On April 15, 2004, EPA designated these same counties as moderate non-attainment for the eight-hour ozone standard which became effective as of June 15, 2004 (LOCMA was moved to the Poughkeepsie moderate non-attainment area for eight-hour ozone). EPA revoked the one-hour standard on June 15, 2005; however, the specific control measures for the one-hour standard included in the SIP are required to stay in place until the eight-hour standard is attained. The discretionary emissions reductions in the SIP would also remain but could be revised or dropped based on modeling. On February 8, 2008,. the New York State Department of Environmental Conservation (NYSDEC) submitted final revisions to a new SIP for ozone to EPA. NYSDEC has determined that achieving attainment for ozone before 2012 is unlikely, and has therefore made a request for a voluntary reclassification of the New York non-attainment area as "serious".

In March 2008, EPA strengthened the eight–hour ozone standards. EPA expects designations to take effect no later than March 2010 unless there is insufficient information to make these designation decisions. In that case, EPA will issue designations no later than March 2011. SIPs would be due three years after the final designations are made.

DETERMINING THE SIGNIFICANCE OF AIR QUALITY IMPACTS

New York's State Environmental Quality Review Act (SEQRA) regulations state that the significance of a likely consequence (i.e., whether it is material, substantial, large, or important) should be assessed in connection with its setting (e.g., urban or rural), probability of occurrence, duration, irreversibility, geographic scope, magnitude, and the number of people affected.[1] In terms of the magnitude of air quality impacts, any action predicted to increase the concentration of a criteria air pollutant to a level that would exceed the concentrations defined by the NAAQS (see Table 14-1) would be deemed to have a potential significant adverse impact. In addition, in order to maintain concentrations lower than the NAAQS in attainment areas, or to ensure that concentrations will not be significantly increased in non-attainment areas, threshold levels have been defined for certain pollutants; any action predicted to increase the concentrations of these pollutants above the thresholds would be deemed to have a potential significant adverse impact, even in cases where violations of the NAAQS are not predicted.

C. EXISTING CONDITIONS

SOURCES OF AIR EMISSIONS NEAR THE PROJECT SITES

As discussed in Chapter 3, "Land Use, Zoning, and Other Programs," the area near the Project Sites has a mix of industrial and residential uses. The Water Treatment Plant Site is located on a portion of the Town of Haverstraw Landfill, which is no longer in active use. The adjacent Haverstraw Joint Regional Sewage Treatment Plant (JRSTP) is the primary source of air emissions in the immediate area. Near the Intake Site, the gypsum conveyor operated by the U.S. Gypsum Company (USG) is the primary stationary source of air emissions in the immediate area. Existing traffic on Beach Road, boats entering and leaving the Haverstraw Marina, and the trains that currently use the existing CSX railroad right-of-way adjacent to the Water Treatment Plant Site are mobile sources that affect the existing air quality in the immediate area of the Project Sites.

[1] State Environmental Quality Review Act § 617.7.

EXISTING MONITORED AIR QUALITY CONDITIONS

Monitored background concentrations of SO_2, NO_2, CO, ozone, lead, PM_{10}, and $PM_{2.5}$ for the study area are shown in Table 14-2. These values (2006) are based on recent monitored data that have been made available by NYSDEC. In the case of the eight-hour ozone and 24-hour $PM_{2.5}$, concentrations reflect three years of data, consistent with the basis for these standards. There were no monitored violations of NAAQS at these monitoring sites, with the exception of the maximum 24-hour $PM_{2.5}$ concentration, which is above the recently revised NAAQS.

Table 14-2
Representative Monitored Ambient Air Quality Data

Pollutants	Location	Units	Period	Concentration	Exceeds Federal Standard?	
					Primary	Secondary
CO	Botanical Gardens, Bronx County	ppm	8-hour	1.7	N	N
			1-hour	2.2	N	N
SO_2	Mt. Ninham, Putnam County	ppm	Annual	0.002	N	-
			24-hour	0.011	N	-
			3-hour	0.019	-	N
Respirable particulates (PM_{10})	P.S. 59, Manhattan	$\mu g/m^3$	Annual	23	-	-
			24-hour	60	N	N
Respirable particulates ($PM_{2.5}$)	Newburgh, Orange County	$\mu g/m^3$	Annual	9.6	N	N
			24-hour	27.5	N	N
NO_2	Botanical Gardens, Bronx County	ppm	Annual	0.025	N	N
Lead	Wallkill, Orange County	$\mu g/m^3$	3-month	0.08	N	-
Ozone (O_3)	White Plains, NY	ppm	1-hour	0.11 [1]	Y	Y
			8-hour	0.083	Y	Y

Notes:
[1] The 1-hour ozone NAAQS has been replaced with the 8-hour standard; however, the maximum monitored concentration is provided for informational purposes.
Source: NYSDEC, 2006 New York State Ambient Air Quality Data.

D. THE FUTURE WITHOUT THE PROPOSED PROJECT

This DEIS assumes that no development would occur on the Project Sites or in the immediate area in the future without the Proposed Project. Air quality in the area near the Project Sites would likely be very similar to existing conditions.

E. PROBABLE IMPACTS OF THE PROPOSED PROJECT

EMISSION SOURCES

Adequate electric power and natural gas are available in the vicinity of the Project Sites to provide the Project's energy needs. As described in Chapter 2, "Project Description," United Water New York Inc. (United Water) is currently investigating the provision of alternative power sources for the Proposed Project as part of the Project's initiative for sustainable design.

This analysis assumes fossil fuel-fired equipment would be used to provide building heat and hot water. The heating demand would be very small and therefore, emissions from HVAC equipment would be very low. It is anticipated that any boilers, space heaters, and hot water heaters that would be installed would be below 20 million British Thermal Units per hour (MMBtu/hr) and therefore exempt from NYSDEC permitting requirements pursuant to 6 NYCRR Part 201.

Emergency generators would be installed at the Intake Site and the Water Treatment Plant Site to serve the equipment and facilities in the event of the loss of utility electrical power. At the new intake pumping station, it is anticipated that one 800 kilowatt standby generator would be provided. At the water treatment plant, one or more standby emergency generators with a combined capacity of 2.5 megawatts (MW) are anticipated. United Water typically uses natural gas to fuel its emergency generators. For purposes of this air quality analysis, however, it is assumed that the emergency generators could utilize diesel fuel.

The emergency generators would be tested periodically for a short period to ensure their availability and reliability in the event of a sudden loss in utility electrical power. They could also be utilized to reduce the utility electrical demand of the Proposed Project at certain times. Emergency generators are exempt from NYSDEC air permitting requirements, but if used during non-emergency periods would be required to obtain an air permit or registration. The generators would be installed and operated in accordance with EPA requirements, as well as other applicable codes and standards. The EPA new source performance standards (NSPS) at 40 CFR 60 Subpart IIII and JJJJ regulate NO_x, CO, non-methane hydrocarbons (NMOC) and particulate matter from new, modified, and reconstructed stationary and emergency combustion ignition (CI) engines, depending on date of manufacture and engine capacity. In addition, for engines that are subject to these regulations, beginning October 1, 2007, engines that use diesel fuel must use fuel that has a maximum sulfur content of 500 ppm or less. Beginning June 1, 2010, the fuel used in the engines must have a maximum sulfur content of 15 ppm or less. In addition, generators would be required to meet stringent emission limits for particulate matter and NO_x. The regulations include monitoring and reporting requirements to help ensure that the applicable emission limits are met.

Potential air quality impacts from the testing and operation of the generators would be insignificant. Testing would occur one hour per month per generator, and individual generators would be tested at different times. Operation of the generators during longer periods associated with peak shaving would not result in any significant adverse air quality impacts based on the estimated emissions, and distance to the nearest sensitive receptor (approximately 100 feet).

Air emissions generated by mobile sources associated with the operation of the Proposed Project would mainly consist of trucks delivering water treatment chemicals and other materials and removing dewatered sludge from the Project Sites, and a small number of employee and visitor vehicles. No hazardous chemicals would be delivered and/or utilized at the Project Sites that would have the potential for harmful effects on nearby sensitive receptors.

The maximum hourly incremental traffic from the Proposed Project would be very low based on a projected project employment of fewer than 10 people. This extremely low level of passenger vehicle and truck traffic would not have the potential to result in a significant impact on air quality or contribute to any violation of any National or State Ambient Air Quality Standard. Therefore, a quantified assessment of on-street mobile source emissions is not warranted.

CONCLUSIONS

The heat and hot water systems and generators at the intake pumping station and water treatment plant would generate insignificant air emissions. With a small number of employees present at the Project Sites and minimal truck trips associated with operations of the Proposed Project, the low level of passenger vehicle and truck traffic would not have the potential to result in a significant impact on air quality or contribute to any violation of any National or State Ambient Air Quality Standard. Overall, the operation of the Proposed Project would not significantly increase air emissions, result in a violation of any National or State Ambient Air Quality Standard, or result in any significant adverse air quality impacts. ✳

A. INTRODUCTION

This chapter describes the anticipated construction activities for the Proposed Project and the potential environmental impacts that might result from those construction activities. The chapter describes the construction activities that would be required to build the new water intake, intake pumping station, water treatment plant, and raw water transmission line and potable water mains associated with the Proposed Project, and then evaluates the potential environmental impacts associated with those activities.

This chapter of the DEIS includes the following sections:

Section B: Description of Construction Activities and Schedule. This includes a review of construction phasing and of the construction activities required for the river water intake and intake pumping station, raw water transmission line, water treatment plant, and potable water mains.

Section C: Potential Impacts of Construction Activities. This section of the chapter evaluates potential impacts of construction on the full range of technical areas considered in other chapters of this DEIS.

The analysis presented in this chapter concludes that the three-year construction period associated with Phase 1 of the Proposed Project would result in temporary and intermittent disruptions to the surrounding neighborhoods. These would be primarily associated with construction-related traffic and increased noise from that traffic and from the construction activities on the Project Sites. Disruption (traffic, noise, dust) would occur to nearby land uses, and particularly the residences closest to the Intake Site on Grassy Point Road. Access would be maintained to all land uses throughout construction. Maintenance and protection of traffic plans would be employed to manage construction-related traffic and maintain traffic on roads near the Project Sites throughout the construction period. In addition, minor signal retimings were also identified to address potential traffic impacts during construction.

A stormwater pollution prevention plan would be implemented to minimize potential impacts to the Hudson River and Minisceongo Creek. The use of trenchless technology to construct the river tunnel and of a cofferdam to enclose the water intake site would minimize potential changes to water quality and impacts to aquatic biota during construction. Overall, construction of the Proposed Project would not result in significant adverse impacts to water quality or to the species identified as important for the Significant Coastal Fish and Wildlife Habitat of Haverstraw Bay.

A construction health and safety plan would be prepared and implemented to address potential issues related to contamination of soil and groundwater near the Project Sites. During construction, a dust suppression program would be in place to minimize dust from earthmoving activities.

B. DESCRIPTION OF CONSTRUCTION ACTIVITIES AND SCHEDULE

Planning for the Proposed Project is still under way. Some aspects of the Proposed Project are not yet fully known, since final designs have not yet been prepared. In such cases, this DEIS describes and analyzes a reasonable assumption for the design, as is common for projects of this nature. The construction information presented in this chapter represents conservative but reasonable assumptions for the types, durations, and intensity of construction activities expected to occur, based on the conceptual designs developed for the Proposed Project and experience with other, similar construction projects.

CONSTRUCTION PHASING

As described in Chapter 2, "Project Description," the Proposed Project is being designed to treat and deliver up to 7.5 million gallons per day (mgd) of potable water. Initially, the plant would be constructed to treat 2.5 mgd to potentially 5 mgd. As Rockland County's water demand increases, the Proposed Project would be expanded to meet that demand, with the ultimate capacity at 7.5 mgd.

