CROTON WATER TREATMENT PLANT
DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT
EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

1. INTRODUCTION, BACKGROUND AND SITING ALTERNATIVES

1.1. INTRODUCTION

The New York City Department of Environmental Protection (NYCDEP) proposes to design, construct and place into operation a 290 million-gallon-per-day (mgd) water treatment plant to provide filtration and disinfection of the Croton Water Supply System (Croton System). The Croton System is part of an intricate water system that provides New York City (City) with its drinking water. This Draft Supplemental Environmental Impact Statement (Draft SEIS) describes the proposed Croton Water Treatment Plant (WTP) that would filter and disinfect the Croton System. The Draft SEIS has been prepared to assess the potential for significant adverse environmental impacts that are predicted to occur at three alternative sites under consideration for siting the WTP facility. The Draft SEIS includes a description of the proposed project; engineering analyses leading to the proposed project; methods of the analysis; descriptions of existing environmental conditions and future conditions without the project; and, potential impacts of the project during the WTP's operation and during its construction. The Draft SEIS also describes the potential mitigation measures to reduce both the potential impacts from the facility's operation and construction.

The WTP also includes the construction of new water tunnels to connect the proposed plant to the New Croton Aqueduct (NCA) and the improvements and rehabilitation of structures related to distribution connections at and near Jerome Park Reservoir in the Bronx, New York City. The purpose of the Draft SEIS is to evaluate the potential for environmental impacts at the three alternative sites so an informed decision can be made about the selection of a preferred site. The three alternative sites for the WTP that are evaluated in this Draft SEIS includes: The Eastview Site in the Town of Mount Pleasant, Westchester County; the Mosholu Site in the Bronx, New York City; and, the Harlem River Site, also in the Bronx, New York City. The Eastview Site alternative includes work at other sites along the NCA or possible future connection to the proposed Kensico-City Tunnel.

It should be noted, the inspection and baseline rehabilitation of the NCA and its appurtenant structures would occur irrespective of the location of the proposed plant. The repairs are required to preserve the NCA and prevent it from falling into disrepair. If however the Croton WTP were sited at the Eastview Site, the NCA would be required to be pressurized. The work on the NCA for pressurization would take place after the completion of the WTP construction. The NCA pressurization is analyzed as part of the Draft SEIS. In addition, the NCA repairs are necessary before improvements are made to another intricate part of the City's water supply system, the Catskill Aqueduct. In order to maintain redundancy in the City's water supply during improvements to the Catskill Aqueduct, which are planned in the future, this inspection and baseline rehabilitation work to the NCA would be accelerated in time and completed before it is necessary to shutdown the Catskill Aqueduct prior to the start of any proposed work on the Croton WTP. The inspection and rehabilitation program would be analyzed under a separate environmental review since it would occur irrespective of the siting or construction of the Croton WTP.

This Draft SEIS enumerates all the various impacts of the proposed plant at the three proposed sites. The Draft SEIS lays out plans to avoid or mitigate potential significant adverse impacts to the maximum extent that is possible to be protective of public health and safety and the environment.

FIGURE 1 CROTON WATERSHED AND RESERVOIRS

1.2. DESCRIPTION OF THE CROTON WATER SUPPLY SYSTEM

The Croton System is the oldest of City's three systems (Croton, Catskill and Delaware) that provide drinking water to the City and upstate communities. Although it was once the only reservoir system supplying water from outside the City, the Croton System is now the smallest of the three systems. The Croton watershed is a series of interconnected reservoirs and lakes in northern Westchester and Putnam Counties (Figure 1). The Jerome Park Reservoir, a distribution reservoir, is located at the downstream end of the Croton System and is the point at which Croton water enters City's water distribution system. The Croton System provides an average of approximately 10 percent of the City's average daily demand. During droughts, the Croton System provides up to 30 percent of in-City consumption. Croton water is primarily used in low-lying areas of the Bronx and Manhattan, where the water can be conveyed by gravity. Two pump stations, the Jerome Avenue Pump Station and the Mosholu Pump Station, can supply additional Croton water to the Intermediate and High Level service areas, normally served by the Catskill and Delaware Systems.

1.2.1. Existing Croton Water Supply Users

1.2.1.1. Upstate Users

Croton water is conveyed to Westchester County residents directly from the reservoir system and through the NCA, which extends from New Croton Reservoir in Westchester County to the 135th Street Pumping Station in Manhattan. The City provides approximately 200 mgd of water to upstate consumers based on maximum day demand of which approximately 114 mgd is supplied to southern Westchester County. The Croton System provides approximately eight percent (~9 mgd) of the water demand of upstate consumers that use New York City water. The Catskill and Delaware Systems provide the remainder of the upstate demand. The NCA is responsible for delivering approximately three (3) mgd of the nine (9) mgd demand, with the remainder being withdrawn directly from the reservoirs in the Croton System. The following users withdraw water directly from the Croton System: Katonah Water District, Carmel Water District, Hunter Brook Cove Water District, Amawalk Department of Environmental Facilities, Town of Southeast (Brewster), Village of Croton-on-Hudson Water District, Putnam County Hospital, and the Village of Ossining.

The seven municipalities connected to the NCA are the Town of New Castle, the Village of Ossining, the Village of Briarcliff Manor, the Village of Sleepy Hollow, the Village of Tarrytown, the Village of Irvington, and the Village of Ardsley (supplied by United Water New Rochelle). Most of these users do not use Croton water as their primary source (usually the Catskill/Delaware System is the primary source).

1.2.1.2. New York City Users

1.2.1.2.1. The Croton System

Year 2000 census data were used to develop population profiles of Bronx and Manhattan residents typically served by the Croton System as compared to the population profiles of those areas not typically served by the Croton System. Typical Croton water users are those who are regular users of the Low Level Croton Water Supply System[1]. These are the users who receive Croton water by gravity. The typical Croton user in the Bronx represents 23.4 percent of the Bronx population. Approximately 48.7 percent of this population is between the ages of 20–54 years, with approximately 20.5 percent over the age of 55. The per capita income of the typical Croton user is approximately $13,801 per year. Approximately one-quarter of the typical Croton water users are below the poverty line.

The typical Croton distribution areas in Manhattan encompass approximately 450,793 people, which represent 29.3 percent of the population. In Manhattan, unlike in the Bronx, there are significant differences between the typical Croton users and those who receive their water from the Catskill and Delaware Water Systems. Of the approximately 451,000 persons typically receiving Croton water, approximately 70.0 percent are minority, contrasted with just 44.5 percent minority among the approximately 1,086,000 primarily non-Croton users. The percentage of persons of Hispanic origin in the typical Croton user group is approximately 10 percent higher than in the non-Croton water users. In addition, the region typically receiving Croton water is characterized by a larger Afro-American population (30.8 percent vs. 8.8 percent). On the other hand, the Asian population is slightly lower in the Croton users region (5.0 percent vs. 11.2 percent) than the region serviced primarily by the Catskill and Delaware Water Systems. The per capita income of the typical Croton user in Manhattan is approximately $30,114.per year. Approximately 27.3 percent of Manhattan Croton users are below the poverty line. In contrast, 16.1 percent of those persons receiving primarily non-Croton water are below the poverty level, and the area as a whole is characterized by a per capita income of $54,141 per year.

1.2.1.2.2. The Catskill/Delaware Systems

The typical non-Croton water user on average is not statistically different than the typical Croton user in Bronx County. Approximately 49.6 percent of the typical non-Croton water user population is between the ages of 20–54 years, with approximately 16.8 percent over the age of 55. The non-Croton water distribution area is characterized by a slightly higher Afro-American population (33.0 percent vs. 25.6 percent) and a slightly smaller Caucasian population (12.8 percent vs. 20.1 percent) than the Croton water distribution area. Percentage of Asians, Hispanics, Native Americans, Two Or More Races and Others categories within the two groups are quite similar. Approximately 81.7 percent of the Catskill/Delaware water users are minorities, approximately 8 percent higher than the typical Croton user area. The percentage of persons below the poverty line in the Catskill/Delaware distribution system is approximately eight percent greater than that within the Croton system. There is no significant difference between the per capita income of the typical Catskill/Delaware and typical Croton user.

[1] City water is supplied at three pressures, Low, Intermediate and High, depending on the height of the neighborhoods above Sea Level. The Croton System supplies the Low Level service by gravity. Croton water can be supplied to the Intermediate and High Level service by pumping the water. The Catskill/Delaware System water arrives in the City by gravity at the High Level. The High Level service pressure can be reduced in the distribution system to supply the other systems.

1.3. NEED FOR THE PROJECT

The project is being proposed to meet the public water supply and public health needs of the City, and to comply with State and Federal drinking water standards and regulations.

The New York State Department of Health (NYSDOH) and the United States Environmental Protection Agency (USEPA) have mandated the filtration and disinfection of the Croton water supply to comply with standards set forth in sub-part 5.1 of Chapter 1, New York State Sanitary Code, and the USEPA Surface Water Treatment Rule (SWTR), a National Primary Drinking Water Regulation promulgated under the Safe Drinking Water Act (SDWA), 1974. The City did not apply for Filtration Avoidance for Croton water discharged into the NCA in 1991 under the SWTR because the NYCDEP believed that Croton water would require filtration. Instead, in 1992 the City entered into a Stipulation Agreement with NYSDOH for filtration of Croton water. Subsequently, in 1993, USEPA issued a determination pursuant to the SWTR, requiring the City to filter the Croton water supply. More recently, these two regulatory agencies, USEPA and NYSDOH sought a federal court order to obligate the City to construct a Croton filtration plant according to a specified schedule.

The Croton System has provided high quality water to consumers for many years. Although Croton water currently meets all existing health-based water quality regulations, it frequently violates the aesthetic standard for color. Water quality problems have resulted in the Croton System being removed from service on numerous occasions, typically during the summer and fall months (in four of the last several years – 1992, 1993, 1994 and 1998). The entire system was shut down for most of 2000-2001 because of contaminants that leaked into the NCA.

While the USEPA distinguishes between health-based (*primary*) and aesthetic (*secondary*) standards with respect to mandatory compliance, NYSDOH considers all standards on an equal basis. Croton water consistently is more colored than the Catskill and Delaware Systems (Figure 2). The raw water, as shown in Figure 2, is above the color standard of 15 scu (standard color units), but the chlorination of the raw water generally bleaches the color and brings it into compliance in the distribution system before it reaches the consumer. The City's goal is to provide equally high quality water to all its users while minimizing the risks associated with the use of chemicals.

The 1996 SDWA Amendments and the rules and regulations that were promulgated subsequent to the SDWA Amendments placed further regulatory burdens on the Croton System. The Interim Enhanced Surface Water Treatment Rule (1998) increased required protection from microorganisms, lowered the turbidity standard, and required the covering of all new treated water reservoirs. One of the Safe Drinking Act Amendments, the Disinfectants and Disinfection Byproducts Rule has rendered the filtration of Croton water a necessity. Stage 1 of this Rule limits certain by-products of chlorination. These disinfection byproducts have been implicated as a factor in bladder, colon and rectal cancers as well as congenital fetal defects and miscarriages. Stage II of this will require measuring the disinfection byproducts as a quarterly running average and to change the points of measurement in the distribution system. As a result of these regulatory changes, without filtration the Croton water is not predicted to consistently meet the Stage 2 Disinfectants and Disinfection Byproducts Rule (Figure 3). Recently Croton water has violated turbidity in 2002, requiring the notification of all users that the water exceeded standards.

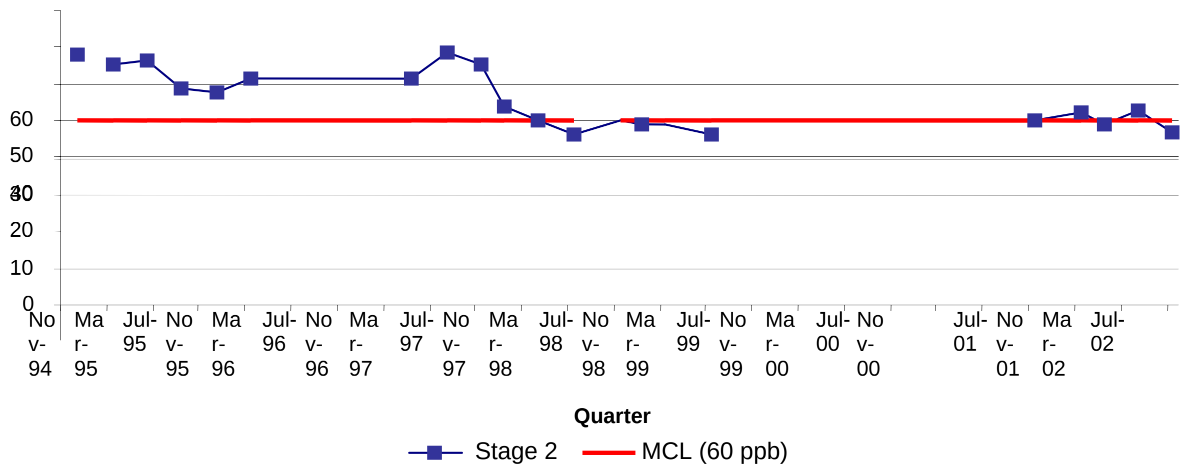
The proposed project is designed to meet all current and anticipated future water quality regulations and goals. In addition, the project is intended to allow the City to maximize the use of Croton water that can be conveyed down the NCA.

This project is required to provide filtration and disinfection of the Croton System to: 1) allow NYCDEP to continue to provide drinking water of the highest quality; 2) prevent the periodic shutdown of the Croton System, particularly at times of the year when the City water demand is at its highest; 3) meet the requirements of existing and future regulations; 4) augment the effective yield and operational flexibility of the City's overall water supply system, and 5) provide additional protection from contamination of the treated water in the water conveyances by pressurizing the treated water conveyances.

For a more detailed discussion of the need for the Croton WTP, see Section 2.3.

FIGURE 2. CROTON SYSTEM DAILY COLOR RESULTS FOR THE YEAR 2002

FIGURE 3. CROTON HALOACETIC ACIDS (HAA5) QUARTERLY RUNNING AVERAGES



1.4. BACKGROUND TO THE PROJECT

In planning the Croton System in the late 1800s, the City anticipated that filtration might some day be necessary to ensure that good quality water could be delivered to consumers. Planning for the system assumed that filtration would need to be added in the future, and a large area of land immediately adjacent to Jerome Park Reservoir was reserved for that purpose. As early as 1911, the City designed a slow sand filtration system. This project was never implemented because the microbiological water quality problems being experienced were solved by a new technology, disinfection using chlorine. Subsequently, the land reserved for a treatment plant was released for other uses, which now include Lehman College, Harris Park, subway yards, Bronx High School of Science, De Witt Clinton High School, and residential buildings.

In the late 1960s episodes of insect larvae in the Croton distribution system provided the impetus to begin new, active planning for a Croton filtration plant. During the 1970s and 1980s planning progressed, and the capacity, treatment process and configuration of a proposed plant and its related distribution system components at Jerome Park Reservoir were defined. In 1993 NYCDEP initiated the State Environmental Quality Review Act (SEQRA)/City Environmental Quality Review (CEQR) processes and began preliminary design of a Croton filtration project.

City officials, NYCDEP, and the public recognized in 1994 and 1995 that many issues relating to the Croton System had changed, and that re-evaluation of threshold issues was warranted. These threshold issues were defined as fundamental decisions on the future of the Croton System that needed to be re-examined before planning, permitting and design of a proposed Croton WTP should proceed. In 1995, an Extended Special Study Program (ESSP)(1996-97) was undertaken to evaluate the following specific questions:

1. Given the success of NYCDEP's water conservation programs in reducing water consumption in the City, and recognizing that, on average, the Croton System supplies 10 percent of the City's water, is the Croton System still needed?

2. If the Croton System is still needed, how much proposed plant capacity should be provided to bring Croton water to the City?

3. Given the success of the City's efforts to protect the Catskill and Delaware watersheds and to obtain Filtration Avoidance of those supplies, is filtration of the Croton supply necessary?

4. In light of changing regulatory emphasis regarding microbiological control, disinfection byproducts, and distribution system re-growth, is the previously proposed treatment process proposed in 1993 the best for the City or should a different process be used?

5. Where should the Croton and its Related Facilities be located? Are there feasible alternatives to Jerome Park Reservoir?

6. Is treated water storage necessary for reliable system operation? If it is necessary, how much is needed?

In its Extended Special Study Program report, NYCDEP reached the following conclusions in response to these questions:

1. There is clearly a continued need for the Croton System. Prudent, responsible public policy dictates that the Croton System should continue to be used as an integral part of the City's water supply system.

2. 290-mgd capacity should be provided, by restoring but not pressurizing the NCA.

3. Non-filtration alternatives would improve water quality, potentially enough to meet water quality goals, but these combinations of alternatives would not meet all of NYCDEP's stated water quality goals, particularly system reliability, maximization of system supplies during droughts, and minimization of reliance on chemicals. Furthermore, some methods to meet water quality goals are not permitted by NYSDEC and preliminary concerns are that aquatic resources could be significantly impacted.

4. While the previously proposed treatment process would meet all treatment goals, a different treatment process (dissolved air flotation-filtration) now offers economic and other advantages. The treatment process recommended for the proposed Croton WTP comprises dissolved air flotation (DAF), ozonation and biologically active carbon filtration.

5. Treated water storage is necessary for reliable system operation, with a minimum usable volume of 20 million gallons[2].

1.4.1. Consent Decree

In 1997 the United States of America Department of Justice brought an action against the City and the NYCDEP pursuant to Section 1414(b) of the Safe Drinking Water Act, 42 U.S.C. § 300g-3(b), for alleged violation of the Surface Water Treatment Rule, 40 C.F.R. § 141.70-141.75, promulgated under Section 1412 of the Safe Drinking Water Act, 42 U.S.C. 300g-1. The State of New York joined the suit, as plaintiff-intervener, alleging that the City was not in compliance with provisions of the State Sanitary Code, 10 NYCRR Part 5, by virtue of its failure to install filtration treatment for its Croton System. As settlement of the action against the City and the NYCDEP, the City and the NYCDEP negotiated a Consent Decree with the United States of America and the State of New York. This Consent Decree required NYCDEP, among other things, to prepare an Environmental Impact Statement (EIS) and to site, design, construct and place into operation a proposed plant to provide filtration and disinfection of the water supplied to the City from the Croton System. The Court entered the Decree on November 27th, 1998.

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[2] Subsequent to the ESSP additional engineering design concluded that the 20 million gallons of storage could be reduced to 2 million gallons if some of the treated water were pumped to high pressures. The high-pressure water would be used to make up for short-term demands. This lower storage requirement was introduced into designs since 1999.

1.4.2. 1999 Croton Water Treatment Plant

In compliance with the Consent Decree, public hearings on this Scope of Work for an EIS began in February 1998 to receive comments that were considered in developing the conceptual design. The Final Scope of Work for the EIS was issued on July 1998.

According to the Consent Decree, eight new water treatment plant sites were evaluated, in addition to Jerome Park Reservoir. Four of these sites were located in the Bronx, and the other four were in Westchester County. The nine site alternatives were the following:

- Cove Site Alternative at New Croton Reservoir, Town of Yorktown, Westchester County
- Mount Pleasant Site Alternative, Town of Mount Pleasant, Westchester County
- Greenburgh Site Alternative, Town of Greenburgh, Westchester County
- Yonkers raceway Site Alternative, City of Yonkers, Westchester County
- Croton Woods Site Alternative, Van Cortlandt Park, Borough of the Bronx, New York City
- Mosholu Golf Course Site Alternative, Van Cortlandt Park, Borough of the Bronx, New York City
- Shandler Recreation Area, Van Cortlandt Park, Borough of the Bronx, New York City
- Jerome Park Reservoir, Borough of the Bronx, New York City
- Harris Park, Borough of the Bronx, New York City (pump station and treated water reservoir only)

The EIS for the 1999 Croton WTP equally addressed the different site alternatives and analyzed the potential environmental impacts of each site in accordance with the SEQRA/CEQR procedures. The timetable for the completion of the EIS was set by the Consent Decree milestone schedule.

Based on these sites, the proposed project and sixteen project engineering alternatives were developed and analyzed in the Final EIS. NYCDEP determined that the preferred site for the proposed plant and related facilities was the Mosholu Golf Course Site (Mosholu Site). The City Planning Commission approved the proposal on June 30, 1999 and the New York City Council approved the siting recommendation on July 21, 1999.

One of the Consent Decree milestones required the City to apply for any necessary state legislative approval and home rule messages by July 31, 1999. The City believed that no legislative approval was required, but a lawsuit brought by community groups and joined by the State of New York challenged this opinion. The U.S. District Court granted the City's motion and concluded that legislative approval was not necessary. Meanwhile, final design of the Croton WTP progressed and construction documents were in preparation while the U.S. District Court opinion was appealed to the Federal Court of Appeals. This court, in turn, referred the question to the New York State Court of Appeals. The New York State Court of Appeals determined on February 8, 2001, that state legislative approval was required to use the Mosholu Site. This decision prevented the commencement of any work at the Mosholu Site until such time that the legislative approval could be obtained.

1.4.3. Supplement to the Consent Decree

All parties signed a Supplement to the Consent Decree on December 12, 2001. It replaced the schedule in the Consent Decree with a new timetable. The document required the evaluation of two water treatment plant sites: one in the Bronx and one in Westchester County. The Eastview Site in the Town of Mount Pleasant, Westchester County, and the Harlem River Site in the Bronx were selected for further evaluation. The Supplement to the Consent Decree required the issuance of a Draft EIS by April 30, 2003. The Supplement to the Consent Decree further stipulated that the City could elect to build a water treatment plant at the Mosholu Site if the New York State Legislature approval was received by April 15, 2003, and the proposed plant would be operational by October 21, 2011, or, if later, within a timeframe acceptable to the United States and the State of New York.

1.4.4. 2003 Croton WTP EIS

The Supplement to the Consent Decree required design work to proceed at both the Eastview and Harlem River Sites simultaneously. The submission of an application for site plan approval was to commence by April 30, 2003 in the Town of Mount Pleasant, if the Eastview Site was chosen as the preferred site, or the Uniform Land Use Review Procedure (ULURP) was to begin in the City if the Harlem River Site was chosen as the preferred site. A local Site Approval application for the Town of Mount Pleasant was filed on April 30, 2003 and a ULURP application for the City was filed on April 21, 2003. The City also initiated action to secure the necessary State Legislature approval for use of the Mosholu Site. Since this was underway, the Draft EIS that was released on April 17, 2003 did not select a preferred site. Design of the proposed project proceeds for both of these sites, as well as for the Mosholu Site.

1.4.5. State Legislature's Approval of Park Alienation

Following the February 8, 2001 determination that the Legislature's approval was required for the City to build the Croton WTP at the Mosholu Site, the City made a request for the necessary approval. A home rule message was passed by the New York City Council on June 13, 2003. On June 20, 2003 the State Legislature passed a bill authorizing park alienation[3] of certain land within Van Cortlandt Park (Park) and such legislation was signed into law by Governor George Pataki on July 22, 2003. The legislation provides for temporary alienation of portions of the Park during construction of the Croton WTP and permanent alienation of portions of the Park to operate and maintain the Croton WTP and related facilities. This legislation has allowed the reconsideration of the Mosholu Golf Course and Driving Range as a possible site for the Croton WTP. In light of these developments, it is anticipated that the parties would negotiate new milestones under the Supplement to the Consent Decree. An updated evaluation of the Mosholu Site, along with the Eastview and the Harlem River Sites, which were under consideration in the April 2003 Draft EIS, are the subject of this Draft SEIS, consistent with the terms of the aforementioned home rule message and provisions of the legislation.

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[3] Alienation is the act of transferring property. In this context it refers to the transfer of parkland to another use. This requires New York State Legislative approval in New York State.

