to the railroads, another important development within northern Manhattan, the Bronx, and Westchester County was construction of the Croton Dam and Aqueduct. As New York City rapidly expanded during the nineteenth century the need for clean water was of paramount importance. The original Croton Aqueduct was constructed in 1842 after years of failed attempts to deal with New York City's impoverished and unsanitary water conditions. The aqueduct, designed by the engineer John B. Jervis, consisted of iron pipes protected by

brick masonry. Built by Irish immigrants over a period of five years, it covered a distance of 41 miles, running from the Croton Dam in Westchester County south to a receiving reservoir at what is now the Great Lawn in Central Park. Water was then piped to a distributing reservoir at 42nd Street, where the New York City Public Library now stands (Jackson 1995: 301). The 40.5 miles of the Old Croton Aqueduct was built in response to devastating fires and epidemics in New York City. The Aqueduct, an elliptical brick-lined tube approximately 8.5 ft. x 7.5 feet, was mainly constructed by the "cut and cover" method (Friends of the Old Croton Aqueduct 1998). Six of these aqueduct miles run through Yonkers. When it opened, the Croton Water System supplied over 60 million gallons of water a day to the City via what the Croton Aqueduct. When it was completed in 1842, it was the main source of water for the city until its capacity proved inadequate. By 1861 an enlarged main was constructed, and the need for a greater supply was still recognized. In the 1880s the construction of the New Croton Aqueduct was planned in conjunction with the creation of the Jerome Park Reservoir, and the original aqueduct system was renamed the "Old Croton Aqueduct."

"Construction of the New Croton Aqueduct began in 1885 following severe droughts in 1880-81, and exponential increases in water demands" (Cooper n.d.:5). The New Croton Aqueduct is mostly a tunnel laid through rock. It is at least three times larger than the Old Croton Aqueduct and is situated further inland, emptying into the Jerome Park Reservoir. Both the old and new aqueducts ended at the 135th Street Gate House, where cast-iron pipes carried water into the current Central Park reservoir. With the inception of the New Croton Aqueduct, portions of the old aqueduct were closed down while others were drastically altered and demolished. Regardless, it continued to carry a diminished capacity of water to New York through 1955. While portions of it are still in use in northern Westchester County, it no longer brings water to New York City (Cooper n.d.: 5-7).

During the later nineteenth and early twentieth centuries, the project area continued to develop as transportation improved throughout northern Manhattan, the Bronx, and Westchester County and immigration increased. In particular, thousands of Italians and Eastern Europeans arrived in the area to help build the railroads, dams, and other necessities of local life, and to work in the many factories that were being built in the lower part of Westchester County. Developers constructed affordable houses along the railroad lines, and many middle class residents moved into these new suburban neighborhoods. By the onset of World War I, most farms were now located north of White Plains, with southern Westchester County comprised chiefly of towns and cities (Swanson and Fuller 1982). The first subway connecting the Bronx with Manhattan opened in 1904, prompting many workers to settle in spacious apartments in the Bronx, including large numbers of Eastern European Jews (Hermalyn and Ultan n.d.).

Throughout the twentieth century, development of the project area continued to be spurred by new transportation options, specifically major roadways. These included the Bronx River Parkway, which opened in 1925, the Grand Concourse Extension (later called the Mosholu Parkway Extension) in 1931, the Henry Hudson Parkway in 1935 and the Major Deegan Expressway in 1948. By 1950 major road alignment changes had created the Saw Mill River Parkway west of the Saw Mill River, and the New Saw Mill River Road, or Route 9A

(Mount Pleasant Department of Planning Map, 1950). Access via the parkways prompted further home buying in Westchester County, particularly as post-war prosperity affected many residents (Swanson and Fuller 1982).

VI. SITE SPECIFIC STUDIES

The following individual documentary studies are focused on the specific area of impact for each Shaft Site listed in the Table in Chapter II. Although some of the Shafts were located in areas of generalized precontact or historical archaeological sensitivity, no work would necessarily be undertaken outside of the footprint of the existing Shaft and/or associated structures so no new disturbance is anticipated. Original records documenting the area of impact outside of each shaft are no longer available as they were created in the 1890s. However, it is assumed that area of at least ten feet squared around each shaft was disturbed extensively and that potential archaeological deposits in the immediate vicinity of each shaft would lack integrity. The heavy machinery utilized to undertake the construction of each shaft would have undoubtedly impacted an even larger area, but since documentation to this effect was unavailable, these impacts could not be verified.

The following discussions provide information on the potential for each site to yield precontact and historical archaeological deposits.

1. CROTON LAKE GATE HOUSE

The Croton Lake Gate House is located next to the southern shore of the New Croton Reservoir (Figure CLG-1). The 1890 stone building is part of the overall New Croton Aqueduct (NCA or Aqueduct) water management system that was constructed between 1884 and 1891 (Photograph CLG-1). A large parking lot separates the 1890 facility from the new Croton Lake Gate House constructed in the 1980s (Photograph CLG-2). The new Gate House is situated on the north side of Arcady Road on top of an existing man-made platform at an elevation of approximately 200 feet above sea level (ASL). The New Croton Reservoir, adjacent to the Gate House site, is an important component of the New York City water system, and the New York State Historic Preservation Office (NYSHPO) considers the 1890 Croton Gate House historically significant.

Prior to beginning the project, the Contractor would decide which Gate House structure would be used for the proposed activities. These proposed activities include opening and preparing the structure for air intake to the Aqueduct for the ventilation system. A fan would be installed and mounted directly on top of the Shaft and air would be drawn from the exterior of the building through a door, which is to be left open but screened to prevent foreign matter from being drawn through the system. The screen would also perform a security function to prevent personnel entry into the room through this door. The fan would be required to operate continuously throughout the duration of the in-tunnel or shaft work. All fans would be hard-wired to local utility connections. Backup generators capable of maintaining adequate mechanical ventilation within the tunnel would be required in the event of a power outage in the local utility connections. No ground disturbance is proposed in the location of either of the Gate House structures during ventilation activities.

The fans would run continuously throughout the duration of the project, from September, 2004 to May, 2005 and from September, 2005 to March, 2006. During the project, the

Contractor has an option to remove and replace the 72-inch diameter blind flange at the beginning of the Aqueduct, if required for initial access from this point.

Precontact Archaeological Potential

A site file search at the New York State Museum (NYSM) and the New York State Office of Parks and Recreation and Historic Preservation (OPRHP) found that the project site is in an area of high sensitivity for precontact resources. A search of the NYSM's Archaeological Site Files located an Indian village near Deer Pond on the north shore of the Croton River. This village, (site # 5239), was investigated by Arthur C. Parker in the early part of the twentieth century. Unfortunately little information is available, although it is safe to assume a Woodland occupation, since the Woodland people were the first to settle in true villages. There is no clear agreement about the location of the village. Parker himself placed the site north of the Croton River "near the Village of Croton Lake and just west of a brook between the north road to Yorktown Heights and Bald Mountain" (to the north west of the Croton Lake Gate House). He also concluded that the site had "probably been obliterated by the Croton Reservoir" (Parker 1920: 711).

Additional precontact sites identified within a five mile radius of the project site, either on file at the NYSOPRHP and/or listed in the abstracts of the New York Archaeological Council, are described in the following table:

NYSM/OPRHP Report Number or Site Number	Town/Village	Site Name	Site Type	Period
5239			Village	Woodland?
Report No. 96	Bedford	Greenridge Subdivision	Rockshelters	Late Archaic-Terminal Archaic-Early Woodland. Late Woodland
Report No. 85	Cortlandt/ New Castle	Little Lakes Estates	Hunting Camp	Late Archaic-Woodland
Report No. 110	New Castle	Brandywine Subdivision	Hunting Camps	Late Archaic
Report No. 117	North Castle	Thomas Wright Subdivision	Hunting Camps	Middle Archaic – Late Woodland
Report No. 100	Somers	The Primrose Site		Late-Terminal Archaic/Late Woodland
Report No. 107	Somers	Somers Golf Course	Hunting Camp/Seasonal Camp	Late Archaic
5147 (ACP West 11)	New Castle		Village/Burial Site	Woodland

Precontact Archaeological Sensitivity

The physiographic characteristics of the current project site and surrounding reservoir, together with the information extracted from the documentary record, suggest that Native American peoples may have exploited the proposed project site. However, the construction of the 1890 Gate House, adjacent twentieth century parking facilities, and the New Croton Gate House likely destroyed any buried precontact cultural resources at this site.

Historical Archaeological Potential

Historical Land Use

In 1697 William III of England officially conferred to New York merchant Stephanus Van Cortlandt the lands that were later described as the Manor of Cortlandt. Van Cortlandt had numerous tenant farmers working his vast holdings, which grew to 80,000 acres. Although the majority of the project area was under Van Cortlandt control, several trappers and traders existed on the fringes of the manor. Game and fish were plentiful in the inland areas, especially along the routes of the Croton and Muscoot Rivers. Throughout the seventeenth through late nineteenth century, most of the people in the area were farmers, producing wheat, rye, oats and corn (French 1925: 866). Many concentrated on fattening cattle for market in New York (Ibid: 845). Once the Manor was partitioned among the heirs of Stephanus Van Cortlandt (1734), land sales to new settlers, mostly from Connecticut and lower portions of the county became common.

No battles were fought in this location during the Revolutionary War, but there were skirmishes and raids and the farmers were often required to provide provisions (French 1925: 868). Pines Bridge, approximately three miles east/southeast of the project site, was a critical crossing of the Croton River and a British soldier is said to have died there of wounds acquired during a skirmish (French 1925: 869).

During the nineteenth century, the population of the northern part of Westchester County grew steadily. The farmers continued to grow market crops and raise cattle for the urban markets of both New York and Boston. Cartographic research indicates that no historic structures were located directly on the project site.

Not only did the proximity of New York City have a strong influence upon the goods produced in this region during the nineteenth century, the topography of the very land itself was altered by the growing demand for fresh water in the sprawling metropolis. During the nineteenth century, the creation of the complex New York City Water System, first via the Old Croton Aqueduct (1837-1842) and later the New Croton Aqueduct (1884 and 1891), influenced the development of the area. During the late nineteenth century, many of the farms that were lost to the rising waters were purchased or taken over by the City of New York. Because the City's acquisition of land could not be contested, many farmers sold their land at a fraction of its value. The 1890 Gate House was constructed as part of the New Croton Water system (Hopkins 1930, Figure CLG-2). By the 1980s a newer and larger facility was needed and the new Gate House was constructed.

During the twentieth century, the reservoir shoreline stabilized and many now use the area as parkland. Numerous joggers and hikers visit the reservoir daily. The many paths or trails that cover the landscape around the reservoir attest to these visits.

Historical Archaeological Sensitivity

There is no record of historical structures in the project location. Further, if any isolated activities did take place on this site during the historical era, the construction of the platform and Gate Houses would have obliterated any associated cultural resources.

Historic Resources in the Project Area

The large 1890 stone Gate House (a.k.a. Gate House Number 1) is part of the overall New Croton Aqueduct water management system that was constructed between 1884 and 1891. A large parking lot separates the 1890 facility from the new Gate House constructed in the 1980s. The New Croton Reservoir is an important component of the New York City water system, and the NYSHPO considers the 1890 Croton Gate House historically significant.

The New Croton Reservoir itself is also National Register eligible as part of the New Croton Aqueduct System (Peter Shaver, NYSOPRHP December 1994).

Proposed Impacts to Potential Resources

Archaeological Resources: No ground disturbance is proposed in the location of either of the Croton Lake Gate House structures during ventilation activities. Therefore, no impacts to archaeological resources are anticipated as part of this project.

Architectural Resources: The 1890 Croton Lake Gate House and the New Croton Aqueduct are eligible for listing on the National Register of Historic Places. Subsequent to the preparation for ventilation intake into the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. If the 1890 Croton Lake Gate House is chosen for the ventilation activities, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

In addition to the work at the Croton Lake Gate House, the Contractor also has an option to remove and replace the 72-inch diameter blind flange at the beginning of the Aqueduct. If this is completed, then the replacement of new blind flange would permanently alter the appearance of the Aqueduct. Due to the eligible listing of the Aqueduct, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structure.

2. SHAFT NO. 1 (YORKTOWN)

Shaft No. 1 is located on a parcel of land to the west of Aqueduct Road in the Town of Yorktown, Westchester County, New York (Figure 1-1; Photograph 1-1). The area is currently forest with residential parcels located to the north. Both the shaft and its cap are currently below grade. No structures associated with the shaft lie above grade.

Inspection of Shaft No. 1 would consist of clearing and grubbing a 20-foot wide access track 125 feet long to the shaft location from Aqueduct Road and the construction, maintenance and subsequent removal of a graded gravel roadway with an overall width of 13 feet. The access track would generally follow an existing trail, which leads from Aqueduct Road to the Shaft. A staging area, enclosed by security fencing, would be constructed with a minimum area of 2,000 square feet around the Shaft. Additionally, clearing and grubbing of a 20-foot wide corridor around all four sides of the security fencing would be conducted. The total area of ground disturbance proposed at this location is 0.25 acres, including areas disturbed for the access track and all staging area needs.

Once construction of the staging area is completed, the existing Shaft cover would be removed and the Shaft opening would be secured, as necessary, to prevent falling debris from entering the Shaft. Excavation of up to three feet around the shaft cap may be required, since the Shaft cap is buried. A crane would be positioned over the Shaft opening to allow for the Engineer's inspection of the Shaft. Inspection of the Shaft would either be conducted from within a personnel cage lowered into the Shaft, or by a remote operated video camera. Once inspection is completed, a new replacement cover (minimum thickness of 10 inch, precast concrete) would be placed over the Shaft opening and buried with a minimum of 18 inches of fill and the area reseeded. Within 15 days of completion of the inspection, the materials used for the access track and staging area would be removed from the site and legally disposed of.

Work at Shaft No. 1 would occur for up to two months between the periods September, 2004 to April, 2005.

Precontact Archaeological Potential

A site file search at the NYSM and the OPRHP found that the project site is in an area of high sensitivity for precontact resources. A search of the New York State Museum's Archaeological Site Files located an Indian village near Deer Pond on the north shore of the Croton River. This village, (site # 5239), was investigated by Arthur C. Parker in the early part of the twentieth century. Unfortunately little information is available, although it assumed to be a Woodland occupation, since research in the region suggests that Woodland people were the first to settle in true villages. There is no clear agreement about the location of the village. Parker placed the site north of the Croton River "near the Village of Croton Lake and just west of a brook between the north road to Yorktown Heights and Bald Mountain" (to the northwest of Shaft No. 1). He also found that the site had "probably been obliterated by the Croton Reservoir" (Parker 1920: 711).

Additional precontact sites identified within a one-mile radius of the project site and on file at the NYSOPRHP and listed in contract abstracts printed by the New York Archaeological Council are described in the following table:

NYSM/OPRHP Report Number or Site Number	Town/Village	Site Name	Site Type	Period
5239			Village	Woodland?
Report No. 85	Cortlandt/ New Castle	Little Lakes Estates	Hunting Camp	Late Archaic-Woodland
Report No. 110	New Castle	Brandywine Subdivision	Hunting Camps	Late Archaic
Report No. 117	North Castle	Thomas Wright Subdivision	Hunting Camps	Middle Archaic - Late Woodland
5147 (ACP West 11)	New Castle		Village/Burial Site	Woodland

The village/burial site (#5147) identified by Arthur C. Parker is located less than one-quarter mile to the east of the project site.

Precontact Archaeological Sensitivity

The physiographic characteristics of the current project site, together with the information extracted from the documentary record, suggest that Native American peoples may have exploited the proposed project site. Although the construction of the Shaft No. 1, likely destroyed any buried precontact cultural resources immediately above the Shaft, the surrounding area is considered sensitive for these resources.

Historical Archaeological Potential

Historical Land Use

See Chapter V, subsection 1 (Croton Lake Gate House) for the general history of the project area.

The earliest map that depicts individual buildings in the area of Shaft No. 1 dates to 1851 (Sidney and Neff 1851). At that time only a few houses were depicted near the Croton River or on the east side of Old Croton Dam Road (now known as Aqueduct Road). Although the area had been slightly more developed by 1867, no structures were located on the project site (Beers 1867; Figure 1-2). The site appears to be part of a 23-acre parcel owned by "J. Halstead," whose house was situated on the opposite side of Old Croton Dam Road, out of the project site. Later maps indicate that the property remained in the Halstead family hands for many years: "D. T. Halstead" in 1893 and "D. J. Halstead" in 1901 (Bien 1893; Bromley 1901). By 1930, the property was owned by "A, A Forest" and four structures are depicted

on the east side of Old Croton Dam Road (Hopkins 1930). No structures were shown on the project site on any of the maps reviewed for this project. The remnants of a small twentieth century quarry are also present to the north of the Shaft site.

Historical Archaeological Sensitivity

Cartographic research found no evidence of potential historical structures/resources in the location of the Shaft. Research indicates that most of the historical activity took place to the east of the road or to the north of the Shaft site. Therefore, Shaft No. 1 is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

No structures associated with the shaft lie above grade. However, the Shaft, as part of the New Croton Aqueduct system, is eligible for listing on the National Register of Historic Places.

Parts of the Taconic State Parkway, a 105 mile scenic pleasure drive located to the west of the Shaft site, are eligible for listing on the National Register of Historic Places (see Figure 1-1). It is a component of a large-scale recreation/transportation system that includes the Bronx River Parkway, the Bear Mountain Parkway, the Palisades Interstate Parkway system, and the Westchester County Parkway system. The Taconic is screened from the surrounding community by a vegetation buffer, except where it crosses the Reservoir. At this location the historically important parkway embraces an unusual and especially distinguished suspension bridge over the water. The wooded location of Shaft No. 1 separates the Parkway both physically and visually from the Shaft site.

Proposed Impacts to Potential Resources

Archaeological Resources: Minimal ground disturbance is proposed directly above the shaft cover to allow inspection of the shaft. Excavation of up to three feet around the Shaft cap may be required. Significant archaeological resources are not anticipated in the location above the shaft as severe disturbance of site strata occurred during the construction of the shaft in the late 1800's. No impacts to archaeological resources are therefore anticipated as a result of this action.

Proposed activities at the shaft site include the creation of a staging area, roughly 2000 square feet in size, and a 20-foot access track with a 13-foot graded gravel roadway. The access track would follow an existing trail in a wooded area between Aqueduct Road and the Shaft. This part of Yorktown is known to be sensitive for precontact resources. The extent of prior disturbance has not been established, so it is possible that areas of precontact sensitivity may lie within the proposed access track and staging area. The undulating topography around the shaft and in the location of the access road may require grading and leveling in order to complete the planned actions. Therefore, archaeological field testing is recommended in the locations where planned grading activities would occur. If precontact resources are identified within areas of proposed ground disturbance, and it is determined

that they are eligible for inclusion on the National Register of Historic Places, a mitigation plan would be developed in consultation with SHPO.

Architectural Resources: The shaft is eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection only. Placement of a new Shaft cover would be the only action, which would alter the character or appearance of the shaft. Subsequent to the use of the shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

3. SHAFT NO. 2 (NEW CASTLE)

Shaft No. 2 is located on a parcel of land in New Castle, New York (Figure 2-1, Photograph 2-1). At present Shaft No. 2 is located in a wooded area and is surrounded by a circular sinkhole depression, approximately 40 feet in diameter and eight to ten feet deep. No aboveground structures are present in the location of Shaft No. 2.

Inspection of Shaft No. 2 would consist of clearing and grubbing a 150-feet long 20-foot wide access track to the Shaft location from the intersection of North Ridges Road and Woods Lane and the construction, maintenance and subsequent removal of a graded gravel roadway with an overall width of 13 feet. Construction of the access track would require the crossing of a stream. The depression surrounding the Shaft would be filled with self draining granular backfill material prior to inspection of the Shaft. A staging area, enclosed by security fencing, would be constructed with a minimum area of 2,000 square feet around the Shaft. Additionally, clearing and grubbing of a 20-foot wide corridor around all four sides of the security fencing would be conducted. Once construction of the staging area is completed, the exiting Shaft cover would be removed and the Shaft opening would be secured, as necessary, to prevent falling debris from entering the Shaft. A crane would be positioned over the Shaft opening to allow for the Engineer's inspection of the Shaft. Inspection of the Shaft would either be conducted from within a personnel cage lowered into the Shaft, or by a remote operated video camera. Once inspection is completed, a new replacement cover (minimum thickness of 10 inch, precast concrete) would be placed over the Shaft opening and buried with a minimum of 18 inches of fill and the area reseeded. Within 15 days of completion of the inspection, the materials used for the access track and staging area would be removed from the site and legally disposed of.

Work at Shaft No. 2 would occur for up to two months between the period of September, 2004 to April, 2005.

Precontact Archaeological Potential

For the assessment of sensitivity a site file search at the NYSM and the OPRHP was completed. The search identified five precontact sites and three surveys within a one-mile radius of Shaft No. 2.

OPRHP or NYSM #	Site Identifier	Site Description
119.18.000013	Colbert Site	Undetermined
119.18.000014	Hudson Hills GC #9	Scatter in Plow zone
119.18.000015	Hudson Hills GC #8	Scatter in Plow zone
119.09.000016	Amsterdam Locus 4	Lithic debitage
119.09.000230	New Castle	Camp Site

The closest identified site is Site #119.09.000230, which was identified during a 1991 survey conducted by Eugene Boesch and Arnold Pickman approximately one-third of a mile to the southeast of he project site (Boesch and Pickman 1991). The study found a concentration of precontact lithic material dating to the Late Archaic Period. Just over one-third of a mile to the west, a 1984 study at the Hudson Hills Golf Course, identified two loci (119.18.000014 and 119.18.000015) of precontact material possibly dating to the Late Archaic period (Wilbur Smith Associates 1984). Near the location of the Golf Course, archaeologist Ernest Wiegand identified lithic debitage at the Amsterdam site (119.09.000016) on the IBM parcel (Wiegand 1983).

Precontact Archaeological Sensitivity

The physiographic characteristics of the current project site, together with the information extracted during the site file search, indicates that Native American peoples likely exploited the project area. The absence of significant development in the area during the historical era suggests that potential precontact resources may be present on the project site.

Historical Archaeological Potential

Historical Land Use

Throughout much of Westchester County, small farmhouses with their associated outbuildings and cultivated fields were present. Most of these dwellings were located along the main transportation routes and watercourses. Although most of the County was divided into the large manors, the lands to the west of the Bronx River were open territory comprised of scattered small farms and forestland. Following the American Revolution, an act of Legislature divided the County into 21 towns in 1788 (Shonnard and Spooner 1900: 531-533). The project area was originally in the largest township of North Castle, but was located in the section that was subdivided into the Town of New Castle in 1791 (Ibid). During the nineteenth century, most of the development in Westchester County took place closer to the

Hudson River where the Hudson River Railroad and the Old Croton Aqueduct were constructed. New Castle remained a mostly agricultural community.

The earliest map that depicts individual buildings in the area of Shaft No. 2 dates to 1851 (Sidney and Neff 1851). This map clearly indicates that no houses were present in the project area. No specific land owner or property boundary is depicted in the exact location of Shaft No. 2 in 1867 as most of the people lived along Pines Bridge Road to the east of the Shaft site (Figure 2-2). No structures or other above ground features were depicted on historic maps until 1929, when the location of Shaft No 2 is was shown in the Atlas of Westchester County (Bromley 1881; Bien 1893; Bromley 1901; Hopkins 1929).

During the site file review, two historical archaeological sites were identified approximately 1/4 mile to the northeast of the Shaft site. Site # 119.18.000039 was identified as a collection of historical materials and Site # 119.18.000040 was comprised of a foundation and artifact scatter.

Historical Archaeological Sensitivity

Cartographic research found no evidence of historical structures in the location of Shaft No. 2. Therefore, Shaft No. 2 is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Shaft No. 2 is situated above the New Croton Aqueduct (1884-1890) and both features are eligible for inclusion on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: The shaft is in a wooded area and is surrounded by a circular 40-foot sinkhole depression and minimal ground disturbance is proposed directly above the Shaft cover to allow inspection of the shaft. It is unlikely that significant archaeological resources would be present in the area above the Shaft as severe disturbance would have occurred during the construction of the Shaft in the late 1800's. No impacts to archaeological resources are therefore anticipated directly above, and immediately surrounding, the Shaft.

Proposed actions at the site include the construction of a fenced staging area around the shaft, approximately 2000 square feet in size, the clearing and grubbing of a 20 foot corridor on all four sides of the security fencing, and the creation of a 20-foot access track and 13-foot graded gravel roadway between the intersection of North Ridges Road and Woods Lane and the Shaft. This part of Westchester County is known to be sensitive for precontact resources. The extent of prior disturbance has not been established, so it is possible that areas of precontact sensitivity may lie within the proposed access track and staging area. The undulating topography around the Shaft and in the location of the access road may require grading and leveling in order to complete the planned actions. Archaeological field-testing is therefore recommended around the rim of the sinkhole and in locations where planned

grading activities would occur. If precontact resources are identified within areas of proposed ground disturbance, and it is determined that they are eligible for inclusion on the National Register of Historic Places, a mitigation plan would be developed in consultation with SHPO.

Architectural Resources: The shaft is eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection only. Placement of a new Shaft cover would be the only action that would alter the character or appearance of the shaft. Subsequent to the use of the Shaft for the inspection of the NCA , recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the Shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

4. SHAFT NO. 3 (NEW CASTLE)

Shaft No. 3 is situated inside the New Castle Stanwood Water District pump house adjacent to Inningwood Road. The shaft contains two, 16-inch diameter header pipes and vertical pumps that supply the town of New Castle with water from the Aqueduct. The area surrounding the pump house is grassed, level, and close to a two-lane paved road. A small parking area is located east of the pump house.

Inspection of Shaft No. 3 would be performed from within the building and would consist of opening the Shaft by removing steel sheeting and header pipes and possibly a portion of the concrete slab foundation for the pump house. Inspection of the Shaft would be conducted by a remote operated video camera. Once inspection is completed, the pump house would be restored to its original condition. No ground disturbance would be necessary at this location. Work at Shaft No. 3 would occur for up to one month between the period of September, 2004 to April, 2005.

Precontact Archaeological Potential

For the assessment of sensitivity a site file search at the NYSM and the OPRHP was completed. The search identified four precontact sites within a one-mile radius of the Shaft Site.

OPRHP or NYSM #	Site Identifier	Site Description
610	Hanotak Rockshelter	
119.18.000013	Colbert Site	Undetermined
119.18.000014	Hudson Hills GC #9	Scatter in Plow zone
119.18.000015	Hudson Hills GC #8	Scatter in Plow zone

The site file search identified five additional survey reports completed within a one-mile radius of the project site. Only one of these studies produced precontact material. A lithic scatter was recovered approximately one-half mile southeast of the Shaft site in the hamlet of Millwood (Lain and Schmitt 2001).

Precontact Archaeological Sensitivity

Although precontact peoples likely exploited the project area, the construction of the Shaft, and the twentieth century building that now surrounds it, would have destroyed any precontact resources in this location.

Historical Archaeological Potential

Historical Land Use

Shaft No. 3 is located close to Shaft No. 2 and shares a similar early history (see Chapter V, subsection 15).

The earliest map that depicts individual buildings in the area of Shaft No. 3 dates to 1851 (Sidney and Neff 1851). At that time there were several houses located along Pines Bridge Road to the west of the Shaft site. Although the area had been slightly more developed by 1867, no structures were located on the project site (Beers 1867; Figure 3-2). No structures are shown on the Shaft site on later nineteenth and early twentieth century maps (Bromley 1881; Bien 1893; Bromley 1901). The Atlas of Westchester County in 1930 identifies the location of Shaft No. 3, but no structure is shown above it (Hopkins 1930).

Historical Archaeological Sensitivity

No historical use is associated with the Shaft Site or its immediate vicinity. Therefore, Shaft No. 3 is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Shaft No. 3 is situated above the New Croton Aqueduct (1884-1890). The documented aqueduct and existing Shaft are functioning components of New York City's water supply system. Both are eligible for inclusion on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: No ground disturbance is proposed in the location of the Shaft during the inspection. There is an existing parking area adjacent to the pump house for staging activities. No impacts to archaeological resources are anticipated as part of this project.

Architectural Resources: The small brick twentieth century pump house is not considered a contributing element of the New Croton Aqueduct system. It is a modern structure that is

part of the water supply system for the Town of New Castle and as such is not eligible for listing on the National Register of Historic Places. The Shaft itself, however, is eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection only. The inspection of the Shaft would be performed from within the brick pump house and would consist of opening the shaft by removing steel sheeting and header pipes and possibly a portion of the concrete slab pump house foundation. Once inspection is completed, the pump house would be restored to its original condition. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

5. SHAFT NO. 4 (OSSINING)

Shaft No. 4 is located adjacent to the Warren Terry Memorial Pumping Station, on a parcel of land to the west of Morningside Road in the Town of Ossining. The Shaft contains two header pipes and pumps that supply the town of Ossining with water from the New Croton Aqueduct. Access to the Shaft can be made via a two-lane paved road that services the pumping station. Inspection of the Shaft would consist of opening this Shaft by removing steel sheeting and header pipes and possibly a portion of the concrete slab foundation. Inspection of the Shaft would be conducted by a remote operated video camera. Once inspection is completed, the Shaft would be restored to its condition prior to inspection. No ground disturbance would be necessary at this location.

Work at Shaft No. 4 would occur for up to one month between the period of September, 2004 to April, 2005.

Precontact Archaeological Potential

For the assessment of sensitivity a site file search at the NYSM and the OPRHP was completed. The search identified one precontact site within a one mile of the Shaft site. The Hanotak Rockshelter (NYSM #610) was identified one mile north of the project site. The site was reported in 1943. No detailed information on this precontact site was available.

Precontact Archaeological Sensitivity

Although precontact peoples likely exploited the project area, the construction of the Shaft, and the twentieth century building that stands adjacent to it, would have destroyed any precontact resources in this location.

Historical Archaeological Potential

Historical Land Use

In 1685, Frederick Philipse purchased the land in what later became the Town of Ossining from the Sint Sinck Indians. This purchase became part of the Manor of Philipsburg that extended from Spuyten Duyvil Creek to the Croton River. In 1779 the lands of the Manor were confiscated by the state because the last Lord of the Manor, Colonel Frederick Philipse, was a Loyalist during the Revolutionary War. Many of the former tenants purchased their farms from the state. By an act of the state Legislature, a new township was divided from the northern part of the Town of Mount Pleasant in 1845. The new town was named *Ossinsing*, after the main Village of Sing Sing within the Township. The following year the name of the town was shortened to Ossining.

The earliest map that depicts individual buildings in the area of Shaft No. 4 dates to 1851 (Sidney and Neff 1851). At that time there were only a few scattered dwellings in the northeastern section of Ossining. Although the area was slightly more developed in 1867, no structures were located on the project site (Beers 1867; Figure 4-2). No structures are shown at the Shaft site on later nineteenth and early twentieth century maps (Bromley 1881; Bien 1893; Bromley 1901). During the early twentieth century the area to the south and east of the project site was developed into a residential neighborhood (Hopkins 1930).

Historical Archaeological Sensitivity

No historical use is associated with the Shaft site or its immediate vicinity. Therefore, Shaft No. 4 is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Shaft No. 4 is situated above the New Croton Aqueduct (1884-1890). The documented aqueduct and existing Shaft are functioning components of New York City's water supply system. Both are eligible for inclusion on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: No ground disturbance is proposed in the location of the Shaft during inspection. There is an existing parking area adjacent to the pump house for staging activities. No impacts to archaeological resources are anticipated as part of this project.

Architectural Resources: The adjacent twentieth century brick pump house is not considered a contributing element of the New Croton Aqueduct system. It is a modern structure that is part of the water supply system for the Town of Ossining and as such is not eligible for listing on the National Register of Historic Places. The proposed action would not impact this structure. The adjacent Shaft, however, is eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection only. The inspection of the Shaft would be performed from within the brick pump house and would consist of opening the shaft by removing steel sheeting and header pipes and possibly a portion of the concrete slab foundation. Following this action, the Shaft would be restored to its condition

prior to the inspection. Subsequent to the use of the shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

6. SHAFT NO. 5 (BRIARCLIFF MANOR)

Shaft No. 5 is located on a parcel of land in a well-developed commercial area in the Village of Briarcliff Manor (Figure 5-1). The fenced Shaft site is adjacent to a private parking lot.

Inspection of Shaft No. 5 would consist of clearing and grubbing the area surrounding an existing security fence around the Shaft. The existing Shaft cover would be removed by a crane, which would be seated within the private parking lot adjacent to the site location, and stored on site. The Shaft opening would be secured as necessary to prevent falling debris from entering the Shaft. Inspection of the Shaft would be conducted from within a personnel cage lowered into the Shaft by the crane. Once inspection is completed, the existing cover would be put back into place over the Shaft opening. Within 15 days of completion of the inspection, any temporary materials used on-site would be removed from the site and legally disposed of.

Work at Shaft No. 5 would occur for up to one month between the period of September, 2004 to April, 2005.

Precontact Archaeological Potential

For the assessment of sensitivity a site file search at the NYSM and the OPRHP was completed. The search identified one precontact site within a one mile of the Shaft Site. On the Arnold estate in Scarborough, approximately one mile west of the project site Arthur C. Parker identified a possible village site (NYSM #5184). The site was reported in 1922 and no detailed information on this precontact village site was available.

Precontact Archaeological Sensitivity

Although precontact peoples likely exploited the project area, the construction of the Shaft and subsequent development of the surrounding area would have likely destroyed any precontact resources in this location.

Historical Archaeological Potential

Historical Land Use

Shaft No. 5 is located close to Shaft No. 4 and shares a similar early history (see Chapter V, subsection 5).

The Shaft site is located in the Village of Briarcliff Manor. Originally called Whitson's Corners, the area was settled during the nineteenth century. In 1890, English businessman Walter Law moved from Yonkers to the hamlet after purchasing 232 acres of farmland. Law called his property "Briarcliff Farms" and began a profitable dairy operation. He also cultivated American Beauty Roses (Briarcliff Roses) that were shipped daily to New York City. On November 21, 1902, the hamlet was officially incorporated as the Village of Briarcliff Manor.

The earliest map that depicts individual buildings in the area of Shaft No. 5 dates to 1851 (Sidney and Neff 1851). At that time there were several houses located along Pleasantville Road to the west of the Shaft Site. Although the area had been slightly more developed by 1867, no structures were located on the project site (Beers 1867; Figure 5-2). No structures are shown on the Shaft site on later nineteenth century maps (Bromley 1881; Bien 1893). During the early twentieth century, Walter Law owned the property surrounding the Shaft Site (Bromley 1901; Hopkins 1930). No buildings were depicted in the location of the Shaft.

Historical Archaeological Sensitivity

No historical use is associated with the Shaft Site or its immediate vicinity. Therefore, Shaft No. 5 is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Shaft No. 5 is situated above the New Croton Aqueduct (1884-1890). The documented aqueduct and existing Shaft are functioning components of New York City's water supply system. Both are eligible for inclusion on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: No ground disturbance is proposed in the location of the shaft during inspection. Therefore, no impacts to archaeological resources are anticipated as part of this project.

Architectural Resources: The Shaft is eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection only. During the inspection, the Shaft cover will be stored in an existing private parking lot adjacent to the Shaft site. The cover would be put back into place following the inspection. Subsequent to the use of the shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the Shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of

Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

7. SHAFT NO. 6 (BRIARCLIFF MANOR)

Shaft No. 6 is located adjacent to the Town of Briarcliff Manor municipal pumping station North of Long Hill Road (Figure 6-1; Photograph 6-1). The Shaft contains two header pipes and pumps that supply the town of Briarcliff Manor with water from the Aqueduct. The access road to the pumping station is located approximately 850-feet east of the intersection of Sleepy Hollow Road and Long Hill Road. The shaft is situated with an existing chain-link fence surrounded by a flat, grassed area with existing and maintained access. Inspection of the Shaft would consist of removing steel sheeting and header pipes and possibly a portion of the concrete slab foundation. Inspection of the Shaft would be conducted by a remote operated video camera. Once inspection is completed, the Shaft would be restored to its condition prior to inspection.
Work at Shaft No. 6 would occur for up to one month between the period of September, 2004 to April, 2005.

Precontact Archaeological Potential

For the assessment of sensitivity a site file search at the NYSM and the OPRHP was completed. The search identified one precontact site within a one mile of the Shaft site. On the Arnold estate in Scarborough, approximately one mile west of the project site Arthur C. Parker identified a possible village site (NYSM #5184). The site was reported in 1922 and no detailed information on this precontact village site was available.

Precontact Archaeological Sensitivity

Although precontact peoples likely exploited the project area, the construction of the Shaft and subsequent development of the surrounding area would have likely destroyed any precontact resources in this location.

Historical Archaeological Potential

Historical Land Use

Shaft No. 6 is located close to Shaft No. 4 and shares a similar history (see Chapter V, subsection 6).

The earliest map that depicts individual buildings in the project area dates to 1851 (Sidney and Neff 1851). At that time there were no houses located in the immediate vicinity of the Shaft Site. Although the area had been slightly more developed by 1867, no structures were located on the project site (Beers 1867; Figure 6-2). In 1881, two small structures are depicted to the east of the Shaft site (Bromley 1881). The 1893 Atlas also indicates that by that date, Walter Law had purchased the property surrounding the Shaft Site (Bien 1893).

The 1901 Atlas identifies "A. Ward" as the owner of the two buildings to the east of the Shaft site (Bromley 1901). No buildings were depicted in the location of the Shaft in 1930 (Hopkins 1930).

Historical Archaeological Sensitivity

No historical use is associated with the Shaft site or its immediate vicinity. Therefore, Shaft No. 6 is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Shaft No. 6 is situated above the New Croton Aqueduct (1884-1890). The documented aqueduct and existing Shaft are functioning components of New York City's water supply system. Both are eligible for inclusion on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: No ground disturbance is proposed in the location of the shaft during inspection. There is an existing parking area adjacent to the pump house for staging activities. No impacts to archaeological resources are anticipated as part of this project.

Architectural Resources: The adjacent twentieth century brick pumping station is not considered a contributing element of the New Croton Aqueduct system. It is a modern structure that is part of the water supply system for the Village of Briarcliff Manor and as such is not eligible for listing on the National Register of Historic Places. The proposed action would not impact this structure. The adjacent Shaft, however, is eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection only. The inspection of the shaft would be performed from within the brick pump house and would consist of opening the shaft by removing steel sheeting and header pipes and possibly a portion of the concrete slab foundation. Following this action, the Shaft would be restored to its condition prior to the inspection. Subsequent to the use of the shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the Shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

8. SHAFT NO. 8 (MOUNT PLEASANT)

Shaft No. 8 is located on a parcel of land within the Town of Mount Pleasant (Figure 8-1). The Shaft site is located near the Pocantico River, to the southeast of Pocantico Lake (see Figure 8-1).

Shaft No. 8 would be inspected from within the New Croton Aqueduct tunnel, with access provided by the Contractor in the form of a proprietary scaffold system with integral ladders. There would be no surface disturbance at the Shaft location due to the inspection of the Shaft, other than occasional access by foot. The Shaft would be inspected between the period of September, 2004 to April, 2005.

Precontact Archaeological Potential

See Chapter V, subsection 9 (Shaft No. 9) for information about the Precontact Period in the project area.

Precontact Archaeological Sensitivity

Documentary research found that the location of Shaft No. 8, like that of Shaft No. 9, is in an area sensitive for precontact resources. Native American sites are often found near fresh water resources like the Pocantico River. While the extent and depth of disturbance to the parcel during the original installation of the Shaft is not known, the area directly above the shaft would have been completely disturbed.

Historical Archaeological Potential

Historical Land Use

See Chapter V, subsection 9 (Shaft No. 9) for the general history of the project area.

The earliest maps that depict individual buildings in the project area date to 1851 and 1867 (Sidney and Neff 1851; Beers 1867). For much of the late nineteenth century, the project site was located on the Miller Farm (Beers 1867, Bromley 1881, Bien 1893). All of the structures associated with the farm were located far south of the Shaft site along Sleepy Hollow Road. During the twentieth century, the Shaft parcel remained undeveloped (Bromley 1901; Hopkins 1930).

Historical Archaeological Sensitivity

No historical use is associated with the Shaft Site or its immediate vicinity. Therefore, Shaft No. 8 is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Shaft No. 8 is situated above the New Croton Aqueduct (1884-1890). The documented aqueduct and existing Shaft are functioning components of New York City's water supply system. Both are eligible for inclusion on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: No ground disturbance is proposed in the location of the shaft during inspection, which would take place from within the tunnel. No impacts to archaeological resources are anticipated as part of this project.

Architectural Resources: Shaft No. 8 is eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection only. The inspection of the Shaft would be performed from within the tunnel. Subsequent to the use of the Shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

9. SHAFT NO. 9 (SLEEPY HOLLOW)

Shaft No. 9 is located on a parcel of land within the Town of Mount Pleasant at the northeastern corner of the Village of Sleepy Hollow (Figure 9-1, Photographs 9-1, 9-2). The large Rockefeller State Park Preserve currently surrounds the property, which is owned by the City of New York. In this location, the parcel associated with the Shaft is approximately 5-6 acres in size with three standing structures, including a stone superstructure above the existing Shaft to the NCA. A stone-lined spillway leading into Welker's Brook is also located immediately west of the building. The brook flows into the Pocantico River, located to the west of the Shaft site. The Pocantico then flows southwest toward the Hudson River. The project parcel is situated on a small rise between 100 and 150 feet ASL on the east side of Sleepy Hollow Road.

The proposed plans include using Shaft No. 9 as a construction access shaft to the Aqueduct. The site would serve as a main access location for personnel, equipment and materials into the Aqueduct to perform baseline rehabilitation. During the project, the staging area surrounding the Shaft would be covered with a temporary artificial hard surface and geomembrane and surrounded by noise attenuation fencing and sediment erosion control measures, as required. Work at the site includes inspection of blow-off structures, main gates and outlet fences/gates and reconstruction and waterproofing of walls and floor of the Shaft Chamber. Additionally, Shaft No. 9 would serve as a point for sediment and debris removal from within the section of Aqueduct between Croton Lake Gate House and Gould's Swamp Siphon. A crane would hoist the material to the surface where it would be loaded directly into sealed containers located within a dedicated storage area for subsequent disposal to licensed landfill sites.

Stationary equipment at the Shaft includes a 20-ton mobile crane and a change facility equipped with lockers, showers and toilets. A removable roof is designed to be removed in 3

sections and may be removed by the Contractor to allow for easier access to the shaft for materials and equipment.

Work at Shaft No. 9 would occur for the duration of the project, from September, 2004 to May, 2005 and from September, 2005 to March, 2006. The staging area would remain during the no-work period from June, 2005 to August, 2005.

Precontact Archaeological Potential

Documentary research found that the project site is sensitive for prehistoric cultural resources. According to early records of the area, the location of one of the main native villages, called *Aliponeck* (the place of many elms), was near the mouth of the Pocantico River in Sleepy Hollow. Further, the name Pocantico is derived from the native word "Po-can-tee-co" meaning "a swift dark stream running between two hills."

For the assessment of sensitivity, a review of archaeological literature was completed. As early as the 1920s, historian and archaeologist Arthur C. Parker identified two Native American sites within a two-mile radius of the project site. To the north, a small native village was identified in the Town of Ossining, and to the southwest Native American fortifications and mounds were identified near the Pocantico River in the location of the Old Dutch Church in Sleepy Hollow. To the west of the site, from Croton to Dobbs Ferry, numerous prehistoric sites have been identified by Parker, historian Robert Bolton and archaeologist Louis Brennan along the Hudson River and it's many tributaries.

A site file search at the NYSM and the OPRHP found that there were 5 identified prehistoric sites within a one-mile radius of Shaft No. 9.

OPRHP or NYSM #	Site Identifier	Site Description
5235	ACP WEST NO#	Traces of Occupation
5185	ACP WEST NO-49	Fortifications/Mounds
5236	ACP WEST NO#	Traces of Occupation
A11960.000015	Site #91	Late Archaic Campsite
A11960.000014	Site #49	Late Archaic-Early Woodland

In addition, four archaeological surveys have been conducted within the same radius. A Phase1A Assessment of the Kendal-on-Hudson Project site, located approximately 1/2 mile west of Shaft No. 9, found that the project area was sensitive for the presence of prehistoric cultural materials (City/Scape Cultural Resource Consultants 1988). Archaeological testing was recommended at this site. Adjacent to the Kendal Property, on the grounds of Phelps Memorial Hospital, a site assessment was completed for the location of a communications tower (Oberon 1999). Six test units were excavated and no trace of prehistoric material was encountered. Approximately 1/2 mile to the south of the Shaft No, 9, another survey was conducted along Route 448 in Sleepy Hollow (Santangelo 1991). The survey was confined to the road and found that previous excavation and grading associated with road construction

and drainage, as well as the installation of buried utility lines had disturbed the entire route. The final report examined was a Phase 1B Field Survey of the Proposed Pocantico Hill State Park, now the Rockefeller State Park Preserve (Hartgen Archaeological Associates, Inc. 1982). This survey identified Sites #91 and #49 dating the Late Archaic and Early Woodland periods, now on file with the State Historic Preservation Office. Both of these sites are located less than 1/4 mile to the west of Shaft No. 9.

Historic documents describe the "sale" of the Native lands to European settlers throughout the seventeenth century. In 1680, the local Weckquaskeck Indians sold a large strip of land surrounding the Pocantico to Frederick Philipse. According to nineteenth century historian E. M. Ruttenber, the Weckquaskeck chieftaincy concentrated in the territory encompassing the towns of Greenburgh, White Plains and Mount Pleasant (1992).

Precontact Archaeological Sensitivity

The physiographic characteristics of the current project site and surrounding park, together with the information extracted from the documentary record and the number of prehistoric sites identified in the vicinity, suggests that Native American peoples likely exploited the project site. The Pocantico River, which travels roughly northeast-southwest, is just north of the project site. The river provided an ample water supply and was well suited for supporting game animals and agricultural activity. Topographic maps from the nineteenth and twentieth centuries indicate that the terrain found in the location of the project site is characterized by low hills, brooks and ponds, and open fields that are surrounded by forest land. These attributes likely provided an ideal locale for primary and secondary prehistoric sites. The late nineteenth century construction of the standing stone building and associated spillway however, would have severely impacted any precontact resources in this location. Outside the footprint of these structures, the surrounding terrain may be sensitive for precontact resources. Two soil borings were drilled in the area to the east of the Shaft (Figure 9-2). The boring data indicate that there is at least 15 feet of fill to the east of the Shaft building. It is likely that the strata identified, as fill during analysis may be displaced soils from the construction of the superstructure, which extends to a depth of approximately 20 feet below the ground surface. Therefore, any potential precontact resources may be deeply buried under the fill in the area to the east of the Shaft building.

Historical Archaeological Potential

Historical Land Use

During the late seventeenth and through most of the eighteenth century, the project site was part of Philipsburgh Manor. Frederick Philipse, who began amassing property in 1680, eventually owned much of what is now Westchester County. All over his vast estate Philipse leased large sections of his property to tenant farmers. Small farmhouses with their associated outbuildings and cultivated fields were likely present until the Revolutionary War. Most of these dwellings were probably located along the main transportation routes, where the terrain is less hilly and more suited for homelots and agricultural pursuits. Sleepy Hollow

Road was one of these old transportation corridors and historical maps indicate that numerous farms were located adjacent to it.

The earliest maps that depict individual buildings in this location date to 1851 and 1867 (Sidney and Neff 1851; Beers 1867). In 1867 a large mill complex, called Harts Mills, was located on the west side of Sleepy Hollow Road, directly across from the project site (Beers 1867, Figure 9-3). The former village historian of North Tarrytown believes that this complex may have been the site of a Philipse mill during the colonial period. On the east side, a small structure, identified as "J. Carl" was depicted on the 1867 map. Historical records indicate that Mr. Carl also had a mill in the nineteenth century. It is unknown if he sold his mill to George Hart (Harts Mill) or built his own complex on the small tributary brook located on the east side of the road within the project site.

The entire area, including the mill complex, was immortalized when author Washington Irving described the valley in his Legend of Sleepy Hollow. Irving further described a mill in the hollow as "an old goblin-looking mill, situated among rocks and waterfalls, with clanking wheels and rushing streams." In a later book, *Wolferts Roost,* Irving wrote that "in a remote part of the hollow where the Pocantico forced its way down rugged rocks stood Carl's Mill, the haunted house of the neighborhood." These writings brought fame to the area and a drawing of Carl's Mill was published in *Gleason's Pictorial* in 1853. The buildings in the area fell into ruin during the 1890s and were razed by the Rockefeller family.

Historical Archaeological Sensitivity

A site file search at the NYSM and the OPRHP found that there was one identified historical site within a one-mile radius of Shaft No. 9. This site, along with other traces of historical occupation, was identified during an archaeological survey of Proposed Pocantico Hill State Park, now the Rockefeller State Park Preserve (Hartgen Archaeological Associates, Inc. 1982). Site #94 (A11908.000018), a rock quarry, was identified and recorded with the State Historic Preservation Office. In addition, to that site, the survey included information on the presence of fieldstone features near the Pocantico River. Although research found that the locale surrounding the stream was clearly exploited by historic peoples, there is no evidence that any structures or features were once present on the project site prior to the construction of Shaft No. 9. Further, because the site was completely altered by the construction of the stone building and associated spillway, there is also no possibility that any unrecorded historical resources are still present within the footprint the building above Shaft No. 9 and the associated spillway.

Historic Resources in the Project Area

Shaft No. 9 is situated above the New Croton Aqueduct (1884-1890). The stone building and adjacent stone-lined spillway, both associated with the large Croton water management system, are located on the site. Each of these facilities, including the underground aqueduct, is eligible for listing on the National Register of Historic Places. The stone building relates closely in design to other shaft buildings and gate houses erected along the route of the New Croton Aqueduct. The existing building is approximately 42 x 44 feet and 20 feet tall. The

building extends down approximately 20 feet below the surface. At present, the horizontal extent of disturbance from the construction of the stone building is unknown. Two twentieth century pump buildings are also present on the site to the east of the stone structure. These buildings are not considered contributing elements of the New Croton Aqueduct system. They are later structures that are part of the water supply system for the Village of Sleepy Hollow, and as such are not eligible for listing on the National Register of Historic Places.

The surrounding Rockefeller State Park Preserve (1984) was once part of the vast holdings of the Rockefeller family. Beginning in 1893, John D. Rockefeller, Sr., and later John D. Rockefeller, Jr., began purchasing large land parcels, mostly old farms, in Mount Pleasant and North Tarrytown (now Sleepy Hollow). The main body of the family estate, including the main mansion called Kykuit, is located to the southwest of the site in the hamlet of Pocantico Hills. The shaft feature is visually and physically separated from any standing historic structures associated with the Rockefeller family. During the early twentieth century, the Rockefellers demolished most of the old farmhouses, although many of the old stone fences, picturesque fields, and historic farm roads were maintained. The Rockefeller State Park Preserve itself may be considered historically important as a representative example of the American public park movement, but no formal process has been undertaken to definitively determine its eligibility for landmarking.

Proposed Impacts to Potential Resources

Archaeological Resources: Although the area outside of the existing Shaft and associated structures may be sensitive for precontact archaeological deposits, no ground disturbance is proposed in the location of the shaft during inspection and minimal ground disturbance is proposed for the creation of a staging area. In addition, the area to the east of the shaft is covered with a layer of fill, protecting any potentially deeply buried archaeological resources. At this time, the extent and depth of the fill material across the site is unknown. During the project, the entire staging area surrounding the Shaft would be covered with a temporary artificial hard surface and geomembrane and surrounded by noise attenuation fencing and sediment erosion control measures, as required. These measures would ensure that the existing surface and any potential archaeological deposits are not disturbed. No impacts to archaeological resources are therefore anticipated as part of this project.

Architectural Resources: For the duration of the project, Shaft No. 9 would be used as a construction access shaft and would serve as a main access location for personnel, equipment and materials into the Aqueduct to perform baseline rehabilitation. Work at the site would also involve inspection of blow-off structures, main gates and outlet fences/gates. Also planned is the reconstruction and waterproofing of the walls and floor of the Shaft Chamber. Additionally the Shaft would be used for sediment and debris removal from within the section of the Aqueduct between the Croton Lake Gate House and Gould's Swamp Siphon. Shaft No. 9 and the surrounding structure are eligible for listing on the National Register of Historic Places. Subsequent to the use of the Shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to construction, the

Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

10. SHAFT NO. 10 (SLEEPY HOLLOW)

Shaft No. 10 is located on the north side of Tarrytown Reservoir adjacent to County House Road in Mount Pleasant (Figure 10-1). The Shaft site is located on the hillside to the north of the man-made lakes in a small cleared parcel. The Shaft incorporates a municipal well installation for withdrawal of water from the Aqueduct. Access to the Shaft is from a two-lane road.

Inspection of the Shaft would consist of removing steel sheeting and header pipes and possibly a portion of the concrete slab foundation for the pumps. Inspection of the Shaft would be conducted by a remote operated video camera. Once inspection is completed, the Shaft would be restored to its condition prior to inspection. Work at Shaft No. 10 would occur for up to one month between the period of September, 2004 to April, 2005.

Precontact Archaeological Potential

Documentary research found that the project site is sensitive for precontact cultural resources. For the assessment of sensitivity, a review of archaeological literature was completed. As early as the 1920s, historian and archaeologist Arthur C. Parker identified the area around the Tarrytown Reservoir as a location of Native American activity.

A site file search at the NYSM and the OPRHP found that there were eight identified precontact sites within a one-mile radius of Shaft No. 10.

OPRHP or NYSM #	Site Identifier	Site Description
A11904.000170	Landmark at Eastview	Precontact Site, Area 4
A11904.000171	Landmark at Eastview	Precontact Site, Area 6
A11904.000174	Landmark at Eastview	Precontact Site, Area 2
A11904.000175	Landmark at Eastview	Precontact Site, Area 3
A11904.000170	Landmark at Eastview	Precontact Site, Area 5
5234	ACP West no #	Traces of occupation
7828	Aliponeck/Alipconk	Historic? (Contact) village
9252	Brennan Collection	Surface Finds-Grasslands Farm

At the Landmark at Eastview, located approximately a 1/2 mile east of the project site on Saw Mill River Road, five sites were identified by Historical Perspectives, Inc. during a survey (Kearns, Saunders, and Schneiderman-Fox 1996). Investigations to the northwest of the project site identified precontact cultural material during a walkover survey. Quartz flakes and shatter were discovered lying on the surface in several areas, and in one location

was directly associated with a quartz outcrop. These precontact artifacts were exposed either by erosion, or by other natural or cultural forces. In some places, recent dirt-bike tracks had exposed quartz flakes, which were previously buried beneath the surface. Archaeological field-testing performed at the site by Historical Perspectives, Inc. in 1996 concluded that this site contained a precontact quartz quarry, where quartz outcrops were exploited for raw materials needed for tool production. Testing recovered a significant amount of worked lithic material, mostly quartz, rose quartz, and chert. Small pottery fragments of the Woodland Period were also recovered. Additional testing was recommended to identify the extent and date of this precontact site prior to any proposed development in this location.