Accordingly, construction would also occur in phases. Based on the conceptual designs developed to date, it is assumed that the construction phasing would occur as follows:

- **Phase 1:** By the end of 2015, the intake pumping station and water treatment plant would be constructed to an initial production capacity of either 2.5 mgd or 5 mgd. Major hydraulic components, such as the intake system and the raw water transmission line, would be designed and constructed to accommodate full build-out (7.5 mgd production capacity) to eliminate subsequent disruptions when the facility is expanded. Most likely, the building envelopes for the intake pumping station and some of the buildings at the water treatment plant would be constructed to be large enough to accommodate the equipment of future phases, but the equipment would not be installed. Construction work for this phase of the Proposed Project would begin in spring 2013 and the Proposed Project would be operational by the end of 2015, although some construction activities may extend into 2016. Potential upgrades to the nearby Haverstraw Joint Regional Sewage Treatment Plant (JRSTP) would also be completed by the end of 2015. Overall, the estimated duration for construction activities in Phase 1 is 36 months.

- **Phase 2:** If the Proposed Project is built to produce 2.5 mgd of potable water in Phase 1, a second phase of construction after 2015 would bring production to 5.0 mgd. This would involve installing additional pumps and mechanical equipment at the intake pumping station. At the Water Treatment Plant Site, additional equipment would be installed within buildings constructed during Phase 1 (or, if smaller buildings were built in Phase 1, then expanding the buildings to accommodate the equipment), and additional raw water storage tanks and finished water reservoirs and chlorine contact basins would be added. Additional water mains or upgrades to existing water mains to transmit potable water to the existing United Water New York (United Water) distribution system would be added for this phase. Construction work for this phase of the Proposed Project would occur to allow completion of the work to meet increasing demand for water. This is potentially anticipated to be approximately five years after completion of Phase 1 (i.e., approximately 2020) if the plant is not initially constructed to produce 5.0 mgd. Overall, the estimated duration for construction activities in Phase 2 is up to 12 months.

- **Phase 3:** A third phase of construction, initiated at some point in time after completion of the second phase, would expand on the intake pumping station and the water treatment plant to accommodate production capacity of 7.5 mgd. Similar to Phase 2, this would involve installing additional pumps and mechanical equipment at the intake pumping station, and installing additional equipment, raw water storage tanks, and finished water reservoirs and chlorine contact basins at the water treatment plant. Additional water mains to transmit potable water to the existing United Water distribution system or upgrades to existing water mains would be added for this phase. Construction work for this phase of the Proposed Project would occur to allow completion of the work to meet increasing demand for water at some point in the future, after 2020. Overall, the estimated duration for construction activities in Phase 3 is up to 12 months.

If two phases are constructed together, the total duration (and level of activity) of construction for the two phases combined would be less than the sum of each individual phase. This is because combining phases would eliminate the need to create staging areas and mobilize workers a second time, and would allow other efficiencies of effort as well.

CONSTRUCTION ACTIVITIES

The construction activities required for the different elements of the Proposed Project are described in this section. These include construction of the raw water intake system, the intake pumping station to be constructed on the Intake Site, the raw water transmission line to be installed beneath Beach Road and Ecology Lane, the water treatment plant, and the new water mains to transmit finished (potable) water to the distribution system from the water treatment plant. In total, based on the conceptual design information available at this time, the preliminary construction schedule for Phase 1 is estimated at 36 months. A construction schedule depicting a conceptual timeline for the construction activities described below is provided in Figure 15-1.

RAW WATER INTAKE SYSTEM CONSTRUCTION ACTIVITIES

Construction of the raw water intake system would be staged from the Intake Site and would occur prior to construction of the raw water intake pumping station on the Intake Site. This work would consist of five basic steps, as follows:

Step 1: Site Preparation and Staging Area;
Step 2: River Intake Area Preparation;
Step 3: Tunneling;
Step 4: Installation of Intake System; and
Step 5: Demobilization and Completion.

These steps, described below, may not occur sequentially, and may overlap. The schedule for the work would be adjusted as necessary to account for seasonal limitations on in-water construction activities, to be developed in coordination with the New York State Department of Environmental Conservation (NYSDEC) and New York State Department of State (NYSDOS), to avoid adverse impacts to fish spawning and early development.

Step 1: Site Preparation and Staging Area

Construction would begin with development of a staging area at the Hudson River shoreline on the Intake Site. This area would be used to store large pieces of equipment and machinery needed for construction of the intake system, including installation of the 60-inch-diameter steel tunnel structure, 36-inch-diameter intake pipe and two 12-inch-diameter air backwash pipes. It is also possible that some equipment storage and staging may also occur at a nearby property, such

as the vacant property adjacent to the Water Treatment Plant Site owned by DSB Realty Associates, LLC (DSB) or another property near the Intake Site.

The tunneling operation would occur from the staging area, as discussed below. A "launch pit" would be constructed, from which the tunneling operation would occur. This pit would be excavated on the Intake Site and the excavation would be supported by steel sheet piling or another retaining wall system. Sheet piles are sections of pre-fabricated wall, typically constructed of steel or pre-cast concrete, that are driven vertically into the ground to obstruct the lateral movement of earth or water.

Preparation of the staging area would take approximately one month to complete.

During construction of the river tunnel, construction crews would operate from the staging area. Deliveries would arrive by truck at this area and excavated materials being removed from the tunnel would be stockpiled and removed via truck at this location. Materials would be transported to the construction zone in the river (discussed below) by barges. Barges would operate from an existing dock or pier, such as at the Haverstraw Marina, rather than from the Intake Site.

Step 2: River Intake Area Preparation

While the staging area is being prepared, the intake area would also be prepared in the Hudson River. As described in Chapter 2, "Project Description," the intake is proposed to be located approximately 1,000 to 1,200 feet east of the shoreline in the river. To construct the intake, a tremie cofferdam would be constructed to enclose a 30-foot diameter area of the river at the water intake location. A tremie cofferdam is a cofferdam that includes a "tremie" seal, a thick layer of concrete at the bottom of the cofferdam that acts as a counterweight to prevent the cofferdam from floating out of the ground. The work would be performed from a floating work platform created by connecting four barges together at the work zone. Working from the barges, which would be equipped with a crawler crane, pile driving equipment, and other construction equipment and materials, the cofferdam would be constructed by driving sheet piling into the river bottom down to solid rock.

As noted earlier, sheet piles are sections of pre-fabricated wall, typically constructed of steel (or pre-cast concrete), that are driven vertically into the ground to obstruct the lateral movement of earth or water. They are typically installed using either a pile hammer or vibrating hammer. The sections are interconnected and driven one at a time, sequentially, to form a continuous barrier. Once the sheet piling is installed, circular steel bracing is installed on the inside perimeter of the cofferdam.

Before dewatering the inside of the cofferdam, the earthen material within the cofferdam would be excavated down to solid rock using a clamshell bucket, and the dredged material would be loaded onto a scow (a type of boat) anchored adjacent to the barges. Each time the scow is filled up, it would transport the dredged material back to shore, where it would be stockpiled on shore and subsequently trucked off-site for appropriate disposal. A small portion of the material dredged from the river bottom during construction of the cofferdam would be stored for replaced within the cofferdam once construction of the intake structure is complete (see Step 5, below).

Once all earth material is removed from the cofferdam, the inside of the cell would be dewatered and a concrete seal would be placed at the bottom of the cofferdam using a concrete "tremie" method, on top of the rock. This concrete would serve to overcome the significant forces from the water pressure, buoyancy, water current, wave impact, and mooring forces. The tremie seal

9.9.08

PROJECT ELEMENT	DURATION (Calandar Days)
Raw Water Intake System	150
Land-side Site Preparation and Equipment Delivery	30
Excavation and Drilling	60
Install Cofferdam in Water	30
Work within Cofferdam to Install Intake Structure	40
Landside Backfilling and Equipment Removal	40
Pumping Station	365
Site Preparation and Equipment Delivery	30
Drive Sheet Piling	21
Excavation	22
Drive Foundation Piles	21
Foundation and Building Construction - Concrete Work	120
Building Construction	90
Mechanical Work	150
Architectural Finishes	80
Electrical and I&C Work	180
Final Grading, Roadwork, and Landscaping	60
Raw Water Transmission Line	365
Site Preparation (Clearing and Grading)	90
Piping and Stone Bedding Material Delivery	300
Install Sheet Piles	300
Install Pipe and Remove Sheet Piles	300
Haul Excess Material, Seed & Mulch	60
Water Treatment Plant	990
Site Preparation, Staging, and Equipment Delivery	90
Excavation and Grading	120
Drive Foundation Piles	300
Yard Piping	180
Foundation and Building Construction - Concrete Work	300
Building Construction	210
Install Equipment	270
Mechanical Work	570
Architectural Finishes	360
Electrical and I&C Work	480
Remove Equipment	30
Final Grading, Roadwork, and Landscaping	120

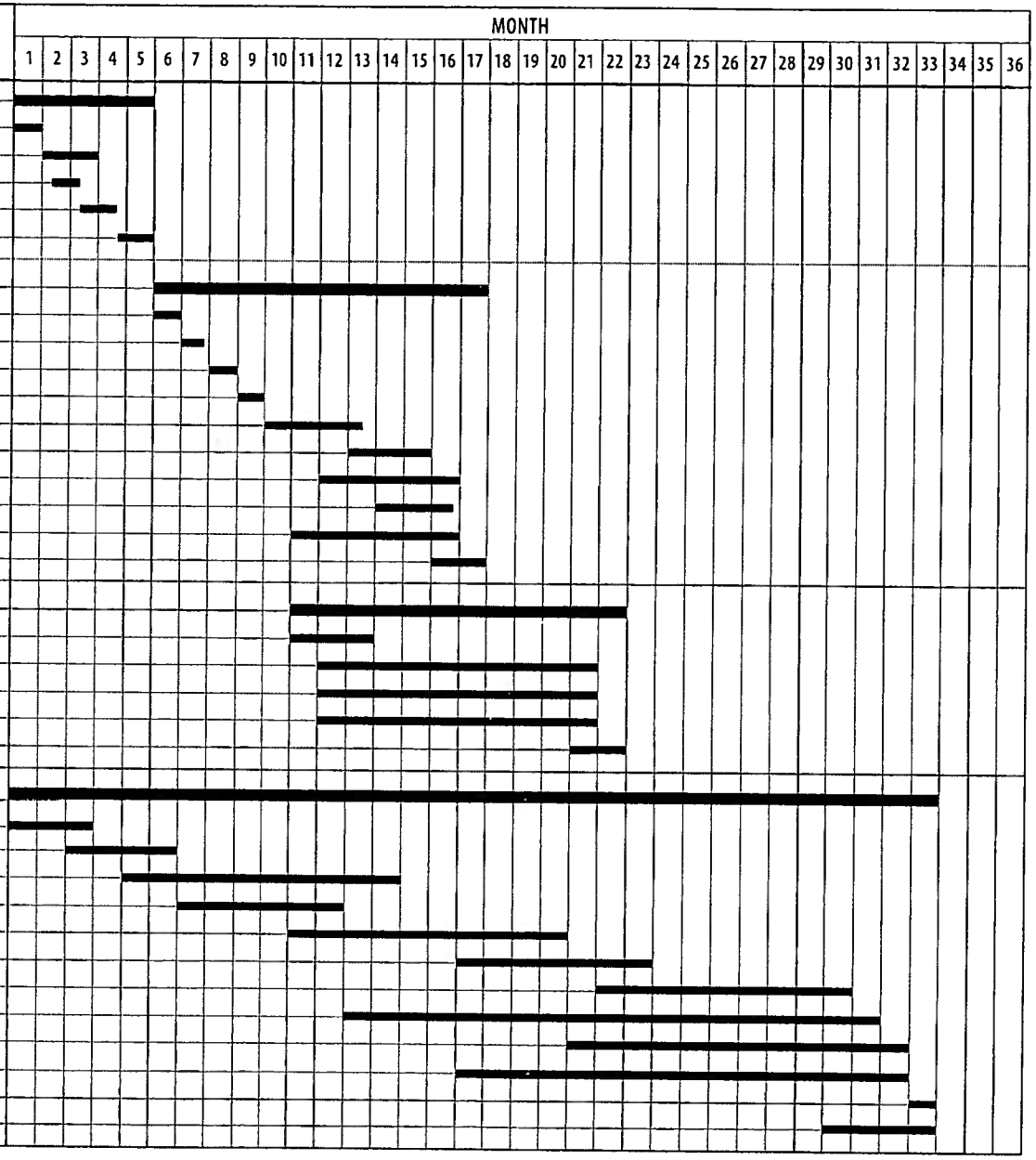

Figure 15-1

UNITED WATER Haverstraw Water Supply Project

Conceptual Construction Schedule - Phase 1

thickness would be about equal to the dewatered depth (i.e., if the area within the cofferdam held 30 feet of water before being dewatered, the tremie seal would be approximately 30 feet deep, extending from approximately the elevation of the river bottom downward). Water removed at the cofferdam would be pumped through a filter system and discharged back into the Hudson River. A State Pollutant Discharge Elimination System (SPDES) permit would be required for this discharge.