1.5. SITE SELECTION

1.5.1. Site Screening

In 1970, the City undertook an engineering study of the future treatment of the Croton Water Supply, including evaluation of potential sites for a WTP, and concluded that Jerome Park Reservoir in the Bronx should be the site for a proposed plant. In 1993 the NYCDEP undertook an environmental assessment of the Jerome Park Reservoir for the site of the Croton WTP. In response to public comments received on the 1993 Draft Scope of Work for an Environmental Impact Statement (EIS), another siting study for the proposed Croton WTP was initiated, to update the previous study and to consider alternatives to the Jerome Park Reservoir. This study was a three-phased, multi-criteria, focused screening process that evaluated numerous potential locations within the Bronx and Westchester County, New York. This screening effort began with 120 sites, reduced that pool to 23 alternatives, and finally six alternatives to Jerome Park Reservoir that were evaluated in depth.

Each of these screening efforts considered lot size, distance from the NCA, zoning, height, and the possibility of a willing seller. In 1995, based on public comment asking that NYCDEP consider all sites equally and not select a preferred site until the public could review new, similar impact analyses, Jerome Park Reservoir was no longer identified as a preferred site and all the alternatives under consideration at that time were considered as equal candidates.

In 1996 and 1997, based on public comment and revised site screening analyses, additional sites were identified and evaluated. Because the sites initially screened were found to be unavailable or unacceptable, screening criteria were broadened to consider smaller lots, and parks for the first time. The sites under consideration when the Draft Scope of Work for this EIS was published were:

- Cove Site Alternative at New Croton Reservoir, Town of Yorktown, Westchester County
- Mount Pleasant Site Alternative, Town of Mount Pleasant, Westchester County
- Greenburgh Site Alternative, Town of Greenburgh, Westchester County
- Yonkers Raceway Site Alternative, City of Yonkers, Westchester County
- Croton Woods Site Alternative, Van Cortlandt Park, Borough of the Bronx, New York City
- Shandler Recreation Area Site Alternative, Van Cortlandt Park, Borough of the Bronx, New York City
- Jerome Park Reservoir Site Alternative, Borough of the Bronx, New York City, and
- Harris Park Site Alternative, Borough of the Bronx, New York City (Related Facilities only).

The Mosholu Site, in Van Cortlandt Park, Borough of the Bronx, New York City, was added in May 1998 in response to public comment on the Draft Scope of Work for this EIS. The Draft EIS published in 1998 selected the Mosholu Site, but in February 200l; the use of this site was suspended pending approval from the State Legislature and in accordance to the court decision described above.

Revised siting criteria established subsequent to the February 2001 court decision include much smaller lots, greater distances from the NCA, larger changes in height, and for the first time, the consideration of land that could require the condemnation of private property. The site selection criteria were:

1. In accordance with the June 11, 2001 Order from the federal Magistrate, two sites must be evaluated and preliminary design started on both: one potential site must be in Bronx and one potential site must in Westchester County;

2. At least eight acres for permanent facilities, and four acres for staging, must be available;

3. The site must be within 8,000 feet of the NCA;

4. The site must be in a site zoned Manufacturing, or suitable for development by a Special Use Permit;

5. Access for the conveyance of materials to and from the site must be readily available from major surface roads, rail, or barge traffic on waterways; and

6. The site must not be immediately adjacent to schools, residences, or other sensitive receptors.

These criteria led to the choice to pursue the Harlem River Site in the Bronx and the Eastview Site in the Town of Mount Pleasant. Neither of these sites was evaluated in the 1999 Draft EIS. The Harlem Site failed to meet the size criterion used for site selection in that document. At that time, only sites greater than 15 acres were considered viable. It was also over a mile from the NCA.

The 83-acre New York City-owned Eastview Site in the Town of Mount Pleasant has long been considered the best site for a water treatment plant for the Catskill and Delaware Systems, and has been declared as the City's preferred site in a recent (July, 1998) Filtration Avoidance Determination deliverable required as a parallel track planning exercise from NYCDEP to USEPA. Although NYCDEP strongly believes the Filtration Avoidance Determination would be renewed on either a temporary or permanent basis, there is no guarantee. The approval in 2000 of ultraviolet light treatment as a primary disinfectant by the NYSDOH allowed for a smaller plant footprint for both the Catskill and Delaware water treatment plant and the Croton water treatment plant. These smaller footprints now allow the design of two water treatment plants on the same site and the Eastview Site was selected as the Westchester site alternative for the Croton WTP. This site is also the preferred site for a Catskill Delaware Ultraviolet Treatment Facility (UV Facility). If it ever becomes necessary to build a Catskill Delaware water treatment plant, the UV facility could be a component of the future project.

The Harlem River Site, with a water treatment plant footprint of only 10.5 acres, also was selected as the site alternative in the Bronx. Both sites are farther from the NCA than previously considered, not at ideal hydraulic grades, and are smaller than the sites considered in 1999. They also each present unique engineering challenges compared to the sites evaluated in the past.

However the other sites considered in 1999 and earlier were eliminated from the list of current candidates because they did not have any advantages over the Mosholu Site, that is they were either in parks, adjacent to schools and residences, or were not zoned appropriately.

1.5.2. Selection of the Proposed Project

1.5.2.1. Disadvantages of the Eastview Site

The Eastview Site is not without disadvantages. These include:

- The Croton WTP would share the Eastview Site with the UV Facility planned for the Catskill and Delaware Systems, as well as a new NYCDEP police precinct. Work would also take place on this site for required pressurization of the Catskill Aqueduct, and in the future this site is likely to be used for staging of the Kensico-City Tunnel. There are potentially adverse impacts that would result from the construction of these other projects that could be significant when added to the impacts resulting from the construction of the Croton WTP.

- Costs of the WTP at the Eastview Site are in excess of the costs at the Bronx sites.
  - The City would pay taxes on the improvements in perpetuity. These payments would add considerable costs to the project that would not benefit the taxpayers in the City.
  - The NCA would have to be pressurized to carry the treated water southward to the City to avoid any risk of infiltration of untreated groundwater. The cost of this pressurization would approach $600 million. Alternatively, the Kensico-City Tunnel could be used for finished water and the NCA would be used only for overflows. This would remove some of the flexibility in the water supply system by removing a major conduit and would require NYSDOH approval to use the temporary connection to the Delaware Aqueduct for many years while the Kensico-City Tunnel is under construction.
  - The operating costs of a Croton WTP at the Eastview Site are higher than sites in the Bronx. In addition to tax payments, all of the raw water would have to be pumped to the high service level, resulting in higher energy costs.
- The Croton WTP at the Eastview Site would require the construction of a raw water pump station and surge chamber 200 feet below the surface. This would be a technically challenging construction.
- If the NCA is used for treated water, the blow-off[4] at NCA Shaft No. 9 in the Village of Sleepy Hollow would have to be rehabilitated and prepared to accommodate full aqueduct flows (290 mgd) in the event of an unplanned shutdown of the raw water pumps at the WTP. This flow into the Pocantico River could have unavoidable adverse impacts on natural resources.
- Jerome Park Reservoir would be taken off line and potentially used for emergency supply and a receiver of water from upstream if a sudden system shutdown would start to

[4] A "blow-off" is a structure built into the aqueduct at a point where the aqueduct is above grade to relieve excess pressure. There is a wall (a weir) over which water can flow to an open discharge if the water in the aqueduct rises above the top of the weir.

surcharge the aqueduct. The preservation of water quality in the Jerome Park Reservoir could become problematic and would require resources and maintenance.

- If the Croton WTP were built at Eastview, all of the City's water supply elements would pass through one location, creating a potential security problem.
- There is no public transportation to the site; all workers would have to arrive by car.
- In order to site the facility on the Eastview Site, NYCDEP intends to seek local site approval from the Town of Mount Pleasant. Mount Pleasant's approval process does not have a defined timetable. Because of this uncertainty, this could result in delay in Mount Pleasant issuing the local site approval and require a shift to one of the other sites in order to meet the construction and operation dates of the Croton WTP.

1.5.2.2. Advantages of the Eastview Site

The Eastview Site has several notable advantages over the alternative Harlem River and Mosholu Sites.

- All of the City's water would be delivered at the same pressure. This represents a change in the way the water is delivered now, but ultimately it offers more flexibility and operational redundancy.
- The proposed construction at this site would be done with common subsurface conditions. It is unlikely that extensive dewatering, underpinning of other structures, or mixed phase tunneling would be required. Construction at this site is more predictable and less subject to schedule or cost overruns than the Harlem River Site.
- There is adequate room on the site for worker parking, laydown areas, construction trailers, and construction equipment.
- This site is easier to provide facility security than the Harlem River Site.
- The City owns the site.

1.5.2.3. Disadvantages of the Mosholu Site

The Mosholu Site has several disadvantages compared to the other sites.

- Maintaining park uses throughout the construction period, as required by the Alienation Legislation, would require construction staging and coordination with the NYC Department of Parks and Recreation and the golf concessionaire.
- This site requires the most amount of excavation; this makes the construction scheduling difficult.
- It is necessary to temporarily or permanently alienate and discontinue the use of some parkland.

1.5.2.4. Advantages of the Mosholu Site

Several advantages to this site over the Eastview and Harlem River Sites include:

- The plant layout is almost square, maximizing the efficiency of the space and simplifying operations.
- Costs are lower at this site.
    - Construction costs are expected to be lower than the other sites.
    - It is anticipated that construction material and equipment would be purchased from City-based businesses keeping the benefits from these transactions in the City as opposed to the Eastview Site.
- The plant would preserve the current, simple gravity distribution system for the Low Level Service to Manhattan and the Bronx.
- The dewatering of residuals could be done at the City's Hunts Point WPCP. This WPCP has surplus capacity for dewatering, so no impacts would accrue at this facility.
- Jerome Park Reservoir would remain a final raw water reservoir with no change in operation.
- Most traffic impacts would be confined to the unpopulated area between the Major Deegan Expressway exit at 233rd Street and the entrance along Jerome Avenue. The site is served directly by the No. 4 Interborough Rapid Transit (IRT) train, NYC Transit buses.
- The site approval process would not threaten the schedule for constructing and operating the WTP.
- The site is well served by public transportation, which would minimize impacts from workers arriving to the area by car.
- The City owns the site.

1.5.2.5. Disadvantages of the Harlem River Site

The disadvantages with the Harlem River Site include:

- The Harlem River Site is long and narrow, requiring design modifications to fit the site.
    - The long thin shape of the site with the adjacent rail and river complicates the City's ability to secure the facility.
    - The site is at an elevation of only 9 ft. Mean Sea Level (MSL). This low elevation imposes several design challenges including dewatering during construction and building on soft fill.
    - Unlike the other two sites, the Harlem River Site requires the installation of turbines is required to lower the pressure in the raw water and then to recover some of the energy in the raw water.
    - Construction of the facility must be accomplished on fill; piles or caissons must be sunk to stable fill material deep below the surface.
    - Water would be encountered when excavation for the foundation and the tunnels begins, requiring extensive dewatering, treatment, and the installation of expensive slurry walls to limit infiltration.

- The site is downstream of the distribution connections at Jerome Park Reservoir. This would necessitate the construction of a tunnel back to Jerome Park Reservoir to make connections to the distribution system, as well as tunnels to and from the NCA. Special problems with these tunnels include:
    - Steep changes in grade of the tunnel, from a depth of –40 MSL below the site to +100 MSL at Jerome Park Reservoir.
    - "Mixed media" tunnels would be required. These are tunnels that transition from soft fill to hard rock. This requires a change in tunneling technique mid-tunnel.
    - Underpinning the foundations of the Metro-North Railroad tracks and the Major Deegan Expressway to avoid any impact on these important transportation links.
- Access to the site via roadways is difficult because of its location in an area of the Bronx where surface roadways are already congested.
    - In order to avoid significant traffic impacts by construction vehicle traffic, the contractors would be required to make extensive use of barges to bring in and remove bulk materials.
    - Parking would not be available for workers on site during construction. There is adequate public transportation nearby, but this does add another constraint to the contractor.
- The location of the proposed WTP along the waterfront provides additional challenges:
    - The existing rock riprap shoreline would be replaced with a bulkhead at the mapped Pierhead and Bulkhead line. This would involve the filling of approximately 1.5 acres of tidal wetland. The current habitat value of this shoreline is poor, but nonetheless extensive City, State and Federal permitting procedures are triggered by this proposed action.
- Most of the land at the Harlem River Site is privately owned. The Consolidated Rail Corporation (CSX) and Consolidated Edison own some of the property. It is possible that the City would have to exercise its powers of eminent domain to obtain the site. If an amicable transfer of property cannot be negotiated the condemnation proceedings could result in protracted litigation.
- The plant would require that all treated water would have to be pumped; the simple gravity-flow distribution that currently occurs would not take place in the future.

1.5.2.6. Advantages of the Harlem River Site

The Harlem River Site has several characteristics that weigh against its disadvantages.

- Compared to the Eastview Site, it would cost less to build and operate.
    - Construction costs at the WTP site would be approximately the same, but there would be an almost $600 million saving because of the extent of work required to pressurized the NCA for treated water conveyance, which is not required for the Mosholu or Harlem River Sites since the NCA would be carrying raw water in the gravity section.
    - Taxes would not be required, and energy recovery from the pressurized raw water would partially offset pumping costs.
    - It is anticipated that most of the construction work force would come from the City, keeping the benefits of these wages in the City.

    - It is anticipated that construction material and equipment would be purchased from City-based businesses keeping the benefits from these transactions in the City.

- The dewatering of residuals could be done at the City's Hunts Point Water Pollution Control Plant (WPCP). Hunts Point has surplus capacity for dewatering, so no impacts would accrue at this facility.
- Jerome Park Reservoir would remain a final raw water reservoir with no change in operation.
- Security concerns exist, but there is an advantage in separating this component of the water system from the Catskill and Delaware Systems.
- Although the required permits and approvals are very complex, the discretionary land use approval, ULURP, is on a limited timetable.
- The site is well served by public transportation, which would minimize impacts from workers arriving to the area by car.

1.5.3. Site Comparison

Each site has advantages and disadvantages compared to the other two. In addition, the designs for each site are different. For example, the Mosholu Site requires an internal perimeter roadway that results in a larger building footprint than the other sites because they use an exterior passageway for this purpose. Table 1 summarizes general characteristics of the WTP facilities at each site.

TABLE 1. SITE COMPARISON FOR THE CROTON WATER TREATMENT PLANT

	Eastview NCA[1]	**Eastview KCT**[2]	**Mosholu**[3]	**Harlem River**
Approximate dimensions – main building	1,000t. X 267 ft	1,000. X 267 ft	555 ft X 685 ft	920 ft X 260 ft.
Approximate dimensions- Other buildings	51 ft. X 44 ft.	51 ft. X 44 ft.	60 ft X 75 ft 60 ft. X 60 ft.	320 ft. X 180 ft.
Approximate building footprint area	262,000 sq. ft	262,000 sq. ft	380,000 sq. ft	264,000 sq ft
Maximum main building height above grade	65 ft	65 ft	Main building at grade - 0 ft. Others ~ 30 ft.	Penthouse – 76.5 ft. Roof – 65 ft.
Length of Raw Water Tunnel	7,500 ft	7,500 ft	1,000 ft	1,415 ft
Length of Treated Water Tunnel	7,500 ft	0	3,710 ft	350 ft combined 6,640 High Level 1,200 Low Level
Approximate area affected during construction	30 acres	30 acres	28 acres	17.5 acres
Approximate finished WTP site area (buildings and roads)	12 acres	12 acres	11 acres	11 acres
Construction Costs, 2003[4] $million	$1,566	$1,216[5]	$1,235	$1,205
Annual Operating Costs, 2003 $million	$33	$33	$22	$25
Life Cycle Costs, 2003 $million	$1,788	$1,495	$1,352	$1,370

[1] NCA as the finished water conveyance. Includes $558,000,000 cost of aqueduct pressurization plus $125,000,000 for the Treated Water Tunnel.
[2] Kensico-City Tunnel. This is a proposed new City Water Tunnel to connect Kensico Reservoir, the Eastview Site, and the Van Cortlandt Valve Chamber. The New Croton Aqueduct would only be used for plant overflows.
[3] The Mosholu Design requires a passageway around the perimeter of the underground WTP to move equipment that is accomplished at the other sites by an exterior roadway.
[4] Costs are based on 2.75% inflation, 6.4% interest, and 30 year life cycle. All costs are from Conceptual Designs

TABLE 1. SITE COMPARISON FOR THE CROTON WATER TREATMENT PLANT

	Eastview NCA[1]	Eastview KCT[2]	Mosholu[3]	Harlem River

and would be updated when Preliminary and Final Designs are available. Estimates of amenities and mitigation costs are included. Baseline NCA rehabilitation is not included.

[5] Includes $290 million pro rata share for the Croton System's share of the Kensico-City Tunnel. This represents 12% (Croton's 290 mgd / Tunnel Capacity 2,400 mgd) of $2,400,000,000 estimated project costs.

A decision on the site would be made upon completion of the Final SEIS. This is to allow the incorporation of public and agency review and comments into the decision-making process. The decision would be made based upon a reasoned evaluation of all factors relating to social, economic, and environmental considerations first presented in this Draft SEIS, responding to public comments in the Final SEIS.

2. SUMMARY OF THE PROPOSED PROJECT

The largest potential impacts associated with the proposed project would be confined to the WTP sites. After a brief introduction to the WTP process that is common to all sites, the following section provides a summary of the proposed work at each of the three sites. The tunnels and connections associated with each site are also included with each WTP site description.

In order to expedite inspection and rehabilitation of the NCA, the baseline rehabilitation of the NCA would be completed before the start of the WTP construction and would be evaluated through a separate environmental impact analysis since the expedited inspection and rehabilitation of the NCA needs to occur irregardless of a decision about the siting of the Croton WTP. This includes seasonal work in 2004-2006 at most of the accessible shafts along the NCA. The work at shaft sites specifically related to the construction of the WTP is described in this Draft SEIS. Most of this extra work along the NCA would only occur if the Eastview Site is selected and the NCA is chosen as the preferred treated water conveyance. That work is described in the Off-Site Facilities – NCA Pressurization section. All the sites require some work at Jerome Park Reservoir, and the proposed work at this site is described in the Off-Site Facilities – Jerome Park Reservoir section after the description of the three WTP site alternatives.

2.1. WATER TREATMENT PROCESS

The water treatment process design is very similar for the three project designs. The only significant difference, as described in the Draft SEIS, is that the solids (residuals) would be removed on site at the Eastview Site but the solids would be pumped to the Hunts Point Water Pollution Control Plant (WPCP) if the WTP were to be built at the Mosholu or Harlem River Sites.

The primary goals of the proposed project are to meet the public water supply and public health needs of the City and to comply with State and Federal drinking water standards and regulations. The key treated water quality objectives considered in evaluating and selecting a treatment process for the Croton System focus on source water quality and current and anticipated water quality regulations. These water quality objectives include:

- **Filtration**, for concerns over *Giardia* cysts (Giardia) and *Cryptosporidium* oocysts (Cryptosporidium) making optimizing both turbidity and particle removal critical;
- **Aesthetics**, improving aesthetic parameters such as color, taste and odor, iron and manganese, and visible larvae, due to consumer complaints;
- **Disinfection**, compliance with the disinfectant concentration and contact time (CT) requirements of the Surface Water Treatment Rule (SWTR) and the future Enhanced Surface Water Treatment Rule (ESWTR) to balance against lower trihalomethane (THM) and other disinfection by-product (DBP) standards that have been proposed under the future Disinfectant/Disinfection By-Products Rule (D/DBPR); and
- **Disinfection By-Products**, future standards of 64 ug/l for Total Trihalomethanes and 48 ug/l for the total of five Haloacetic Acids (HAA5) (on a locational running annual average basis at the worst case points in the distribution system) have been identified.

To satisfy the above-mentioned criteria, the selected treatment process for the proposed plant would be a "stacked" dissolved air flotation/filtration (DAF/Filtration) system. This proposed 290 mgd plant would include coagulation/mixing, flocculation, dissolved air flotation (DAF), filtration, and UV disinfection. This selection would achieve treated water quality goals including a 99.9 percent (3-log) removal/inactivation of *Giardia* and 99.9-percent (3-log) removal of *Cryptosporidium*.

In an achievable dose, UV disinfection has been found to effectively prevent the *Cryptosporidium* from replicating itself and is therefore shed from a host's digestive tract without causing illness. UV disinfection has also been found to render *Giardia lamblia* non-infective, but was deemed inefficient with respect to inactivating viruses. To inactivate many microorganisms (bacteria, viruses, and *Giardia lamblia*), chlorination is effective, but it is not effective for inactivating *Cryptosporidium parvum*. In the USEPA's published September 2000 Agreement-in-Principle and subsequently was adopted in the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) that was published on August 11, 2003 in the Federal Register (Volume 68, Number 154), chlorination is given no credit for *Cryptosporidium* inactivation. UV technology, on the other hand, has been approved in the Agreement-in-Principle for use against *Cryptosporidium*. Based on its approval by the USEPA for the inactivation of *Cryptosporidium*, UV has been selected for the proposed plant.

Ancillary systems in the proposed plant would include pre/post-treatment chemical storage and handling, process waste backwash water handling and residual facilities, with necessary support facilities such as: electrical; instrumentation; plumbing; security; and heating, ventilation and air conditioning systems. Figure 4 outlines the arrangement of proposed facilities at the proposed plant.

The proposed plant at any of the sites would include the water treatment building (housing the treatment processes, administrative offices, and a process laboratory), an electrical substation, a raw water tunnel from the NCA, treated water conveyances, and pumping or turbine station as required for each site.

FIGURE 4. WATER TREATMENT PLANT PROCESS BLOCK DIAGRAM.

The proposed plant layout would be designed to minimize space requirements. This design practice involves using appropriate loading rates in the treatment processes, common wall construction with rectangular treatment units and vertically stacking some process components. The structural components would be designed in accordance with state and local codes to accommodate normal and seismic forces. The proposed plant design would incorporate levels of redundancy based on good engineering practices and regulatory requirements (*Recommended Standards for Water Works*, which is also referred to as the *Ten State Standards*). Although these design levels of redundancy are not considered mandatory, they would be used in the process design and by the NYSDOH as a guideline for approval of the proposed project. Therefore, the proposed project would incorporate an "n+1+1" redundancy for the critical equipment design.

The proposed plant would be designed such that the main flow of water through the treatment processes would be by gravity. The average design flow would be 144 mgd with a maximum capacity of 290 mgd. With the design principle that no single plant component would treat, convey, or power more than 50 percent of the plant design flow, in the event of an unforeseen shutdown or emergency, the main treatment processes would be divided into two separate water treatment trains (Train A and Train B). Further subdivision, yet parallel process units, would appear in the plant design.

The treatment processes (i.e. rapid mixing, flocculation, DAF, filtration, and UV) would be connected in the proposed plant by means of channels, conduits, and pipelines. Electrically operated sluice gates and valves would control and regulate flows through the proposed plant. In the event of a power or mechanical failure, these gates and valves may fail to operate. Provisions to handle these process overflows would be required to assure that tank levels could not rise above the elevation of the operating floor and flood the proposed plant.

Two process overflows would also be provided, one for each half of the plant. These overflows include the combined contribution from the backwash tanks, the waste backwash water tanks, and the filter-to-waste tanks.

Treatment of Croton water would result in the production of residuals throughout the treatment process. The proposed plant residual handling facility would serve the following purposes:

- Collection and recycling of waste backwash water and filter-to-waste water from periodic cleaning of the DAF tanks and filters (e.g., backwashing),
- Collection of the floated solids from the DAF tanks, and
- Transferring floated solids off-site for dewatering and disposal.

Solids would be handled differently at the sites in the Bronx as compared to the site in Westchester County. At the Eastview Site, the waste streams would be dewatered via centrifugation. The water would return to the head of the WTP and the solids would be conveyed to the sewer for ultimate dewatering at the Westchester County WPCP in Yonkers. At the Mosholu and Harlem River Sites the wastewater would be conveyed to the Hunts Point WPCP in the Bronx. This WPCP has adequate capacity to handle the solids from the Croton WTP without additional construction or staffing. The conveyance to Hunts Point would be via a 6-inch force main in City streets.