The exact size and date of the village of Aliponeck (NYSM #7828) is unknown. Arthur C. Parker, an early twentieth century researcher, identified several camps along the Saw Mill River that might be associated with the larger village. On such site is NYSM #5234, which was simply described as "traces of occupation" (Parker 1920:714).

Precontact Archaeological Sensitivity

The physiographic characteristics of the current project site, together with the information extracted from the documentary record and the number of precontact sites identified in the vicinity, suggests that Native American peoples likely exploited the project site. The Saw Mill River, which travels roughly north south, is located less than one-half mile east of the project site. The river provided an ample water supply and was well suited for supporting game animals and agricultural activity. Topographic maps from the nineteenth and twentieth centuries indicate that the terrain found in the location of the project site is characterized by low hills, brooks and ponds, and open fields that are surrounded by forest land. These attributes likely provided an ideal locale for primary and secondary precontact sites.

Historical Archaeological Potential

Historical Land Use

During the late seventeenth and through most of the eighteenth century, the project site was part of Philipsburgh Manor. Frederick Philipse, who began amassing property in 1680, eventually owned much of what is now Westchester County. All over his vast estate Philipse leased large sections of his property to tenant farmers. Small farmhouses with their associated outbuildings and cultivated fields were likely present until the Revolutionary War. Most of these dwellings were probably located along the main transportation routes, where the terrain is less hilly and more suited for homelots and agricultural pursuits.

During the American Revolution, most of Westchester County was located between the British and Colonial Lines and many of the residents were active in the fight against the British. From 1776 to 1783, the British and American armies faced each other across the County, described as the Neutral Ground. In 1780, three local militiamen captured the British spy, Major John Andre, in nearby Tarrytown. At the time of his capture, Andre was returning from a meeting with Benedict Arnold when Isaac Van Wart, David Williams and John Paulding apprehended him. The Paulding tenant farm was located approximately 1/2 of

a mile to the west of the current project site. After apprehending Andre, the three men took him to the Reed farmhouse/tavern to await orders. Eventually, the captors turned over their prisoner to the commander of the American headquarters at Armonk. (Westchester County Historical Society Vertical Files, the Route of Major John Andre in the Town of Mount Pleasant: n.d.).

The entire project area was completely changed during the late nineteenth century with the introduction of the Putnam Division of the New York and Northern Railroad and the creation of the Tarrytown Reservoir. In 1880 the Putnam railroad was constructed to the east and north of the project site. Prior to the creation of the Reservoir, there was a steep valley to the east of the project site. An 80-foot Trestle Bridge was built over the valley for the Putnam Line. Because of passenger fears that the bridge would collapse, it was torn down after only a year and the tracks were altered to go around the valley. The former route of the tracks is located one-eighth of a mile to the north of the Shaft Site. The course of the Putnam Division was altered several times during the twentieth century until the entire line was eventually dismantled. The Tarrytown Reservoir was constructed during the 1880s and 1890s. Two large lakes were created when the valley to the south of the Shaft site was flooded. The water covered portions of the farms and roads in the small valley.

The earliest maps that depict individual dwellings in the project area date to 1851 and 1867 (Sidney and Neff 1851; Beers 1867). The 1867 map clearly depicts the Landrine house on a parcel of land directly south of site of Shaft 10 (Beers 1867, Figure 10-2). William Landrine had purchased the famous Reed Tavern in 1824 (Vertical Files, The Historical Society serving Sleepy Hollow and Tarrytown). Prior to that date Isaac Reed, who had purchased the land from the Commissioners of Forfeiture after the Revolutionary War, had owned it. Reed lived in the building and used part of it for a tavern. The house was located on a flat parcel of land with a steep hillside to the north.

Maps indicate that the house was present to the north of the site until the second quarter of the twentieth century (Bromley 1901; Hopkins 1930). During the early twentieth century, the site of the former Landrine property and the surrounding acreage (including the location of Shaft 10) were purchased by John D. Rockefeller, Sr. The Landrine house was removed and later the modern Pump House for the Reservoir was constructed in the vicinity of the house. No structures were depicted on the hillside where Shaft No. 10 is located.

Historical Archaeological Sensitivity

Although research found that the locale surrounding the site was clearly utilized during the historical period, there is no evidence that any structures or features were once present on the project site prior to the construction of Shaft No. 10. Further, the location of the former Reed, or Landrine, house was on a flat parcel below, and to the south of, the Shaft Site. It is unlikely that any associated structures were built on the hillside. Because the site was altered by the construction of the Shaft, there is also no possibility that any unrecorded historical resources are still present above Shaft No. 10.

Historic Resources in the Project Area

Proposed Impacts to Potential Resources

Archaeological Resources: No ground disturbance is proposed in the location of the Shaft during the inspection of the New Croton Aqueduct. No impacts to archaeological resources are anticipated as part of this project.

Architectural Resources: Shaft No. 10 is eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection only. The inspection would consist of opening the shaft by removing steel sheeting and header pipes, and possibly a portion of the concrete slab foundation for the pumps, for the insertion of a remote operated video camera. The Shaft would be restored to its condition prior to inspection. Subsequent to the use of the shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the Shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

11. SHAFT NO. 11A (GREENBURGH)

NCA Shaft 11A is located on a very small parcel of land within the Town of Greenburgh (Figure 11A-1, Photograph 11A-1). The Shaft is situated within a headhouse located between Old White Plains Road and White Plains Roads in the hamlet of Glenville at the eastern edge of the village of Tarrytown. The surrounding area is firm, flat and grassed and immediately adjacent to Old White Plains Road. The small stone building, built in the style typical of most of the NCA headhouses, is present on a grassy lot above Shaft No. 11A (see Photograph 11A-1).

The Shaft would be opened and prepared for ventilation exhaust for the ventilation system prior to dewatering of the Gould's Swamp Siphon directly to the south of the Shaft. Inspection of the Shaft would require removal and storage of the existing cover from within the headhouse and placement of hoists or frames over the Shaft opening. Inspection of the Shaft would either be conducted from within a personnel cage lowered into the Shaft or by a remote operated video camera. Once inspection is completed and the Shaft is no longer needed for ventilation purposes, the existing cover would be put back into place over the Shaft opening and the headhouse doors would be sealed.

The inspection at Shaft No. 11A would occur for up to one month between the period of September, 2004 to April, 2005. The Shaft may be used for ventilation throughout the duration of the project depending on the Contractor's ventilation design.

Precontact Archaeological Potential

At the time of European contact, a Native American group known as the Wiechquaeskecks, a Munsee-speaking group of Delawares occupied the Westchester County area (Goddard 1978:214). Shell beds along the Hudson River in Tarrytown attest to the extensive use of the area (Bolton 1848:164). Greenburgh was then called Weic-quoes-guck, translating to "the place of the bark kettle" (Bolton 1881:163). A powerful group of Wiechquaeskecks lived in Greenburgh until the mid-eighteenth century. Kykuit Hill, northwest of the project site, was a high point over the river that was reportedly used by Indians for sending signals (miscellaneous papers, The Historical Society serving Sleepy Hollow and Tarrytown).

A site file search at the NYSM and the OPRHP identified six precontact sites within a one-mile radius of the NCA shaft location. Below is a list of these sites and their description:

OPRHP or NYSM #	Site Identifier	Site Description
5186	ACP West 50	Village: Shell Middens
5190	ACP West 54	Village
5234	ACP West no #	Traces of Occupation
7828	Aliponeck/Alipconk	Village at Tarrytown
A11904.000159	Avalon Green II	Middle-Late Woodland Point
A11966.000005	Site # 4	Shell Middens

Three of the sites were identified by Arthur C. Parker (ACP), an early twentieth century researcher, two were recorded during recent archaeological surveys, and one was identified as the village of Alipkonk. The exact size and date of the village of Alipkonk (NYSM #6870 and #7828) is unknown, and so is the extent of site #5234, which is simply described as "traces of occupation" (Parker 1920:714). A site map provided by the state indicates that the physiographic characteristics of these sites are similar to those observed in the location of the Shaft No. 11A.

The search of the OPRHP files identified five CRM surveys within one mile of the project area. One of these reports examined was a NYSDOT archaeological survey along the White Plains Road (Route 119) corridor, located immediately south of Shaft No, 11A (Ross 1983). Researchers, testing a limited area along the southern side of the road, found no evidence of precontact activity. Because of the limitations of this survey, little can be inferred from this finding. Only two of the five surveys identified precontact materials. A Middle-Late Woodland Levanna projectile point was discovered along with quartz debris at the Avalon Green II site, approximately 1/2 mile to the southeast of Shaft 11A and precontact material was also recovered from the Saw Mill River site, approximately 3/4 of a mile to the northeast (Hartgen Archaeological Associates 2000; Lutins et al. 1996).

Precontact Archaeological Sensitivity

Documentary research and a review of archaeological literature found that the project site is in an area of sensitive for precontact archaeological resources. The nearby Sheldon Brook provided an ample water supply and was well suited for supporting game animals and agricultural activity. Historical topographic maps from the nineteenth century indicate that the terrain found in the location of the project site was characterized by flat land with, brooks, ponds and open fields surrounded by low hills and forest land. These attributes likely provided an ideal locale for primary and secondary precontact sites.

Historical Archaeological Potential

Historical Land Use

During the early colonial period the project area was considered part of Philipsburg Manor. Frederick Philipse came to New Amsterdam with Peter Stuyvesant and quickly set about making his fortune. Well-known as a trader in wampum and other goods, Philipse was rumored to have dealt with the infamous Captain Kidd while amassing an immense fortune. After making an advantageous marriage to a wealthy widow in 1662, Philipse began to acquire land along the Hudson River in 1681. Shortly after that date, he built a mill and manor house near the Hudson River and proceeded to purchase approximately 22 miles of land, or 90,000 acres along the east bank of the river. Governor Benjamin Fletcher granted Philipse manorial rights over his land in 1693. This was quickly ratified by King William and Queen Mary of England (Scharf 1886:174). During his lifetime, Philipse had become one of the richest men in the colony. Adolph Philipse took over the manor following his father's death in 1702, and his son Frederick who became the third Lord of the Manor of Philipsburg subsequently inherited the parcel.

By the 1750s over one thousand people were living in the Manor, farming the land, and clearing forests to support the demand for lumber. Most of these residents were tenant farmers who leased land-use rights from the Philipse family. The residents of the manor who established small hamlets throughout the Philipse estate ran civil affairs. In these hamlets, meeting houses, taverns, mills and industries were constructed.

Westchester County's residents were active in their fight against the British during the American Revolution, and many skirmishes were fought on county soil. From 1776 to 1783 Westchester County was situated between the British army, stationed in New York City, and the American lines posted north of the Croton River. Westchester County was known as the Neutral Ground, where British and Loyalist troops battled for a foothold. Battles were fought in Pelham and White Plains, and troops were marched through the county on many occasions.

Philipsburg, which had remained intact for over eighty years, was finally dissolved following the American Revolution when the Philipse family, who sided with the British, lost their land rights. The former tenant farmers quickly subdivided and purchased their holdings from the Commissioners of Forfeiture. As tenant farmers transformed into land owners, agricultural

production in the county increased. Throughout the late eighteenth and early nineteenth centuries, farming, fishing, and milling were the chief occupations of the residents of Greenburgh. The local farmers were engaged in market-garden farming and cattle raising, in order to help supply the cities of White Plains and New York with produce and meat.

The Town of Greenburgh was one of the 21 Westchester townships established by the State of New York in 1788. The town includes the villages of Tarrytown, Elmsford, Irvington, Ardsley, Hartsdale, Hastings-on-Hudson, Dobbs Ferry, and certain unincorporated areas at the edges of some of these villages, including the hamlet of Glenville. During the mid-nineteenth century, workers at the S.J. Sackett quarries established the hamlet of Glenville in the area just north of Shaft No. 11A. At that time, several granite quarries were located on a ridge leading from Hackley Hill in Tarrytown (less than 1/4 of a mile north of the project site) eastward toward the village of Elmsford. Many of the stones from these quarries were used for walls along White Plains Road (Route 119) and at the entrances to many local estates.

The first Croton water system opened in 1842 and supplied over 60 million gallons of water a day to the City via the Old Croton Aqueduct, which is located approximately 1/2 mile to the west of Shaft No. 11A. New York City needed more water almost immediately, and the enabling act for the second aqueduct was passed June 1, 1883, with construction beginning in January 1885 and finishing in 1893 (Galusha 1999: 272).

Under a new state law authorizing the establishment of local governments, Tarrytown was officially incorporated as a village in 1870 followed by Elmsford and Irvington (Canning and Buxton 1975: 63). Portions of the land east of Glenville remained part of unincorporated Greenburgh.

The earliest map that identifies landowners in the location of Shaft No. 11A is the 1867 Beers Atlas of Westchester County (Figure 11A-2). The Atlas indicates that a "G. Lawrence" and "H. Wiley" owned two parcels of land in the vicinity of the future Shaft No. 11A site. Unfortunately, the Beers Atlas does not accurately depict property boundaries and it is difficult to determine the exact location of the Shaft Site. Land records detail that Robert Lawrence, likely a relative of the "G. Lawrence" on the map, sold the property that same year to Sarah Tompkins (Land Records Liber 627: 325). Cartographic records indicate that S. Tompkins remained the owner of the property (Beers 1872; Bromley 1881) until it was sold to the City of New York on June 29, 1882 for a reservoir and conduit pipe for the purpose of maintaining preserving and increasing the supply of pure and wholesome water for the use of the City of New York (Land Records Liber 1072: 236).

The Wiley property was sold after 1872 to Ichabod Smith who resold it to the City of New York in the early 1880s. Neither the 1867 nor the 1872 atlases depict a structure in the location of Shaft No. 11A.

During the late nineteenth through the early twentieth century, the millionaires' colony was firmly established by the influx of wealthy families to Westchester County. The large estates of the millionaires' colony were eventually divided during the second half of the twentieth

century as many wealthy families moved further north up the Hudson. By the end of the century, the proximity to New York City firmly established the project area as a suburban commuter locale.

Historical Archaeological Sensitivity

The site file search at the NYSM and the OPRHP identified only one historical archaeological site within 1/2 mile. The ca. 1880 Old Putnam Railroad Line Site (A11904.000149) was recorded in the Saw Mill River Valley approximately 1/2 mile northeast of Shaft No. 11A.

The hamlet of Glenville was established in the mid-nineteenth century. It appears that most of the development of the area took place to the north of Shaft No. 11A and documentary research found no record of any structures in the location of the future NCA shaft. The construction of the stone headhouse at Shaft No. 11A, with its associated connection to the NCA, would likely have obliterated any isolated historical resource within the footprint of the structure.

Historic Resources in the Project Area

Historic sites that are located within 1/2 mile of Shaft No. 11A include Carrollcliff (a neo-gothic castle ca. 1900), Hackley School (1899) and a small late eighteenth century stagecoach stop along the route of the White Plains Road (Route 119).

A stone headhouse, associated with the large underground water management feature, is located on the site of Shaft No. 11A. This structure, as well as the underground aqueduct, is eligible for listing on the National Register of Historic Places. The small above ground building on the parcel is well designed, with cut rock faces and a smooth stone foundation. It is set on a relatively flat parcel and has a large arched metal double door on one side.

Proposed Impacts to Potential Resources

Archaeological Resources: Although the locale within the project area was almost certainly exploited by precontact peoples and at least six precontact sites have been identified within a one-mile radius of Shaft No. 11A, there is little possibility that any *in situ* buried cultural resources are present in the location of the actual shafts, as potential resources would have been disturbed by their construction. Further, no ground disturbance is proposed in the location of the shaft during inspection. There is an existing parking area adjacent to the site for staging activities. No impacts to archaeological resources are anticipated as part of this project.

Architectural Resources: Shaft No. 11A is located within a stone headhouse between Old White Plains Road and White Plains Road. The headhouse is a small stone building with a large iron front door. Both the headhouse and Shaft are eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection and ventilation only. Inspection of the Shaft would require the temporary removal of the existing shaft cover.

Following the inspection, the Shaft would be prepared for ventilation exhaust for the ventilation system prior to dewatering of the nearby Gould's Swamp Siphon. Following these actions, the existing cover would be put back in place and the headhouse doors sealed. Subsequent to the use of the Shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the Shaft, prior to construction (inspection/rehabilitation), the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

12. SHAFT NOS. 11B AND 11C (GREENBURGH)

NCA Shaft Nos. 11B and 11C are located within a commercial area between White Plains Road and NY State Thruway within the Town of Greenburgh (Figure 11B and C-1, Photograph 11B and C-1). They are at the edge of a wooded area and are surrounded by a modern metal fence.

The access road to the Shaft sites is White Plains Road, a four-lane road that leads to a parking area for the office buildings. The two covered Shafts are separated by 34 feet and are topped by clearly marked circular steel cover plates and are surrounded by chain-linked security fences. Shaft No. 11C would be opened and prepared for ventilation exhaust for the ventilation system after dewatering Gould's Swamp Siphon, located directly to the north of the Shaft. Inspection of the Shaft would include removal and storage of the existing covers. A crane would be positioned over the Shaft openings. Inspection of the Shafts would either be conducted from within a personnel cage lowered into the Shaft or by a remote operated video camera. Once inspection of both Shafts is completed and Shaft No. 11C is no longer needed for ventilation purposes, the existing covers would be reinstalled.

Additionally, Shaft No. 11C would serve as a point for sediment and debris removal from within the Aqueduct. A crane would hoist the material to the surface where it would be loaded directly into sealed containers located within a dedicated storage area for subsequent disposal.

The sediment and debris removal from Shaft No. 11C and inspection of Shaft Nos. 11B and 11C would occur for up to one month between the period of September, 2004 to April, 2005. Shaft No. 11C may be used for ventilation throughout the duration of the project depending on the contractor's ventilation design.

Precontact Archaeological Potential

See Chapter V, subsection 11 (Shaft 11A) for information about the Precontact Period.

Precontact Archaeological Sensitivity

Documentary research and a review of archaeological literature found that the project site is in an area of limited sensitivity for precontact archaeological resources. Historical topographic maps from the nineteenth century indicate that the terrain found in the project area was characterized by forested low land with ponds and swamps. These attributes likely made the locale less desirable for primary and secondary precontact sites. The construction of each of the Shafts in this location would have also likely impacted any potential precontact features above and immediately adjacent to them.

Historical Archaeological Potential

Historical Land Use

Shaft Nos. 11B and 11C are located close to Shaft No. 11A and share a similar early history (see Chapter V, subsection 11).

The earliest map that identifies landowners in the location of Shaft No. 11A is the 1867 Beers Atlas of Westchester County (Beers 1867, Figure 11B and C-2). No structures are depicted in the location of the two Shafts. Subsequent nineteenth and twentieth century maps also do not show any structures in this location (Bromley 1881; Bien 1893; Bromley 1901; Hopkins 1930).

During the twentieth century, the land bordering Route 119 shifted from residential to commercial as office buildings were constructed along the transportation corridor. Much of the low-lying and swamp land was filled for development.

Historical Archaeological Sensitivity

No historical structures were identified in the locations of Shaft Nos. 11B and 11C. As with Shaft No. 11A, it is unlikely that any possible isolated historical resource has survived in the direct locations of these NCA Shafts. A site visit also found no evidence of a significant historical presence, beyond that of the NCA Shafts themselves.

Historic Resources in the Project Area

Shaft Nos. 11B and 11C are located close to Shaft No. 11A and the historic sites within a half mile radius (see Chapter V, subsection 11).

Shaft Nos. 11B and 11C are situated above the New Croton Aqueduct (1884-1890). The documented aqueduct and existing Shafts are functioning components of New York City's water supply system. Both are eligible for inclusion on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: Although six precontact sites have been identified within a one-mile radius of Shaft Nos. 11B and 11C, there is little possibility that any *in situ* buried cultural resources are present in the location of the actual Shafts. Further, no ground disturbance is proposed in the location of the shaft during inspection. Therefore, no impacts to archaeological resources are anticipated as part of this project.

Architectural Resources: Both Shafts are eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection and ventilation only. The proposed actions call for the removal of the shaft covers and inspections via personnel cage or remote operated video camera. Shaft No. 11C would be prepared for ventilation exhaust for the ventilation system after the dewatering of the Gould's Swamp Siphon, located directly north of the Shaft. Additionally, Shaft No. 11C would serve as a point for sediment and debris removal from within the Aqueduct. Following these actions the Shaft covers would be reinstalled. Subsequent to the use of the shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

13. SHAFT NO. 12A (GREENBURGH)

Shaft No. 12A is located on a very small parcel of land within the Town of Greenburgh (Figure 12A-1, Photograph 12A-1). The Shaft is located alongside the New York State Thruway (East Side), near its intersection with the Saw Mill River. Shaft No. 12 A is located within V. Everett Macy Park.

The Shaft has a municipal connection that provides water to the Village of Irvington. Inspection of the Shaft would consist of removing steel sheeting and header pipes and possibly a portion of the concrete slab foundation for the pumps. Inspection of the Shaft would be conducted by a remote operated video camera. Once inspection is completed, the Shaft would be restored to its condition prior to inspection. Work at Shaft No. 12A would occur for up to one month between the period of September, 2004 to April, 2005.

Precontact Archaeological Potential

At the time of European contact, a Native American group known as the Wiechquaeskecks, a Munsee-speaking group of Delawares occupied the Westchester County area (Goddard 1978:214). Shell beds along the Hudson River in Tarrytown attest to the extensive use of the area (Bolton 1848:164). Greenburgh was then called Weic-quoes-guck, translating to "the place of the bark kettle" (Bolton 1881:163).

A site file search at the NYSM and the OPRHP identified seven precontact sites within a one-mile radius of the NCA shaft location. Below is a list of these sites and their description:

OPRHP or NYSM #	Site Identifier	Site Description
5190	ACP West 54	Village
6798	Blackie Site on Lander Farm	No data
7780	ACP West	Camp
7781	ACP West	Camp
A119.04.000015	Site # 1	Shell deposit/lithics
A119.04.000016	Site # 2	Shell deposit/lithics
A119.04.000017	Site # 3	Shell deposit/charcoal

Three of the sites were identified by Arthur C. Parker (ACP), an early twentieth century researcher, one was recorded by Andrew Whitman from Blackie's manuscript and three were identified during a 1980 archaeological survey of the Saw Mill River Basin. The closest site to the project location is the Parker site #5190, located approximately one-eighth of a mile north of Shaft No. 12A. Unfortunately, no information on the exact location and boundaries of this precontact site is known.

Precontact Archaeological Sensitivity

Documentary research and a review of archaeological literature found that the project site is in an area sensitive for precontact archaeological resources. The nearby Saw Mill River provided an ample water supply and was well suited for supporting game animals and agricultural activity. However, the installation of the Shaft and local municipal connection would have likely destroyed any potential precontact resources in the location Shaft No. 12A.

Historical Archaeological Potential

Historical Land Use

During the early colonial period the project area was considered part of Philipsburg Manor. Much of the area was sparsely settled by farmers on the Philipse land. During the American Revolution, the residents of the project area were active in their fight against British rule. To the north of the site in Elmsford, several skirmishes were fought including one instance when the British burned down the house of a local family suspected of aiding the American forces. Philipsburg, which had remained intact for over eighty years, was finally dissolved following the American Revolution when the Philipse family, who sided with the British, lost their land rights. Many of the former tenant farmers purchased their holdings from the New York Commissioners of Forfeiture. The Town of Greenburgh was one of the 21 Westchester townships established by the State of New York in 1788. The town includes the villages of Tarrytown, Elmsford, Irvington, Ardsley, Hartsdale, Hastings-on-Hudson, and Dobbs Ferry.

Throughout the late eighteenth and early nineteenth centuries, farming, fishing, and milling were the chief occupations of the residents of Greenburgh. Many of the local farmers were engaged in market-garden farming and cattle raising, in order to help supply produce and meat to the cities of White Plains and New York. The Village of Irvington, named after

Washington Irving, was incorporated in 1872 (Shonnard and Spooner 1900: 611). The main village center is located over one-half mile to the west of the Shaft site.

The earliest map that identifies landowners in the location of Shaft No. 12A is the 1867 Beers Atlas of Westchester County (Figure 12A-2). The Atlas indicates that a "D Decline" owned a parcel of land in the vicinity of the future location of Shaft No. 12A. Unfortunately, the Beers Atlas does not accurately depict property boundaries and it is difficult to determine the exact location of the Shaft Site, however it appears to be vacant. The Decline house is located on the east side of Saw Mill River Road, and outside of the project site.

No structures are depicted in the location of the Shaft on the 1881 and 1893 Atlases of Westchester County (Bromley 1881; Bien 1893). The course of the Saw Mill River seems to have been slightly altered, possibly by the introduction of the Putnam Division of the New York and Northern Railroad in 1880.

The site is shown within a parcel of land owned by Mrs. A. S. Rae in 1901 (Bromley 1901). No structures other than the NCA are shown in the location of the Shaft site. The property is shown as owned by the City of New York in 1930 (Hopkins 1930). No structures are depicted on the project site at that time.

Historical Archaeological Sensitivity

It appears that most of the historical development of the area took place to the north and west of Shaft No. 12A and documentary research found no record of any structures in the location of the future NCA shaft. The construction of the Shaft and the municipal connection for the Village of Irvington would likely have obliterated any potential isolated historical resource within the footprint of the structure.

Historic Resources in the Project Area

Shaft No. 12A is integral with the New Croton Aqueduct (1884-1890), which is eligible for inclusion on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: No ground disturbance is proposed in the location of the shaft during inspection. Therefore, no impacts to archaeological resources are anticipated as part of this project.

Architectural Resources: Shaft No. 12A is eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection only. The inspection would consist of opening the shaft by removing steel sheeting and header pipes, and possibly a portion of the concrete slab foundation for the pumps, for the insertion of a remote operated video camera. The Shaft would be restored to its condition prior to inspection. Subsequent to the use of the shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the

historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

14. SHAFT NO. 13 (GREENBURGH)

Shaft No. 13 is located on a parcel of land to the north of Secor Road in the Town of Greenburgh, New York (Figure 13-1; Photographs 13-1, 13-2 and 13-3). No structures associated with the shaft lie above grade. The shaft is in a wooded area located to the west of Ferncliff Cemetery. It is separated from the cemetery by a stone wall. The parcel is located at a higher elevation than Secor Road, located immediately south of the Shaft parcel (see Photograph 13-3).

Inspection of Shaft No. 13 would consist of clearing and grubbing a 20-foot wide access track, 150 feet long to the Shaft location from Secor Road. A temporary 13-foot wide graded gravel access track would be established along this alignment.. A staging area, enclosed by security fencing, would be constructed with a minimum area of 2000 square feet around the Shaft. Additionally, clearing and grubbing of a 20-foot wide corridor around all four sides of the security fencing would be conducted. Once construction of the staging area is completed, the existing Shaft cover would be removed and the Shaft opening would be secured, as necessary, to prevent falling debris from entering the Shaft. Hoists or frames would be constructed over the Shaft opening to allow for the Engineer's inspection of the Shaft. The inspection would either be conducted from within a personnel cage lowered into the Shaft or by a remote operated video camera. Once inspection is completed, a new replacement cover (minimum thickness of 10 inch, precast concrete) would be placed over the Shaft opening and buried with a minimum of 18 inches of fill and reseeded. Within 15 days of completion of the inspection, the materials used for the access track and staging area would be removed from the site and legally disposed of.

Work at Shaft No. 13 would occur for up to two months between the period September, 2004 to April, 2005.

Precontact Archaeological Potential

Documentary research found that the project site is in an area of high sensitivity for precontact archaeological resources. The nearby Saw Mill River would have provided an ample water supply and was well suited for supporting game animals. Historical topographic maps from the nineteenth century indicate that the terrain found in the location of the project site was characterized by flat land with, brooks, ponds and open fields surrounded by low hills and forestland. These attributes likely provided an ideal locale for primary and secondary precontact sites.

Prior to, and during the early period of European contact the Weckquaskeck Indians, a tribe of the Algonquin nation, occupied much of the lands of Westchester County. The location of

one of the main native villages was directly west of the project site in the village of Dobbs Ferry adjacent to the Hudson River on a small creek (approximately one mile west of Shaft No. 13). The New York State museum has numerous artifacts collected from the documented "Wickers Creek" village site. It is believed that Saw Mill River Road also follows the route of a north-south Native American trail that once paralleled the river.

For the assessment of sensitivity, a review of archaeological literature was completed. Archaeologist Arthur C. Parker identified five Native American sites, including the "Wickers Creek" site, within a two-mile radius of the project site. A second site identified was a village and burial site near the center of the village of Ardsley, just to the south Shaft No. 13. The site was described and mapped by the Rev. W. R. Blackie (Blackie's map is now in the collection of the American Museum of Natural History).

A site file search reported three inventoried archaeological sites within a half-mile of the project site.

OPRHP or NYSM #	Site Identifier	Site Description
6798	Blackie Site on Lander Farm	No data
7780	ACP West	Camp
7781	ACP West	Camp

According to the filed inventory, NYSM # 7780 is located immediately north of Ferncliff Cemetery and Shaft No. 13. NYSM # 7781 is located to the west of the project site on the opposite side of the Saw Mill River.

Precontact Archaeological Sensitivity

Documentary research and a review of archaeological literature found that the project site is in an area of sensitive for precontact archaeological resources. The nearby Saw Mill River provided an ample water supply and was well suited for supporting game animals and agricultural activity. The installation of Shaft No. 13 would have likely destroyed potential precontact resources only in the area immediately above and adjacent to the Shaft. The area surrounding the shaft site is considered sensitive for the potential presence of precontact resources.

Historical Archaeological Potential

Historical Land Use

Shaft No. 13 is located close to Shaft No. 12A and they share a similar early history (see Chapter V, subsection 13).

The earliest map that identifies landowners in the location of Shaft No. 13 is the 1851 Map of Westchester County (Sidney and Neff 1851). Although the map indicates that some houses

were present bordering Secor Road, none were present in the location of Shaft No. 13. The 1867 atlas identifies "N. Secor" as being the landowner to the east of the Shaft No. 13 site (Figure 13-2). Norman Secor is shown as the landowner of the site in 1881, but his house is located on the south side of Secor Road outside of the project site (Bromley 1881).

No structures are depicted in the location of the Shaft on the 1893 and 1901 Atlases of Westchester County (Bien 1893; Bromley 1901). By the latter date, the boundaries of the neighboring 63-acre parcel, where the future Ferncliff Cemetery is eventually located, are delineated. By 1930 Ferncliff Cemetery is present on the parcel immediately east of Shaft No. 13 (Hopkins 1930). No structures other than the NCA are shown in the location of the Shaft site.

Historical Archaeological Sensitivity

It appears that most of the historical development of the area took place to the south and east of Shaft No. 13. Cartographic research found no evidence of historical structures in the location or immediate vicinity of Shaft No. 13. Therefore, Shaft No. 13 is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Proposed Impacts to Potential Resources

Archaeological Resources: The Shaft site is in a wooded area located to the west of Ferncliff Cemetery. No ground disturbance is proposed directly above the Shaft. Proposed actions at the site include the construction of a fenced staging area around the Shaft, approximately 2000 square feet in size, the clearing and grubbing of a 20 foot corridor on all four sides of the security fencing, and clearing and grubbing for the creation of a 150-foot long, 20-foot access track with a 13-foot graded gravel roadway between Secor Road and the Shaft. Secor Road is presently at a lower elevation than the Shaft site and significant grading may be necessary (see Photograph 13-3). This portion of Westchester County is known to be sensitive for precontact resources. The horizontal extent of prior disturbance from the installation of the Shaft has not been established, so it is possible that areas of precontact sensitivity may lie within the proposed access track and staging area. Archaeological field testing is therefore recommended in locations where planned grading activities would occur.

If precontact resources are identified within areas of proposed ground disturbance, and it is determined that they are eligible for inclusion on the National Register of Historic Places, a mitigation plan would be developed in consultation with SHPO.

Architectural Resources: The Shaft is eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection only. Placement of a new Shaft cover would be the only action that would alter the character or appearance of the shaft. Subsequent to the use of the shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents.

Due to the eligible listing of the shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

15. SHAFT NO. 14 (ARDSLEY)

Shaft No. 14 is located on a small parcel of land within the village of Ardsley, New York (Figure 14-1, Photograph 14-1). The Saw Mill River, flowing roughly north-south, is located to the west of Shaft No. 14. This site is an inverted L-shaped parcel, situated to the north of Ashford Avenue on the east side of Saw Mill River Road, which parallels the river in this location. Access to the NCA is provided at ground level via a ladder. In addition, a small concrete spillway and drain are present above Shaft No. 14. The drain allows excess water to flow into the nearby Saw Mill River.

Proposed plans include utilizing Shaft No. 14 as a construction access shaft to the Aqueduct. The Shaft would serve as a main access location for personnel, equipment and materials into the Aqueduct to perform baseline rehabilitation. During the project, the staging area surrounding the Shaft would be covered with a temporary artificial hard surface and geomembrane and surrounded by noise attenuation fencing and sediment erosion control measures, as required. Work at the site includes inspection of blow-off structures, main gates and outlet fences/gates. Additionally, Shaft No. 14 would serve as a point for sediment and debris removal from within the chamber invert and the section of Aqueduct between Gould's Swamp Siphon and approximately Shaft No. 16. A crane will hoist the material to the surface where it would be loaded directly into sealed containers located within a dedicated storage area for subsequent disposal to licensed landfill sites. Stationary equipment at the Shaft includes an Engineer's office, a 20-ton mobile crane, and a changing facility equipped with lockers, showers and toilets.

Work at Shaft No. 14 would occur for the duration of the project, from September, 2004 to May, 2005 and from September, 2005 to March, 2006. The engineer's office would remain staffed through the no-work period from June to August, 2005.

Precontact Archaeological Potential

Documentary research found that the project site is in an area of high sensitivity for precontact archaeological resources. The nearby Saw Mill River provided an ample water supply and was well suited for supporting game animals and agricultural activity. Historical topographic maps from the nineteenth century indicate that the terrain found in the location of the project site was characterized by flat land with, brooks, ponds and open fields surrounded by low hills and forest land. These attributes likely provided an ideal locale for primary and secondary precontact sites.

Prior to, and during the early period of European contact, the Weckquaskeck Indians, a tribe of the Algonquin nation occupied much of the lands of Westchester County. The location of one of the main native villages was directly west of the project site in the village of Dobbs

Ferry adjacent to the Hudson River on a small creek. The New York State museum has numerous artifacts collected from the documented "Wickers Creek" village site. Ashford Avenue is thought to be the route of one of the primary native trails extending from the Hudson to the Long Island Sound. It is believed that Saw Mill River Road also follows the route of a north-south trail paralleling the river. According to early records of the area, the Saw Mill River was originally called the "Nepperhaen" by the native peoples.

For the assessment of sensitivity, a review of archaeological literature was completed. Archaeologist Arthur C. Parker identified five Native American sites, including the "Wickers Creek" site, within a two-mile radius of the project site. A second site identified was a village and burial site near the center of the village of Ardsley, just northeast of the location of Shaft No. 14. The site was described and mapped by the Rev. W. R. Blackie (Blackie's map is now in the collection of the American Museum of Natural History). The other precontact sites located nearby include a village to the northwest of the site, just south of Woodlands Lake; another village was also located less than a mile to the northwest; and a third village site was located to the east, along the banks of the Sprain Brook near Heatherdell Road (Daisy Avenue).

A site file search reported two inventoried archaeological sites within a mile of the project site. The two sites, NYSM 7780 and NYSM 7781, were both Native American Camp sites identified by Arthur C. Parker in the early part of the twentieth century. The sites were located approximately one-half mile to the north of Shaft No. 14. No additional information was found on these sites.

Precontact Archaeological Sensitivity

The physiographic characteristics of the current project site, together with the information extracted from the documentary record and the number of precontact sites identified in the vicinity, suggests that Native American peoples likely exploited the proposed project area. The site immediately around and beneath the Shaft was impacted when it was constructed. The extent of this impact around the Shaft site is unknown at present. Therefore the area surrounding the structure may be sensitive for buried precontact resources.

Historical Archaeological Potential

Historic Land Use

Historic documents describe the "sale" of land to European settlers beginning in the early seventeenth century when Adrian Van der Donck was given approximately 16 miles of land along the Hudson to create a patroonship. In an attempt to solidify their control over the Hudson River Valley the Dutch granted Van der Donck this important acreage in 1645. His charge was to bring at least 50 families to colonize the area. Following Van der Donck's death in 1655 his widow sold the land called "Colon Donck" to her brother who divided and resold the individual parcels. During the 1670s, Frederick Philipse began purchasing these parcels until he eventually owned much of what is now Westchester County. He was eventually granted a royal charter in 1693, making him the Lord of the Manor of Philipsburg.

The manor remained strong until the American Revolution when the Philipse family, who remained loyal to the crown, lost their land at the end of the war. Small tenant farm houses with their associated outbuildings and cultivated fields were likely present in the project area until that time. Most of these dwellings were probably located along the main transportation routes, Ashford Avenue and the Saw Mill River Road outside of the project. Following the Revolution, the small hamlet of Ashford began to grow on the east side of the Saw Mill River. In the late nineteenth century, the new village petitioned for a post office. Because there already was a village of Ashford in New York, the village name was changed to Ardsley after the estate of Cyrus W. Field.

The earliest map that depicts individual buildings in the area of Shaft No. 14 dates to 1851 (Sidney and Neff 1851). At that time there were several houses located along Ashford Avenue to the south of the site, but the project site was vacant. By 1867 the Methodist Episcopal Church was present immediately to the south of the site and a small carpenter's shop may have been located within the parcel (Beers 1867, Figure 14-2). A second unidentified structure may also have been located on the project site between Saw Mill River Road and the Saw Mill River. The carpenter's shop is also depicted on other nineteenth century maps until the land was purchased by the City of New York for access to the New Croton Aqueduct. During the twentieth century, three water-management structures were built on the property, including the Shaft.

Historical Archaeological Sensitivity

Documentary evidence suggests that the project site may have the potential to contain buried cultural material related to the nineteenth century occupation of the site. However, there is no possibility that any *in situ* historical cultural resources remain directly in the footprint of Shaft No. 14 (and the associated spillway and drain), which was completely altered by the construction of this water management feature. Because the impact of the construction of the Shaft is unknown, the area surrounding the standing stone structure is still considered sensitive for historical archaeological resources.

During the late twentieth century, an above grade oil tank leaked in the location of the project site. Subsequent remediation involved testing the ground water for contamination. None of the tests conducted would have impacted potential archaeological resources, or altered the potential sensitivity of the project site because they were limited to confined locations.

Historic Resources in the Project Area

Shaft No. 14 is situated on a four to five acre site above the New Croton Aqueduct (1884-1890). The documented aqueduct and existing stone below-grade infrastructure are functioning components of New York City's water supply system. Both are eligible for inclusion on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: Although located in an area potentially sensitive for the presence of archaeological resources, minimal ground disturbance is proposed in the location of the shaft during it use as a construction access location. In addition, the staging area in this location would be covered with a temporary artificial hard surface and geomembrane and enclosed by security/noise reduction fencing. It is unlikely that significant archaeological resources would be present in the location of the shaft as severe disturbance would have occurred during its construction. Furthermore, the temporary surface measures undertaken to ensure that the existing ground is not disturbed, will also protect any potential archaeological deposits around the Shaft site. No impacts to archaeological resources are therefore anticipated as part of this project.

Architectural Resources: During the project, Shaft No. 14 would be used as a construction access shaft to the Aqueduct and would serve as a main access location for personnel, equipment and materials into the Aqueduct to perform baseline rehabilitation. Inspections will include the examination of the blow-off structures, main gates and outlet fences/gates. Additionally Shaft 14 would serve as a point for sediment and debris removal from within the chamber. The shaft is eligible for listing on the National Register of Historic Places. When work is complete, the Shaft will be restored to its condition prior to inspection. Subsequent to the use of the shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the Shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

16. SHAFT NO. 14A (ARDSLEY)

Shaft No. 14A is located within the playground area of a nursery school and is buried by a few inches of sand in the village of Ardsley, New York (Figure 14A-1, Photograph 14A-1). The Shaft incorporates a municipal well installation for withdrawal of water from the Aqueduct. A staging area, enclosed by security fencing, will be constructed around the Shaft. Inspection of the Shaft will consist of removing steel sheeting and possibly the header pipes and checking the pump vault located below the plates. Inspection of the Shaft will be conducted by a remote operated video camera. Once inspection is completed, the Shaft and ground surface will be restored to its condition prior to inspection.

Work at Shaft No. 14A will occur for up to one month between the period of September, 2004 to April, 2005.

Precontact Archaeological Potential

Shaft No. 14A is located close to Shaft No. 14 and shares a similar precontact period background (see Chapter V, subsection 15).

Precontact Archaeological Sensitivity

The physiographic characteristics of the current project site, together with the information extracted from the documentary record and the number of precontact sites identified, suggests that Native American peoples likely exploited the proposed project site. The area immediately around and beneath the structure was impacted when the shaft to the New Croton Aqueduct was constructed. The extent of this impact outside of the footprint of the Shaft Site is unknown at present. Therefore the area surrounding the Shaft may be sensitive for buried precontact resources.

Historical Background

Shaft No. 14A is located close to Shaft No. 14 and shares a similar early history (see Chapter V, subsection 15).

The earliest map that depicts individual buildings in the area of Shaft No. 14A dates to 1851 (Sidney and Neff 1851). At that time there were several houses located along Ashford Avenue to the south of the site. By 1867 the Methodist Episcopal Church was present immediately to the east of the site. A small dwelling, also located immediately north of the site was depicted on the 1901 Atlas of Westchester County (Bromley 1901). During the twentieth century, the small nursery school and playground was constructed in this location (see Photograph 14A-1).

Historical Archaeological Sensitivity

Documentary evidence suggests that the project site has little potential to contain significant buried historical cultural resources due tot the lack of use during the historical period. In addition, the impact of the construction of the shaft in this location would have destroyed any potential resources.

Historic Resources

Shaft No. 14A is situated above the New Croton Aqueduct (1884-1890). The documented aqueduct and existing Shaft are functioning components of New York City's water supply system. Both are eligible for inclusion on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: While the locale surrounding the Saw Mill River was clearly once exploited by precontact and historic peoples, there is no evidence that any structures or features were once present on the project site. Furthermore, the recent construction of a nursery school and a playground has disturbed the area around the shaft. Minimal ground disturbance is proposed in the location of Shaft No. 14A during inspection. A staging area, enclosed by security fencing would be constructed around the Shaft. It is unlikely that significant archaeological resources would be present in the location of the Shaft, as severe

disturbance would have occurred during its construction. No impacts to archaeological resources are therefore anticipated directly above, and immediately surrounding, the shaft.

Architectural Resources: Shaft No. 14A is eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection only. The inspection will consist of opening the shaft by removing steel sheeting and possibly the header pipes, and checking the pump vault below the plates. The inspection will be conducted by a remote operated video camera. The Shaft will be restored to its condition prior to inspection. Subsequent to the use of the shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the Shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

17. SHAFT NO. 15½ (GREENBURGH).

Shaft No. 15½ is located on a parcel of land in the Mount Hope Cemetery in a clear, gradually sloping field about fifty feet from a private cemetery road in Greenburgh, New York (Figure 15½ -1, Photograph 15½ -1).

Inspection of Shaft No. 15½ would require the construction of a temporary 13-foot wide graded gravel access track, approximately 30 feet long, from a cemetery drive to the Shaft. A staging area, enclosed by security fencing mounted on concrete Jersey Barriers, would be created having an area of 2,000 square feet around the Shaft. Once construction of the staging area is completed, the existing Shaft cover would be removed and the Shaft opening would be secured, as necessary, to prevent falling debris from entering the Shaft. Excavation of up to three feet around the shaft cap may be required, since the Shaft cap may be buried. A crane would be positioned over the Shaft opening to allow for the Engineer's inspection of the Shaft, which would either be conducted from within a personnel cage lowered into the Shaft or by a remote operated video camera. Once inspection is completed, a new replacement cover (minimum thickness of 10 inch, precast concrete) would be placed over the Shaft opening and buried with a minimum of 18 inches of fill and reseeded. Within 15 days of completion of the inspection, the materials used for the access track and staging area would be removed from the site and legally disposed of.

Work at Shaft No. 15½ would occur for up to two months between the period September, 2004 to April, 2005.

Precontact Archaeological Potential

Shaft No. 15½ is located less than one-half of a mile north of Shaft No. 16. See Chapter V, subsection 18 (Shaft 16) for information about the Precontact Period.

Precontact Archaeological Sensitivity

The physiographic characteristics of the current project site, together with the information extracted from the documentary record and the number of precontact sites in the vicinity suggests that Native American peoples likely exploited the project area. The absence of extensive historical development might suggest that the site of Shaft No. 15½ is sensitive for precontact resources.

Historical Archaeological Potential

Historical Land Use

Shaft No. 15½ is located close to Shaft No. 16 and shares a similar early history (see Chapter V, subsection 18).

Shaft No. 15½ is located on what was once the Odell Farm (Beers 1867, Figure 15½-2). Historic Records indicate that during the American Revolution, French General Rochambeau used the house as his headquarters with his men stationed on the surrounding farm. Nineteenth century maps indicate that the house was located to the west of Shaft No. 15½ (Beers 1867, Bromley 1881). The founders of Mount Hope Cemetery purchased the Odell farm in 1886. Maps show the development of the Cemetery around the project site through twentieth century, and indicate that no structures or interments were ever located within the project site (Bien 1893; Bromley 1901; Hopkins 1930).

Historical Archaeological Sensitivity

Cartographic research found no evidence of historical structures in the location of Shaft No. 15½. The use of the site as a family farm and Revolutionary War of the headquarters suggests that the location of Shaft No. 15½ is sensitive for these historical resources.

Historic Resources in the Project Area

Shaft No. 15½ is integral with the New Croton Aqueduct (1884-1890), which is eligible for inclusion on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: Minimal ground disturbance is proposed for the location directly above the Shaft cover to allow inspection of the shaft. Excavation of up to three feet around the Shaft cap may be required. Significant archaeological resources would not be located in the area of proposed ground disturbance as severe disturbance of site strata occurred during the construction of the shaft in the late 1800's.

A staging area, roughly 2000 square feet in size and enclosed by security fencing would be created, along with the construction, maintenance and subsequent removal of a graded gravel access roadway between a private cemetery road and the Shaft. The Shaft site is known to be

sensitive for historical resources. The present Mount Hope Cemetery was once the location of the Odell family residence, which was used as the headquarters of French General Rochambeau during the American Revolution. Mount Hope Cemetery was founded in 1886 and the Shaft location was kept as open land and never used for burials.

The extent of prior disturbance has not been established, so it is possible that areas of historical sensitivity may lie within the proposed access track and staging area. If historical archaeological resources are identified within areas of proposed ground disturbance, and it is determined that they are eligible for inclusion on the National Register of Historic Places, a mitigation plan would be developed in consultation with SHPO.

Architectural Resources: The Shaft is eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection only. Placement of a new Shaft cover would be the only action that would alter the character or appearance of the Shaft. Subsequent to the use of the Shaft for inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the Shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

18. SHAFT NO. 16 (YONKERS).

Shaft No. 16 is located on a parcel of land in Yonkers, New York (Figure 16-1, Photograph 16-1). It is located adjacent to an access road off of Austin Avenue. Much of the surrounding area is overgrown and has been used for the storage of large pipes and concrete transportation dividers. At present Shaft No. 16 is surrounded by a modern metal fence and is bordered by a wooded area (see Photograph 16-1). The Saw Mill River, on a north-south course, is located less than 1/8 of a mile to the west of the Shaft site and the Grassy Sprain Reservoir is located less than 1/2 of a mile to the east.

Shaft No. 16 is capped by two iron covers with diameters of 3 and 4 feet surrounded by a chain-linked security fence. Some clearing and grubbing of brush may be required to access the fenced area. Inspection of the Shaft would consist of removal and storage of the existing steel covers and the placement of hoists or frames over the Shaft opening. Inspection of the Shaft would either be conducted from within a personnel cage lowered into the Shaft or by a remote operated video camera. Once inspection is completed, the existing steel covers would be reinstalled and the site would be returned to its condition prior to inspection. Work at Shaft No. 16 would occur for up to 2 months between the period September, 2004 to April, 2005.

Precontact Archaeological Potential

Documentary research found that the project site is in an area of high sensitivity for prehistoric archaeological resources. The nearby Saw Mill River is a well-documented

locale for prehistoric activity in Westchester County. According to early records of the area, the Saw Mill River was originally called the "Nepperhaen" by the native peoples. The river provided an ample water supply and was well suited for supporting game animals and horticultural activity. Historical topographic maps from the nineteenth century indicate that the terrain found in the location of the project site was characterized by flat land and open fields surrounded by low hills and forestland. These attributes likely provided an ideal locale for primary and secondary prehistoric sites.

Prior to, and during the early period of European contact, the Weckquaskeck Indians, a tribe of the Algonquin nation occupied much of the lands of Westchester County. The location of one of the main native villages was to the northwest of the project site in the village of Dobbs Ferry. The New York State museum has numerous artifacts collected from the documented "Wickers Creek" village site, which was found adjacent to the Hudson River on a small creek.

The NYSM site file search identified two inventoried archaeological sites within a one-mile radius of the project site. Arthur C. Parker (ACP), an early twentieth century researcher, identified one of the sites and the second site was described and mapped by the Rev. W. R. Blackie. Blackie's map is now in the collection of the American Museum of Natural History. Below is a list of these sites and their description:

OPRHP or NYSM #	Site Identifier	Site Description
5253	ACP West No#	Traces of Occupation
6799	Sprain Reservoir Vicinity	Blackie Manuscript

The site file search at the NYSM and the OPRHP also produced information about three archaeological surveys conducted within a one-mile radius of Shaft No. 16, including one immediately adjacent to the project site. A 1982 survey of Neperan Park, approximately 1/5 of a mile north of Shaft No. 16 did not produce any evidence of prehistoric activity (Marshall). The study however, was limited in scope and only a small number of test units were investigated. Approximately 1/2 mile south of the shaft site, a survey of the Saw Mill River Basin also found no evidence of prehistoric occupation (Marshall 1978). This study was also limited in scope. In 1996 Greenhouse Consultants completed a study along Hoover Road (the access road adjacent to the west side of Shaft No. 16). No evidence of prehistoric activity was noted in the 11 shovel test pits examined (Greenhouse Consultants 1996). During testing the archaeological team also noted that bedrock was extremely close to the surface in this area.

Precontact Archaeological Sensitivity

The physiographic characteristics of the current project site, together with the information extracted from the documentary record and the number of prehistoric sites in the vicinity suggests that Native American peoples likely exploited the project area. However, the lack of any findings in the archaeological study conducted immediately adjacent to the site, the

presence of bedrock close to the surface, and the impacts that likely occurred during the construction of Shaft No. 16, indicate that it is unlikely that the site of Shaft No. 16 is sensitive for buried prehistoric resources.

Historical Archaeological Potential

Historical Land Use

During the 1670s, Frederick Philipse began purchasing parcels of land along the Hudson River until he eventually owned much of what is now Westchester County. He was granted a royal charter in 1693, making him the Lord of the Manor of Philipsburg. The manor remained strong until the American Revolution when the Philipse family, who remained loyal to the crown, lost their land at the end of the war. Throughout much of the County, small tenant farmhouses with their associated outbuildings and cultivated fields were present. Most of these dwellings were located along the main transportation routes and watercourses.

The earliest map that depicts individual buildings in the area of Shaft No. 16 dates to 1851 (Sidney and Neff 1851). This map clearly indicates that the houses in the project area are located adjacent to Saw Mill River Road, which is approximately 1/10 of a mile to the west of the project site. No specific landowner or property boundary is depicted in the exact location of Shaft No. 16. By 1867, property boundaries were more well defined and it appears that Shaft No. 16 was on the southwestern corner of property owned by Benjamin See (Beers 1867; Figure 16-2). No buildings were depicted in this location. To the south, William Varian, who established a small family cemetery, well south of the project site, owned the land to the south of See (Ibid). During the 1880s most of the property owners in the vicinity sold portions of their land to the City of New York. Eventually, in 1885, Margaret S. See and H (Husband) also sold their property to the City (Land Records Liber 1068:285).

Historical Archaeological Sensitivity

Cartographic research found no evidence of historical structures in the location of Shaft No. 16. Further, the archaeological survey conducted by Greenhouse Consultants adjacent to the project site noted no surface evidence of any historical structures (1996). During testing, only modern trash was noted in the shovel test pits excavated suggesting that no significant historical resources are present in the vicinity.

Historic Resources in the Project Area

Shaft No. 16 is integral with the New Croton Aqueduct (1884-1890), which is eligible for inclusion on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: Although research suggests that Native Americans may have once been present in the project area, it is unlikely that any precontact resources are present

within the location of Shaft No. 16. During the project, some above ground clearing and grubbing may be required to access the fenced area, but no ground disturbance is proposed in the location of the Shaft during inspection. Therefore, no impacts to archaeological resources are anticipated as part of this project. No further archaeological consideration for prehistoric and historical archaeological resources are recommended for Shaft No. 16.

Architectural Resources: Shaft 16 is eligible for listing on the National Register of Historic Places. The proposed action is for Shaft inspection only. The Shaft will be restored to its condition prior to inspection. Subsequent to the inspection, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

19. SHAFT NO. 17½ (YONKERS)

Shaft No. 17½ is located on a clear, generally flat parcel of land north of Tuckahoe Road in Yonkers (Figure 17½-1; Photograph 17½-1). The exact location of the Shaft is unknown but would be confirmed after an in-tunnel survey is conducted prior to the commencement of work in October, 2004. The Shaft site is located to the east of a commercial complex.