Dewatering pumps would remove any river water that seeps into the cell. The water would be pumped through a filter system and discharged back into the river.

Preparation of the cofferdam would take approximately one month.

Step 3: Tunneling

When the cofferdam construction is complete, tunneling would begin to construct the 60-inch-diameter tunnel that would house the raw water intake pipe and the air-cleaning system piping. This tunnel would be constructed beneath the river bed, extending 1,000 to 1,200 feet between the shoreline and the water intake location out in the river. The tunnel would not be installed by excavating an open trench in the river bottom. It would instead be constructed using trenchless construction methods from the shoreline, to avoid the need to disturb the river bottom and the aquatic environment. The tunnel most likely would be constructed using either horizontal directional drilling (HDD) or microtunneling.

- **Horizontal directional drilling** involves construction of a tunnel using a two-step process. Working from the shoreline, a small "pilot" hole would be drilled using an HDD machine. The drill would also pull a drilling rod through the pilot hole. As the tunnel advances, additional lengths of drill rod would be added to the pipe string by the machine. These would be stored at the staging area before being added to the machine. The pilot hole would be filled with a thick bentonite slurry—a mix of water and bentonite, which is a natural (inert) clay material—that would also be used to transport the excavated soils back to the staging area.

  The drill assembly would be removed in the protected cofferdam area in the river and the pilot hole would then be enlarged ("reamed") to a larger diameter. This would be accomplished by attaching a "reamer" to the drilling rod in the cofferdam and pulling it back through the pilot hole to the shoreline staging area. This can be accomplished through one or several passes until the tunnel is at the required diameter. Throughout the reaming process, the hole is kept open by filling it with a thick bentonite slurry—a mix of water and bentonite. Once the tunnel is large enough, the steel casing pipe, attached to the drilling rod with a swivel, would be pulled from the cofferdam through the excavated bore to the shoreline intake location using the HDD machine. During pull-back of the casing pipe into the tunnel, the slurry would be displaced into the slurry pit located on the shoreline at the staging area.

  To avoid the potential risk of bentonite slurry escaping through fractures in the soils around the tunnel, best practices would be followed as established by the tunneling industry. Operations would be conducted in general accordance with *Horizontal Directional Drilling Good Practices Guidelines*, published by the HDD Consortium, dated May 2001 (or as updated when the drilling occurs), and as modified for specific conditions related to the Proposed Project.

- **Microtunneling** involves drilling a small-diameter tunnel using a micro-tunnel boring machine (MTBM) that is operated remotely, with real-time operation/guidance control, and "jacked" pipe installation. The MTBM is launched from a pit dug at the start of the tunnel drive—in this case, the launching pit would be at the shoreline at the Intake Site. The MTBM would proceed from the launching pit under the river bed to the receiving pit created by the cofferdam. Typically, MTBMs tunneling through soil use a pressurized face in front of the machine to provide ground support around the excavation area. The MBTM exerts pressure to balance the natural downward pressure of the earth through the use of a slurry mixture. The pressure is constantly monitored so that adjustments to the slurry mixture can be made if pressure is lost. Soils excavated by the MTBM are mixed with the bentonite slurry and removed from the tunnel behind the machine, via slurry lines to the launching pit. At the launching pit, the spoil (excavated soils) would be separated from the slurry using a slurry separation plant and the slurry would then be circulated back to the head of the tunnel for re-use. The slurry system is a closed loop system. The slurry plant would be located on the Intake Site or, if an adjacent area is used for staging, could be located there.

  As part of the construction process for the tunnel, permanent steel casing pipe sections are hydraulically "jacked" (pushed using hydraulic equipment) into place from the launching pit. The pipes are installed behind the MTBM as it moves forward. When the MTBM reaches the end of its drive, it would be removed via a receiving area within the cofferdam area at the intake location in the river. Following removal of the MTBM, the pipe would be jacked into the receiving pit. A small volume of slurry would be present in front of the MTBM as it moves through the cofferdam sidewall into the pit. Following completion of mining operations, the slurry lines would be pumped free of slurry to a tanker at the Intake Site and disposed of in accordance with applicable federal, state, and local regulations.

Using either HDD or microtunneling, the tunnel would be dewatered during construction at the Intake Site. Water would be filtered prior to discharge back to the river. A SPDES permit would be required for this discharge.

The tunneling activities associated with the water intake system would take approximately two months.

Step 4: Installation of Intake System

Following installation of the steel casing pipe, the water pipes and air pipes would be installed within the river tunnel using a spacer that would position the pipes correctly within the casing pipe.

Once the piping is in place, the vertical riser and supports for the water intake system would be installed on top of the concrete tremie seal at the bottom of the cofferdam, and the wedge-wire screen intake system would be installed.

This stage would take approximately six weeks to complete.

Step 5: Demobilization and Completion

Upon completion of the tunnel and installation of the intake screen system, the cofferdam would be flooded and then removed. A small portion of the material dredged from the river bottom during construction of the cofferdam would be stored and replaced within the cofferdam to create substrate on top of the concrete. The dredged material would be replaced prior to removal of the sheet pile walls. The steel sheet piling would then be extracted using a vibratory extractor. This step would take approximately one week.

The staging area at the shoreline Intake Site would also be removed. Most likely, the launch pit that was used for the tunneling operation would be maintained for re-use as part of the intake pumping station to be built on the Intake Site.

This final step would take approximately three weeks to complete.

Schedule and Personnel

In total, the construction of the river tunnel and intake system described above is expected to be completed within five months. During that period, the floating work platform of connected barges would be in place about 10 weeks.

As noted earlier, all construction activities for the river tunnel and intake system would be staged from the Intake Site. Deliveries would be made to this Site and excavated materials ("muck") would be removed from this location. Staging and worker parking for the construction activities would be located on the Intake Site during construction of the river tunnel and intake system.

Construction of the raw water intake system would require an average of 10 construction workers each day, with 20 workers on peak days. An estimated four trucks on average would arrive at the Intake Site each day in connection with the river intake construction. This would result in an average of eight truck "trips" each day, since each truck is considered to be two truck "trips" (an arrival and a departure) for purposes of traffic analyses. Using HDD technology for tunneling, an estimated 27 trucks per day may be required for approximately one week, when the muck is being removed from the tunnel.

Phases 2 and 3

The intake system would be constructed to accommodate the full capacity required for the 7.5 mgd water treatment plant, so that no additional construction work would be required for Phases 2 and 3.

INTAKE PUMPING STATION CONSTRUCTION ACTIVITIES

Construction of the Proposed Project's intake pumping station on the Intake Site would most likely begin after construction of the river tunnel and intake system is completed, so that multiple construction crews are not working on the Intake Site at the same time.

Construction Activities

Construction of the intake pumping station would consist of four basic steps:

Step 1: Site preparation;
Step 2: Excavation;
Step 3: Building construction and installation of large equipment;
Step 4: Installation of piping, mechanical, and electrical equipment and site finishes.

Once the staging area for the river tunnel work is removed, construction of the intake pumping station could begin. The first step would be the delivery of equipment and preparation of the new construction zone.

The next step in construction of the intake pumping station would be excavation of the area where the intake pumping station would be located. As noted earlier, the excavation area that was used for the river tunnel construction could potentially be re-used as a required excavation area for the intake pumping station. Excavation would consist of installing sheet piles and

excavating the area within the area protected by the sheet piles. Following that work, foundation piles would be installed (for approximately three weeks).

The intake pumping station foundation would be constructed of concrete that would be poured on-site. The masonry walls and the roof of the pump station would then be erected to form the shell of the structure. When the structure is in place, the large vertical pump(s) and other large equipment would be installed. It is anticipated that two pumps would be installed in Phase 1.

The final stage of construction work at the intake pumping station would be the installation of piping, mechanical and electrical equipment, and information and communications systems required within the building. At the same time, architectural finishes would be completed (such as exterior brickwork, for example) and final landscaping and site finishes would be completed.

Schedule and Personnel

Construction activities for the intake pumping station would last an estimated 12 months. During that time, an average of 15 construction workers would be on the Intake Site daily and as many as 55 workers would be present daily during the peak construction period. An estimated three to five trucks would arrive at the Intake Site on average each day (for a total of 6 to 10 round-trip truck trips), with an additional 8 to 10 concrete trucks on average and 40 concrete trucks on peak days.

Staging and worker parking for the construction activities would be located on or near the Intake Site during construction of the intake pumping station.

Phases 2 and 3

For Phases 2 and 3, some additional construction work would be required at the intake pumping station to add the additional pumps required for the increased capacity of the water treatment plant. In each subsequent phase, this work would consist of installation of an additional pump and associated mechanical equipment, electrical, and information and communication systems and, other than the delivery of materials, would occur inside the existing structure completed in Phase 1. In total, this work would take approximately four months for each phase.

RAW WATER TRANSMISSION LINE CONSTRUCTION ACTIVITIES

The 30-inch-diameter pipeline that would transmit raw water from the intake pumping station to the water treatment plant would be installed beneath the roadbed of Beach Road and Ecology Lane, and then alongside the JRSTP to reach the Water Treatment Plant Site.

Construction Activities

Installation of the pipeline would follow standard procedures for installation of water mains, used by United Water throughout its service area when new water mains are provided. This would consist of four basic steps, described below.

Step 1: Pavement cutting and excavation;
Step 2: Placement of bedding and water main;
Step 3: Removal of excavation support; and
Step 4: Backfill and repaving.

During the first step, the contractor would use machinery to cut the existing roadway asphalt and concrete base and excavate a trench of the required width and depth. The trench would be approximately six to eight feet wide and a minimum of seven feet deep, so that the top of the completed pipe would be at least four feet below ground. The sides of the excavation would be

supported by steel sheeting or other supporting measures. The excavated roadway material and soil would be removed with a backhoe and placed in dump trucks. Sump pumps would be used as needed to maintain dry conditions in the trench.

The second step would consist of placement of "bedding" material in the trench (i.e., materials used to support the loading of the water main in the excavated trench). For the Proposed Project, it is anticipated that the bedding material would consist of a reinforced concrete cradle to support the water main. Concrete trucks (one per day) would make deliveries to the construction zone throughout construction to provide the needed materials. The water main itself would then be placed into this bedding using a small crane. The water main would subsequently be aligned and installed with connecting joints.

The third step would consist of removing the sheet piling or excavation support. It is anticipated that a crew of construction workers working at the rear of the water main route would remove the sheet piling once the pipe is in place and transport it to the front of the construction zone for re-use in a new portion of the construction zone as construction proceeds.

The final (fourth) step would consist of backfilling of the trench with fill material, removal of the supporting materials, and repaving of the street.

