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APPENDIX D.8

HISTORICAL AND ARCHAEOLOGICAL RESOURCES

JEROME PARK RESERVOIR, BRONX, NY

1067

JEROME PARK RESERVOIR (BRONX)

Introduction and Environmental Setting

The Jerome Park Reservoir (JPR) is located in the Borough of the Bronx of the City of New York (Figure A-6). The site is bounded by Reservoir Avenue to the south, Sedgwick Avenue to the west, and north, and Goulden Avenue to the east. The exterior of the 92-acre JPR is formed of vertical stone-masonry walls and earth embankment. The existing 1,500-foot long Dividing Wall forms two separate unequal sections, the north basin and the south basin. The maximum water level in the Reservoir is at Elevation 135 feet above sea level (ASL) and the top of the Dividing Wall is at Elevation 140 feet ASL. The existing reservoir concrete floor varies between Elevations 109 and 110 ASL. The east perimeter wall of the Reservoir is made of stone and rubble masonry with top elevation of 139.5 feet ASL. Within the upper portions of this wall, there are two brick-lined aqueducts of horseshoe shape: the Old Croton Aqueduct, which is no longer in service, and the New Croton Branch Aqueduct (NCBA) which discharges into the southern end of the Reservoir through the South Portal. The two aqueduct structures are approximately two feet apart with the Old Croton Aqueduct on the reservoir side.

The following is a summary of proposed work activities at the JPR and associated sites. A full description of these proposed activities can be found in the Harlem River Site Conceptual Design Report (May 2002). Proposed work activities at the JPR include modifications at Gate House No. 5, Gate House No. 2, and Gate House No. 3. The modifications to Gate House No. 5 would consist of measures to modify the distribution functions, and provide overall architectural, HVAC and plumbing improvements for personnel. Proposed activities also include the demolition of the Demonstration Water Treatment Plant on the east side of the JPR and taking both the Jerome Pumping Station and Mosholu Pumping Station off-line. Further modifications are also proposed at Gate House No. 7, located along the northeast corner of the JPR. This alternative would also use the JPR as a potassium permanganate addition facility. Offsite treated water facilities are also proposed including a new Shaft Chamber constructed in the Harris Park Annex or near the north basin of the JPR and the rehabilitation of the Gravity Flow portion of the New Croton Aqueduct. Finally, there are three alternatives for conveying the treated water from the proposed WTP to the distribution system.

Prehistoric Research

The earliest cartographic source reviewed identifying aboriginal habitation in the vicinity of the JPR was the Hendricks Map of 1616. The map depicts the Wikagyl (Wiechquaesgeek) Indians inhabiting the southern New York mainland just north of the Manhattes Indians on Manhattan Island. A number of seventeenth century Dutch and English manuscripts, deeds, treaties, and maps describe the Wiechquaesgeek as the group of Native Americans living in northern Manhattan, the Bronx, and southern Westchester County (Bolton 1934:128; Grumet 1981:59-60). There are also at least five documented nearby settlements including; Shorakapkok, near 230th Street and Broadway; Nipinichsen, in Riverdale near 230th Street; Gowahasuasing, on Tibbett's Neck; Keskeskick, in Van Cortlandt Park; and Saperewack, on the Harlem River in the Marble Hill area.

Published literature supports the ethnohistoric reports of aboriginal occupation. Some of these sites are probably part of the same camps and/or villages reported in the earlier sources. They include: Kingsbridge Post Office, 231st Street, Ewen Park at 231st Street,

Marble Hill, Broadway and 230th Street, Paparinemin Island, Tibbett's Neck, Spuyten Duyvil Hill, Van Cortlandt Park, and the Chapel Farm Site (Bolton 1934:12, 134-141; Jenkins 1912:329; Kearns and Kirkorian 1990; Skinner 1915: 55-56; Tieck 1968: 3, 56).

Evidence of Native American occupation has also been recorded 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 (Kearns and Kirkorian 1986). Documentary and archaeological research indicates that the JPR neighborhood saw significant prehistoric activity. The streams and knolls, which were formerly located on the site would have been sought for temporary encampments and possibly longer-term occupations.

The OPRHP site file search reported site number A061-01-0114, the Harlem River Shellheaps, about a half mile south of the project site adjacent to the Harlem River. The midden site included the remains of dog burials. Just south of this, site A061-01-0538, another shell midden of unknown age was exposed during the grading of Tenth Avenue

A site files search conducted at the NYSM, which inventories only prehistoric sites, reported fourteen sites either directly adjacent to or within a mile of the JPR. NYSM site numbers 709, 711, 2823, 2838, 2839, 4052, 4053, 4054, 4055, 4056, 5320, 5321, 5322 and 7727 are all located nearby. Some of these sites are duplicates of the sites described above.

Prehistoric Archaeological Sensitivity

There is strong evidence of an extensive Native American presence in the neighborhood of the JPR as indicated by the numerous documented habitation sites and trails. The known Indian trail "Sachkerah," which once passed through the north basin of the reservoir but has since been obliterated, strongly supports the prehistoric Native American presence in the immediate area. Prehistoric campsites were frequently situated on well-drained knolls in proximity to fresh water sources, similar to those that existed within the project site prior to reservoir construction (Viele 1874). However, the creation of the reservoir obliterated all of these potentially sensitive land forms within the JPR, and almost certainly destroyed any which may have once existed directly outside of the basin (Photograph A-6).