Inspection of Shaft No. 17½ would require the construction of a temporary 13-foot-wide, 60-foot-long, graded gravel access track from an adjacent parking lot to the Shaft. A staging area, enclosed by security fencing, would be constructed with a minimum area of 2000 square feet around the Shaft. Once construction of the staging area is completed, the existing Shaft cover would be removed and the Shaft opening would be secured, as necessary, to prevent falling debris from entering the Shaft. Excavation of up to three feet around the Shaft's cap may be required, since the Shaft cap may be buried. A crane would be positioned over the Shaft opening to allow for the Engineer's inspection of the Shaft, which would either be conducted from within a personnel cage lowered into the Shaft or by a remote operated video camera. Once inspection is completed, a new replacement cover (minimum thickness of 10 inch, precast concrete) would be placed over the Shaft opening and buried with a minimum of 18 inches of fill and reseeded. Within 15 days of completion of the inspection, the materials used for the access track and staging area would be removed from the site and legally disposed of.

Work at Shaft No. 17½ would occur for up to two months between the period September 2004 to April, 2005.

Precontact Archaeological Potential

Early seventeenth century documents and ethnographic accounts identify the *Wiechquaesgeek* Indians as the native group inhabiting northern Manhattan, Bronx County, and southern Westchester County (Bolton 1972: 128; Grumet 1981: 59-60). The closest

well-documented native settlement was the permanent village of *Keskeskick*, located in Van Cortlandt Park about 2.5 miles south of the proposed project site. Extensive shell middens, burials, and evidence of extensive precontact activity have been reported throughout the park by archaeologists.

The NYSM site file search reported several inventoried archaeological sites within the general area of the project site, but no sites within one mile of the Shaft No. 17½ site. The two closest sites, numbered NYSM #7725 and #7726 are listed as a burial site and shell heaps/midden, respectively. Each of these sites is located approximately 2.3 miles south of Shaft No. 17½.

Precontact Archaeological Sensitivity

Documentary research suggests that Native Americans likely exploited the location of Shaft No. 17½ during the precontact period. However, the extent and depth of disturbance to the total parcel during the original installation of the Shaft likely impacted any precontact resources in the location above and adjacent to Shaft 17½.

Historical Archaeological Potential

Historical Land Use

Shaft No. 17½ is located close to Shaft No. 18 and they share a common history up through the nineteenth century (see Chapter V, subsection 20).

At the beginning of the nineteenth century, agriculture was still the principal industry in Westchester County. The Yonkers area was comprised of large farms centered around small hamlets (Westchester County Historical Society 1978: 140). The population in Yonkers grew steadily as dramatic changes in transportation occurred during the first half of the nineteenth century. In 1831 the first steamboat landing was made at Yonkers; it was followed by the introduction of the New York and Harlem Railroad and the Hudson River Railroad in the 1840s (Ibid: 149).

The 1851 Map of Westchester County is the earliest map that identifies landowners in the project area (Sidney and Neff 1851). No structures are depicted in the vicinity of Shaft 17½. In 1867 the project area is also vacant and Tuckahoe Road, immediately south of the Shaft site, has not yet been created (Beers 1867, Figure 17½-2). The 1881 and 1893 Atlases of Westchester County indicates that the property surrounding the Shaft was owned by the "RR Co." and the path of the New York and Northern Railroad traveled immediately west of Shaft No. 17½ (Bromley 1881; Bien 1893). Tuckahoe Road is depicted in 1881 and no structures are shown on the project site on either atlas. In 1930 the .5-acre Shaft No. 17½ site is designated "City of New York" and also contains no structures (Hopkins 1930).

Historical Archaeological Sensitivity

No historical use beyond the New Croton Aqueduct is associated with the Shaft or its immediate vicinity. Therefore, Shaft No. 17½ is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Shaft No. 17½ is situated above the New Croton Aqueduct (1884-1890). The Shaft is eligible for listing on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: Minimal ground disturbance is only proposed directly above the Shaft's cover to allow inspection of the Shaft. Excavation of up to three feet around the Shaft's cap may be required. Significant archaeological resources would not be located in the area of proposed ground disturbance as severe disturbance of site strata occurred during the construction of Shaft No. 17½.

A staging area, roughly 2000 square feet in size and enclosed by security fencing would be created, along with the construction, maintenance and subsequent removal of a graded gravel access roadway. The installation of the Shaft and the intensive urban development of the area have severely impacted the land bordering Tuckahoe Road. Therefore, no impacts to archaeological resources are anticipated as part of this project.

Architectural Resource: The Shaft is eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection only. Placement of a new Shaft cover would be the only action, which would alter the character or appearance of the shaft. Subsequent to use of the Shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the Shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

20. SHAFT NO. 18 (YONKERS)

Shaft No. 18 is located on a parcel of land in Yonkers that is currently in a greenbelt setting (Figure 18-1, Photographs 18-1, 18-2). A 40 x 43 foot stone superstructure covers the surface of the existing shaft to the NCA. The building extends approximately 18.8 feet below the surface. In this location, the National Register-eligible NCA forms a visible ridge near the surface but is covered with dirt and a service roadway for access. Historically, the project site was part of the narrow Tibbetts Brook stream corridor, lying at an elevation of approximately 135 feet above mean sea level. There is a distinct rise in elevation to 300 feet

above mean sea level to the west and to the east of the site. Tibbetts Brook currently flows under the superstructure via conduits.

Shaft No. 18 would be a construction access shaft to the Aqueduct and would serve as a main access location for personnel, equipment and materials into the Aqueduct to perform baseline rehabilitation. The staging area surrounding the Shaft would be covered with a temporary artificial hard surface and geomembrane and surrounded by noise attenuation fencing and sediment erosion control measures, as required. Tibbetts Brook, within the limits of the stone walls, would be cleared and grubbed.

Work at the site includes inspection of blow-off structures and main gates. Additionally, Shaft No. 18 would serve as a point for sediment and debris removal from within the section of Aqueduct between Shaft No. 16 and Gate House No. 1. Material would be hoisted to the surface where it would be loaded directly into sealed containers located within a dedicated storage area for subsequent disposal to licensed landfill sites. Stationary equipment at the Shaft would include a 20-ton mobile crane and a changing facility equipped with lockers, showers and toilets.

Work at Shaft No. 18 would occur for the duration of the project, from September, 2004 to May, 2005 and from September, 2005 to March, 2006.

Precontact Archaeological Potential

Early seventeenth century documents and ethnographic accounts identify the Wiechquaesgeek Indians as the native group inhabiting northern Manhattan, Bronx County, and southern Westchester County (Bolton 1972: 128; Grumet 1981: 59-60). The closest well-documented native settlement was the permanent village of Keskeskick, located in Van Cortlandt Park about 2.1 miles south of the proposed project site. Extensive shell middens, burials, and evidence of extensive precontact activity have been reported throughout the park by archaeologists.

Historian Reginald Bolton reported that the closest known Native American trail was located along the route of Broadway, which runs well west of the project site near the Hudson River (Bolton 1922: 136). The trail originated at the Harlem River and ran north through Westchester County. A review of twentieth century literature supports the ethnohistoric reports of aboriginal occupation in this portion of Westchester County.

The NYSM site file search reported several inventoried archaeological sites within the general area of the project site, but no sites within one mile of the Shaft No. 18 lot. The two closest sites, numbered NYSM #7725 and #7726 are listed as a burial site and shell heaps/midden, respectively. Each of these sites is located approximately 1.7 miles south of Shaft No. 18.

Precontact Archaeological Sensitivity

Documentary research, including a study of pre-1900 topographic features and comparative analysis of known settlement patterns, found that the approximately 12-acre project parcel is sensitive for precontact resources. The extent and depth of disturbance to the total parcel during the original installation of the NCA and shaft house is not known, however the construction of the Shaft Site and superstructure would have disturbed any potential resources within their footprints.

Historical Archaeological Potential

Historical Land Use

The NCA, constructed ca. 1885, is mostly a tunnel in rock; part constructed at grade, part under pressure. In the project site location it is a horseshoe shaped, non-pressurized, at-grade line approximately 12.5 feet in diameter. The base of the aqueduct at the project site is roughly 124.3 feet above mean sea level (New York City Board of Water Supply 1965: Croton Rehabilitation Studies). The aqueduct is clearly visible as a raised earthen feature on the project site.

At the same time that the NCA was being constructed on the site, several major changes were occurring in the lands to the east and west of the site. The Dunwoodie Golf Course, immediately to the west of the site, is one of the oldest active courses in America. Named and developed by the North End Land Improvement Company in 1889, it became known as the "Golf Course of the Stars" because of the many Broadway actors and famous musicians that played the links during the early years. The 126-acre course was purchased by the County in 1955 and has been a public course since that time (Westchester County: 2001). It is unknown if the grading, cutting, and contouring necessary for the creation of fairways, bunkers, tees, and greens impacted the adjacent project site, as well as any subsequent golf-related maintenance or drainage activities.

To the east and south of Shaft No. 18, the Catholic Archdiocese of New York acquired Valentine's Hill –the elevated site of Washington's headquarters - at the end of the nineteenth century. The cornerstone to Saint Joseph's Seminary was laid on the crest of Valentine's Hill in 1891 and the first scholastic year began in 1896. Saint Joseph's is still open with a body of approximately of 150 students.

At the end of the first quarter of the twentieth century the county acquired the area south of the project site. The flat, open and undeveloped land around Tibbetts Brook, 161 acres in total, was transferred from private to public ownership. Tibbetts Brook Park, the county's first large-scale recreational development, was opened to the public in June of 1926.

Drastic transportation changes further transformed the lands immediately south of the project site during the same time period. The Saw Mill River Parkway, a "hybrid" limited-access highway, was envisioned by the Westchester County Parks Commission as a key element in

the creation of a garden suburb. The first section of the Parkway, completed in 1926, was through Yonkers, paralleling the Tibbetts Brook corridor southwest of the project site.

Planned as an east-west route to connect the north-south corridors, e.g. the Saw Mill River Parkway, the major Cross County Parkway link south of the project site was built between 1929 and 1932. Originally, the Cross County was an undivided, 40-foot-wide roadway that could accommodate four lanes of traffic. Although other sections of the Cross County have experienced extensive upgrading to widen the roadbed, the Cross County directly south of the project site was never widened and it still accommodates the railroad overpass of the New York Central Railroad's Putnam Division. The rail line was abandoned, however, in 1958 (DOT 2001). As with the activities associated with the Tibbetts Brook Park and the Saw Mill Parkway, all Cross-County work is separated from the project site by the Yonkers Avenue roadbed.

Historical Archaeological Sensitivity

Documentary evidence indicates that the project site may have the potential to contain buried cultural material related to the historical development of the area. This section of Yonkers clearly experienced much activity during the Revolutionary War, including the temporary Washington headquarters on Valentine's Hill to the southeast.

Historic Resources in the Project Area

A stone Gate House, associated with the large underground water management feature, is located on the site. This structure, as well as the underground Aqueduct, is eligible for listing on the National Register of Historic Places. The small above ground building on the parcel is well designed, with cut rock faces and smooth stone. It is set on a sloping site and has a rock-faced base set into the slope. The lower level of the main mass of the building is smooth granite, while the upper section is rough. A parapet ornamented with recessed diamond shaped detail caps the building. Round arched windows and doors articulate the facades. The building relates closely in design to other Gate Houses erected along the route of the NCA, including the Gate House at 135th Street in Manhattan. The stone building and the NCA are both eligible for listing on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: Research found that the project site is sensitive for the presence of both precontact and historical archaeological resources. However, the depth and extent of subsequent disturbance to the project site area during original installation of the NCA and the extant gate house would have likely destroyed any potential resources within their footprints. Further, no ground disturbance is proposed in the location of the Shaft during inspection and minimal ground disturbance is proposed for the creation of a staging area. The staging area surrounding the Shaft would be covered with a temporary artificial hard surface and geomembrane and surrounded by noise attenuation fencing and sediment erosion control measures, as required. These measures would ensure that the existing surface and any

potential archaeological deposits in the surrounding area are not disturbed. No impacts to archaeological resources are therefore anticipated as part of this project.

Architectural Resources: Shaft 18 would be a construction access shaft to the Aqueduct that would serve as a main access location for personnel, equipment and materials into the Aqueduct to perform baseline rehabilitation. Work at the site would also involve inspection of the blow-off structures and main gates. Additionally the Shaft would be used for sediment and debris removal from within the section of the Aqueduct between Shaft 16 and Gate House 1. Shaft 18 and the surrounding structure are eligible for listing on the National Register of Historic Places. Subsequent to the use of the Shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

21. SHAFT NO. 18 ¼ (YONKERS)

Shaft No. 18¼ is located on a small parcel of land in Yonkers (Figure 18¼-1, Photographs 18¼-1). The Shaft is located within a chain-linked security fence adjacent to Midland Avenue. Inspection of the Shaft would consist of removal and storage of the existing steel cover over the Shaft opening. Inspection of the Shaft would either be conducted from within a personnel cage lowered into the Shaft or by a remote operated video camera. Once inspection is completed, the existing steel covers would be reinstalled and the site will be returned to its condition prior to inspection.

The connection to the Old Croton Aqueduct (OCA) is located adjacent to the western side of Midland Avenue, approximately 250 feet north of Shaft No. 18¼. To enable the construction of the concrete plug between the NCA and the OCA, it is proposed that all preparatory work for constructing the plug would be performed from within the NCA, however the placement of concrete for the plug would be from the surface through an existing manhole which is located just off the curb line of Midland Avenue. The centerline distance between the NCA and the OCA at this point is 103-feet. The connection tunnel between the two is length 55-feet and this would be filled with concrete, in addition to the plug itself which would have an overall length of 17-feet from the centerline of the NCA.

The exact position of the manhole is currently unknown, however it has been identified from within the NCA and an in-tunnel survey at the start of the contract will position the manhole and the coordinates will be transferred to the surface. The manhole cover would be exposed and lifted to allow for a 6-inch diameter flexible pipe be temporarily installed through which concrete will be pumped to fill the plug below.

Work at Shaft No. 18 1/4 will occur for up to one month between the period of September, 2004 to April, 2005.

Precontact Archaeological Potential

Shaft 18 1/4 is located close to Shaft 18. See Chapter V, subsection 20 (Shaft 18) for information about the Precontact Period.

The NYSM site file search reported several inventoried archaeological sites within the general area of the project site, but no sites within one mile of the Shaft No. 18 ¼. The two closest sites, numbered NYSM #7725 and #7726 are listed as a burial site and shell heaps/midden, respectively. Each of these sites is located approximately 1.1 miles south of Shaft No. 18 ¼.

Precontact Archaeological Sensitivity

Documentary research, including a study of pre-1900 topographic features and comparative analysis of known settlement patterns, found that the project parcel is in an area sensitive for precontact resources. However, the Shaft site was disturbed by the construction of the Shaft, but the horizontal and vertical extent of disturbance to the surrounding area during the original installation of the Shaft is not known.

Historical Archaeological Potential

Historical Land Use

Shaft 18 ¼ is located close to Shaft 18 and shares a similar early history (see Chapter V, subsection 20).

The earliest map that depicts individual buildings in the area of Shaft No. 18 ¼ dates to 1851 (Sidney and Neff 1851). At that time there were several houses located along Jerome Avenue to the west of the site. Although the area had been slightly more developed by 1867, no structures were located on the project site (Beers 1867). Midland Avenue, which had been created during the late nineteenth century, was developed to the south of the project site (Bromley 1881; Figure 18¼-2). Nothing is depicted on the project site. No structures are shown on the project site on later twentieth century maps (Bromley 1901; Hopkins 1930).

Historical Archaeological Sensitivity

No historical use is associated with the Shaft Site or its immediate vicinity. Therefore, Shaft No. 18¼ is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Shaft No. 18¼ is situated above the New Croton Aqueduct (1884-1890). The documented aqueduct and existing Shaft are functioning components of New York City's water supply system. Both are eligible for inclusion on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: No ground disturbance is proposed in the location of the Shaft during inspection. Therefore, no impacts to archaeological resources are anticipated as part of this project.

Architectural Resources: This Shaft is eligible for listing on the National Register of Historic Places. The proposed action is for Shaft inspection only. Following that activity, the Shaft cover will be reinstalled. Subsequent to the use of the shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

22. SHAFT NO. 19 (YONKERS)

Shaft No. 19 is located on a parcel of land at the edge of Conor Park in Yonkers (Figure 19-1). Both the Shaft and its cover are currently below grade. No structures associated with the Shaft lie above grade. Conor Park, owned by the City of Yonkers, encompasses the location of the shaft, which is owned by the City of New York. The park is bounded by McLean Avenue on the south, Devoe Avenue on the west, Sanford Street on the north, and Central Avenue on the east (Figure 19-1, Photograph 19-1).

The proposed plans include only the inspection of Shaft No. 19, and would consist of the construction, maintenance and subsequent removal of a staging area, enclosed by security fencing, with a minimum area of 2000 square feet around the Shaft. Access to the Shaft would be along existing paths leading to the Shaft cover. Once construction of the staging area is completed, the existing Shaft cover would be removed and the Shaft opening would be secured, as necessary, to prevent falling debris from entering the Shaft. Excavation of up to three feet around the shaft cap may be required. A crane would be positioned over the Shaft opening to allow for the Engineer's inspection of the Shaft that would either be conducted from within a personnel cage lowered into the Shaft or by a remote operated video camera. Once inspection is completed, a new replacement cover (minimum thickness of 10 inch, precast concrete) would be placed over the Shaft opening and buried with granular fill material Upon completion of the work, the staging area and would be reseeded in coordination with the City of Yonkers Department of Parks, Recreation and Conservation. Work at Shaft No. 19 would occur for up to one month between the period September, 2004 to April, 2005.

Precontact Archaeological Potential

Documentary research found that the project site is located in an area that may be sensitive for precontact cultural resources. Precontact archaeological sites have been recovered

throughout the surrounding area of Yonkers, and directly south of the project site in the Bronx.

A site file search at the NYSM and the OPRHP found that there were six identified prehistoric sites within a one-mile radius of Shaft No. 19.

OPRHP or NYSM #	Site Identifier	Site Description
7725	ACP Bronx no #	Burial Site, Westchester Co.
7726	ACP Bronx no #	Middens (shell), Westchester Co.
7727	ACP Bronx no #	Camp, firepits
7729	Chapel Farm II	Workshop, quartz quarry
2823	ACP Bronx 1A	Village in Van Cortlandt Park
2837	ACP Bronx 15	Camp

The site closest to the current project area NYSM #7725, is described by Arthur C. Parker as a burial site. Although it was given a Bronx designation, the site is reported in Yonkers although its precise location is rather vague.

Primary sites (villages), secondary sites (tool manufacturing, food processing), and isolated finds (single items or features) have been investigated in the area surrounding Van Cortlandt Park, which lies just south of the project site. Some of the precontact sites identified within roughly two miles of the present project location include several shell middens and precontact quartz processing sites (Beauchamp 1900:10; Lenik and Gibbs 1994: 55).

Several precontact sites have been identified within the confines of Van Cortlandt Park not far from the project site. A map depicting Native American sites in the Bronx indicates that the village called Keskeskick was at one time located in Van Cortlandt Park (Bolton 1972: 136; Anderson 1991: 4). Historical deeds from the seventeenth century also describe this village when it was sold to the early Dutch settlers of the Bronx (Grumet 1981: 19). Reginald Bolton's research further indicates that this "extensive and probably permanent village" was located close to the Van Cortlandt mansion, to the west of Van Cortlandt Lake and to the southwest of the present project site. The examination of documents also indicates that the area surrounding the mansion was where some of the village inhabitants had large planting fields (Grumet 1981: 15). Grumet's research also identified that another "Indian field" was located on the eastern side of the park, far south of the current project site.

A native trail, identified by Reginald Bolton and confirmed by Robert Grumet's research, extended south from Van Cortlandt Park into Yonkers, west of the project site. This trail, which traveled roughly north-south along what is now Broadway (Old Post Road), curved eastward into the park near its southwest corner before turning south again following the path of the present day Deegan Expressway (Bolton 1972: 136; Grumet 1981: 69).

The earliest archaeological exploration within the immediate region was in Van Cortlandt Park in 1890 by J. B. James, who recovered pottery, fire pits, lithic material, burials, and

other traces of the long-term occupation of this locale (Anderson 1991: 4; Bolton 1972: 141; Storch Associates 1986: 36). Additional material has been recovered from sites all over the park including storage pits, pottery fragments, shell middens, burials, and lithic material (Bolton 1934: 141; Tieck 1968: 3; Skinner 1915: 55).

More recent investigations within Van Cortlandt Park to the south of Shaft 19 have identified a camp, village, shell midden, and campsite in locales throughout the park. During the early 1990s several archaeological investigations were conducted within the park. Bankoff and Winter recovered a storage pit containing shell, ash, and lithic material (Bankoff and Winter 1991:4).

Precontact Archaeological Sensitivity

The physiographic characteristics of the current project site and surrounding park, together with the information extracted from the documentary record and the number of prehistoric sites identified in the vicinity, suggests that Native American peoples likely exploited the project site. Tibbetts Brook, which travels roughly north-south, is located several blocks west of the project site. This large brook provided an ample water supply and was well suited for supporting game animals and agricultural activity. Topographic maps from the nineteenth and twentieth centuries indicate that the terrain found in the location of the project site is characterized by low hills, brooks and ponds, and open fields that are surrounded by forest land. These attributes likely provided an ideal locale for primary and secondary prehistoric sites. The late nineteenth century construction of the shaft has severely impacted any precontact resources in this location. However, outside the footprint of this structure and the area excavated for its installation, the surrounding terrain may be sensitive for precontact resources.

Historical Archaeological Potential

Historical Land Use

During the late seventeenth and through most of the eighteenth century, the project site was part of Philipsburgh Manor. Frederick Philipse, who began amassing property in 1680, eventually owned much of what is now Westchester County. All over his vast estate Philipse leased large sections of his property to tenant farmers. Small farmhouses with their associated outbuildings and cultivated fields were likely present until the Revolutionary War. Most of these dwellings were probably located along the main transportation routes, where the terrain is less hilly and more suited for homelots and agricultural pursuits.

In 1851, the first map to show details of development in the area, the Shaft Site was vacant (Sidney and Neff 1851). By 1867 McLean Avenue had been laid out just south of the project site, although Central Avenue did not exist (Beers 1867). What is now Conor Park was under the ownership of T. Sanford, whose main dwelling stood north of McLean Avenue. The project site itself was still vacant (Beers 1867). However, by 1868 Central Avenue had been laid out, and the T. Sanford property had been improved with a small building constructed near McLean Avenue directly west of Central Avenue, and south of a small

stream that was a tributary to Tibbetts Brook (Beers 1868; Figure 19-2). This building stood just east of the future site of the New Croton Aqueduct and Shaft No. 19. Two additional structures belonging to T. Sanford stood north of the stream, and out of the project site.

An 1881 atlas, which provides greater detail, shows two small structures near the intersection of Central and McLean Avenues, with the main dwelling, still owned by T.S. Sanford, located north of the project site and north of the stream (Bromley 1881). One of these ancillary buildings, which is not of the size or scale of other mapped dwellings, appeared to stand directly east of the Shaft Site. At that time the surrounding area was still fairly rural, and was occupied by a number of large estates, most owned by James McLean. Evidence of increasing urbanization is noted about a mile to the east.

By 1891 the New Croton Aqueduct had been constructed within the project site, and all of the buildings, except the northernmost Sanford dwelling, which falls outside of the project site, had been razed (Watson 1891). A gate house had been built over the aqueduct within the project site, presumably over Shaft 19 (Figure 9-3). By 1901 the entire Sanford parcel, or all the land that now forms Conor Park, was vacant except for the Gate House (Bromley 1901). By 1937, the surrounding neighborhood had been subdivided into blocks, with Devoe and Sanford Streets laid out. The Lewis Connor Jr. Memorial Park had been created, and a playground and handball court had been installed. By this time the gate house for the aqueduct had been removed (Hopkins 1937).

Historical Archaeological Sensitivity

Although no archaeological work has been undertaken within the immediate vicinity of the Shaft site, excavations have been conducted to the south in Van Cortlandt Park by both avocational and professional archaeologists on sites that have been dated to the historical period. In 1910, workmen excavating for a new sewer near the Van Cortlandt Manor Mansion uncovered a foundation for what may have been Van der Donck's house. The subsequent excavation revealed a large amount of domestic debris dating to the seventeenth century. Archaeological excavations in other areas surrounding the Manor house have also been conducted.

The first historical developed noted in the vicinity of the project site dates to the late 1860s when T. Sanford maintained a dwelling north of McLean Avenue, with a smaller outbuilding near the Shaft Site at the intersection of McLean and Central Avenues (Beers 1868). The outbuilding was razed prior to 1891, probably when the NCA was built in the 1880s. Although it cannot be stated with any certainty whether or not the structure stood within the project site, even if it did, all traces of it would have been eradicated with the extensive excavations undertaken for the installation of the NCA and Shaft No. 19. The types of archaeological features typically associated with older historical dwellings (e.g., cisterns, wells, and privies) would have been located about a block north of the project site in proximity to the main Sanford dwelling. Therefore, only the footprint of the outbuilding may remain somewhere east of the Shaft site. However, much of the park was landscaped in the early 20th century with the creation of the Park and playground.

In addition, a NCA Gate House stood within the project site in 1891, but this was razed sometime between 1901 and 1937. The location of the former gatehouse was landscaped when the Park was created and the playground was installed. It is highly unlikely that much, if anything, remains of the gate house foundation, and it has virtually no research value beyond documenting its presence, which was already accomplished through the cartographic review.

Historic Resources in the Project Area

Shaft No. 19 is situated above the New Croton Aqueduct (1884-1890). There are no extant structures associated with the Shaft. The historic Van Cortlandt Mansion, now a museum, and Vault Hill are in the southwestern section of the Van Cortlandt Park southwest of the Shaft site and are visually and physically removed from it.

Proposed Impacts to Potential Resources

Archaeological Resources: Although the area outside of the existing Shaft and the former location of the Gate House may be sensitive for precontact and possibly historical archaeological deposits, no ground disturbance is proposed in the location of the Shaft during inspection and minimal ground disturbance is proposed for the creation of a roughly 2000 square foot staging area. The staging area surrounding the Shaft would be covered with a temporary artificial hard surface and geomembrane and surrounded by noise attenuation fencing and sediment erosion control measures, as required. These measures would ensure that the existing surface and any potential archaeological deposits are not disturbed.

Access to the Shaft would be along existing paths leading to the Shaft cover. Excavation of up to three feet around the Shaft cap may be required. Significant archaeological resources would not be located in the area of proposed ground disturbance as severe disturbance of site strata occurred during the construction of the shaft in the late 1800's. No impacts to archaeological resources are therefore anticipated as part of this project.

Architectural Resources: Shaft No. 19 is eligible for listing on the National Register of Historic Places as a component of the NCA. The proposed action is for shaft inspection only. Placement of a new Shaft cover would be the only action that would alter the character or appearance of the shaft. However, the existing Shaft cover is unsafe and poses a potential risk to public health. Subsequent to the inspection, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

23. SHAFT NO. 19 5/8 (BRONX)

Shaft No. 19⅝ is located in the western central portion Van Cortlandt Park, in the Bronx, approximately 400-feet north of Gate House No. 1 (Figure 19 5/8-1, Photograph 19 5/8-1). Both the Shaft and its cover are currently below grade. No structures associated with the Shaft lie above grade. The Shaft is located directly west of the Deegan Expressway near its interchange with 233rd Street.

Inspection of Shaft No. 19⅝ would require the construction of a temporary 13-foot-wide graded gravel access track, 400 feet long, to the shaft location from the staging area surrounding Gate House No. 1. The access route would follow an existing wood trail, typically 10 to 15 feet wide, which leads from Gate House No. 1 to the Shaft. A staging area, enclosed by security fencing mounted on concrete Jersey Barriers, would be established around the shaft, with an area of approximately 1,200 square feet, so as to minimize the impacts to mature trees. The total area required for staging and access would be approximately 0.15 acres including the 400 feet access track and staging area surrounding the shaft. Once construction of the staging area is completed, the existing Shaft cover would be removed and the Shaft opening would be secured, as necessary, to prevent falling debris from entering the Shaft. Excavation of up to three feet around the Shaft cap may be required, since the Shaft cap may be buried. Hoists or frames would be constructed over the Shaft opening to allow for the Engineer's inspection of the Shaft. Inspection of the Shaft would either be conducted by caged access or by a remote operated video camera. Once inspection is completed, a new replacement cover (minimum thickness of 10 inch, precast concrete) would be placed over the Shaft opening and buried with a minimum of 18 inches of fill and reseeded. Within 15 days of completion of the inspection, the materials used for the access track and staging area would be removed from the site and legally disposed. Work at Shaft No. 19⅝ would occur for up to two months during the period between September 2004 and March 2005.

Precontact Archaeological Potential

Documentary research found that the project site is located in an area that may be sensitive for precontact cultural resources. Precontact archaeological sites have been recovered throughout the surrounding area in the Bronx.

A site file search at the NYSM and the OPRHP found that there were six identified precontact sites within a one-mile radius of Shaft No. 19 5/8.

OPRHP or NYSM #	Site Identifier	Site Description
7725	ACP Bronx no #	Burial Site, Westchester Co.
7726	ACP Bronx no #	Middens (shell), Westchester Co.
7727	ACP Bronx no #	Camp, fire pits
7729	Chapel Farm II	Workshop, quartz quarry
2823	ACP Bronx 1A	Village in Van Cortlandt Park
2837	ACP Bronx 15	Camp

Primary sites (villages), secondary sites (tool manufacturing, food processing), and isolated finds (single items or features) have been investigated in the area surrounding Van Cortlandt Park, which lies just south of the project site. Some of the precontact sites identified within roughly two miles of the present project location include several shell middens and precontact quartz processing sites (Beauchamp 1900:10; Lenik and Gibbs 1994: 55).

Several precontact sites have been identified within the confines of Van Cortlandt Park not far from the project site. A map depicting Native American sites in the Bronx indicates that the village called Keskeskick was at one time located in Van Cortlandt Park (Bolton 1972: 136; Anderson 1991: 4). Historical deeds from the seventeenth century also describe this village when it was sold to the early Dutch settlers of the Bronx (Grumet 1981: 19). Reginald Bolton's research further indicates that this "extensive and probably permanent village" was located close to the Van Cortlandt mansion, to the west of Van Cortlandt Lake and to the southwest of the present project site. The examination of documents also indicates that the area surrounding the mansion was where some of the village inhabitants had large planting fields (Grumet 1981: 15). Robert Grumet's research also identified that another "Indian field" was located on the eastern side of the park, north of the current project site.

A native trail, identified by Reginald Bolton and confirmed by Grumet's research, extended south from Van Cortlandt Park into Westchester County, west of the project site. This trail, which traveled roughly north-south along what is now Broadway (Old Post Road), curved eastward into the park near its southwest corner before turning south again following the path of the present day Deegan Expressway (Bolton 1972: 136; Grumet 1981: 69).

The earliest archaeological exploration within the immediate region was in Van Cortlandt Park in 1890 by J. B. James, who recovered pottery, fire pits, lithic material, burials, and other traces of the long-term occupation of this locale (Anderson 1991: 4; Bolton 1972: 141; Storch Associates 1986: 36). Additional material has been recovered from sites all over the park including storage pits, pottery fragments, shell middens, burials, and lithic material (Bolton 1934: 141; Tieck 1968: 3; Skinner 1915: 55).

More recent investigations within Van Cortlandt Park to the southwest of Shaft 19 5/8 have identified a camp, village, shell midden, and campsite in locales throughout the park. During the early 1990s several archaeological investigations were conducted within the park. Bankoff and Winter recovered a storage pit containing shell, ash, and lithic material (Bankoff and Winter 1991:4).

Precontact Archaeological Sensitivity

The physiographic characteristics of the current project site and surrounding park, together with the information extracted from the documentary record and the number of precontact sites identified in the vicinity, suggests that Native American peoples likely exploited the project site. Tibbetts Brook, which travels roughly north-south, is located several blocks west of the project site. This large brook provided an ample water supply and was well suited for supporting game animals and agricultural activity. Topographic maps from the

nineteenth and twentieth centuries indicate that the terrain found in the location of the project site is characterized by low hills, brooks and ponds, and open fields that are surrounded by forest land. These attributes likely provided an ideal locale for primary and secondary precontact sites. The late nineteenth century construction of the shaft has severely impacted any precontact resources in this location. However, outside the footprint of this structure and the area excavated for its installation, the surrounding terrain may be sensitive for precontact resources.

Historical Archaeological Potential

Historical Land Use

During the late seventeenth and through most of the eighteenth century, the project site was part of Philipsburgh Manor. Frederick Philipse, who began amassing property in 1680, eventually owned much of what is now Westchester County. All over his vast estate Philipse leased large sections of his property to tenant farmers. Small farmhouses with their associated outbuildings and cultivated fields were likely present until the Revolutionary War. Most of these dwellings were probably located along the main transportation routes, where the terrain is less hilly and more suited for homelots and agricultural pursuits.

In 1851, the first map to show details of development in the area, the Shaft site was vacant (Sidney and Neff 1851). In 1868, long before Van Cortlandt Park was established, the S. Valentine house was located east of the Shaft site, but the Shaft site itself was vacant (Beers 1868, Figure 19 5/8-2). In 1879, the Dr. Samuel Valentine house was clearly depicted about 200 feet east of Shaft No. 19 5/8, but an outbuilding was shown within what eventually became the route of the NCA (Bromley 1879). Its relationship to the location of Shaft ite 19 5/8 is not discernable due to the scale of the 1879 atlas, but the outbuilding may have stood near, or within, the project site. By 1885 the main Valentine house and the outbuilding were both removed, and the NCA had been constructed (Robinson 1885). In 1911 the project site remained undeveloped (Bromley 1911). The project site has continued to remain undeveloped throughout the twentieth century.

Historical Archaeological Sensitivity

Although no archaeological work has been undertaken within the immediate vicinity of the Shaft site, excavations have been conducted to the south in Van Cortlandt Park by both avocational and professional archaeologists on sites that have been dated to the historical period. In 1910, workmen excavating for a new sewer near the Van Cortlandt Manor Mansion uncovered a foundation for what may have been Van der Donck's house. The subsequent excavation revealed a large amount of domestic debris dating to the seventeenth century. Archaeological excavations in other areas surrounding the Manor house have also been conducted.

The first historical developed noted in the vicinity of the project site dates to the late 1860s when Dr. Valentine owned a house east of the project site (Beers 1868). By 1879 an outbuilding is depicted near the Shaft site location, but it was removed by 1885 and its

location was extensively disturbed by the construction of the NCA and the excavations undertaken for Shaft No. 19 5/8. The types of archaeological features typically associated with older historical dwellings (e.g., cisterns, wells, and privies) would have been located east of the project site in proximity to the Valentine dwelling. Due to extensive disturbance, the vicinity of the Shaft site is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Shaft No. 19 5/8 is situated above the NCA (1884-1890). There are no extant structures associated with the Shaft. The historic Van Cortlandt Mansion, now a museum, and Vault Hill are in the southwestern section of the Van Cortlandt Park southwest of the Shaft site and are visually and physically removed from it.

Proposed Impacts to Potential Resources

Archaeological Resources: Although the area outside of the existing Shaft may be sensitive for precontact archaeological deposits, proposed ground disturbance is minimal and would not affect archaeological resources. Inspection of Shaft No. 19 5/8 would consist of the construction, maintenance and subsequent removal of a graded gravel roadway with an overall width of 13 feet from the Gate House No. 1 staging area to the Shaft. The access track from Gate House No. 1 to the Shaft would follow an existing wood trail and the removal of trees would not be required. This is a trail that was historically a traveled road and has experienced prior vehicular traffic. A staging area, enclosed by security fencing, would be constructed around the Shaft. Once construction of the staging area is completed, the existing Shaft cover would be removed and the Shaft opening would be secured, as necessary, to prevent falling debris from entering the Shaft. Excavation of up to three feet around the Shaft cap may be required. Significant archaeological resources would not be located in the area of proposed ground disturbance as severe disturbance of site strata occurred during the construction of the Shaft in the late 1800's. No impacts to archaeological resources are therefore anticipated as part of this project.

Architectural Resources: Shaft No. 19 5/8 is eligible for listing on the National Register of Historic Places as a component of the NCA. The proposed action is for shaft inspection only. Placement of a new Shaft cover would be the only action that would alter the character or appearance of the shaft. However, the existing Shaft cover is unsafe and poses a potential risk to public health. Subsequent to the use of the shaft for the inspection of the NCA, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the Shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

24. GATE HOUSE NO. 1 (BRONX)

Gate House No. 1 is located in the western central portion Van Cortlandt Park, in the Bronx, approximately 400-feet south of Shaft No. 19 5/8 (Figure GH1-1, Photograph GH1-1). There is no superstructure associated with Gate House No. 1, only a shaft and its cover, which are currently below grade. The Shaft is located directly west of the Deegan Expressway, just south of its interchange with 233rd Street.

Gate House No. 1 would be a construction access shaft to the Aqueduct that would serve as a main access location for personnel, equipment and materials into the Aqueduct to perform baseline rehabilitation. The staging area surrounding the Shaft would be covered with a temporary artificial hard surface and geomembrane and surrounded by noise attenuation fencing and sediment erosion control measures, as required. Additional staging areas would be located adjacent to the Shaft and along the shoulder of the nearby Major Deegan Expressway. Stationary equipment at the Shaft includes a 20-ton mobile crane. Work at Gate House No. 1 would occur for the duration of the project, from September, 2004 to May, 2005 and from September, 2005 to March, 2006.

Precontact Archaeological Potential

Documentary research found that the project site is located in an area that may be sensitive for precontact cultural resources. Precontact archaeological sites have been recovered throughout the surrounding area in the Bronx.

A site file search at the NYSM and the OPRHP found that there were six identified precontact sites within a one-mile radius of Gate House No. 1.

OPRHP or NYSM #	Site Identifier	Site Description
7725	ACP Bronx no #	Burial Site, Westchester Co.
7726	ACP Bronx no #	Middens (shell), Westchester Co.
7727	ACP Bronx no #	Camp, fire pits
7729	Chapel Farm II	Workshop, quartz quarry
2823	ACP Bronx 1A	Village in Van Cortlandt Park
2837	ACP Bronx 15	Camp

Primary sites (villages), secondary sites (tool manufacturing, food processing), and isolated finds (single items or features) have been investigated in the area surrounding Van Cortlandt Park, which lies just south of the project site. Some of the precontact sites identified within roughly two miles of the present project location include several shell middens and precontact quartz processing sites (Beauchamp 1900:10; Lenik and Gibbs 1994: 55).

Several precontact sites have been identified within the confines of Van Cortlandt Park not far from the project site. A map depicting Native American sites in the Bronx indicates that the village called Keskeskick was at one time located in Van Cortlandt Park (Bolton 1972:

136; Anderson 1991: 4). Historical deeds from the seventeenth century also describe this village when it was sold to the early Dutch settlers of the Bronx (Grumet 1981: 19). Reginald Bolton's research further indicates that this "extensive and probably permanent village" was located close to the Van Cortlandt mansion, to the west of Van Cortlandt Lake and to the southwest of the present project site. The examination of documents also indicates that the area surrounding the mansion was where some of the village inhabitants had large planting fields (Grumet 1981: 15). Grumet's research also identified that another "Indian field" was located on the eastern side of the park, north of the current project site.

A native trail, identified by Reginald Bolton and confirmed by Robert Grumet's research, extended south from Van Cortlandt Park into Westchester County, west of the project site. This trail, which traveled roughly north south along what is now Broadway (Old Post Road), curved eastward into the park near its southwest corner before turning south again following the path of the present day Deegan Expressway (Bolton 1972: 136; Grumet 1981: 69).

The earliest archaeological exploration within the immediate region was in Van Cortlandt Park in 1890 by J. B. James, who recovered pottery, fire pits, lithic material, burials, and other traces of the long-term occupation of this locale (Anderson 1991: 4; Bolton 1972: 141; Storch Associates 1986: 36). Additional material has been recovered from sites all over the park including storage pits, pottery fragments, shell middens, burials, and lithic material (Bolton 1934: 141; Tieck 1968: 3; Skinner 1915: 55).

More recent investigations within Van Cortlandt Park to the southwest of Shaft 19 5/8 have identified a camp, village, shell midden, and campsite in locales throughout the park. During the early 1990s several archaeological investigations were conducted within the park. Bankoff and Winter recovered a storage pit containing shell, ash, and lithic material (Bankoff and Winter 1991:4).

Precontact Archaeological Sensitivity

The physiographic characteristics of the current project site and surrounding park, together with the information extracted from the documentary record and the number of precontact sites identified in the vicinity, suggests that Native American peoples likely exploited the project site. Tibbetts Brook, which travels roughly north-south, is located several blocks west of the project site. This large brook provided an ample water supply and was well suited for supporting game animals and agricultural activity. Topographic maps from the nineteenth and twentieth centuries indicate that the terrain found in the location of the project site is characterized by low hills, brooks and ponds, and open fields that are surrounded by forest land. These attributes likely provided an ideal locale for primary and secondary precontact sites. The late nineteenth century construction of the shaft has severely impacted any precontact resources in this location. However, outside the footprint of this structure and the former Gate House, as well as the area excavated for their installation, the surrounding terrain may be sensitive for potential precontact resources.

Historical Archaeological Potential

Historical Land Use

During the late seventeenth and through most of the eighteenth century, the project site was part of Philipsburgh Manor. Frederick Philipse, who began amassing property in 1680, eventually owned much of what is now Westchester County. All over his vast estate Philipse leased large sections of his property to tenant farmers. Small farmhouses with their associated outbuildings and cultivated fields were likely present until the Revolutionary War. Most of these dwellings were probably located along the main transportation routes, where the terrain is less hilly and more suited for homelots and agricultural pursuits.

In 1851, the first map to show details of development in the area, the Gate House site was vacant and the property was owned by A. Valentine (Sidney and Neff 1851). In 1868, long before Van Cortlandt Park was established, the S. Valentine house was located northeast of Gate House No. 1, but the project site itself was vacant and owned by Dr. A. Valentine (Beers 1868, Figure GH1-2). In 1879 Jos Disbrow owned the property, and a house and outbuilding had been built about 100 feet north of Gate House No. 1 (Bromley 1879). The house was west of the line of the Aqueduct, but the outbuilding stood within it. Regardless, both buildings were north of the future location of the Gate House. The project site appeared vacant and unchanged in 1885 (Robinson 1885). By 1911 the two Disbrow structures north of the project site had been razed and Gate House No. 1 appeared to have been constructed adjacent to the aqueduct (Bromley 1911, Figure GH1-3). The Gate House was razed sometime in the twentieth century.

Historical Archaeological Sensitivity

Although no archaeological work has been undertaken within the immediate vicinity of the Shaft Site, excavations have been conducted to the south in Van Cortlandt Park by both avocational and professional archaeologists on sites that have been dated to the historical period. In 1910, workmen excavating for a new sewer near the Van Cortlandt Manor Mansion uncovered a foundation for what may have been Van der Donck's house. The subsequent excavation revealed a large amount of domestic debris dating to the seventeenth century. Archaeological excavations in other areas surrounding the Manor house have also been conducted.

The first historical developed noted in the vicinity of the project site dates to the late 1860s when Dr. Valentine owned a house north of the project site (Beers 1868). The types of archaeological features typically associated with older historical dwellings (e.g., cisterns, wells, and privies) would have been located about north of the project site in proximity to the Valentine dwelling. Therefore, the vicinity of Gate House No. 1 is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Gate House No. 1 is situated above the New Croton Aqueduct (1884-1890). There are no extant structures associated with the Shaft. The historic Van Cortlandt Mansion, now a museum, and Vault Hill are in the southwestern section of the Van Cortlandt Park southwest of the Shaft Site and are visually and physically removed from it.

Proposed Impacts to Potential Resources

Archaeological Resources: Although the area outside of the existing shaft may be sensitive for precontact archaeological deposits, proposed ground disturbance would not affect archaeological resources. Minimal ground disturbance is proposed directly above the shaft cover to allow inspection of the Shaft, and for the creation of a staging area roughly 2000 square feet in size. The staging area surrounding the Shaft would be covered with a temporary artificial hard surface and geomembrane. Additional staging areas would be located adjacent to the Shaft and along the shoulder of the Major Deegan Expressway, which has already been disturbed by the construction of the highway.

Significant archaeological resources would not be located in the area of proposed ground disturbance as severe disturbance of site strata occurred during the construction of the shaft in the late 1800's. Furthermore, the measures undertaken to ensure that the existing surface is not disturbed, through the introduction of a hard surface and geomembrane, would also ensure that potential archaeological deposits are not disturbed. No impacts to archaeological resources are therefore anticipated as part of this project.

Architectural Resources: Gate House No. 1 would be a construction access shaft to the Aqueduct that would serve as a main access location for personnel, equipment and materials into the Aqueduct to perform the inspection program of the Manhattan Pressurized Section of the Aqueduct. The Shaft is eligible for listing on the National Register of Historic Places. The potential placement of a new shaft cover would be the only action that would alter the character or appearance of the Shaft. However, the existing Shaft cover may be unsafe and poses a potential risk to public health. Subsequent to the use of the Shaft for the inspection of the Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

25. SHAFT NO. 20 (BRONX)

Shaft No. 20 is located within Van Cortlandt Park adjacent to the Allen Shandler Recreational Area, in the Bronx (Figure 20-1; Photograph 20-1). The site is located just north of the Mosholu Golf Course, and south of an access road that originates from Jerome Avenue to the east. To the north and west of the site is the Deegan Expressway. The Shaft

and its cover are located underground. There is no superstructure associated with Shaft No. 20.

Shaft No. 20 would be a construction access shaft to the Aqueduct that would serve as a main access location for personnel, equipment and materials into the Aqueduct to perform the inspection program of the Bronx Pressurized Section of the Aqueduct. The staging area surrounding the Shaft would be covered with a temporary artificial hard surface and geomembrane and surrounded by noise attenuation fencing and sediment erosion control measures, as required. Access to the Shaft would be from an existing asphalt track surrounding the recreational area where the Shaft is located. Access to the Shaft would be from the construction of a temporary 13-foot-wide gravel access track leading from an adjacent parking lot to the staging area surrounding the Shaft. Shaft No. 20 would serve as a point for sediment and debris removal from within the Bronx Pressurized Section of the Aqueduct. A crane would hoist the material to the surface where it would be loaded directly into sealed containers located within a dedicated storage area for subsequent disposal to licensed landfill sites. Transportation of the filled sediment and debris containers is expected to occur no more than once a day over a three-week period. Transportation to a landfill would be conducted in accordance with all applicable Federal, State and local laws and regulations.

Stationary equipment at the Shaft includes a 20-ton mobile crane, minor ventilation equipment, and a change facility equipped with lockers, showers and toilets. Inspection of the Shaft would include removal of the existing Shaft cover and securing the Shaft opening to prevent falling debris from entering the Shaft. Excavation of up to three feet around the shaft cap may be required, since the Shaft cap may be buried. A crane would be positioned over the Shaft opening to allow for the Engineer's inspection of the Shaft that would either be conducted from within a personnel cage lowered into the Shaft or by a remote operated video camera. Once work at the site is completed, a new replacement cover (minimum thickness of 10 inch, precast concrete) would be placed over the Shaft opening and buried with a minimum of 18 inches of fill and reseeded. Work at Shaft No. 20 would occur from September, 2004 to February, 2005.

Precontact Archaeological Potential

Documentary research found that the project site is located in an area that may be sensitive for precontact cultural resources. Precontact archaeological sites have been recovered throughout the surrounding area in the Bronx.

A site file search at the NYSM and the OPRHP found that there are six identified precontact sites within a one-mile radius of Shaft No. 20.

OPRHP or NYSM #	Site Identifier	Site Description
7725	ACP Bronx no #	Burial Site, Westchester Co.
7726	ACP Bronx no #	Middens (shell), Westchester Co.
7727	ACP Bronx no #	Camp, fire pits
7729	Chapel Farm II	Workshop, quartz quarry
2823	ACP Bronx 1A	Village in Van Cortlandt Park
2837	ACP Bronx 15	Camp

Primary sites (villages), secondary sites (tool manufacturing, food processing), and isolated finds (single items or features) have been investigated in the area surrounding Van Cortlandt Park, which lies just south of the project site. Some of the precontact sites identified within roughly two miles of the present project location include several shell middens and precontact quartz processing sites (Beauchamp 1900:10; Lenik and Gibbs 1994: 55).

Several precontact sites have been identified within the confines of Van Cortlandt Park not far from the project site. A map depicting Native American sites in the Bronx indicates that the village called Keskeskick was at one time located in Van Cortlandt Park (Bolton 1972: 136; Anderson 1991: 4). Historical deeds from the seventeenth century also describe this village when it was sold to the early Dutch settlers of the Bronx (Grumet 1981: 19). Reginald Bolton's research further indicates that this "extensive and probably permanent village" was located close to the Van Cortlandt mansion, to the west of Van Cortlandt Lake and to the southwest of the present project site. The examination of documents also indicates that the area surrounding the mansion was where some of the village inhabitants had large planting fields (Grumet 1981: 15). Grumet's research also identified that another "Indian field" was located on the eastern side of the park, north of the current project site.

A native trail, identified by Reginald Bolton and confirmed by Robert Grumet's research, extended south from Van Cortlandt Park into Westchester County, west of the project site. This trail, which traveled roughly north-south along what is now Broadway (Old Post Road), curved eastward into the park near its southwest corner before turning south again following the path of the present day Deegan Expressway (Bolton 1972: 136; Grumet 1981: 69).

The earliest archaeological exploration within the immediate region was in Van Cortlandt Park in 1890 by J. B. James, who recovered pottery, fire pits, lithic material, burials, and other traces of the long-term occupation of this locale (Anderson 1991: 4; Bolton 1972: 141; Storch Associates 1986: 36). Additional material has been recovered from sites all over the park including storage pits, pottery fragments, shell middens, burials, and lithic material (Bolton 1934: 141; Tieck 1968: 3; Skinner 1915: 55).

More recent investigations within Van Cortlandt Park to the southwest of Shaft 20 have identified a camp, village, shell midden, and campsite in locales throughout the park. During the early 1990s several archaeological investigations were conducted within the park. Bankoff and Winter recovered a storage pit containing shell, ash, and lithic material (Bankoff and Winter 1991:4).

Precontact Archaeological Sensitivity

The physiographic characteristics of the current project site and surrounding park, together with the information extracted from the documentary record and the number of precontact sites identified in the vicinity, suggests that Native American peoples likely exploited the project site. Tibbetts Brook, which travels roughly north-south, is located several blocks west of the project site. This large brook provided an ample water supply and was well suited for supporting game animals and agricultural activity. Topographic maps from the nineteenth and twentieth centuries indicate that the terrain found in the location of the project site is characterized by low hills, brooks and ponds, and open fields that are surrounded by forest land. These attributes likely provided an ideal locale for primary and secondary precontact sites. The late nineteenth century construction of the shaft has severely impacted any precontact resources in this location. Furthermore, landscaping to create the recreation area, which contains ball fields and running tracks, may have further disturbed potential resources. Therefore, outside the footprint of this structure, as well as the area excavated for its installation, the surrounding terrain is only moderately sensitive for potential precontact resources.

Historical Archaeological Potential

Historical Land Use

During the late seventeenth and through most of the eighteenth century, the project site was part of Philipsburgh Manor. Frederick Philipse, who began amassing property in 1680, eventually owned much of what is now Westchester County. All over his vast estate Philipse leased large sections of his property to tenant farmers. Small farmhouses with their associated outbuildings and cultivated fields were likely present until the Revolutionary War. Most of these dwellings were probably located along the main transportation routes, where the terrain is less hilly and more suited for homelots and agricultural pursuits.

In 1851, the first map to show details of development in the area, Shaft No. 20 was vacant (Sidney and Neff 1851). In 1868, long before Van Cortlandt Park was established, the project site was vacant and owned by C. Van Tassell (Beers 1868, Figure 20-2). In 1879 the project site was unchanged (Bromley 1879). The project site appeared vacant and unchanged in 1885, but the line of the New Croton Aqueduct had been laid out (Robinson 1885). The site has remained vacant through the twentieth century, although landscaping was undertaken for the creation for the Shandler Recreation Area (Bromley 1911; U.S.G.S. 1984).

Historical Archaeological Sensitivity

Although no archaeological work has been undertaken within the immediate vicinity of the Shaft site, excavations have been conducted to the south in Van Cortlandt Park by both avocational and professional archaeologists on sites that have been dated to the historical period. In 1910, workmen excavating for a new sewer near the Van Cortlandt Manor Mansion uncovered a foundation for what may have been Van der Donck's house. The subsequent excavation revealed a large amount of domestic debris dating to the seventeenth

century. Archaeological excavations in other areas surrounding the Manor house have also been conducted.

No historical use is associated with the Shaft Site or its immediate vicinity. Therefore, Shaft No. 20 is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Gate House No. 1 is situated above the New Croton Aqueduct (1884-1890). There are no extant structures associated with the Shaft. The historic Van Cortlandt Mansion, now a museum, and Vault Hill are in the southwestern section of the Van Cortlandt Park southwest of the Shaft Site and are visually and physically removed from it.

Proposed Impacts to Potential Resources

Archaeological Resources: Although the area outside of the existing shaft may be sensitive for precontact archaeological deposits, proposed ground disturbance would not affect archaeological resources. Minimal ground disturbance is proposed directly above the shaft cover to allow inspection of the Shaft, and for the creation of a staging area roughly 2000 square feet in size. The staging area surrounding the Shaft would be covered with a temporary artificial hard surface and geomembrane.

Significant archaeological resources would not be located in the area of proposed ground disturbance as severe disturbance of site strata occurred during the construction of the shaft in the late 1800's. Furthermore, the measures undertaken to ensure that the existing surface is not disturbed, through the introduction of a hard surface and geomembrane, would also ensure that potential archaeological deposits are not disturbed. No impacts to archaeological resources are therefore anticipated as part of this project.

Architectural Resources: Shaft 20 would be a construction access shaft to the Aqueduct, which would serve as a main access location for personnel, equipment and materials into the Aqueduct to perform the inspection program of the Manhattan Pressurized Section of the Aqueduct. The shaft is eligible for listing on the National Register of Historic Places. Placement of a new Shaft cover would be the only action that would alter the character or appearance of the shaft. However, the existing Shaft cover may be unsafe and poses a potential risk to public health. Subsequent to the use of the shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

26. SHAFT NO. 21 (BRONX)

Shaft No. 21 is located within the Jerome Park Reservoir in the Bronx (Figure 21-1). The reservoir was finished in 1906, and was built as a receiving basin for the New Croton Aqueduct system. Shaft 21 is the shaft which links the New Aqueduct at 115 feet below grade to the surface.