Where Beach Road crosses Minisceongo Creek, the water pipeline would also cross the creek. Depending on the ground conditions near the creek, this would be accomplished in one of two possible ways. The pipeline could be installed beneath the creek through the use of a tunneling technology, such as microtunneling or horizontal directional drilling, described above. Another technique that could be used is "jacking and boring." Jacking and boring would involve digging access pits on each side of the creek and hydraulically jacking (pushing) a steel casing from the first pit under the creek to the second pit. The water transmission pipe (carrier pipe) would then be installed through the casings from pit to pit. The space between the casings pipe and the carrier pipe would then be filled with flowable grout. Alternatively, the pipe may be routed above the creek, beside the roadway in an above-grade crossing. In this case, the pipe would be heat-insulated to protect against freezing.

Schedule and Personnel

Installation of the water main is anticipated to proceed at approximately 40 feet per day, for a total of 10 months for installation of the entire 7,500-foot-long water main. During that time, Beach Road and Ecology Road would remain open and traffic would be routed around the construction zone, as is typical for water main and road improvement projects throughout Rockland County. Staging areas for laydown of materials would likely be located within the streets where construction is occurring. One to two construction crews of 5 to 10 people each would be working in the construction zone during that time. An estimated four trucks would arrive each day in connection with the water main construction, including one concrete truck, other delivery trucks, and trucks removing excavated soils from the construction zone.

Phases 2 and 3

The pipeline that would be installed would be large enough to accommodate the full capacity of the water treatment plant, so that no additional raw water pipeline installation would be required for Phases 2 and 3.

WATER TREATMENT PLANT CONSTRUCTION ACTIVITIES

Construction of the water treatment plant on the Water Treatment Plant Site would occur at the same time as construction work on the other sites, described above.

Construction Activities

Construction of the water treatment plant would consist of the following basic steps:

Step 1: Site preparation and grading;
Step 2: Pile driving;
Step 3: Building and basin construction;
Step 4: Installation of the water treatment equipment; and
Step 5: Site finishes.

Construction staging, including storage of materials, would likely occur on the Water Treatment Plant Site. An additional staging area may be established on an adjacent property, such as the adjacent DSB property, subject to an agreement with the owner of that property.

The first step would be to clear the limited vegetation from the Water Treatment Plant Site. Once clearing is complete, grading would occur. Based on the conceptual designs developed at this time, it is anticipated that minimal grading would be required. Any re-grading of the Site would be minimized by the fact that the facility's planned layout takes advantage of the natural grades of the Site. Some cutting of higher elevations and some filling of the low areas at the center of the Site would be required. Soil removed by cutting operations would be re-used for filling operations, to minimize the amount of soils that must be either exported or imported during grading. If the grading resulted in excess material that could not be managed on site, the material would be characterized, loaded into trucks, and transported for off-site disposal at an appropriately licensed facility. If the grading required a net import of soils, the fill material would be transported from either a site containing uncontaminated soil from other construction sites, material that can be considered "beneficial re-use" according to NYSDEC regulations, or material from regulated recycling facilities.

Following grading of the Water Treatment Plant Site, foundation piles would be driven throughout the Site. (Alternatively, depending on the final construction schedule, pile driving could also occur prior to grading activities.) Pile driving is expected to occur for approximately 10 months on the Water Treatment Plant Site, with multiple crews working in different areas of the Site during that time.

The foundation and basements for the water treatment plant buildings would be constructed of concrete that would be poured on-site. Concrete would also be used to construct the finished water reservoirs, chlorine contact basins, and the new stormwater detention basin in the northeast corner of the Water Treatment Plant Site. Concrete work on the Site would last an estimated 9 to 12 months, during which time up to 8 to 10 concrete trucks would arrive at the Site each day, with a peak of 40 concrete trucks per day. Alternatively, a concrete batching plant could be located at the Site to process the concrete needed for the construction, which would eliminate the need for concrete truck deliveries.

The masonry walls and the roof of the water treatment plant buildings would then be erected to form the shell of the buildings planned for the Site. At the same time, work would be under way installing the water treatment equipment at the Site. Construction work at the Water Treatment Plant Site would also include installing the underground pipes and connections across the Site that would transmit raw water, process wastewater, and finished water to and from the Site.

The work related to yard piping and installation of mechanical and electrical equipment, and information and communications systems required within the buildings would take almost two years. At the same time, architectural finishes would be completed (such as exterior brickwork, for example).

Final grading, landscaping, and construction of the driveway and parking area would be the final construction activity at the Site.

As described in Chapter 2, the Proposed Project would also require some upgrade to the outfall at the JRSTP and connection of new effluent pipelines to the JRSTP. These upgrades and connections would be performed during the same period as work on the water treatment plant, and would not require disruption to operations of the JRSTP.

Schedule and Personnel

Construction activities at the Water Treatment Plant Site would occur over an estimated three-year-long (36-month) period. The activities with the longest durations would be pile driving (10 months); concrete work (9 to 12 months); and mechanical work, architectural work, and installation of information and communications, which would all occur simultaneously and would have a duration of approximately 20 months.

Construction of the water treatment plant would require an average of 50 to 75 construction workers daily and as many as 100 workers daily during the peak construction periods.

During the three-year construction period, delivery vehicles and concrete trucks would arrive at and depart from the Water Treatment Plant Site each day. An estimated three to five delivery trucks would arrive at the Site each day (for a total of 6 to 10 round-trip truck trips daily). In addition, an average of 8 to 10 concrete trucks would be required each day, with a peak of up to 40 concrete trucks per day.

The construction access point would potentially be the same as the final location for the water treatment plant driveway. The most likely construction access route would be a new roadway from Railroad Avenue alongside the CSX railroad right-of-way. Alternatively, a new roadway could be created extending from the end of Carol Street or North Wayne Avenue. In addition, United Water will explore the possibility of using the adjacent CSX railroad tracks for delivery of construction materials by rail.

Phases 2 and 3

As described earlier in this chapter, construction of the water treatment plant could include as many as three separate phases. Depending on final designs developed for the plant, the initial phase may be constructed to include buildings large enough to house all the equipment that would eventually be needed at the plant. In that case, construction work in Phases 2 and 3 would consist of installation of equipment and construction of additional water tanks and storage reservoirs. Alternatively, it is possible that the buildings at the plant would also be expanded for Phases 2 and 3 and then additional equipment, tanks, and reservoirs would be added. Figure 15-2 illustrates the elements of the Proposed Project that might be added in Phases 2 and 3. As shown in the figure, this could include expansion of processing buildings and the addition of raw water reservoirs, chlorine contact basins, and treated water reservoirs as the plant is expanded. The construction work for Phases 2 and 3 would last approximately one year for each phase, and would be conducted so as not to interfere with ongoing operations of the completed portions of the water treatment plant. During that time, a similar number of workers and delivery vehicles would be expected as for the first phase of construction.

POTABLE WATER MAINS CONSTRUCTION ACTIVITY

The installation of buried water mains that would carry the finished (potable) water from the water treatment plant to the United Water distribution system would be conducted in the same manner as described earlier for the raw water transmission line. The water mains would be installed either in existing streets or in existing utility rights-of-way. As described above, the construction would consist of four basic steps:

Step 1: Pavement cutting and excavation;
Step 2: Placement of bedding and water main;
Step 3: Removal of excavation support; and
Step 4: Backfill and repaving.

Installation of the water mains is anticipated to proceed at approximately 40 to 80 feet per day, depending on geological conditions. During that time, the affected roadways would remain open and traffic would be routed around the construction zone, as is typical for water main and road improvement projects throughout Rockland County. One to two construction crews of 5 to 10 people each would be working in the construction zone during that time. Staging areas for laydown of materials would likely be located within the streets where construction is occurring.

At locations where new water mains must cross major intersections, it is possible that the mains would be laid using "jacking and boring," described above in the discussion of the raw water transmission mains. As discussed above, this construction technique allows installation of short segments of water mains without excavation. This technique would also be used for any locations where the mains must cross beneath the CSX railroad right-of-way, unless the water main can cross beneath an existing railroad trestle.

As described in Chapter 2, potential routes have been identified but not finalized for the potable water main connections. Final routes would depend on the results of utility surveys and geological investigations to be conducted following completion of this DEIS. The potential routes are shown in Figure 15-3. As shown in the figure, some of the potential routes extend westward from the Water Treatment Plant Site, crossing the CSX railroad tracks and continuing along an east-west street to meet Route 9W. Others extend south from the Water Treatment Plant Site, along North Wayne Avenue, Carol Street, or the CSX access road adjacent to the railroad tracks, and then continue via Railroad Avenue either westward to Route 9W or eastward to Tanneyanns Lane.

For Phases 2 and 3, it is possible that some existing water mains would need to be rehabilitated or replaced with larger mains to accommodate the increased flow. This may include an existing main beneath Route 9W and a main beneath Filors Lane between Route 9W and Thiells Road. This replacement and/or rehabilitation could be conducted as part of United Water's regular water main rehabilitation program.

In addition, it is possible that one or more additional pumping stations may be required in Phase 2 or 3 to transmit the additional water to locations farther from the water treatment plant. These would be added as part of the replacement and/or rehabilitation project. United Water's pumping stations are sometimes located below-ground in the public right-of-way, and at other times are above-grade structures located outside the right-of-way. They are typically relatively small structures, e.g., less than 2,000 square feet in size and 30 feet high. Any new pumping stations located outside the right-of-way may be subject to review under the State Environmental Quality Review Act (SEQRA) and future site plan approval.

MAPS PULLED FROM:

Case: 06-W-0131

Date: 10/2/08 (of)

Specific:

- ☐ Brief
- ☐ Comment
- ☐ Correspondence
- ☐ Exhibit
- ☐ Order
- ☐ Petition
- ☐ Plan
- ☐ Report

Map # 45-46

GENERAL CONSTRUCTION PRACTICES

The following section describes general construction practices that are typical in New York State and/or the Town of Haverstraw, and that would be observed throughout construction of the Proposed Project.

COMMUNITY LIAISON

United Water would designate a contact person for community relations throughout the construction period. This person would serve as the contact for the community to voice concerns about construction activities, and would be available to meet with the community to resolve concerns or problems. In addition, United Water would establish a construction "hot line" that could be used to register complaints or ask questions. Calls to the hot line would be returned within 24 hours. United Water would also maintain a website with information on upcoming construction activities.

HOURS OF WORK

Construction activities generally would take place in accordance with Town of Haverstraw Zoning Code § 167-40 regulations, which permit construction, blasting, drilling, and demolition between the hours of 7:00 AM and 7:00 PM on weekdays, and from 8:00 AM to 5:00 PM on Saturdays. Under the Zoning Code, work is prohibited on Sundays and legal holidays.[1] It is possible that some non-intrusive construction work at the Project Sites (e.g., interior work within buildings on the Project Sites) may be conducted beyond those hours with permission from the Town of Haverstraw.

STAGING AND LAYDOWN AREAS

It is expected that most staging and laydown areas for construction activities would be located within the boundaries of the Project Sites. It is possible that a site nearby, such as the vacant DSB property adjacent to the Water Treatment Plant Site and/or a property near the Intake Site, may also be used for staging and/or construction worker parking. Materials that are needed during the day are usually delivered early that day. These materials, such as reinforcing bars and prefabricated pieces, are stored until needed. In certain cases, several days of construction materials would be stored. As noted above, construction deliveries would include concrete trucks for delivery of concrete; however, it is possible that a concrete batching plant could be used at one of the Project Sites to provide the concrete on-site.

DELIVERIES AND ACCESS

Access to the construction sites would be controlled. The work areas would be fenced off, and limited access points for workers and trucks would be provided. After work hours, the gates would be closed and locked. Unauthorized access would be prevented after work hours and during the weekend. Material deliveries to the Project Sites would be controlled and scheduled.