The pre-reservoir topography of the site ranged in elevation from 123 feet to 158 feet above sea level (The Aqueduct Commissioners map: 1895). Soil borings conducted in 1991 (Warren George Inc. 1991) show that extensive excavations drastically reduced the pre-reservoir elevations, with the basin floor now laying between 108 feet and 109 feet above mean sea level. The knolls which may have once hosted archaeological deposits were leveled, with between fourteen and forty-nine feet of earth removed for the creation of the reservoir. Even the lowlands and streams around the knolls, also in the reservoir basin and once depicted as about 123 feet above mean sea level (Viele 1874; The Aqueduct Commissioners map: 1895), have been removed and the land lowered by at least fourteen feet to 109 feet above mean sea level.

Historical Background of the Neighborhood

The first official purchase of lands from the Native Americans of the Bronx area took place in 1639 by the Dutch West India Company. Two years later Jonas Bronk became the first white settler of the region when he bought 500 acres between the Harlem and Bronx Rivers. As with the rest of the borough, Kingsbridge was rural farmland until the time of intensified

residential and commercial development in the mid-to-late nineteenth century. Historically, the project site was in the township of West Farms (Fordham), which was incorporated into the township of Westchester in 1788, and then established as a separate township in 1846. The Bronx then became the Annexed District of New York City in 1874 and was chartered as a Borough in 1898 (Jenkins 1912:7).

Kingsbridge was laid out in the township of West Farms just north of Papirinemen Hill, an Indian name translated as "a place parceled out." Kingsbridge was named for the first bridge built across the Harlem River in 1693 by Frederick Philipse, linking Manhattan to what is now the Bronx. The community is not far from the neighborhood of Marble Hill, which was named for old marble quarries.

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. The north-south route of the Albany Post Road ran just west of the JPR in the approximate location of what is now Bailey Avenue. It nearly paralleled the Boston Post Road that ran along the route of Kingsbridge Road and through the JPR site (Jenkins 1912:215).

During the American Revolution 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 seven sites were selected for redoubts; two on the northern end of Manhattan and five in the Kingsbridge area of the Bronx. To the west of the project site, three forts were built on Spuyten Duyvil Neck and Tippet's Hill. Although the English captured them in November of 1776, each was subsequently abandoned by 1779.

Revolutionary War Sites

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

Following the American Revolution the JPR site remained vacant farmland until the late 1800s. After the Civil War the American Jockey Club controlled a large tract in the neighborhood and laid out a track for racing purposes. The track proved to be successful, and the race club flourished until 1894 when the City of New York acquired the property for the purpose of erecting the Jerome Park Reservoir (McNamara 1984).

The JPR, situated directly west of Harris Park, is an important element in New York City's water system; its construction in the early twentieth century reflects the evolution of the water system as the city expanded. The JPR is the oldest system supplying water to New York City and is the one closest to the city. The major architectural features of the reservoir structure itself are low ring walls of massive rock-faced, stone blocks. What is now the East Basin Wall was originally planned as a dividing wall between proposed East and West Basins, but plans for the East Basin were never realized (see below). The wall was built to support the Old Croton Aqueduct and a section of the Branch Aqueduct of the New Croton Aqueduct. All the basin walls were built of

stone and blocks excavated from the site. On the west side and on much of the north side, the reservoir wall is built above the level of the street, and the water is not visible. Built into the interior section of the West Wall is a waste weir.

Physically, the reservoir is set apart from its surroundings. Much of it is raised above eye-level and its use and design are different from that of the neighborhood. It is, however, a structure that, due to its scale and placement in the area, is a defining element of the neighborhood.

Construction of the Jerome Park Reservoir

The construction of the reservoir basin, as we see it today, was completed in 1906. Critical to understanding the placement of gate house chambers and the changes over time is an understanding of the original design of the JPR. First proposed ca. 1884 as a part of the construction plans for the New Croton Aqueduct, the "reservoir" was to function as a receiving and distributing reservoir (based in the 24th Ward) to ensure the city of at least a 10-day consumption source. The design flow was 50 million gallons a day. The location of the reservoir, on the grounds of the Jerome Park Racetrack, was selected in 1885 due to its elevation. The plans specified construction of the reservoir bottom at an elevation that would guarantee gravity flow into the reservoirs in Central Park. "A study of the available topographical maps showed that Jerome Park and vicinity contained the only site in the Annexed District [24th Ward] at the proper elevation for the construction of such reservoir" (DWSG&E 1907). Construction plans did not move forward for many years.

When the contract for the proposed reservoir was first circulated in 1894, the planned capacity was 1.5 billion gallons, corresponding nominally to seven and one-half days' drinking water supply. However, by 1895 the plans and specifications were amended to increase the capacity to 2 billion gallons. 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 would connect the flow of water between the basin and aqueducts (DWSG&E 1907).

The reservoir construction, under the supervision of John B. McDonald of McDonald & Onderdonk, was not completed in 1902 as originally scheduled. By that year, the contract was amended again to the following reduced capacity: easterly basin, 1.13 billion gallons and the westerly basin, 773.4 million gallons. When the reservoir was officially opened in 1906 only the smaller westerly basin was completed and functioning.

The second basin, east of the division wall which now functions as the East Basin Wall, was still planned in 1906, and the land was cleared and partially excavated in preparation for construction. Two Gate Houses, Nos. 4 and No. 6, were first built well east of what is now the eastern ring wall of the reservoir on the assumption that the proposed two-basin reservoir would be completed. In 1912, the two-basin plan was officially abandoned. In 1913, the possibility of erecting a filtration plant in the east basin area was studied and funds (\$8,690,000) were tentatively appropriated for construction; however, the funding was rescinded and the city did not act on the proposal (DWSG&E 1913). The excavated area of the east basin was eventually filled and graded. The east basin site was turned over to the City for other uses. It was later developed into Lehman College, a subway yard for two subway lines, three high schools, a park,

and several public housing developments.