There is no inspection of this Shaft under this contract. Shaft No. 21 would be opened and prepared for ventilation intake or exhaust for the Contractor-designed ventilation system. Once all work is completed and the Shaft is no longer needed for ventilation purposes, the existing covers would be reinstalled and the site would be returned to its condition prior to inspection.

Precontact Archaeological Potential

Documentary research found that the project site is located in an area that may be sensitive for precontact cultural resources. Precontact archaeological sites have been recovered throughout the surrounding area in the Bronx. A site files search conducted at the NYSM, which inventories only precontact sites, reported fourteen sites either directly adjacent to or within a mile of the Jerome Park Reservoir. NYSM site numbers 709, 711, 2823, 2838, 2839, 4052, 4053, 4054, 4055, 4056, 5320, 5321, 5322 and 7727 are all located nearby. Evidence of Native American occupation has been observed to the west in Kingsbridge, Spuyten Duyvil, and Inwood Hill Park, north in Van Cortlandt Park, south in Fordham, and east in the New York Botanical Gardens and at Pelham Bay Park. The extensive documentation of aboriginal occupation throughout the area suggests that the vicinity of the project site was, at the very least, used in a limited capacity during the precontact period.

Precontact Archaeological Sensitivity

Based on the documentary record it can be assumed that the topography of the project site prior to reservoir construction would have ideally suited precontact populations. The site may have once hosted precontact archaeological deposits. However, the entire reservoir was excavated to a depth of at least 15 feet below grade at the turn of the nineteenth century and the shaft was subsequently built within the reservoir basin. Therefore, no archaeological resources predating the reservoir would have survived.

Historical Archaeological Potential

Historical Land Use

By 1673 the Albany Post Road had been laid out through the Bronx, crossing the Harlem River at Kingsbridge near its intersection with the Boston Post Road. This early route connected Manhattan with the vast trading post at Fort Orange, now Albany. Stage coach service was established on it in 1785. The north-south route of the Albany Post Road ran just west of the Jerome Park Reservoir in the approximate location of what is now Bailey

Avenue. It nearly paralleled the Boston Post Road which ran along the route of Kingsbridge Road and through the Jerome Park Reservoir site (Jenkins 1912:215).

During the American Revolution the strategic importance of safe passage over the Harlem River at Kingsbridge was recognized by both British and American militia. As a result, Kingsbridge witnessed extensive Revolutionary War activity with several fortifications built nearby. Under the command of Major-General Charles Lee, a total of seven sites were selected for redoubts, two on the northern end of Manhattan, and five in the Kingsbridge area of the Bronx. Three forts were built on Spuyten Duyvil Neck and Tippett's Hill, west of the project site. These were captured by the English in November of 1776, and were subsequently abandoned by 1779.

Fort Independence (a.k.a. Fort No. 4), and Fort No. 5 were the two forts closest to Shaft No. 21. The extant Fort Independence Park at the north end of the Jerome Park Reservoir and Old Fort Park at the south end of the reservoir approximate the two forts' eighteenth century locations.

In 1869 a portion of the Van Cortlandt estate, lying between Fort Independence Hill and Van Cortlandt Lake north of the project site, was bought and subdivided for building lots. The tract, named "Oloff Park" after Oloff Stevensen Van Cortlandt, contained about 100 acres including part of the Jerome Park Reservoir site (Jenkins 1912:340). The remainder of the reservoir site was situated on Bathgate farm, formerly belonging to the Montgomery family. James Bathgate, brother of Alexander the overseer of the Morris Manor lands, farmed the site until the 1860s (McNamara 1984:310). Through the 1870s the project site remained as vacant farm land, with the Bathgate's farm buildings located south of the project site (Beers 1872).

After the Civil War the Bathgate farm and part of Oloff Park were acquired by the Jerome Park Villa Site Improvement Company. The American Jockey Club leased the land and laid out a track for racing (Jenkins 1912:290). The race track proved to be successful and flourished.

In 1874 the study area was shown as possessing several hills and knolls bordering two small streams, while the racetrack and associated structures were shown west of what is now Goulden Avenue (Viele 1874). By the 1880s William Dunn had established his small farmstead where the north reservoir basin is now located (Bromley 1882). The project site continued to be used in part as a racetrack, and in part for farming until 1894 when the City of New York acquired the property for the purpose of erecting the Jerome Park Reservoir (McNamara 1984:416).

By 1895 the plans and specifications for the Jerome Park Reservoir were amended to increase the proposed capacity to 2,000,000,000 gallons of water. As envisioned at that time, the reservoir was to be comprised of an easterly and westerly basin with a massive stone dividing wall running the north-south length of the entire reservoir. The division wall would support a new conduit to replace the old aqueduct, and a new aqueduct was to pass approximately 100 feet beneath the reservoir. A series of shafts and tunnels, including Shaft

No. 21, were designed to connect the flow of water between the basin and aqueducts (New York City 1907:1212).

During reservoir construction, previous ca. 1880 farm structures were removed, and encompassing terrain was excavated to a depth of more than 15 feet. Excavations of earth and rock removed from the entire complex, both east and west of Goulden Avenue, totaled approximately 4,000,000 cubic yards (Duane 1895:79).

Historical Archaeological Sensitivity

The location of the shaft within the reservoir has no historical archaeological potential due to extensive prior disturbance.

Historic Resources in the Project Area

Shaft No. 21 is located within the Jerome Park Reservoir. The shaft was built to link the New Aqueduct at 115 feet below grade to the surface, and its top is visible. The shaft is eligible for listing on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: There is no inspection of this Shaft under this contract. Shaft No. 21 would be opened and prepared for ventilation intake or exhaust for the Contractor-designed ventilation system. The location of the Shaft within the reservoir has no archaeological potential due to extensive prior disturbance. No impacts to archaeological resources are therefore anticipated as part of this project.

Architectural Resources: Shaft No. 21 is eligible for listing on the National Register of Historic Places. The proposed action is for the temporary use of the Shaft for a Contractor-designed intake and exhaust ventilation system. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to its utilization, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structure. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structure.

27. SHAFT NO. 22 (BRONX)

Shaft No. 22 is located partly beneath the north sidewalk on West Fordham Road and partly beneath the road in the University Heights section of the Bronx (Figure 22-1; Photograph 22-1). The site is located just north of West Fordham Road between Martin Luther King Jr. Boulevard to the east, and Sedgwick Avenue to the west. Devoe Park abuts the north boundary of the project site.

Work at Shaft No. 22 would occur for two separate periods within the duration of the project during the fall 2004 season (two months) and the fall of 2005 season (two months). This

Shaft would need to be accessed on two separate occasions due to the current uncertainty of the arrangement of the top and lower pressure covers. The Shaft situated approximately 6-feet below the road level. Access to the Shaft for the purpose of allowing inspection of the cover would require excavation and support of sidewalk and pavement together with covering up the opening with heavy duty steel plates outside of working hours or when the Contractor is not working at the site. Once the inspection of the top cover is completed, the roadway and sidewalk would be reinstated to its original condition.

During the second construction season, access to the Shaft would be gained by again excavating the roadway and sidewalk and removing the existing top and lower pressure covers to allow for the inspection of the shaft. Hoists, frames, or a crane would be positioned over the Shaft opening to allow for the Engineer's inspection of the Shaft that would either be conducted from within a personnel cage lowered into the Shaft or by a remote operated video camera. After completion of the inspection, new pressure covers would be installed. Once work is completed, the roadway and sidewalk would be reinstated to its original condition.

Precontact Archaeological Potential

Documentary research found that the project site is located in an area that may have once been sensitive for precontact cultural resources. Precontact archaeological sites have been recovered throughout the surrounding area in the Bronx. A site files search conducted at the NYSM, which inventories only precontact sites, reported fourteen sites within a two-mile radius of the project site. NYSM site numbers 709, 711, 2823, 2838, 2839, 4052, 4053, 4054, 4055, 4056, 5320, 5321, 5322 and 7727 are all located nearby. Evidence of Native American occupation has been observed to the north in Kingsbridge and Spuyten Duyvil, to the west on Manhattan at Inwood Hill Park, to the northeast in Van Cortlandt Park, and to the east in Fordham. The extensive documentation of aboriginal occupation throughout the area suggests that the vicinity of the project site was, at the very least, used in a limited capacity during the precontact period.

Precontact Archaeological Sensitivity

The physiographic characteristics of the current project site and surrounding park, together with the information extracted from the documentary record and the number of precontact sites identified in the vicinity, suggests that Native American peoples likely exploited the project site in some capacity. The Harlem River is located several blocks west of the project site and is the known location of several precontact encampments.

Topographic maps from the nineteenth and twentieth centuries indicate that the project site was historically characterized by a low hill that sloped northwest down to the Harlem River. Valentine's Brook was sited about one hundred feet north of the Shaft Site, and drained into the Harlem River (Viele 1874; Bien 1890). The hillside in proximity to fresh water may have provided an ideal locale for precontact campsites. However, the late nineteenth century construction of the shaft has severely impacted any precontact resources in this location. Furthermore, the construction of a building over the shaft prior to 1911, and the installation

of subsurface utilities beneath the sidewalk and adjacent roadbed have caused additional subsurface disturbance in the immediate vicinity of the shaft. Therefore, it is highly unlikely that precontact resources remain undisturbed in the project site.

Historical Archaeological Potential

Historical Land Use

The township of Westchester was formed in 1788 and included the manor of Fordham and the West Farms tract where the project site now exists. West Farms was formed in 1846, and comprised all the land west of the Bronx River as far as the Harlem River, south of Yonkers. In 1855 the township of Morrisania was annexed, which included the manors of Morrisania and Fordham as well as the West Farms patent of 1663 (Jenkins 1912:6). Development of the area intensified in the latter half of the nineteenth century.

In 1851, the earliest map to depict details of development, the project site was vacant and was owned by J. Valentine (Sidney and Neff 1851). The site remained vacant through the remainder of the nineteenth century, and was part of the M. Devoe holdings (Dripps 1866; Beers 1867, 1868, Figure 22-2; Bromley 1879; Robinson 1885). Devoe Park was formed in 1907 when the City acquired the project parcel. It was formally opened in 1910 on land that formerly belonged to the Devoe family. In 1911 a small one-story brick building stood over the Shaft Site, which was otherwise vacant (Bromley 1911). The parcel has experienced improvements to the sidewalk and adjacent roadbed, and the superstructure over the shaft has been removed. Undoubtedly, utility lines have been laid beneath the sidewalk, which is common throughout the metropolitan New York area.

Historical Archaeological Sensitivity

No historical use is associated with the Shaft Site or its immediate vicinity. Therefore, Shaft No. 22 is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Shaft No. 22 is situated above the New Croton Aqueduct (1884-1890). There are no extant structures associated with the Shaft although there was a one-story brick structure over the shaft in 1911. However, this has since been removed. Its footprint is not considered archaeologically sensitive, as it has little research value beyond documenting its presence.

Proposed Impacts to Potential Resources

Archaeological Resources: Minimal ground disturbance is only proposed directly above the shaft cover to allow inspection of the pressure covers and the shaft. Significant archaeological resources would not be located in the area of proposed ground disturbance as severe disturbance of site strata occurred during the construction of the Shaft in the late 1800's. No impacts to archaeological resources are therefore anticipated as part of this project.

Architectural Resources: The shaft is eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection only. Placement of new Shaft top and bottom pressure covers would be the only action that would alter the character or appearance of the Shaft. However, the existing Shaft pressure covers may unsafe and poses a potential risk to public health. Subsequent to the use of the shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

28. SHAFT NO. 23 (BRONX)

Shaft No. 23 is located within a headhouse on West Burnside Avenue in the Bronx (Figure 23-1, Photograph 23-1). The site is located on West Burnside Avenue.

Work at the Shaft would include removal of the existing top pressure cover, inspection of the existing lower pressure cover, and subsequent installation of new top and lower pressure covers. Hoists or frames would be constructed over the Shaft opening to allow for the Engineer's inspection of the Shaft which would either be conducted from within a personnel cage lowered into the Shaft or by a remote operated video camera. Upon completion of inspection, the new pressure covers would be installed. The Shaft headhouse would be reinstated to its existing condition prior to inspection upon the completion of work. Work at Shaft No. 23 would occur for up to two months during the first construction season.

Precontact Archaeological Potential

Documentary research found that the project site is located in an area that may have once been sensitive for precontact cultural resources. Precontact archaeological sites have been recovered throughout the surrounding area in the Bronx. A site files search conducted at the NYSM, which inventories only precontact sites, reported fourteen sites within a two mile radius of the project site. NYSM site numbers 709, 711, 2823, 2838, 2839, 4052, 4053, 4054, 4055, 4056, 5320, 5321, 5322 and 7727 are all located nearby. Evidence of Native American occupation has been observed to the north in Kingsbridge and Spuyten Duyvil, to the west on Manhattan at Inwood Hill Park, to the northeast in Van Cortlandt Park, and to the east in Fordham. The extensive documentation of aboriginal occupation throughout the area suggests that the vicinity of the project site was, at the very least, used in a limited capacity during the precontact period.

Precontact Archaeological Sensitivity

The physiographic characteristics of the current project site, together with the information extracted from the documentary record and the number of precontact sites identified in the

vicinity, suggests that Native American peoples likely exploited the project site in some capacity. The Harlem River is located several blocks west of the project site and is the known location of several precontact encampments.

Topographic maps from the nineteenth and twentieth centuries indicate that the project site was historically characterized by a low hill which sloped west down to the Harlem River (Bien 1890; U.S.G.S. 1891). A small stream crossed Burnside Avenue east of the project site (Robinson 1885). The hillside in proximity to fresh water may have provided an ideal locale for precontact camp sites. However, the late nineteenth century construction of the shaft has severely impacted any precontact resources in this location. Furthermore, the construction of a headhouse over the shaft prior to 1911 has caused additional subsurface disturbance in the immediate vicinity of the shaft. Therefore, it is highly unlikely that precontact resources remain undisturbed in the project site.

Historical Archaeological Potential

Historical Land Use

The township of Westchester was formed in 1788 and included the manor of Fordham and the West Farms tract where the project site now exists. West Farms was formed in 1846, and comprised all the land west of the Bronx River as far as the Harlem River, south of Yonkers. In 1855 the township of Morrisania was annexed, which included the manors of Morrisania and Fordham as well as the West Farms patent of 1663 (Jenkins 1912:6). Development of the area intensified in the latter half of the nineteenth century.

In 1851, the earliest map to depict details of development, the project site was vacant and was owned by S. Archer (Sidney and Neff 1851). The site remained vacant through the remainder of the nineteenth century, and was part of the F. L Johnson property, and subsequently the H. Morrison estate (Dripps 1866; Beers 1867, 1868, Figure 23-2; Bromley 1879; Robinson 1885). In 1911 a small one-story brick building stood over the Shaft Site, which was otherwise vacant (Bromley 1911). The parcel has remained unchanged, and the headhouse is still standing.

Historical Archaeological Sensitivity

No historical use is associated with the Shaft Site or its immediate vicinity. Therefore, Shaft No. 23 is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Shaft No. 23 is situated above the New Croton Aqueduct (1884-1890). There is a one-story brick headhouse over the shaft which was built prior to 1911. The headhouse is a small building with a fieldstone foundation and visible cement repairs. The one-story structure has a large iron front door, and the narrow windows have bars. The headhouse and shaft are eligible for listing on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: Minimal ground disturbance is only proposed directly above the shaft cover to allow inspection of the shaft. Significant archaeological resources would not be located in the area of proposed disturbance as severe disturbance of site strata occurred during the construction of the shaft in the late 1800's. No impacts to archaeological resources are therefore anticipated as part of this project.

Architectural Resources: The headhouse and Shaft are eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection only. Placement of a new Shaft covers would be the only action that would alter the character or appearance of the Shaft. However, the existing Shaft cover may be unsafe and poses a potential risk to public health. Subsequent to the use of the shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the Shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

29. SHAFT NO. 24 (BRONX)

Shaft No. 24 is located adjacent to the interchange of the Alexander Hamilton Bridge and University Avenue in the Bronx (Figure 24-1, Photograph 24-1). Access to Shaft No. 24 is from an existing 30-feet deep manhole alongside the Alexander Hamilton Bridge near Sedgwick Avenue.

Work at the Shaft would include removal of the existing top pressure cover, inspection of the existing lower pressure cover, and subsequent installation of new top and lower pressure covers. No grading or clearing activities are necessary to accommodate access, staging or inspections. Hoists or frames would be constructed over the Shaft opening to allow for the Engineer's inspection of the Shaft that would either be conducted from within a personnel cage lowered into the Shaft or by a remote operated video camera. Upon completion of the inspection, the new pressure covers would be installed. The Shaft and surrounding area would be reinstated to its original condition upon the completion of work. Work at Shaft No. 24 would occur for up to two months during the first construction season.

Precontact Archaeological Potential

Documentary research found that the project site is located in an area that may have once been sensitive for precontact cultural resources. Precontact archaeological sites have been recovered throughout the surrounding area in the Bronx. A site files search conducted at the NYSM, which inventories only precontact sites, reported fourteen sites within a two-mile radius of the project site. NYSM site numbers 709, 711, 2823, 2838, 2839, 4052, 4053, 4054, 4055, 4056, 5320, 5321, 5322 and 7727 are all located nearby. Evidence of Native American occupation has been observed to the north in Kingsbridge and Spuyten Duyvil, to

the west on Manhattan at Inwood Hill Park, to the northeast in Van Cortlandt Park, and to the east in Fordham. The extensive documentation of aboriginal occupation throughout the area suggests that the vicinity of the project site was, at the very least, used in a limited capacity during the precontact period.

Precontact Archaeological Sensitivity

The physiographic characteristics of the current project site, together with the information extracted from the documentary record and the number of precontact sites identified in the vicinity, suggests that Native American peoples likely exploited the project site in some capacity. The Harlem River is located one block west of the project site and is the known location of several precontact encampments.

Topographic maps from the nineteenth and twentieth centuries indicate that the project site was historically characterized by a low hill, which sloped west down to the Harlem River (Bien 1890; U.S.G.S. 1891). However, the late nineteenth century construction of the 30-foot deep manhole and shaft has severely impacted any precontact resources in this location. Furthermore, intensive development to accommodate vehicular access to the Alexander Hamilton Bridge and a series of adjacent roads (University Avenue, Undercliff Avenue, Sedgwick Avenue, etc...) has further disturbed the immediate area. Therefore, it is highly unlikely that precontact resources remain undisturbed in the project site.

Historical Archaeological Potential

Historical Land Use

The township of Westchester was formed in 1788 and included the manor of Fordham and the West Farms tract where the project site now exists. West Farms was formed in 1846, and comprised all the land west of the Bronx River as far as the Harlem River, south of Yonkers. In 1855 the township of Morrisania was annexed, which included the manors of Morrisania and Fordham as well as the West Farms patent of 1663 (Jenkins 1912:6). Development of the area intensified in the latter half of the nineteenth century.

In 1851, the earliest map to depict details of development, the project site was vacant and was owned by Mrs. W. Ogden (Sidney and Neff 1851). The site remained vacant through the remainder of the nineteenth century, and remained part of the Ogden estate (Dripps 1866; Beers 1867, 1868, Figure 24-2; Bromley 1879; Robinson 1885). In 1911 the site was still vacant (Bromley 1911). In 1963 the Alexander Hamilton Bridge was built across the Harlem River in response to the need for additional traffic from the Cross Bronx Expressway. The design included two elaborate highway interchanges that connect the bridge with the Harlem River Drive – in Manhattan - and the Major Deegan Expressway (I-87) – in the Bronx - more than 100 feet below.

Historical Archaeological Sensitivity

No historical use is associated with the Shaft site or its immediate vicinity. Therefore, Shaft No. 24 is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Shaft No. 24 is situated above the New Croton Aqueduct (1884-1890). The Shaft and Aqueduct are eligible for listing on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: Access to the Shaft cover is through an existing manhole, so no ground disturbance is anticipated. No impacts to archaeological resources are therefore anticipated as part of this project.

Architectural Resources: The Shaft is eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection only. Placement of new Shaft covers would be the only action that would alter the character or appearance of the Shaft. However, the existing Shaft cover may be unsafe and poses a potential risk to public health. Subsequent to the use of the shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

30. SHAFT NO. 24A (BRONX)

Shaft No. 24A is located between the Major Deegan Expressway and the Harlem River beneath the Alexander Hamilton Bridge in the Bronx (Figure 24A-1, Photograph 24A-1). Metro-North rail tracks lie west of the project site.

Currently, a one-story brick structure built during the construction of the Alexander Hamilton Bridge in the 1960s lies atop the Shaft. Shaft No. 24A, currently unoperational, is a headhouse structure once used as a blow-off to the Harlem River. The Shaft is connected to Shaft 24, located approximately 400 feet to the east, by a 30-inch pipe. Shaft 24A is not along the alignment of the Aqueduct Access to the shaft consists of a maintained un-paved driveway from the Major Deegan Highway. No grading or clearing activities would be necessary to accommodate access, staging or inspections.

Inspection of the Shaft would include removal of sediment and debris from within the headhouse structure. Once the debris is removed and the structure is clean, inspection of a series of pipes and valves within the Shaft would commence. Inspection at Shaft No. 24A would occur for up to one month between the period of September, 2004 to February, 2005.

Precontact Archaeological Potential

Documentary research found that the project site is located in an area that may have once been sensitive for precontact cultural resources. Precontact archaeological sites have been recovered throughout the surrounding area in the Bronx. A site files search conducted at the NYSM, which inventories only precontact sites, reported fourteen sites within a two-mile radius of the project site. NYSM site numbers 709, 711, 2823, 2838, 2839, 4052, 4053, 4054, 4055, 4056, 5320, 5321, 5322 and 7727 are all located nearby. Evidence of Native American occupation has been observed to the north in Kingsbridge and Spuyten Duyvil, to the west on Manhattan at Inwood Hill Park, to the northeast in Van Cortlandt Park, and to the east in Fordham. The extensive documentation of aboriginal occupation throughout the area suggests that the vicinity of the project site was, at the very least, used in a limited capacity during the precontact period.

Precontact Archaeological Sensitivity

The physiographic characteristics of the current project site suggest it is not sensitive for precontact resources. Topographic maps from the nineteenth and twentieth centuries indicate that the project site was historically along the banks of the Harlem River (Bien 1890; U.S.G.S. 1891). The shoreline has been subjected to intensive development with the construction of the Alexander Hamilton Bridge and the Major Deegan Expressway. Furthermore, the late nineteenth century construction of the shaft has severely impacted any precontact resources in this location. Therefore, it is highly unlikely that precontact resources remain undisturbed in the project site.

Historical Archaeological Potential

Historical Land Use

The township of Westchester was formed in 1788 and included the manor of Fordham and the West Farms tract where the project site now exists. West Farms was formed in 1846, and comprised all the land west of the Bronx River as far as the Harlem River, south of Yonkers. In 1855 the township of Morrisania was annexed, which included the manors of Morrisania and Fordham as well as the West Farms patent of 1663 (Jenkins 1912:6). Development of the area intensified in the latter half of the nineteenth century.

In 1851, the earliest map to depict details of development, the project site was vacant and was owned by Mrs. W. Ogden (Sidney and Neff 1851). The site remained vacant through the remainder of the nineteenth century, and remained part of the Ogden estate (Dripps 1866; Beers 1867, 1868, Figure 24A-2; Bromley 1879; Robinson 1885). In 1911 the site was still vacant (Bromley 1911). In 1963 the Alexander Hamilton Bridge was built across the Harlem River in response to the need for additional traffic from the Cross Bronx Expressway. The design included two elaborate highway interchanges that connect the bridge with the Harlem River Drive – in Manhattan - and the Major Deegan Expressway (I-87) – in the Bronx - more than 100 feet below.

Historical Archaeological Sensitivity

No historical use is associated with the Shaft Site or its immediate vicinity. Therefore, Shaft No. 24A is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Shaft No. 24A is eligible for listing on the National Register of Historic Places. Currently, a one-story brick structure built during the construction of the Alexander Hamilton Bridge in the 1960s lies atop the Shaft. The new structure is not considered a potentially significant element of the NCA system due to its relatively recent construction.

Proposed Impacts to Potential Resources

Archaeological Resources: Minimal ground disturbance is only proposed directly above the Shaft cover to allow inspection of the Shaft. This area is not sensitive for archaeological deposits as it was previously disturbed by the construction of the Shaft and the ca. 1960s brick structure. No impacts to archaeological resources are therefore anticipated as part of this project.

Architectural Resources: Shaft 24A is not on the Aqueduct alignment. A 30" pipe runs from Shaft 24 to Shaft 24A and the building serves as a blow-off for water to run into the Hudson River. The Shaft is currently not functional. Plans are to enter the existing building, remove sediment on the bottom, and inspect the pipes to see what work needs to be undertaken to reinstate the blow-off.

The Shaft, but not the relatively modern brick structure above it, is eligible for listing on the National Register of Historic Places. Subsequent to the inspection of the Shaft, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

31. SHAFT NO. 25 (MANHATTAN)

Shaft No. 25 is located is located within High Bridge Park between the Alexander Hamilton Bridge and the Washington Bridge in Manhattan (Figure 25-1, Photograph 25-1). The Shaft's cap lies atop an existing structure located along Harlem River Drive between the Alexander Hamilton and Washington Bridges. The structure, a NYCDEP facility, is seated into a cliff along the Harlem River and is used solely for the Aqueduct operation and maintenance. A blow-off exists at Shaft No. 25 which is used to empty Aqueduct water to the Harlem River when dewatering of the Aqueduct is required. Access to the Shaft is on New York City Department of Park and Recreation property from the Harlem River Drive.

Access to the Shaft would be by an "access track," consisting of a 13-foot-wide graded gravel surface underlain by a geomembrane of approximate length of 100 feet; constructed over the manicured lawn surrounding the Shaft. The access track would generally follow an existing access track from the southbound lane of Harlem River Drive near High Bridge. A staging area, enclosed by security fencing, would be constructed with a minimum area of 2000 square feet around the Shaft. Once construction of the staging area is completed, the surface level concrete covers would be removed and an inspection of the upper portion of the Shaft and the twin top pressure covers would be conducted. Once the inspection of the covers is completed, the park would be reinstated to its original condition.

During the second construction season, both pairs of top and lower pressure covers would be removed to allow for the inspection of the shaft. Hoists or frames would be constructed over the Shaft opening to allow for the Engineer's inspection which would either be conducted from within a personnel cage lowered into the Shaft or by a remote operated video camera. After completion of the inspection, the new pressure covers would be installed. Once work is completed, the park would be reinstated to its original condition. Work at Shaft No. 25 would occur for up to two months during the first construction season and three months during the second construction season.

Precontact Archaeological Potential

Documentary research found that the project site is located in an area that may have once been sensitive for precontact cultural resources. Precontact archaeological sites have been recovered throughout the surrounding area in Manhattan and the nearby Bronx. A site files search conducted at the NYSM, which inventories only precontact sites, reported fourteen sites within a two mile radius of the project site. NYSM site numbers 709, 711, 2823, 2838, 2839, 4052, 4053, 4054, 4055, 4056, 5320, 5321, 5322 and 7727 are all located nearby. Evidence of Native American occupation has been observed to the north in Kingsbridge and Spuyten Duyvil, to the west at Inwood Hill Park, and to the east in Fordham. The extensive documentation of aboriginal occupation throughout the area suggests that the vicinity of the project site was, at the very least, used in a limited capacity during the precontact period.

Precontact Archaeological Sensitivity

The project site is not considered potentially sensitive for precontact resources. The Shaft lies directly west of the Harlem River Drive, and was extensively disturbed during the late nineteenth and twentieth centuries with the construction of the New Croton Aqueduct and Shaft 25, the ca. 1888 construction of the Washington Bridge, the ca. 1897 construction of the Harlem River Speedway, which is now the route of the Harlem River Drive, and the ca. 1963 construction of the Alexander Hamilton Bridge. The extensive construction episodes in and around the Shaft site have eliminated any potential precontact archaeological sensitivity.

Historical Archaeological Potential

Historical Land Use

The project site was historically at the top of a bluff along the edge of the Harlem River (Viele 1865). Although northern Manhattan saw activity during the Revolutionary War, no structures reportedly stood near the project site in 1783 (British Headquarters Map 1783). The site was also vacant in 1836, 1851, and 1866, but by the 1850s adjacent streets west of the project site had been laid out (Colton 1836; Dripps 1851, 1866). In 1879 the project site was still vacant and was part of the Chesebrough estate, whose main dwelling stood about a block south of the project site (Bromley 1879). By this time, High Bridge Park had been established south of Shaft No. 25. The park eventually expanded to the north to incorporate the project site, although the parcel remained vacant (Robinson 1885; Bromley 1897).

In 1888 the Washington Bridge was built over the Harlem River just north of Shaft No. 25, connecting Manhattan and the Bronx. The bridge was specifically designed to cross the "relatively deep and narrow valley that surrounds the Harlem River" (http://www.nycroads.com/crossings/washington-heights, May 5, 2004). An undated photograph, which predates the construction of the Harlem River Drive (1897), but post-dates the construction of the Washington Bridge (1888), shows that the Manhattan shoreline in the vicinity of Shaft No. 25 was steep and extremely rocky (Jackson nd.; Figure 25-2). When the Harlem River Speedway was completed in 1897, massive rock cuts were made along the Manhattan shoreline. In fact, it was reported that there was a great rock cut...

One-thousand feet long to the north of Washington Bridge where 160,000 cubic yards of solid rock were taken out, the depth of the cut at its highest point being fully 110 feet...Further limitations were imposed by existing structures, such as the Gate House of the Croton Aqueduct and the piers of the two bridges... (Scientific American 1897)

Another such cut was required south of the bridge, but this one was not as extensive and was confined to the area directly east of Shaft No. 25, between the shaft and the river.

Shaft No. 25 essentially had two access points when it was first built. Its cap was at the top of the ridge along the Harlem River in what is now High Bridge Park. A Gate House was originally constructed directly west of this, and stood as late as 1934, but it was removed when an elaborate system of roadways was built in the 20th century (Figure 25-3). The construction of the adjacent Alexander Hamilton Bridge (ca. 1963) precipitated the need for a system of interconnecting roads which were constructed through and above High Bridge Park. As a result, existing exit and entrance ramps were depressed in tunnels, and additional ramps were built above them.

The Shaft also has a blow-off which is used to empty Aqueduct water to the Harlem River when dewatering of the Aqueduct is required. A stone structure is built into the hillside and serves as a portal to the shaft. This second access point is still visible from the Harlem River Drive (Figure 25-3).

Historical Archaeological Sensitivity

No historical use beyond the New Croton Aqueduct is associated with the Shaft Site or its immediate vicinity. Therefore, Shaft No. 25 is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Shaft No. 25 is situated above the New Croton Aqueduct (1884-1890). There is a stone structure which serves as an accessway to the shaft built into the hillside. Both the structure and the shaft are eligible for listing on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: Minimal ground disturbance is proposed directly above the Shaft cover to allow inspection of the Shaft, and for the creation of a staging area roughly 2000 square feet in size. As described above, the access track would generally follow an existing access track from the southbound lane of Harlem River Drive near High Bridge that has been frequently used by heavy equipment in the past.

Significant archaeological resources would not be located in the area of proposed ground disturbance as severe disturbance of site strata occurred during the construction of the shaft in the late 1800's, the building of an extensive road system between the two adjacent bridges, grading for the park, and filling the Harlem River shoreline for the creation of Harlem River Drive. No impacts to archaeological resources are therefore anticipated as part of this project.

Architectural Resources: Shaft No. 25 is located atop an existing stone structure located along Harlem River Drive between the Alexander Hamilton and Washington Bridges in High Bridge Park. The Shaft and structure are eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection only. After the completion of the inspection of the New Croton Aqueduct via the shaft, temporary bulkheads would be installed in place of the current pressure caps to remain until recommendations for rehabilitation would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

32. SHAFT NO. 26 (MANHATTAN)

Shaft No. 26 is located within a Pumping Station on the east side of Amsterdam Avenue in High Bridge Park in Manhattan (Figure 26-1, Photograph 26-1). The site is located across from and between 179th and 180th Streets.

Inspection of the Shaft would consist of removal and storage of the existing Shaft cover and the placement of hoists or frames over the Shaft opening. Inspection of the Shaft would either be conducted from within a personnel cage lowered into the Shaft or by a remote operated video camera. Additionally, Shaft No. 26 would be opened and prepared for ventilation intake or exhaust for the Contractor-designed ventilation system. Once all work is completed and the Shaft is no longer needed for ventilation purposes, the existing cover would be reinstalled and the site would be returned to its condition prior to inspection.

Ventilation at Shaft No. 26 would occur from September, 2004 to February, 2005. Inspection of the shaft would occur for up to one month between the above period.

Precontact Archaeological Potential

Documentary research found that the project site is located in an area that may have once been sensitive for precontact cultural resources. Precontact archaeological sites have been recovered throughout the surrounding area in Manhattan and the nearby Bronx. A site files search conducted at the NYSM, which inventories only precontact sites, reported fourteen sites within a two-mile radius of the project site. NYSM site numbers 709, 711, 2823, 2838, 2839, 4052, 4053, 4054, 4055, 4056, 5320, 5321, 5322 and 7727 are all located nearby. Evidence of Native American occupation has been observed to the north in Kingsbridge and Spuyten Duyvil, to the west at Inwood Hill Park, and to the east in Fordham. The extensive documentation of aboriginal occupation throughout the area suggests that the vicinity of the project site was, at the very least, used in a limited capacity during the precontact period.

Precontact Archaeological Sensitivity

The project site is not considered potentially sensitive for precontact resources. The Shaft lies directly east of Amsterdam Avenue, and was extensively disturbed during the late nineteenth and twentieth centuries with the construction of Shaft No. 26 and the Pumping Station. The area around the Pumping Station was also disturbed by the ca. 1963 construction of the Alexander Hamilton Bridge, the entrance to which lies directly south of the project site. An elaborate system of interchanges was built in the 1960s to accommodate the Alexander Hamilton Bridge and the extant Washington Bridge, the entrance to which is directly north of the project site. At that time, the original Pumping Station in the park was razed, and a new Pumping Station, visible today, was constructed. The extensive construction episodes in and around the shaft site have eliminated any potential precontact archaeological sensitivity.

Historical Archaeological Potential

Historical Land Use

The project site was historically at the top of a bluff along the edge of the Harlem River (Viele 1865). Although northern Manhattan saw activity during the Revolutionary War, no structures reportedly stood near the project site in 1782 (British Headquarters Map 1782). The site was also vacant in 1836, 1851, and 1866, but by the 1850s adjacent streets west of

the project site had been laid out (Colton 1836; Dripps 1851, 1866). In 1879 the project site was still vacant and was part of the Chesebrough estate, whose main dwelling stood about a block southeast of the project site (Bromley 1879). By this time, High Bridge Park had been established south of Shaft No. 26. The park eventually expanded to the north to incorporate the project site, although the parcel remained vacant (Robinson 1885). In 1888 the Washington Bridge was built over the Harlem River just north of Shaft No. 26, connecting Manhattan and the Bronx. By 1897, the New Croton Aqueduct had been constructed, and a Pumping Station was built in High Bridge Park (Bromley 1897; Figure 26-2). The Pumping Station stood midway between Amsterdam Avenue and the Harlem River Speedway to the east.

The Pumping Station stood as late as 1934, but it was removed when an elaborate system of roadways was built through the park in the twentieth century (Bromley 1934). The construction of the adjacent Alexander Hamilton Bridge (ca. 1963) precipitated the need for a system of interconnecting roads that were constructed through and above High Bridge Park. As a result, existing exit and entrance ramps were depressed in tunnels, and additional ramps were built above them. The original ca. 1890s Pumping Station was razed, and a new Pumping Station, extant today, was built further west of the original Pumping Station's location, adjacent to Amsterdam Avenue (Photograph 26-1).

Historical Archaeological Sensitivity

No historical use beyond the New Croton Aqueduct is associated with the Shaft Site or its immediate vicinity. Therefore, Shaft No. 26 is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Shaft No. 26 is situated above the New Croton Aqueduct (1884-1890), within a Pumping Station. The Pumping Station, built in the second half of the twentieth century, is a two-story brick building with two sets of metal doors that open onto Amsterdam Avenue. The shaft is eligible for listing on the National Register of Historic Places, but the Pumping Station is not due to its relatively modern construction. It is not an original element of the New Croton Aqueduct system.

Proposed Impacts to Potential Resources

Archaeological Resources: Minimal ground disturbance is only proposed directly above the Shaft cover to allow inspection of the Shaft. Significant archaeological resources would not be located in the area of proposed disturbance as severe disturbance of site strata occurred during the construction of the shaft in the late 1800's, and the construction of a new Pumping Station in the 1960s. No impacts to archaeological resources are therefore anticipated as part of this project.

Architectural Resources: Shaft No. 26 is eligible for listing on the National Register of Historic Places. The Shaft would be opened and prepared for ventilation intake or exhaust

for the Contractor-designed ventilation system. Subsequent to the use of the Shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the Shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structure.

33. SHAFT NO. 28 (MANHATTAN)

Shaft No. 28 is located along the centerline of Amsterdam Avenue near 165th Street in Manhattan (Figure 26-1, Photograph 26-1). The cover to the Shaft is visible in the center of Amsterdam Avenue.

Access to the Shaft for the purpose of inspection would require excavation and support of pavement of asphalt, sub base and soil, together with covering up the opening with heavy duty steel plates outside of working hours or when the Contractor is not working at the site. The existing Shaft cover would be removed and stored. Hoists, frames, or a crane would be positioned over the Shaft opening to allow for the Engineer's inspection which would either be conducted from within a personnel cage lowered into the Shaft or by a remote operated video camera. Once work is completed, the existing cover would be reinstalled and the roadway would be reinstated to its original condition.

Precontact Archaeological Potential

Documentary research found that the project site is located in an area that may have once been sensitive for precontact cultural resources. Precontact archaeological sites have been recovered throughout the surrounding area in Manhattan and the nearby Bronx. A site files search conducted at the NYSM, which inventories only precontact sites, reported fourteen sites within a two mile radius of the project site. NYSM site numbers 709, 711, 2823, 2838, 2839, 4052, 4053, 4054, 4055, 4056, 5320, 5321, 5322 and 7727 are all located nearby. Evidence of Native American occupation has been observed to the north in Kingsbridge and Spuyten Duyvil, to the west at Inwood Hill Park, and to the east in Fordham. The extensive documentation of aboriginal occupation throughout the area suggests that the vicinity of the project site was, at the very least, used in a limited capacity during the precontact period.

Precontact Archaeological Sensitivity

The project site is not considered potentially sensitive for precontact resources. The Shaft lies directly in the center of Amsterdam Avenue, and was extensively disturbed during the late nineteenth century construction of Shaft No. 28. The Shaft is in the center of an active roadbed, which has been updated periodically and has subsurface utilities. Therefore, the Shaft site is not considered potentially sensitive for precontact resources.

Historical Archaeological Potential

Historical Land Use

The project site was historically at on a small rise just south of a stream which crossed what is now Amsterdam Avenue (Viele 1865). Although northern Manhattan saw activity during the Revolutionary War, no structures reportedly stood near the project site in 1782 (British Headquarters Map 1782). The site was also vacant in 1836, 1851, and 1866, but by the 1836 Amsterdam Avenue had been laid out (Colton 1836; Dripps 1851, Figure 28-2). Throughout the remainder of the nineteenth and twentieth centuries, the project site was situated in the center of Amsterdam Avenue, which saw no active development (Bromley 1879; Robinson 1885; Bromley 1897; Bromley 1934).

Historical Archaeological Sensitivity

No historical use beyond the New Croton Aqueduct is associated with the Shaft Site or its immediate vicinity. Therefore, Shaft No. 28 is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Shaft No. 28 is situated above the New Croton Aqueduct (1884-1890). The shaft is eligible for listing on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: Minimal ground disturbance is only proposed directly above the shaft cover to allow inspection of the shaft. Significant archaeological resources would not be located in the area of proposed disturbance as severe disturbance of site strata occurred during the construction of the shaft in the late 1800's. No impacts to archaeological resources are therefore anticipated as part of this project.

Architectural Resources: Shaft No. 28 is eligible for listing on the National Register of Historic Places. Both the Shaft and its cover are currently below grade. No structures associated with the Shaft lie above grade. The shaft is eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection only. Subsequent to the use of the shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

34. SHAFT NO. 29 (MANHATTAN)

Shaft No. 29 is located along the centerline of Amsterdam Avenue near 156th Street in Manhattan (Figure 29-1, Photograph 29-1). The cover to the Shaft is visible in the center of Amsterdam Avenue.

Access to the Shaft for the purpose of inspection would require excavation and support of pavement of asphalt, sub base and soil, together with covering up the opening with heavy duty steel plates outside of working hours or when the Contractor is not working at the site. The existing Shaft cover would be removed and stored. Hoists, frames, or a crane would be positioned over the Shaft opening to allow for the Engineer's inspection which would either be conducted from within a personnel cage lowered into the Shaft or by a remote operated video camera. Once work is completed, the existing cover would be reinstalled and the roadway would be reinstated to its original condition

Precontact Archaeological Potential

Documentary research found that the project site is located in an area that may have once been sensitive for precontact cultural resources. Precontact archaeological sites have been recovered throughout the surrounding area in Manhattan and the nearby Bronx. A site files search conducted at the NYSM, which inventories only precontact sites, reported fourteen sites within a two mile radius of the project site. NYSM site numbers 709, 711, 2823, 2838, 2839, 4052, 4053, 4054, 4055, 4056, 5320, 5321, 5322 and 7727 are all located nearby. Evidence of Native American occupation has been observed to the north in Kingsbridge and Spuyten Duyvil, to the west at Inwood Hill Park, and to the east in Fordham. The extensive documentation of aboriginal occupation throughout the area suggests that the vicinity of the project site was, at the very least, used in a limited capacity during the precontact period.

Precontact Archaeological Sensitivity

The project site is not considered potentially sensitive for precontact resources. The Shaft lies directly in the center of Amsterdam Avenue, and was extensively disturbed during the late nineteenth century construction of Shaft No. 29. The Shaft is in the center of an active roadbed, which has been updated periodically and has subsurface utilities. Therefore, the Shaft site is not considered potentially sensitive for precontact resources.

Historical Archaeological Potential

Historical Land Use

The project site was historically located on a level area at what is now Amsterdam Avenue (Viele 1865). Although northern Manhattan saw activity during the Revolutionary War, no structures reportedly stood near the project site in 1782 (British Headquarters Map 1782). The site was also vacant in 1836, 1851, and 1866, but by the 1836 Amsterdam Avenue had been laid out (Colton 1836; Dripps 1851, Figure 29-2). Throughout the remainder of the nineteenth and twentieth centuries, the project site was situated in the center of Amsterdam

Avenue, which saw no active development (Bromley 1879; Robinson 1885; Bromley 1897; Bromley 1934).

Historical Archaeological Sensitivity

No historical use beyond the New Croton Aqueduct is associated with the Shaft Site or its immediate vicinity. Therefore, Shaft No. 29 is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Shaft No. 29 is situated above the New Croton Aqueduct (1884-1890). The shaft is eligible for listing on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: Minimal ground disturbance is only proposed directly above the Shaft cover to allow inspection of the Shaft. Significant archaeological resources would not be located in the area of proposed disturbance as severe disturbance of site strata occurred during the construction of the shaft in the late 1800's. No impacts to archaeological resources are therefore anticipated as part of this project.

Architectural Resources: Shaft No. 29 is eligible for listing on the National Register of Historic Places. Both the Shaft and its cover are currently below grade. No structures associated with the shaft lie above grade. The shaft is eligible for listing on the National Register of Historic Places. The proposed action is for shaft inspection only. Subsequent to the use of the shaft for the inspection of the New Croton Aqueduct, recommendations to rehabilitate identified deficiencies would be made. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structures. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structures.

35. SHAFT NO. 33 (MANHATTAN)

Shaft No. 33 is located partly beneath the sidewalk and partly beneath the road of the southwest corner of the intersection of West 135th Street and Convent Avenue in Manhattan (Figure 33-1, Photograph 33-1). The Shaft and its cover are located below grade. A Gate House for the New Croton Aqueduct is located adjacent, but outside of, the project site.

The Shaft would be a construction access shaft to the Aqueduct which would serve as a main access location for personnel, equipment and materials into the Aqueduct to perform the inspection program of the Manhattan Pressurized Section of the Aqueduct. The staging area surrounding the Shaft would be surrounded by noise attenuation fencing and sediment erosion control measures, as required. Access to the Shaft would require excavation of the

sidewalk and pavement and removal of three precast concrete beams which form the roof of the chamber to the Shaft. Upon removal of the shaft pressure cover, at least one of the beams would be temporarily replaced in position so as to reduce the size of the opening, and a steel grating would be placed over the Shaft opening to allow for exhaust ventilation from the Aqueduct.

Stationary equipment at the Shaft includes a 20-ton mobile crane, ventilation equipment, and a changing facility equipped with lockers, showers and toilets. Once work at the site is completed, the existing cover would be reinstalled and the sidewalk and roadway would be reinstated to their original condition. Work at Shaft No. 33 would occur from September, 2004 to February, 2005 and from September, 2005 to February, 2006.

Precontact Archaeological Potential

Documentary research found that the project site is located in an area that may have once been sensitive for precontact cultural resources. Precontact archaeological sites have been recovered throughout the surrounding area in Manhattan and the nearby Bronx. A site files search conducted at the NYSM, which inventories only precontact sites, reported fourteen sites within a two mile radius of the project site. NYSM site numbers 709, 711, 2823, 2838, 2839, 4052, 4053, 4054, 4055, 4056, 5320, 5321, 5322 and 7727 are all located nearby. Evidence of Native American occupation has been observed to the north in Kingsbridge and Spuyten Duyvil, to the west at Inwood Hill Park, and to the east in Fordham. The extensive documentation of aboriginal occupation throughout the area suggests that the vicinity of the project site was, at the very least, used in a limited capacity during the precontact period.

Precontact Archaeological Sensitivity

The project site is not considered potentially sensitive for precontact resources. The shaft lies at the intersection of West 135th Street and Convent Avenue. The site was extensively disturbed during the late nineteenth century construction of Shaft No. 33. Therefore, the Shaft site is not considered potentially sensitive for precontact resources.

Historical Archaeological Potential

Historical Land Use

The project site was historically located on a level area at what is now West 135th Street (Viele 1865). Although northern Manhattan saw activity during the Revolutionary War, no structures reportedly stood near the project site in 1782 (British Headquarters Map 1782). The site was also vacant in 1836, 1851, and 1866, but by the 1836 surrounding streets had been laid out (Colton 1836; Dripps 1851, Figure 33-2). Throughout most of the remainder of the nineteenth century, the site was situated at the intersection of West 135th Street and Convent Avenue, which saw no active development (Bromley 1879; Robinson 1885). However, when the New Croton Aqueduct was constructed, the Croton Water Works nearby structure was built and Shaft 33 was constructed directly adjacent to it (Bromley 1897). In

1934 the building was labeled a Gate House (Bromley 1934). The structure still stands directly adjacent to, but outside of, the project area (Photograph 33-1).

Historical Archaeological Sensitivity

No historical use beyond the New Croton Aqueduct is associated with the Shaft site or its immediate vicinity. Therefore, Shaft No. 33 is not sensitive for historical archaeological deposits.

Historic Resources in the Project Area

Shaft No. 33 is situated above the New Croton Aqueduct (1884-1890). The Shaft is eligible for listing on the National Register of Historic Places.

Proposed Impacts to Potential Resources

Archaeological Resources: Minimal ground disturbance is only proposed directly above the shaft cover to allow inspection of the shaft. Significant archaeological resources would not be located in the area of proposed disturbance as severe disturbance of site strata occurred during the construction of the shaft in the late 1800's. No impacts to archaeological resources are therefore anticipated as part of this project.

Architectural Resources: Shaft No. 33 is eligible for listing on the National Register of Historic Places. Both the shaft and its cover are currently below grade. No structures associated with the shaft lie above grade within the project site, although it should be noted that a Gate House stands directly adjacent to it. There would be no impacts to the Gate House as part of this project.

The shaft is eligible for listing on the National Register of Historic Places. The Shaft would be a construction access shaft to the Aqueduct which would serve as a main access location for personnel, equipment and materials into the Aqueduct to perform the inspection program of the Manhattan Pressurized Section of the Aqueduct. Access to the Shaft would require excavation of the sidewalk and pavement. The proposed action is for the temporary use of the shaft for access to the Aqueduct and for ventilation. The effect of these measures on the historic facility would be addressed in subsequent environmental documents. Due to the eligible listing of the shaft, prior to its utilization, the Secretary of the Interior's Standards for the Treatment of Historic Properties would be consulted to retain the historic character of the structure. This consultation would ensure that any future proposed work would not cause any significant adverse impact to the historic structure.

VII. CONCLUSIONS AND RECOMMENDATIONS

The proposed inspection and rehabilitation of the New Croton Aqueduct (NCA) from its beginning at the New Croton Reservoir in Yorktown, Westchester County, to the distribution system connections in the Bronx and Manhattan, will entail opening and investigating the current conditions of approximately 35 Shaft Sites as well as the Aqueduct. The 31-mile long NCA is a 110-year old facility that delivers up to 290 million gallons of water per day to New York City and other municipalities served by the Croton Water Supply System.

The documentary research has found that while many of the Shaft Sites are in areas that may have once been sensitive for either precontact or historical archaeological resources, or possibly both, the original construction of the shafts in the 1800s has eliminated potential archaeological sensitivity. However, there are several locations for which work outside of the immediate Shaft Site is proposed, and these areas may have maintained their potential sensitivity. Furthermore, the Shafts and the Aqueduct are both eligible for the National Register of Historic Places. Mitigation measures to avoid impacts to these structures are recommended.

Archeological Resources

Minimal ground disturbance would be required around most NCA structure locations to remove shaft covers for purposes of construction access, ventilation and inspection. In several locations the shaft is located within an existing building. At some locations, it would be necessary to create temporary construction staging areas ranging from 0.1 acre to approximately 0.75 acre in size, as described by specific shaft location later in this section. In such locations, in general, the activities involved would include construction of an access track and staging area, covering both with a geomembrane and temporary artificial hard surface of graded gravel, maintenance, and the subsequent removal of the gravel surface and geomembrane. Excavation of up to three feet around shaft covers may be required. Soil disturbance would also be required for the preparation of the access tracks and staging areas at Shaft Nos. 1, 2, 13 and 15½.

Significant archeological resources would not likely be located above the shaft covers as severe disturbance of the sites' soil strata occurred during the construction of the NCA and shafts in the late 1800s. The measures undertaken to ensure that the existing surface is not disturbed, through the introduction of a geomembrane and graded gravel surface, would also ensure that potential archeological deposits are not disturbed. However, it may be that disturbance can not be avoided at four sites determined to be potentially sensitive for archaeological deposits: Shafts Nos. 1, 2, 13 and 15½. Therefore, further archaeological investigations in the form of Stage 1B field testing is recommended for the potential impact area at each of these four shaft sites.

If Stage 1B field testing determines that precontact and/or historical period archaeological deposits are located at any of these four shaft sites, then additional Stage 2 testing – to establish the age, integrity, extent, and potential significance of deposits – may be warranted. If potentially significant deposits are encountered, mitigation would be undertaken. The

NYCDEP would implement all necessary procedures, in consultation with the NYSOPRHP, to avoid significant adverse impacts to archeological resources.

Architectural Resources

The NCA and associated structures are eligible for listing on the National and State Registers of Historic Places. At shaft locations, proposed activity within the NCA and associated structures is for in-tunnel and shaft inspection and minor rehabilitation only. Existing shaft covers would be removed, and equipment necessary for construction access, ventilation or shaft inspection would be temporarily placed, and subsequently removed, from the shaft site. Placement of a new shaft cover would be required at many locations and is the only action that would represent a minor alteration to the character or appearance of the structures, except at Shaft No. 9 where reconstruction and waterproofing of walls and floor of the shaft chamber are proposed.

Due to the eligible listing of the NCA and associated structures, NYCDEP would coordinate its plans for all NCA work with the NYSOPRHP. Prior to construction, the Secretary of the Interior's Standards for the Treatment of Historic Properties may also be consulted to assist in the retention of the historic character of the structures. By following the recommendations and implementing the requirements of the NYSOPRHP, NYCDEP would avoid significant adverse impacts to the historic character of the NCA and associated structures.