CONSTRUCTION WORKER PARKING

For construction work on the Water Treatment Plant Site, a worker staging area would be established with a contractor trailer and parking area. Workers would report to this location and would travel to the construction site in groups. The staging area may be located on an adjacent

[1] Times of permitted construction, blasting, drilling, and demolition do not apply to emergency work and work performed by a municipal agency.

industrial property, as noted above, or another property within a few minutes' drive of the construction area.

C. POTENTIAL IMPACTS OF CONSTRUCTION ACTIVITIES

The potential impacts of the anticipated construction activities required for the Proposed Project are described below. Unless otherwise noted, the impact discussions generally describe the effects of construction activities required for Phase 1 of the Proposed Project. Phases 2 and 3 would result in similar but reduced effects, because construction would be less intensive and of shorter duration. As noted earlier, if two phases are constructed together, the total duration (and level of activity) of construction for the two phases combined would be less than the sum of each individual phase. This is because combining phases would eliminate the need to create staging areas and mobilize workers a second time, and would allow other efficiencies of effort as well.

LAND USE, ZONING, AND OTHER ACTIONS

Construction activities would result in limited disruption to nearby land uses during the three-year construction period, and again during Phases 2 and 3. As described in Chapter 3 of this DEIS, "Land Use, Zoning, and Other Actions," those uses are predominantly industrial and commercial, but do also include some residential uses and parks. Near the Intake Site, a small residential neighborhood and a waterfront park are located north of the Site on River Road/Grassy Point Road. In addition, the Haverstraw Marina is immediately south of the Intake Site. Near the Water Treatment Plant Site, a residential neighborhood is located to the south of the Site along both sides of North Wayne Avenue. Another residential neighborhood is immediately west of the Water Treatment Plant Site (across the CSX tracks) along Benson Street and Blauvelt Avenue.

Construction activities for the river intake, intake pumping station, and water treatment plant would be largely contained on the Project Sites, although it is possible that land nearby could be used for staging and/or construction worker parking. Construction activities would be noisy and intrusive to nearby residential and park uses at times, particularly during the period when pile driving would occur (up to 2 months for sheet piles and foundation piles at the Intake Site and approximately 10 months for foundation piles at the Water Treatment Plant Site). In addition, the truck traffic associated with the Proposed Project's construction would be noticeable from nearby residences and parks. However, the primary construction sites—the Intake Site and the Water Treatment Plant Site—are somewhat buffered from most nearby sensitive land uses (i.e., residences and parks) by distance and intervening structures, vegetation, and topography. Construction would be most intrusive at the single residence immediately north of the Intake Site, which is the closest sensitive use to a construction site. Construction activities would be discernable from the residences near the Water Treatment Plant Site, and particularly those at the north ends of Benson Street and Blauvelt Avenue, but the intervening grade changes and vegetation would help to buffer that disruption.

Construction associated with installation of the raw water transmission pipe and potable water mains would require lane closures on the affected roadways. As described earlier, this would include Beach Road for the raw water transmission pipe, and potentially North Wayne Avenue, a portion of Railroad Avenue, and possibly Tanneyanns Lane for the potable water mains. This construction work would move along at approximately 40 feet per day, so the disturbance to any particular area would be of limited duration. As discussed below under "Traffic and Transportation," Maintenance and Protection of Traffic (MPT) plans would be developed and implemented to limit the amount of disruption to traffic on the affected roadways. In addition to

the disruption to traffic, the construction work associated with water main installation would be noisy and potentially dusty.

Throughout the construction period, access to residences and businesses would be maintained to the greatest extent possible. Some traffic delays may occur, especially along Beach Road (County Road 108) which is the primary route for the raw water transmission line. Businesses along Beach Road, including the Haverstraw Marina, a contractor business along Beach Road, commercial boating businesses along Beach Road associated with the Haverstraw Marina, and a machine and tool shop, could experience disruption during the year when the raw water transmission pipe is being installed. This disruption would be particularly noticeable during the summer months, when the boat-related businesses, including the marina, are busiest. The potable water main routes could potentially result in disturbance to residential neighborhoods, such as those along North Wayne Avenue, Railroad Avenue, and Tanneyanns Lane.

Overall, the amount of construction-related disruption to nearby land uses would be limited through the use of MPT plans and dust suppression measures. The primary construction sites—the Intake Site and the Water Treatment Plant Site—are somewhat buffered from nearby sensitive land uses (i.e., residences and parks) by distance and intervening structures, vegetation, and topography. Access would be maintained for all uses near the construction sites.

During Phases 2 and 3, construction would be more limited and less disruptive, although noisy activities, truck traffic, and worker vehicle traffic could result in temporary disturbances to land uses near the Water Treatment Plant Site. Little construction work would be required during these phases at the Intake Site, so only limited disruption would be expected.

VISUAL RESOURCES

Construction activities would result in temporary changes to views of the Project Sites. During the five-month period when the river water intake system is being installed, for example, views of the waterfront from the Haverstraw Marina and Riverfront Park along Grassy Point Road/River Road in Stony Point would include views of the barges and barge-mounted crane in the river. These would be located close to the existing U.S. Gypsum conveyor and therefore would not be intrusive in views of the water from the surrounding area. At the Intake Site and Water Treatment Plant Site, construction activities may be visible from the surrounding area as well, although the Water Treatment Plant Site is largely shielded from view by its bowl-like topography (see Chapter 4, "Visual Resources"). Any impacts to visual resources from construction activities in the vicinity of the Intake Site, raw water transmission line route, and Water Treatment Plant Site would be temporary and would not significantly affect the overall visual character of the community in the long-term.

COMMUNITY FACILITIES

LAW ENFORCEMENT, FIRE PROTECTION, AND EMERGENCY SERVICES

Construction activities on the Intake Site and Water Treatment Plant Site would not be anticipated to increase demands for law enforcement or fire protection services. Construction activities associated with installation of the raw water transmission line and the potable water mains would result in some disruption to traffic patterns on affected roadways, but with implementation of MPT plans, this disruption would be minimized. Traffic would be routed around the construction zone but all affected streets would remain open to traffic during water main installation. Access would be maintained at all times for fire trucks, ambulances, and responder vehicles at Thiells Fire District Station #3, which is located at the intersection of

Railroad Avenue and Beach Road. Therefore, construction-related traffic disruption would not result in significant adverse impacts to provision of these emergency services.

RECREATION AND PARKS

Construction activities associated with the Proposed Project could be discernible at the nearby Haverstraw Marina, Haverstraw Bay County Park, and Riverfront Park in Stony Point along River Road/Grassy Point Road. Construction activities in the Hudson River would also be visible from all three of those locations. The noise associated with driving sheet piles for the cofferdam in the river (approximately one month) and driving sheet piles and foundation piles at the Intake Site (approximately two months) would be particularly noticeable. If that occurs during the summer, park-goers may choose not to visit the beaches along the east side of Grassy Point Road/River Road immediately north of the Intake Site, where the noise would be most disruptive. Noise at Haverstraw Bay County Park would be less disruptive, since that park is farther from the construction zone.

Public access would be maintained at those parks and at the boat launch and canoe/kayak launch at Haverstraw Marina during construction in the Hudson River, at the Intake Site, and along Beach Road. As described earlier, MPT plans would be developed and implemented so that Beach Road would remain open to traffic during construction.

OTHER COMMUNITY FACILITIES NEARBY

Two schools are located in the residential neighborhood to the southwest of the Water Treatment Plant Site. These are the North Rockland High School Satellite Campus, on the north side of Railroad Avenue at Cosgrove Avenue, and the West Haverstraw Elementary School on Blauvelt Avenue. The high school is approximately 1,500 feet from the Water Treatment Plant Site, and the elementary school is approximately 800 feet from the Site. These two schools would be unaffected by most construction activities, but the noisiest construction activities (e.g., pile driving) might be discernible at the schools. In addition, construction-related traffic headed to and from the Water Treatment Plant Site would directly pass the high school and would pass the Blauvelt Avenue, on which the elementary school is located. As described below in the discussion of traffic, some potential impacts on traffic could result during construction, but these could be mitigated.

SOCIOECONOMICS

The economic benefits associated with construction activities are directly related to the cost of the Proposed Project. Those benefits were estimated using the IMPLAN (IMpact analysis for PLANning) input-output modeling system, which estimates the number of direct and indirect jobs, tax revenues, and economic output that would result from construction of the Proposed Project. The methodology used for the IMPLAN model is described in Chapter 6 of this DEIS, "Socioeconomics." The IMPLAN model was used to estimate the economic benefits of construction of the full plant.

Estimated construction costs for the Proposed Project were used to estimate the benefits associated with construction activity. The construction costs include sitework, hard costs (actual construction), and soft costs (engineering). The total cost reflects the cost of physical improvements to the Project Sites and therefore excludes other values (such as the value of the land) not directly a part of the expenditures for construction. The total cost including the value of the land would be substantially more.

Costs for equipment were deducted for this analysis on the assumption that much of the equipment (e.g., pumps, water filtration and processing equipment) would be manufactured outside of New York State, and therefore, the purchase of this equipment would not have a direct effect on the regional or statewide economy. The installation of this equipment, however, would result in direct and indirect economic effects. The direct costs of construction, which serve as the basis for calculating indirect and induced economic effects, were organized into IMPLAN industry sectors (which are based on the U.S. Census Bureau's North American Industry Classification System, or NAICS) and modeled accordingly. Table 15-1 shows the direct inputs to IMPLAN and the distribution of construction costs across industry sectors.

Table 15-1
Construction Costs Used as Bases for Economic and Fiscal Benefits Modeling
(Shown in 2008 Dollars)

IMPLAN Sector	Description of Industry Sector	Project Costs (including Equipment)	Equipment Costs	Construction Only
40	Water, sewer, and pipeline construction	$94,590,000	$10,380,000	$84,210,000
38	Commercial and institutional buildings	$2,056,000	-	$2,056,000
439	Engineering*	$24,162,000	-	$24,162,000
Total		**$120,808,000**	**$10,380,000**	**$110,428,000**

Note: * For a conservative analysis of economic impacts in Rockland County, it was assumed that engineering costs are in the State, not in Rockland County.

Sources: Black & Veatch Corporation; AKRF, Inc.

Estimated economic effects from construction of the Proposed Project are shown in Table 15-2 and summarized below.

EMPLOYMENT BENEFITS

The $110.4 million represents the direct expenditures in New York State during the construction period. Of this total, $86.3 million are the direct expenditures in Rockland County during the construction period. As discussed above, it has been assumed that engineering services would be in New York State, not in Rockland County. Thus, the estimated construction cost in the State is higher than the estimated construction cost in Rockland County.

As a result of the direct expenditures, approximately 701 direct jobs (127 per year for 5.5 years) would be generated in the County. Another 203 direct jobs would be generated in New York State due to engineering activities. Based on the modeling conducted, 266 indirect jobs and 404 induced jobs will be created in New York State, of which 226 indirect jobs and 277 induced jobs would be created in Rockland County. Indirect employment would include jobs in industries that provide goods and services to the contractors, and induced employment would include jobs generated by new economic demand from households spending salaries earned through the direct and indirect jobs.

Table 15-2
Economic Benefits from Construction of the Proposed Project

Benefit	Cumulative Effect on Rockland County	Annual Effect on Rockland County*	Cumulative Effect on New York State	Annual Effect on New York State*
Employment (full and part-time jobs)				
Direct (Jobs in construction)	701	127	904	164
Indirect (Jobs in support industries)	226	41	266	48
Induced (Jobs from household spending)	277	50	404	74
Total	1,203	219	1,574	286
Employee Compensation (millions of 2008 dollars)				
Direct (Earnings in construction)	$34.0	$6.2	$45.5	$8.3
Indirect (Earnings in support industries)	$9.3	$1.7	$13.5	$2.4
Induced (Earnings from household spending)	$9.5	$1.7	$16.5	$3.0
Total	$52.8	$9.6	$75.5	$13.7
Total Economic Output or Demand (millions of 2008 dollars)				
Direct (Output from construction)	$86.3	$15.7	$110.4	$20.1
Indirect (Output from support industries)	$26.4	$4.8	$36.5	$6.6
Induced (Output from household spending)	$29.7	$5.4	$51.4	$9.4
Total	$142.4	$25.9	$198.4	$36.1

Notes: Detailed amounts may not add to totals due to rounding.
* Assumes that the construction period would be 5.5 years.
Sources: Construction cost estimate provided by Black & Veatch Corporation. Indirect and induced output and employment and employee compensation estimates generated using IMPLAN.