2.1.1. Treatment Chemicals

Chemical facilities would be designed in accordance with NYSDOH and New York State Department of Environmental Conservation (NYSDEC) requirements. Regulatory requirements encompass chemical storage capacity, redundant transfer and feed pumps, and secondary containment of chemicals to protect against potential spills. The chemicals and their functions are listed below. Chemical application points, average and maximum dosage, and chemical storage volumes per treatment train (with two treatment trains in the proposed plant) are presented in Table 2.

- Potassium permanganate: Intermittent use for manganese control if the filter medium is changed in the future.
- Sulfuric acid: For pH correction prior to coagulation.
- Coagulant alum (Aluminum sulfate)/ PACl (Poly-Aluminum chloride): For coagulation.
- Coagulant Aid Polymer: Coagulant.
- Filter Aid Polymer: Filtration aid.
- Sodium Hypochlorite:
    - Pre-Feed: Used for plant start-up and aids in maintaining an oxide coating on the filter media.
    - Post-Feed: Secondary and disinfection of viruses.
- Hydrofluorosilicic Acid: To prevent dental decay.
- Sodium Hydroxide: For pH adjustment.
- Corrosion Inhibitor (Orthophosphate or Phosphoric Acid): For corrosion control.

Chemical system capacities would be based on the chemical usage data from pilot testing and estimates of required dosages for other chemicals. The storage tank volume would be based on 30-day storage for the design usage, except sodium hypochlorite and potassium permanganate[5], which would be based on 15-day storage. In order to standardize the design of the chemical systems, tanks would be provided for the larger of the 30-day storage or 5,000 gallons. However, the filter aid polymer and residual polymer would be shipped in totes rather than in tanker trucks.

Transfer pumps and transfer (day) tanks are proposed to reduce space requirements in the bulk storage tank area. Transfer tank volumes would be based on maximum flow and maximum dose conditions with a 24-hour detention time for all chemicals. All chemical storage tanks would be provided with secondary containment with the capacity to hold at least 110 percent of the largest single tank volume in the containment area. Incompatible chemicals would be stored in separate areas. The chemical system would be divided into two sub-systems, each serving one half of the treatment plant.

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[5] The currently planned filter medium, anthracite, can remove metals without oxidation by potassium permanganate, but if after operations are underway and it is decided to switch filter media to granular activated carbon, potassium permanganate would have to be added occasionally. The flocculation of iron and manganese with potassium permanganate is a slow reaction, and it would be added at the Croton Lake Gate House for a WTP at Eastview and at Gate House No. 5 for WTP sites in the Bronx. Work to install the potassium permanganate is entirely interior, of short duration, and would not result in any significant adverse impact.

2.1.2. Electrical Power

Power usage at the maximum flow capacity of 290 mgd is estimated at 32.3 MW (34.4 MVA). At the daily average flow of 144 mgd, the power usage would be about 21.6 MW (23.0 MVA). During a power emergency when all Con Edison service feeders are out of service, plant operation would stop (0 mgd), and power usage from life safety and critical equipment would be about 1.31 MW (1.36 MVA). Two 1.5 MWA emergency diesel generators, one standby and one operating, would provide this power until Con Edison power was restored.

TABLE 2. CHEMICAL SYSTEM DESIGN CRITERIA[1]

Chemical	DOSE (mg/L)		DESIGN USAGE[2]		STORAGE[2]		Application Point
	Average	Maximum	(Lbs/day) of active chemical	(Gal/day) of active chemical	No. Of Tanks	Volume per tank (gallon)	
Potassium Permanganate[3]	3.0	3.0	7,256	N/A	15 cycle bins	3,300 lbs	Croton Lake Gate House (Eastview) or Gate House No. 5 (Mosholu or Harlem River)
Coagulant[4]					7	9,284	
Aluminum Sulfate; Alum	17	30	10,640	1,998			First-Stage of Rapid Mixers
Poly-aluminum Chloride; PACl	13	17	8,136	2,464			First-Stage of Rapid Mixers
Sulfuric Acid	2.5	6.5	1,565	141	2	5,861	First-Stage of Rapid Mixers
Coagulant Aid (Cationic) Polymer	1.25	1.75	782	179	2	5,861	Second-Stage of Rapid Mixers
Filter Aid Polymer	0.05	0.2	31	8	Tote or Storage Drums		Second-Stage of Flocculation Tank
Sodium Hypochlorite[5]							
Pre-Feed	2.0	3.0	1,262	1,520	4	9,700	First-Stage of Rapid Mixers
Post-Feed	1.5	2.0	900	1,086			Filtered water discharge from UV reactors
Hydrofluorosilicic Acid	1.0	1.0	601	327	2	5,252	Filtered water discharge from UV reactors
Sodium	5.0	12.5	3,004	468	2	7,800	Filtered water

TABLE 2. CHEMICAL SYSTEM DESIGN CRITERIA[1]

Hydroxide							discharge from UV reactors
Corrosion Inhibitor (Orthophosphate or Phosphoric Acid)	1.0	2.0	601	168	2	5,252	Filtered water discharge from UV reactors

Notes:

(1) Quantities are per treatment train (with two treatment trains in the proposed plant).

(2) Based on Average Dosage and Average Flow (144 mgd).

(3) Potassium permanganate facilities would be at the Croton Lake Gate House for the Eastview Site and at Gate House No. 5 for the Mosholu and Harlem River Sites. It would be delivered in a dry chemical form and therefore gallons per day units are not applicable. Storage is based upon usage of 3,300 lbs cycle-bins a maximum flow and dosage. A cycle-bin system allows ease of storage, transport, and handling of potassium permanganate.

(4) Coagulant storage tanks store either Alum or PACL at one time, depending on which chemical is more desirable to be used as a coagulant.

(5) Sodium hypochlorite tanks store both pre-feed and post-feed sodium hypochlorite.

2.2. EASTVIEW WATER TREATMENT PLANT SITE

The City owns approximately 153 acres of largely undeveloped land located within Westchester County, New York, that is known as the Eastview Property. The Westchester County Grasslands Reservation borders the property to the north, east and northwest. Additional City-owned property is located to the south and southwest, with a residential development to the southeast along Taylor Road, and corporate office parks to the south and southeast. The property consists of 83[6] acres situated in the Town of Mount Pleasant and 66 acres situated in the Town of Greenburgh. The two portions of the property are bisected by Grasslands Road/Route 100C, which serves as the border between the Towns. The proposed project would be situated on the 87-acre portion of the property within the Town of Mount Pleasant, which would be referred to as the Eastview Site for the remainder of this document.

The proposed project requires 12 acres of the Eastview Site for the permanent buildings and about 18 additional acres would be used for piping routes and temporarily for construction staging. This total of 30 acres is identified and delineated from approximately 87 acres of the City-owned property (Figure 5). The proposed project would primarily be an above-grade structure with a height of approximately 65 feet. There would also be a below-grade Raw Water Pumping Station (RWPS) adjacent to the proposed plant, a raw water tunnel from the NCA to the proposed plant, and a treated water conveyance system. A listing of the Croton water distribution system components related to the Eastview Site is included in Table 3.

The site is identified by Section 116-16, Tax Block 1, Lot 2 and Section 116-20 property tax Block 1, and is currently zoned as OB-2 (Office/Business). The City-owned property is currently undeveloped, with the exception of: 1) Shaft No. 19 of the Delaware Aqueduct, situated on the eastern side of the Mount Pleasant parcel with an access road off Grasslands

[6] A four-acre easement was recently provided to Westchester County for the extension of Walker Road along the western boundary of the site; this reduced the acreage from the 87 acres formerly reported.

Road/Route 100C; 2) the Catskill Aqueduct Connection Chamber, adjacent to the Greenburgh parcel with an access road off Grasslands Road/Route 100C; 3) an electrical substation (owned and maintained by Con Edison), situated off Grasslands Road/Route 100C on the Greenburgh parcel; 4) Walker Road, west of the Mount Pleasant parcel that provides access to a satellite bus facility associated with Westchester County's Bee-Line Transit System; and 5) the historic Hammond House, adjacent to Grasslands Road/Route 100C on the Mount Pleasant parcel. The closest residents are located to the north along Cottage Road, with the closest residential neighborhood located to the southeast along Taylor Road. The Eastview Site is accessible from several arterial roadways, including the Sprain Brook Parkway to the east and the Saw Mill River Road (Route 9A) to the west, both north-south roadways.

2.2.1. Raw Water Conveyance and Pumping

Raw water would be conveyed from the Croton Lake Gate House to south of Shaft No. 10 as it is currently operated. One of the water quality problems to be addressed is an occasional episode of elevated color due to iron and manganese in the water. The anthracite filter medium proposed for the WTP would remove the metals, but if, in the future, granulated activated carbon were used instead of anthracite because of its superior ability to remove organic contaminants, potassium permanganate would be added at the 1890 Gate House at the Croton Lake Gate House Site. This involves adding several plastic bins and mixing equipment to the inside, replacing existing unused copper sulfate dosing equipment. No environmental impacts are anticipated from this single action and no further analysis of the Croton Lake Gate House is included.

The raw water would be withdrawn from the NCA, downstream of the existing NCA Shaft No. 10. A new 12-foot diameter raw water tunnel would extend approximately 7,500 feet from the NCA to the proposed plant. The raw water tunnel would be lined with unreinforced, cast-in-place concrete built entirely in rock with the minimum depth of 60 feet below existing grade. The tunnel would convey on average 144 mgd or a maximum of 290 mgd of water to the intake shaft at the proposed plant. The raw water pumping station would deliver water from the intake shaft to the head of the proposed plant at an elevation of 330 feet. The raw water pumping station, approximately 210 feet below the existing grade, would be constructed at the extreme western end of the proposed plant.

2.2.2. Treated Water Conveyance and Pumping

For the proposed project at the Eastview Site, two engineering alternatives, pressurizing the NCA or the proposed Kensico-City Tunnel (KCT) are under investigation for conveying treated water to the City over the long term. An Interim/Permanent Backup System would connect the water treatment plant to the Delaware Aqueduct. This alternative could be used either intermittently as work progresses on the NCA or the proposed KCT, or as a permanent backup system. If the proposed KCT proceeds, it would take many years to complete the design. Therefore, the introduction of a proposed KCT would result in a separate environmental review. A generic description of potential impacts of the proposed KCT is included in this Draft SEIS, but sufficient engineering information to conduct detailed environmental reviews would not be available for several years.

FIGURE 5. AERIAL VIEW OF THE PROPOSED PROJECT AT THE EASTVIEW SITE

TABLE 3. CROTON WATER DISTRIBUTION COMPONENTS OF THE EASTVIEW SITE

Project Alternative & WTP Site	Raw Water Conveyance	Treated Water Conveyance	Off-site Facilities	Connections to Distribution Systems	
				Low Level Service	High Level Service
Interim/ Permanent Back-up Treated Water Conveyance, treated water connection to the Delaware Aqueduct	A maximum of 290 mgd of raw water would be withdrawn from NCA downstream of NCA Shaft No. 10. The raw water pumping station would be located beneath the western end of the plant.	The treated water would be conveyed to the Delaware Aqueduct via Shaft No. 19, located on the Eastview Site.	As part of a separate NCA baseline rehabilitation project, subject to an independent environmental review, NCA facilities from the Croton Lake Gate House to NCA Shaft No. 10 would be rehabilitated to convey raw water.	Treated water would be delivered to Low Level Service via Catskill/Delaware water supply system.	Treated water would be delivered to High Level Service via Catskill/Delaware water supply system.
Long Term Conveyance Alternative, lining of the NCA for pressurized flow.		High pressure treated water would be discharged to NCA downstream from NCA Shaft No. 10 via a new treated water tunnel. The NCA would be rehabilitated to handle the high-pressure flow from the Eastview site to Jerome Park Reservoir.	As part of a separate NCA baseline rehabilitation project, subject to an independent environmental review, NCA facilities from the Croton Lake Gate House to NCA Shaft No. 10 would be rehabilitated to convey raw water. NCA shafts and Gate Houses from NCA Shaft No. 10 to NCA Shaft No. 21 would be modified and rehabilitated. Shafts would be sealed with pressure caps	Low Level treated water would be provided from the High Level Service through sleeve valves and connection to the existing Valve Chamber C to deliver water to the East Bronx. The Low Level Service to South Bronx would be provided from the connection at Shaft No. 21 to the existing 48-inch service pipe in the Jerome Park Reservoir north basin. Treated water would also be discharged to the Low Level Manhattan service through sleeve valves from the new shaft chamber to the NCBA.	High Level treated water would be delivered to a new shaft chamber, located at the Jerome Park Reservoir, and distributed to City Tunnel No. 1, Shaft Nos. 3 and 4 and to City Tunnel No. 3, Shaft No. 4B.

TABLE 3. CROTON WATER DISTRIBUTION COMPONENTS OF THE EASTVIEW SITE

Project Alternative & WTP Site	Raw Water Conveyance	Treated Water Conveyance	Off-site Facilities	Connections to Distribution Systems	
				Low Level Service	High Level Service
Long Term Conveyance Kensico City Tunnel (KCT); deliver filtered Croton water to Shaft No. 19 as in the Interim Conveyance alternative above. This water would mix with treated Catskill / Delaware water and flow through a new proposed Kensico-City Tunnel to the City.	Same as above.	Croton water would be conveyed along with the Catskill / Delaware water supplies via a new tunnel to the City. All the Croton water would be blended with the Catskill / Delaware water.	New Croton Aqueduct would be maintained for emergency purposes and for conveying plant overflows or shutdowns to Jerome Park Reservoir	Same as above	Existing High Level Service would be supplied from the Catskill / Delaware system with Croton water blended.

Notes:

1. Levels (Low, Intermediate, and High) refer to the topographic height of the neighborhoods served. For example, Low Level Service includes low-level areas of the East and South Bronx and Manhattan. This water is transmitted through the distribution system at a lower level than the Intermediate and High Level Service. Intermediate Level Service would be provided from the High Level Service via existing regulators in the distribution system. The existing Intermediate Level service connections would be placed off-line.

FIGURE 6. GENERAL ARRANGEMENT OF NCA, NEW TUNNELS, AND EASTVIEW WTP

The following Interim connection would be constructed to provide Croton water during pressurization of the NCA or during the construction of the proposed KCT. The connections would be available on a permanent basis to provide a backup conveyance for Croton water.

2.2.3. Interim/Permanent Backup System

Upon completion of the proposed plant, treated water would be conveyed to the Delaware Aqueduct via Shaft No. 19, located on the Eastview Site. Treated water would pass through flow meters and be combined into one 14-foot diameter steel pipe. This pipe would be routed approximately 2,000 feet to Shaft No. 19 of the Delaware Aqueduct, on the eastern side of the site. The pipe route would follow the existing topography and wetlands to the property boundary.

During the interim and back-up operations, the City's Low Level and Intermediate Services would be supplied from the in-City High Level Service, using existing pressure reducing valves and regulators. Implementation of an adopted long-term treated water conveyance would downgrade the Shaft No. 19 connection to a permanent (emergency) back-up system.

2.2.4. Long Term Treated Water Conveyance Alternatives

Two long-term alternatives for the conveyance of treated water from the Eastview Site are under consideration. One alternative would convey the water through a treated water tunnel to a pressurized NCA. The other would convey the water to the new KCT. Neither of these alternatives would require any pumping of treated water because the outlet from the water treatment plant is above the level of the water in the High Level Service.

2.2.4.1. New Croton Aqueduct

A new treated water tunnel would convey pressurized (High Level) treated water from the proposed plant to the NCA. The new treated water tunnel would connect to the NCA below ground, immediately downstream of the concrete plug in the NCA that would be constructed downstream of the proposed raw water tunnel. The NCA downstream of the treated water tunnel connection would convey High Level treated water to a new shaft chamber located in the vicinity of Gate House No. 5 at Jerome Park Reservoir. High Level and Low Level treated water would be conveyed from the new shaft chamber to Manhattan and the Bronx. This alternative would require the lining and pressurization of the entire gravity flow section of the NCA downstream of the connection with the new proposed treated water tunnel. A schematic of this conveyance alternative is provided in Figure 6.

FIGURE 7. INTERIM/PERMANENT BACKUP TREATED WATER CONNECTION TO THE DELAWARE AQUEDUCT FOR THE EASTVIEW SITE

The only work required in the raw water section of the NCA would be the rehabilitation of the existing overflow weir at Shaft No. 9 in the Village of Sleepy Hollow. This overflow would divert raw water to a small tributary of the Pocantico River, alternatively known locally as Carl's Brook or Welker's Brook. Although the overflow is an existing structure, it is not currently utilized. If the WTP were built at Eastview and the NCA was utilized as the principal means of long-term conveyance the potential for blow off at this location would occur if the WTP at the Eastview Site were to shut down. The potential impacts of the construction and operational use of the overflow at Shaft No. 9 is evaluated in the Off-Site Facilities section of the Draft SEIS.

The pressurization of the NCA below the finished water connection, south of Shaft No. 10, would involve work in addition to the baseline rehabilitation work to the NCA described earlier as a separate environmental review. This additional work would take place after the WTP is completed, between 2010 and 2015. The principal staging areas and access points for the workers for this project would be Shaft No. 14 in the Village of Ardsley, Shaft No. 18 in the City of Yonkers, Gate House No. 1 in Van Cortlandt Park, the Bronx, and Shaft No. 21 at Jerome Park Reservoir in the Bronx. All these facilities would be fitted with pressure caps. The existing sluice gates and stop logs in Gate House No. 1 would be replaced with new sluice gates. A new shaft chamber and connections to distribution pipes would be constructed in the vicinity of Gate House No. 5. In addition, Shaft Nos. 11A, 11B, 11C, in the Town of Greenburgh, and Shaft No. 16 in the Village of Ardsley would be used for ventilation, personnel access, and lowering of equipment and supplies, but then pressure capped or permanently sealed. The work if the NCA is pressurized at each of these sites is described below in the Off-Site Facilities section.

2.2.4.2. Kensico-City Tunnel

This KCT project involves the construction of an entirely new tunnel from the Kensico Reservoir to the Eastview Site and from there to the City's water distribution system. This new tunnel could potentially be sized to accommodate all of the City's flows, be able to bypass the existing Hillview Reservoir in the City of Yonkers and provide system redundancy for future maintenance of the other conveyances. If the Croton System were to use this new tunnel, the NCA would be used for emergencies and for system overflows.

The proposed KCT is still at the stage of a feasibility study. Its primary purpose would be to provide system flexibility for the Catskill/Delaware supplies. The feasibility study describes three alternative alignments, including three possible intake locations alongside Kensico Reservoir. No specific shaft sites are recommended, but all the alternatives under consideration terminate at the Van Cortlandt Valve Chamber in the Bronx. Siting of the shafts would require a thorough environmental impact analysis. The shaft sites would potentially have to accommodate up to 140 workers and would generate truck traffic from the removal of spoils. This truck traffic would be less than 120 trucks per day, but the long duration of the construction (about 15 years) would require a detailed analysis of the impacts of this proposed work on Traffic, Air, Noise, and other environmental parameters. If construction of this new tunnel were to be proposed by NYCDEP there could be up to a year's overlap between the start of the KCT work and the completion of the Croton WTP at the Eastview Site. The KCT design is still in the future, and if it is adopted it would be subject to a separate thorough public environmental review. If a decision were made to advance the proposed KCT and use it as the long-term treated water conveyance, the pressurization of the NCA would not proceed. The Croton water would be blended with the Catskill and Delaware water and conveyed at the same pressure to the City. Existing boundary valves and regulators would supply the existing Intermediate and Low Level distribution systems.

2.2.5. Emergency Bypass and Blow-Off

If the proposed plant is taken out of service and the Croton Water Supply was required to meet demand, an emergency bypass, subject to NYSDOH review and approval, would be available to convey Croton water downstream of the proposed plant. If the KCT were chosen as the long-term treated water conveyance, an overflow structure would be constructed in the NCA at the raw water tunnel connection. If the proposed plant were taken out of service, raw water would fill the wet well and detention tank at the raw water pump station. The water would rise to a maximum level and cause the water to reverse direction and overflow at the weir located in the NCA. Water would flow through the NCA via gravity to Jerome Park Reservoir. Low Level water could be conveyed through the NCA to Manhattan.

If the design for the pressurized treated water to the NCA is chosen as the long term treated water conveyance, the overflow structure in the NCA would not be capable of serving as an emergency bypass. A plug would be installed upstream from the treated water tunnel connection to the NCA and the overflow structure would be sealed. Subject to NYSDOH approval, a connection at the proposed plant from the raw water shaft to the treated water shaft would serve as a bypass and allow untreated Croton water to be conveyed to the NCA downstream of Shaft No. 10. Due to the loss of power, no pumping would be available and Low Level water would be distributed to the new shaft chamber at Jerome Park Reservoir. Alternatively, the water could be allowed to back up in the raw water section of the NCA and overflow through the existing blow-off at Shaft No. 9 in the Village of Sleepy Hollow, NY. Potential environmental impacts to the area around Shaft No. 9 and to the receiving waters of Carl’s Brook and the Pocantico River are described in the Draft SEIS.

2.3. MOSHOLU SITE

The proposed plant would be located beneath part of the 13-acre driving range of the 74-acre Mosholu Golf Course, located within the 1,146-acre Van Cortlandt Park, Bronx, New York as shown on Figure 8. The Mosholu Golf Course section of the Park is bounded by the Mosholu Parkway and Major Deegan Expressway to the west and north, Jerome Avenue and the IRT No. 4 elevated train tracks and Woodlawn Subway Station to the east, and West Gun Hill Road to the south. Across Jerome Avenue to the northeast of the site is the Woodlawn Cemetery. The Shandler Recreation Area abuts the golf course to the north and the Saturn playground is located to the southeast. Existing facilities at the site include a clubhouse, maintenance facility, driving range, nine-hole golf course, and a parking lot for approximately 75 cars. These facilities would be replaced on a temporary basis during construction and on a permanent basis after construction.

The proposed plant would require a footprint of about nine acres, which would include the water treatment facility, unloading and access building, parking lot, and treated water connections to the City's distribution system via the NCA and City Tunnels No. 1 and No. 3. A listing of the Croton water distribution system components related to the Mosholu Site is included in Table 4. The facilities would be installed below-grade and the surface of the proposed plant would be restored to create a public golf driving range. A new golf course clubhouse, maintenance facility, and new golf course parking lot would be built on the existing Mosholu Golf Course property.

2.3.1. Raw Water Conveyance and Pumping

The NCA would be used to convey raw water from the New Croton Reservoir to the proposed plant at the Mosholu Site. The quantity of raw water entering the NCA would be determined by the operation of the flow control valves at the Croton Lake Gate House. Raw water would flow through the NCA to Gate House No. 1. At Gate House No. 1 raw water would be directed through either the NCA or the New Croton Branch Aqueduct (NCBA) or a combination of both.

During average demand flow conditions all flow would be directed to the NCBA. Raw water would be conveyed through the NCBA to Jerome Park Reservoir. The Jerome Park Reservoir (both the north and south basins) would be used as a raw water reservoir. Gate House No. 5 would supply raw water from the Jerome Park Reservoir to the NCA (via Shaft No. 21) through an 11-foot diameter conduit. A plug would be installed just south of Shaft No. 21 to direct flow in the NCA northward to the new raw water tunnel located in the Mosholu Golf Course area of Van Cortlandt Park (Bronx, New York). The new raw water tunnel would extend from the NCA connection to a new raw water shaft located within the existing driving range to the west of the proposed plant. Raw water pumps would lift the water to the plant inlet. After this initial pumping, water would then flow by gravity through all the main treatment processes within the proposed plant.