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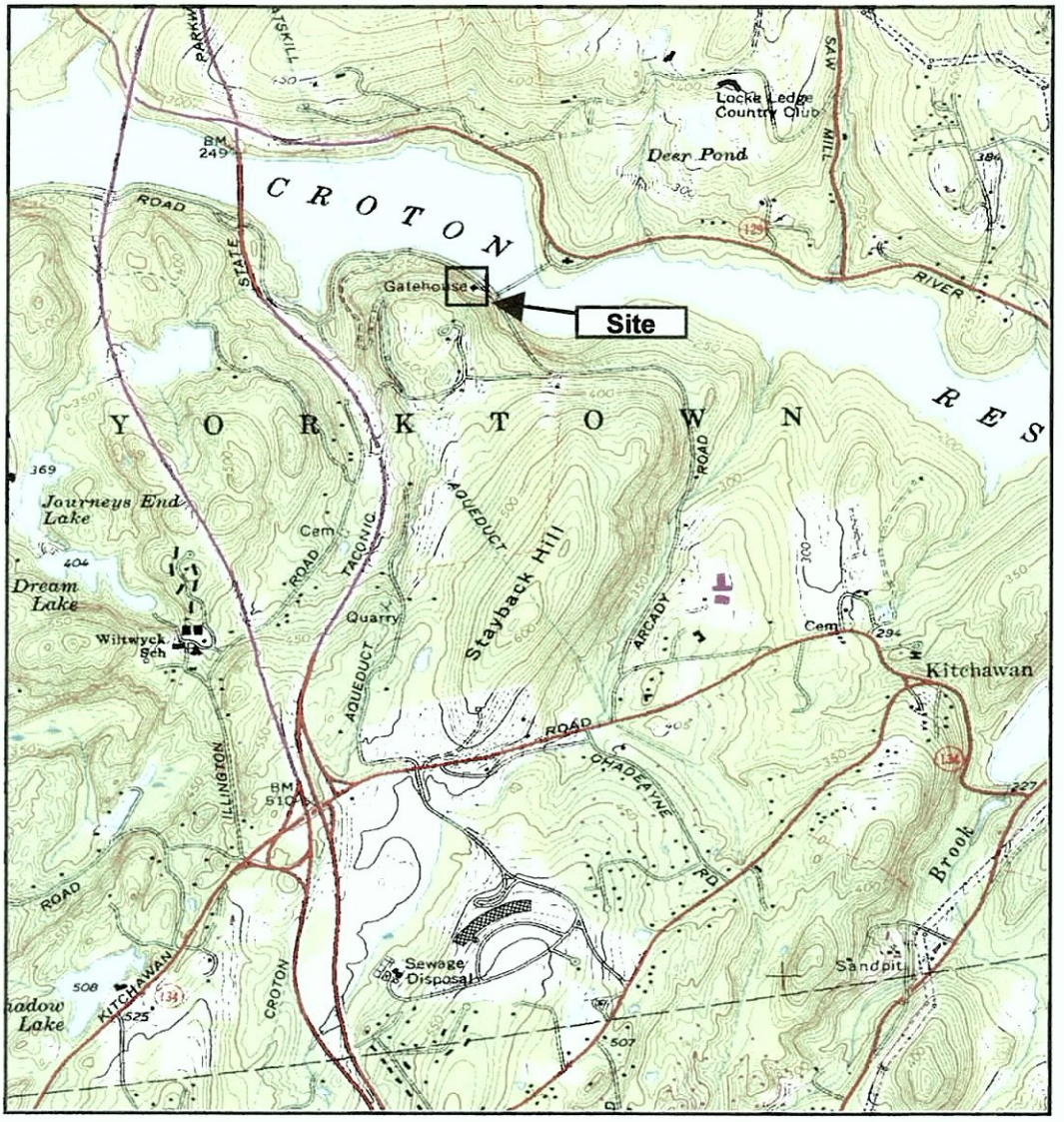


New Croton Aqueduct **Westchester Co., NY**		***Croton Lake Gate House*** Area Map
Ossining Quadrangle		Figure CLG-1

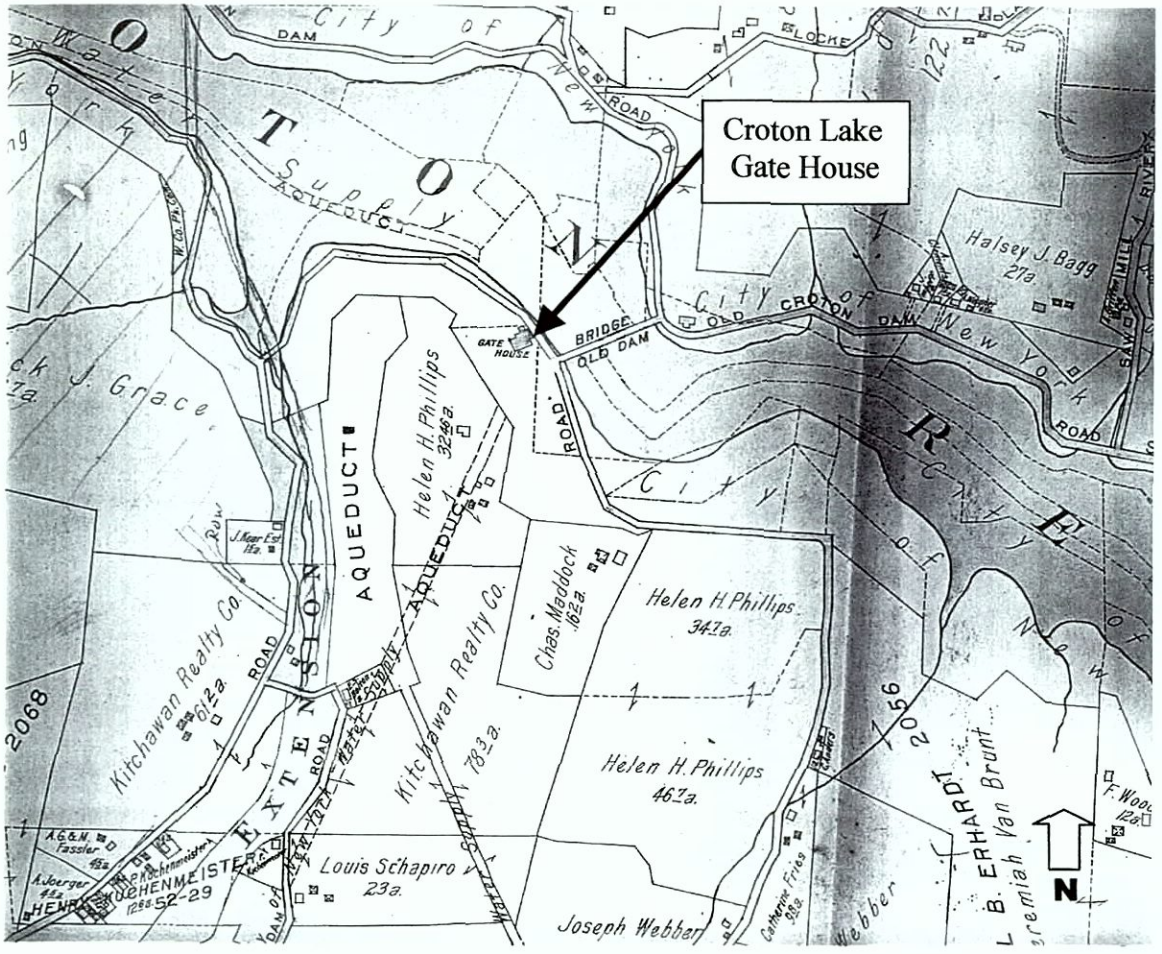
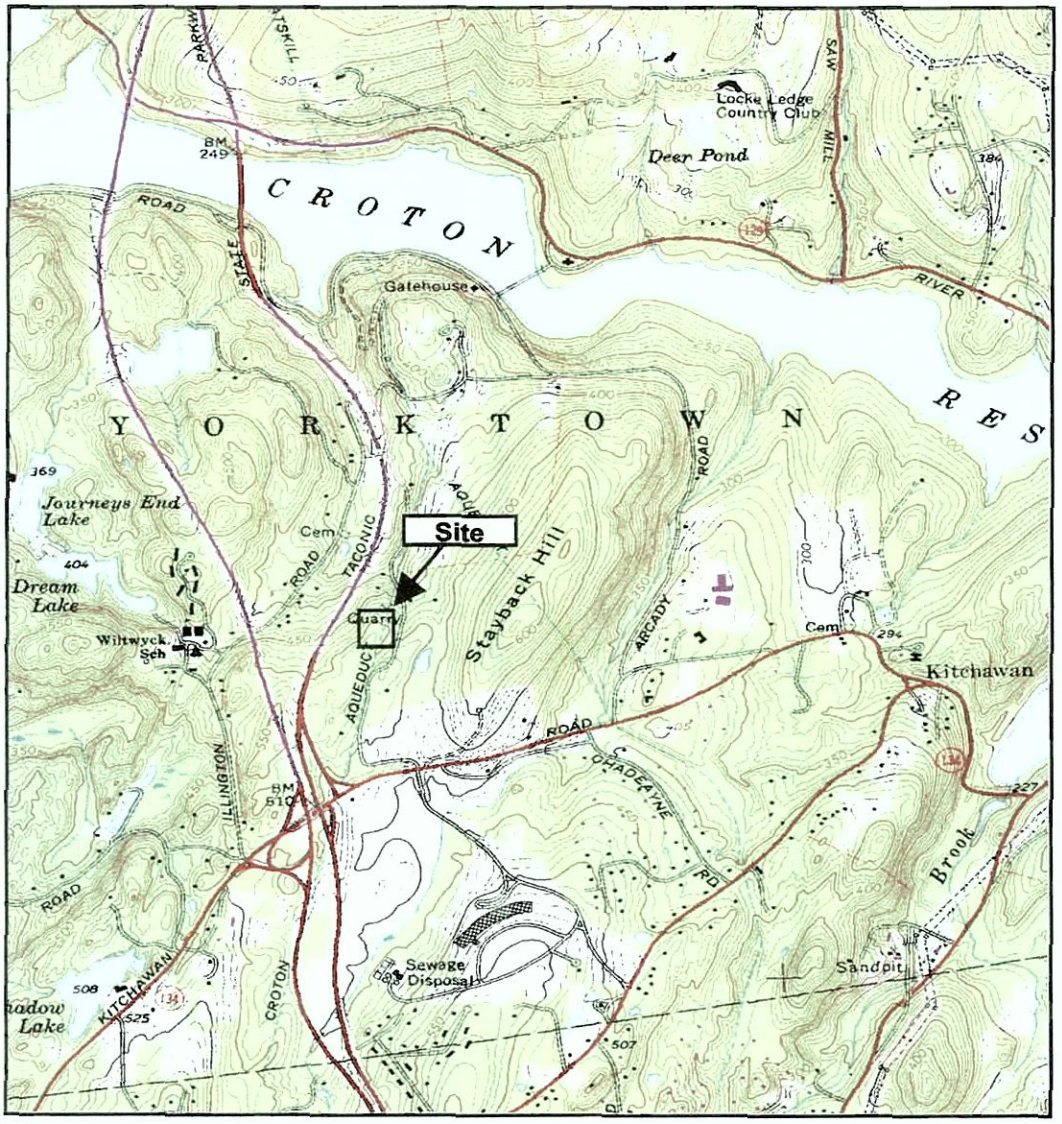


Figure CLG-2: Croton Lake Gate House. Hopkins *Atlas of Westchester County, New York*, 1929. No scale.



New Croton Aqueduct **Westchester Co., NY**		***Shaft No. 1*** Area Map
Ossining Quadrangle		Figure 1-1

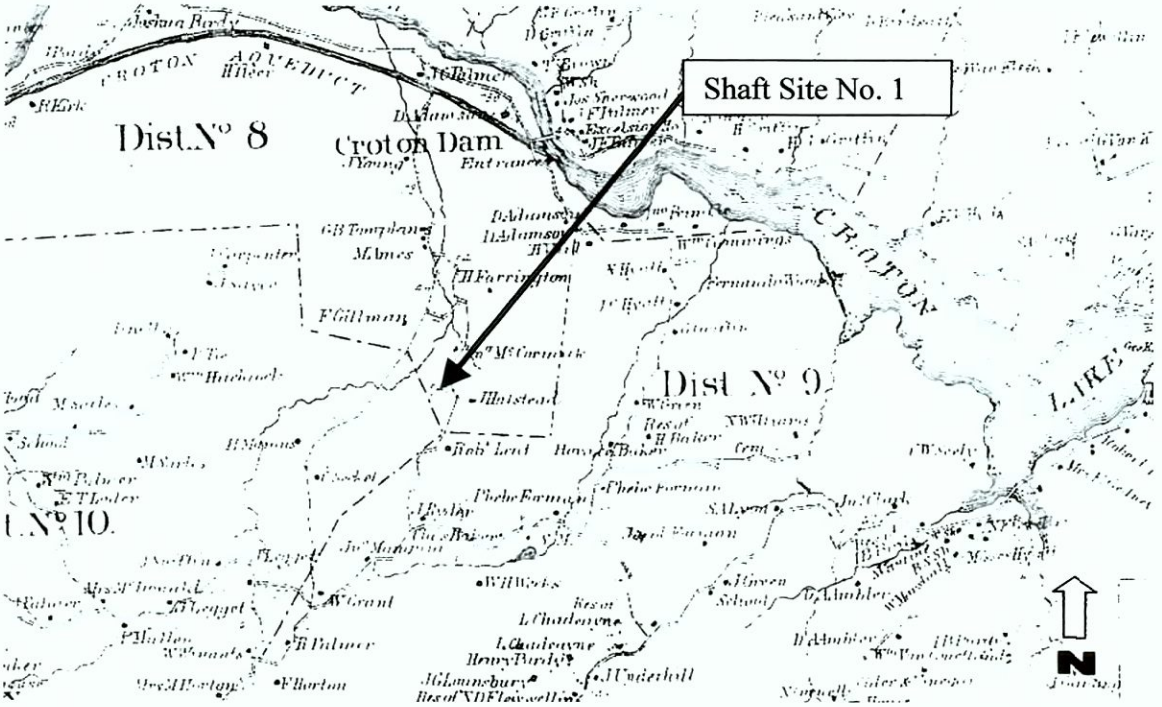
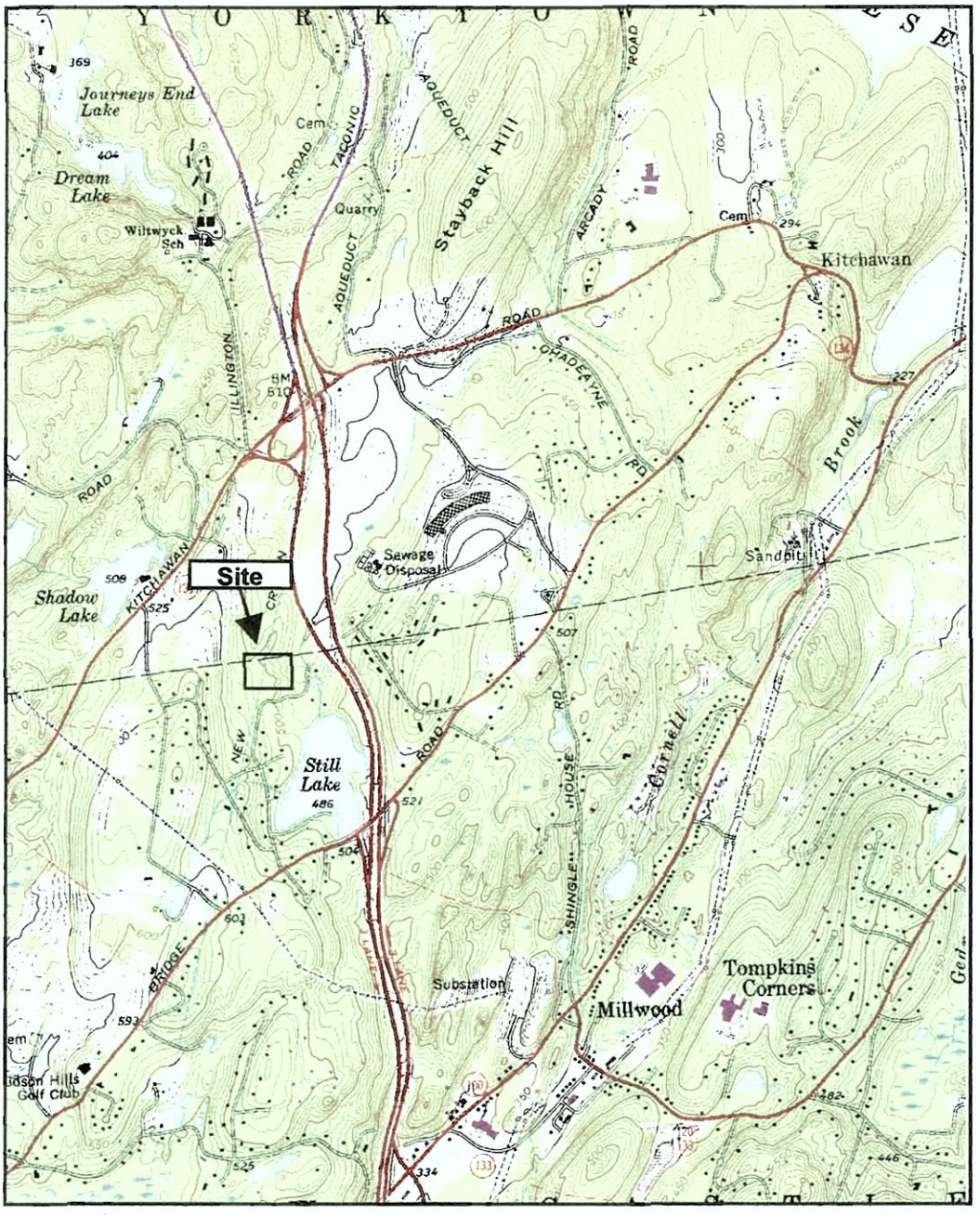
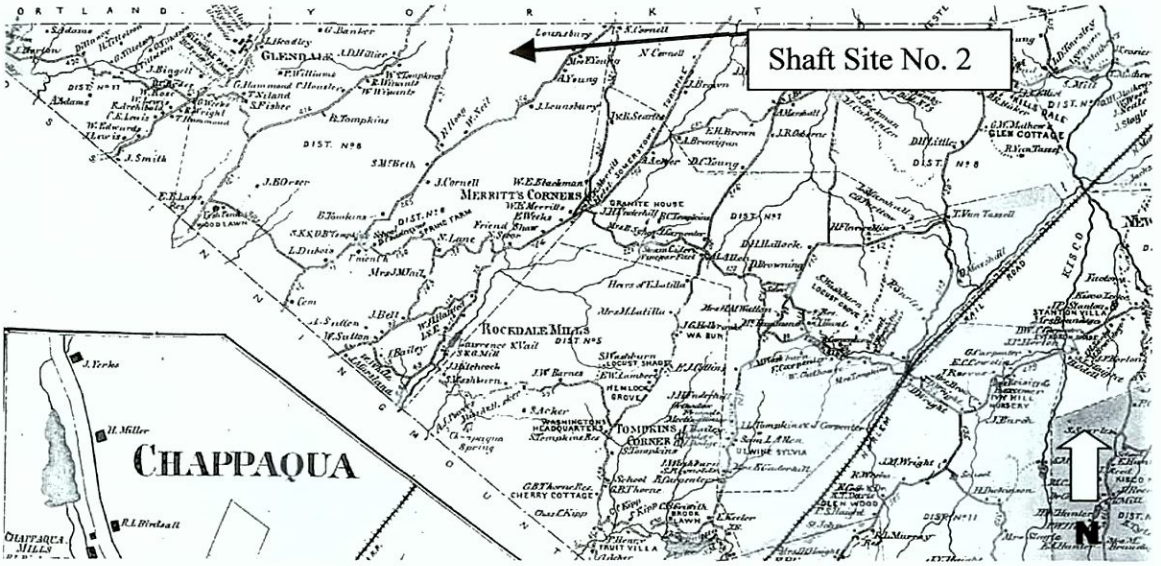


Figure 1-2: Shaft No. 1. Beers *Atlas of New York and Vicinity*, 1867. West Farms, New York. No scale.



New Croton Aqueduct		***Shaft No. 2***
Westchester Co., NY		Area Map
Ossining Quadrangle		Figure 2-1



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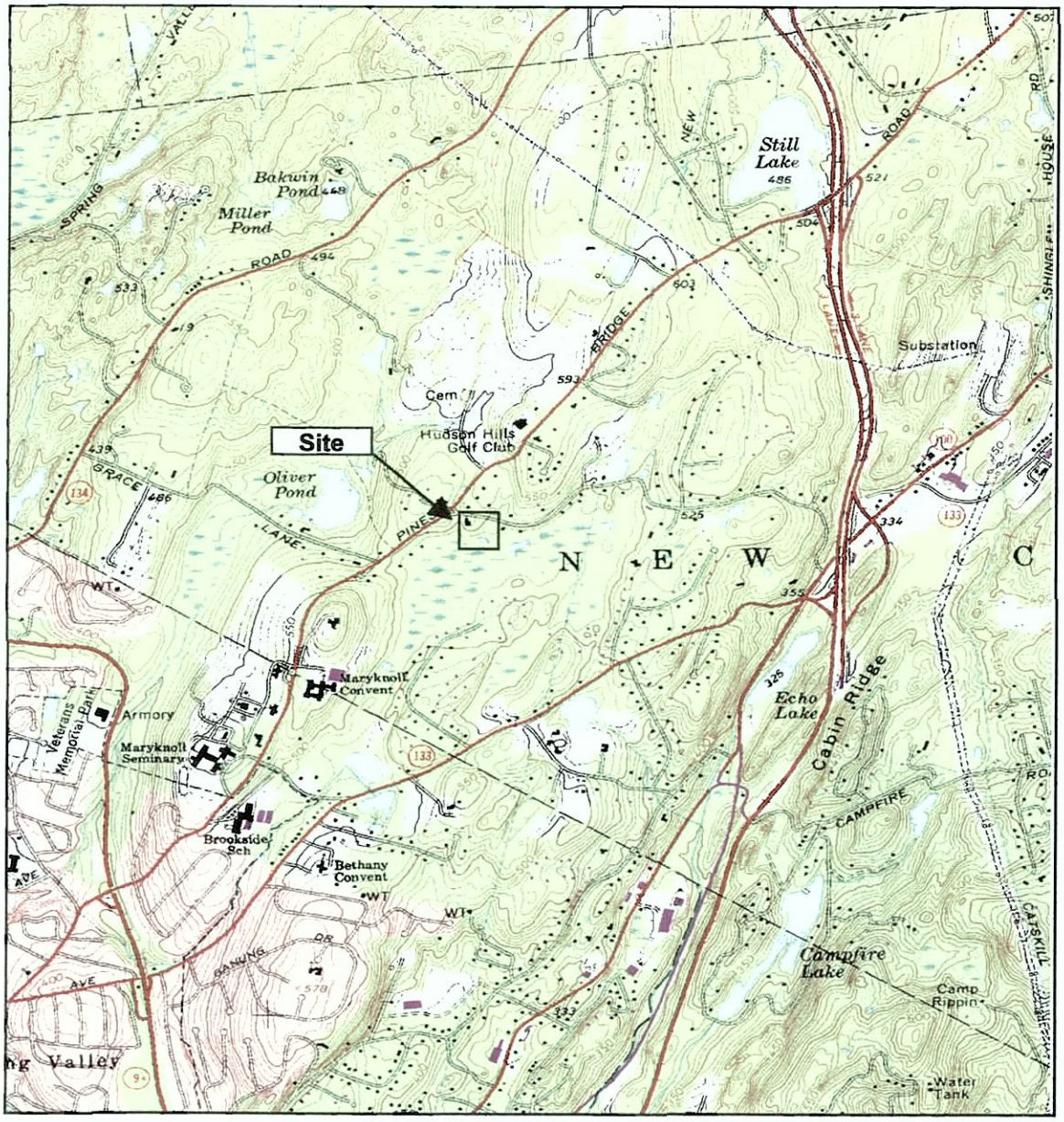
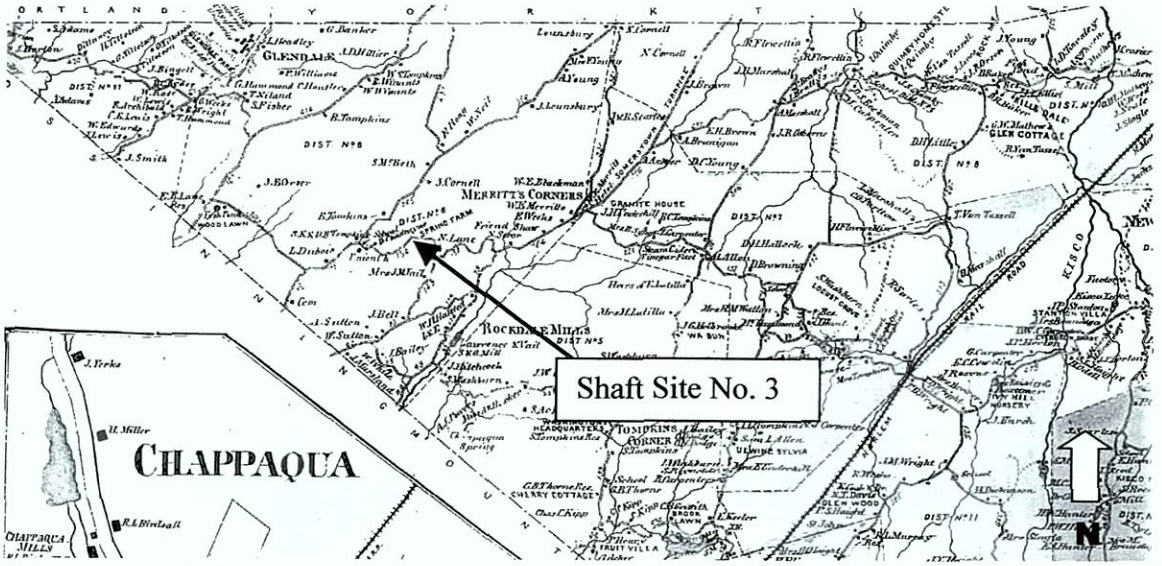


New Croton Aqueduct		***Shaft No. 3***
Westchester Co., NY		Area Map
Ossining Quadrangle		Figure 3-1



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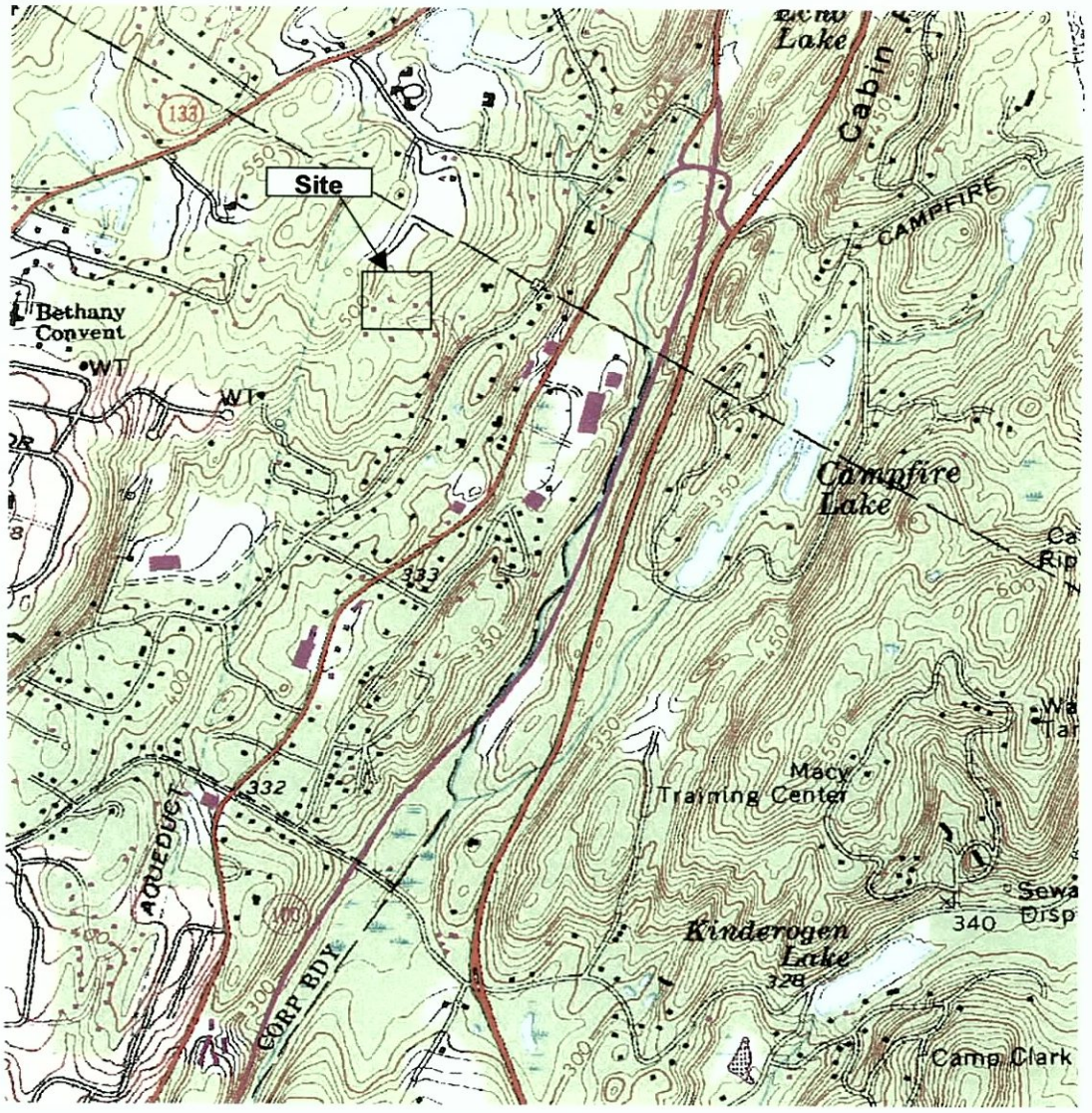
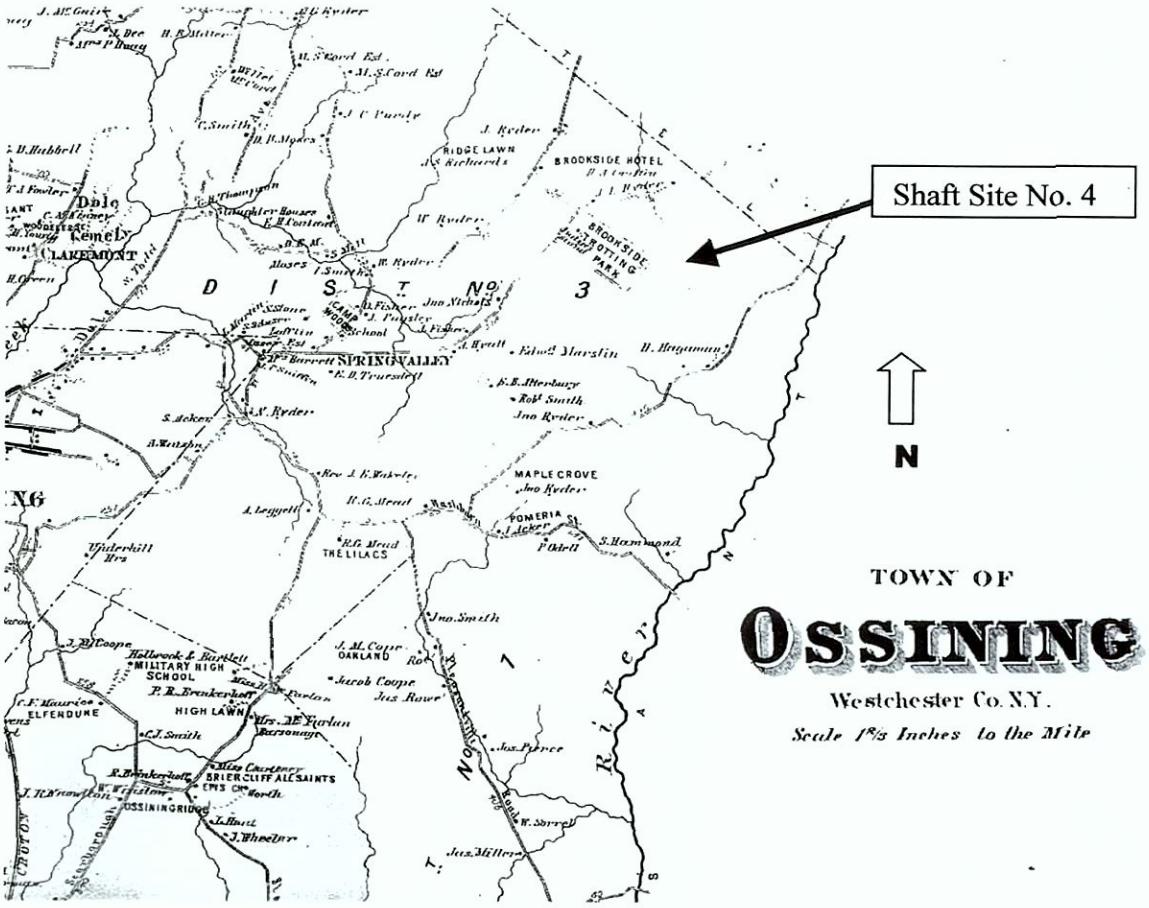


New Croton Aqueduct **Westchester Co., NY**		***Shaft No. 4*** Area Map
Ossining Quadrangle		Figure 4-1



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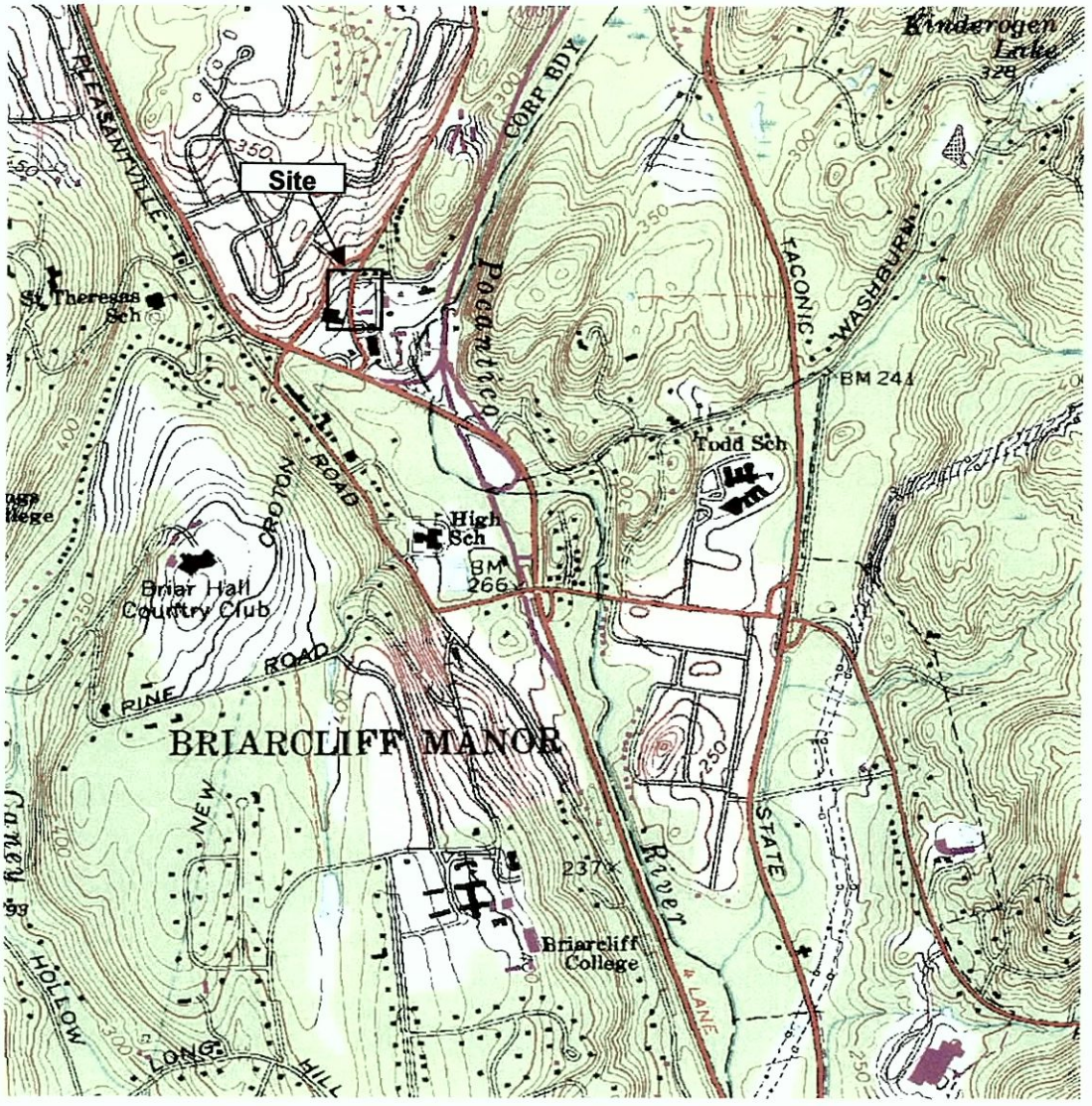
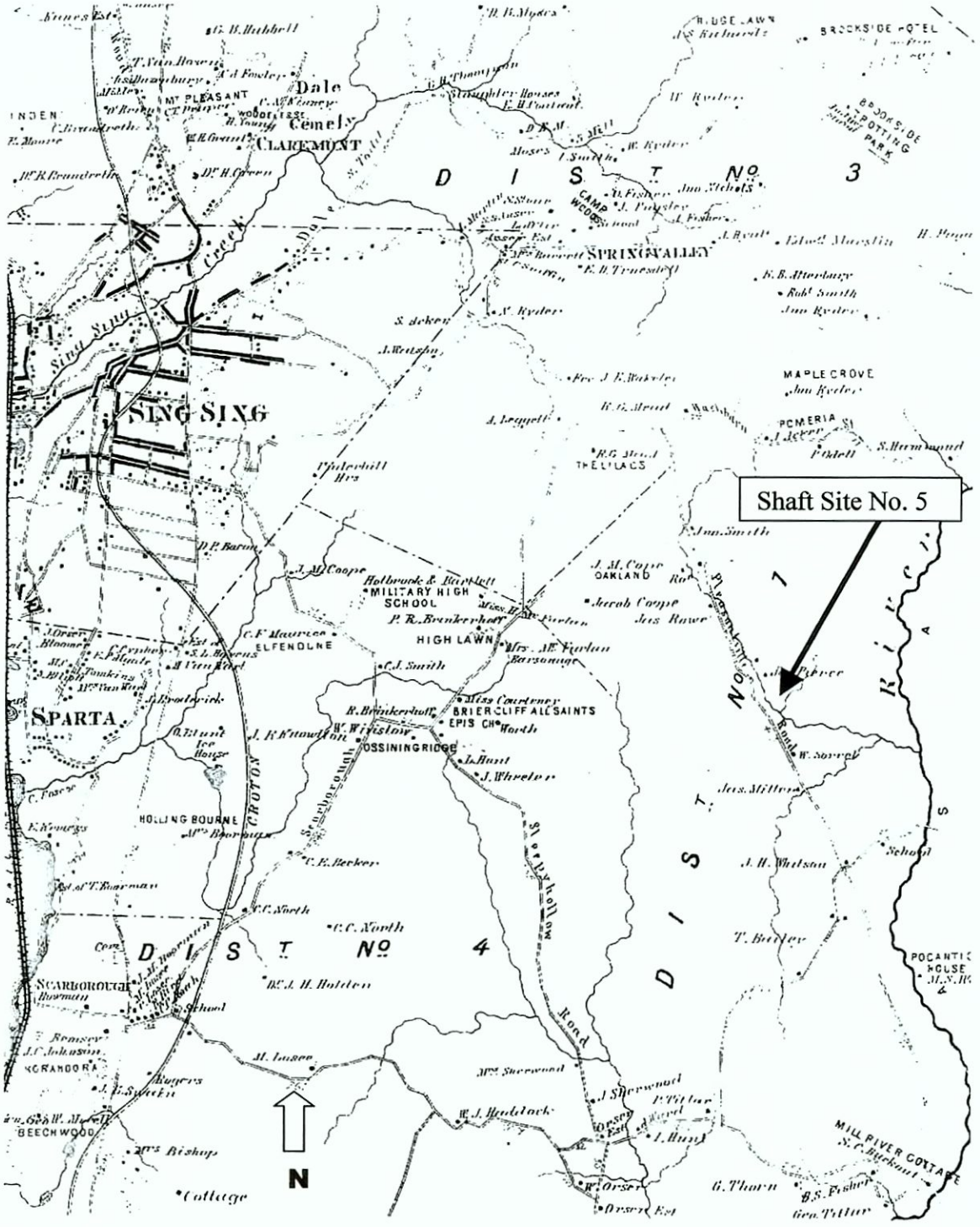


New Croton Aqueduct **Westchester Co., NY**		***Shaft No. 5*** Area Map
Ossining Quadrangle		Figure 5-1



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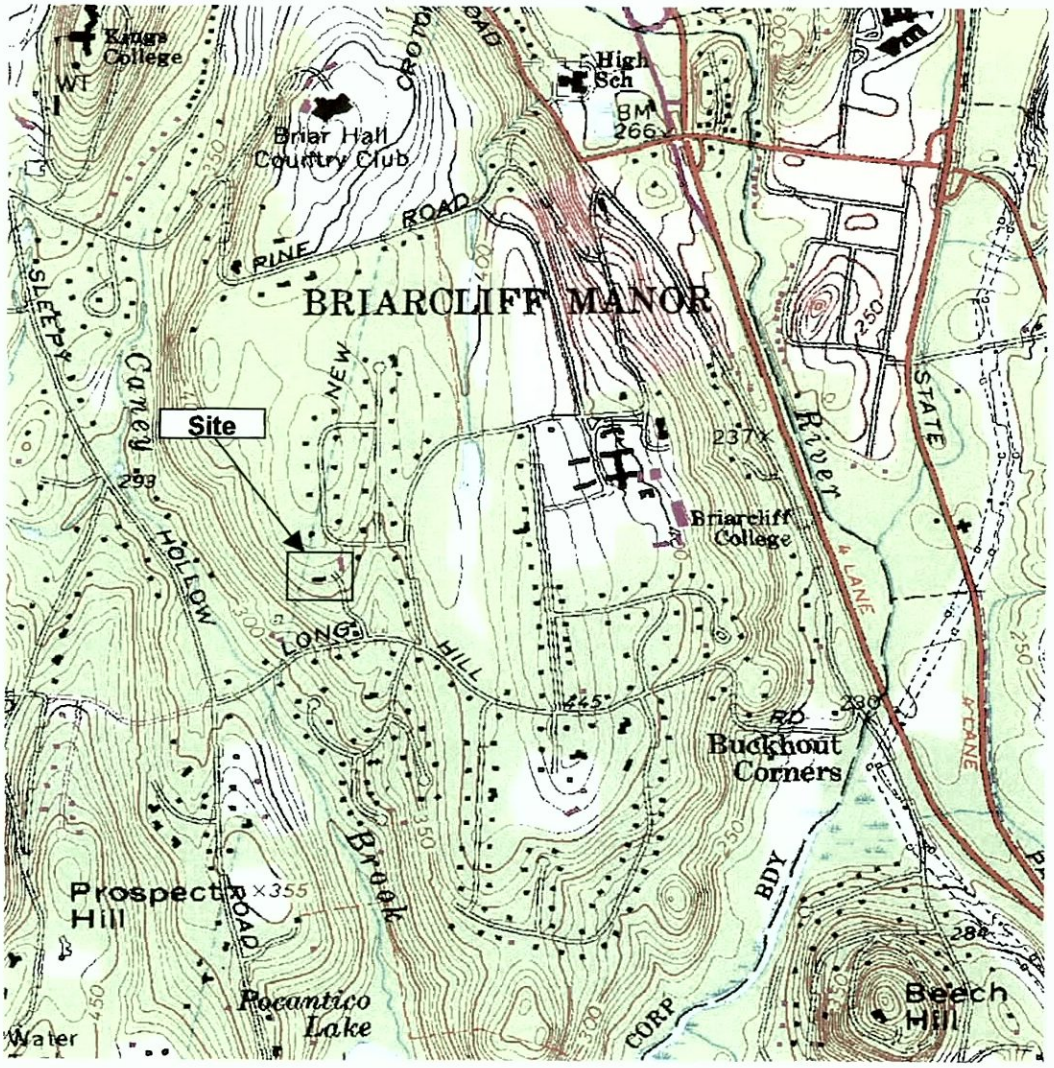
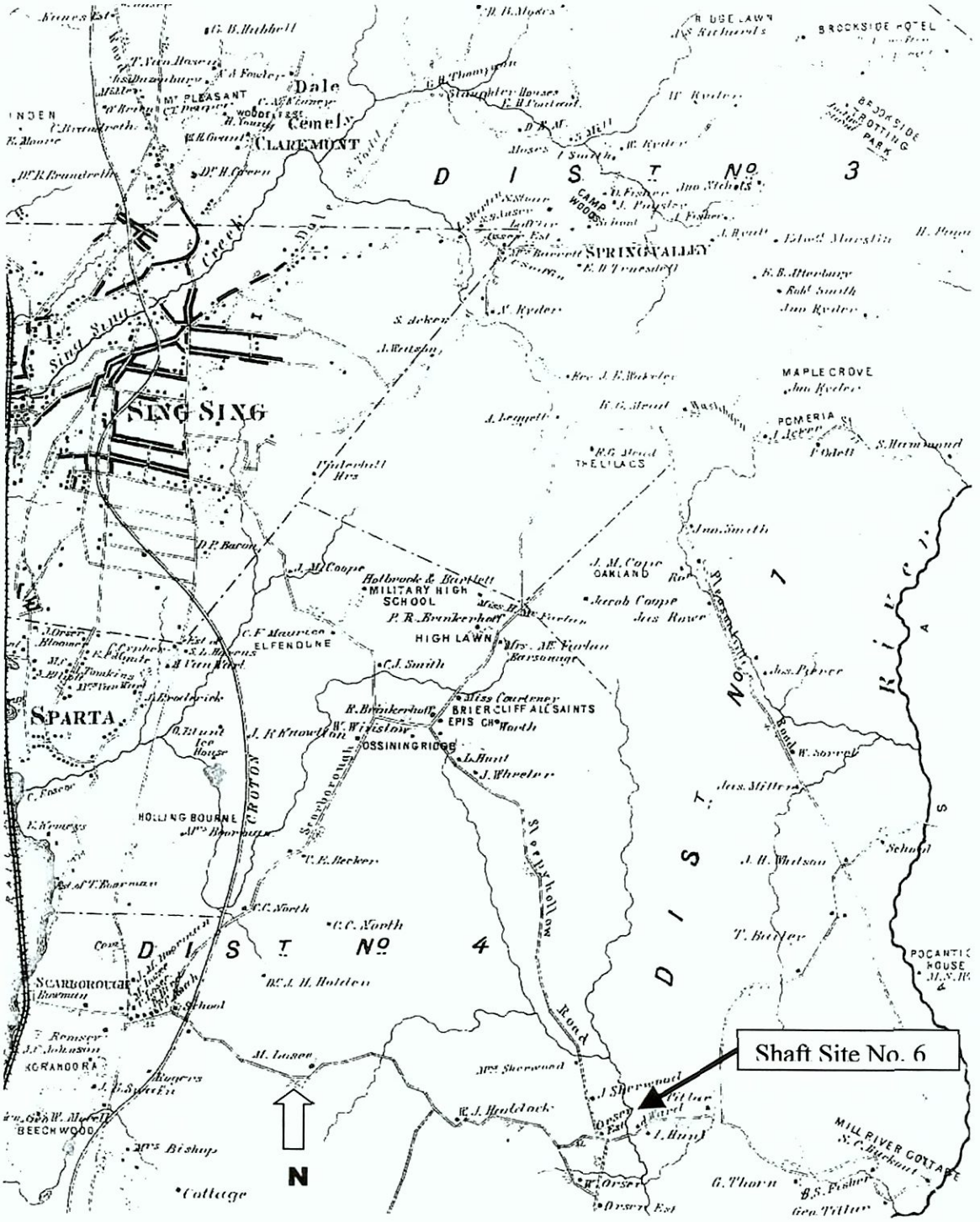


New Croton Aqueduct **Westchester Co., NY**		***Shaft No. 6*** Area Map
Ossining Quadrangle		Figure 6-1



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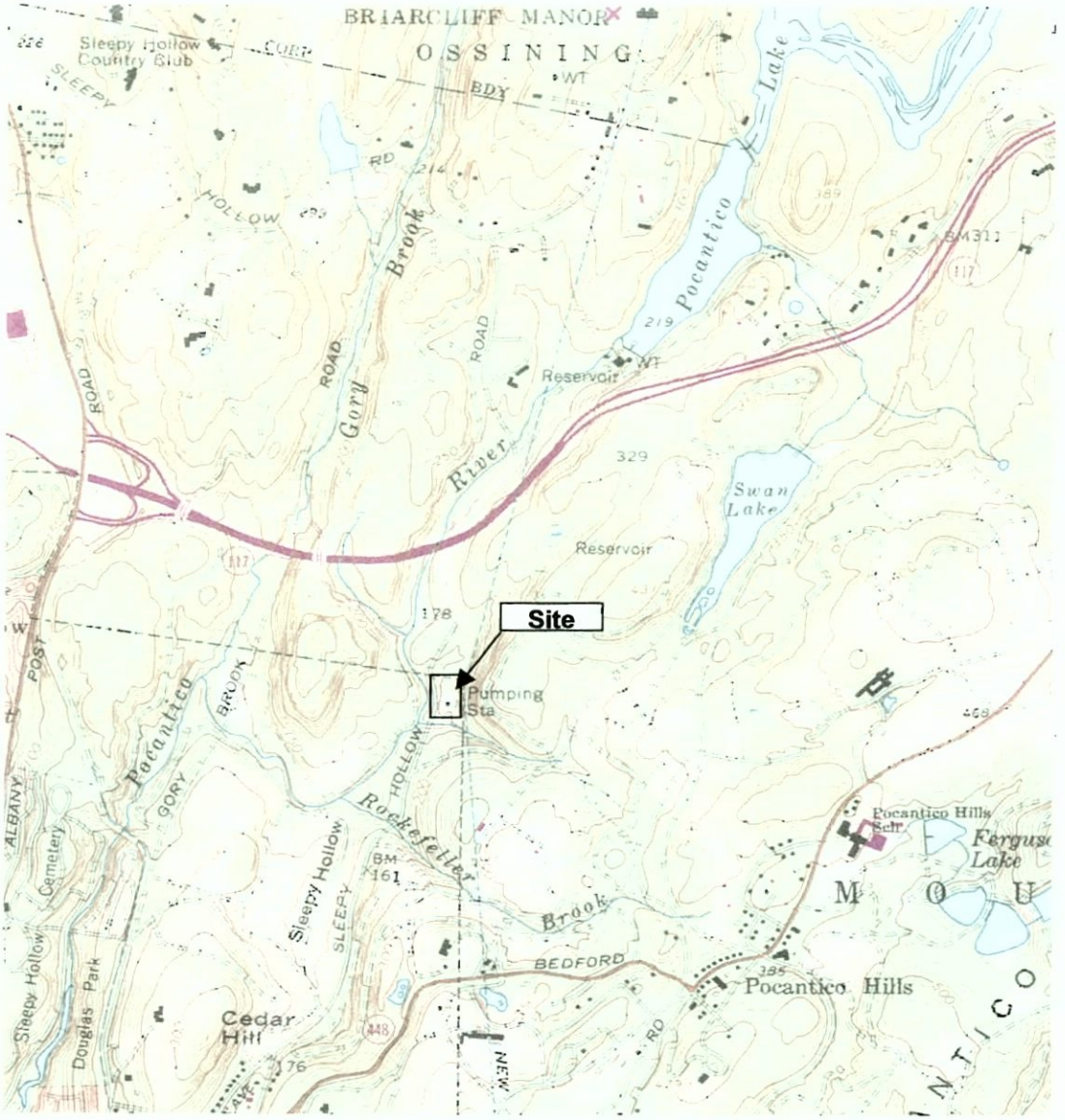
New Croton Aqueduct **Westchester Co., NY**		***Shaft No. 8*** Area Map
White Plains Quadrangle		Figure 8-1

Figure 8-2: Shaft No. 8. Beers *Atlas of New York and Vicinity*, 1867. West Farms, New York. No scale.



New Croton Aqueduct **Westchester Co., NY**		***Shaft No. 9*** Area Map
White Plains Quadrangle		Figure 9-1

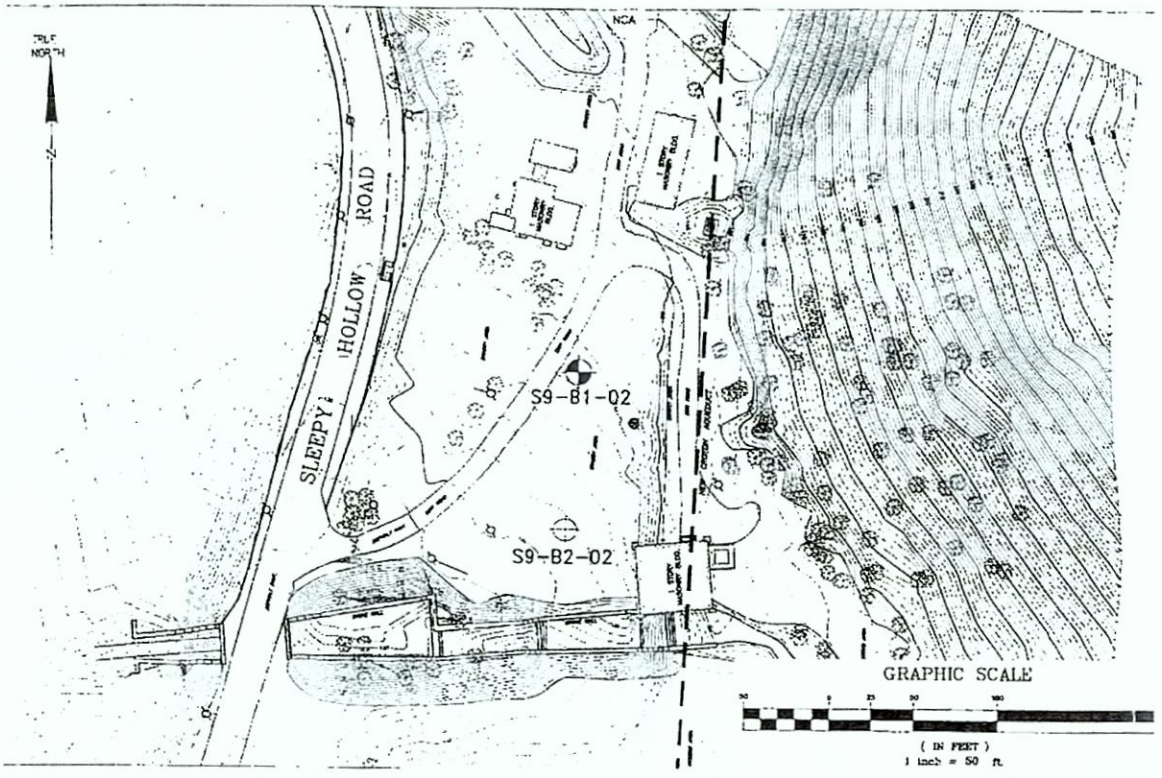


Figure 9-2: Location of soil borings at Shaft Site No. 9.