EMPLOYEE COMPENSATION BENEFITS

Direct construction worker earnings are estimated at $34.0 million in Rockland County and $45.5 million in New York State. Total direct, indirect, and induced employee compensation resulting in Rockland County is estimated at $52.8 million. Total employee compensation in New York State is estimated at $75.5 million.

TOTAL ECONOMIC OUTPUT BENEFITS

Construction costs are estimated at approximately $86.3 million in Rockland County and $110.4 million in New York State. Based on the IMPLAN models for the New York State and Rockland County, the total indirect and induced economic activity resulting from this direct investment would be $87.9 million in the state and $56.1 million in the County.

TAXES

The economic benefits from constructing the Proposed Project would have associated with them non-property tax revenues for Rockland Country, the Metropolitan Transportation Authority (MTA), and New York State. These taxes include sales tax, personal income tax, corporate and business taxes, and numerous other taxes. Based on the construction cost and the existing sales tax rate, sales tax on construction materials would be expected to equal approximately $2.6 million, including approximately $1.2 million for Rockland County, $117,000 for the MTA, and $1.2 million for New York State (all figures in 2008 dollars). Based on the projected employee compensation, New York State personal income tax from constructing the Proposed Project is estimated at approximately $1.66 million from the direct earnings, and $0.95 million from the

indirect and induced earnings, and therefore, to total approximately $2.61 million. In addition, construction of the Proposed Project would be expected to generate corporate and business taxes, utilities taxes, and numerous other taxes on the direct, indirect, and induced activity.

CULTURAL RESOURCES

Chapter 7, "Cultural Resources," describes the cultural resources investigations conducted for this DEIS. As discussed in that chapter, no architectural resources were identified on any of the Project Sites or in the immediate vicinity, and therefore none would be affected during construction of the Proposed Project. In addition, the Intake Site, Water Treatment Plant Site, much of the raw water transmission line route, the potential access roads to the water treatment plant, and the potential potable water main routes have been determined not to be sensitive for archaeological resources.[1] Therefore, construction of the Proposed Project would not result in adverse impacts to archaeological resources at these Project Site locations.

However, the Phase 1A archaeological study conducted for the Project Sites (described in Chapter 7) identified the western portion of the raw water transmission line route as potentially containing pre-contact (i.e., Native American) archaeological resources. If such resources are present, they could be adversely affected by subsurface construction-related activities in these areas.

To determine the presence or absence of archaeological resources in that area, further investigation in the form of Phase 1B archaeological subsurface testing will be undertaken at the western portion of the raw water transmission line route prior to any construction disturbance. The results of the field testing will be submitted to the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) for review. Should archaeological resources be encountered, United Water, in consultation with NYSDEC and OPRHP, would take appropriate measures to identify the significance of such resources. If significant, mitigation measures, such as data recovery, would be undertaken in consultation with OPRHP.

GEOLOGY, SOILS, AND GROUNDWATER

SOILS, GEOLOGY, AND SEISMOLOGY

Construction of the water treatment plant would require some re-grading of the Water Treatment Plant Site. Cutting or filling operations would utilize on-site material to the extent possible. If the re-grading results in excess material that can not be managed on site, the material would be characterized, loaded into trucks, and transported for off-site disposal at an appropriately licensed facility. Any placement of fill within any of the Project Sites to raise the ground elevation would use uncontaminated soil that satisfies 6 NYCRR Part 360-1.15 Beneficial Use, or material from NYSDEC-regulated or registered construction and demolition debris recycling facilities, provided the material complies with the Part 360 regulations. Erosion and sediment controls in accordance with NYSDEC requirements would minimize potential soil losses.

No blasting would occur during construction, and therefore no significant adverse impacts would occur to geologic resources or affect the current low earthquake potential of the Project Sites.

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[1] As noted in Chapter 7, the Phase 1A assessment for the potable water main routes is currently under way as of September 2008. This chapter assumes that because of the location of those routes in public streets, the potable water main routes are disturbed and do not have the potential to contain archaeological resources.

GROUNDWATER RESOURCES

As described earlier in the description of construction activities (see section B of this chapter), limited dewatering is anticipated at the Project Sites during construction. Construction of the Proposed Project would not have the potential to result in adverse impacts to the deeper bedrock aquifer beneath the Project Sites, which is isolated from the shallow, sandy aquifer in the vicinity of the Project Sites. Prior to dewatering, testing would be performed to ensure that the groundwater would meet applicable requirements for discharge to the storm sewer system or Hudson River. If necessary, pretreatment would be conducted prior to discharge, as required by NYSDEC SPDES permits.

NATURAL RESOURCES

A detailed discussion of the existing natural resources on and near the Project Sites and the Proposed Project's effects on those natural resources during construction and operation is provided in Chapter 9 of this DEIS, "Natural Resources." The effects of construction activities for the Proposed Project on natural resources—including wetlands; aquatic resources; terrestrial resources; threatened, endangered, and rare species; and special habitats—are summarized below.

WETLANDS

The construction activities associated with installation of water intake tunnel beneath the Hudson River bed would be conducted using trenchless technology that would minimize the potential for disturbance of tidal wetlands during construction of the intake.

Construction activities along Beach Road for the raw water transmission line would minimize adverse impacts to the adjoining wetlands and watercourses. As currently envisioned, the pipeline would be constructed beneath Minisceongo Creek using a microtunneling technique, or traverse the creek adjacent to the existing bridge. Burying the pipeline would not result in significant adverse impacts to the existing wetlands in the vicinity Beach Road. Placing the pipeline adjacent to the bridge may result in loss of wetlands due to the placement of riprap at the edge of the creek in association with supports for the pipeline. However, the area of wetlands affected by the placement of riprap would be minimal and would not result in a significant adverse impact to wetland resources.

As discussed in Chapter 9, construction activities would require the elimination of wetland features on the Water Treatment Plant Site.

The Proposed Project would be covered under the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity Permit No. GP-0-08-001. To obtain coverage under this permit, a Stormwater Pollution Prevention Plan (SWPPP) would be prepared and a Notice of Intent (NOI) would be submitted to NYSDEC. Implementation of erosion and sediment control measures, and stormwater management measures identified in the SWPPP would minimize potential impacts to tidal wetlands along the edges of the Intake Site and raw water transmission line route associated with discharge of stormwater runoff during land-disturbing activities resulting from construction of the Proposed Project. The SWPPP would include procedures for soil stockpiling and runoff control. Excavated soil would be stockpiled for future reuse or off-site disposal. Stormwater management measures, such as hay bales or silt fencing, would be placed around stockpiles and properly maintained to ensure that stormwater runoff complies with the applicable requirements.

AQUATIC RESOURCES

Water Quality

Implementation of erosion and sediment control measures (e.g., silt fences and straw bale dikes), and stormwater management measures as part of the SWPPP during construction and operation of the upland Proposed Project elements would minimize potential for significant adverse impacts to water quality of the Hudson River and Minisceongo Creek associated with stormwater runoff during land-disturbing activities.

The primary in-water construction activity for the Proposed Project with the potential to result in sediment disturbance is the driving of sheet-pile cofferdam to be installed at the intake location in the Hudson River. The installation and removal of the sheetpile, and the discharge of small amounts of river water recovered during dewatering, has the potential to result in disturbance of sediment, and consequently result in minor, short-term increases in suspended sediment, and resuspension and re-deposition of contaminants. These temporary effects would be localized and confined to the immediate vicinity of construction activity at the cofferdam. Any sediment resuspended during driving and removal of the sheet pile, or resulting from the discharge of river water recovered during dewatering, would move away from the area of in-water construction and would be expected to dissipate shortly after the completion of pile-driving activity. Furthermore, the installation of the sheet pile, by encircling and containing the area for the installation of the water intake, would minimize the potential for adverse impacts to water quality associated with the construction of the intake structure and pipeline. Therefore, in-water construction activities would not result in significant adverse impacts to water quality. Similarly, any contaminants released to the water column as a result of sediment disturbance would be expected to dissipate rapidly and would not result in significant long-term impacts to water quality.

Aquatic Biota

Implementation of the SWPPP would minimize potential adverse impacts to aquatic biota from the discharge of stormwater during construction of the upland elements of the Proposed Project.

The period when in-water construction would occur would be based on seasonal limitations developed in coordination with NYSDEC and NYSDOS to avoid adverse impacts to fish spawning and early development. The primary in-water construction activity for the Proposed Project with the potential to result in sediment disturbance is the driving of sheet-pile cofferdam to be installed at the intake location in the Hudson River. As noted earlier, all in-water construction work would be done using a barge-based crew using barge-mounted cranes. The work would be performed from a floating work platform created by connecting four barges together at the work zone. The barges would be in place for approximately 10 weeks. To create the cofferdam, sheet piling would be driven through the overburden to rock using a pile hammer or vibratory hammer.

Increases in suspended sediment would be localized and temporary and would not result in significant adverse impacts to aquatic biota of the Hudson River. While Hudson River sediments have been found to contain contaminants at concentrations that may pose a risk to some benthic macroinvertebrates, the resuspended sediments are expected to dissipate quickly, and redeposition within or outside the study area is not expected to adversely affect benthic macroinvertebrates or bottom fish. Use of the cofferdam, by encircling and containing the site for the installation of the water intake, would minimize the potential for adverse impacts to water quality associated with the construction of the intake structure and pipeline.

Life stages of estuarine-dependent and anadromous fish species, bivalves and other macroinvertebrates generally are tolerant of elevated suspended sediment concentrations and have evolved behavioral and physiological mechanisms for dealing with variable concentrations of suspended sediment Fish are mobile and generally avoid unsuitable conditions such as increases in suspended sediment and noise. While the localized increase in suspended sediment may cause fish to temporarily avoid the area where driving of the sheet pile is occurring, the affected area would be small. Similar nearby suitable habitats would be available for use by fish to avoid the area being disturbed. Fish also have the ability to expel materials that may clog their gills when they return to cleaner, less sediment laden waters. Most shellfish are adapted to naturally turbid estuarine conditions and can tolerate short-term exposures by closing valves or reducing pumping activity. Mobile benthic invertebrates that occur in estuaries have been found to be tolerant of elevated suspended sediment concentrations.

The installation of the sheet pile for the cofferdam has the potential to result in localized direct impacts to aquatic resources in Haverstraw Bay due to temporary noise and vibration effects during directional drilling, dredging, construction and pile-driving activities, and temporary loss of water column and benthic habitat from the installation of the cofferdam. During the construction of the intake and intake pumping station, the in-water construction period would be only five months, and the length of time during which sheet pile driving would occur for the cofferdam would expected to last no more than two weeks. The length of time for driving each new section of pile should be several hours. Because the length of time for driving each pile section is expected to be short, and the sound generated during pile driving intermittent, individual fish would not be exposed to potentially dangerous sound pressure levels long enough to result in mortality. Therefore, the pile driving that would occur as a result of the Proposed Project would not result in significant adverse impacts to aquatic biota.