During maximum demand flow conditions raw water would be directed at Gate House No. 1 through the NCA and the NCBA. Raw water from the NCBA would flow through the Jerome Park Reservoir and be directed northward through the NCA to the proposed plant. Raw water diverted to the NCA from Gate House No. 1 would be directed to the new raw water tunnel and flow to the raw water shaft at the proposed plant. If the Jerome Park Reservoir were taken off-line, all flow would be diverted to the NCA from Gate House No. 1 and be directed to the proposed plant.

Raw water would be conveyed to the proposed plant from the NCA by gravity flow through an approximately 1,000-foot long, 12-foot diameter tunnel. The tunnel would connect to the NCA downstream of NCA Shaft No. 20. The Raw Water Pumping Station would lift the raw water from the NCA hydraulic grade line into the plant for treatment. See Figure 9 for the general arrangement of the NCA, the new tunnels, and the proposed plant.

TABLE 4. CROTON WATER DISTRIBUTION COMPONENTS OF THE MOSHOLU SITE

Raw Water Conveyance	Treated water Conveyance	Off-site Facilities	Connections to Distribution Systems	
			Low Level Service	High Level Service
A 730-foot long, 12-foot inside diameter tunnel would deliver raw water by gravity to the WTP from the NCA. The connection would be made downstream of NCA Shaft No. 20. A Raw Water Pumping Station would lift the raw water to the water treatment process units.	For Low Level Service, treated water from the Treated Water Pumping Station would flow to the pressurized NCA via a new treated 9-foot diameter tunnel to a new shaft chamber near Jerome Park Reservoir. From there a second new 9-foot diameter Low Level tunnel would convey water to the NCA, downstream of Shaft No. 21. The new shaft chamber would convey Low Level treated water to Manhattan. Intermediate Level Service water would be supplied from the High Level Service, using existing pressure reducing valves and regulators. For High Level Service, an 8-foot diameter tunnel would convey treated water from the Treated Water Pumping Station to a new shaft chamber located near JPR.	A new shaft chamber and flow meters would be installed near the Jerome Park Reservoir. Jerome Park Reservoir would function as a raw water reservoir.	Low Level Service water would be conveyed from the WTP to the new shaft chamber located near Jerome Park Reservoir via a 9-ft diameter tunnel. The water would be conveyed from the new shaft chamber to the NCA, downstream from NCA Shaft No. 21, through a second new 9-foot diameter tunnel that would deliver the water to Manhattan. The East Bronx would receive their Low Level Service water from a new 48-inch diameter pipe, which would be constructed from the new shaft chamber to the existing Valve Chamber "C." The South Bronx would receive their Low Level Service water through a new Flow Meter "D," which would connect to the existing 48-inch diameter service near Jerome Park Reservoir.	High Level Service water would be pumped from the WTP wet wells through a new 8-foot diameter tunnel to the new shaft chamber near Jerome Park Reservoir. The water would be distributed from the new shaft chamber to City Tunnel No. 1, Shaft No. 3, and Shaft No. 4; and City Tunnel No. 3, Shaft No. 4B. A future connection would be constructed to convey an additional 155 mgd. An 84-inch diameter pipe would be constructed from the WTP to Jerome Ave. and stubbed. Existing trunk mains within Jerome Ave. would be replaced with larger diameter pipes to convey the additional flow and would connect to the proposed 84-inch diameter pipe.

1. Levels (Low, Intermediate, and High) refer to the topographic height of the neighborhoods served. For example, Low Level Service includes low-level areas of the East and South Bronx and Manhattan. This water is transmitted through the distribution system at a lower level than the Intermediate and High Level Service. Intermediate Level Service would be provided from the High Level Service via existing regulators in the distribution system. The existing Intermediate Level service connections would be placed off line.

FIGURE 8. AERIAL VIEW OF THE PROPOSED PROJECT AT THE MOSHOLU GOLF COURSE, BRONX, NY

FIGURE 9. GENERAL ARRANGEMENT OF NCA, NEW TUNNELS, AND PROPOSED WTP AT THE MOSHOLU SITE

2.3.2. Treated Water Conveyance and Pumping.

A new shaft would be constructed west of the proposed plant to contain a new 9-foot diameter Low Level treated water conduit and a new 7-foot diameter High Level treated water conduit. A new combined treated water tunnel would be constructed from the bottom of this shaft at the water treatment plant site to a new shaft chamber located near Jerome Park Reservoir. This new tunnel would be approximately 3,710 feet long and would be sufficiently large enough to contain both a 7-foot diameter High Level Service treated water pipe and a 9-foot diameter Low Level Service treated water pipe between the shaft at the water treatment plant site and the new shaft chamber. At the new shaft chamber, the Low Level tunnel would reduce in size and connect to the NCA downstream of Shaft No. 21 to convey Low Level treated water to Manhattan. This tunnel is anticipated to be approximately 650 feet in length and contain an 8-foot diameter conduit.

2.3.3. Emergency Bypass

If the proposed plant is taken out of service and the Croton System is required to meet demand, subject to NYSDOH approval, untreated Croton water could be fed into the distribution system from the Jerome Park Reservoir.

2.4. HARLEM RIVER SITE

The Harlem River Site is located in the Borough of the Bronx, New York. The City proposes to acquire approximately 17.5 acres of land for the proposed plant. The proposed site is located along the Harlem River near the West Fordham Road/University Heights Bridge with Exterior Street and part of the MTA Metro-North Railway Hudson Line on the east and the West 225th Street/Kingsbridge Road to the north (Figure 12). New York City Department of Transportation, Consolidated Edison Company of New York, Inc. (Con Edison), “Storage Post” Self-Storage (under construction, formerly Butler Lumber) XCEL Ready Mix batching plant, and the CSX Corporation currently occupy the water treatment plant site north of University Heights Bridge. The proposed site is identified by property tax Block 3231, Lot 350; Block 3244, Lot 100; Block 3244, Lot 120; Block 3244, Lot 145, Block 3244, Lot 160, Block 3244, Lot 1, and Block 3245, Lot 3. The current zoning of the site consists of M3-1, M2-1, and M1-1 (Manufacturing).

The proposed plant would require a footprint of about eleven acres, which would include the water treatment facility, parking lot, and other support facilities. The proposed plant would be a primarily above-grade structure, approximately 65 feet high. There would also be a Treated Water Pumping Station (TWPS) adjacent to the proposed plant for the treated water connection, and two shafts connecting to the raw and treated water tunnels from the NCA to the site. A listing of the Croton Water distribution system components related to the Harlem River Site is included in Table 5.

2.4.1. Raw Water Conveyance and Pumping

Raw water would be conveyed to the proposed plant from the NCA via a new 10-foot diameter tunnel. The invert of the raw water tunnel at the new shaft would be at Elevation -60 feet, approximately 70 feet below grade. The raw water tunnel would be connected to the NCA upstream from Shaft No. 22 and convey up to 290 mgd to the proposed plant. A concrete plug would be installed downstream from this tunnel connection to prevent raw water flow to the Manhattan Low Level Service. There would also be a turbine station within the raw water shaft to reduce pressure and recover energy as the raw water would enter the proposed plant (Figure 12).

2.4.2. Treated Water Conveyance and Pumping

Treated water from the proposed plant would be pumped to the High Level and Low Level services. Treated water from the proposed plant would be conveyed to the new shaft chamber near the Jerome Park Reservoir (High Level) and the NCA (Low Level), downstream of Shaft No.22, through a combined tunnel containing the two treated water tunnels (High Level and Low Level). The combined tunnel would be approximately 350 feet long and would have a diameter of approximately 24 feet. Upon exiting the combined tunnel, the High Level tunnel (9-foot diameter) would extend north to the new shaft chamber approximately 6,640 feet and the Low Level tunnel (7-foot diameter) would extend south to the NCA approximately 1,200 feet. The profile for the High Level tunnel from the proposed plant to the new shaft chamber starts at an invert elevation of approximately -80 feet and extends to the end of the combined tunnel at an elevation of -75 feet.

FIGURE 10. AERIAL VIEW OF THE PROPOSED WTP PROJECT AT THE HARLEM RIVER SITE BRONX, NY

TABLE 5. CROTON WATER DISTRIBUTION COMPONENTS OF HARLEM RIVER SITE

Raw Water Conveyance	Treated water Conveyance	Off-site Facilities	Connections to Distribution Systems[1]	
			Low Level Service	High Level Service
10-foot diameter tunnel from NCA downstream from Jerome Park Reservoir to the WTP. Turbines would be used to lower the pressure and recover energy.	For Low Level Service, treated water from the Treated Water Pumping Station would flow to the pressurized NCA via a new 7-foot diameter tunnel downstream of Shaft No. 22. A plug would be installed to separate the raw water from the treated water. For High Level Service, new 9-foot diameter tunnel would convey treated water from the Treated Water Pumping Station to a new shaft near Jerome Park Reservoir.	A new shaft, valve chambers, and flow meters would be installed near Jerome Park Reservoir. Jerome Park Reservoir would function as a raw water reservoir.	In addition to providing Low Level Service via the NCA, a new 4-foot diameter pipe would be constructed from the new shaft chamber to the existing valve chamber "C" to deliver up to 30 mgd of Low Level treated water to the East Bronx. Low Level service could also be conveyed, through sleeve valves, from the new shaft chamber to the South Bronx. A new flow meter (flow meter chamber "D") would connect to the existing 4-foot diameter service near Jerome Park Reservoir. This service continues along the floor of the south basin of Jerome Park Reservoir and bypasses Gate House No. 6.	High Level treated water would be distributed from the new shaft chamber to City Tunnel No. 1, Shaft No. 3, Shaft No. 4, and City Tunnel No. 3, Shaft No. 4B. Flow meters would be located on each connection to measure flows from the new shaft chamber to the High Level System.

Notes:
1. Levels (Low, Intermediate, and High) refer to the topographic height of the neighborhoods served. For example, Low Level Service includes low-level areas of the East and South Bronx and Manhattan. This water is transmitted through the distribution system at a lower level than the Intermediate and High Level Service. Intermediate Level Service would be provided from the High Level Service via existing regulators in the distribution system. The existing Intermediate Level service connections would be placed off-line.

FIGURE 11. GENERAL ARRANGEMENT OF NCA, NEW TUNNELS, AND WTP

High Level treated water would be pumped from the pump station wet wells to a new shaft chamber located near the Jerome Park Reservoir, via a new treated water tunnel. The new treated water tunnel would be 9-foot diameter and would supply High Level treated water to the distribution system. High Level treated water would be distributed from the new shaft chamber to City Tunnel No. 1, Shaft No. 3, Shaft No. 4, and to City Tunnel No. 3, Shaft No. 4B. These new High Level service connections would replace the Mosholu Pumping Station, an existing facility, which would be taken off-line but retained by the NYCDEP.

Intermediate Level service to the Bronx would be supplied through the in-City High Level service using existing regulators. This would replace the Jerome Pumping Station, which would be taken off-line but also retained by the NYCDEP.

Low Level treated water would be pumped from the proposed plant to the NCA downstream of NCA Shaft No. 22 via a new Low Level treated water tunnel. The treated water tunnel would be 7-foot diameter and would supply up to 155 mgd of treated water to Manhattan. Low Level treated water could also be conveyed from the new shaft chamber near the Jerome Park Reservoir after passing through sleeve valves. A new 4-foot diameter pipe would be constructed from the new shaft chamber to the existing valve chamber “C” to deliver up to 30 mgd of Low Level treated water to the East Bronx. Low Level service could also be conveyed, through sleeve valves, from the new shaft chamber to the South Bronx. A new flow meter (flow meter chamber “D”) would connect to the existing 4-foot diameter service near the Jerome Park Reservoir.

2.4.3. Emergency Bypass

Subject to approval by the NYSDOH, if the proposed Croton WTP is taken out of service and Croton water is required to meet demand, a connection at the Harlem River Site between the raw water shaft and the Low Level treated water shaft would enable untreated Croton water to be conveyed back to the NCA downstream of NCA Shaft No. 22.

2.5. OFF-SITE FACILITIES

Table 6 summarizes the work at sites outside of the proposed water treatment plant site alternatives. The locations along the NCA would only be required if the NCA is pressurized as part of the Eastview Site alternative instead of relying upon the KCT alternative. The subsections that follow the table summarize the specific work at each of the sites described in the table below.

TABLE 6. OFF-SITE FACILITIES CROTON WTP WORK

Off-site Facilities	Location/Time	Action
Croton Lake Gate House	Town of Yorktown After 2011	For Eastview Site only • Install Potassium permanganate equipment for intermittent treatment of iron and manganese • All inside the 1890 Gate House
NCA Shaft No. 9	Village of Sleepy Hollow 2011-2015	For Eastview Site only • Access point to NCA for construction crews and materials (for pressurization alternative only). • Rehabilitate existing blow-off outlet at Shaft No. 9.
NCA Shaft No. 18	City of Yonkers 2011-2015	For Eastview Site pressurization work only • Access point to NCA for construction crews and materials • Rehabilitate blow-off outlet.
Gate House No. 1	Borough of the Bronx 2011-2015	For Eastview Site pressurization work only • A new access road to permit construction vehicles to access Gate House No. 1. • Modify the existing structures and install new equipment for the Gate House to service the new Croton Water Supply System
NCA Shaft No. 21	Borough of the Bronx Seasonally, 2007-2010	• Rehabilitations/upgrades. • Access point to NCA for construction crews and materials.
Gate House No. 2	Borough of the Bronx Seasonally, 2007-2010	• Provide a new overflow facility for the north basin of the Jerome Park Reservoir. • Close 48-inch diameter gate valve to the distribution system and construct a concrete plug at the gate valve intake. • Extend the 30-inch drain line from the dividing wall to Gate House No. 2 where it would be connected to the existing 4-ft x 7-ft open drain.
Gate House No. 3	Borough of the Bronx Seasonally, 2007-2010	• Minor structural rehabilitation. • Close two 48-inch diameter gate valves to the distribution system and construct concrete plugs at the gate valve intake.
Gate House No. 5	Borough of the Bronx Seasonally, 2007-2010	• Rehabilitate interior and exterior including upgrading the equipment inside the Gate House. • Remove the corrosion inhibitor and chlorination equipment after the Croton WTP is complete. • Remove existing 16-inch raw water pipe to the Demonstration Plant. • Seal Chamber No. 22 and refurbish and automate existing sluice gates. Mosholu and Harlem River sites only • Install Potassium permanganate storage and mixing facilities.
Gate House No. 6/ Microstrainer Building	Borough of the Bronx Seasonally, 2007-2010	• Gate House No. 6 would be taken offline and retained for Bureau of Water Supply use. • The Microstrainer building would be dismantled.
Gate House No. 7	Borough of the Bronx Seasonally, 2007-2011	• Rehabilitate interior and exterior including upgrading equipment to service the new system. • Refurbish and automate sluice gates in the west portal to the JPR.
Jerome Pumping	Borough of the Bronx 2011	• Place off-line.

TABLE 6. OFF-SITE FACILITIES CROTON WTP WORK

Off-site Facilities	Location/Time	Action
Station		
Valve Chambers and Flow Meters near Gate House No. 5.	Borough of the Bronx Seasonally, 2007-2011, through 2015 for Eastview Pressurization	• Make new connections to these below-grade structures; add underground flow meters where required; add or change valves where needed; add pressure caps where required. • This work is required for all site alternative but the work would be conducted 2010-2015 for the Eastview pressurization treated water alternative.
Mosholu Pumping Station	Borough of the Bronx, 2011	• Place offline.

2.5.1. New Croton Aqueduct

If the KCT tunnel would be chosen for the Eastview Site alternative, or if the Mosholu or Harlem River Sites were chosen, the NCA would be used for raw water conveyance to the water treatment plant. It would be used for overflows and an emergency supply to Jerome Park Reservoir if the water treatment plant were built at the Eastview Site. No work would be required at the shafts on the NCA. All of the work described in this section would only take place if the Eastview Site would be chosen. If the NCA would be chosen to convey the water, work at the shafts described below would be required to pressurize the NCA. In addition, some work to treat the raw water at the 1890 Gate House at the Croton Lake Gate House site could be done if either of the water conveyance alternatives for the Eastview Site is selected.

The work described below would occur between 2010 and 2015. During this period the NCA would be out of service and finished water from the Croton WTP at the Eastview Site would be conveyed through the Interim connection described above to the Delaware Aqueduct. Current upstate suppliers that utilize the NCA would be provided with alternative supplies to prevent any disruption of services.

2.5.1.1. 1890 Croton Gate House

The1890 Croton Lake Gate House is adjacent to the Croton Lake Gate House along the shoreline of the New Croton Reservoir, in the Town of Yorktown, to the east of the Croton Dam. The Croton Lake Gate House contains the flow control facility that releases water into the NCA. The 1890 Croton Lake Gate House contains facilities including chlorine and copper sulfate feeding systems to treat the raw water from the New Croton Reservoir.

If the Eastview Site is selected for the Croton WTP, potassium permanganate could be added at the 1890 Gate House at the Croton Lake Gate House site[7]. This chemical combines with iron and manganese and forms a solid that would be subsequently removed by the dissolved air floatation treatment process. This would only have to be done when the raw water contains elevated levels of these metals, which historically has occurred for a month or two every few years. The addition of potassium permanganate would be done at Gate House No. 5 if the water treatment plant were built at the Harlem River or Mosholu Sites.

The work at the 1890 Gate House involves adding several plastic bins and mixing equipment to the inside, replacing existing unused copper sulfate dosing equipment. The construction would take two to three months. The work would be entirely interior work, and would involve only a few truck trips per day and fewer than ten workers. During operations the potassium permanganate would be delivered in dry form. Only two to three deliveries per year would be required. No environmental impacts are anticipated from this single action and no further analysis of the Croton Lake Gate House is included.

2.5.1.2. New Croton Aqueduct Shaft No. 9

NCA Shaft No. 9 is located in the Village of Sleepy Hollow, New York. The existing stone superstructure is approximately 42 feet by 44 feet and 22 feet tall. The superstructure extends approximately 20 feet below grade and contains a ladder for access from the ground level and a blow-off. The Pocantico blow-off is an existing NCA surge control mechanism. The Pocantico blow-off pipe (10 feet by 12 feet) connects to the NCA with gates and a weir wall. The blow-off outlet drains to Welker's Brook (also known locally as Carl's Brook), which flows into the Pocantico River a few hundred feet below the blow-off. The blow-off is currently partially sealed and not in operation.

The blow-off to the Pocantico River would be used more frequently if the WTP were to be at Eastview and the NCA is used for treated water because an unplanned shutdown of the raw water pumps at Eastview would cause a backup of water in the NCA. The potential environmental impacts of this release of raw water are discussed in the impact sections of the Draft SEIS. No work would be required at this site if the KCT would be used for treated water conveyance.

2.5.1.2.1. New Croton Aqueduct Shaft No. 14

NCA Shaft No. 14 is located in the Village of Ardsley, New York and would serve as an access point into the NCA. The structure is approximately 40 feet below grade. The NCA passes through the structure and the blow-off pipe (10 feet by 12 feet) connects to the NCA with gates and a weir wall. The blow-off is currently not in operation. If the water treatment plant were built at the Eastview site, the blow-off and manhole covers would be sealed with pressure tight covers.

[7] The current design plans to use anthracite as a filter medium. Evaluation during operations may indicate that granulated activated carbon may perform better. If this switch in filter mediums occurs it would be after 2011. Neither medium is toxic, they are similar in bulk, and there are no environmental consequences of the switch other than the need to apply occasional pretreatment with potassium permanganate as described in the text.

2.5.1.2.2. New Croton Aqueduct Shaft No. 18

NCA Shaft No. 18 is located in The City of Yonkers, New York. The shaft would serve as an access point into the NCA. The existing stone superstructure is approximately 40 feet by 43 feet and 20 feet tall. The structure extends approximately 19 feet below grade to the NCA. Tibbet's Brook runs perpendicular to the NCA and passes underneath the structure. The structure contains a blow-off with gates and a weir that allows water to flow from the NCA to Tibbet's Brook. Two 6-foot conduits below the superstructure convey the brook through the structure. The blow-off is currently not in operation. If the water treatment plant were built at the Eastview site, the blow-off and manhole covers would be sealed with pressure tight covers.

2.5.1.2.3. Gate House No. 1

Gate House No. 1 is located in the Croton Woods section of Van Cortlandt Park, Bronx, New York. Presently, Gate House No. 1 provides flow diversion and control functions for the NCA and the New Croton Branch Aqueduct, which originates at Gate House No. 1. Flow diversion and control at Gate House No. 1 is achieved using manually operated sluice gates on the NCA and stop logs on the New Croton Branch Aqueduct to direct flow into either or both of the aqueducts. Under current normal operations, the sluice gates on the NCA are kept closed and all water is diverted to the New Croton Branch Aqueduct and sent to the Jerome Park Reservoir, chlorinated and then discharged into the distribution system. The New Croton Branch Aqueduct is typically kept open whenever the Croton System is in service. The Baseline Rehabilitation work would upgrade this facility to allow automated operation of sluice gates and security improvements irrespective of the selection of sites for the water treatment plant.

In the case of a water treatment plant at the Eastview Site and the continued utilization of the NCA for treated water, the sluice gates would have to be upgraded so that they would be pressure tight. No work would be required as part of this project at this site if the water treatment plant were built at the Mosholu or Harlem River Sites.

2.5.1.2.4. New Croton Branch Aqueduct

The New Croton Branch Aqueduct is a horseshoe shaped 13.5-foot high by 13.6-foot wide non-pressurized grade tunnel that begins at Gate House No. 1 and continues southward parallel with the Old Croton Aqueduct to Gate House No. 7 at Jerome Park Reservoir. From there, the Old Croton Aqueduct and the New Croton Branch Aqueduct are both built into the east wall of the Jerome Park Reservoir. The New Croton Branch Aqueduct currently functions as the main source of raw water to the Jerome Park Reservoir.

The Branch Aqueduct would be sealed downstream of Gate House No. 1 if the WTP were built at Eastview and the NCA is pressurized. The Branch Aqueduct would be used to convey finished water from Shaft No. 21 on the NCA to the new shaft chamber near Jerome Park Reservoir. No work would be required along this conveyance if the water treatment plant were built at the Mosholu or Harlem River Sites.

2.5.2. Jerome Park Reservoir

Jerome Park Reservoir currently operates as a distribution reservoir for the Croton System. Jerome Park Reservoir is an open reservoir with a concrete bottom covering approximately 93 acres, formed principally of stone-masonry walls and earth embankment. The north wall is a concrete-faced earth embankment with a concrete core wall. The remaining walls are masonry with a 12 to 1 slope, and are approximately 30 feet high. A concrete dividing wall splits the reservoir into two basins. Gate House No. 5 is located at the east end of the dividing wall. Gate House Nos. 3 and 6 are located in the south basin, and Gate House Nos. 2 and 7 are in the north basin.

As part of the proposed project, Jerome Park Reservoir would be used as a raw water reservoir if either the Mosholu or Harlem River Sites were chosen. If the Eastview Site were chosen, the Jerome Park Reservoir would be used for overflows (KCT treated water conveyance alternative only) and for an emergency supply (either treated water conveyance alternative). Irrespective of the choice of water treatment plant site, work is required to maintain the facilities around Jerome Park Reservoir. The work is the same for the two water treatment plant sites in the Bronx. Differences are noted below for the additional work required at Jerome Park Reservoir if the NCA would be pressurized.

2.5.2.1. Gate House No. 7

Gate House No. 7 is located along the northeast corner of Jerome Park Reservoir at the intersection of Sedgwick and Goulden Avenues. Gate House No. 7 currently functions to control flow into the reservoir from the New Croton Branch Aqueduct and diverts flows from the north basin to various distribution pipes, including a diversion to Mosholu Pumping Station.

As part of the proposed project, Gate House No. 7 would be utilized to either control flow directly into the north basin of Jerome Park Reservoir or to allow water to continue through the New Croton Branch Aqueduct. Gate House No. 7 would no longer discharge water to the Mosholu Pumping Station or continue to be used as the chlorination facility. Therefore, the electrical and chemical equipment and piping systems, all equipment from the switchgear rooms, and all of the screens would be removed. The superstructure would require interior and exterior rehabilitation and the sluice gates in the west portal of the north basin would be refurbished and automated.