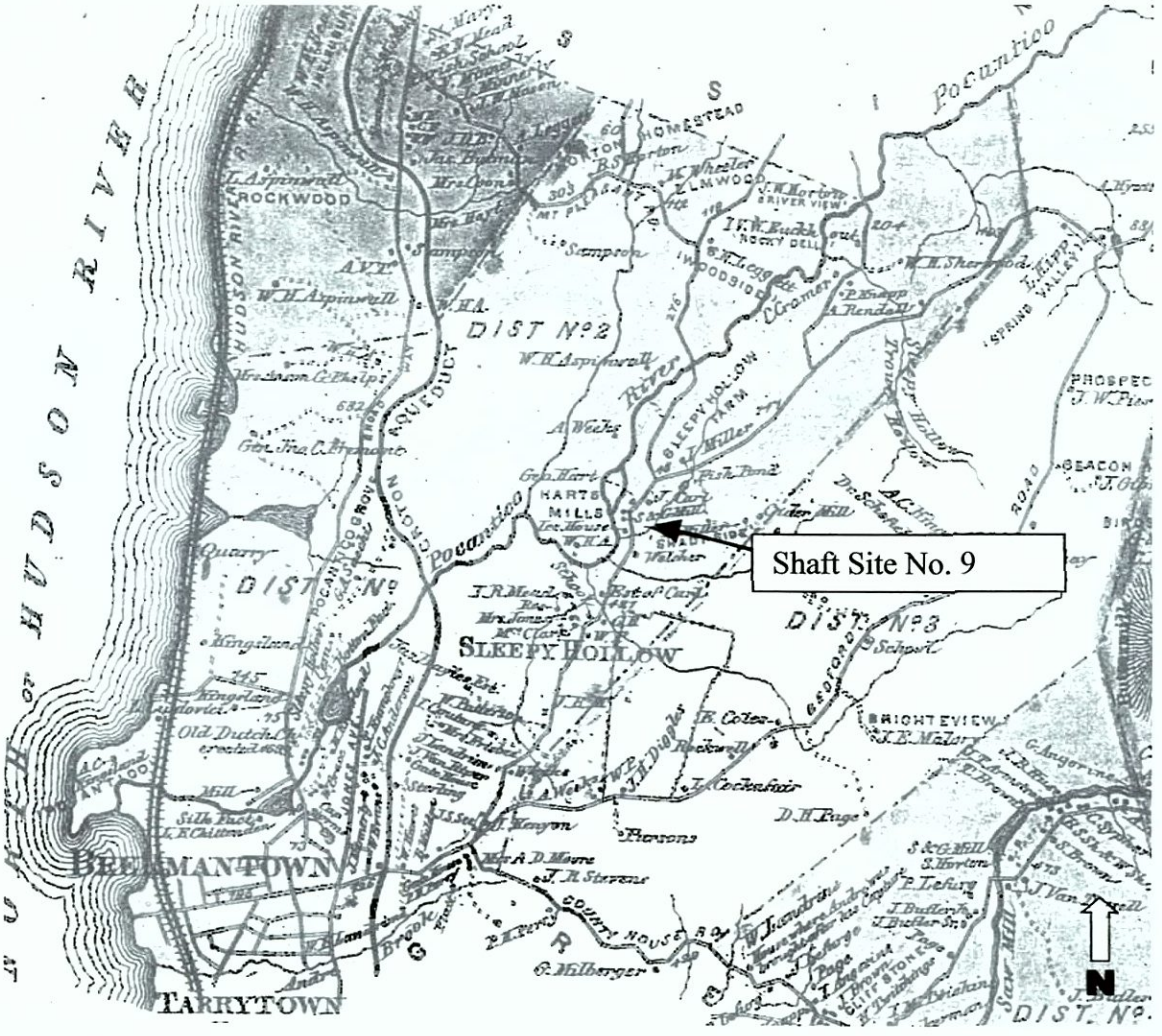
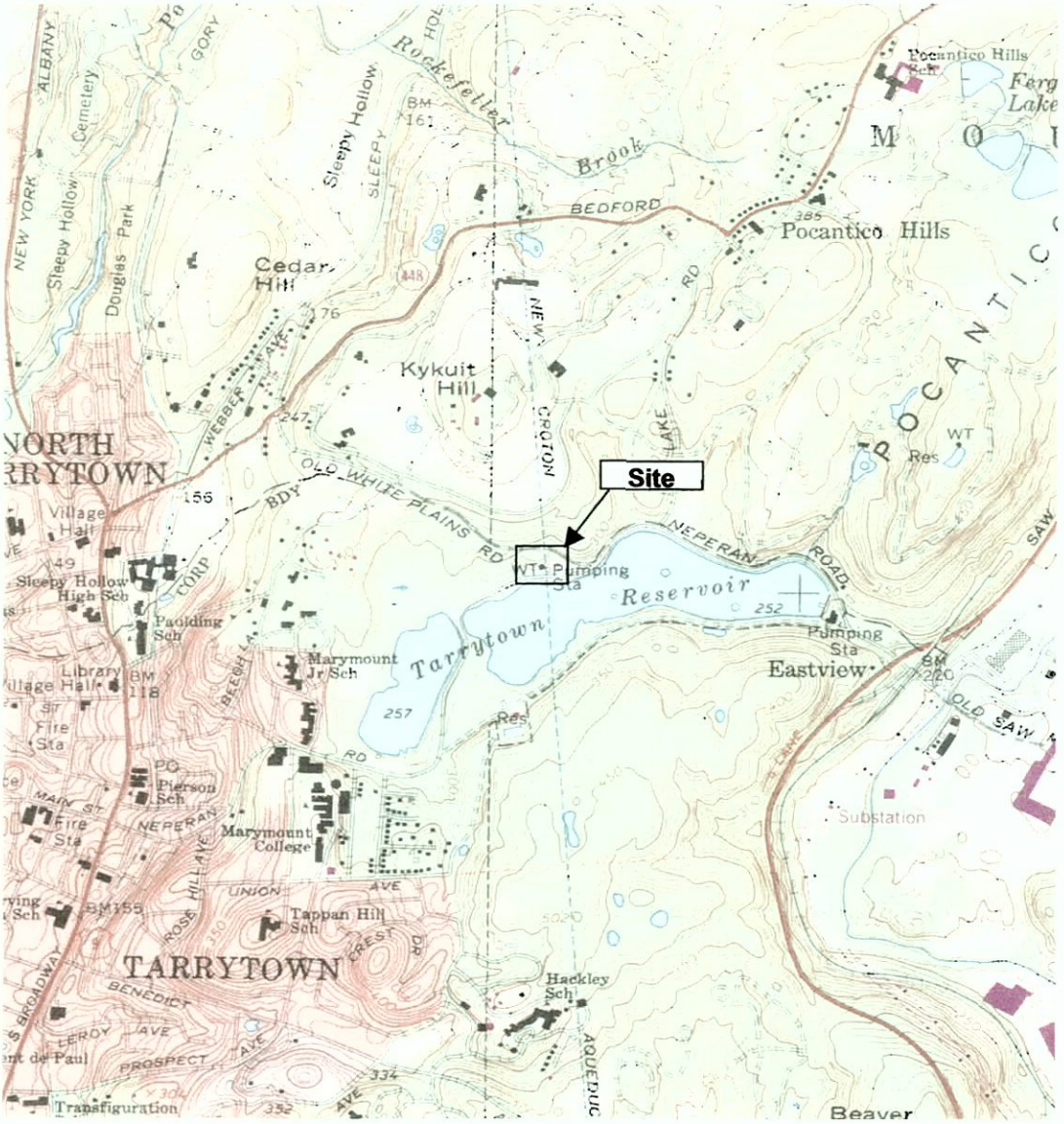


Figure 9-3: Shaft No. 9. Beers *Atlas of New York and Vicinity*, 1867. West Farms, New York. No scale.



New Croton Aqueduct **Westchester Co., NY**		***Shaft No. 10*** Area Map
White Plains Quadrangle		Figure 10-1

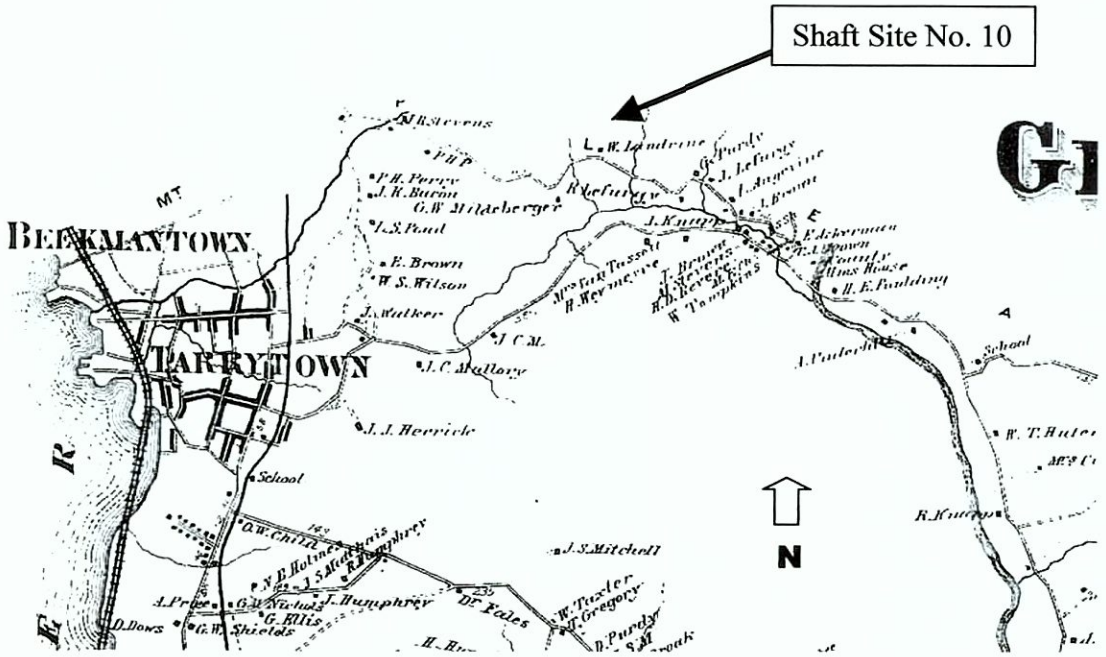
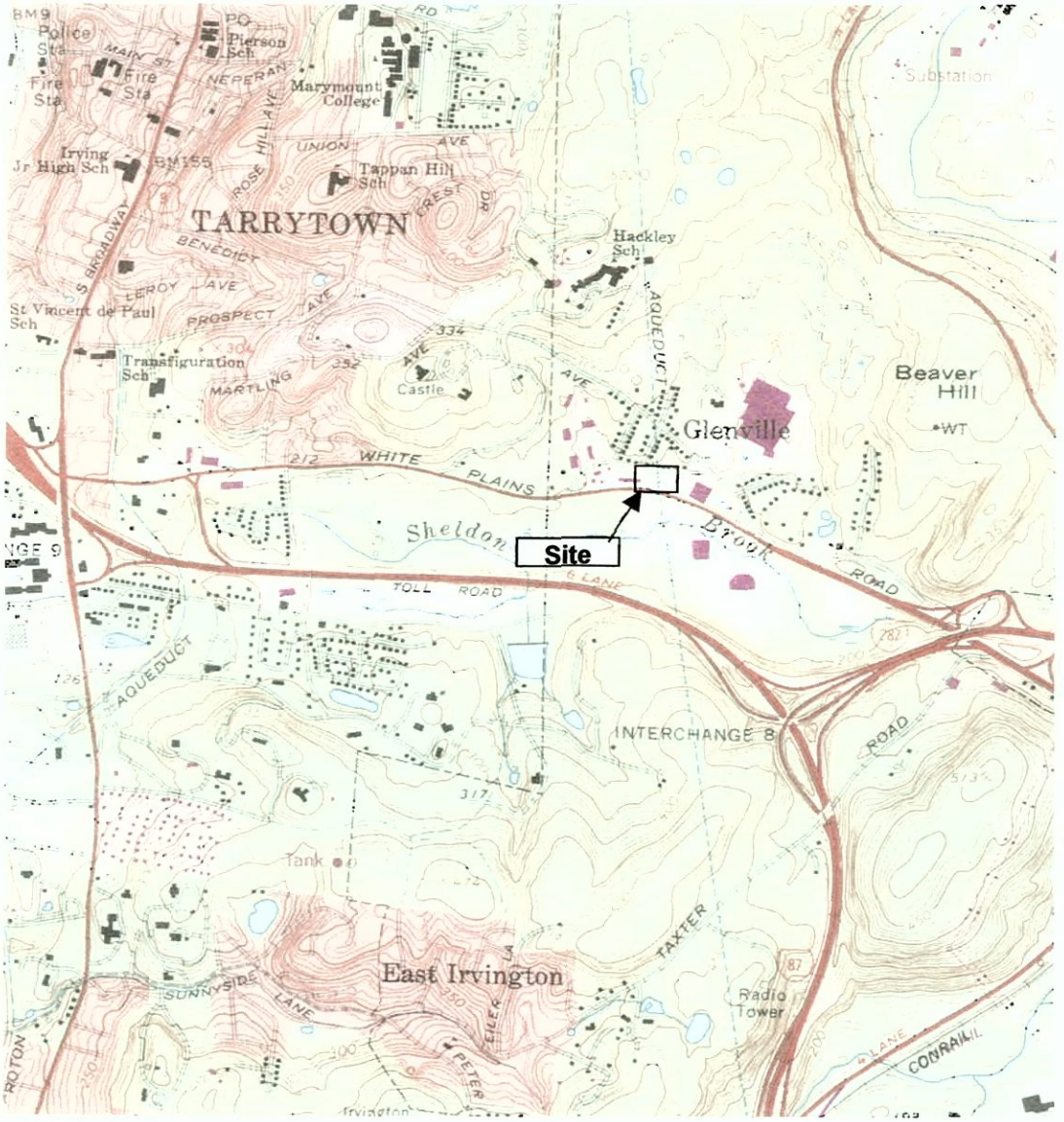


Figure 10-2: Shaft No. 10. Beers *Atlas of New York and Vicinity*, 1867. West Farms, New York. No scale.



New Croton Aqueduct **Westchester Co., NY**		***Shaft No. 11A*** Area Map
White Plains Quadrangle		Figure 11A-1

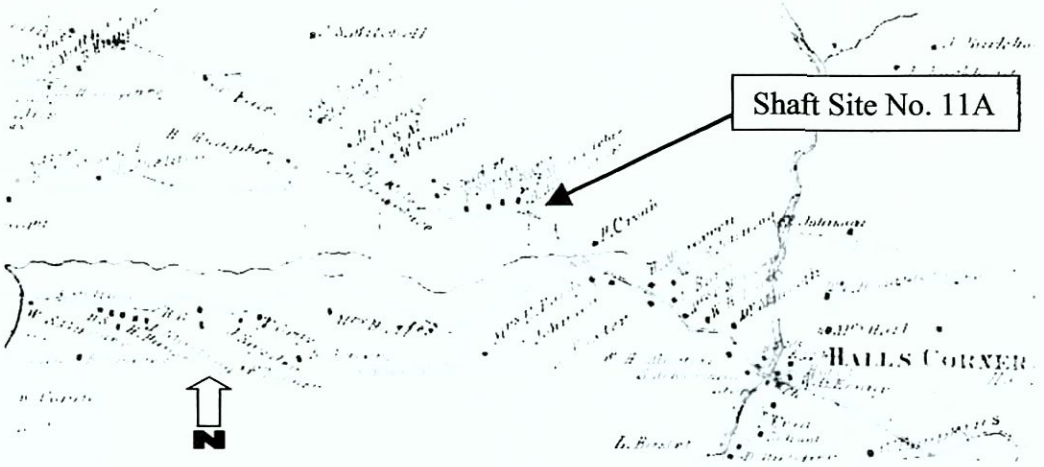
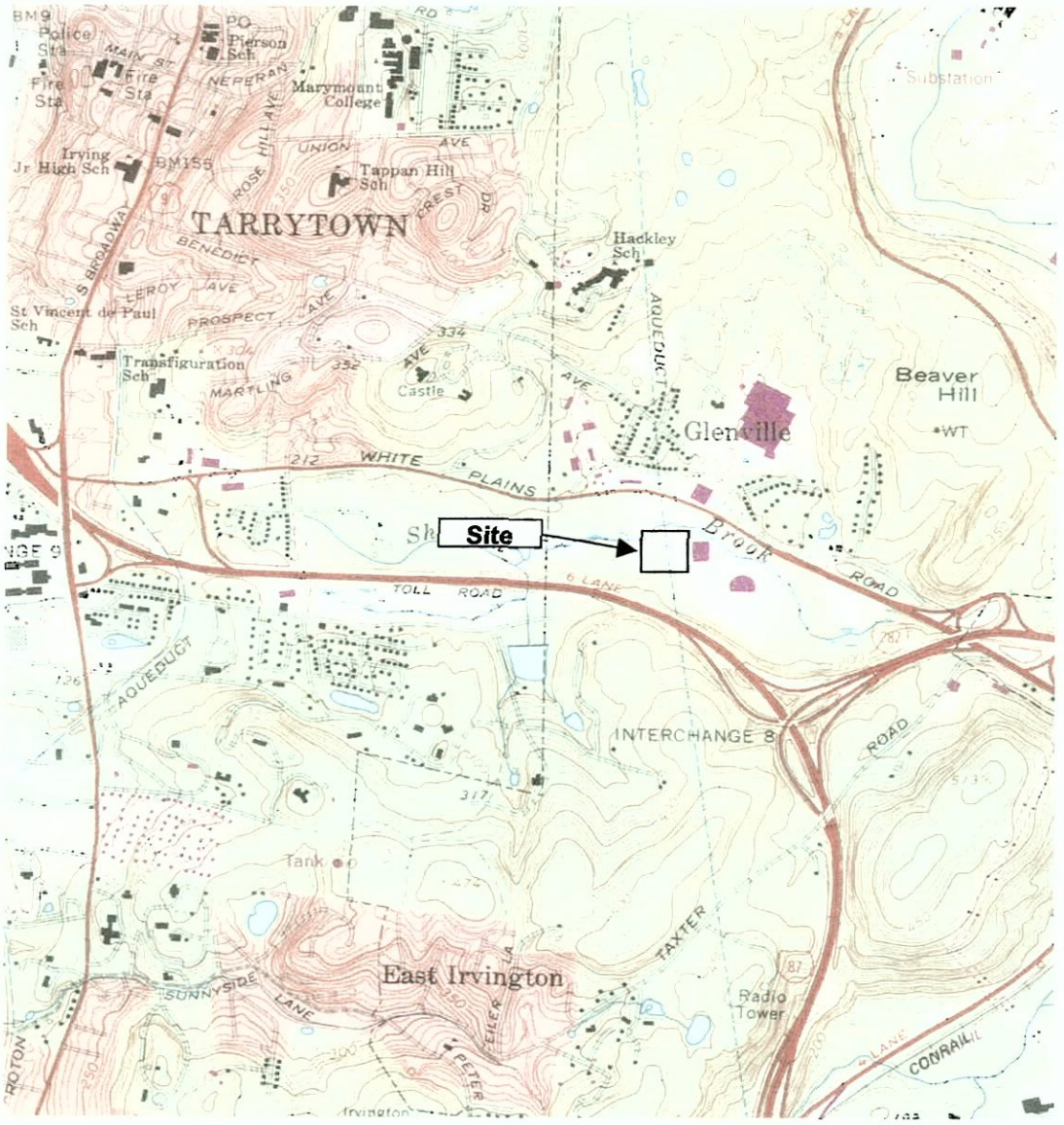


Figure 11A-2: Shaft Site 11A. Beers *Atlas of New York and Vicinity*, 1867. West Farms, New York. No scale.



New Croton Aqueduct **Westchester Co., NY**		***Shaft Nos. 11 B&C*** Area Map
White Plains Quadrangle		Figure 11B&C-1

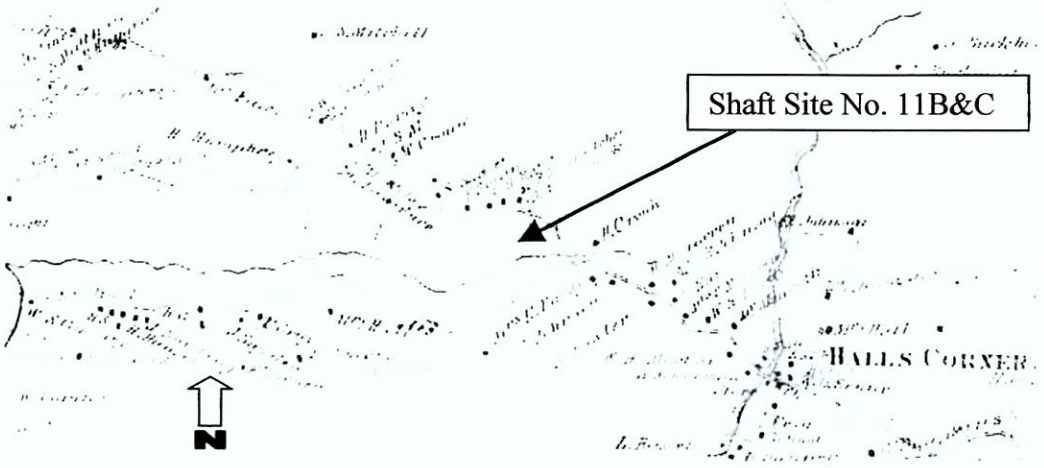
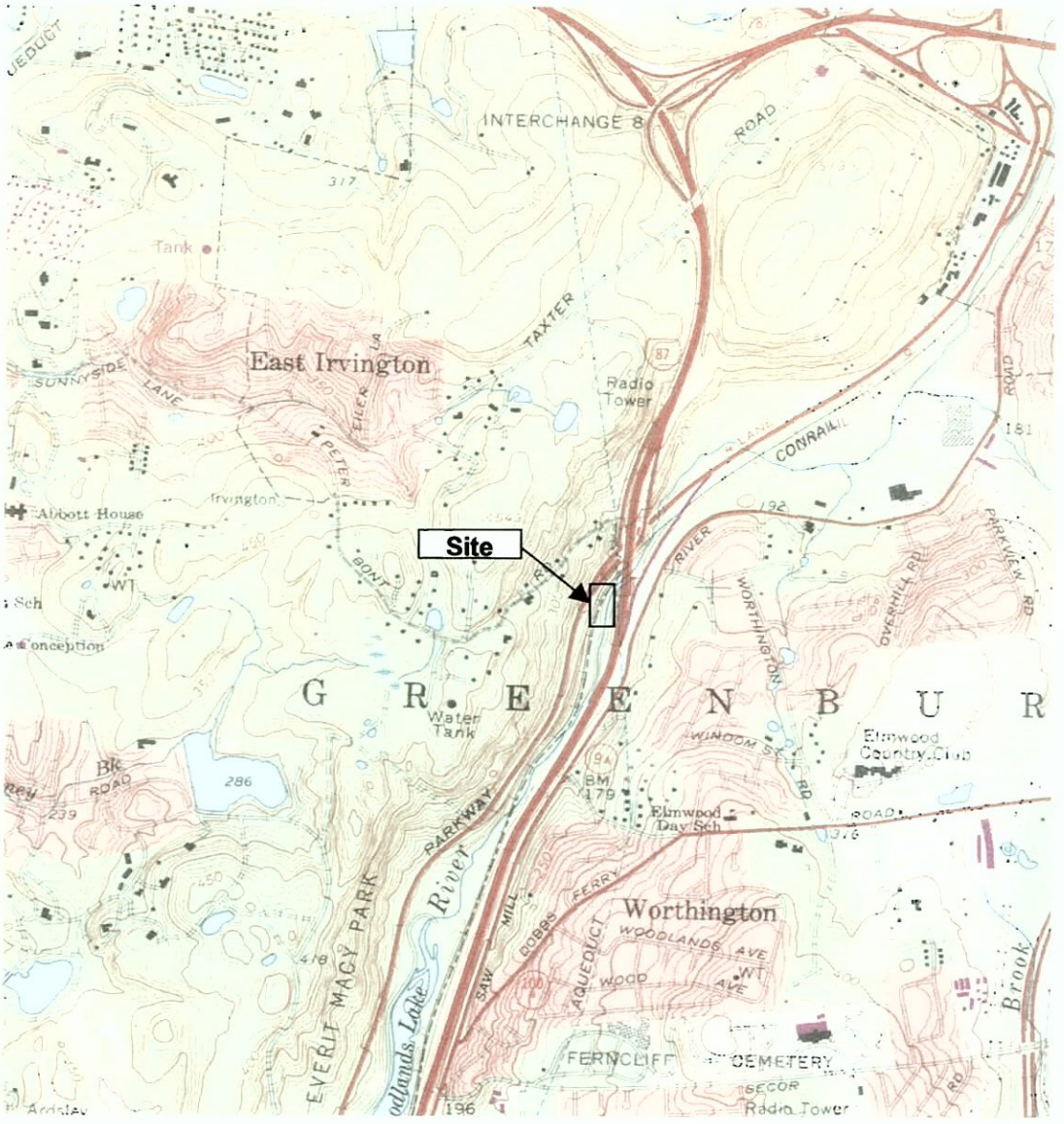


Figure 11B&C-2: Shaft Site11B&C. Beers *Atlas of New York and Vicinity*, 1867. West Farms, New York. No scale.



New Croton Aqueduct **Westchester Co., NY**		***Shaft No. 12A*** Area Map
White Plains Quadrangle		Figure 12A-1

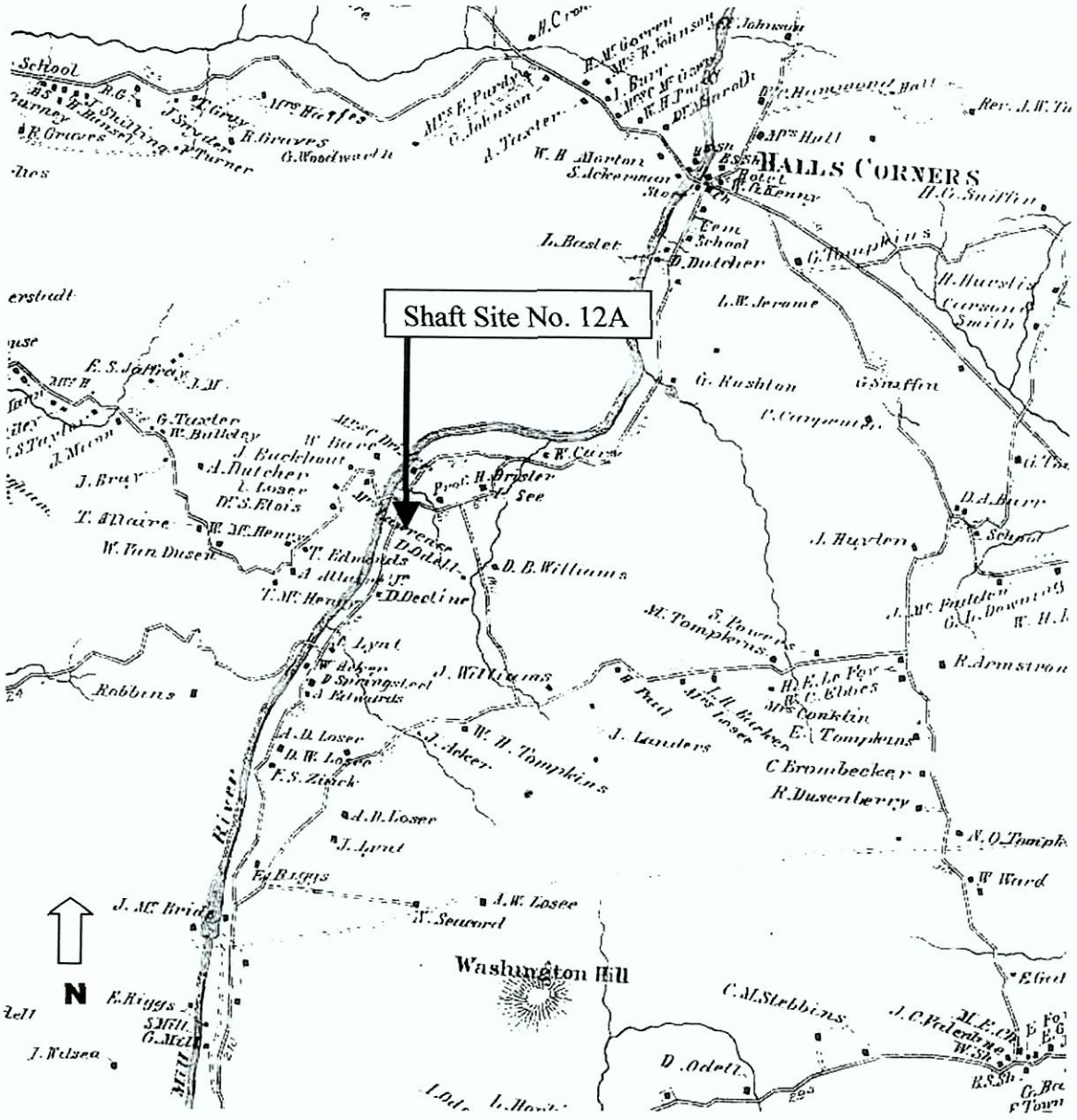
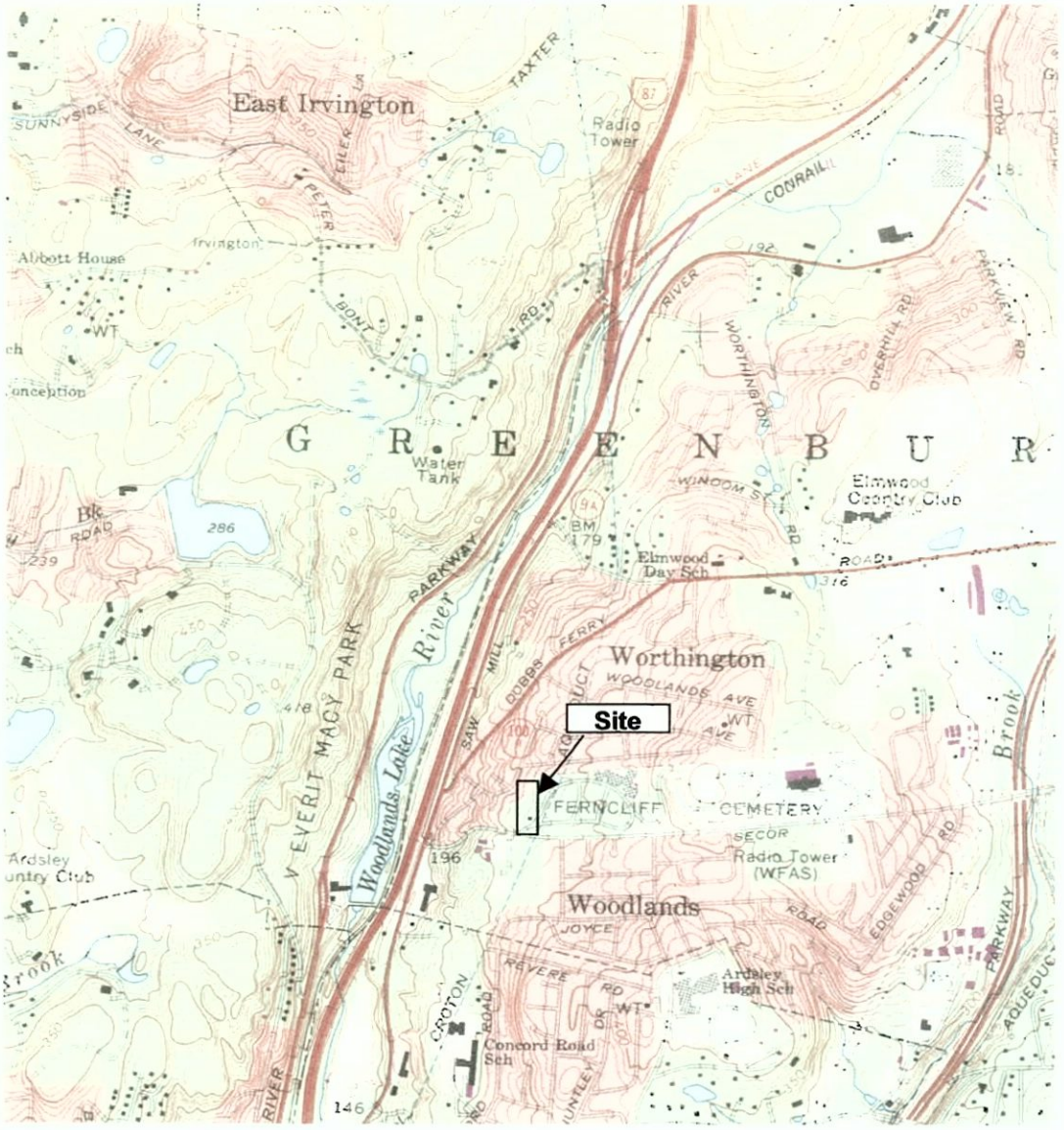


Figure 12A-2: Shaft No. 12A. Beers *Atlas of New York and Vicinity*, 1867. West Farms, New York. No scale.



New Croton Aqueduct **Westchester Co., NY**		***Shaft No. 13*** Area Map
White Plains Quadrangle		Figure 13-1

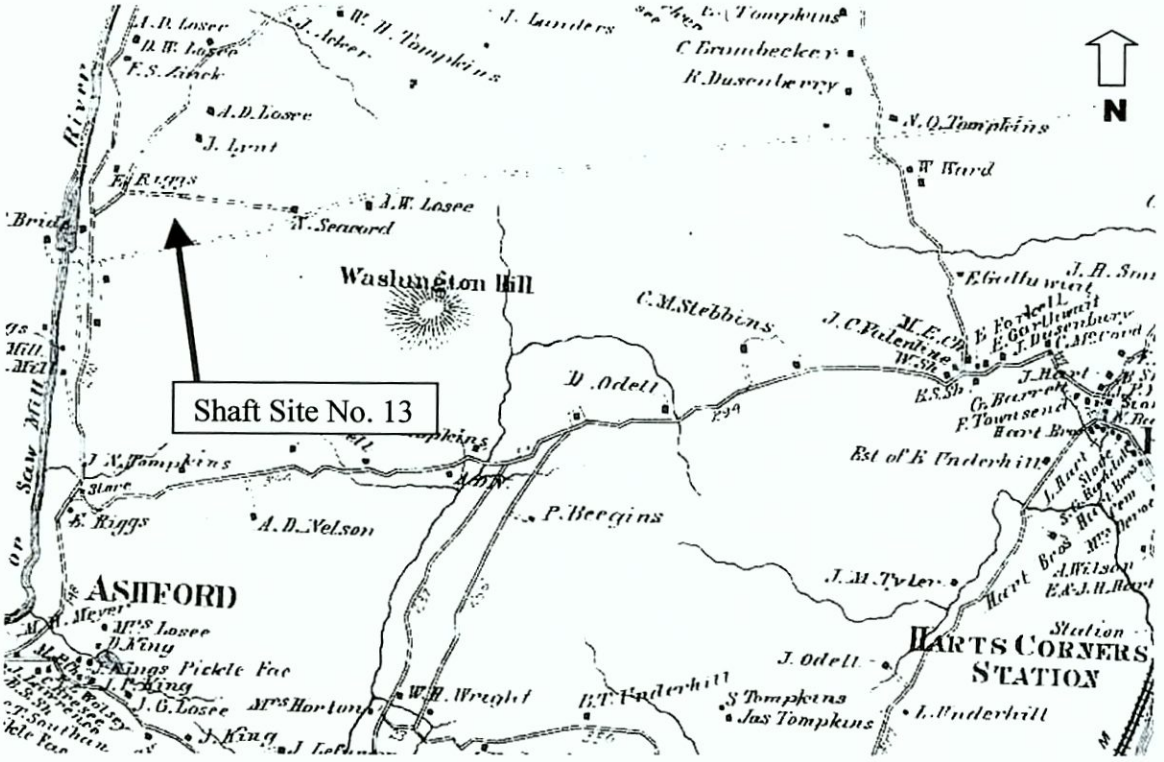
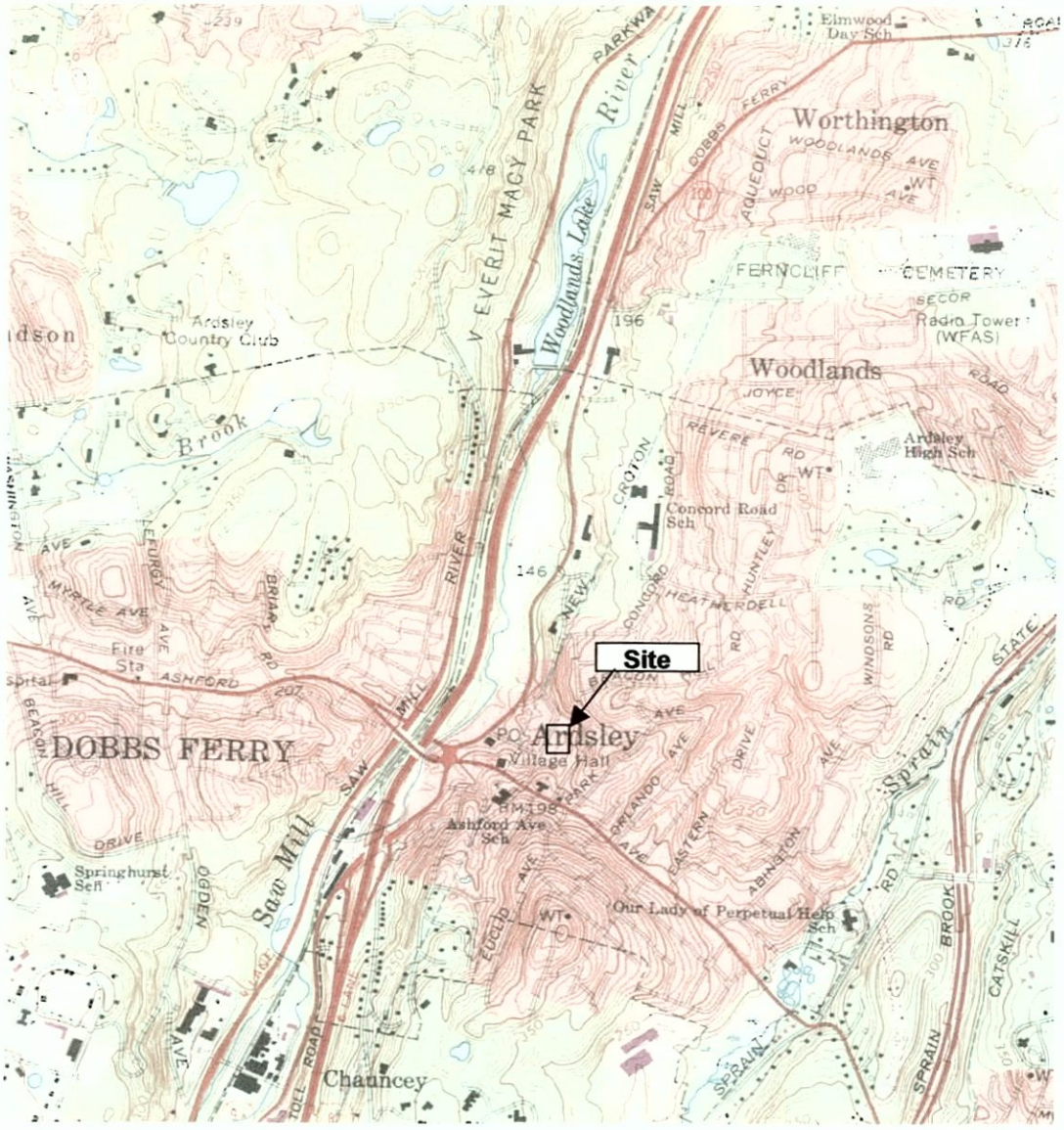


Figure 13-2: Shaft No. 13. Beers *Atlas of New York and Vicinity*, 1867. West Farms, New York. No scale.



New Croton Aqueduct **Westchester Co., NY**		***Shaft No. 14*** Area Map
White Plains Quadrangle		Figure 14-1

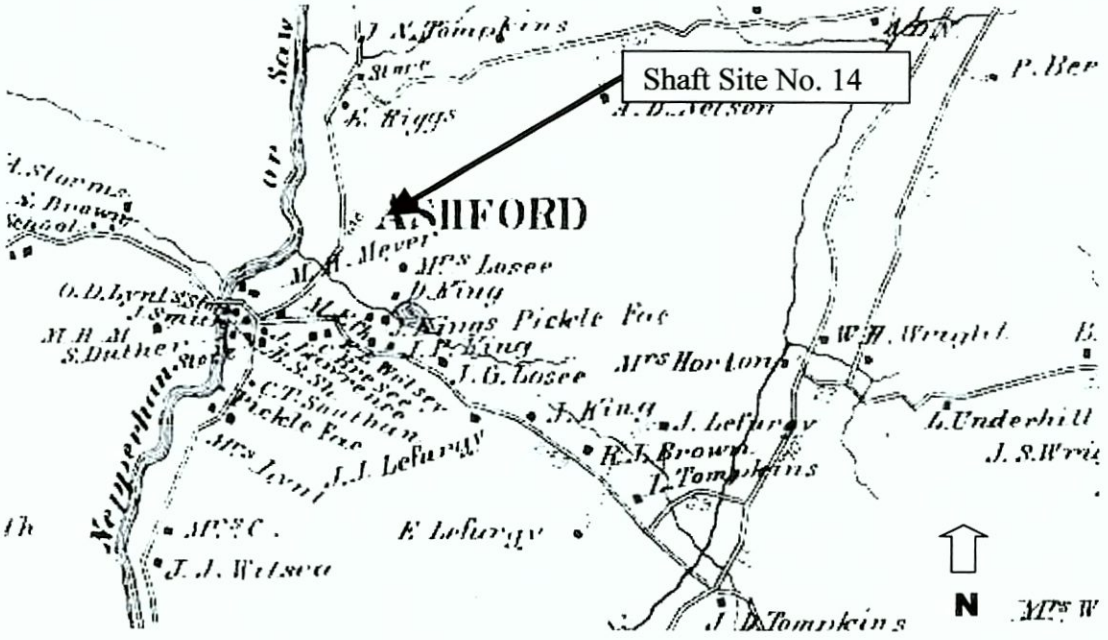
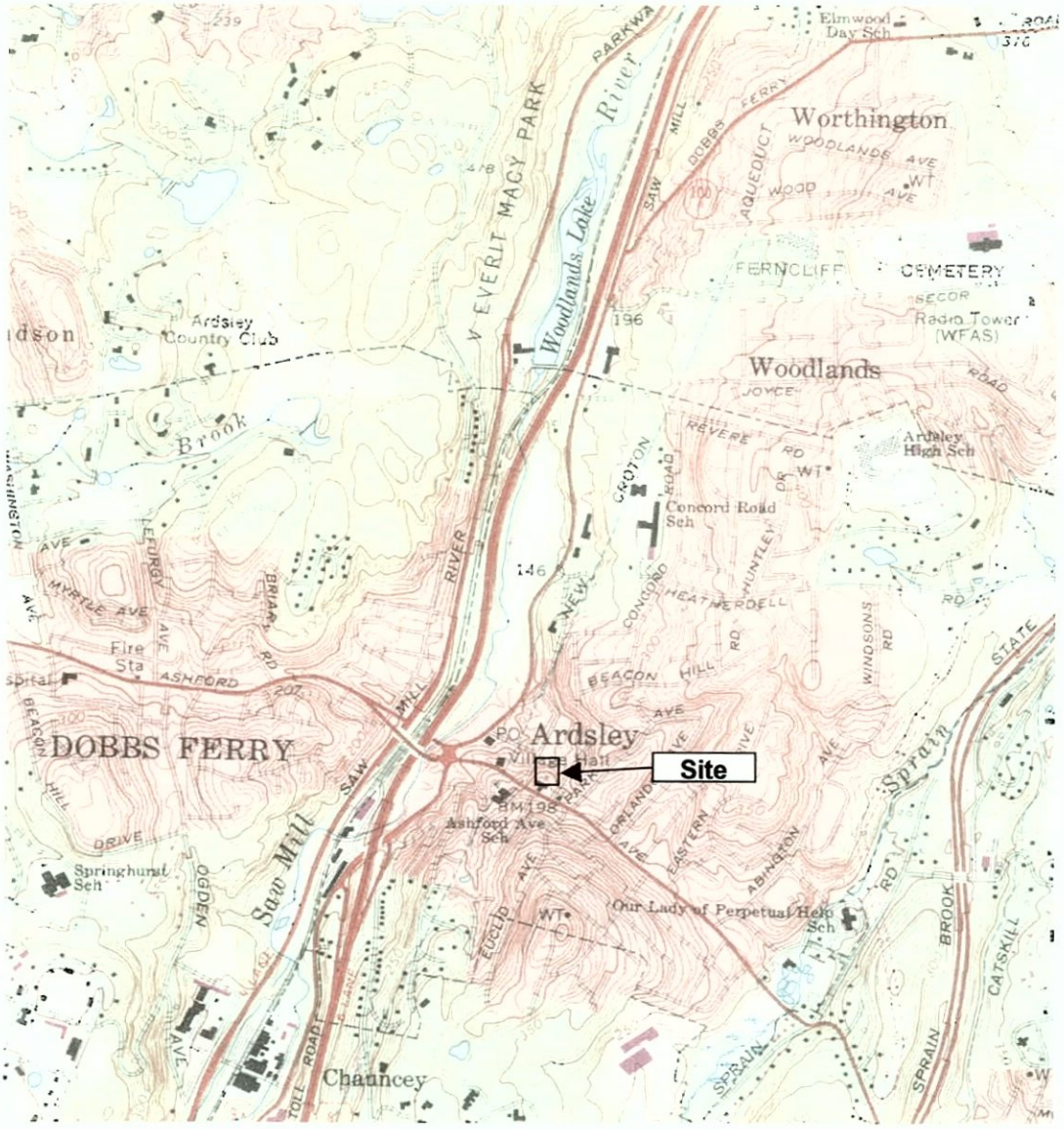
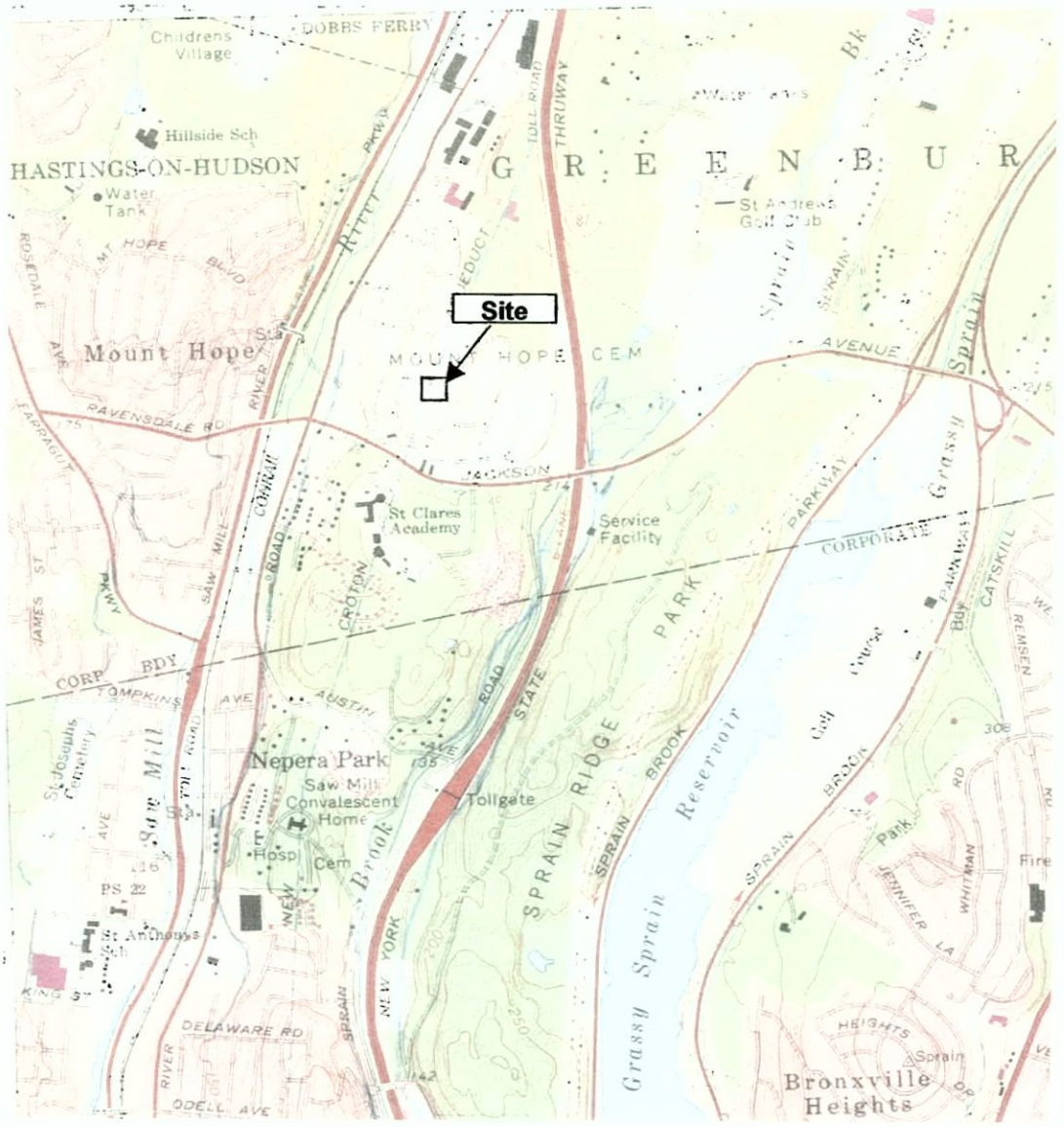


Figure 14-2: Shaft No. 14. Beers *Atlas of New York and Vicinity*, 1867. West Farms, New York. No scale.



New Croton Aqueduct **Westchester Co., NY**		***Shaft No. 14A*** Area Map
White Plains Quadrangle		Figure 14A-1

Figure 14A-2: Shaft No. 14A. Beers *Atlas of New York and Vicinity*, 1867. West Farms, New York. No scale.



New Croton Aqueduct **Westchester Co., NY**		***Shaft No. 15 1/2*** Area Map
Mount Vernon Quadrangle		Figure 15 1/2-1

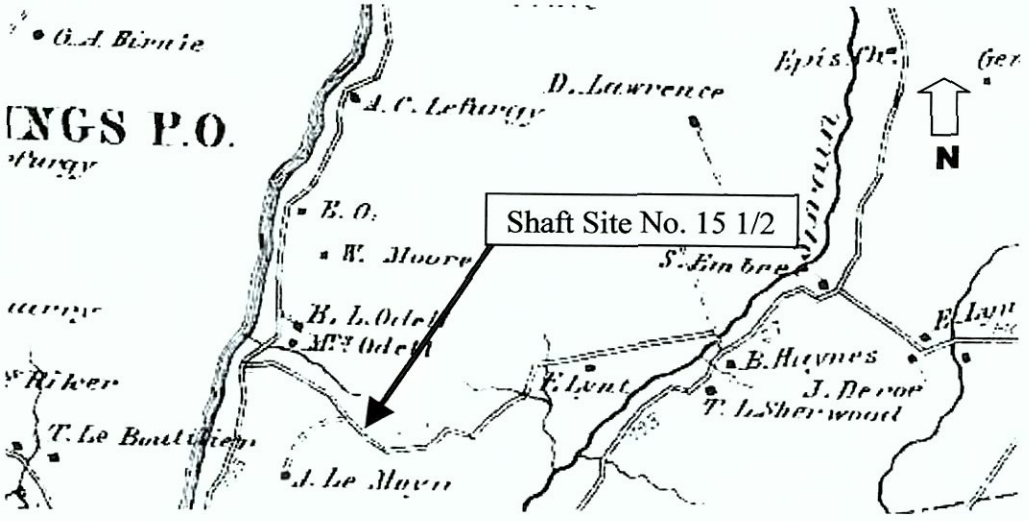
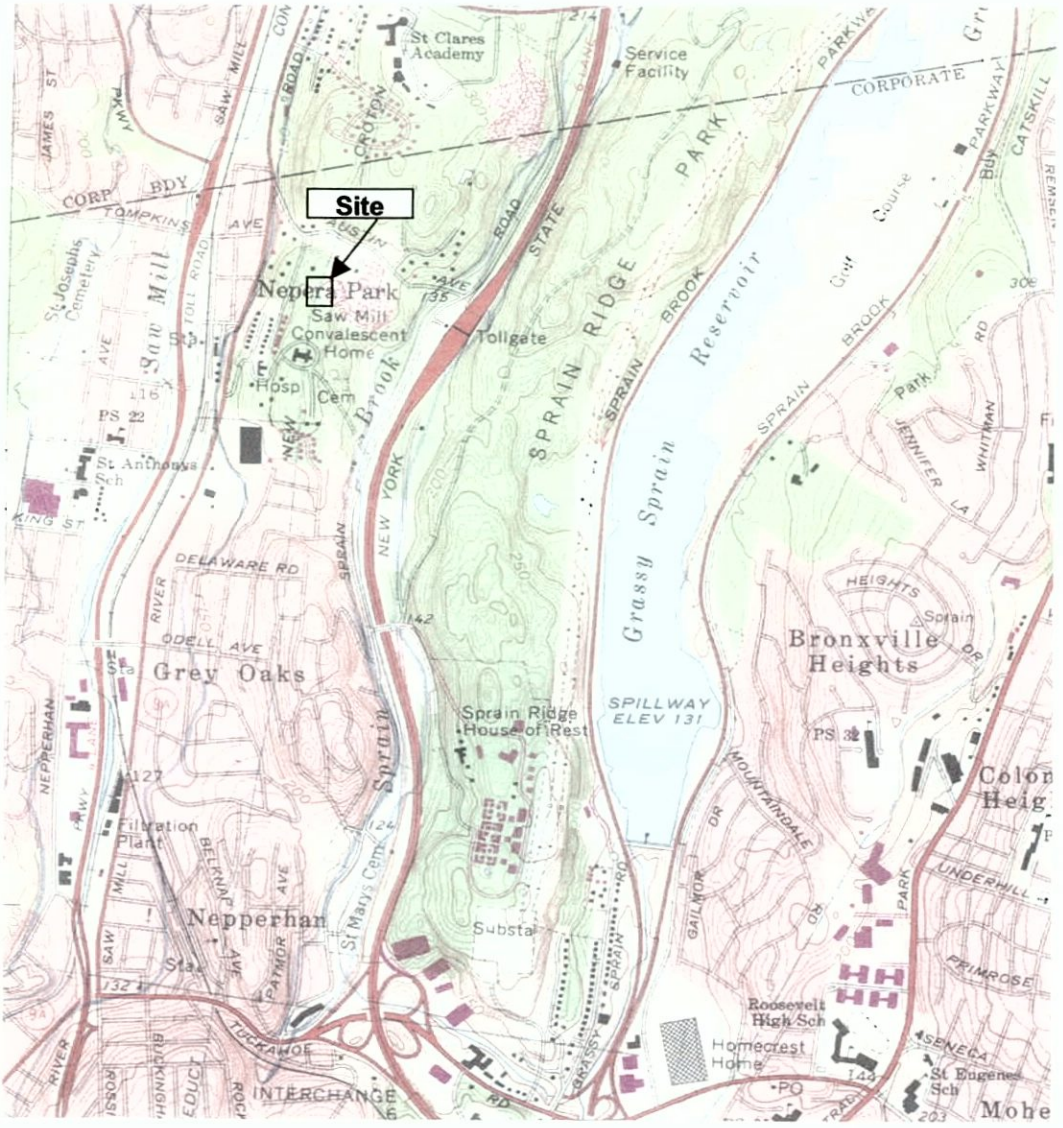


Figure 15 ½-2: Shaft No. 15 ½. Beers *Atlas of New York and Vicinity*, 1867. West Farms, New York. No scale.