The installation of the cofferdam would result in the temporary loss of approximately 700 square feet (0.016 acre) of Hudson River bottom habitat and water column habitat within the dammed area. Benthic organisms unable to move from the vicinity of the cofferdam during driving of the sheet pile would be lost during dredging and dewatering activities. The loss of benthic organisms within this small area of river bottom would not have the potential to result in significant adverse impacts to benthic invertebrate populations within the Hudson River, nor would the loss of these individuals result in significant adverse impacts to fish due to the loss of prey species. The benthic macroinvertebrate community is expected to recover quickly upon completion of the intake structure, replacement of a portion of the dredged sediment, and removal of the cofferdam. Benthic abundance and diversity of benthic communities typically returns to reference or pre-dredging levels within a single year following cessation of dredging/construction activity, with species diversity and faunal similarity achieving pre-construction conditions rapidly.

The linked construction barges would result in adverse impacts to fish habitat due to shading but would be temporary (i.e., 10 weeks) and affect a small area, less than 0.04 acres. The temporary shading of this small area of aquatic habitat would not result in significant adverse impacts to aquatic biota.

TERRESTRIAL ECOLOGY

Vegetation

Construction activities for the Proposed Project would result in the clearing of most or all of the limited vegetation on the one-acre Intake Site. As a result of construction of the Intake Site, three

large individual trees that have been observed being used by overwintering bald eagles, as perches during foraging activity would be removed. Additional coordination with NYSDEC would be conducted with respect to overwintering bald eagles and use of the Intake Site for perching habitat prior to the anticipated start of construction on the Intake Site.

The area of disturbance for the Proposed Project would result in the loss of three acres of disturbed vegetated habitat at the Water Treatment Plant Site, which would not result in significant adverse impacts to regional vegetation resources.

The installation of the raw water transmission pipeline would adversely impact approximately 1.38 acres of oak-hickory forest near Ecology Lane due to clearing and installation of the pipeline. This minimal loss, while it is adverse, would not result in significant adverse impacts to this habitat type, which is distributed throughout the upstate New York region.

Wildlife

Site clearing, grading, and construction within the Project Sites would have the potential to disturb wildlife using habitats within these areas and may result in the direct loss of individual wildlife that are less mobile and/or secretive species (e.g., small mammals, turtles, snakes, salamanders, frogs, and toads), due to collision with construction equipment, or burial during site clearing and grading. In particular, reptiles and amphibians, and mammals such as muskrat, observed or with the potential to use the stormwater management retention pond and other areas of the site containing wetland hydrology would be adversely impacted by the Proposed Project's construction activities. The loss of wildlife individuals using the portion of the Water Treatment Plant Site containing wildlife habitat, while an adverse impact, would be low and would not be expected to result in significant adverse impacts to regional populations of these species. Other mammals and birds using the portion of the Water Treatment Plant Site with wetland hydrology (e.g., eastern cottontail, mice, white-tailed deer, redwing blackbird, and robin) would likely move to nearby suitable habitats in response to disturbance and habitat loss in the Site. However, wildlife individuals unable to find suitable habitat nearby would be adversely affected by construction activities. The loss of these few individuals, while an adverse impact, would not result in significant adverse impacts to regional populations of these common species.

The Intake Site provides limited habitat for birds and other wildlife species common to habitats affected by human development and activity (i.e., rock pigeon, mourning dove, American robin, European starling, house finch, and house sparrow). Construction activities on the Intake Site would have the potential to disturb wildlife individuals using this area, adversely affecting those individuals unable to find suitable available habitat in the vicinity of the Intake Site. The potential loss of a small number of wildlife, while an adverse impact, would not result in significant adverse impacts to regional populations of these common species. Construction activities on this Site would not be expected to result in significant adverse impacts to concentrations of wintering waterfowl known to use the marsh and protected areas of the Hudson River (pier areas, coves, marinas, and near-shore areas) near the Intake Site, due to the limited area and duration of disturbance associated with the construction of the intake, and the existing level of human activity already occurring within the vicinity of the Intake Site.

Depending on the schedule, construction may disturb some overwintering bird species using early successional habitats, or spring or fall bird migrants in the vicinity of the Water Treatment Plant Site. In addition, a portion of the raw water transmission line would be constructed through forested habitat and, as a result, may negatively affect some forest edge species.

THREATENED, ENDANGERED, AND RARE SPECIES

As discussed above, water quality impacts associated with in-water construction activities for the Proposed Project would be localized. Therefore, the deep channel habitat preferred by shortnose and Atlantic sturgeon would not be adversely impacted during installation or removal of the sheet pile for the cofferdam, or other in-water construction activities associated with the intake.

Endangered species observed or expected near the Project Sites include the peregrine falcon and short-eared owl. Threatened species observed or expected near the Project Sites include the bald eagle and northern harrier, Special concern species observed or expected in the vicinity include Cooper's hawk, sharp-shinned hawk, osprey, horned lark, and checkered white. No significant adverse impacts to any of these species would be expected during construction of the Proposed Project. The area of disturbance at the Project Sites would be small, and generally would not result in a significant loss of prey species or overwintering habitat.

At the Intake Site, removal of several trees from the shoreline would result in the loss of over-winter habitat for bald eagles. While the loss of these roosting trees would adversely affect overwintering bald eagles, it would not be expected to result in a reduction in foraging activity within the vicinity of the Intake Site and would not result in a significant adverse impact due to the presence of other known day roosting and perching habitats in the vicinity of the Intake Site. To minimize potential adverse impacts to overwintering bald eagles, to the extent possible outside construction activities would be kept to a minimum in areas being used by bald eagles during the overwintering period. Coordination with NYSDEC would be conducted with respect to overwintering bald eagles and use of the Intake Site for perching habitat prior to the anticipated start of intake pumping station and intake structure construction.

SIGNIFICANT COASTAL FISH AND WILDLIFE HABITAT

Construction of the Proposed Project would not result in significant adverse impacts to water quality or to the species identified as important for the Significant Coastal Fish and Wildlife Habitat of Haverstraw Bay due to in-water construction activities. The intake construction has been designed to minimize effects on the significant habitat. Measures to protect aquatic life and aquatic habitat during construction of the intake in the Hudson River would include the use of a sealed sheet-pile cell that would contain the dredging and all construction work in the river. The period when in-water construction would occur would be based on seasonal limitations developed in coordination with NYSDEC and NYSDOS to avoid adverse impacts to fish spawning and early development. There would be no significant loss of habitat quantity and only a temporary reduction of functional value during and immediately after construction. Restoration of the disturbed area through natural processes would result in a complete restoration of the functional values of the designated habitat. The construction activities would not alter the physical, biological, and chemical processes of Haverstraw Bay; thus the habitat would recover as it has from the previous dredging operations that were not designed and conducted with the care applied to the proposed intake. While the construction of the intake has the potential to disturb waterfowl, the in-water construction period would be short and would not affect a large area of the Bay. Therefore, construction of the intake would not be expected to result in significant adverse impacts to waterfowl that use the area for feeding and resting during spring and fall migrations.

HAZARDOUS MATERIALS

Chapter 10, "Hazardous Materials," summarizes the results of Phase I and Phase II hazardous materials investigations conducted for the Project Sites. Those investigations concluded that it is

possible that contaminated material, especially petroleum-contaminated soil or groundwater, may be encountered during construction of the Proposed Project. If contaminated soil is encountered, it would be excavated, stockpiled, characterized, and transported for disposal at an appropriately licensed facility, as would any other excavated material not planned to be reused on-site. Other materials, including solid wastes excavated (e.g., adjacent to the Haverstraw Landfill) and excavation spoils from the Intake Site could potentially be reused on-site, but only with NYSDEC approval. If additional fill is required for filling activities on the Water Treatment Plant Site, clean fill would be imported.

Minor impacts to aquatic sediments could occur during intake system construction, as discussed above in "Natural Resources." Due to the short-term nature of this disturbance, no significant impact on Hudson River sediment and water quality would be expected.

The SWPPP to be implemented for the Proposed Project would prevent contaminated sediment runoff into nearby water bodies.

Detailed procedures would be incorporated into the Proposed Project's construction documents to govern excavation and other activities that would entail subsurface disturbance, to protect the safety of the public, community residents, and construction workers, as well as the larger environment. A Construction Health and Safety Plan (CHASP) would be prepared to address potential contamination issues identified in the Phase I and Phase II studies and contingency items (e.g., finding unexpected petroleum-contaminated soil) for all Project Sites. The CHASP would describe in detail the health and safety procedures needed to minimize exposure of hazardous materials to workers and the public. The CHASP would include specifications related to the following (for more information, see Chapter 10):

- Health and safety training requirements for workers.
- Procedures for identification and management of known or unexpected contaminated materials that might be encountered during construction.
- Specifications for dust control and air monitoring. During all subsurface disturbance work, dust control measures would be implemented and air quality during subsurface disturbance would be monitored for dust (measured as respirable particulate matter of diameter less than 10 microns—PM_{10}); hydrogen sulfide gas, which is a compound associated with landfills and the gypsum facility; volatile organic compounds (VOCs), which are associated with petroleum or the chlorinated VOCs detected in groundwater; and methane, associated with landfill wastes or natural materials, such as peat. Action levels would be identified, and the appropriate response actions established, which could include increased monitoring and/or corrective actions.
- Requirements for gas monitoring wells. During the construction phase of the Proposed Project, United Water will monitor the existing gas monitoring wells at the Water Treatment Plant Site to monitor for the presence of airborne VOCs and methane gas. Measures would be taken to avoid construction activities in areas if detected airborne methane gas levels exceed the Lower Explosive Limit of 5 percent.
- Specifications for waste management. The CHASP would address procedures for stockpiling, testing, loading, transporting (including truck routes), and properly disposing of all excavated material which would not be reused on-site. All excavated material would be handled and, if required, disposed of properly to comply with federal, state, and local environmental laws.

- Specifications for dewatering. Prior to dewatering, testing would be performed to ensure that the groundwater would meet applicable requirements, whether it was discharged to a municipal stormwater or sewer system, or discharged to the Hudson River. If necessary, pretreatment would be conducted prior to discharge, as required by NYSDEC SPDES permits.

INFRASTRUCTURE

Chapter 11, "Infrastructure," describes the location of water mains, sanitary sewers, storm sewers, electric mains, and natural gas lines serving the Project Sites. During construction of the new intake pumping station on the Intake Site and the new water treatment plant on the Water Treatment Plant Site, temporary disruption to water supply for the nearby areas would be required when service connections are made for the new buildings. This would be a short-term disruption, similar to what occurs for any new building construction. Similar disruptions could also occur to electric service and natural gas. During connections to the sanitary sewer system, no disruptions would be required.

As described earlier in this chapter and in Chapter 2, "Project Description," the Proposed Project would involve upgrades at the JRSTP. These upgrades would be to the effluent system at the plant, and could be made without disturbing the ongoing operations of the JRSTP. Additionally, other construction activities associated with the Proposed Project, including work at the Water Treatment Plant Site and installation of the raw water transmission pipe near the JRSTP, would not require disruptions to the ongoing operation of the JRSTP.

The SWPPP to be prepared and implemented for construction of the Proposed Project would include erosion and sediment control measures, and stormwater management measures. This is discussed earlier in this chapter under "Natural Resources."

TRAFFIC AND TRANSPORTATION

During construction of the Proposed Project, construction-related traffic would be added to the local roadways. As described above in section B of this chapter, construction would occur at the Intake Site and Water Treatment Plant at the same time. During this period, the new raw water transmission lines would also be installed beneath Beach Road.

CONSTRUCTION-RELATED TRAFFIC VOLUMES

Table 15-3 summarizes the assumptions about construction-related traffic during simultaneous construction on the Intake Site and Water Treatment Plant Site that were used for the traffic analysis. Additional details are provided in Appendix 12.1. The traffic volumes shown in the table were developed for the purposes of performing a conservative (i.e., worst-case) analysis of construction-related traffic impacts. These worst-case numbers of construction trucks and worker vehicle trips for the Intake Site and Water Treatment Plant Site are therefore conservatively high and do not reflect the level of construction activity on a typical day-to-day basis, which would be less. The number of vehicles associated with construction work on the raw water transmission line would be smaller, and would be within the total estimated for the other two Project Sites.