Prior to the completion of the reservoir, an important law, Chapter 724 of the Laws of 1905, concerning the management of New York City's water supply, went into effect. This law was largely a reaction to the realization that, even with the imminent completion of the JPR, an additional water supply was of vital consequence. The Board of Water Supply eventually became the city's agency for constructing additions to its water supply system. As each addition or a portion thereof was completed, the physical structures were turned over to the Department of Water Supply, Gas and Electricity (DWSG&E) for operation and maintenance. The DWSG&E thus assumed the maintenance of the reservoir and associated appurtenances. The following discussion, therefore, relies heavily on the original Aqueduct Commissioners' contract drawings of the reservoir and the subsequent annual reports, plans, and records available from the DWSG&E. There are, however, gaps in the information on the gate houses. Both the Department of Environmental Protection archives and the city's Municipal Reference Library are missing critical drawings, plans, and plates of the gate houses.

Other major architectural features of the JPR are the brick gate house superstructures located along the periphery of the structure. Gate House No. 5 on Goulden Avenue at West 205th Street is a substantial structure, while most of the others are smaller buildings. Gate houses were built for the proper distribution and handling of water. Gate house substructures, buried below grade, host the vital piping and pumps necessary to maintain the required water flow. Visible to the public on today's landscape are the gate house superstructures which serve as above-grade access structures for the piping and pump mechanisms. Although the JPR was completed in 1906, no gate house superstructures were erected at that time. Although DEP archives provided plans and elevations of gate house proposals, these gate houses were never built.

In 1906, designs were prepared for at least five gate houses (Nos. 2, 3, 4, 6, and 7). Designs for bold rock-faced stone gate houses with copper cornices and Spanish tile roofs were completed by the prominent architectural firm of Trowbridge & Livingston. Gate Houses Nos. 4 and 6, which were subterranean systems in 1906, never functioned. Gate House No. 4 was eventually abandoned. Gate House No. 6 was rebuilt, and the control chambers and valves moved to the southern tip of the west basin where it stands today.

In 1909, designs were prepared under the auspices of chief engineer F. S. Cook for Gate House No. 1. In 1920, another design was prepared for this gate house. Apparently, no construction was undertaken. A design was prepared for Gate House No. 2 in 1925; again, no construction was undertaken. There may have been other aborted gate house design projects as well.

In 1938, designs were prepared for Gate Houses Nos. 2, 5, and 7. Plans were prepared by the Design Unit, Project Planning Section, Division of Operations, Works Progress Administration (WPA) (Quilty 1939). No architect's name is associated with these designs since they were prepared by the staff of the WPA for the New York City DWSG&E. There is no evidence that the construction of these gate houses entailed any changes to the mechanical systems of the reservoir. While apparently there had been interest in building gate house superstructures from the time that the JPR opened in 1906, it was not until 1938 that funds were available for this work. The smaller gate houses surrounding the reservoir appear to be similar to those designed by the WPA in 1938, but no evidence has been located as to how these were funded or who built

them.

Historic Resources

The JPR is a historically important complex. Based on the recommendation of the New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP), the JPR and adjacent associated buildings, structures, and sites are now listed on the New York State Register of Historic Places. In 2000 the JPR was also listed on the National Register of Historic Places. The JPR's statement of significance includes two criteria: Criterion A. *Property associated with events that have made a significant contribution to the broad patterns of our history*; and Criterion C. *Property embodies the distinctive characteristics of a type, period, or methods of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction*. The site encompasses an approximately 125-130 acre reservoir-park that consists of 94 acres of open water and the surrounding 30 acres of constructed and landscaped earth; it lists 11 contributing structures, 5 contributing buildings, and 3 contributing sites.

The 11 contributing structures listed in the NR nomination are found encircling, under, or inside the west side of the completed reservoir: the basin, east wall, west wall, core wall dam, conduits of the Old and New Croton Aqueducts, system of stabilizing revetments, Shaft No. 21, waste weir, pipe vault portal, and south portal. The 5 contributing buildings are Gate Houses 2, 3, 5, 6, and 7. The three contributing sites are Old Fort Four Park, Fort Independence Park, and the Harris Park Annex.

The WPA funded a significant number of New York City projects relating to the water system, including surveys, water main installations, and the alteration, repair, and construction of buildings. The designs for Gate Houses Nos. 2, 5, and 7 are nearly identical to the completed buildings. The buildings generally retain their integrity. A discussion of JPR Gate Houses Nos. 1, 2, 3, 4, 5, 6, and 7 follows.

Gate House No. 1. A gate house of small dimensions was built at the origin of the new section of the aqueduct, at the point where it branched from the main structures. This is now Gate House No. 1, located below ground to the north in Van Cortland Park, outside of the project site. This gate house originally consisted of an underground concrete vault accessed through an at-grade stairway and manhole, built over the intersection of New Croton Aqueduct and the Branch Aqueduct. Apparently sometime after 1909, the year a city specifications contract was printed, a superstructure was built at Gate House No. 1. Over the last 90 years, the gate house mechanisms, which originally controlled the flow through the aqueduct by a combination of two drop-gates and simple stop-planks, have undergone some technological changes and improvements. There is no extant evidence of a superstructure at this time. Gate House No. 1 is located a considerable distance upstream of the reservoir and well outside the project impact study area.