The Mosholu Pumping Station is contained within Gate House No. 7. As part of the proposed project, the 75-year-old Mosholu Pumping Station would be taken off line and all connections to the distribution system and the access pipe from Jerome Park Reservoir Gate House No. 7 would be plugged, sealed, and equipment would be removed. New piping and flow meters would connect the two shaft risers with the two 48-inch diameter High Level Service transmission mains outside the new shaft chamber on Goulden Avenue.

2.5.2.2. Gate House No. 5

Gate House No. 5 is located on the east side of the reservoir, near the intersection of Goulden Avenue and West 205th Street. Gate House No. 5 currently has multiple functions that include distribution control, a chlorination facility, a rescue skiff, offices and an employee lounge. It receives Croton water from the north and south basins of the Jerome Park Reservoir, through Gate House Nos. 2, 3 and 7 (via the New Croton Branch Aqueduct). Gate House No. 5 supplies Croton water to the NCA (via NCA Shaft No. 21), the south basin (via the south portal), the north basin, the East Bronx distribution system, and the Jerome Pumping Station.

As part of the proposed project, a potassium permanganate facility would be constructed within Gate House No. 5 for the water treatment plant at the Mosholu or Harlem River Sites if it were deemed necessary in the future. This would entail placing plastic bins and mixing equipment where some of the equipment that would have been previously removed as part of the hypochlorination project[8].

2.5.2.3. New Croton Aqueduct Shaft No. 21

NCA Shaft No. 21 is located in the north basin of Jerome Park Reservoir. NCA Shaft No. 21 currently connects Gate House No. 5 to the NCA. The shaft functions as a conduit transferring water from Jerome Park Reservoir into the NCA and provides Croton water to the Low Level Service areas of the Manhattan distribution system.

In the proposed project, NCA Shaft No. 21 would direct raw water from Jerome Park Reservoir to the proposed plant via the NCA for the Mosholu or Harlem River Site alternatives. Minor rehabilitation work is probable but no modifications to the facility at NCA Shaft No. 21 are proposed at this time.

Shaft No. 21 would be used to divert finished water to the new shaft chamber via a short pipeline to the New Croton Branch Aqueduct for the Eastview site alternative that uses the pressurized NCA.

[8] The NYDEP has committed to removing the existing gaseous chlorination equipment from Gate House No. 5 as part of its Risk Management Plan. This work is anticipated for 2004, prior to the start of the Croton WTP, and is being evaluated in a separate environmental review. It would be completed irrespective of the choice of sites for the Croton WTP. It involves removing the gaseous chlorine tanks and replacing them with liquid sodium hypochlorite equipment.

2.5.2.4. Gate House No. 6 / Microstrainer Building

The Gate House No. 6 building and Microstrainer Building are located at the southern edge of the Jerome Park Reservoir at the intersection of Reservoir Avenue and Goulden Avenue.

As part of the proposed project, Gate House No. 6, which is not currently utilized, would be taken offline and the connections from the Gate House to the bypass piping and the two inlet pipes from the Jerome Park Reservoir would be plugged. Gate House No. 6 would be retained for NYCDEP use, but all of the operating equipment would be removed. The Microstrainer Building could be dismantled, and the area could be landscaped and kept open for a potential access road to the Reservoir.

2.5.2.5. Gate House No. 3

Gate House No. 3 is a one-story, 30-foot by 33-foot building located on the west side of the south basin of the reservoir. Its current function is to supply water to the south basin from Gate House No. 5 and allow Jerome Park Reservoir water to be circulated.

As part of the proposed project, Gate House No. 3 would continue to function as a water intake structure. The interior and exterior of the structure would be rehabilitated. Two 48-inch diameter gate valves to the distribution system would be removed and the operating stems would be cut. Concrete plugs at the gate valve intakes would be constructed.

2.5.2.6. Gate House No. 2.

Gate House No. 2 is located in the north basin of Jerome Park Reservoir. Gate House No. 2 consists of two components; a 40-foot by 35-foot main building that extends from the bedrock below the reservoir floor to one story above the top of the reservoir embankment. Currently, Gate House No. 2 serves as the main drainage facility of the Jerome Park Reservoir and also functions as a north basin water supply source for Gate House No. 5.

As part of the proposed project, Gate House No. 2 would continue to serve as the main drainage facility for both basins of the reservoir and supply water to Gate House No. 5. A new overflow facility for the north basin would also be installed in Gate House No. 2. The interior and exterior of the structure would be rehabilitated. The 48-inch diameter gate valve to the distribution system would be closed and the operating stem would be cut. A concrete plug at the gate valve intake would be constructed. A new overflow weir in Gate House No. 2 would be constructed to independently control water levels in the north basin

In addition, a 30-inch drain line would be extended from the dividing wall approximately 700-feet to Gate House No. 2, where it would be connected to a drain. The extension would allow the south basin to be drained without having to use the present method of using a diver to remove the blind flange to the drain inlet located on the Reservoir floor.

2.5.2.7. Jerome Pumping Station.

The Jerome Pumping Station is located on Jerome Avenue between Mosholu Parkway and West 205th Street in the Bronx. The pumping station was built in 1906 to house steam driven pumps, which were replaced in 1938 by three 19 mgd electric pumps that are capable of delivering 50 mgd of water to the Bronx Intermediate Level Service. The pumping station superstructure is a three-story building, but only the main floor is at grade. The basement and mezzanine levels are below grade. The basement level contains pumps, motors, and piping. The mezzanine level contains electrical switchgear. Jerome Pumping Station currently pumps water from Jerome Park Reservoir to the Intermediate Level service area.

As part of the proposed project, the Intermediate Level service would be supplied from the in-City High Level Service using existing pressure reducing valves and regulators. The Jerome Pumping Station would no longer be needed and would be taken off line, but would be retained for NYCDEP use. All the mechanical equipment, suction mains and discharge mains would be capped at the face of the building. Future use of the Jerome Pumping Station would be the subject of further study.

2.6. CONSTRUCTION SCHEDULES AND COST ESTIMATES

The Supplemental Consent Decree stipulates plant operation on or before October 31, 2011 for the Harlem River and Mosholu Sites, and September 30, 2010 for the Eastview Site. Some mitigation work would occur before the WTP construction. The award of construction contracts would be timed to expedite completion of the project, but construction would be phased to minimize siting conflicts. Anticipated timetables for the major items of the construction plan are presented in Figure 12.

The estimated capital, operating and life cycle costs (and increases to water/sewer rates) for the project are presented in Table 7. All costs are presented in 2003 dollars unless noted otherwise. Four cost scenarios are presented in the following comparative cost table for the three sites under consideration. The Eastview Site is represented by two scenarios, one using the (KCT for the treated water conveyance and the second using a pressurized NCA to convey the treated water. A portion of the KCT construction costs are allocated to the Croton WTP based on the percentage of total aqueduct capacity that could be represented by the Croton water.

The costs include approximate values for land acquisition for the Harlem River Site, and mitigation and amenities costs. The mitigation and amenities costs for the Mosholu Site are more fully developed than the costs at the other sites, but estimates are included for natural resources, visual improvements, and local improvements to the transportation networks.

The costs are based on a 2.75 percent annual inflation rate, a 6.4 percent interest rate on the capital, and a 30-year term on the debt. These are the assumptions that NYCDEP uses for modeling its capital improvements. All these costs are based on conceptual design. A contingency is included for the costs not captured at the conceptual level. The costs would be reported again based on preliminary design in the Final SEIS. The projected impacts on water rates are in Table 8.

ID	Task Name	Start	Finish
1	EASTVIEW SITE	Mon 9/5/05	Wed 10/26/11
2	Raw Water Tunnel	Mon 9/4/06	Wed 5/28/08
3	WTP and Pump Station	Mon 9/5/05	Fri 2/26/10
4	Startup and Testing	Mon 3/1/10	Thu 9/30/10
5	Facilities at Jerome Park	Thu 7/30/09	Wed 10/26/11
6	NCA Alternative	Mon 9/4/06	Tue 9/29/15
7	Treated Water Tunnel	Mon 9/4/06	Wed 5/28/08
8	Facilities at Jerome Park	Thu 12/1/11	Mon 4/1/13
9	Shaft Sites	Thu 12/1/11	Tue 9/29/15
10	KCT Alternative	Mon 6/1/09	Mon 1/20/20
11	Construction	Mon 6/1/09	Mon 1/20/20
12			
13	MOSHOLU SITE	Thu 8/5/04	Mon 10/31/11
14	Traffic mitigation	Thu 8/5/04	Fri 9/30/05
15	Site Preparation	Wed 4/13/05	Tue 4/10/07
16	Raw and Treated Water Tunnel	Fri 7/1/05	Thu 6/25/09
17	WTP and Pump Station	Wed 3/1/06	Tue 3/22/11
18	Startup and Testing	Wed 3/23/11	Mon 10/31/11
19	Facilities at Jerome Park	Thu 7/30/09	Wed 10/26/11
20			
21	HARLEM RIVER SITE	Thu 3/31/05	Mon 10/31/11
22	Site Preparation	Thu 3/31/05	Fri 3/31/06
23	Raw and Treated Water Tunnel	Mon 9/4/06	Wed 5/28/08
24	WTP and Pump Station	Mon 9/5/05	Tue 3/22/11
25	Startup and Testing	Wed 3/23/11	Mon 10/31/11
26	Facilities at Jerome Park	Thu 7/30/09	Wed 10/26/11

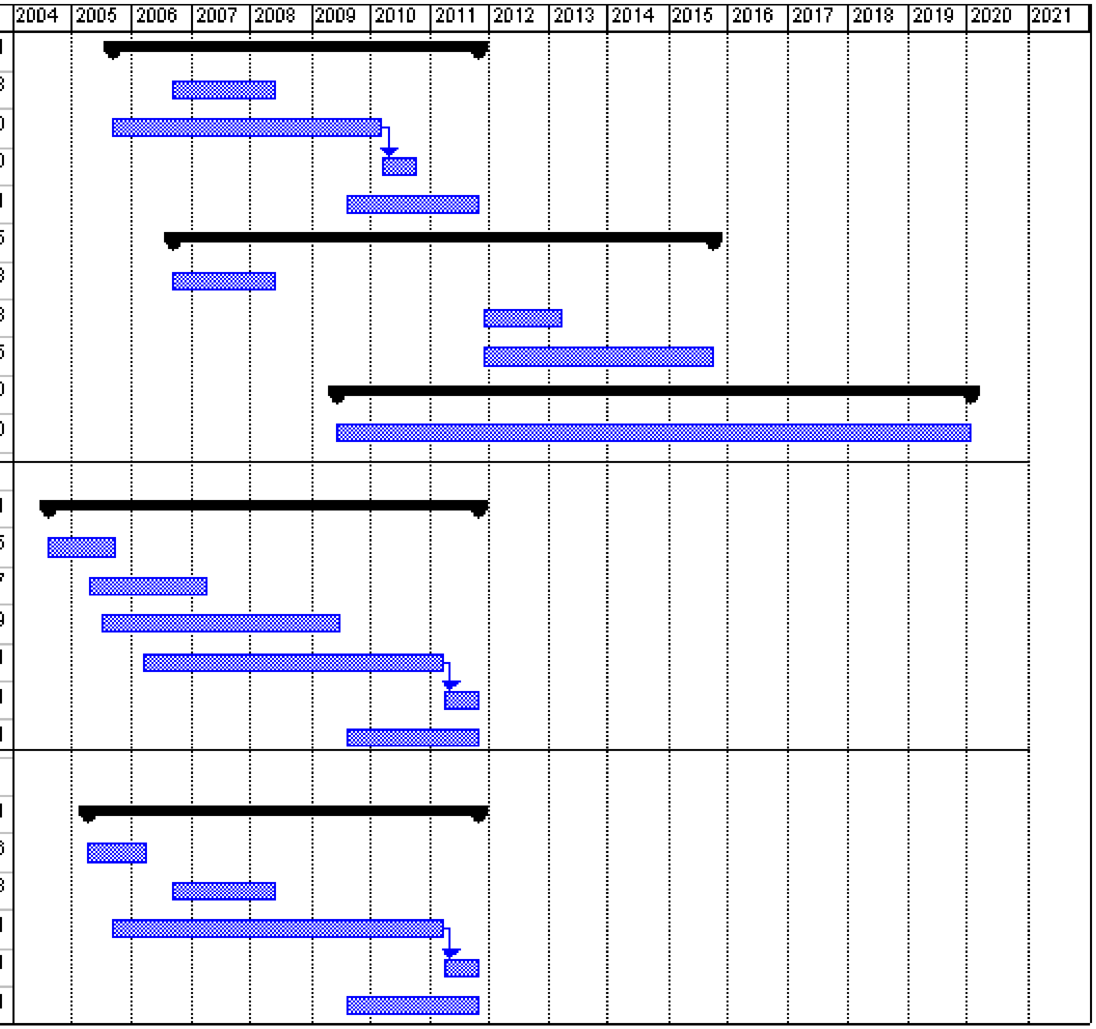

FIGURE 12. WATER TREATMENT PLANT CONSTRUCTION SCHEDULE

TABLE 7. SUMMARY OF COST ESTIMATES

Capital Costs	Eastview with KCT	Eastview with NCA	Mosholu	Harlem River
Capital Cost	**$1,216**	**$1,566**	**$1,235**	**$1,205**
Operating Cost	**$33**	**$33**	**$22**	**$25**
Life Cycle Cost	**$1,495**	**$1,788**	**$1,352**	**$1,370**

TABLE 8. POTENTIAL IMPACTS ON WATER AND SEWER RATES

	Eastview with KCT	Eastview with NCA	Mosholu	Harlem River
Combined Water and Sewer Rate increase, NYC users (% increase over 2010 base rate, $850)	$26 (3.1%)	$28 (3.3%)	$32 (3.8%)	$36 (4.2%)
Uniform Water Rate increase, upstate users (% increase over 2010 base rate, $77)	$18 (23.4%)	$20 (23.4%)	$0 (0%)	$0 (0%)

3. SUMMARY OF POTENTIAL SIGNIFICANT ADVERSE ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

3.1. INTRODUCTION

This section summarizes the potential significant adverse environmental and public health impacts and where necessary and feasible or practicable, mitigation measures. Potential adverse impacts that would not be considered significant are described in the detailed sections within the Draft SEIS. Detailed methods of analysis are presented in the Draft SEIS. For each of the parameters that were studied, the Existing Conditions were assessed. These assessments included traffic counts, collection of air quality data, noise monitoring at the site and at adjacent businesses, homes or parks (sensitive receptors). Interviews with schools and other community facilities were gathered, as were census data on the local socioeconomic conditions. Photographs of views, and samples of water and river bottom were collected. When all this information was gathered, the values for each of these parameters were predicted for the peak year of construction and the year of operation. This is termed “Future Without the Project,” or “No-Build Year.” Then, the project-induced impacts for the peak year of construction and the year of operation were developed to create a scenario of the “Future With the Project,” or “Build Year.” The impacts for both construction and operation were assessed by subtracting (or comparing for non-quantitative parameters) the Future With the Project with the Future Without the Project. Thresholds to determine significance were compared with established environmental impact criteria as published by New York City in the CEQR Technical Manual updated in 2001, and compared with relevant criteria published by the communities in Westchester County, as described in the Methodology section of the Draft SEIS.

It should be noted that as the conceptual design evolved, many features have been incorporated based on engineering judgment and previous experience with the design of this project. For example, the project alternative at the Harlem River Site includes public access to the waterfront, even though that access is not required in a Manufacturing Zone. This access was added to avoid any potential conflict with waterfront plans. These sorts of project components are not specifically called out as mitigation, but they do avoid potential impacts. Significant impacts that cannot be fully avoided or mitigated are also described. Details of these potential impacts, and the explanations and descriptions of the environmental impact categories that were analyzed, are provided in the Draft SEIS.

Below is a listing of potential adverse and significant adverse impacts that may occur, despite the attempts to avoid or minimize them during design. Where feasible, mitigation is proposed. It should be noted that construction-related impacts are not generally classified as significant because of their temporary nature. They are, because of the 5.5-year construction duration of this project, quantified and identified below along with mitigation measures wherever possible.

The potential adverse or significantly adverse impacts of the proposed project alternatives are divided in the following pages into first those impacts associated with the water treatment plant sites and then at the offsite facilities, including the NCA sites and Jerome Park Reservoir. If mitigation is called for to reduce potentially significant impacts it is described along with the impacts.

3.2. POTENTIALLY SIGNIFICANT ADVERSE IMPACTS AND MITIGATION AT THE EASTVIEW SITE

3.2.1. Introduction

Avoidance of potential environmental impacts would be an integral part of the construction plans. For example, a vibration prevention/monitoring program would be implemented during construction. Similarly, paving of some interior construction roadways and dust suppression techniques are incorporated in construction plans to eliminate air and noise quality nuisances to the extent feasible and practicable. Stormwater management both during construction and operations would be provided to prevent the release of particulate material into the nearby Mine Brook.

The project impact sections for several parameters concluded that neither the proposed construction nor operational activities would result in significant impacts. The parameters are not discussed in this section and include: Land Use, Zoning, and Public Policy; Open Space; Visual Character; Community Facilities; Neighborhood Character; Infrastructure and Energy;

Growth Inducement; Water Resources; Hazardous Materials, Electric and Magnetic Fields/Extremely Low Frequency Fields (EMF/ELF); Solid Waste; Public Health, and Socioeconomic Conditions. The potential impacts on these parameters are described in the appropriate construction and project impact sections.

3.2.2. Neighborhood Character

The construction of the Croton WTP is consistent with the light industrial, institutional, and office park environment around the site. No significant adverse impact on neighborhood character would result from the construction and operation of the Croton WTP alone.

The combination of the construction of the Croton WTP and the other NYCDEP proposed projects at the Eastview Site would potentially have a significant adverse impact on the neighborhood character of the area during construction. The construction of the proposed Croton WTP, the NYCDEP police precinct, the UV Facility, and work associated with the Kensico-City Tunnel (KCT) Project would have a number of contributing factors leading to this conclusion such as traffic increases, noise level increases, air quality changes, and overall degradation of the visual quality of the land resulting from development of NYCDEP projects converting a vegetated setting to a fully developed light industrial area. This impact will be mitigated to the extent practical and feasible by developing architectural themes for the structures consistent with the neighborhood, and landscaping and planting of trees to provide visual breaks.

3.2.3. Traffic

The main access routes to the Eastview Site would be Grasslands Road/Route 100C and Saw Mill River Road. The analysis of the traffic conditions in the Construction Year (2013) indicated that capacity deficiencies would occur in the future without and with the proposed project at eleven intersections along these roads. Two of these intersections are also anticipated to experience potential significant adverse impacts as a result of the operational traffic in the Future With the Project condition. In order to maximize capacity of these intersections, and to mitigate the potential impacts of the construction traffic and the Future with the Project traffic, the following mitigations measures are recommended to be part by the project at the Eastview Site. Each of these intersection mitigation plans would be based upon the potential construction impacts that would occur during peak construction periods

It should be noted that the following proposed mitigation plans contemplate the re-apportioning of the “green light time” for critical approaches at different intersections in the study area. This measure is intended to improve the overall intersection LOS and delay in certain intersection. These plans would improve the LOS and reduce delays back to the Future Without the Project conditions. However, in some cases these improvements might actually worsen other approaches to the same intersection i.e., increases delay or worsen LOS, but overall would improve the intersection or balance the anticipated delay

1. *Grasslands Road (Route 100C) and Bradhurst Avenue:* Optimize signal timing. Even with the proposed mitigation plan this intersection would operate at LOS D in the AM peak hour and LOS E in the PM peak hour, but with reduced or equal delays compared to the Future Without the Project conditions.

2. *Saw Mill River Road (Route 9A) and Tarrytown White Plains Road:* Optimize signal timing. With mitigation, this intersection would still operate at LOS C in the AM and PM peak hours with delays very similar to the no-build conditions.

3. *Saw Mill River Road (Route 9A) and Hunter Lane:* Optimize signal timing. With mitigation this intersection would be predicted to result in LOS D conditions compared with LOS F conditions in the Future Without the Project in the AM peak hour. The intersection would continue to operate at LOS B in the PM peak hour.

4. *Saw Mill River Road (Route 9A) and Dana Road:* Optimize signal timing. This intersection would continue to operate at LOS D in the AM peak hour and LOS C in the PM peak hour with reduced delays during the AM peak hour and slightly higher delays (2.7 seconds) during the PM conditions when compared to the Future Without the Project conditions. This minor increase in delay is in the middle D range and would not alter the Future Without the Project conditions during the PM conditions.

5. *Grasslands Road (Route 100C) and Clearbrook Road/Walker Road:* Optimize signal timing. This intersection would have potential impacts during both the construction and Future With the Project conditions. The AM and PM peak hours would be mitigated by the optimization of signal timing adjusted according to the relative delay during construction and operation of the proposed project. The intersection would operate at LOS D in the AM peak hour. In the PM peak hour the intersection would have less delay compared to the Future Without traffic conditions with a LOS E. A reduction in delay for the PM peak hour occurs at this location with the signal optimization since the construction traffic would be exiting the site later than the peak hour.

   The mitigation will be submitted to the appropriate jurisdictional oversight. If this mitigation is not approved and implement the sign adverse impact would remain unmitigated. Between the Draft and Final SEIS the feasibility of this mitigation will be examined.

6. *Grasslands Road (Route 100C) and Woods Drive/Taylor Road:* Optimize signal timing. This intersection would operate at LOS C and LOS D conditions in the AM and PM peak hours respectively. Although delays at this intersection would not be decreased totally back to the Future Without the Project conditions, they would not worsen the Future Without the Project condition since they remain in the middle LOS C and D ranges.

7. *Grasslands Road (Route 100C) and Sprain Brook Pkwy SB Ramp:* Optimize signal timing. The intersection would continue to operate at LOS C in the AM and PM peak hours with the mitigation measure implemented.

   The mitigation will be submitted to the appropriate jurisdictional oversight. If this mitigation is not approved and implement the sign adverse impact would remain unmitigated. Between the Draft and Final SEIS the feasibility of this mitigation will be examined.

8. *Grasslands Road (Route 100C) and Sprain Brook Pkwy NB Ramp:* Optimize signal timing. The potential construction impacts analysis indicated the possibility of traffic improvements beyond signal optimization at this location. This conservative analysis did not take into account that the construction traffic is anticipated to arrive between 6-7 AM and leave between 6-7 PM compared to the 8-9 AM and 5-6 PM peak hours being analyzed. By placing the construction traffic during the peak hours, the traffic improvements needed could be overstated. To address this, additional analysis was performed for the AM peak hour at this location. The traffic volumes on the roadway network are 65 and 40 percent less then the peak hours during the AM and PM periods, respectively. Table 9.1-1 shows the traffic analysis results for a 65 percent reduced AM analysis period. The signal optimizing traffic improvement at this intersection would operate at LOS C in the AM peak hour and PM peak hour.

9. *Saw Mill River Road and Ramada Inn/Broadway Plaza:* This unsignalized intersection is near the lower end of the volume threshold that could constitute a significant adverse impact. Since the construction volume peaks are temporary and are anticipated to arrive before and after the AM and PM peak hours respectively of non-construction vehicular traffic, no intersection improvements are proposed for this location.

10. *Old Saw Mill River Road and Grasslands Road (Route 100C):* This unsignalized intersection is near the lower end of the volume threshold that could constitute a significant adverse impact. Since the construction volumes peaks are temporary and are anticipated to arrive before and after the AM and PM peak hours respectively, no intersection improvements are proposed for this location. The construction traffic is anticipated to arrive between 6-7 AM and leave between 6-7 PM compared to the 8-9 AM and 5-6 PM peak hours being analyzed. The traffic volumes on the roadway network are 65 and 40 percent less then the peak hours during these AM and PM periods, respectively. Table 9.1-2 shows the traffic analysis for the Future Without the Project and Construction conditions for these earlier periods.