New Croton Aqueduct **Westchester Co., NY**		***Shaft No. 16*** Area Map
Mount Vernon Quadrangle		Figure 16-1

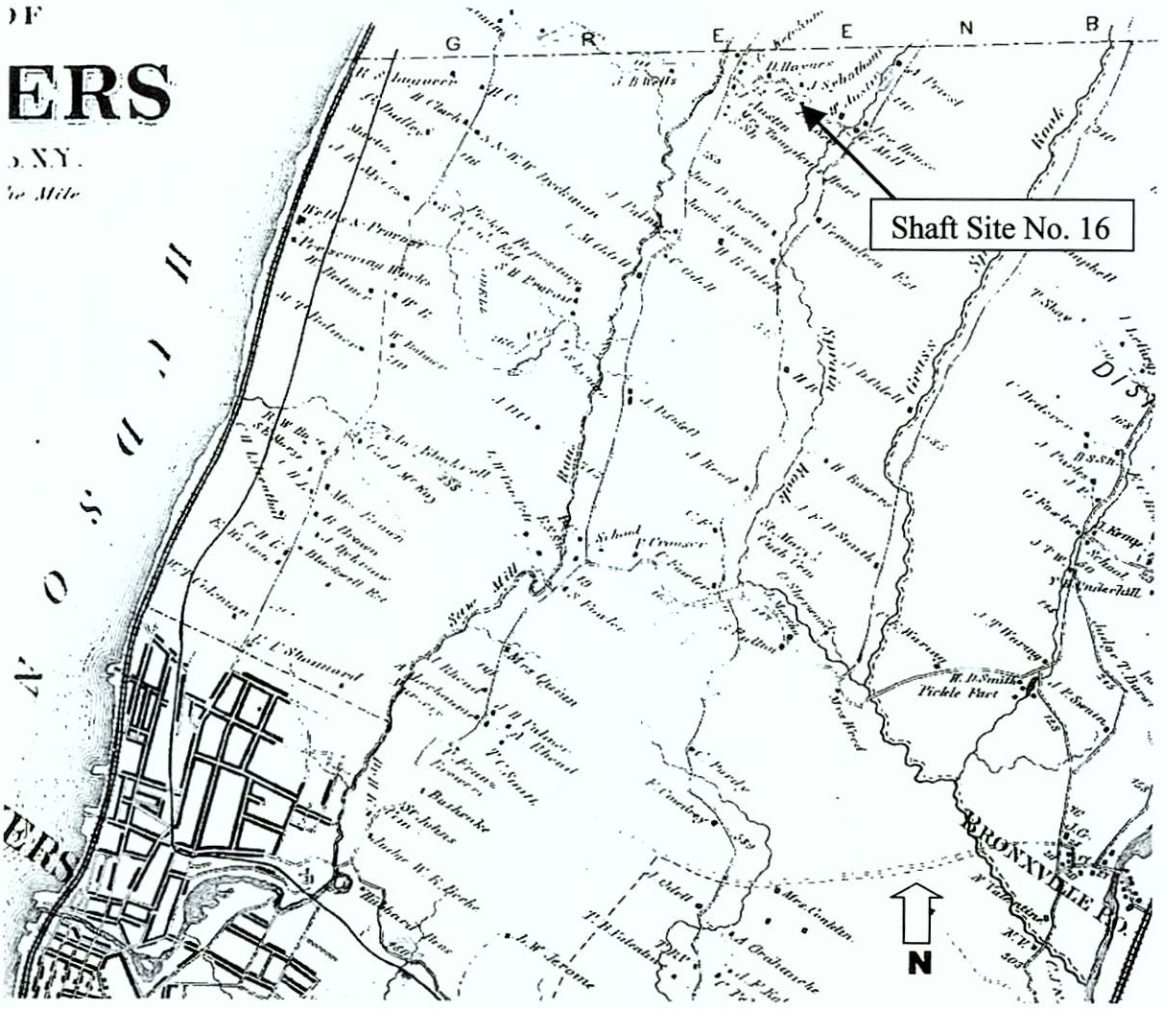
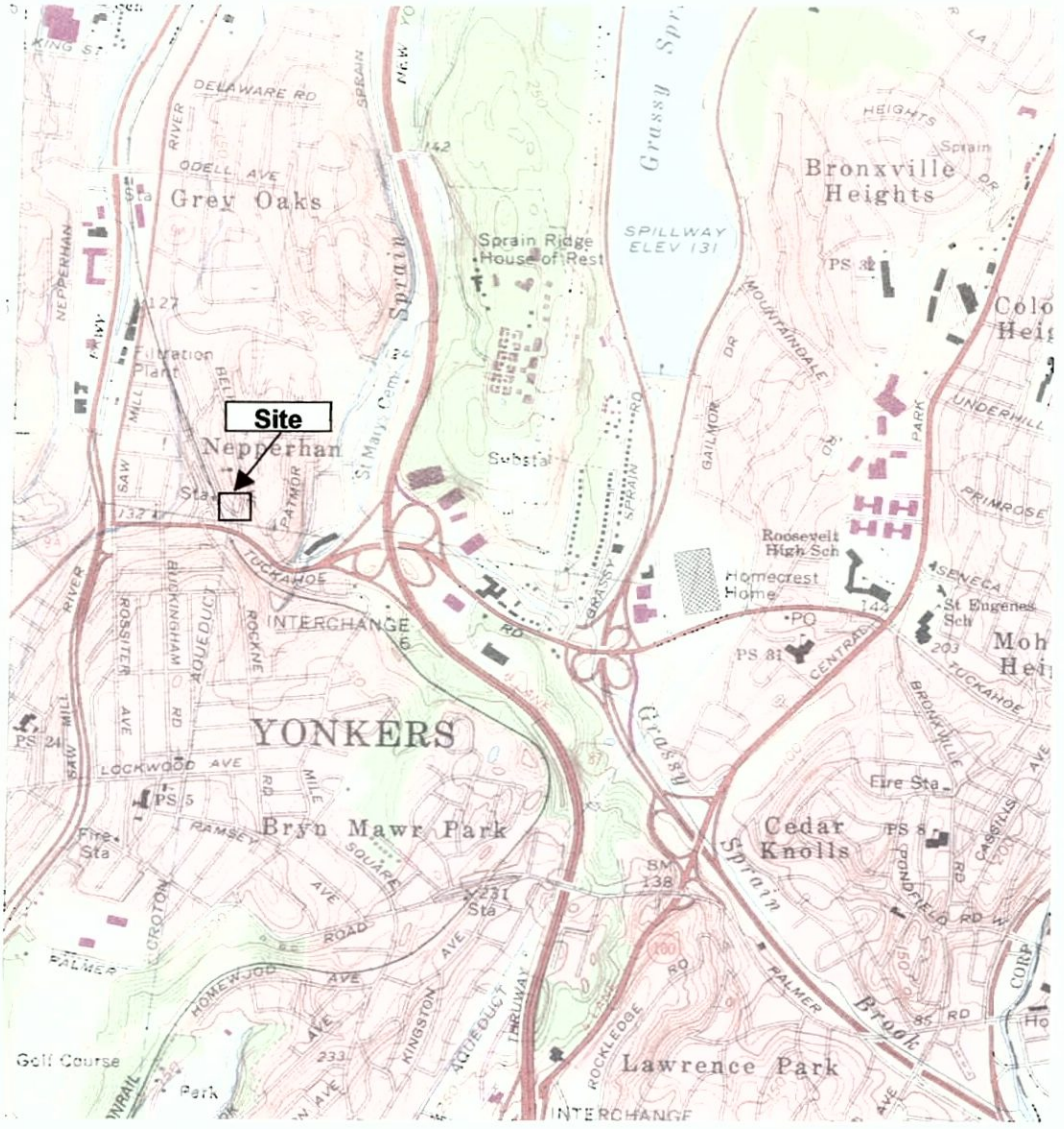


Figure 16-2: Shaft No. 16. Beers *Atlas of New York and Vicinity*, 1867. West Farms, New York. No scale.



New Croton Aqueduct **Westchester Co., NY**		***Shaft No. 17 1/2*** Area Map
Mount Vernon Quadrangle		Figure 17 1/2-1

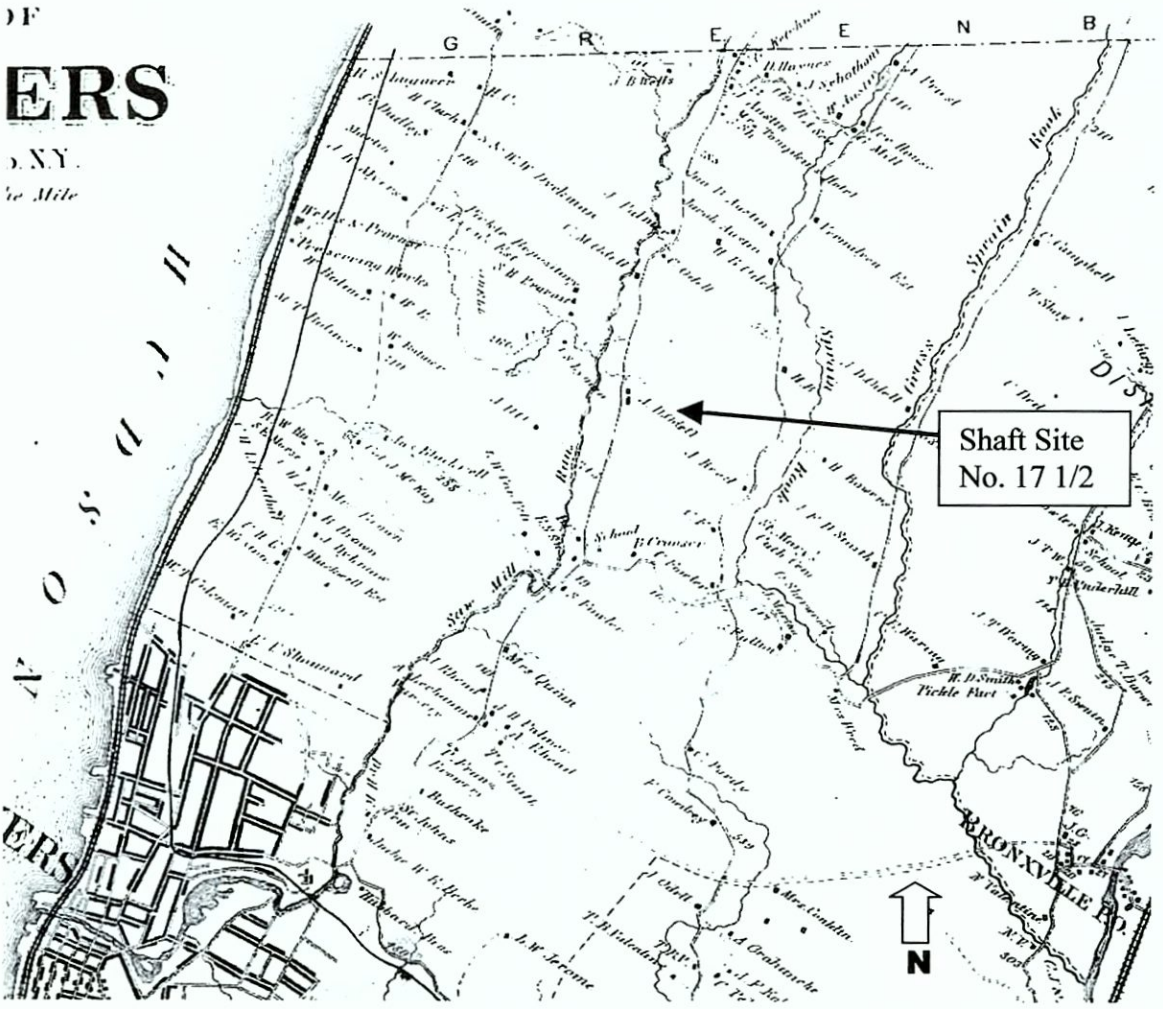
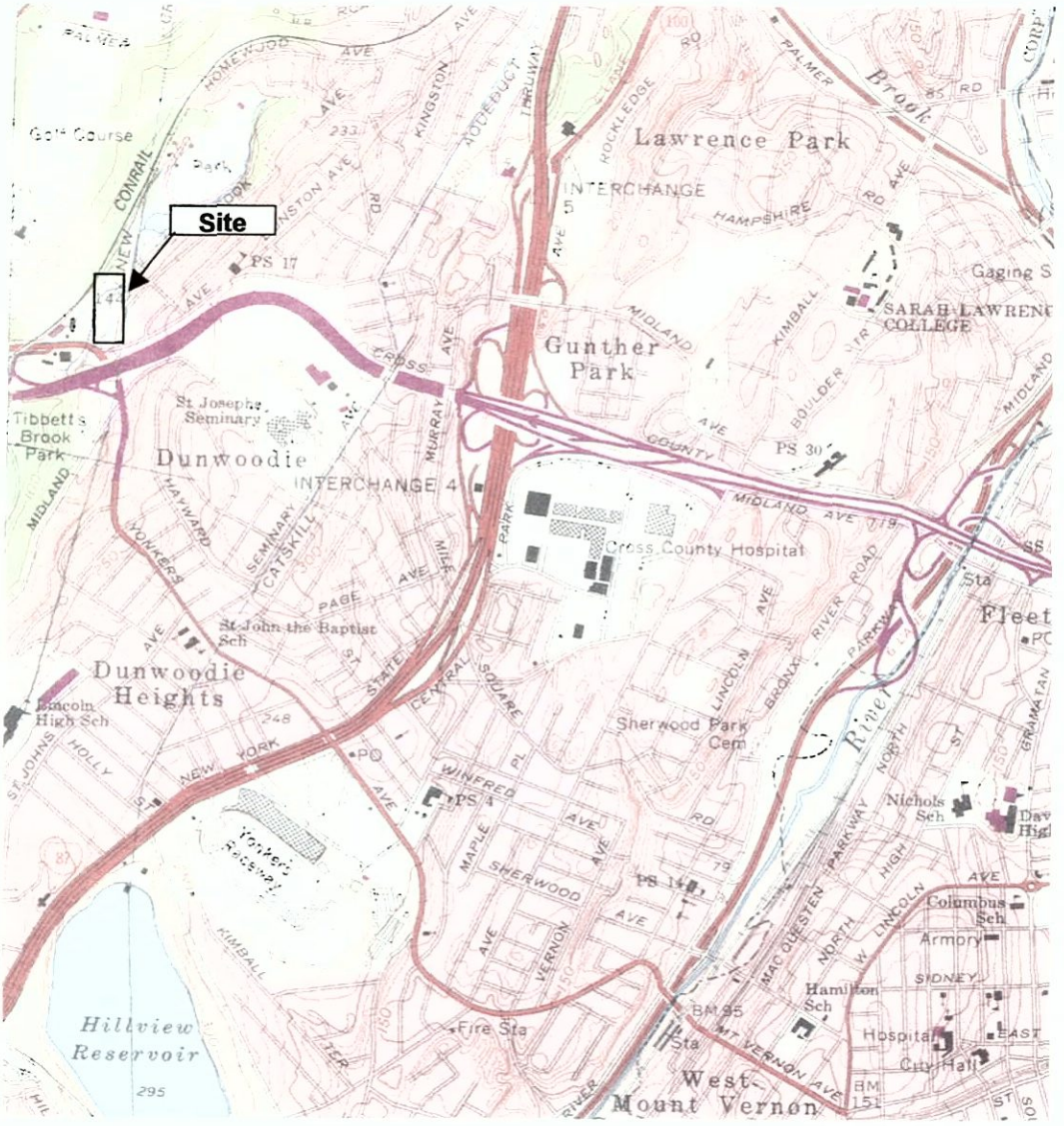


Figure 17 ½-2: Shaft No. 17 ½. Beers *Atlas of New York and Vicinity*, 1867. West Farms, New York. No scale.



New Croton Aqueduct **Westchester Co., NY**		***Shaft No. 18*** Area Map
Mount Vernon Quadrangle		Figure 18-1

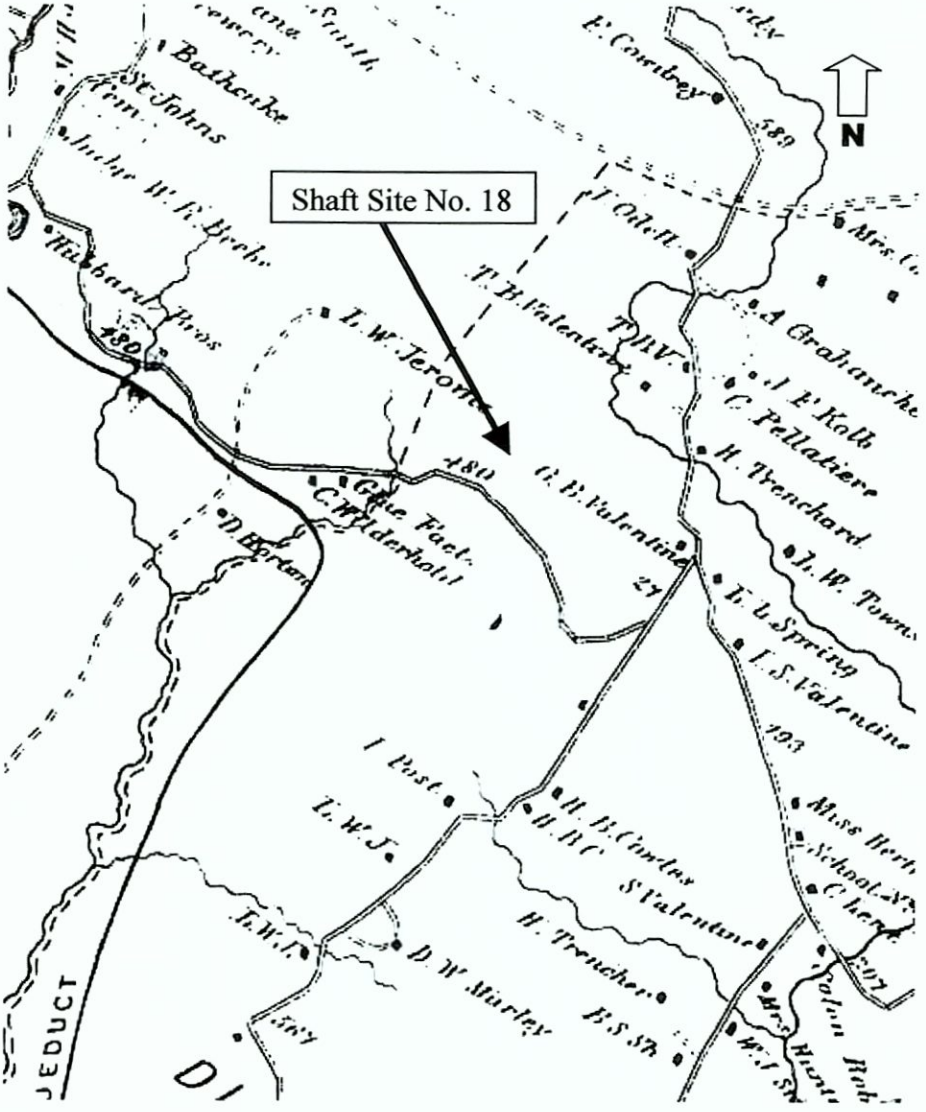


Figure 18-2: Shaft No. 18. Beers *Atlas of New York and Vicinity*, 1867. West Farms, New York. No scale.

New Croton Aqueduct **Westchester Co., NY**		***Shaft No. 18 1/4*** Area Map
Mount Vernon Quadrangle		Figure 18 1/4-1

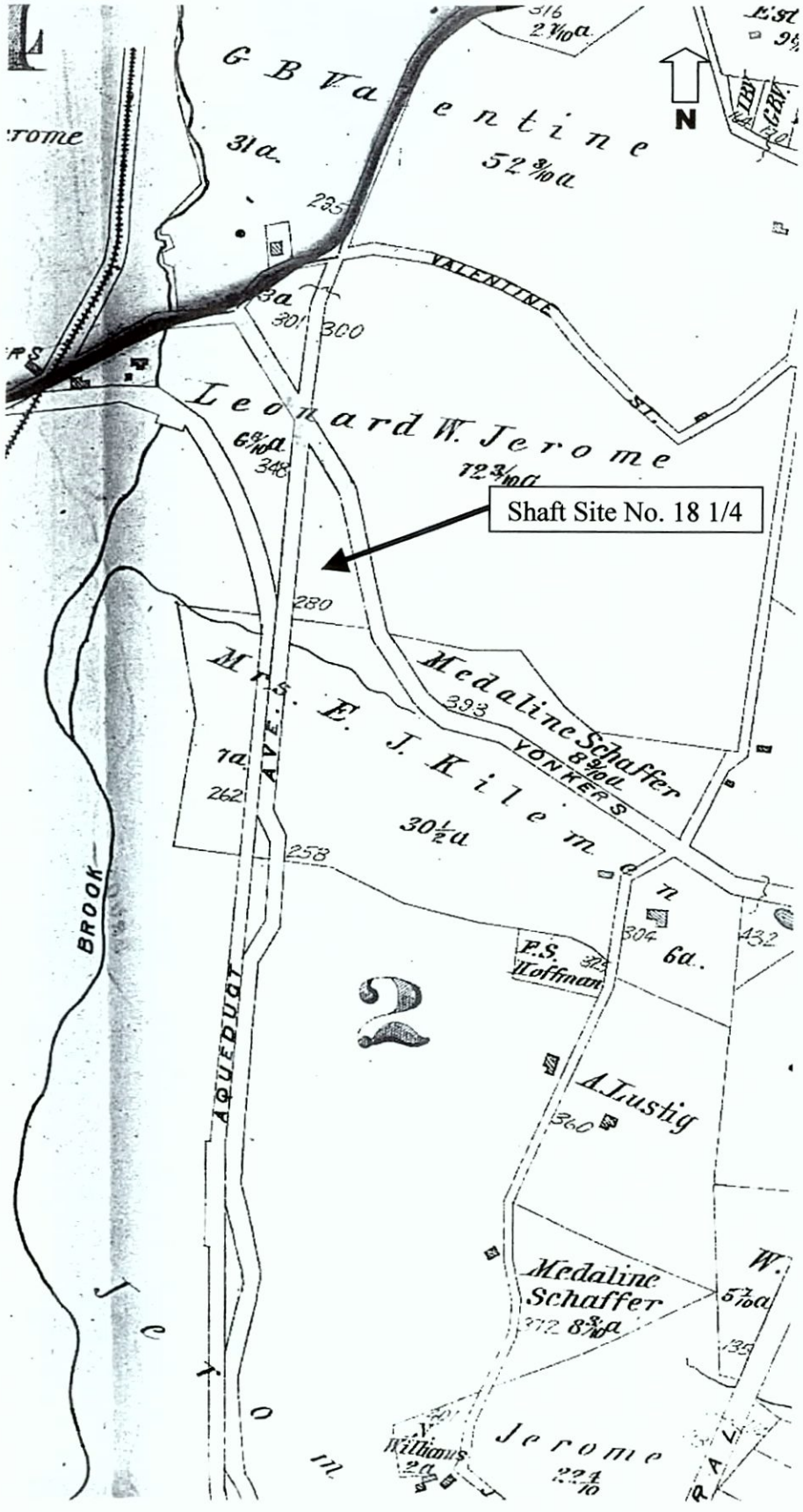


Figure 18 ¼-2: Shaft No. 18 ¼. Bromley *Atlas of Westchester County, New York*, 1881. No scale.

New Croton Aqueduct **Westchester Co., NY**		***Shaft No. 19*** Area Map
Yonkers Quadrangle		Figure 19-1

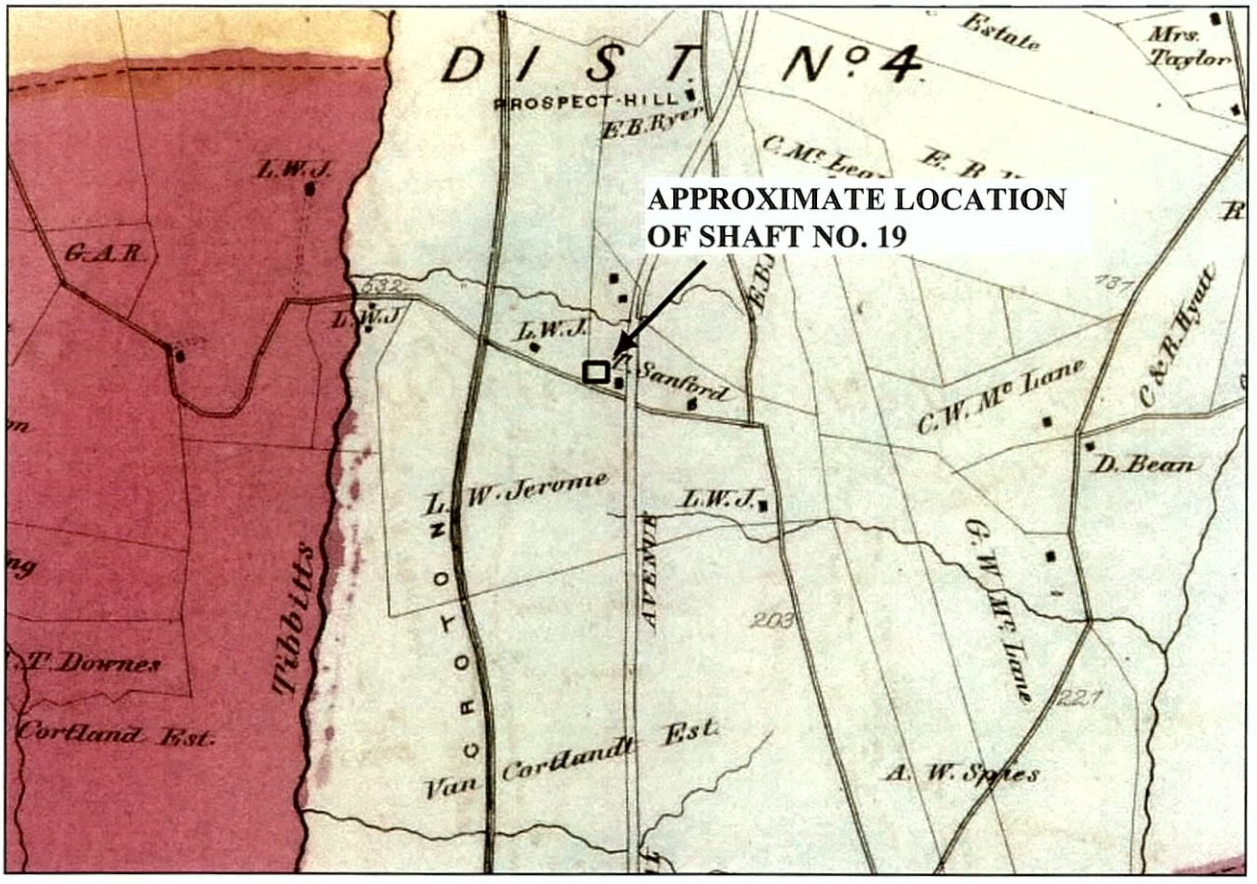
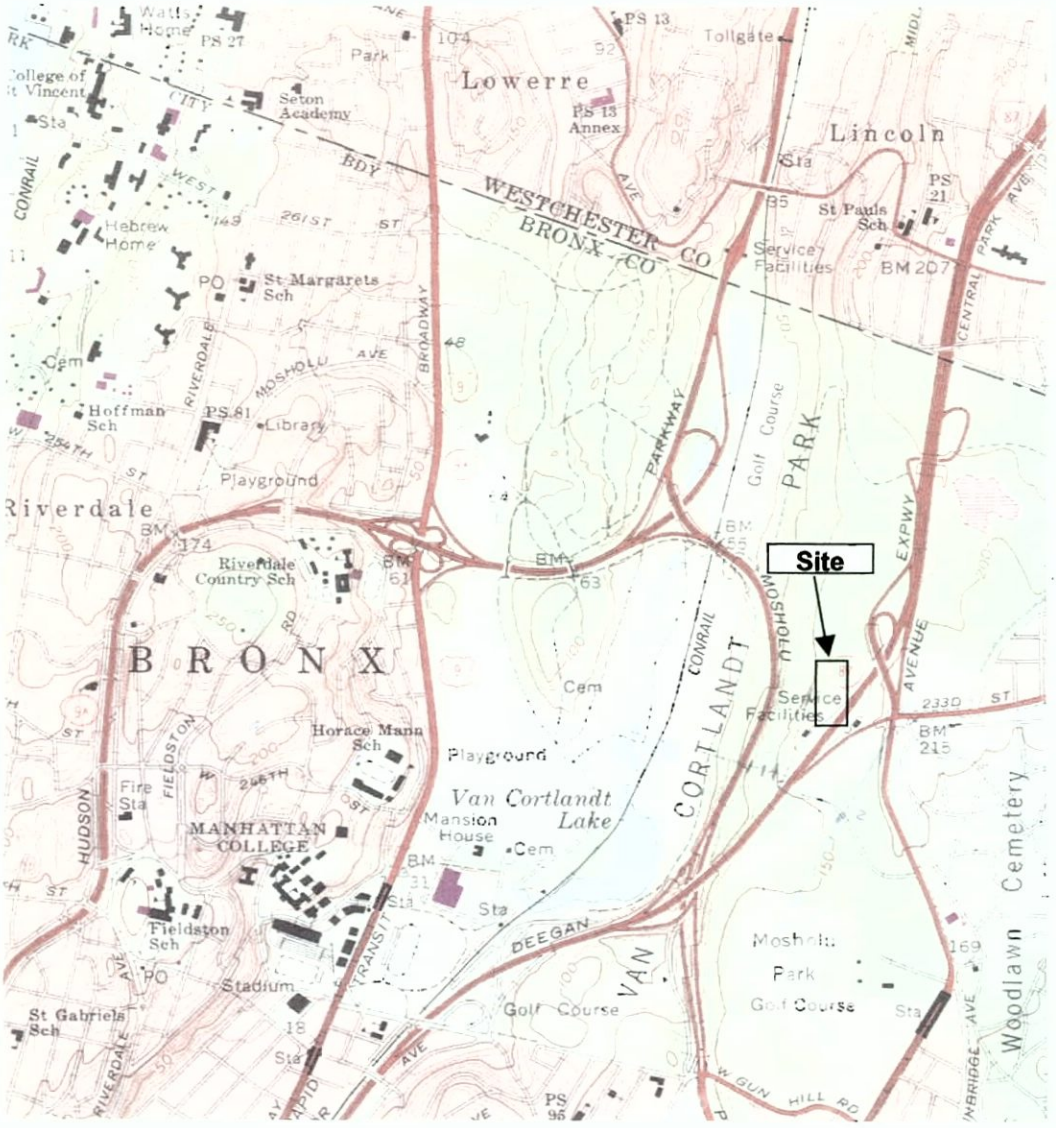


Figure 19-2: Shaft No. 19. Beers *Atlas of New York and Vicinity,* 1868. Yonkers, New York. No scale.



New Croton Aqueduct **Bronx, NY**		***Shaft No. 19 5/8*** Area Map
Yonkers Quadrangle		Figure 19 5/8-1

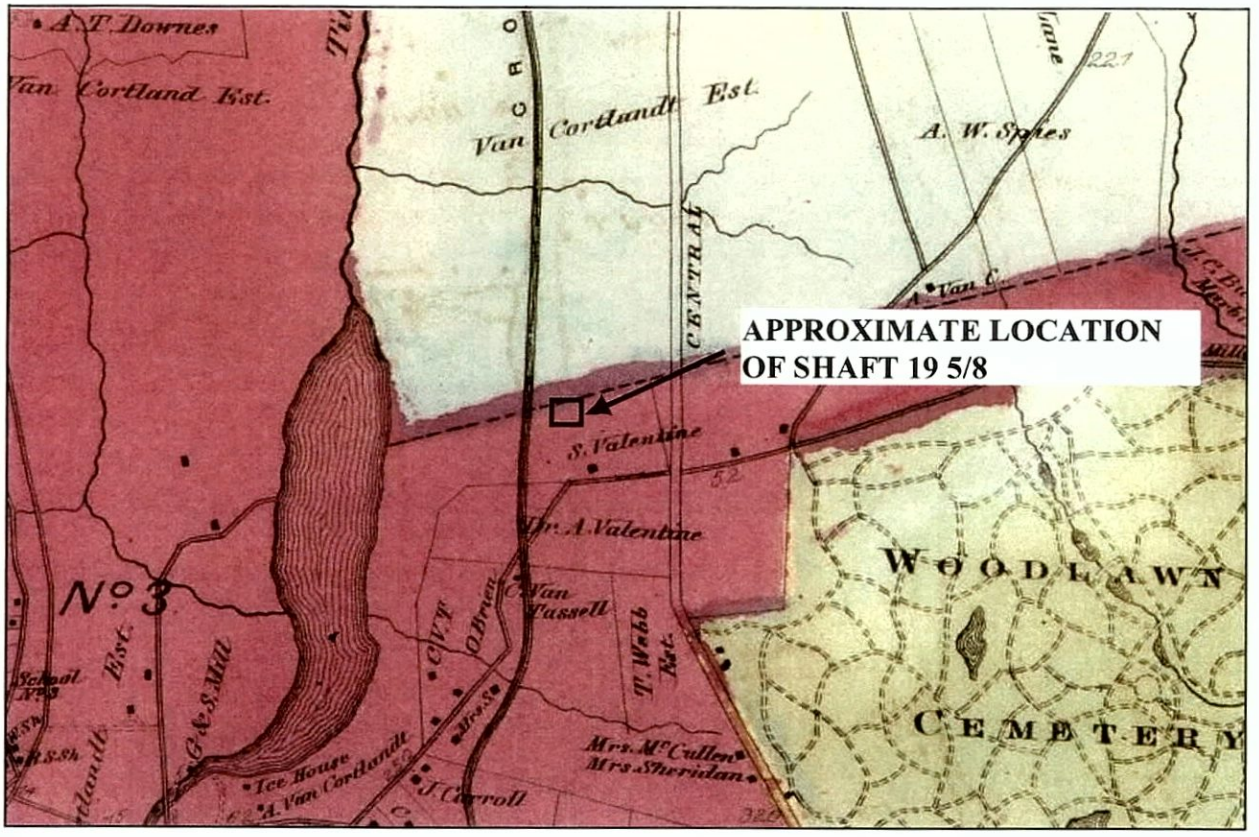
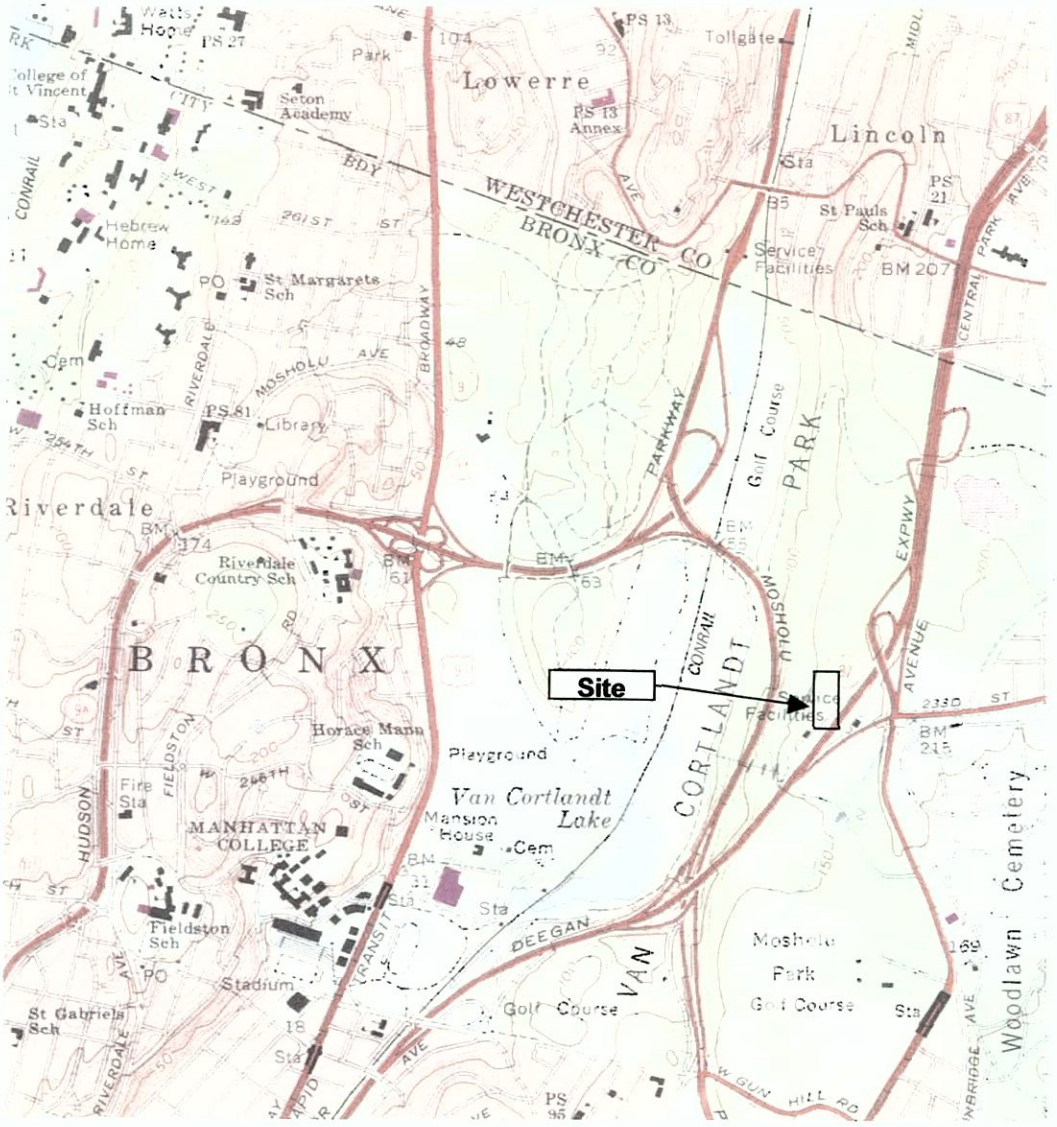


Figure 19 5/8 -2: Shaft 19 5/8. Beers *Atlas of New York and Vicinity,* 1868. Yonkers, New York. No scale.



New Croton Aqueduct **Bronx, NY**		***Gate House No. 1*** Area Map
Yonkers Quadrangle		Figure GH1-1

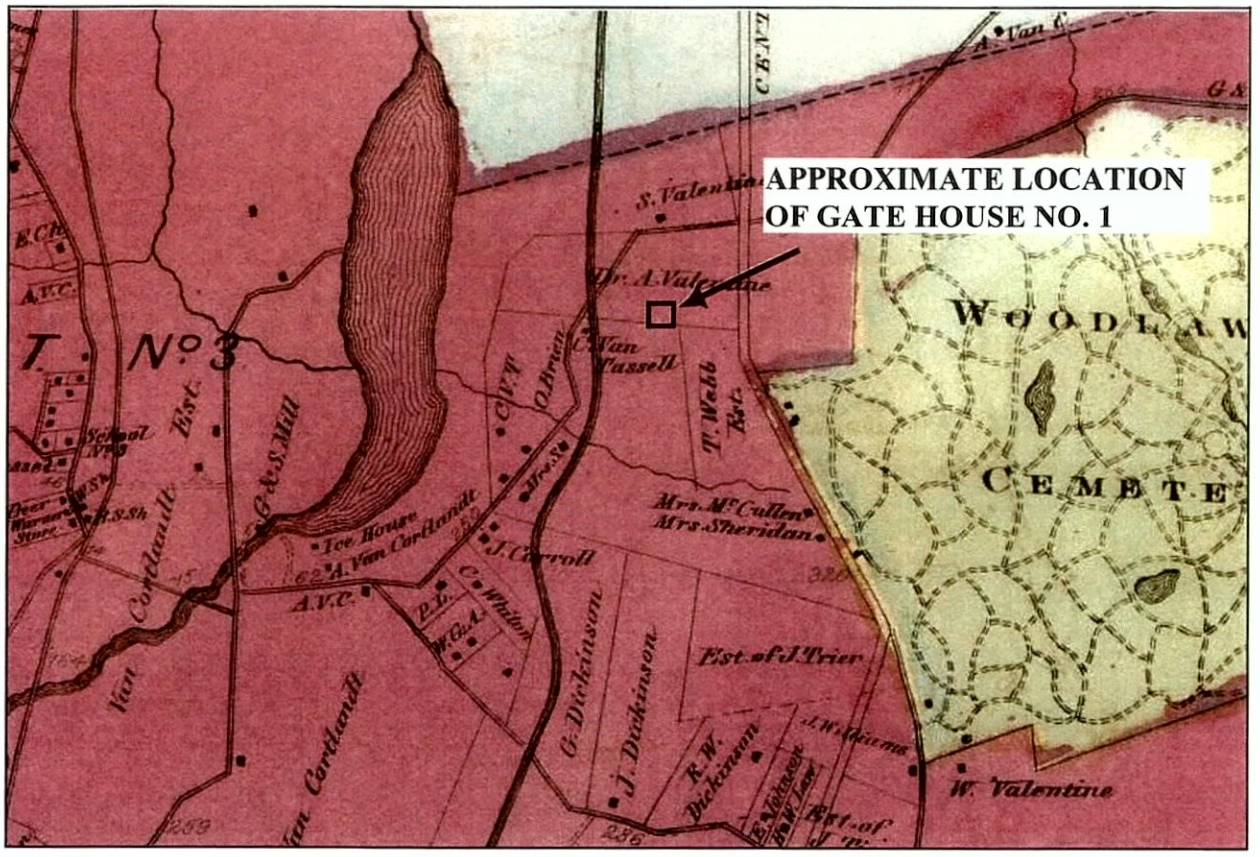


Figure GH1-2: Gate House No. 1. Beers *Atlas of Westchester County,* 1868. Yonkers, New York. No scale.

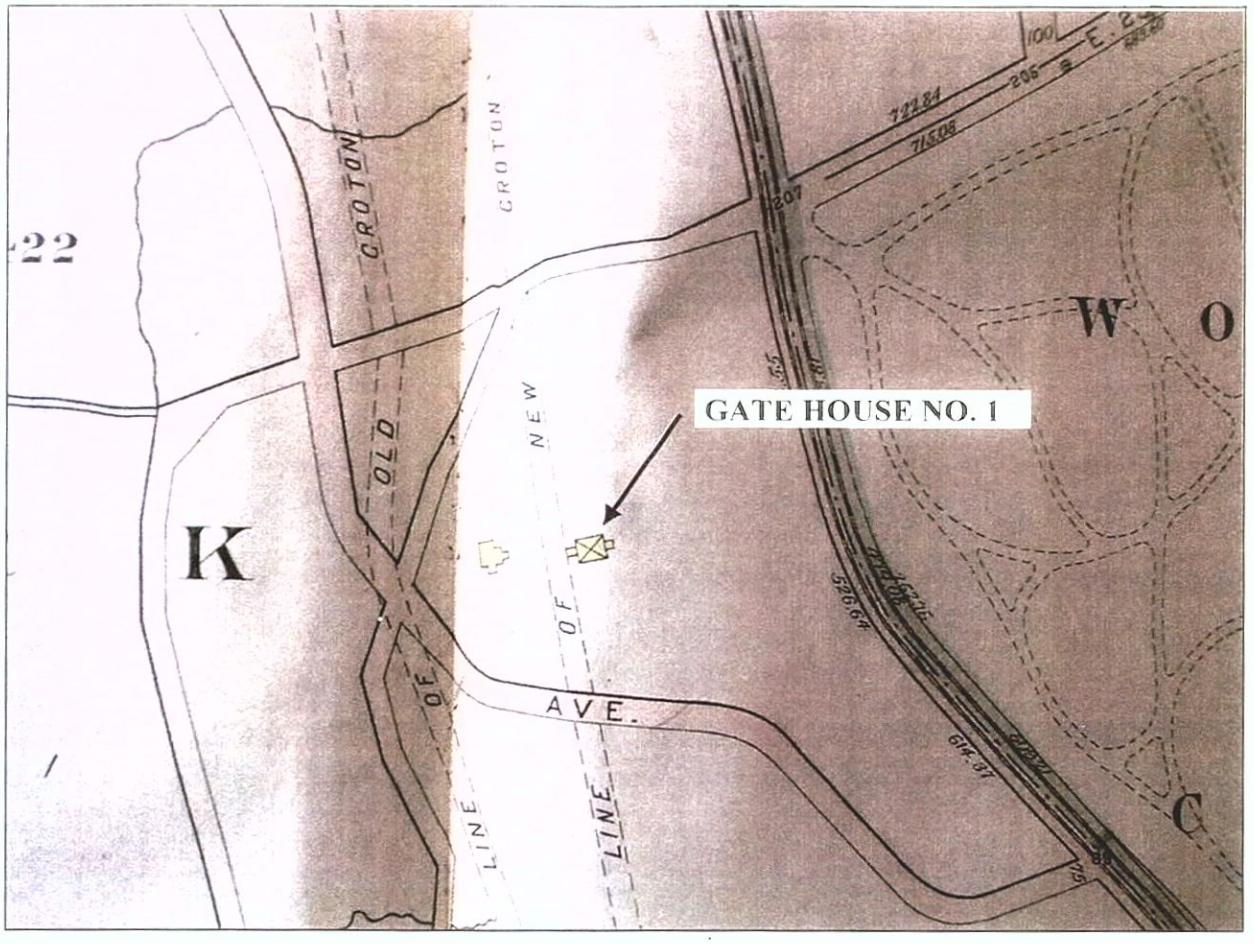


Figure GH1-3: Gate House No. 1. Bromley *Atlas of the City of New York, Borough of the Bronx*, 1911. No scale.

New Croton Aqueduct **Bronx, NY**		***Shaft No. 20*** Area Map
Yonkers Quadrangle		Figure 20-1

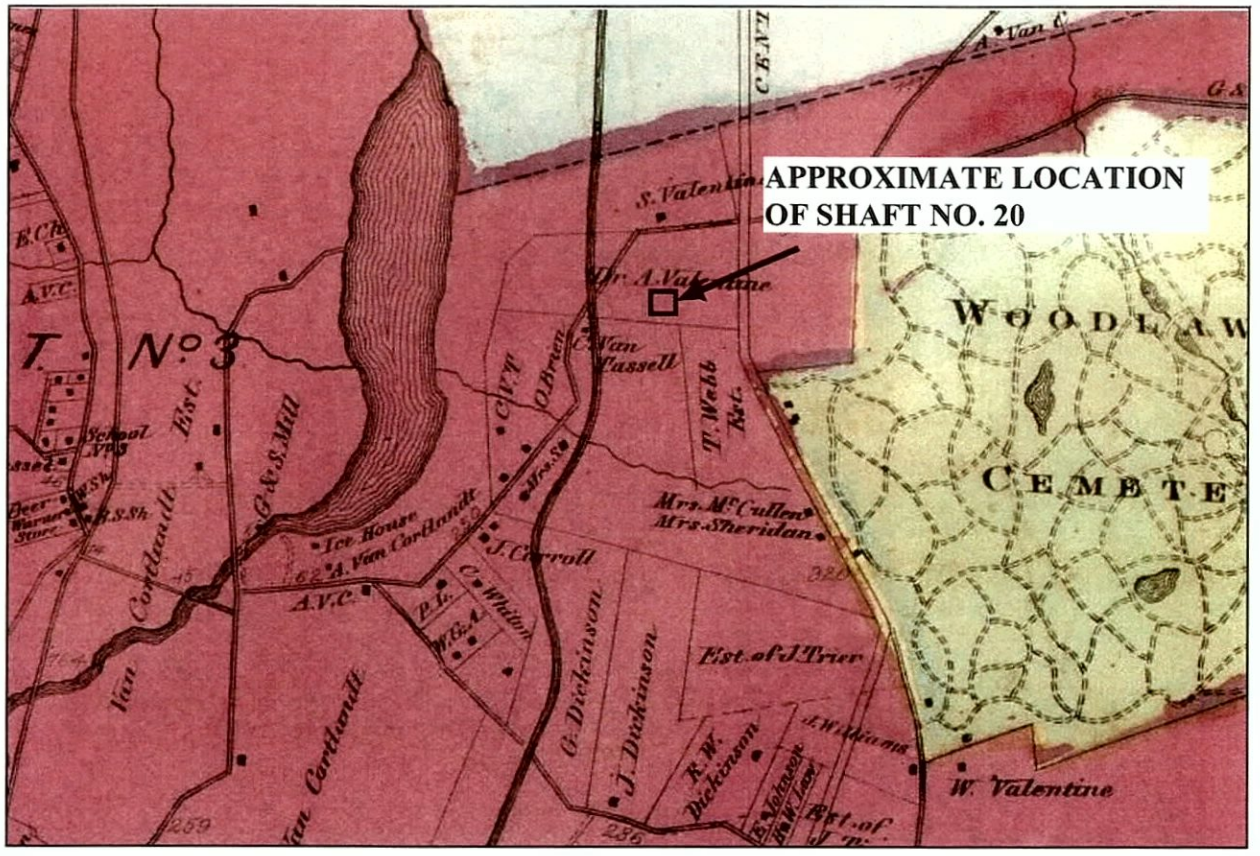
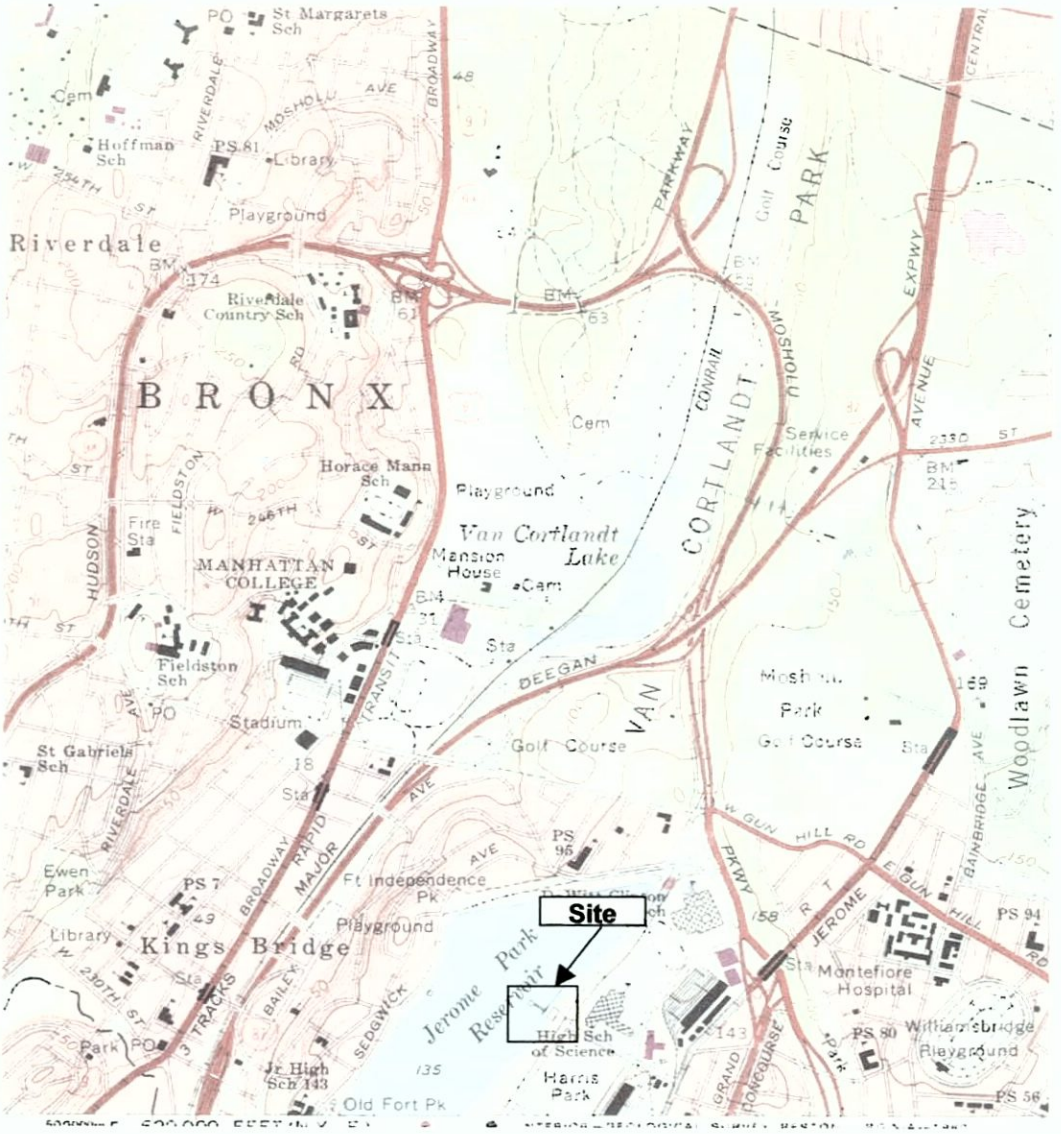


Figure 20-2: Shaft No. 20. Beers *Atlas of New York and Vicinity,* 1868. Yonkers, New York. No scale.