The following summary of Gate Houses Nos. 2 through 7 was taken primarily from the descriptions found in the 1907 *Report of the Aqueduct Commissioners* (DWSG&E) on file at NYC Municipal References.

Gate House No. 2. Gate House No. 2 is a small "outlet structure" on the edge of the reservoir on

Sedgwick Avenue. It was originally designed to contain 48-inch pipes connected directly to the city's distribution system. The substructure as originally designed, has two inlet chambers, one admitting the water from the West Basin of the reservoir through a bottom, middle, and surface inlet, and the other drawing water from the central gate house, No. 5, by two lines of 48-inch pipe laid on the bottom of the reservoir.

The two 48-inch mains running northwest into Van Cortlandt Avenue are laid through the north embankment of the reservoir in a brick culvert, and are provided with suitable manholes and a vault entrance. This vault was built to prevent any leakage from coming in contact with the earthen embankment, and to divert it into the sewer built therein. This culvert also originally covered a waste and drainage sewer, which is constructed from Gate House No. 2.

Although the proposed 1906 and 1909 elaborate gate houses were not built, it is assumed that some form of simple frame structure was erected at Gate House No. 2 shortly after construction of the aqueduct.

According to plans and elevations on file with the NYCDEP (Job No. 254), the extant Gate House No. 2 superstructure was built as part of the 1937-38 WPA effort for the DWSGE. The Gate House No. 2 superstructure is an irregularly-shaped, one-story, flat-roofed structure, and the projecting brick piers, with limestone lintels, divide the walls into bays. On the reservoir facade, or south elevation, are three windows set into the bays. The massive ashlar foundation is visible from the reservoir. Originally, it was fitted with a wood-paneled door. A limestone cornice is on all sides. On the street facade, or north elevation, is a concrete rectangular plaque over the door opening; a series of smaller square plaques ornament all elevations. Currently, the windows are boarded up, the entry is covered by a corrugated metal overhead door, and there is considerable deterioration of a portion of the facade and cornice.

Gate House No. 3. Gate House No. 3 is also a small "outlet structure" on the edge of the reservoir on Sedgwick Avenue. It was originally designed to contain 48-inch pipes connected directly to the city's distribution system. This gate house, constructed on the west side of the reservoir, has the same general plan as Gate House No. 2; however, it contains no waste chamber. Instead, a special waste-weir built about half-way between Gate Houses Nos. 2 and 3 is joined with the drainage culvert of the former by a masonry drain; this drain was built in a tunnel (4 feet wide by 7 feet high), which was constructed outside the reservoir wall by Clark & Company. This gate house controls the flow into two lines of 48-inch mains running westerly along the Boston Road. As with the discussion above regarding Gate House No. 2, it is assumed that some form of simple frame structure was erected at Gate House No. 3 shortly after the aqueduct construction.

Over several years, WPA workers built at least three and possibly five of the brick superstructures over the Jerome Park Reservoir gate houses. DWSG&E annual reports do not always identify the actual gate house superstructure that was completed by the WPA in any one year; however, the uniform design and materials indicate that Gate House No. 3 was completed at approximately the same time as Gate Houses Nos. 2, 5, 6, and 7. The massive ashlar foundation is visible from the reservoir. The gate house is a one-story, flat-roofed structure with a limestone cornice; its projecting brick piers, with concrete lintels, divide the walls into bays. On the reservoir side are three windows set into the bays. On the street facade, or west elevation,

is a limestone rectangular plaque over the door opening; smaller square plaques ornament all elevations. The side wall fenestration originally consisted of three narrow single-stacked pane windows. The Gate House No. 3 superstructure, approximately 27.5 feet by 32 feet, has an iron-railing balcony projecting over the reservoir. Gate House No. 3 is boarded up and considered a maintenance liability by the New York City Department of Environmental Protection (NYCDEP).

Gate House No. 4. East of Goulden Avenue, Gate House No. 4 (substructure only) was built just south of West 205th Street on what is now the Transit Yard. The gate house was built at the time of original reservoir construction, circa 1900, when the original plans called for the reservoir to be twice as large; Goulden Avenue was planned as a dividing wall between two large basins. Although the gate house has since been removed, remnant foundation walls can still be seen in the Transit Yard. The gate house is outside the impact area, but is part of the study area.

Gate House No. 4, the substructure only, was constructed on the easterly side of the two-basin reservoir, based on the same general plan as Gate Houses Nos. 2 and 3. It differs, however, in that it was arranged for three lines of 48-inch mains, one supplying the high-service pumping station built by the DWSG&E on Jerome Avenue (a.k.a, the "High Pumping Station," a National Register property described in detail below), and the other two being connected with the distribution system. This gate house, like Gate House No. 2, has an overflow and waste-chamber. A 48-inch pipe conveys the waste water to the blow-off sewer constructed in Jerome Avenue and in 204th Street.

Plates for Gate House No. 4 (#102-105) referred to in the 1907 report were not appended to the report reviewed at Municipal Archives. Because this gate house was constructed on the "same general plan" as Gate House Nos. 2 and 3, we can assume that the below-grade construction of extant Gate Houses Nos. 2 and 3 is similar.