11. *Saw Mill River Road NB Ramp (Route 9A) and Grasslands Road (Route 100C):* The northbound ramp lane designations would be modified to accommodate the increased traffic volumes. The delay on the northbound approach would still increase during the AM peak hour. The major eastbound and westbound approaches should not experience significant changes in delay from the Future Without conditions. Since the construction volumes peaks are temporary and are anticipated to arrive before and

after the AM and PM peak hours respectively, no additional intersection improvements are proposed for this location. The construction traffic is anticipated to arrive between 6-7 AM and leave between 6-7 PM compared to the 8-9 AM and 5-6 PM peak hours being analyzed. The traffic volumes on the roadway network are 65percent and 40percent less then the peak hours during these AM and PM periods, respectively. Table 9.1-2 shows the traffic analysis for the Future Without the Project and Construction conditions for these earlier periods.

The potential traffic improvements primarily call for optimizing signal timings. Since the construction volumes peaks are anticipated to arrive before and after the AM and PM peak hours respectively, the optimum signal timings utilized are approximate. It is routine for counts to be performed at these locations after construction begins to provide actual traffic patterns to support the request for the modification of the signal timings. The potential traffic improvements would be developed in accordance with NYSDOT design guidelines for approval. In addition, the potential mitigation designs would undergo review by the NYSDOT and/or other roadway jurisdictional bodies prior to being implemented. If these signal optimization plans to reduce the predicted increases in delay at the intersections in the study area are not adopted, these adverse traffic impacts would remain unmitigated. The potential adverse impacts from the proposed construction-related activity would be short-term and mainly related to peak construction periods.

3.2.3.1.1. Combined Impacts with the Catskill/Delaware UV Facility

The NYCDEP is currently preparing a Draft EIS for an Ultraviolet Light Disinfection Facility for the Catskill/Delaware System that could be located at the Eastview site. The anticipated construction schedule for this facility overlaps the Croton WTP and could cause more substantial impact to the traffic network. Construction generation volumes should be available for the Final SEIS, but are not available for this Draft SEIS, since engineering for this plant is in its preliminary stage. However, to present an order of magnitude review, the Croton WTP construction traffic generation has been doubled to account for the other facility's construction. The affects that this would have on traffic improvements for the nine previously identified intersections with potential adverse impacts are described as follows:

1. *Grasslands Road (Route 100C) and Bradhurst Avenue:* Optimize signal timing. This intersection would still operate at LOS D in the AM peak hour and LOS E in the PM peak hour, but with reduced delays.

2. *Saw Mill River Road (Route 9A) and Tarrytown White Plains Road:* Optimize signal timing. This intersection would operate at LOS D in the AM and PM peak hours, but with reduced delays.

3. *Saw Mill River Road (Route 9A) and Hunter Lane:* Optimize signal timing. The intersection would still operate at LOS D in the AM peak hour, but with reduced delays and the intersection would operate at LOS B in the PM peak hour.

4. *Saw Mill River Road (Route 9A) and Dana Road:* Optimize signal timing. This intersection would operate at LOS C in the AM peak hour and LOS mid-D in the PM peak hour.

5. *Grasslands Road (Route 100C) and Clearbrook Road/Walker Road:* Optimize signal timing. This intersection would have potential impacts during both the construction and Future With the Project conditions. The AM and PM peak hours would be mitigated by the optimization of signal timing adjusted according to the relative delay during construction and operation of the proposed project. The intersection would operate at LOS D in the AM peak hour. In the PM peak hour the intersection would have less delay compared to the Future Without traffic conditions with a LOS E. A reduction in delay for the PM peak hour occurs at this location with the signal optimization since the construction traffic would be exiting the site later than the peak hour.

   The construction period is from 2005 to 2010. The cumulative construction traffic that would require additional eastbound, westbound, and southbound lanes is not anticipated until February 2006. Optimizing the signal timing may accommodate the construction traffic volumes up to that point.

6. *Grasslands Road (Route 100C) and Sprain Brook Pkwy SB Ramp:* Optimize signal timing and add a channelized right turn lane for the southbound approach. The intersection would operate at LOS C in the AM and PM peak hours with this mitigation measures implemented.

   The construction period is from 2005 to 2010. The cumulative construction traffic that would require the channelized southbound right turn lane is not anticipated until 2008. Optimizing the signal timing may accommodate the construction traffic volumes up to that point.

7. *Grasslands Road (Route 100C) and Sprain Brook Pkwy NB Ramp:* Add a left turn lane on the northbound approaches and adjust the signal timing. The addition of a northbound left turn lane would create a dual left turn lane from this approach. The northbound approach has a wide pavement section that combined with the grassed area adjacent to the roadway does not present significant construction constraints for the addition of this turn lane. In addition there are two existing westbound through lanes that can receive the traffic from a dual left turn lane northbound approach. The intersection would operate at LOS C in the AM peak hour and LOS D in the PM peak hour.

   The mitigation will be submitted to the appropriate jurisdictional oversight. If this mitigation is not approved and implemented, the significant adverse traffic impact would remain unmitigated. Between the Draft and Final SEIS the feasibility of this mitigation will be examined.

8. *Saw Mill River Road and Ramada Inn/Broadway Plaza:* This unsignalized intersection is near the lower end of the volume threshold that could constitute an adverse impact. Since the construction volumes peaks are temporary and are anticipated to arrive before and after the AM and PM peak hours respectively, no intersection improvements are proposed for this location.

9. *Saw Mill River Road SB Ramp and Grasslands Road (Route 100C):* This unsignalized intersection meets the peak hour signal warrant for the 2005 Future Without conditions. The cumulative construction traffic would require a signal to be installed at this location.

The potential traffic improvements primarily call for optimizing signal timings. Since the construction volumes peaks are anticipated to arrive before and after the AM and PM peak hours respectively, the optimum signal timings utilized are approximate. It is routine for counts to be performed at these locations after construction begins to provide actual traffic patterns to support the request for the modification of the signal timings. The potential traffic improvements would be developed in accordance with NYSDOT design guidelines for approval. In addition, the potential mitigation designs would undergo review by the NYSDOT and/or other roadway jurisdictional bodies prior to being implemented. If these signal optimization plans to reduce the predicted increases in delay at the intersections in the study area are not adopted, these adverse traffic impacts would remain unmitigated. The potential adverse impacts from the proposed construction-related activity would be short-term and mainly related to peak construction periods.

3.2.4. Noise

No significant mobile or stationary noise impacts were anticipated as a result of future normal operations of the proposed plant. Construction-generated noise level increases that exceed the 3-5 dBA noise increase threshold as established by CEQR to define the potential for significant adverse impacts would be experienced at noise sensitive receptors in the vicinity of the water treatment plant (WTP) at the Eastview Site. These noise level increases would be temporary in nature, lasting for duration of less than a year, and therefore would not constitute a significant impact. Measures to attenuate potential construction-generated noise impacts at sensitive receptors in the vicinity of the site were studied. For each noise-sensitive receptor, predicted project-induced noise levels for the peak construction-noise year (2005) were compared to the predicted future baseline noise levels for 2005.

3.2.4.1. Mobile Source Noise.

No significant noise impacts are anticipated from mobile sources as a result of operation or construction at the water treatment plant site. The results of the potential proposed plant operations and construction impacts analysis are presented in Section 5.10. Mitigation measures were not required along noise sensitive route segments.

3.2.4.2. Stationary Source Noise

Mitigation measures required for stationary noise impacts during construction at sensitive receptors were analyzed. Table 9 presents information regarding the sensitive receptors. Figure 9.1-1 shows the location of the receptors in relation to the proposed construction site.

TABLE 9. DESCRIPTION OF STATIONARY SOURCE SENSITIVE RECEPTORS NEAR THE EASTVIEW SITE

Receptor Name	Description of Receptor
EV-S1	Westchester medical laboratory
EV-S2	County penitentiary
EV-S3	Private residence on Grasslands Road
EV-S4	Juvenile detention center

Construction activities could increase the noise levels experienced at receptors EV-S1, EV-S3 and EV-S4. Noise levels that exceed the 3-5 dBA threshold were anticipated only during weekday construction hours (7:00 AM – 6:00 PM) for less than a year during the construction period.

Noise attenuation systems that would lower the elevated noise levels at sensitive receptors neighboring the site were identified. Noise barriers facing the receptors could be installed at fixed locations along the northern and southern boundary of the construction site. Noise barriers placed in a fixed location would satisfy the attenuation requirements and would not restrict the movement of on-site workers and equipment during construction.

This type of noise barrier is capable of approximately 13 dBA of sound transmission loss. The exact amount of sound transmission loss from a barrier is a function of its height, thickness, material of construction, and precise location with respect to the noise source and noise sensitive receptor. The greatest predicted increase in noise levels would be 11.1 dBA at Receptor EV-S4. The noise barrier would be capable of attenuating approximately 13 dBA of noise; therefore it would be sufficient to attenuate to an acceptable level the elevated noise levels resulting from construction activities.

The combined effect of the construction of the Croton WTP with the simultaneous construction of the Catskill / Delaware UV Facility could result in significant adverse noise impacts during the overlapping peak construction periods. The practicality of erecting noise barriers to attenuate the potential noise level increases at so few sensitive receptors must be considered further because noise barriers take time to construct, and installing them has the potential to result in adverse noise and construction-related effects. The predicted change in noise levels and the anticipated duration of the noise level changes will be considered further between the issuance of the Draft and Final SEIS.

3.2.5. Air Quality

The operation of the water treatment plant would have no significant adverse impacts on air quality. Possible effects on local air quality during construction at the project sites include:

- Fugitive dust and other emissions from land-clearing operations and excavation,
- Air emissions from on-site construction equipment, and
- Mobile source emissions from construction workers' private vehicles and construction trucks.

For the fine particulates ($PM_{2.5}$) incremental impact analysis, the maximum impacts were calculated for nearby institutional and sensitive uses for comparison with draft interim guidance criteria. While the highest incremental $PM_{2.5}$ concentrations at the Westchester County Department of Laboratories and Research facility was slightly greater than the draft interim guidance criteria for localized 24-hour impacts (i.e., 5 $\mu g/m^3$), the maximum predicted incremental 24-hour concentration at sensitive public locations would be substantially less. For example, the highest predicted increase in the 24 hour average $PM_{2.5}$ concentrations at the nearest sensitive use to the planned construction activities (the Juvenile Center) was 2.95 $\mu g/m^3$. It should be noted that the determination of potential significant environmental impacts is not typically done for construction related activities because these activities are temporary in nature.

The combination of the NYCDEP projects being undertaken at the Eastview Site would result in potentially significant adverse air quality impacts. Additional analysis to quantify the potential affects of DEP projects on this site will be conducted between the Draft SEIS and Final SEIS. During construction at the project site, all appropriate fugitive dust control—including watering of exposed areas and using dust covers for trucks—would be employed.

3.2.6. Historic and Archaeological Resources

During construction of the proposed plant at the Eastview Site excavation could significantly impact archaeological resources by disrupting prehistoric and historic archaeological resources within areas characterized as highly sensitive. In order to mitigate these potential impacts at Hammond House, the New York State (NYS) Office of Parks, Recreation and Historic Preservation (OPRHP) would be consulted for appropriate action.

Prior to excavation in any area of the project site identified as archaeologically sensitive, field-testing would be undertaken for both prehistoric and historical cultural resources in consultation with OPRHP. Testing would begin with a Stage 1B archaeological reconnaissance for those areas deemed to have moderate and high prehistoric and historic sensitivity that would be disturbed by excavation for the proposed project. This type of study is designed to ascertain the presence/absence of archaeological resources through the excavation of a series of test pits within the locations deemed archaeologically sensitive. The results of the testing would be submitted to OPRHP for review and approval.

If necessary, based on the results of the Stage IB testing, a Stage II field investigation would be designed and undertaken in consultation with OPRHP to determine the age, function, limits, integrity, and National Register eligibility of the sites or resources found.

The connections planned to the NCA to and from the proposed plant would potentially alter the historic character of the aqueduct, which is eligible for inclusion on the National Register of Historic Places. Consultation on the appropriate level of mitigation would be undertaken with the New York State Office of Parks, Recreation and Historic Preservation (OPRHP). It is likely that photo documentation would be required prior to construction. The black and white photographic documentation would be to the standards of the Historic American Engineering Record (HAER) which stipulate the types of views to be shot, large format film, acid free film, archivally stable developing chemicals, and acid free storage sleeves.

The combined effect of the proposed Croton Water Treatment Plant and the other NYCDEP projects proposed for the site in the Future Without the Project condition would result in potentially significant adverse impacts on historic resources as a result of the physical alteration of the site. The pastoral and rural-like setting of the historic Hammond House residence would be altered. No possible mitigation measures have been identified at this time to address the combined effect of the multiple projects on the historic character of the Hammond House and therefore the potential significant adverse impact on historic resources would remain unmitigated.

3.2.7. Natural and Water Resources

Potentially significant but mitigatable impacts from the construction and operation of the proposed plant at the Eastview Site include the removal of 554 trees greater than four inches diameter at breast height (dbh) and the filling of 0.07 acres of isolated shrub wetland in the northwestern area of the site. An additional 0.11 acres would be disturbed across a stream corridor during construction of a finished water pipeline. An on-site wetland mitigation area at a replacement ratio of 2:1 was designed to provide the greatest possible return of lost wetland functions. In addition, off-site areas would also be evaluated and presented in the Final SEIS if it is determined that on-site mitigation is not feasible. The creation of a 0.39-acre forested wetland with a 50-foot buffer (Figures 9.1-2 and 9.1-3) and a reforestation plan would be developed to compensate for the loss of the vegetation and wetlands on-site with the reforestation equivalent value of 850 trees (as listed in Table 9.1-5 and Figure 9.1-4). Because NYCDEP is intending to construct other projects on the Eastview Site, it is probable that on-site mitigation may not be feasible. In that case off-site property would be used to implement the reforestation plan and wetland mitigation as necessary for all the NYCDEP properties. NYCDEP owns appropriate properties for these mitigation areas within the Town of Mount Pleasant, including near the Kensico Reservoir and the Bronx River Corridor, and potentially Town, County, and State properties within the Town if agreement can be reached with the entities. . An example of a landscape and tree reforestation plan that specifies the placement of vegetation is depicted in Appendix F.

The proposed project is designed to control stormwater, which would have a secondary benefit of recharging groundwater and preventing adverse impacts to fish, benthic macroinvertebrates, and the adjacent vegetative communities surrounding Mine Brook. A detailed groundwater and stormwater model of the area influenced by the proposed excavation and subsequent operation of the proposed water treatment plant was developed and is described in Section 5.15, Water Resources.

The influence of the combined effects of other NYCDEP proposed projects for the Eastview Site during construction and operation of the proposed facilities has the potential to significantly and adversely affect the groundwater and surface water features at the project site. In addition, not all the wetland impacts of the combined projects could be mitigated on site because of the proposed development. Mitigation plans may include infiltration trenches for groundwater flow and stormwater retrofit techniques to restore or reengineer the water resource features on the site to maintain the value of these resources for stormwater control and habitat. If these designs were not implemented or considered to be feasible or practicable, these potentially significant adverse impacts on the natural and water resource functions at the Eastview Site would be unmitigated.

3.2.8. Public Health

A public health concern at the Eastview Site is the potential effect of dust and truck emissions during construction on air quality. The measures and/or best construction management practices described in Section 9.1 would reduce potentially adverse PM_{10} and $PM_{2.5}$ impacts during the construction period, when truck exhaust and dust could raise the emissions of particulates. The air quality analysis that was conducted for the proposed project concluded that no potential significant adverse impacts on sensitive receptors or public health as a result of peak construction activity or the operation of the proposed project would occur. The combined effect on the DEP projects proposed for the site may impose potential significant adverse affects on air quality from the construction related equipment. These potential significant adverse impacts would be localized and are not generally expected to affect public health in the study area. Additional analysis to quantify the potential affects of DEP projects on this site will be conducted between the Draft SEIS and Final SEIS.

The detention pond and created wetland could provide habitat for mosquitoes. Stormwater detention basins, if designed properly, do not become a health problem, and the design was reviewed with this consideration in mind. The operation and startup period of the water treatment plant would include monitoring of mosquitoes during the warm weather season, and if mosquitoes were determined to be a problem a regular program of pest control would be included in the operations and maintenance of the facility.

3.3. POTENTIALLY SIGNIFICANT ADVERSE IMPACTS AND MITIGATION AT THE MOSHOLU SITE.

3.3.1. Introduction

It should be noted that as design evolved, many features have been incorporated based on engineering judgment and public input. For example, the proposed project at the Mosholu Site would be built substantially below existing grade and fully covered, allowing the replacement and enhancement of existing park uses. The costs of burying the proposed facilities, relocating the existing golf club house, replacing the existing driving range, rebuilding and enhancing the existing golf course, and landscaping are all included in the project design. A vibration prevention/monitoring program would also be implemented during construction. An ornamental wall could be placed along the construction boundary to screen the view of the construction site. Similarly, to the extent possible, noise barriers and paving of interior construction roadways and dust suppression techniques are incorporated in construction plans to eliminate nuisances to the extent feasible and practicable. Finally, some of the planned improvements to traffic conditions would represent mitigation of impacts, but planned improvements to the entrance to the Mosholu Golf Course would be incorporated into the project plan despite the lack of predicted impacts based on the traffic analysis.

The Draft SEIS analyses demonstrate that there would be no significant adverse impacts associated with the proposed project at the Mosholu Site for Land Use, Visual Character, Community Facilities, Neighborhood Character, Air Quality, Open Space, Historic and Archaeological Resources, Socioeconomic Impacts, Growth Inducement, EMF/ELF, Hazardous Materials, Infrastructure and Energy, and Solid Waste.

Below is a listing of potential significant impacts that may occur, despite the design considerations discussed above. Where feasible and practicable mitigation would be proposed.

3.3.2. Traffic

No significant traffic impacts are expected during the operation of the proposed facilities. However, the construction phase of the proposed project is expected to result in traffic impacts at the 233rd Street and Jerome Avenue and Jerome Avenue and the Mosholu Golf Course entrance. A plan has been developed that would require the majority of the construction related truck traffic to use the Major Deegan Expressway 233rd Street exit, and travel south along Jerome Avenue to enter the site. Construction truck traffic exiting the site would be required to travel north along Jerome Avenue to 233rd Street. Combined with the improvements proposed at 233rd Street/Jerome Avenue and the 233rd off-ramp of the Major Deegan Expressway, this designated truck route plan is projected to improve current congested conditions and eliminate the potential for the proposed project to adversely affect this intersection.

In order to maximize capacity of these intersections, and to mitigate the potential impacts of the construction traffic and the Future with the Project traffic, the following mitigations measures are recommended to be part by the project at the Eastview Site. Each of these intersection mitigation plans would be based upon the potential construction impacts that would occur during peak construction periods

It should be noted that the following proposed mitigation plans contemplate the re-apportioning of the "green light time" for critical approaches at different intersections in the study area. This measure is intended to improve the overall intersection LOS and delay in certain intersection. These plans will improve the LOS and reduce delays back to the Future Without the Project conditions. However, in some cases these improvements might actually worsen other approaches to the same intersection i.e., increases delay or worsen LOS, but overall would improve the intersection or balance the anticipated delay

1. *East 233rd Street/Jerome Avenue***:** The analyses, as well as field inspections, show that there is severe traffic congestion at this location that would worsen with or without the proposed project. Although there is a right-turn channel at Jerome Avenue, queuing prevents vehicles from utilizing the channel because it is located too close to the intersection. This problem can be resolved by widening the ramp, to provide an exclusive, temporary right-turn lane leading into the existing channel. This would allow right-turning vehicles to clear the ramp quickly and also improve the overall queuing condition on this ramp. Since this area was included as part of the alienation legislation authorizing the use of the Mosholu Golf Course as a site for the Croton WTP, if the New York City Department of Parks and Recreation, NYCDOT, and the community make an official request that NYCDEP make this improvement permanent.

   The southbound left-turn at this intersection has restricted capacity due to the high opposing volume. During PM peak conditions, field inspections have shown left turning drivers utilize one of the southbound through lanes as a second left turn lane. This illegal maneuver is allowing additional southbound lefts to get through the intersection then would otherwise occur with the current intersection configuration and signal phasing. To improve the delay for southbound lefts, a left-turn signal phase would be added.

   Another problematic approach at this intersection is the westbound left-turn movement on E. 233rd Street. As there are a limited number of east-west roadways in this area, many vehicles heading south use westbound E. 233rd Street and then make a left-turn at Jerome Avenue. The high number of vehicles and limited green signal time result in delays during rush hours. To address this problem, it is proposed to widen E. 233rd Street and to add a second left-turn travel lane on the westbound approach.

   After the physical changes, a signal timing warrant analysis would be conducted and submitted too NYCDOT for review and approval to make the intersection more efficient.

2. *Jerome Avenue and Bainbridge:* Although this intersection is not predicted to result in potentially adverse impacts based on the traffic capacity analysis, it would be used as the primary site access. The existing entrance to Mosholu Golf Course is at a complex intersection where Jerome Avenue and Bainbridge Avenue join at an acute angle. There is limited sight visibility at this intersection because of the columns that support the elevated No. 4 IRT Woodlawn train station. Construction traffic would not likely choose to use Jerome Avenue for access from the south, but several steps would be taken to insure that truck traffic does not use this route. The existing entrance to Mosholu Golf Course would be converted to a one-way exit. The right turn would be marked "No Trucks." A new entrance would be created approximately 150 ft. north of the existing entrance. The northbound approach to this entrance would be marked "No Trucks." Finally, a Traffic Control person would be placed on duty at this intersection during peak traffic periods and to enforce the ban on project-generated truck traffic traveling to and from the south along Jerome Avenue. This would also enhance pedestrian safety.

The potential traffic improvements primarily call for optimizing signal timings. Since the construction volumes peaks are anticipated to arrive before and after the AM and PM peak hours respectively, the optimum signal timings utilized are approximate. It is routine for counts to be performed at these locations after construction begins to provide actual traffic patterns to support the request for the modification of the signal timings. The potential traffic improvements would be developed in accordance with NYSDOT design guidelines for approval. In addition, the potential mitigation designs would undergo review by the NYSDOT and/or other roadway jurisdictional bodies prior to being implemented. If these signal optimization plans to reduce the predicted increases in delay at the intersections in the study area are not adopted, these adverse traffic impacts would remain unmitigated. The potential adverse impacts from the proposed construction-related activity would be short-term and mainly related to peak construction periods.

3.3.3. Noise

Construction-generated noise level increases that exceed the acceptable 3-5 dBA noise increase threshold as established by CEQR would be experienced at noise sensitive receptors in the vicinity of the proposed WTP at the Mosholu Site. For four of the receptors (Saturn Playground, Mosholu Golf Course, Shandler Recreation Area in Van Cortlandt Park, and residences at the intersection of Jerome Avenue and 213th Street), these noise level increases would last long enough to constitute a significant adverse impact. Woodlawn Cemetery may experience some increased noise levels during excavation and rock drilling phases of construction. However, the short duration of the increases would be considered temporary and not significant.

Measures to mitigate potential construction-generated noise impacts at sensitive receptors in the vicinity of the WTP at the Mosholu Site were studied. No significant mobile or stationary noise impacts were expected as a result of future normal operations of the proposed plant. For each noise-sensitive receptor, predicted project-induced noise levels for the peak construction-noise year (2006) were compared to the predicted future baseline noise levels for 2006. For those receptors that would experience a significant impact, attenuation measures were identified and the noise level at sensitive receptors following implementation of mitigation was estimated.

3.3.3.1. Mobile Source Noise

No significant noise impacts are expected from mobile sources as a result of operation or construction at the WTP site. The results of the potential proposed plant operations and construction impacts analysis are presented in Section 6.10. Mitigation measures were not required along noise sensitive route segments.