New Croton Aqueduct **Bronx, NY**		***Shaft No. 21*** Area Map
Yonkers Quadrangle		Figure 21-1

New Croton Aqueduct **Bronx, NY**		***Shaft No. 22*** Area Map
Central Park Quadrangle		Figure 22-1

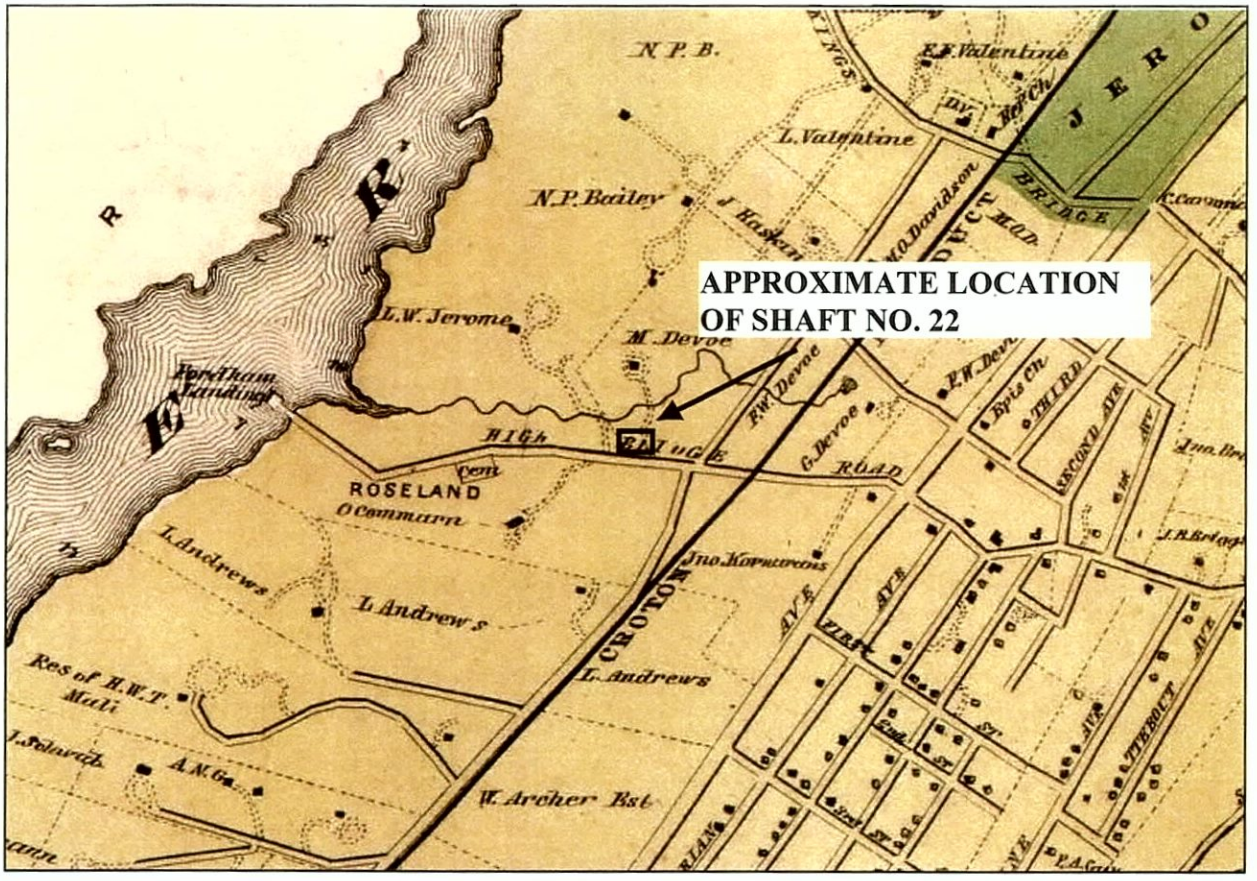


Figure 22-2: Shaft No. 22. Beers *Atlas of New York and Vicinity,* 1868. West Farms, New York. No scale.

New Croton Aqueduct **Bronx, NY**		***Shaft No. 23*** Area Map
Central Park Quadrangle		Figure 23-1

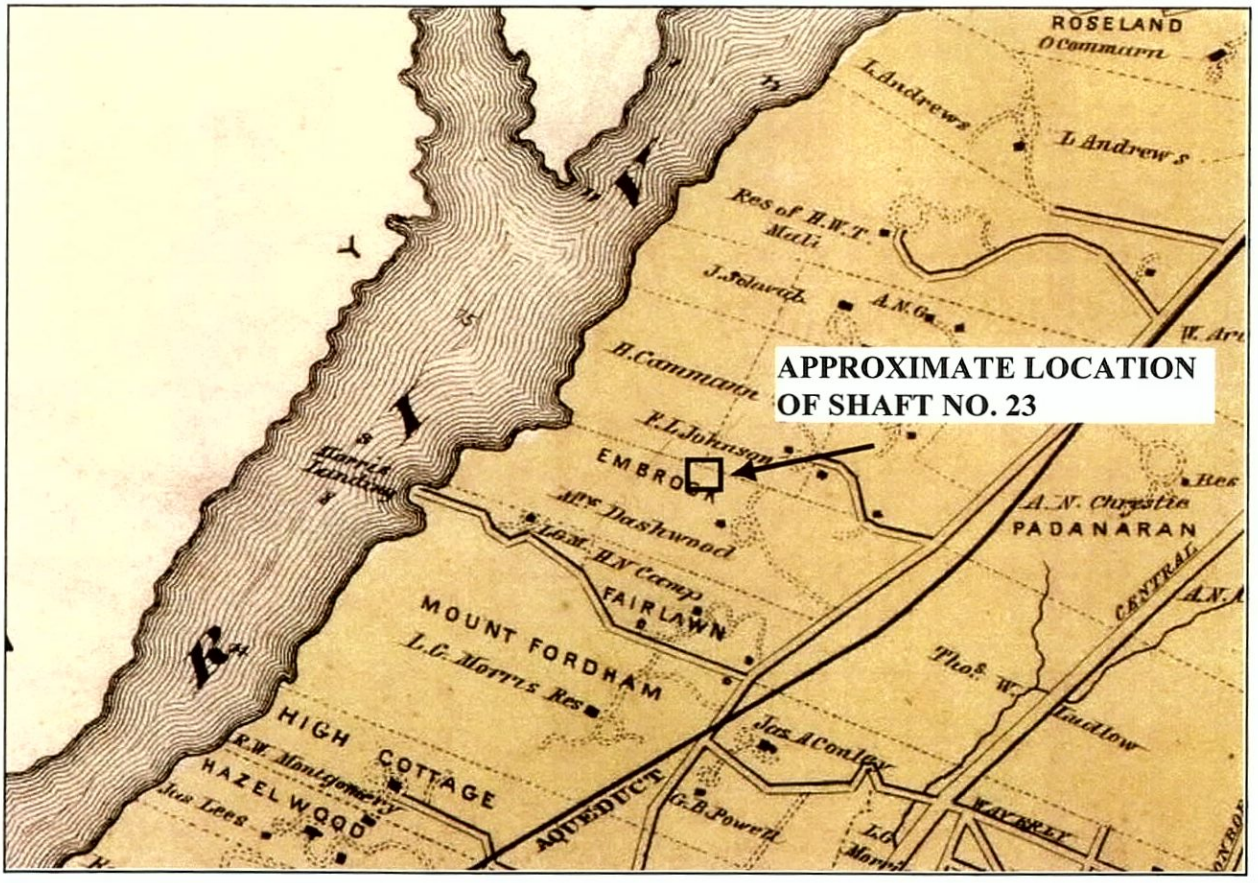
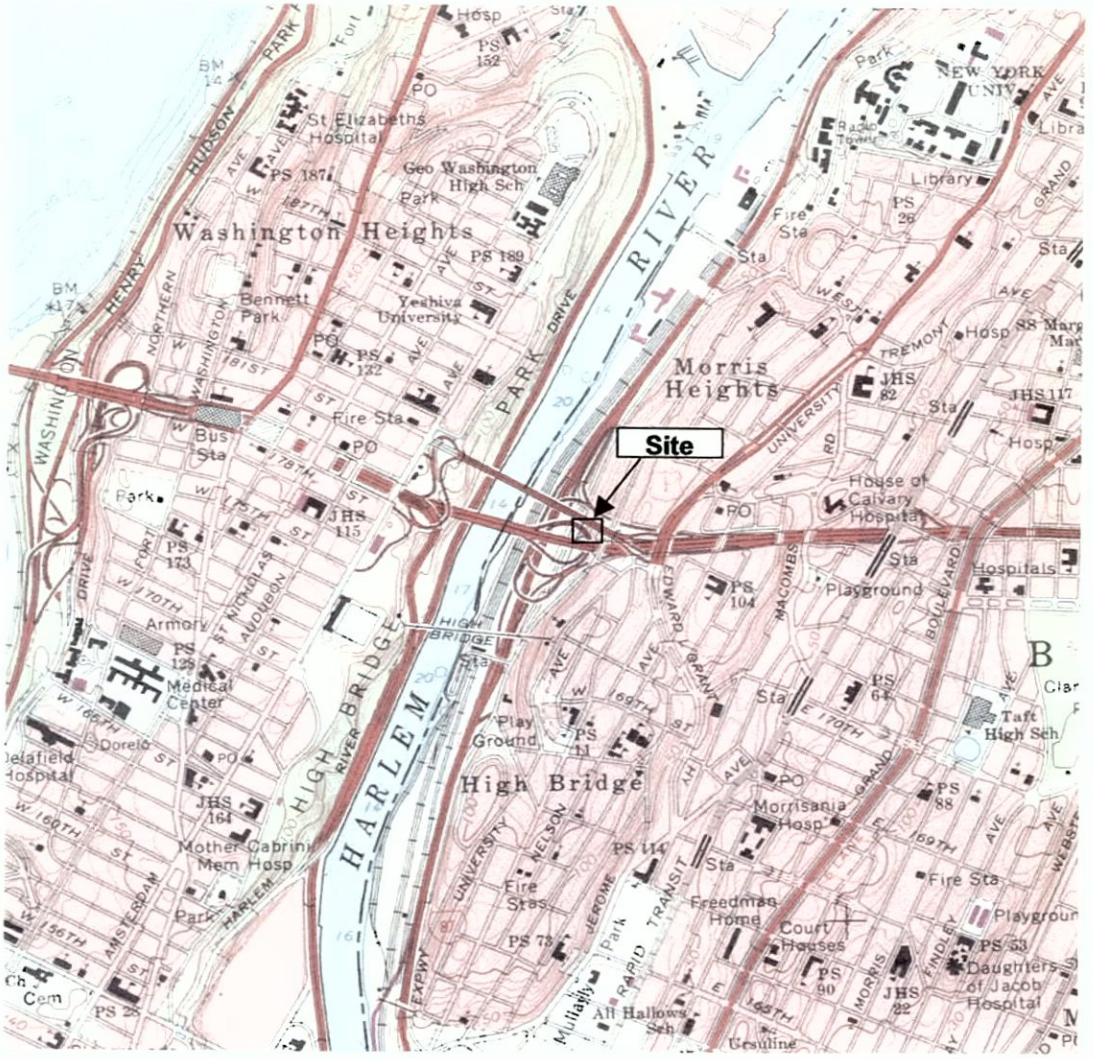


Figure 23-2: Shaft No. 23. Beers *Atlas of New York and Vicinity,* 1868. West Farms, New York. No scale.



New Croton Aqueduct **Bronx, NY**		***Shaft No. 24*** Area Map
Central Park Quadrangle		Figure 24-1

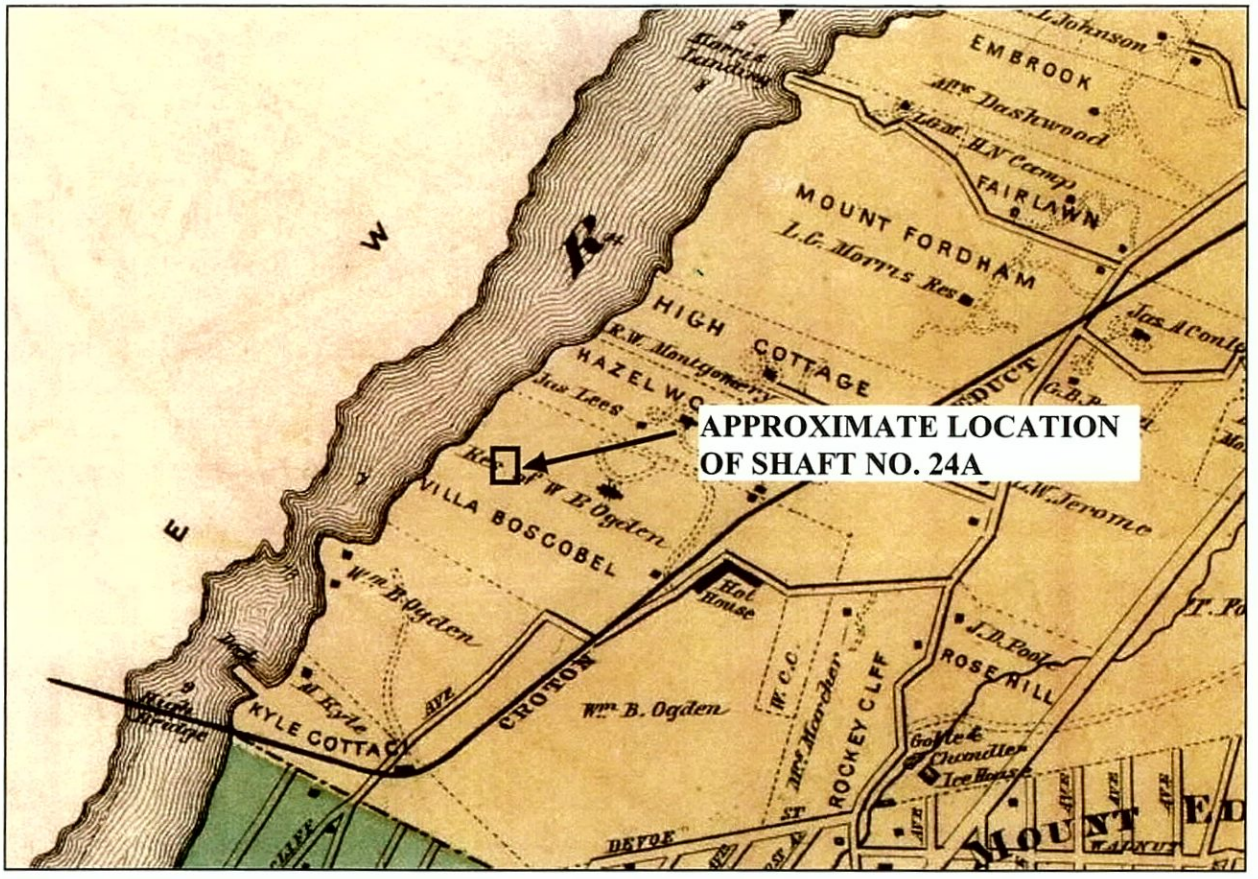


Figure 24A-2: Shaft No. 24A. Beers *Atlas of New York and Vicinity,* 1868. West Farms, New York. No scale.

New Croton Aqueduct **Bronx, NY**		***Shaft No. 24A*** Area Map
Central Park Quadrangle		Figure 24A-1

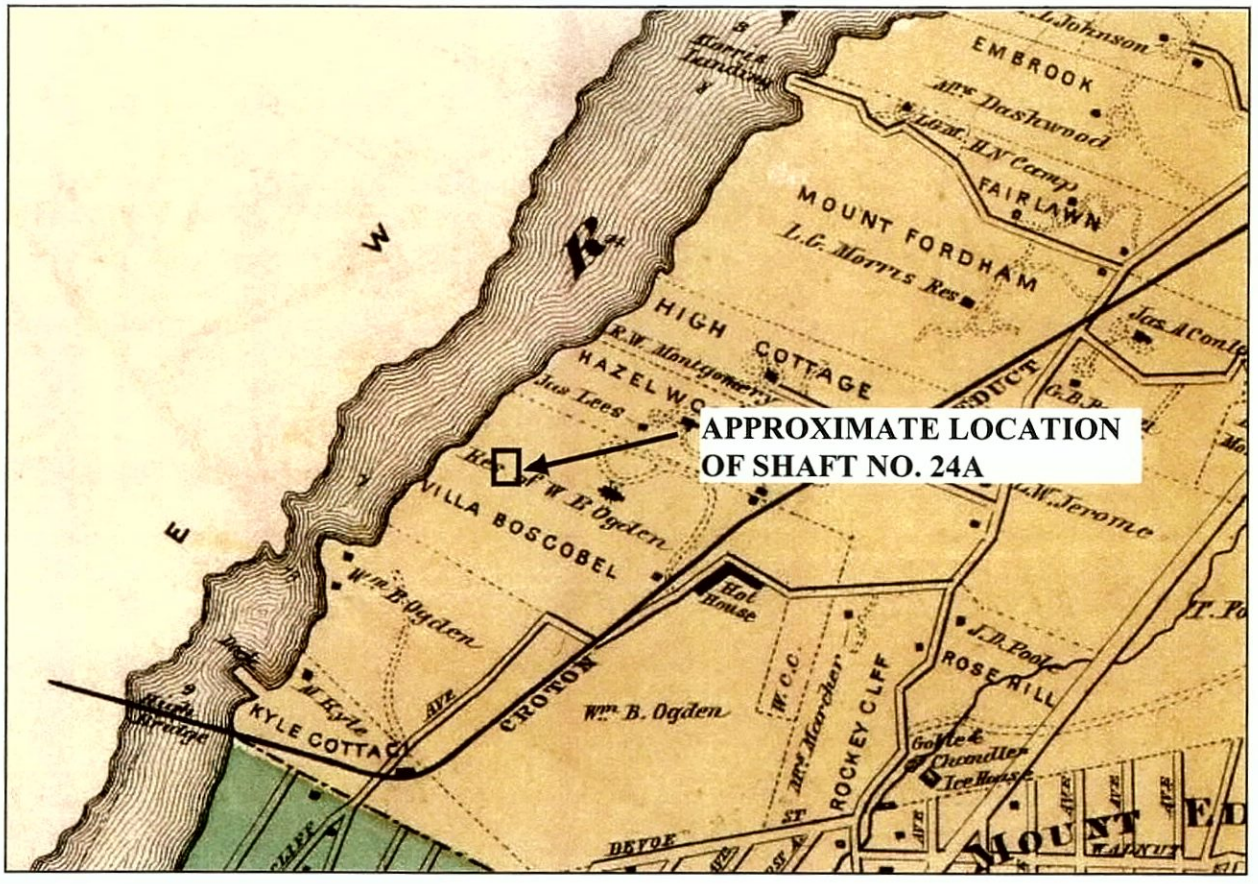
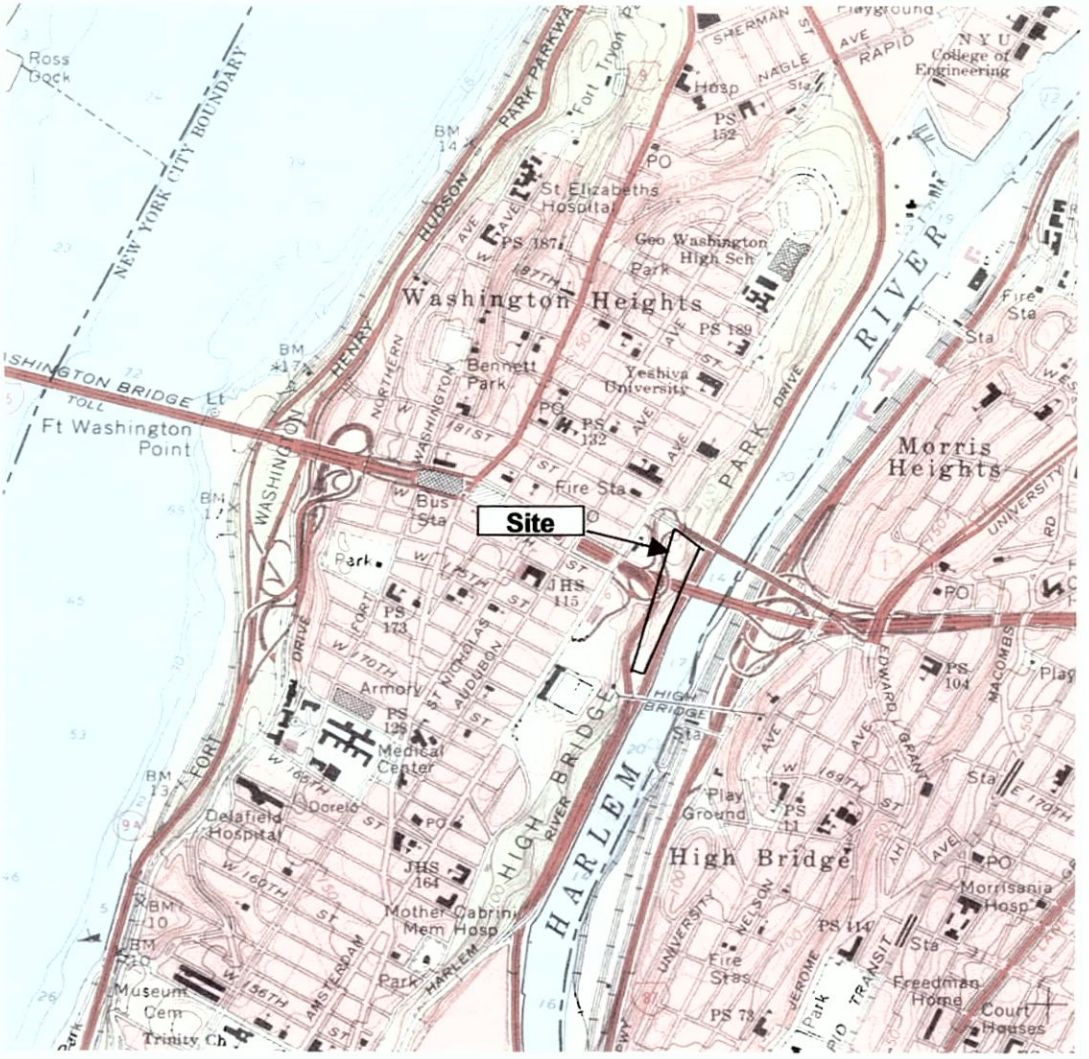


Figure 24A-2: Shaft No. 24A. Beers *Atlas of New York and Vicinity,* 1868. West Farms, New York. No scale.



New Croton Aqueduct **New York, NY**		***Shaft No. 25*** Area Map
Central Park Quadrangle		Figure 25-1

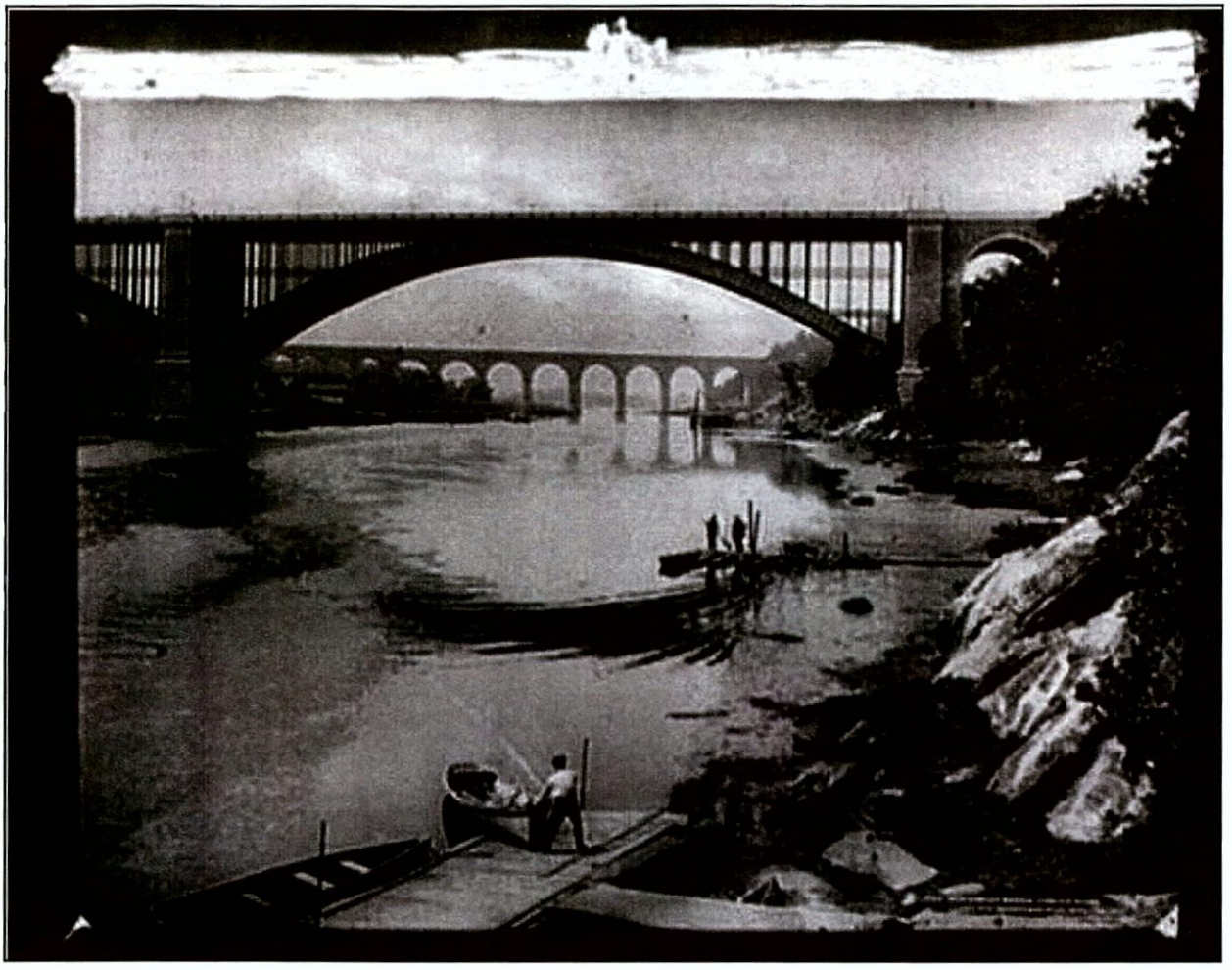


Figure 25-2: Shaft No. 25. Historic Photograph of Harlem River Shoreline along Manhattan. Facing south toward Washington Bridge, with Manhattan on right. Ca.1888-1897.

Figure 25-3: Shaft No. 25. Ca. 1960s Photograph. Looking southwest from Washington Bridge over the Harlem River toward Shaft No. 25. Note construction of ramps and roadways in background. Photo predates construction of Alexander Hamilton Bridge in 1963.

New Croton Aqueduct **New York, NY**		***Shaft No. 26*** Area Map
Central Park Quadrangle		Figure 26-1

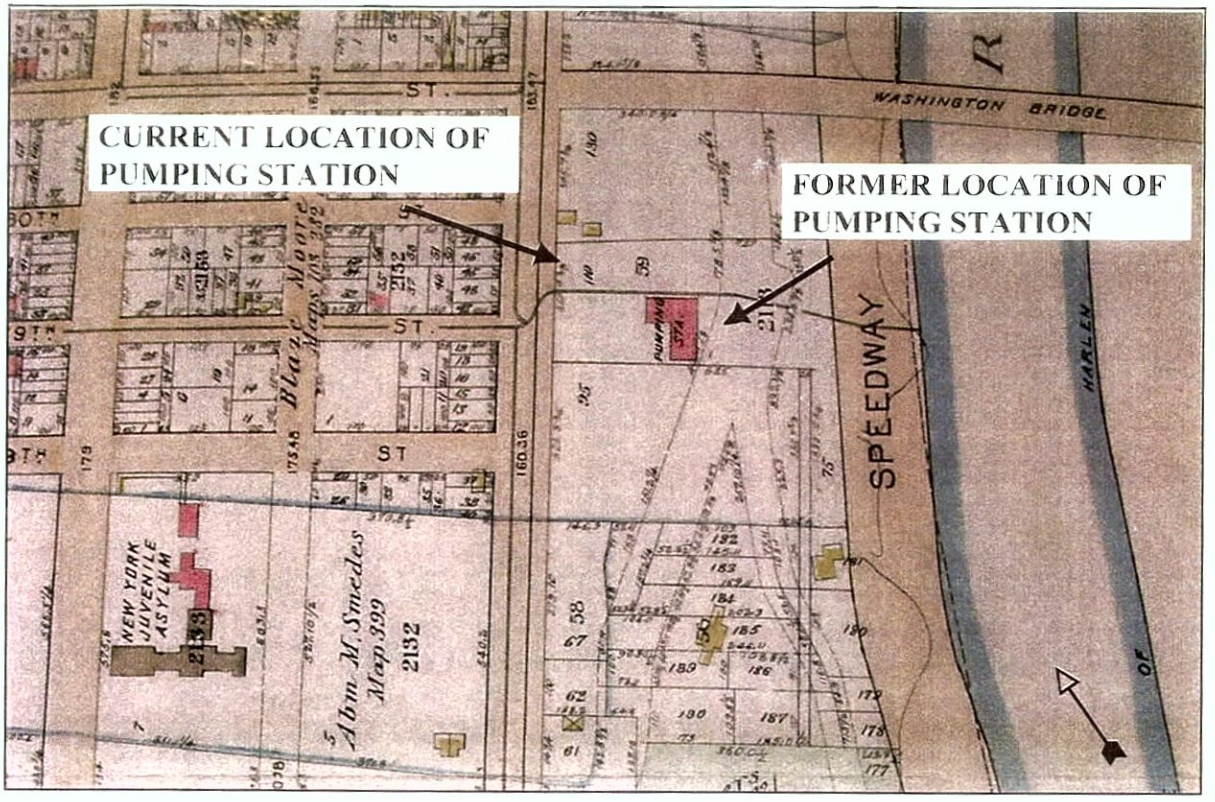
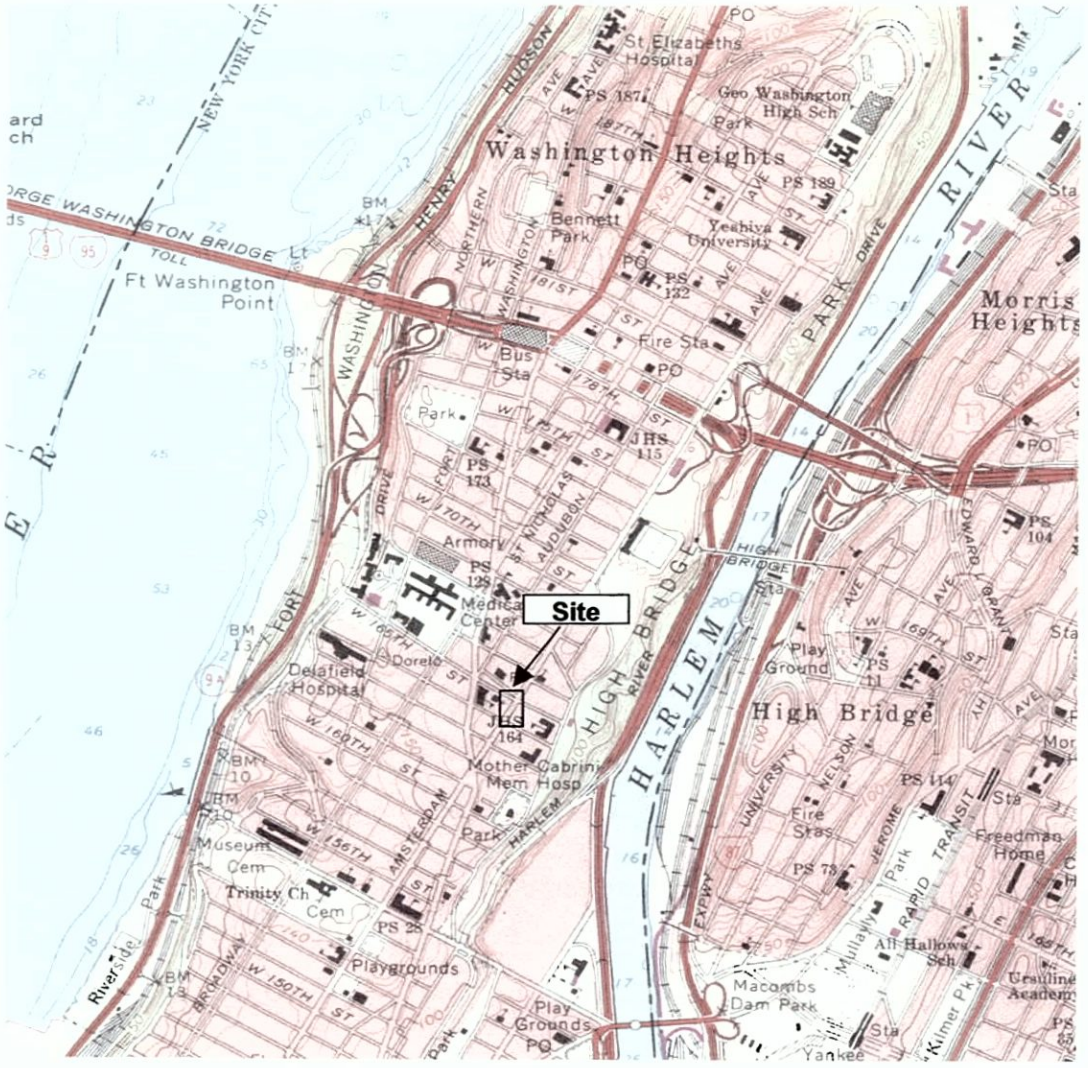


Figure 26-2: Shaft No. 26 and Pumping Station. Bromley *Atlas of the City of New York, Borough of Manhattan,* 1897. No scale.



New Croton Aqueduct **New York, NY**		***Shaft No. 28*** Area Map
Central Park Quadrangle		Figure 28-1

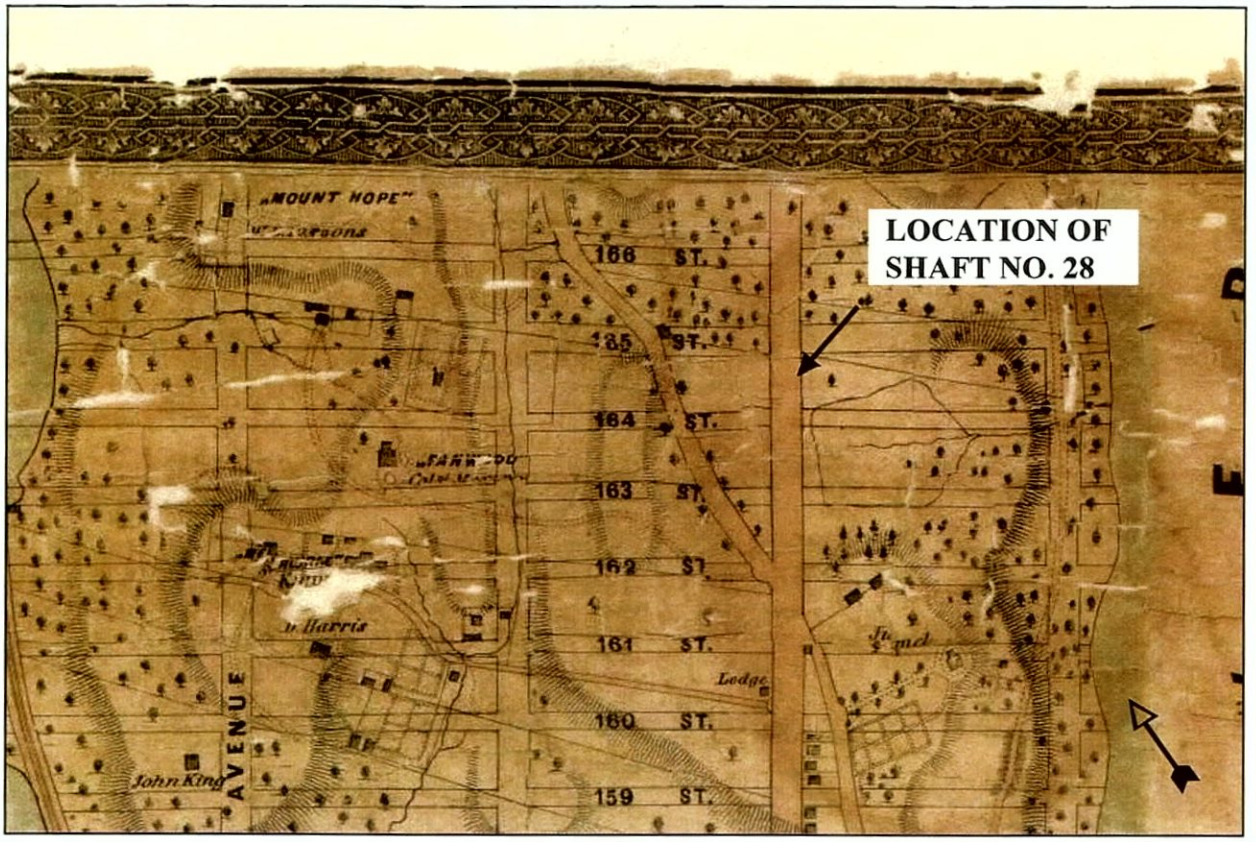


Figure 28-2: Shaft No. 28. Dripps *Map of the City of New York North of 50th Street,* 1851. No scale.

New Croton Aqueduct **New York, NY**		***Shaft No. 29*** Area Map
Central Park Quadrangle		Figure 29-1

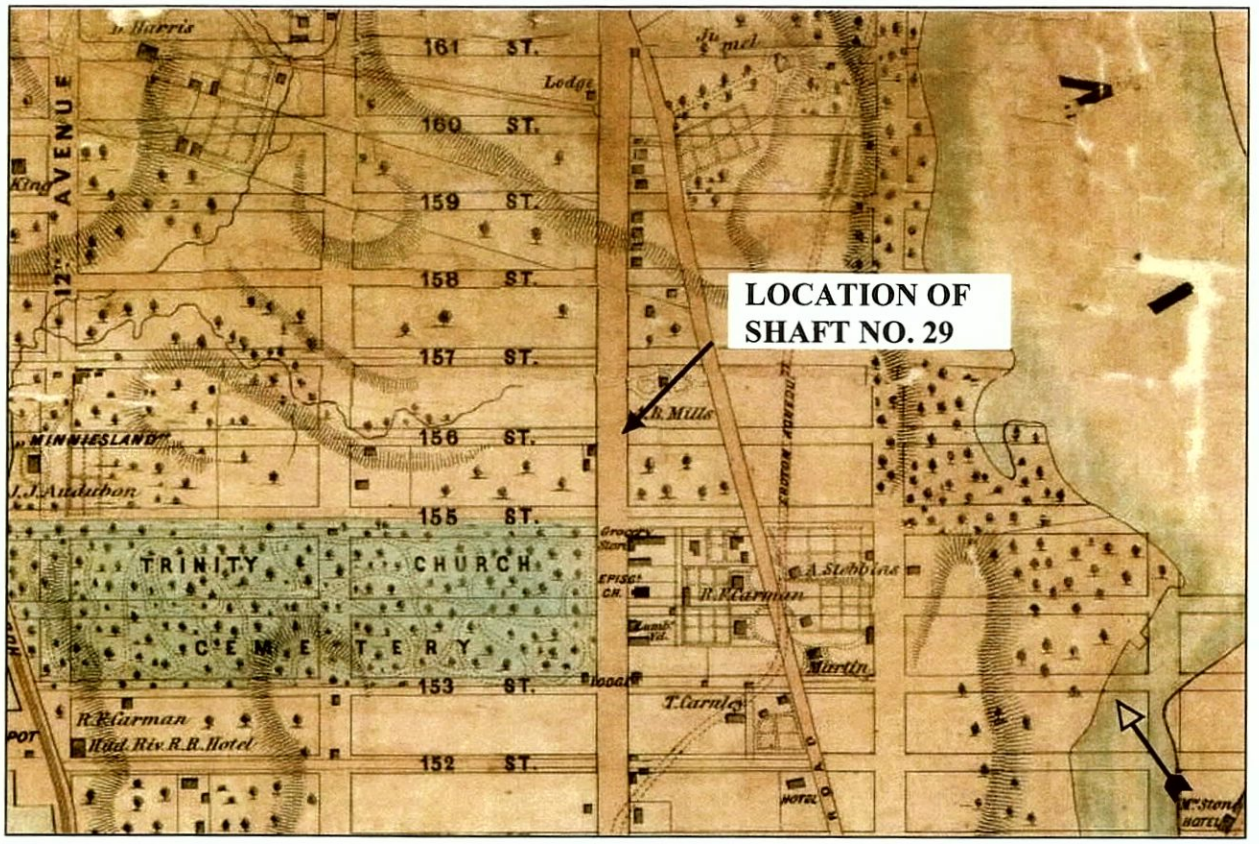


Figure 29-2: Shaft No. 29. Dripps *Map of the City of New York North of 50th Street,* 1851. No scale.

New Croton Aqueduct **New York, NY**		***Shaft No. 33*** Area Map
Central Park Quadrangle		Figure 33-1

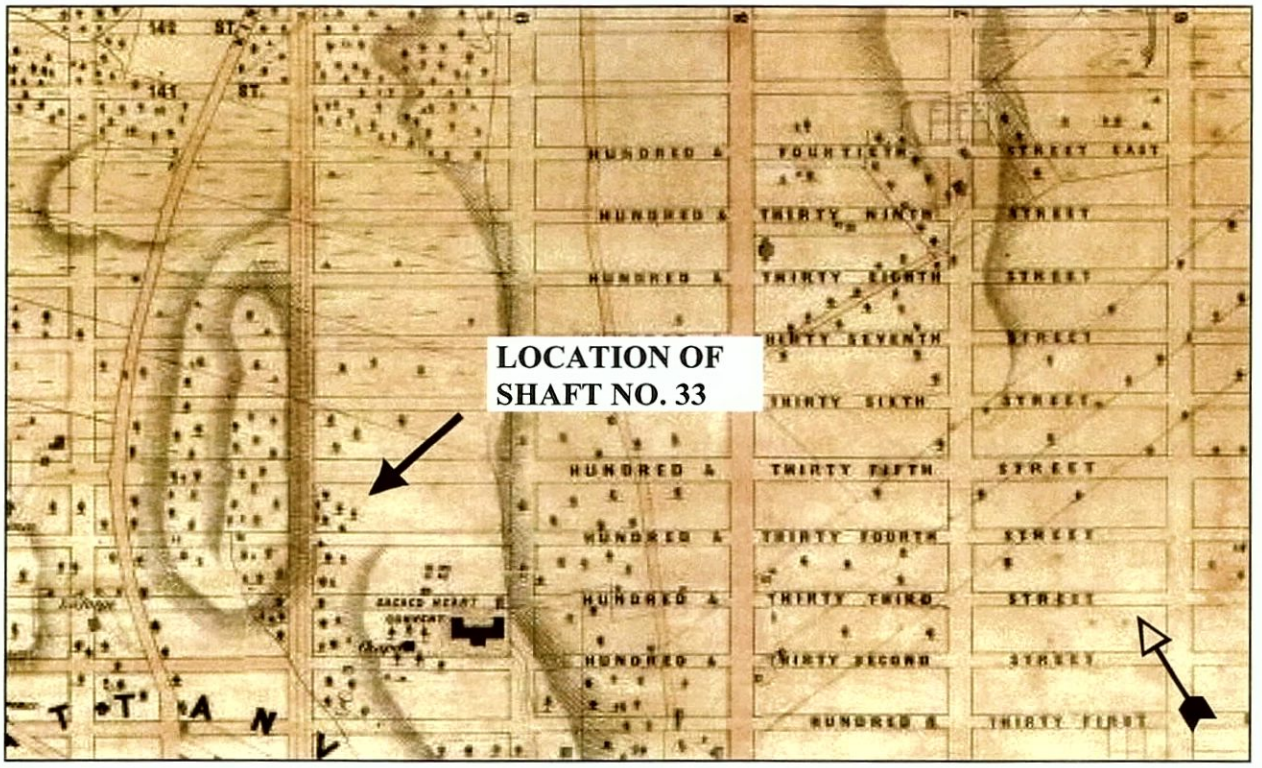
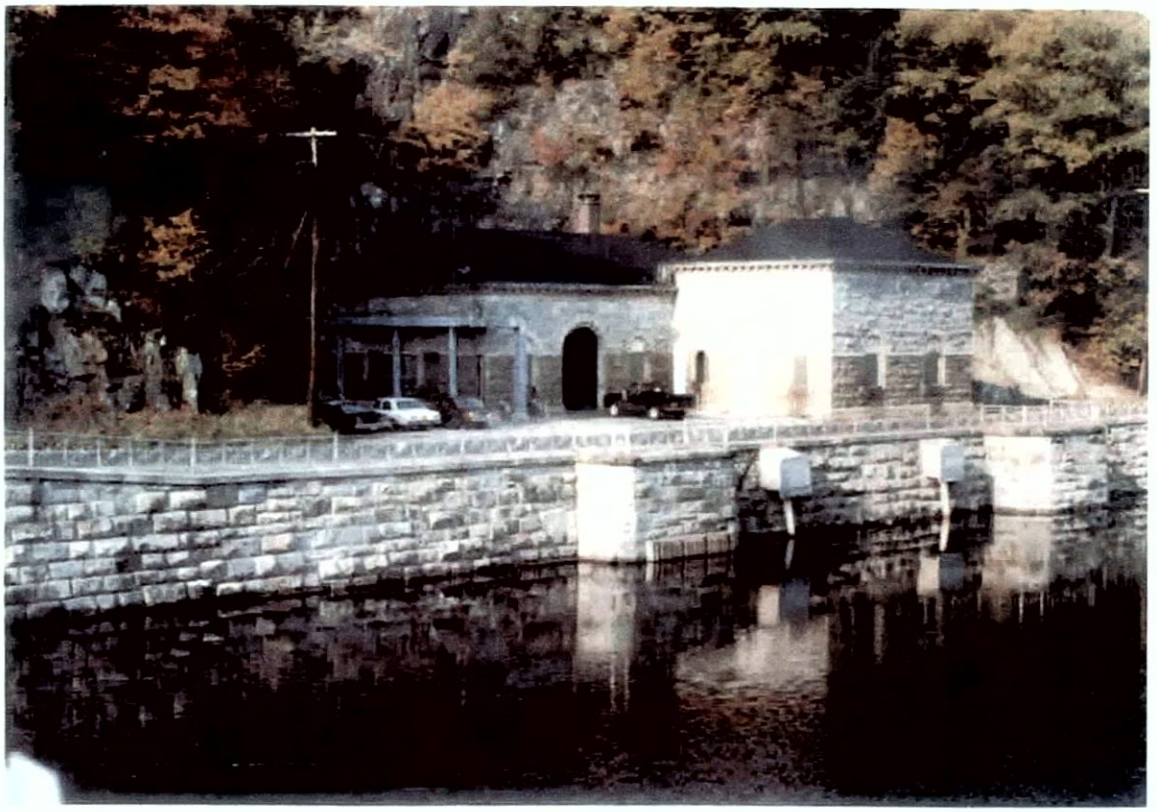
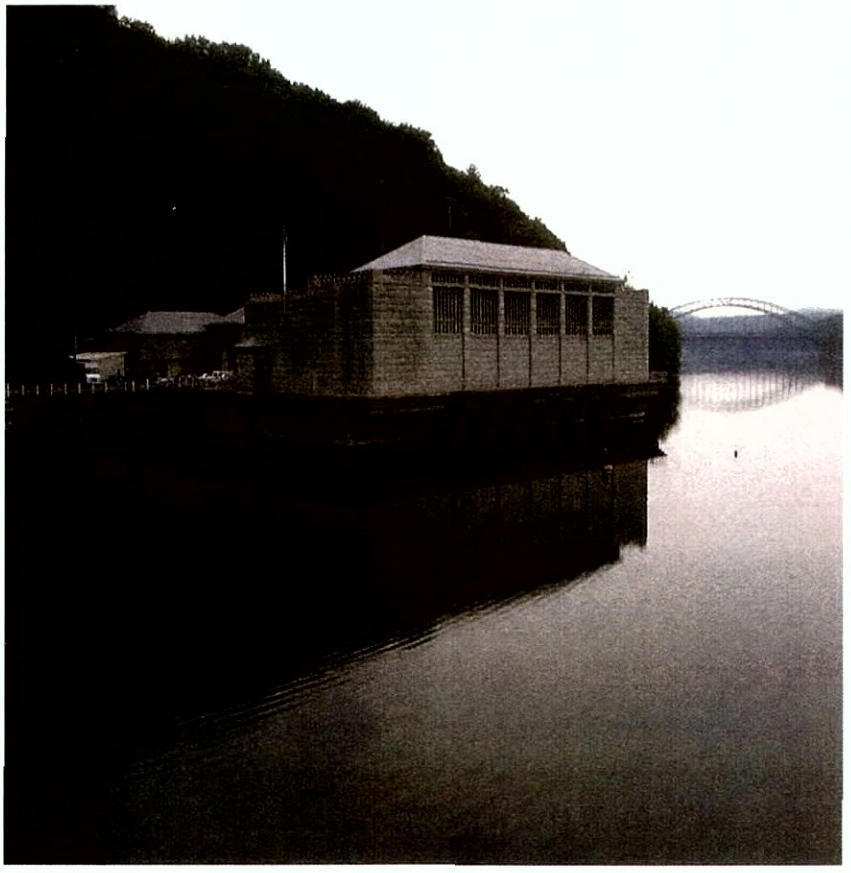


Figure 33-2: Shaft No. 33. Dripps *Map of the City of New York North of 50th Street,* 1851. No scale.



Photograph CLG-1: Photograph of 1890 Croton Lake Gate House.



Photograph CLG-2: View of the New Croton Lake Gate House constructed during the 1980s.

Photograph 1-1: Looking west, Shaft Site 1.

Photograph 2-1: Looking west, Shaft Site 2.

Photograph 3-1: Looking south, Shaft Site 3.

Photograph 3-2: Looking southwest, Shaft Site 3.

Photograph 4-1: Looking west, Shaft Site 4.

Photograph 4-2: Looking west, Shaft Site 4.

Photograph 6-1: Looking northwest, Shaft Site 6.

Photograph 9-1: Looking east, Shaft Site 9.

Photograph 9-2: Looking west, Shaft Site 9.

Photograph 10-1: Looking northwest from County House Road, Shaft Site 10.

Photograph 11A-1: Looking northeast, Shaft Site 11A.

Photograph 11C-1: Shaft Site 11C.

Photograph 12A-1: Looking northwest from Saw Mill River Road, Shaft Site 12A.

Photograph 13-1: Looking northwest from Secor Road, Shaft Site 13.

Photograph 13-2: Looking west, Shaft Site 13.

Photograph 13-3: Looking northwest from Secor Road, Shaft Site 13 and proposed access track location.

Photograph 14-1: Looking east, Shaft Site 14.

Photograph 14A-1: Looking east from American Legion Drive, Shaft Site 14A.

Photograph 15 1/2-1: Looking northeast from a private road within the Mount Hope Cemetery, Shaft Site 15 ½.

Photograph 16-1: Shaft Site 16.

Photograph 17 1/2-1: Looking southwest from Belknap Avenue, Shaft Site 17 ½.

Photograph 18-1: Looking northwest from Rumsey Avenue, Shaft Site 18.

Photograph 18-2: Looking west from Rumsey Avenue, Shaft Site 18.

Photograph 18 1/4-1: Looking northeast, from Midland Avenue and the eastern edge of Tibbetts Brook Park, Shaft Site 18 1/4.

Photograph 19-1: Looking northeast, from the northeast corner of McLean Avenue and Devoe Avenue, Shaft Site 19.

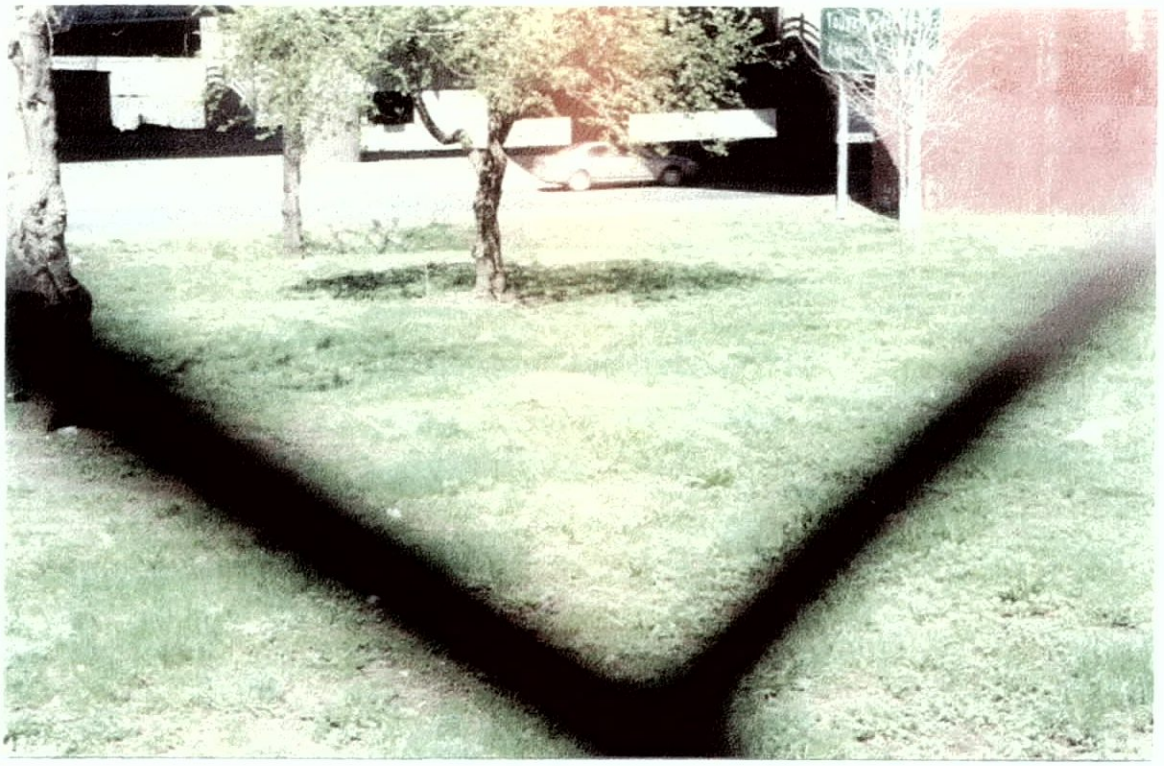
Photograph 19 5/8-1: Looking north from the southwest corner of Jerome Avenue and 233rd Street, Shaft Site 19 5/8.

Photograph GH1-1: Looking north from the northwest corner of Jerome Avenue and 233rd Street, Gate House 1.

Photograph 20-1: From Allen Shandler Recreation Area, Shaft Site 20.

Photograph 22-1: Northeastern corner of West Fordham Road and Sedgwick Avenue, Shaft Site 22.

Photograph 23-1: From the southeast corner of West Burnside Avenue & Loring Place, Shaft Site 23.



Photograph 24&24A-1: Looking west from Sedgwick Avenue, Shaft Sites 24& 24A.

Photograph 25-1: Shaft No. 25. Facing west from the Harlem River. Source: Kornfeld 1998.

Photograph 26-1: Looking southeast on Amsterdam Avenue, the 179th Street Pumping Station—Shaft Site 26.

Photograph 28-1: Looking west toward the centerline of Amsterdam Avenue between 164th and 165th Streets—Shaft Site 28.

Photograph 29-1: Looking west toward the centerline of Amsterdam Avenue between 156th and 157th Streets—Shaft Site 29.

Photograph 33-1: Looking southwest, from southwest corner of Convent Avenue and 135th Street, 135th Street Gatehouse and Shaft Site 33.