As with the discussion above regarding Gate House No. 2, it is assumed that some form of simple frame structure was erected at Gate House No. 4 shortly after the aqueduct's construction. It also is assumed that sometime after abandoning the plan to construct an east basin and the transfer of the property to another city agency, any Gate House No. 4 superstructure was then demolished. There is currently no Gate House No. 4 superstructure.

Gate House No. 5. Gate House No. 5, the main JPR Gate House, is a large structure built near Shaft No. 21 (the shaft which linked the New Aqueduct at 115 feet below grade to the surface). This Gate House, located near the intersection of Goulden Avenue and West 205th Street, was designed to: allow the "Old Aqueduct" to carry water directly to the city or be emptied into the new reservoir; establish a connection between the two aqueducts; take water back from the reservoir after circulation and empty it through Shaft No. 21; keep up the supply if one or both reservoirs were empty by means of pipes connected with three outlet Gate Houses. A superstructure building at Gate House No. 5 was the result of a 1937-1939 WPA effort. The one-story structure measured approximately 91 feet by 131 feet (Quilty 1939).

Gate House No. 5 is constructed in the division wall, in a central position on Goulden Avenue, directly opposite West 205th Street. When originally constructed it was to serve the following purposes:

1. It was to receive water from the Old Croton Aqueduct and from the branch conduit leading from the New Croton Aqueduct, and discharge this water into the east or west basin of the reservoir or into both; or let the water pass to the City in the new or old aqueduct without entering the reservoir.
2. It would provide a connection between the two basins of the reservoir.
3. It would control the inlet into the 48-inch pipes laid on the bottom of the reservoir from this Gate House to Gate Houses Nos. 2, 3, and 4 and insure a supply of water to the Gate Houses when one or both basins of the reservoir are empty.
4. It would provide a connection to Shaft No. 21 of the new aqueduct, which is located in a tunnel, about 100 feet directly below the bottom of the West Basin of the reservoir.

The original plan for the Gate House was as follows:

The water flowing in the branch conduit from the new aqueduct passes through three inlets, each 5 feet 3 inches wide, into an inlet chamber and thence, through four pairs of 2 x 8-foot sluice-gates, into a main chamber. The inlets are arched over and each is provided with a double set of grooves for stop-planks. The water from the old aqueduct can either pass through two arched inlets 5 feet 3 inches wide, controlled by sluice-gates, into the inlet chamber mentioned above, or it can flow in a conduit built around the Gate House and in the top of the division wall to the southerly end of the reservoir where it enters the old aqueduct structure leading to New York.

When the water is to enter the Gate House, stop-planks are placed in a double set of grooves constructed, at the Gate House, in the conduit built for the old aqueduct. Each of the inlets from the old aqueduct is controlled by a double 2 x 8 foot sluice-gate, on each side of which a double set of grooves for stop-planks is provided. This makes it possible to enclose the gates by coffer-dams of stop-planks when repairs may be needed.

All the inlets, outlets, and other gate openings in Gate House No. 5 are made uniformly 5 feet 3 inches wide, and, with the exception of the three inlets from the new aqueduct mentioned above, each gate opening (sluiceway) is controlled by a double 2x8-foot sluice-gate, having on each side a double set of grooves for stop-planks.

From the inlet chamber the water passes through four double 2x8-foot sluice-gate openings into a main or central chamber, 34 feet by 50 feet 3 inches in plan, having its bottom at Elevation 107. A masonry viaduct, 17 feet wide, is constructed over the central part of this chamber, resting on two arches, each 14 feet wide, through which the water can pass from one side of the chamber to the other. Above these openings, and at right angles to them, there is an arched passage 9 feet wide, through the viaduct, leading from the inlet to the southerly end of the outlet chamber.

The water may be discharged into the reservoir at the Gate House at different levels, viz., through two bottom and one upper sluiceways into the East Basin and through one

bottom and one upper similar sluiceways into the West Basin. Instead of discharging the water at the Gate House, it may be made to pass southerly [through] conduits...constructed in the division wall. One discharges into the East Basin and the other into the West Basin, about 2,025 feet south of the center of the Gate House.³

Four waste-weirs, each 5 feet 3 inches side, are constructed in the Gate House. Each of the waste-weirs is provided with a double set of grooves for stop-planks.

The main water chamber is, also, connected with Shaft No. 21 of the new aqueduct by a circular conduit, 11 feet in diameter and about 185 feet long, constructed below the bottom of the reservoir. This conduit discharges in the Gate House into a small arched chamber from which the water passes through four 2 x 8-foot sluice gateways into the main water chamber. On top of the conduit six arches support a viaduct with a roadway 13 feet wide, constructed to reach the top of Shaft No. 21 for maintenance.

Any one or all the water chambers of the Gate House may be emptied by a system of drainage pipes, from which the water is taken by a 20-inch iron drain pipe, laid under the bottom of the reservoir to Gate House No. 2, where this 20-inch pipe discharges into the drainage culvert. (New York City 1907:125-6) [Gate House No. 5 Plates, 105-108, referred to in the 1907 report are not appended to the report].

The pipes (48-inch cast iron) connecting Gate House No. 5 with Gate Houses Nos. 2, 3, and 4 were not constructed as originally designed. The pipes were to be simply laid along the bottom of the reservoir but that proved impossible as they floated when empty. It was decided to lay the pipes for Gate Houses Nos. 2 and 3 on concrete piers, which were to be carried up 12 inches above the pipes with a view to loading down or anchoring them. Each pier contains 2 cubic yards of concrete, mixed 1-2-5, reinforced with two-inch expanded metal rods. The rods were placed within the concrete to prevent cracking or breaking apart (New York City 1907:126).