3.3.3.2. Stationary Source Noise

Mitigation measures required for stationary noise impacts at sensitive receptors were analyzed. Table 10 presents information regarding the sensitive receptors. Figure 9.2-1 shows the location of the receptors in relation to the proposed construction site.

TABLE 10. DESCRIPTION OF NOISE SENSITIVE RECEPTORS FOR STATIONARY NOISE SOURCE ANALYSIS

Receptor Name	Description of Receptors
MGC-S1	Saturn Playground (Van Cortlandt Park)
MGC-S2	Mosholu Golf Course (west of proposed construction zone)
MGC-S3	Shandler Recreation Area (Van Cortlandt Park)
MGC-S4	Woodlawn Cemetery
MGC-S5	Residences at intersection of West Gun Hill Road and Jerome Avenue
MGC-S6	Residences at intersection of Jerome Avenue and 213th Street

Construction activities could produce increased noise levels requiring mitigation at receptors MGC-S1, MGC-S2, MGC-S3, and MGC-S6. Impacts were anticipated only during weekday construction hours (7:00 AM – 6:00 PM). As discussed in Section 6.10, the residences to the south of the site at the intersection of Jerome Avenue and East Gun Hill (MGC-S5) were not considered in the construction-noise impacts. Saturn Playground (MGC-S1) is located to the south of the site and between the site and MGC-S5. It was assumed that if significant impacts from construction noise could be mitigated for MGC-S1, which is much closer to the site than MGC-S5, then the impacts also could be mitigated for MGC-S5.

An analysis was performed to determine what equipment used at which time was responsible for producing the greatest incremental change in noise levels. The maximum noise levels from construction activities would occur during the early phases of the construction period (from approximately April 2006 until July 2007). This period corresponds with excavation activities at the site. Equipment most responsible for the elevated noise levels would be the rock drills and the large volume of excavators and trucks that would be on site during that period.

Noise attenuation systems that could mitigate the noise impacts from construction activities at sensitive receptors neighboring the site were identified. Receptors experiencing significant impacts would be on all sides of the site. The most affected receptor would be Mosholu Golf Course immediately to the west of the site (Receptor MGC-S2). Noise barriers facing the potentially impacted receptors would be installed at fixed locations along the boundaries of the construction site (see Figure 9.2-1). Noise barriers placed in a fixed location would not restrict the movement of on-site workers and equipment during construction.

The barriers would act as an acoustical enclosure, effectively shielding the receptors from noise emanating from construction equipment. A barrier approximately 20 feet in height could minimize the noise reaching sensitive receptors due to noise absorption and diffraction (i.e. bending of the sound waves over the top of the barrier).

This type of noise barrier is capable of approximately 13 dBA of sound transmission loss. The exact amount of sound transmission loss from a barrier is a function of its height, thickness, material of construction, and precise location with respect to the noise source and noise sensitive receptor. The greatest predicted incremental noise level change due to construction would be 26.1 dBA at Mosholu Golf Course (MGC-S2). Mitigation requirements for this receptor would be discussed in greater detail below. The other receptors (MGC-S1, MGC-S3, and MGC-S6) each would experience incremental noise changes ranging from 4.8 dBA to 16.1 dBA. The noise barrier would be capable of attenuating approximately 13 dBA of noise; therefore it would be sufficient to attenuate to an acceptable level the potential noise impacts of 16.1 dBA resulting from construction activities. With the noise barrier in place, the construction-related noise level at MGC-S3 (the receptor that may experience an additional 16.1 dBA of construction-related noise) would be approximately 56.5 dBA. This level represents a 3.1 dBA increase over the lowest Future Without the Project level at this receptor (53.4 dBA). The noise increase of 3.9 dBA is within the 5 dBA threshold considered acceptable under CEQR.

With the exception of the Mosholu Golf Course (MGC-S2), construction-related noise would be attenuated to acceptable levels with the noise barriers in place. The residences along Jerome Avenue and the more distant residences on East Gun Hill Road would be mitigated by the installation of the noise barrier. These receptors would not experience a significant adverse impact from the proposed construction following mitigation.

In this potential scenario, construction-generated noise would still result in a significant impact at the Mosholu Golf Course immediately to the west of the construction site (Receptor MGC-S2). With the noise barrier in place, the receptor would experience an increase in noise levels of approximately 13.1 dBA. Given that the future without the project noise levels at this receptor is 52.2 dBA (at its quietest) and the Future With the Project level with the noise barrier in place is 65.3, a reduction of at least 9.8 dBA would be necessary to bring noise levels to within the 5 dBA acceptable thresholds mandated by CEQR.

A number of options are available to further attenuate noise at this receptor. A noise barrier constructed of a more sound absorbent material, such as concrete, masonry, or rock, could be used along the west boundary of the construction site. These materials give a transmission loss of upwards to 25 dBA, which would be enough to attenuate construction noise to an acceptable level[9]. This option has the advantage of not restricting access and movement of construction workers and equipment around the site.

Another option is to identify noise-generating equipment on site that is stationary (such as air compressors, rock drills, welding machines, cranes, etc.) and place portable noise barriers around them. These barriers could be moved as needed. Noise curtains are typically capable of approximately 11 dBA of sound transmission loss (i.e. attenuation) for each piece of equipment to which it is applied. A full 11-dBA reduction would not be observed in the total noise levels experienced at the receptors because there are other pieces of construction equipment on site that also would be generating noise. However, if portable barriers are placed around stationary equipment, a 9.8 dBA reduction could be achieved. The disadvantage to this approach is that portable barriers restrict the movement of workers on a construction site.

As a supplement to the noise abatement systems that are proposed for the WTP site, NYCDEP would establish a monitoring program and dedicated complaint response system to address any unforeseen construction- or operations-related noise impacts. Mitigation measures in addition to those discussed above would be developed by the contractor whose contract specifications would require performance at or below a 3-5 dBA increase threshold (the threshold of detection by humans is approximately 3 dBA).

3.3.4. Natural Resources

3.3.4.1. Vegetation and Trees

The necessary clearing and grading for the proposed water treatment plant facilities would result in the direct loss of 278 trees. In addition, trees adjacent to the proposed limit of construction line or close to the proposed infiltration trench (part of the stormwater/groundwater management plan described below) could be adversely affected by compaction of soils over their roots, changes in surface or groundwater drainage patterns, or accidental damage, if special care is not taken to protect them. There are 106 trees that would fall into this category. Even though the NYCDEP plans to protect these trees by placing Jersey barriers at least twenty feet from their canopies and by other means described below, for the purpose of this environmental analysis, the trees are considered potentially lost.

A group of 16 small trees, mostly white pines (*Pinus strobus*), would be threatened by the proposed temporary widening of the Major Deegan Expressway off-ramp at 233rd Street proposed as a permanent traffic improvement measure.

Trees of this nature and associated vegetation in a preserved park environment are rare in the City; therefore, their loss would represent a potentially significant adverse impact. In order to mitigate this impact and the potential adverse impact to the five acre forested wetland area discussed below, a comprehensive reforestation/monitoring program has been developed in conjunction with the NYCDPR valued at $13.4 million along with a stormwater/groundwater

9 US Department of Housing and Urban Development, The Noise Guidebook, June 2002.

management plan valued at $3 million (The stormwater/groundwater plan is outlined below in the wetlands discussion.). The NYCDPR reforestation/monitoring program would consist of the planting of trees to replace the trees that would be lost during the construction of the proposed water treatment plant, to preserve the forested wetlands area discussed below, and to restore and preserve other natural resources of Van Cortlandt Park. The reforestation/monitoring program would start prior to construction and extend for at least three years after the proposed water treatment plant operations commence, this represents a ten-year effort.

3.3.4.2. Wetlands

There would be a potential change in the stormwater and groundwater hydrology of the site area that could adversely affect the five-acre forested wetland north of the site entrance roadway in the Shandler Recreation Area. The change to this forested wetland would represent a potential significant adverse impact.

To mitigate this impact, a number of actions would be taken. First, during excavation, any fractures that leak water into the excavation would be sealed with grout under pressure. This would seal rock fractures and reduce the potential for water to flow from the wetland to the excavation site. Second, a stormwater/groundwater management plan would be implemented to maintain the existing hydrology, to the extent possible.

The stormwater/groundwater management plan calls for the construction of infiltration structures adjacent to the site access road and to the south of the forested wetland. Water would be collected along the west and northwestern side of the proposed water treatment plant at an elevation of 180 feet, along the top of the bedrock. This is the flow that currently drains toward the wetland. This flow would be supplemented with Croton raw water to maintain a base flow equal to the volume that would migrate through bedrock toward the bottom of the foundation. This water would be passed to a series of infiltration galleries (horizontal underground diffusion devices) north and northwest of the renovated clubhouse. Overflow from the galleries would be channeled to an infiltration trench adjacent to the site access road. This infiltration trench would also receive storm flows from the parking area after it passes through an oil/water separator. Excess storm flow would pass through a weir to the combined sewer on Jerome Avenue. These devices would replenish groundwater and produce a mound of water that would prevent flows from leaving the forested wetland area to travel toward the proposed water treatment plant facilities. Once built and calibrated, these stormwater/groundwater control devices would require no pumping, active control devices, or extensive maintenance.

During construction of the water treatment plant, water collected in the excavated areas would be pumped to the combined sewer on Jerome Avenue. The infiltration galleries and trench would be constructed and connected to the City water supply system and calibrated to preserve the local hydrologic conditions as described above while construction dewatering operations are taking place.

Initial operation of this system would be monitored by NYCDEP in conjunction with NYCDPR. Additional numerical modeling would be utilized to adjust the rate of flow, if necessary. Once the flow to the infiltration device is shown to be maintaining the existing hydrology, no additional adjustments or maintenance would be required except for periodic cleanout of the infiltration trench.

The efforts described above would minimize impacts to the forested wetland area by providing a base flow that would allow the existing groundwater characteristics to be maintained at the existing average standing water elevation during dry weather. It would also provide storm flow that would replicate stormwater events thereby providing wet weather and seasonal variability.

However, even with these measures in place, the hydrologic regime would change to some extent leading to natural resource changes. It is likely soils near the infiltration trench may become over-saturated leading to the loss of trees unable to adjust to this condition. The number of threatened trees would be approximately thirty-six. (This estimate is included in the total number of 106 threatened trees discussed above under vegetation and tress.) In addition, the understory of the forested wetland would likely change in character because of the changes in hydrology. The understory changes are not expected to be significant. Overall, the potential loss of trees and changes to the forested wetland understory are not expected to be significant if the stormwater/groundwater management plan is properly functioning and the area is monitored and actively managed. The continuous monitoring and management of the forested wetland would be undertaken by the NYCDPR as part of the reforestation/monitoring program described above.

In summary, the combination of constructing the stormwater/groundwater control devices and the implementation of the NYCDPR reforestation/monitoring program is expected to mitigate any potential significant adverse impacts to natural resources. However, should the monitoring and reforestation programs prove less successful than predicted in this Draft SEIS, the NYCDEP would work with the NYCDPR to adjust the mitigation program and would be responsible for replacing any unforeseen natural resource losses.

The NYCDPR has developed plans to maintain the golf course and driving range during the proposed construction of the water treatment plant at the Mosholu Site. These plans include a temporary golf course clubhouse and parking area, as well as the reconfiguration of several golf course holes so that nine holes can be maintained in the area that currently includes holes 1-8 of the existing Mosholu Golf Course. In addition, the existing maintenance sheds, which would be demolished during construction, would be relocated north of their present position in a new building.

The NYCDPR plans for the temporary golf facilities and new permanent maintenance building would require the clearing of 60 trees. These trees are in an overgrown area north of the existing maintenance sheds that is not currently accessible.

3.3.5. Public Health

In response to public concerns about the potential for construction activities to increase movement of nuisance rodents, NYCDEP has developed a rodent control and monitoring plan that would be implemented at this site if it were selected for the water treatment plant. An active program would be instituted to control the existing population, prevent the opening of conduits for rodents to and from the site, and a hygiene program during construction to prevent the creation of new food sources. This type of program has been proven to be successful on other large construction sites (e.g. "the Big Dig" in Boston) where very extensive tunneling and deep excavation occurred.

3.4. POTENTIALLY SIGNIFICANT ADVERSE IMPACTS AND MITIGATION AT THE HARLEM RIVER SITE.

3.4.1. Introduction

Avoidance of potential environmental impacts would be part of the construction plans. For example, a vibration prevention/monitoring program would be implemented during construction. Similarly, to the extent possible, paving of interior construction roadways and dust suppression techniques are incorporated in construction plans to eliminate air quality nuisances. Stormwater management both during construction and operations would be provided to prevent the release of particulate material to the nearby Harlem River. The historic University Heights Bridge, on the southern boundary of the proposed site, would be protected from direct impact. The heavy granite architectural character of the Bridge, its ramps, and abutments, would be used in the design of facades and plant roadways around the site. Finally, contractors would be required to utilize barges for the transport of bulk materials in order to avoid adding significant numbers of trucks onto the local road network and the Major Deegan Expressway, which are already congested and constrained.

This section discloses potentially significant impacts and details mitigation measures that could be used to minimize or avoid impacts. The project impact sections for several parameters concluded that neither the proposed construction nor operational activities would result in significant impacts. These parameters are not discussed in this section and include: Land Use, Zoning, Open Space, Waterfront Revitalization, Visual Character, Community Facilities, Neighborhood Character, Air Quality, Historic and Archaeological Resources, Socioeconomic Impacts, Growth Inducement, Noise, Infrastructure and Energy, EMF/ELF, and Solid Waste. The potential impacts on these parameters are described in the appropriate construction and project impact sections.

3.4.2. Traffic

The main access routes to the Harlem River Site would be the Major Deegan Expressway (I-87) and West Fordham Road. The analysis of the traffic conditions in the Construction Year indicated that capacity deficiencies would occur in the future without and with the proposed project at three intersections along these roads. In order to maximize capacity of these intersections, and to mitigate the potential impacts of the construction traffic and the Future With the Project traffic, the following mitigations measures are recommended to be part of the project at the Harlem River Site. Each of these intersection mitigation plans would be based upon the potential construction impacts that would occur during peak construction periods.

It should be noted that the following proposed mitigation plans contemplate the re-apportioning of the "green light time" for critical approaches at different intersections in the study area. This measure is intended to improve the overall intersection LOS and delay in certain intersection. These plans will improve the LOS and reduce delays back to the Future Without the Project conditions. However, in some cases these improvements might actually worsen other approaches to the same intersection i.e., increases delay or worsen LOS, but overall would improve the intersection conditions and LOS.

5. *West Fordham Road at the Major Deegan Expressway (I-87) Southbound Ramps:* Optimize signal timing. This intersection would operate at LOS D in both the AM and PM peak hours. During both the AM and PM peak hours, the signal optimization traffic improvement proposed as mitigation would not reduce all of the individual lane group construction traffic delays below those considered to be significant adverse impacts in accordance with CEQR criteria. Additional intersection geometric improvements have not been proposed due to the constraints at this location. Therefore, potential traffic impacts at this intersection during construction would be unmitigatable.

6. *West Fordham Road at the Major Deegan Expressway (I-87) Northbound Ramps:* Optimize signal timing. This intersection would operate at LOS C in both the AM and PM peak hour. During both the AM and PM peak hours, the signal optimization traffic improvement would not reduce all of the individual lane group construction traffic delays below those considered to be significant adverse impacts in accordance with CEQR criteria. Therefore, the potential significant adverse impact at this intersection would remain unmitigated.

7. *West Fordham Road at Sedgwick Avenue:* Optimizing signal timing and adding a northbound left turn lane would result in the intersection operating at LOS D in the AM and PM peak hours with reduced delay. On-street parking would need to be removed along the northbound approach to accommodate the additional lane. The construction traffic would necessitate signal optimization at the start of construction as described below. Construction traffic volume levels would not reach the levels necessitating the northbound left turn lane until 2009. Therefore, it is not considered to be practicable to mitigate this impact, since the length of time that the significant adverse impact would persist would be approximately two years.

The potential traffic improvements primarily call for optimizing signal timings to reduce the potential increase in delay created by construction traffic volumes. Since the construction volume peaks are anticipated to arrive before and after the AM and PM peak hours respectively, the optimum signal timings utilized are approximate. It is standard that traffic counts be performed at these locations after construction begins to provide actual traffic patterns to document and justify the modification to signal timings. The potential traffic improvements would be developed in accordance with NYSDOT and NYCDOT design guidelines. In addition, the potential traffic improvement designs would need to undergo review by the NYSDOT, NYCDOT, and/or other roadway jurisdictional bodies prior to being implemented. Should the potential mitigation measures proposed (i.e., the optimization of signal timing) to reduce project-related delays not be reasonable because of the increase in delay at other approaches, or because the construction period impacts would be short-term and temporary, not warranting signal timing changes, these potential construction impacts would be unmitigated.

3.4.3. Hazardous Materials

3.4.3.1. Hazardous Materials Disturbed During Construction

Based on sampling efforts performed for this Draft SEIS, data are available identifying potential contaminants of concern at the Harlem River Site. Volatile and semi-volatile organic compounds (VOCs, SVOCs) related to gasoline and diesel range total petroleum hydrocarbons (TPH) were detected in the soil and groundwater at different locations at the site. The data also indicated that selected metals were found in the soil at concentrations that could be considered higher than normal background levels for the eastern United States. Based on information derived from regulatory reports (see Section 7.13, Hazardous Materials), PCB residues in soil may be present at a localized portion of the site. In addition, sediment in the river adjacent to the Site was found to contain semi-volatile organic compounds as well as elevated concentrations of selected metals. Although the concentrations of the environmental contaminants present in the soil, groundwater, and sediment at the Harlem River Site do not pose an imminent public health risk, the potential for significant adverse impacts from the existing hazardous material exists. Specialized management of these materials during construction is necessary to mitigate the potential for significant adverse impacts on public health and safety of construction workers and adjacent site occupants both during construction and operation of the proposed project.

As a mitigating measure, a site-specific Construction Contamination Management Plan (CCMP) would be prepared which contains a detailed Sampling and Analysis Plan (SAP). The SAP would be implemented to more precisely delineate the zone(s) of potential contamination (ZOPC) in areas where construction activities that would disturb the soil, groundwater, or river sediment are planned. Results derived from the application of the SAP would provide the specific types of data needed to make appropriate and cost-effective waste management decisions (e.g., treatment, stabilization, off-site disposal, health and safety). The CCMP would be developed in conjunction with Local, State, and Federal agencies and would address all applicable or relevant and appropriate requirements.

The CCMP would also describe the requirements for handling, management, treatment, and disposal of contaminated materials encountered during construction. Since proposed actions at the Harlem River Site would involve excavation below the groundwater table, tunneling, and the construction of shafts and subsurface chambers, the CCMP would address management of groundwater contamination, if present, including containment, treatment, and discharge options. The CCMP would include contingencies to address unexpected hazardous materials discovered during construction activities such as drums, underground tanks, waste debris, and related types of contaminated media.

The CCMP would identify requirements for Health and Safety Plans (HASPs) to be developed by each construction contractor and approved by NYCDEP prior to the commencement of work at the site. The HASPs would comply with 29 CFR §1910.120 and would include health and safety requirements related to site-specific environmental conditions. Worker safety issues related to construction activities and general public protection would be included in the plans.

3.4.4. Natural Resources

Potentially significant impacts from the construction and operation of the proposed plant at the Harlem River Site include the removal of 101 trees and the construction of a permanent bulkhead structure that would result in filling approximately 63,000 square feet (approximately 1.5 acres) of the Harlem River between the existing riprap shoreline and the mapped pier and bulkhead line. Although the site is heavily disturbed, industrialized, and offers limited habitat value, mitigation has been planned to fully compensate for the loss of vegetation and tidal wetlands onsite. The concept planned for this mitigation would include 1.8 acres of wetland mitigation onsite and an additional 1.2 acres offsite to provide enhanced habitat for the aquatic and riparian wildlife at a mitigation ratio of 2:1.

3.4.5. Public Health

In response to public concerns about the potential for construction activities to increase movement of nuisance rodents, NYCDEP has developed a rodent control and monitoring plan that would be implemented at this site if it were selected for the water treatment plant. An active program would be instituted to control the existing population, prevent the opening of conduits for rodents to and from the site, and a hygiene program during construction to prevent the creation of new food sources. This type of program has been proven to be successful on other large construction sites (e.g. “the Big Dig” in Boston) where very extensive tunneling and deep excavation occurred.

3.5. POTENTIALLY ADVERSE IMPACTS AND MITIGATION AT THE OFF-SITE FACILITIES

3.5.1. Introduction

Each of the work sites for the NCA pressurization, and all the ancillary sites around Jerome Park Reservoir, was analyzed for the potential project impacts. The methods of analyses were the same at these sites as those applied to the water treatment plant sites, but many of the analyses were screened out based on screening criteria.

In general, these sites would be restored to their existing conditions after construction. Some of the sites, including the 1890 Gate House and Gate House No. 5, would have equipment changes inside the buildings depending on the selection of preferred site for the water treatment plant. Some facilities around Jerome Park Reservoir would be decommissioned. Except for the Microstrainer Building, which would be dismantled, none of the aboveground facilities would be changed in appearance, size, operational staffing, or general operating activities, after the project was complete. Consequently, none of the offsite facilities required a full analysis of operational impacts. The following summaries of potential impacts are confined to the construction conditions.

The potential construction impacts for the work associated with the pressurization of the NCA (Eastview Site only, NCA treated water conveyance alternative) were analyzed for 2013, the midpoint of the construction at the off-site facilities. Some of the work around Jerome Park Reservoir (related to all three WTP sites) would take place seasonally between 2007 and 2011. This work would occur in the summer, fall, and early winter, when the NCA is often shut down due to water quality problems in the raw water. In addition, the decommissioning of Mosholu and Jerome Pumping Stations would occur in 2011 after the water treatment plant was in operation. Finally, if the water treatment plant were built at Eastview and the NCA were pressurized; new connections would be built to the distribution system around Jerome Park Reservoir in 2007-2011, with some final connections completed during several months between 2010-2015. Because of the long duration of the total work around Jerome Park Reservoir, the multiple work sites, and the relatively low intensity of the work at any one time, 2010 was chosen as a typical peak year for the construction impact analyses.

Avoidance of potential environmental impacts would be an integral part of construction plans at the various off-site facilities associated with the Eastview WTP site alternative. For example, noise barriers and dust suppression techniques would be incorporated into construction plans to eliminate nuisances where practicable and feasible, if noise reduction measures are not implemented, depending on further refinement of the project design, significant adverse construction noise impacts would occur. Stormwater management during construction would be provided to prevent the release of particulate material into nearby water bodies. Without the incorporation of these and other design features, additional significant impacts could have occurred.

This section discloses potentially significant impacts and details mitigation measures that would minimize or avoid impacts. The project impact sections for several parameters concluded that neither the proposed construction nor operational activities would result in significant impacts. These parameters are not discussed in this section and include: Land Use, Zoning, Open Space, Visual Character, Community Facilities, Neighborhood Character, Socioeconomic Analysis, Growth Inducement, Air Quality, Hazardous Materials, Natural Resources (except for the NCA pressurization treated water conveyance alternative for the Eastview Site), Water Resources, Historic and Archaeological Resources, Infrastructure and Energy, EMF/ELF, Solid Waste, and Public Health. Significant impacts as a result of proposed project activities at the off-site facilities were identified and discussed in Section 8.

The parameters that could result in significant adverse impacts because of the long duration period include noise and traffic impacts. The traffic impacts are discussed for each site below, but the noise impacts discussion below can be applied to NCA Shaft No. 9, NCA Shaft No. 14, NCA Shaft No. 18, Gate House No. 1, and the new shaft chamber near Gate House No. 5 and other work at Jerome Park Reservoir.