The 1907 report states that the pipe connection between Gate Houses Nos. 4 and 5 was laid in a trench below the bottom of the reservoir. This pipe connection, consisting of two 48-inch pipes, does show on a survey of the construction project but it is unclear as to the date of completion of this connection and when and how this connection was later altered when Gate House No. 4 was decommissioned. An elevation of Gate House No. 5, ca.1906, clearly shows conduits to both basins. Elevations of Gate House No. 5, dated 1965, depict both a "West Basin outlet" and a "plugged outlet" that obviously once directed water to Gate House No. 4 (Board of Water Supply, Acc. XC-208).

According to 1909 Minutes of the Aqueduct Commissioners, contract specifications for a Gate House No. 5 superstructure were approved and filed with the Corporation Counsel. It is assumed that a simple, frame superstructure was erected fairly soon after this October 1909 action. A new one story, frame "field office" was built at Gate House No. 5 in 1936. This field office may have not functioned as a superstructure but may have been in direct response to the increased activity along Goulden Avenue as a WPA work force moved into the area to complete many reservoir repairs and new construction. The Gate House No. 5 superstructure was replaced three years

³ The conduit from Gate House No. 5 that leads to the West Basin, terminates at the South Portal, an arched opening in the East Basin Wall of the reservoir.

later by the extant one-story fireproof building. The superstructure - at 205th Street and Goulden Avenue - measures roughly 91'x131'. This same year the two 48-inch mains leading from what had become Goulden Avenue into Gate House No. 5 were encased in concrete and that section of the Croton Aqueduct between Gate Houses Nos. 5 and 7 was waterproofed (DWSG&E 1939:38). By 1965 Gate House No. 5's superstructure chamber was subdivided to accommodate a chlorinator room and two chlorine storage rooms and an employee locker room (Board of Water Supply 1965: Acc XC-213).

The flat roofed, single story structure has small recessed side, one bay, projecting walls connected to the front facade by narrow 45-degree angled walls. The red brick structure rests on a raised ashlar block foundation, which is defined by a projecting beltcourse of polished stone blocks. Limestone lintels top the tall, slender windows. Additional light reaches the sluice gate operator chamber through two overhead skylights. There is a limestone beltcourse above the windows and a limestone (block) cornice. The building's seven bay facade, with the wide center block steps, makes a strong 1930s statement of a public facility as it faces Goulden Avenue. The opposite west elevation, leading to the Shaft No. 21 service road, is seven bays but is unornamented. The north and south facades are five bays wide. The east elevation's dominant central double doors are set within a limestone architrave surround and multi-paned light transoms (now covered over). Rectangular, stepped parapeted, projecting blocks of stone and concrete frame this entry bay.

Over the years Gate House No. 5 has absorbed an array of extra duties. Today the large main room is dominated by a series of 17 upright hand wheels that control water flow through sluice gates. Currently it also houses the Reservoir rescue skiff, an office, and an employee lounge. It is considered obsolete by the Department of Environmental Protection.

Gate House No. 6. Gate House No. 6 was originally constructed at what was to be the eastern end of the larger reservoir, east of Goulden Avenue near what is now the Kingsbridge Armory. It was later moved to its present location at the southern edge of the south basin. In 1939 a new superstructure was built over Gate House No. 6.

Gate House No. 6 was constructed at the southerly end of the easterly reservoir to control the flow into two lines of 48-inch mains. Detailed information on the construction of the relocated Gate House 6 at the southern tip of the western basin has not been located. It is assumed that a subterranean foundation plan, similar to those already functioning as part of the complex, was executed sometime just prior to 1939. In 1939, the city paid the A.W.B. Contracting Corporation for laying 1,483.8 linear feet of 48-inch pipe in Reservoir Avenue, the roadway that connects the sites of the old and new Gate House No. 6. The annual report of that year further states that the original Gate House No. 6 was eliminated, and the property it occupied adjacent to the Kingsbridge Armory on Kingsbridge Road was released to the Armory Board.

It is assumed that the extant, one-story, flat-roofed, parapeted superstructure was probably built under the same subterranean chamber contract, since it is somewhat similar in style to the other gate houses of this vintage but does not have the same ornamental detail. Approximately 30 feet by 22 feet, the gate house is relieved by projecting brick bays on three facades, as well as a limestone beltcourse and cornice. However, there are no windows, plaques, or balconies. Vertical brick stretchers form a string course between the foundation and the superstructure. On

the east elevation, an at-grade service door pierces the string course. The single bay front facade, or south elevation, focuses on the single door set within a slender limestone architrave surround. Although there are no transoms above the door as in Gate House No. 5, the header bonding does make the "transom area" distinctive.

Gate House No. 7. According to the DWSG&E's 1907 report, Gate House No. 7 was situated at the north end of the division wall for the following purposes:

1. To admit water from the new aqueducts that will, in all probability, be built in the near future.
2. To discharge the water of the old and new aqueduct at the northerly end of the reservoir with a view for producing circulation.
3. To control the outlet from the reservoir at this point through eight lines of 48-inch mains.

Gate House No. 7 consists of two substructures, one on each side of the division wall, which are connected by two concrete conduits. The substructure on one side of the division wall is the exact counterpart of the one on the other side. Each substructure has a horseshoe-shaped inlet to which a branch conduit from one of the proposed new aqueducts may be attached.

The gate house was designed to have, in all, nine 2-foot by 8-foot double sluice gates and twelve 2-foot x 5-foot sluice gates. A system of drain pipes was provided for emptying the different water chambers, and the water was conveyed by a 20-inch iron pipe laid on the bottom of the reservoir to Gate House No. 2, where it was discharged into the blow-off culvert.

In 1939, the extant superstructure at the intersection of Sedgwick and Goulden Avenues was built as part of the WPA work effort (Quilty 1939). The superstructure, measuring roughly 97 feet by 124 feet, is really two separate structures that are joined by one roof. The gates and portals originally installed to conduct water into the east basin of the reservoir were bricked-up. By 1965, the superstructure chamber of Gate House No. 7 had undergone some changes, being subdivided to accommodate a chlorinating room in the east building and a transformer room in the west building. It is unclear if the "switch room" and "office" in the east building were original to the 1939 plan or were added later.

Dominating the Sedgwick and Goulden Avenue intersection, Gate House No. 7 is a combination of design elements from the smaller outlet gate houses (Nos. 2, 3, and 6) and the larger central gate house (No. 5). The at-grade, front facade maintains a seven-bay rhythm defined by projecting brick piers with limestone lintels. Attention is focused on the central bay, a 14-foot and eleven inch drive-through entrance, that mimics, minus the ashlar blocks, the Gate House No. 5 stepped parapet entrance. It should be noted that the at-grade driveway corresponds to the below-grade routing of the two aqueduct conduits feeding the reservoir. A limestone cornice encircles the entire irregularly-shaped building. On the south, east, and west elevations, the seven bays are defined by tall slender windows, now boarded, without pronounced lintels. The central bay in the south elevation, or drive-through, is recessed. On the south elevation, the projecting brick piers are limited to forming limestone-capped quoins.

Currently, the Gate House No. 7 superstructure, in addition to housing a series of sluice gate floorstands for flow control and chlorinating equipment, serves as an occasional manned office when work is being conducted on the nearby subterranean Mosholu Pumping Station. It is considered a maintenance liability by the NYCDEP.

National Register Contributing Sites

The 3 contributing sites that surround the JPR include Fort Independence Park, Old Fort Park, and the Harris Park Annex. Fort Independence (a.k.a. Fort No. 4), and Fort Nos. 5, 6, 7, and 8 were Revolutionary War defenses located in the Bronx. The extant Fort Independence Park at the north end of the Jerome Park Reservoir and Old Fort Park (Fort No. 5) at the south end of the reservoir are in the approximate locations of the original forts' footprints. An archaeological salvage investigation of Fort Independence was conducted during the late 1950s and archaeologists uncovered evidence of the army occupation.

Fort No. 5 was a redoubt situated due south of Fort Independence at the southwest end of the Jerome Park Reservoir. The Fort was confiscated and occupied by the British in 1777 and abandoned two years later (Jenkins 1912:128). Portions of this site were excavated during the early twentieth century and the remains of brick fireplaces and military artifacts were found (Jenkins 1912:129).

Harris Park is bounded by Goulden Avenue to the west, 250th Street to the north, Paul Avenue to the east, and Bedford Park Boulevard to the south. A designated mapped park under the jurisdiction of the New York City Department of Parks and Recreation (NYCDPR), Harris Park is currently a landscaped recreation area. The park is underlain by 15 to 35 feet of fill from the excavations associated with the construction of the JPR. The Harris Park Annex is a narrow parcel located between the northeastern edge of the JPR and Goulden Avenue. This area was also disturbed during the excavation and construction of the reservoir.

Historic Structures

Other historic structures in the vicinity of the JPR include the Jerome Avenue Pump Station, the Mosholu Pump Station, the Kingsbridge Armory, the 40th Police Precinct Station House, the Shalom Aleichem Houses, the Amalgamated Houses, DeWitt Clinton High School, Hunter College and the house located at 2860 Webb Avenue.

Jerome Avenue Pump Station. The Jerome Avenue Pump Station, or High Pumping Station, listed on the National Register of Historic Places, is located on the west side of Jerome Avenue between Mosholu Avenue and 206th Street, several blocks east of the reservoir. The structure, built between 1901 and 1906, was designed to pump water from the reservoir to consumers throughout the borough. The pump station was designed by George W. Birdsall, built by the DWSE&E, and constructed as part of the Jerome Reservoir complex, an adjunct to the Croton Aqueduct system. In 1981 the structure received "Landmark" status from the NYCLPC, and in 1983 it was listed on the National Register of Historic Places.

Mosholu Pump Station. The Mosholu Pump Station is an underground pump facility located at the corner of Goulden and Sedgwick Avenues. No above-ground features are associated with this facility. The station consists of a shaft that houses pipes and pumping equipment. The inner workings of this facility have been repeatedly updated through the years. None of the original workings are still in place. Although this facility may once have been eligible for the National Register as a component to the aqueduct system, it has not retained its integrity, and thus no longer meets the necessary criteria.

The Kingsbridge Armory (originally, the Eighth Coastal Artillery Armory; later, the Eighth Regiment Armory), located on the full block bounded by Kingsbridge Road, Reservoir Avenue, West 195th Street, and Jerome Avenue, is one of the largest and most impressive structures in the Bronx. In recognition of the importance of the armory, it was designated a New York City Landmark on September 24, 1974, and was listed on the National Register of Historic Places on December 21, 1992.

40th Police Precinct Station House. The 40th Police Precinct Station House (now a community center), located at 3101 Kingsbridge Terrace, is currently a New York City Landmark.