3.5.2. Noise at the Shaft Sites

Construction activities would lead to an increase in noise levels that exceed the 3-5 dBA acceptable noise increase threshold as established under CEQR. The noise level increases could last for the duration of the proposed construction (2010 until 2015) at the shaft sites. Noise levels at Jerome Park Reservoir could be elevated during the construction of the new shaft chamber near Gate House No. 5. The shaft chamber would be constructed between 2007 and 2010, with most of the work done during planned shutdowns of the NCA during the winter through early summers. Measures to mitigate potential construction-generated noise impacts at the sensitive receptors around all the shaft sites were studied. Following completion of construction at the shaft site, activities would return to those presented in the existing conditions. Therefore, no significant mobile or stationary noise impacts were expected as a result of future normal operations at the shaft site. Sensitive receptors could experience a significant impact as a result of construction activities. Predicted project-induced noise levels for the peak construction-noise year (2013 shaft sites, 2010 Jerome Park Reservoir) were compared to the predicted future baseline noise levels for 2013 and 2010. Attenuation measures were identified and the noise levels at the sensitive receptors following the possible implementation of mitigation were estimated.

3.5.2.1. Mobile Source Noise

No noise contributions are expected from mobile sources as a result of operation or construction at any of the shaft sites. The results of the mobile source operation and construction impacts analysis are presented in Section 8.0. Mitigation measures were not required along noise sensitive route segments.

3.5.2.2. Stationary Source Noise

No significant stationary noise impacts were expected as a result of future normal operations at the shaft sites. However, construction activities could potentially produce a noise impact requiring mitigation, if determined to be practicable and feasible. As such, noise level increases were anticipated only during weekday construction hours (7:00 AM – 6:00 PM). The construction noise increases are considered to be temporary impacts.

The equipment usage and the number of personnel working at the shaft site would not fluctuate over the duration of the construction schedule. As a result, peak noise levels at the site are not expected to vary and any noise-mitigation requirements would be constant for the entirety of the project. The equipment most responsible for the increased noise levels would be the concrete pump and idling delivery trucks. The greatest predicted incremental change in noise levels would occur during work hours when the background noise levels are lowest, which is 9:00 through 10:00 AM on weekdays. Predicted maximum incremental increases at the shaft sites are as follows:

- Shaft No. 9, Village of Sleepy Hollow, NY: Greatest incremental change would be 10.5 dBA at park west of shaft
- Shaft No. 14, Village of Ardsley, NY: Greatest incremental change would be 20.4 dBA at park in front of public library north of shaft
- Shaft No. 18, City of Yonkers, NY: Greatest incremental change would be 19.6 dBA at residence on Summerfield St. immediately east of shaft
- Gate House No. 1, Bronx, NY: Greatest incremental change would be 15.5 dBA at park surrounding gate house
- Jerome Park Reservoir, Bronx, NY: Greatest incremental change would be 7.6 dBA at a school east of the site.

Noise attenuation systems that could reduce the increased noise levels from construction activities at the sensitive receptors were identified. Noise barriers facing the potentially impacted residential and library receptors at Shaft No 14 and the residential receptors at Shaft No. 18 would be installed at fixed locations along the boundary of the construction sites if they are found to be practical and feasible. Noise barriers placed in a fixed location would satisfy the attenuation requirements and would not restrict the movement of on-site workers and equipment during construction.

3.5.3. Traffic at the Shaft Sites

The project would not create any new traffic at the off-site facilities during operations, so no traffic analysis is necessary for operational conditions. Construction traffic was studied in detail, and potentially significant adverse impacts could occur at intersections near Shaft No. 14, Shaft No. 18, and Jerome Park Reservoir due to the increases in traffic in these congested areas induced by the long construction durations (5 years).

In order to maximize capacity of these potentially affected intersections, and to mitigate the potential impacts of the construction traffic and the Future With the Project traffic, the following mitigations measures are recommended to be part of the project at the sites described separately below. Each of these intersection mitigation plans would be based upon the potential construction impacts that would occur during peak construction periods.

It should be noted that the following proposed mitigation plans contemplate the re-apportioning of the “green light time” for critical approaches at different intersections in the study area. This measure is intended to improve the overall intersection LOS and delay in certain intersection. These plans will improve the LOS and reduce delays back to the Future Without the Project conditions. However, in some cases these improvements might actually worsen other approaches to the same intersection i.e., increases delay or worsen LOS, but overall would improve the intersection conditions and LOS.

The potential traffic improvements described below primarily call for optimizing signal timings to reduce the potential increase in delay created by construction traffic volumes. Since the construction volume peaks are anticipated to arrive before and after the AM and PM peak hours respectively, the optimum signal timings utilized are approximate. It is standard that traffic counts be performed at these locations after construction begins to provide actual traffic patterns to document and justify the modification to signal timings. The potential traffic improvements would be developed in accordance with NYSDOT and NYCDOT design guidelines. In addition, the potential traffic improvement designs would need to undergo review by the NYSDOT, NYCDOT, and/or other roadway jurisdictional bodies prior to being implemented. Should the potential mitigation measures proposed (i.e., the optimization of signal timing) to reduce project-related delays not be reasonable because of the increase in delay at other approaches, or because the construction period impacts would be short-term and temporary, not warranting signal timing changes, these potential construction impacts would be unmitigated.

3.5.3.1. NCA Shaft No. 14

Saw Mill River Road is the primary access route to the NCA Shaft No. 14 site. The traffic analysis of the Construction Year conditions indicated that capacity deficiencies would be expected at three intersections. In order to maximize capacity of these intersections, and to reduce the impact of the construction traffic, the following mitigation measures are recommended and are considered to be part of the project.

1. *Saw Mill River Rd (Rt 9A) at Ashford Avenue:* Optimize signal timing and adjust phasing scheme. This intersection would still operate at LOS F in the AM and LOS E in the PM peak hours, but with reduced delays.

2. *Ashford Ave at Saw Mill River Parkway NB Ramps:* Optimize signal timing. This intersection would operate at LOS C in the AM peak hours and LOS B in the PM peak hours.

3. *Ashford Ave at Saw Mill River Parkway SB Off Ramps:* Optimize signal timing. This intersection would operate at LOS E in the AM peak hours and LOS D in the PM peak hours, but with reduced delays.

3.5.3.2. NCA Shaft No. 18

The main access routes to the shaft site are along Yonkers Avenue and Broadway (Route 9A). The traffic analysis of the Construction Year conditions indicated that capacity deficiencies would be anticipated at two intersections along this road. In order to maximize capacity of these intersections, and to mitigate the potential impacts of the construction traffic, the following mitigations measures are recommended and are considered to be part of the project.

1. *Yonkers Avenue and Midland/Cook Avenue:* Optimize signal timing. This intersection would still operate at LOS C in the AM peak hour and PM peak hours.

2. *Nepperhan Avenue and Broadway (Route 9A):* Optimize signal timing. This intersection would operate at LOS D in the AM and PM peak hours, but with reduced delays.

3.5.4. Jerome Park Reservoir Facilities

As described above in the project description, most of the facilities around Jerome Park Reservoir would undergo rehabilitation regardless of the choice of water treatment plant site. Shaft No. 21 would be fitted with an electrically driven ventilation fan. This site is far enough from any receptor that noise emissions would not be a concern.

The new shaft chamber north of Gate House No. 5, along the west side of Goulden Avenue would be excavated to receive a finished water tunnel. If the water treatment plant were built in Eastview, and the NCA is chosen as the treated water conveyance, the finished water tunnel would be from the NCA near Shaft No. 21. If the water treatment plant were built at the Mosholu Site the tunnel would arrive from the north; if the Harlem River site were selected the finished water tunnel would be approaching from the south. In any case the magnitude and duration of the work would be similar for all three site alternatives.

Most of this work would take place seasonally between 2007 and 2010. Some of this work would take after the water treatment plant would be operational, in 2010-2011. After construction the facilities would be restored to their existing appearance, and no new above-grade structures would be built. The surface ventilation structure above the Mosholu Pump Station and the Microstrainer building near Gate House No. 6 would be removed.

A hazardous material evaluation would be conducted within the Off-Site Facilities in order to ensure environmental safety for construction workers and NYCDEP personnel and to ensure compliance with all applicable hazardous material rules and regulations. In addition, potential contamination within the Off-Site Facilities would not pose a threat to public health or safety since the facility is a restricted use facility. The information gathered as part of this evaluation would be used to develop a Construction Contamination Management Plan (CCMP) and to determine the proper disposal requirements for material removed from the facility as part of the rehabilitation conducted as part of this project. The hazardous materials investigation to determine the appropriate level of material handling in accordance with a detailed CCMP would ensure the safety of public health. Therefore, no potential hazardous material impact is anticipated.

This work would not result in any potential significant impacts except that noise from the construction planned near Gate House No. 5 would potentially have a significant adverse impact on the Bronx High School of Science. Other receptors farther away would have measurable increases in noise as well. A 20-foot high noise barrier, described above in the impact summaries for noise at the shaft sites, would effectively prevent this noise from being significant during the construction period and would be included as part of the proposed project. This increase in noise levels would occur seasonally during the winters through early summers 2007-2010.

3.5.4.1.1. Noise at Jerome Park Reservoir

The work around Jerome Park Reservoir would occur seasonally between 2007 and 2010. Some interior work at the Mosholu and Jerome Pumping Station would occur after the water treatment plant was opened. The only work site that would involve outside construction near receptors is the connection work at new shaft chamber near Gate House No. 5. The greatest incremental increase in noise would be 7.6 dBA, at the Bronx High School of Science, directly east of the work site. A noise barrier would be capable of attenuating 13 dBA of noise; therefore it would be sufficient to attenuate the potential noise impacts of 7.6 dBA resulting from construction activities.

3.5.4.2. Traffic at Jerome Park Reservoir

The main access route to Jerome Park Reservoir site is along Van Cortlandt Park Avenue West. The traffic analysis of the Construction Year conditions indicated that capacity deficiencies would be expected at two intersections along this road. No intersections are anticipated to have potential adverse impacts affected by operational traffic in the Future With the Project conditions. In order to maximize capacity of these intersections, and to mitigate the potential impacts of the construction traffic and the Future with the Project traffic, the following mitigations measures are recommended to be part by the project at the Eastview Site. Each of these intersection mitigation plans would be based upon the potential construction impacts that would occur during peak construction periods.

It should be noted that the following proposed mitigation plans contemplate the re-apportioning of the “green light time” for critical approaches at different intersections in the study area. This measure is intended to improve the overall intersection LOS and delay in certain intersection. These plans will improve the LOS and reduce delays back to the Future Without the Project conditions. However, in some cases these improvements might actually worsen other approaches to the same intersection i.e., increases delay or worsen LOS, but overall would improve the intersection or balance the anticipated delay.

8. *Van Cortlandt Park (S-W) at Bailey Avenue (N-S):* Optimize signal timing and adjust phasing scheme. This intersection would still operate at improved LOS D in the AM and PM peak hours.

9. *Van Cortlandt Park West (E-W) at Sedgwick Avenue (N-S):* Optimize signal timing. This intersection would operate at LOS C in the AM peak hour and LOS B in the PM peak hours.

The potential traffic improvements primarily call for optimizing signal timings. Since the construction volumes peaks are anticipated to arrive before and after the AM and PM peak hours respectively, the optimum signal timings utilized are approximate. It is routine for counts to be performed at these locations after construction begins to provide actual traffic patterns to support the request for the modification of the signal timings. The potential traffic improvements would be developed in accordance with NYSDOT design guidelines for approval. In addition, the potential mitigation designs would undergo review by the NYSDOT and/or other roadway jurisdictional bodies prior to being implemented. If these signal optimization plans to reduce the predicted increases in delay at the intersections in the study area are not adopted, these adverse traffic impacts would remain unmitigated. The potential adverse impacts from the proposed construction-related activity would be short-term and mainly related to peak construction periods.

4. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS

4.1. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS REQUIRED FOR THE EASTVIEW SITE

DEPARTMENT	PERMIT TITLE
U.S. Federal Government	
Army Corps of Engineers	• Dredge and Fill Permit/ Freshwater Wetlands (Clean Water Act, Section 404)
New York State	
Department of Environmental Conservation	• State Pollution Discharge Elimination System (Environmental Conservation Law, Article 17, Title 8; 6 NYCRR Parts 750 through 757) • Water Quality Certification (Clean Water Act, Section 401) • Protection of Waters Permit (Environmental Conservation Law, Article 15, Title 15; 6 NYCRR Part 608) • State Facility (Air) Permit (Environmental Conservation Law, Article 19; 6 NYCRR 200-317) • Water Supply Permit (Environmental Conservation Law, Article 15, Title 15; 6 NYCRR Part 601)
Department of Health	• State Environmental Review Certification for New York Revolving Fund Program (Public Health Law, Sections 1161 and 1162; 21 NYCRR Part 2604)
Department of Transportation	• Highway Work Permit (Title 17, Part 126 of NYCRR)
NYSOPRHP	• State Historic Preservation Office Approval
Westchester County	
Department of Environmental Facilities	• Permit to Connect to County Sewer System (Westchester County Code, Chapter 824) • Industrial User's Permit 6 (Westchester County Code, Article IX of Chapter 624; County Environmental Facilities Sewer Act)
Department of Health	• Approval of Treatment Process (County Sanitary Code, Chapter 873)
Planning Board Review	• Site Plan referral review (Section 239 L, M, and N of NYS General Municipal Law and Section 277.1 of County Administrative Code)
Department of Transportation	• Curb cut approval
Town of Mount Pleasant	
Planning Board	• Site Plan Approval (Mount Pleasant Code, Section 218-97) • Freshwater Wetlands Permit (Mount Pleasant Code,

4.1. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS REQUIRED FOR THE EASTVIEW SITE

DEPARTMENT	PERMIT TITLE
	Section 111.1) • Site Coverage Variance (Mount Pleasant Code, Section 218-70)*
Zoning Board of Appeals	• Special Use Permit (Mount Pleasant Code, Section 218-55) • Height Variances (Mount Pleasant Code, Section 218-70) • Parking and Loading Spaces (Mount Pleasant Code, Section 218-70)
Town Board	• Approval by Advisory Board on Architectural and Community Appearance (Mount Pleasant Code, Section 14 Article 1)
Building Department	• Building Permit (Mount Pleasant Code, Section 68) • Excavation Permit (Mount Pleasant Code, Section 96) • Code Inspection (Mount Pleasant Code, Section 68) • Noise Variance (Mount Pleasant Code, Section 139-18)
Town Highway Department	• Curb/Street Cut Access Permit (Mount Pleasant Code, Section 188)

* If the Croton WTP were the first large NYCDEP project to apply for Site Approval on the Eastview Site this approval would not be needed. If the Catskill / Delaware UV Disinfection Facility is the first project to apply for Site Approval, the Croton WTP would require a coverage variance.

4.2. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS REQUIRED FOR THE MOSHOLU SITE

DEPARTMENT	PERMIT TITLE
New York State	
Department of Environmental Conservation	• State Facility (Air) Permit (Environmental Conservation Law, Article 19; 6 NYCRR 200-317) • State Pollution Discharge Elimination System (Environmental Conservation Law, Article 17, Title 8; 6 NYCRR Parts 750 through 757)
Department of Health	• State Environmental Review Certification for New York Revolving Fund Program (Public Health Law, Sections 1161 and 1162; 21 NYCRR Part 2604)
Department of Transportation	• Highway Work Permit (Title 17, Part 126 of NYCRR) • Traffic Enhancement Permit (Title 17, Part 125 of NYCRR)
NYSOPRHP	• State Historic Preservation Office Approval

New York City Approvals

Permits and approvals required for the construction and operation of the Croton Water Treatment Plant (WTP) within New York City include permits from the New York City Department of Parks and Recreation for work in the vicinity of the Jerome Park Reservoir and Van Cortlandt Park. Approvals from the New York City Landmarks Preservation Commission are also required for work in the vicinity of the Jerome Park Reservoir.

The City would secure all applicable approvals necessary. The applicability of New York City Zoning Resolution Section 11-13 is still under consideration. All permits and approvals considered being potentially required and the rationale for them would be made public.

4.3. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS REQUIRED FOR THE HARLEM RIVER SITE

DEPARTMENT	PERMIT TITLE
U.S. Federal Government	
Army Corps of Engineers	• Dredge and Fill Permit (Clean Water Act, Section 404)
Department of Commerce	• Federal Coastal Zone Management Program Review (16 USC, Chapter 33, Section 1451)
Coast Guard	• Docking Approval
New York State	
Department of Environmental Conservation	• State Pollution Discharge Elimination System (Environmental Conservation Law, Article 17, Title 8; 6 NYCRR Parts 750 through 757) • Water Quality Certification (Clean Water Act, Section 401) • Protection of Waters Permit (Environmental Conservation Law, Article 15, Title 15; 6 NYCRR Part 608) • Tidal Wetlands Permit (Environmental Conservation Law, Article 25, 6 NYCRR 661) • State Facility (Air) Permit (Environmental Conservation Law, Article 19; 6 NYCRR 200-317)
Department of State	• Coastal Management Plans (Part 600 of Title 19 NYCRR)
Department of Health	• State Environmental Review Certification for New York Revolving Fund Program (Public Health Law, Sections 1161 and 1162; 21 NYCRR Part 2604)
Department of Transportation	• Highway Work Permit (Title 17, Part 126 of NYCRR) • Traffic Enhancement Permit (Title 17, Part 125 of NYCRR)
NYSOPRHP	• State Historic Preservation Office Approval

<u>**New York City Approvals**</u>

Permits and approvals required for the construction and operation of the Croton Water Treatment Plant (WTP) within New York City include permits from the New York City Department of Parks and Recreation for work in the vicinity of the Jerome Park Reservoir and Van Cortlandt Park. Approvals from the New York City Landmarks Preservation Commission are also required for work in the vicinity of the Jerome Park Reservoir.

The City would secure all applicable approvals necessary. All permits and approvals considered being potentially required and the rationale for them would be made public.

4.4. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS REQUIRED FOR CROTON LAKE GATE HOUSE

DEPARTMENT	PERMIT TITLE
New York State	
Department of Health	• State Environmental Review Certification for New York Revolving Fund Program (Public Health Law, Sections 1161 and 1162; 21 NYCRR Part 2604)
NYSOPRHP	• State Historic Preservation Office Approval
Town of Yorktown	
Town Board	• Building Permit (Yorktown Town Code, Section 130-2)

4.5. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS REQUIRED FOR NCA SHAFT NO. 9 FOR THE WTP AT THE EASTVIEW SITE

DEPARTMENT	PERMIT TITLE
U.S. Federal Government	
Army Corps of Engineers	• General Permit; NWP (Clean Water Act, Section 404)
New York State	
Department of Environmental Conservation	• State Pollution Discharge Elimination System (Environmental Conservation Law, Article 17, Title 8; 6 NYCRR Parts 750 through 757) • Water Quality Certification (Clean Water Act, Section 401) • Protection of Waters Permit (Environmental Conservation Law, Article 15, Title 15; 6 NYCRR Part 608)
Department of Health	• State Environmental Review Certification for New York Revolving Fund Program (Public Health Law, Sections 1161 and 1162; 21 NYCRR Part 2604)
NYSOPRHP	• State Historic Preservation Office Approval
Village of Sleepy Hollow	
Planning Board	• Site Plan Approval (Mount Pleasant Code, Section 218-97) • Freshwater Wetlands Permit (Mount Pleasant Code, Section 111)
Building Department	• Building Permit (Mount Pleasant Code, Section 68-7) • Noise Variance (Mount Pleasant Code, Section 139-18)

4.6. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS REQUIRED FOR NCA SHAFT NO. 14

DEPARTMENT	PERMIT TITLE
New York State	
Department of Health	• State Environmental Review Certification for New York Revolving Fund Program (Public Health Law, Sections 1161 and 1162; 21 NYCRR Part 2604)
NYSOPRHP	• State Historic Preservation Office Approval
Village of Ardsley	
Board of Trustees	• Building Permit (Greenburgh Town Code, Section 100-5) • Noise Variance (Ardsley Village Code Chapter 137-1 through 137-4)

4.7. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS REQUIRED FOR NCA SHAFT NO. 18

DEPARTMENT	PERMIT TITLE
U.S. Federal Government	
Army Corps of Engineers	• General Permit; NWP (Clean Water Act, Section 404)
New York State	
Department of Environmental Conservation	• State Pollution Discharge Elimination System (Environmental Conservation Law, Article 17, Title 8; 6 NYCRR Parts 750 through 757) • Water Quality Certification (Clean Water Act, Section 401) • Protection of Waters Permit (Environmental Conservation Law, Article 15, Title 15; 6 NYCRR Part 608)
Department of Health	• State Environmental Review Certification for New York Revolving Fund Program (Public Health Law, Sections 1161 and 1162; 21 NYCRR Part 2604)
NYSOPRHP	• State Historic Preservation Office Approval
City of Yonkers	
Director of the Bureau of Housing and Buildings	• Building Permit (Yonkers Town Code, Section 43-105)

4.8. POSSIBLE DISCRETIONARY APPROVALS AND PERMITS REQUIRED FOR GATE HOUSE NO. 1

DEPARTMENT	PERMIT TITLE
New York State	
Department of Health	• State Environmental Review Certification for New York Revolving Fund Program (Public Health Law, Sections 1161 and 1162; 21 NYCRR Part 2604)
NYSOPRHP	• State Historic Preservation Office Approval

New York City Approvals

Permits and approvals required for the construction and operation of the Croton Water Treatment Plant (WTP) within New York City include permits from the New York City Department of Parks and Recreation for work in the vicinity of the Jerome Park Reservoir and Van Cortlandt Park. Approvals from the New York City Landmarks Preservation Commission are also required for work in the vicinity of the Jerome Park Reservoir.

The City would secure all applicable approvals necessary. All permits and approvals considered being potentially required and the rationale for them would be made public.

4.9. APPROVALS AND PERMITS REQUIRED FOR JEROME PARK RESERVOIR

DEPARTMENT	PERMIT TITLE
New York State	
Department of Health	• State Environmental Review Certification for New York Revolving Fund Program (Public Health Law, Sections 1161 and 1162; 21 NYCRR Part 2604)
NYSOPRHP	• State Historic Preservation Office Approval

New York City Approvals

Permits and approvals required for the construction and operation of the Croton Water Treatment Plant (WTP) within New York City include permits from the New York City Department of Parks and Recreation for work in the vicinity of the Jerome Park Reservoir and Van Cortlandt Park. Approvals from the New York City Landmarks Preservation Commission are also required for work in the vicinity of the Jerome Park Reservoir.

The City would secure all applicable approvals necessary. All permits and approvals considered being potentially required and the rationale for them would be made public.

5. SUMMARY OF OTHER ALTERNATIVES INCLUDING THE NO BUILD

The Draft SEIS provides a detailed description of numerous engineering alternatives that have been evaluated. This includes alternative treatment processes, alternative treated water conveyance plans, and the history of research on alternatives to filtration. The project has investigated many alternative sites since project planning began. The three sites considered here are preferred over those evaluated in the past environmental reviews.

The No Build alternative is not viable. It is explained in the section on Engineering Alternatives that because of a court ordered action, and the City's commitment to deliver high quality drinking water to all its customers, the No Build alternative is not a feasible alternative. The section on the Need for the Project describes this in detail and summarizes the City's continuing efforts to explore ways to improve water quality without filtration.

Significant adverse impacts predicted to occur as a result of the proposed water treatment plant at any of the sites would be similar. Construction related impacts on traffic, air quality, and noise would occur for a similar duration. A 5.5-year construction period is estimated at all three sites. The sites could experience potential significant adverse air quality impacts during construction. The truck traffic would be more intense at the Eastview Site, because barging would be possible at the Harlem River Site and the Mosholu Site has good access to the Major Deegan Expressway. Potential significant adverse impacts on natural impacts would be more intense at the Harlem Site because filling of up to 1.5 acres of tidal wetlands would be required. On balance, a comparison of environmental impacts indicates that the three sites are comparable, and no site emerges as a potentially fully mitigated alternative.