Sholom Aleichem Houses. The Shalom Aleichem Houses, located at Giles Place at Sedgwick Avenue, are eligible for listing on the National Register of Historic Places.

Amalgamated Houses. The Amalgamated Houses, located at Sedgwick Avenue, Hillman Avenue, Van Cortlandt Park South, Gouverneur Avenue, and Saxon Avenue, are eligible for listing on the National Register of Historic Places.

DeWitt Clinton High School. The DeWitt Clinton High School, located at Mosholu Parkway South between Goulden and Paul Avenues, is eligible for listing on the National Register of Historic Places.

Hunter College. Hunter College, now Lehman College has four original buildings (Main, Gym, Davis, and Gillet) that are eligible for listing on the National Register of Historic Places.

2860 Webb Avenue. A Queen Anne house at 2860 Webb Avenue, located on the southeast corner of Reservoir Avenue and known as Our Lady of Angels Rectory, is eligible for listing on the National Register of Historic Places.

Historical Archaeological Resources

Historically, the project area was heavily utilized during the American Revolution, which may have resulted in the deposition of potentially important archaeological materials within the project site. Fort Independence, ca.1776, was located directly north of the north basin, and Fort No. 5 was located just south of the south basin. During reservoir construction workmen reportedly encountered several cannon balls, bayonets, swords, buttons, and other military relics, including burials.

When the excavations began, the workmen turned up with their tools several cannon balls, bayonets, swords, buttons, and other military relics, one man throwing out a shovelful of earth, which gave up an English sovereign. All through this section, from time to time, similar relics have been unearthed, including several skeletons, one of which by means of the regimental buttons and shreds of uniform that remained, was identified as that of a British officer (Jenkins 1912:338).

Following the Revolutionary War, the project area remained undeveloped and used as farm land through the late nineteenth century. A small farm complex was situated in what is now the north reservoir basin between the 1880s and 1890s.

Well-drained knolls and upland once within the project site probably hosted historically important revolutionary war period and late nineteenth century farmstead archaeological deposits. However, the massive earth moving that occurred during the creation of the reservoir

obliterated all of these potentially sensitive land forms within the basin, and almost certainly any which may have existed immediately outside its perimeter.

To the south, north and west of the reservoir, undisturbed "pockets" of land now under fill may still be moderately sensitive for revolutionary war related archaeological resources. As recently as 1958 an archaeological excavation at the Giles home lot on Giles Place, west of the reservoir complex, found stone foundations from Fort Independence's living quarters, as well as evidence of campfire hearths, a refuse dump, and miscellaneous camp and military equipment. These Revolutionary War features and artifacts had been preserved underneath the backdirt from the excavation of the Giles' basement (Lopez 1978:1). Similar small pockets of undisturbed land may exist outside of the reservoir basin.

Conclusions and Recommendations

The construction of the JPR required extensive subsurface excavations (see Photograph 6). Construction for the reservoir began in 1895 and was completed in 1905. As originally planned, the reservoir was to consist of two basins capable of holding 2 billion gallons of water and covering 212 acres, making it the largest distributing reservoir in the world at the time of its construction. Although only the basin west of Goulden Avenue was built, general excavations for the second basin to the east were completed between West Kingsbridge Road and the Mosholu Parkway to Jerome Avenue (Bromley 1911; Duane 1895:79). Goulden Avenue, the eastern boundary of the extant reservoir, straddles a combination of the Old Croton Aqueduct and a masonry dividing wall, which was to separate the existing reservoir from the second proposed basin.

The second basin planned for east of Goulden Avenue was to have twice the capacity of the first basin. Excavations for it extended east of the present reservoir between West Kingsbridge Road and the Mosholu Parkway to Jerome Avenue, including the current project site. When plans were abandoned in 1912, the pit was filled in and the site was developed with Lehman College, two subway yards, three high schools, Harris Park, and several public housing developments. In 1911, the state legislature authorized use of part of the site for the state National Guard armory.

Since the entire project area was extensively excavated at the turn of the twentieth century, the site no longer has any prehistoric or historical archaeological potential. Any archaeological deposits that may have existed were removed when the area was excavated for the intended reservoir. In fact, millions of tons of soil were removed from the immediate area, and used to help level street grades throughout the borough. Currently, the park is underlain by 15 to 35 feet of fill. Therefore, the site has no precontact or pre-reservoir construction archaeological potential.

Outside of the impact area, two existing 48-inch water pipes and other utility lines run the length of Goulden Avenue and connect to Gate House No. 5 at West 205th Street. The Old Croton Aqueduct, dating to the 1840s, runs within the upper portions of the east perimeter wall of the Reservoir. The Old Croton Aqueduct, as a water management resource north of Manhattan, is currently listed on the National Register of Historic Places. The New Croton Branch Aqueduct, another brick-lined horseshoe-shaped conduit, also runs through the Reservoir's east wall. The New Croton Aqueduct (1887-1893), which runs approximately 100 feet beneath the JPR, is also potentially eligible for inclusion on the National Register of Historic Places.

There is little possibility that any *in situ* buried cultural resources are present in the location of the actual JPR. If the proposed rehabilitation activities remain within the structure's footprint, it is unlikely that this action would physically or contextually impact any potential cultural resources outside of the structure.

If project impacts do not extend beyond the footprint of the extant structure, no further archaeological consideration for precontact and historical archaeological resources is recommended. . If impacts are planned for locations beyond the footprint of the extant structure, then additional consideration may be required once the final design plans are selected.