Table 15-3
Daily and Peak Hour
Project-Generated Construction Traffic

Item	Intake Site	Water Treatment Plant Site	Combined Construction Traffic
Daily Trips			
Delivery Trucks	3 – 5	3 – 5	6 – 10
Concrete Trucks	40 maximum (8 – 10 average)	40 maximum (8 – 10 average)	80 maximum (16 – 20 average)
Dump Trucks	50 loads	50 loads	100 loads
Total Trucks	93 – 95	93 – 95	186 – 190
Total Truck Trips (Round-Trip)	186 – 190	186 – 190	372 – 380
Construction Worker Trips	75	150	225
Peak-Hour Trips			
Truck Trips (Round-Trip)*	38	38	76
Construction Worker Trips**	75	150	225
Total Peak-Hour Trips*	**113 trips**	**188 trips**	**301**

Notes: * The analysis assumes that 20 percent of the total truck trips occur during the peak hour.
** The analysis assumes that all construction worker trips occur during the peak hour.

While construction-related truck deliveries may be scheduled to avoid peak traffic conditions, this analysis assumes that 20 percent of the deliveries would arrive during the peak hour. Typically, construction workers are on-site before the regular commuter peak hour and frequently work a 7:00 AM to 4:00 PM shift; however, the analysis conservatively assumes that all workers would arrive between 7:00 AM and 8:00 AM, just prior to the observed local roadway peak hour of 8:00 AM to 9:00 AM, and depart during the afternoon peak hour (4:30 PM to 5:30 PM). No major construction activity is anticipated during the weekend periods.

ASSIGNMENT OF SITE-GENERATED TRAFFIC

Construction traffic would arrive at and depart from the Intake Site via Beach Road. Construction traffic would access the Water Treatment Plant Site via an access drive that connects to Railroad Avenue. This access drive may be located alongside the CSX railroad tracks, at the CSX railroad access drive. Alternatively, it may also be at the northern end of North Wayne or Carol Street.

The routes traveled by construction-related traffic on the local roadways near the Project Sites were estimated based on an evaluation of current traffic patterns in the immediate vicinity of the Project Sites. Based on this evaluation, it is estimated that approximately 65 percent of the total construction-related truck traffic would arrive/depart to the south via US Route 9W, and 35 percent would arriving/departing to the north via US Route 9W. For construction workers, it was assumed that 55 percent would arrive/depart to the south via US Route 9W, 35 percent would arrive/depart to the north via US Route 9W, and 10 percent would use other local roadways.

It is anticipated that all commercial truck and heavy vehicle traffic would be directed to avoid local roadways and follow designated truck routes such as US Route 9W. The analysis also assumes that the Maintenance and Protection of Traffic plans to be implemented for the Project would direct all traffic for the Water Treatment Plant Site via Railroad Avenue from the west, to avoid using Beach Road. Similarly, the MPT plans would direct all traffic for the Intake Site via the route north of the Site, so that construction-related traffic would not use the portion of Beach

Road south of the Intake Site. This would avoid any potential conflicts resulting from the combination of the two Project Sites' traffic on Railroad Avenue, and related to traffic on Beach Road where installation of the raw water pipe would be occurring. It would also avoid possible conflicts with Haverstraw Marina.

No conflicts are anticipated between construction vehicles associated with the Proposed Project and the planned reconstruction of the Farley Bridge on Route 9W at Cedar Pond Brook in the Town of Stony Point, because that reconstruction is scheduled to be completed in summer 2011, before construction of the Haverstraw Water Supply Project would begin.

Figures 15-4 through 15-11 present a breakdown of construction-related site-generated traffic by peak hour and trip type (construction worker and truck trips). Figures 15-12 and 15-13 present total construction-generated traffic for the AM peak hour and PM peak hour, respectively.

2015 TRAFFIC VOLUMES WITH CONSTRUCTION TRAFFIC

Chapter 12 of this DEIS, "Traffic and Transportation," describes the locations near the Project Sites where traffic data were collected for existing conditions and presents the existing and future baseline traffic volumes at those locations. As discussed in Chapter 12, future baseline conditions were estimated by applying an annual growth factor to the existing traffic volumes to account for general background growth and traffic associated with planned and proposed future developments in the area. These estimates were made for the year 2015, the latest construction year for the Proposed Project. The peak year of construction activity would likely be 2014, when all elements of the Proposed Project could be under construction together, but the use of 2015 background traffic volumes results in a more conservative analysis, since those volumes are higher.

The projected site-generated traffic volumes were added to the 2015 No Build traffic volumes to create the 2015 Build traffic volumes, which are shown in Figures 15-14 and 15-15 for the AM peak hour (7 AM to 8 AM) and PM peak hour (4:30 PM to 5:30 PM), respectively. Project Site-generated traffic for the construction period during the AM and PM peak hours would be approximately 188 trips for the water treatment plant and 113 trips for the water intake pumping station.

CAPACITY ANALYSIS METHODOLOGY

Procedures have been established by the Transportation Research Board through which roadway segments and intersections can be tested to determine their ability to accommodate traffic volumes. These procedures are described in this section.

The capacity analyses for the study area intersections are based on the methodologies described in the *2000 Highway Capacity Manual (HCM)*, and use Synchro Software, Version 6 (Build 614) to determine the levels of service (LOS), a qualitative measure of an intersection's function based on the amount of vehicle delays. Table 15-4 summarizes the relationship between LOS and delay at intersections.

MAPS PULLED FROM:

Case: 06-W-0131

Date: 10/2/08 (of)

Specific:

- ☐ Brief
- ☐ Comment
- ☐ Correspondence
- ☐ Exhibit
- ☐ Order
- ☐ Petition
- ☐ Plan
- ☐ Report

Map # 4758

Table 15-4
Level of Service (LOS) Criteria For Intersections

Level-of-Service (LOS)	Signalized Intersection Average Total Control Delay (seconds/vehicle)	Unsignalized Intersection Average Total Control Delay (seconds/vehicle)
A	≤10	≤10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

Source: *Highway Capacity Manual.* Transportation Research Board. Washington, DC. 2000.

LOS A represents ideal conditions. LOS F represents conditions characterized by long delays and traffic operational breakdowns at the signalized intersection. LOS B, C, D, and E are the gradual increments between ideal conditions (LOS A) and traffic operational breakdown conditions (LOS F). A further description of LOS is as follows:

LOS A describes operations with low control delay, up to 10 seconds per vehicle. This LOS occurs when progression is extremely favorable and most vehicles arrive at the intersection during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.

LOS B describes operations with control delay greater than 10 and up to 20 seconds per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of delay.

LOS C describes operations with control delay greater than 20 and up to 35 seconds per vehicle. These higher delays may result from only fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. Cycle failure occurs when a given green phase does not serve queued vehicles, and overflows occur. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

LOS D describes operations with control delay greater than 35 and up to 55 seconds per vehicle. At this level, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, and high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

LOS E describes operations with control delay greater than 55 and up to 80 seconds per vehicle. These higher delay values generally indicate poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent.

LOS F describes operations with control delay in excess of 80 seconds per vehicle. This is considered unacceptable to most drivers, and often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of lane groups. It may also occur at high volume-to-capacity ratios with many individual cycle failures. Poor progression and long cycle lengths may also contribute significantly to high delays.

For the unsignalized intersections, delay is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line: LOS A describes operations with very low delay; LOS B, LOS C, and LOS D describe operations with delays which are considered to be acceptable. LOS F describes operation with delays in excess of 50 seconds per vehicle, which is considered unacceptable to most drivers. This condition exists when there are insufficient gaps of suitable size to allow side street traffic to cross safely through a major vehicular traffic stream.

CAPACITY ANALYSIS BY INTERSECTION

A capacity analysis was conducted for the weekday AM and PM peak hours to assess Project-related traffic impacts during the construction period. Representative intersections were selected where Project-generated trips would occur.

For informational purposes, a capacity analysis was also conducted for the existing and No Build conditions for the Saturday midday peak hour. However, no construction activity is anticipated for the weekend periods, so that information is not presented in this chapter. The results of the capacity analyses are discussed below. More information on the analyses, as well as on the Saturday analyses conducted, is provided in Appendix 12.1.

East Main Street (CR 108)/Grassy Point Road and Beach Road/Ba Mar Drive

This four-legged intersection is a two-way stop-sign controlled intersection. Ba Mar Drive forms the northbound approach and Beach Road forms the southbound approach, with the eastbound leg formed by East Main Street and westbound leg formed by Grassy Point Road. The northbound approach provides one shared left-turn/through/right-turn lane and the southbound approach provides one shared left-turn/through lane and a channelized right-turn lane separated by a gore. The eastbound and westbound approaches provide one shared left-turn/through/right-turn lane.

The existing, No Build, and Build capacity analyses are presented in Table 15-5.

As shown in the table, the construction-related traffic associated with the Proposed Project would result in minimal delays to this intersection during the AM and PM peak hours and all movements would continue to operate at LOS B or better. The estimated change in operating conditions under the Build Condition is summarized as follows:

- Weekday AM peak hour: The eastbound approach would change from LOS A to LOS B, with an increase in delay of 2.5 seconds, from 8.3 seconds to 10.8 seconds.
- Weekday PM peak hour: The eastbound approach would changes from LOS A to LOS B, with an increase in delay of 1.6 seconds, from 9.5 seconds to 11.1 seconds.

Table 15-5
East Main Street (CR 108)/Grassy Point Road and Ba Mar Drive/Beach Road (CR 110)—Unsignalized Intersection

Movement	2008 Existing		2015 No Build		2015 Build	
	LOS	Delay	LOS	Delay	LOS	Delay
Weekday AM Peak Hour						
BA MAR DRIVE						
Northbound LTR	A	8.2	A	8.3	A	9.0
BEACH ROAD						
Southbound LT	A	7.9	A	8.0	A	8.5
Southbound R	A	6.3	A	6.3	A	6.3
EAST MAIN STREET						
Eastbound LTR	A	8.1	A	8.3	B	10.8
GRASSY POINT ROAD						
Westbound LTR	A	8.1	A	8.2	A	8.8
OVERALL	**A**	**8.0**	**A**	**8.2**	**B**	**9.8**
Weekday PM Peak Hour						
BA MAR DRIVE						
Northbound LTR	A	8.7	A	8.9	A	9.3
BEACH ROAD						
Southbound LT	A	8.9	A	9.1	A	9.5
Southbound R	A	6.2	A	6.3	A	6.3
EAST MAIN STREET						
Eastbound LTR	A	9.0	A	9.3	A	9.9
GRASSY POINT ROAD						
Westbound LTR	A	9.7	B	10.1	B	12.6
OVERALL	**A**	**9.2**	**A**	**9.5**	**B**	**11.1**

Notes:
Delays are measured in seconds per vehicle.
Overall delay at unsignalized intersection is based upon the critical approach.

US Route 9W and Main Street (CR 108)

This four-legged intersection is controlled by an actuated traffic signal. US Route 9W forms the northbound and southbound approaches of this intersection, with the eastbound and westbound formed by Main Street. The northbound and southbound approaches provide one shared left-turn/through/right-turn lane. The eastbound approach provides one shared left-turn/through/ right-turn lane and the westbound approach provides one shared through/right-turn lane and a left-turn lane.

The existing, No Build, and Build capacity analyses are presented in Table 15-6.

Table 15-6
US Route 9W and Main Street (CR 108)—Signalized Intersection

Movement	2008 Existing		2015 No Build		2015 Build	
	LOS	Delay	LOS	Delay	LOS	Delay
Weekday AM Peak Hour						
US ROUTE 9W						
Northbound LTR	A	6.0	A	7.0	A	8.1
Southbound LTR	A	7.7	A	9.3	B	12.2
WEST MAIN STREET						
Eastbound LTR	A	9.4	A	9.0	B	10.5
EAST MAIN STREET						
Westbound TR	B	19.5	B	19.4	B	18.6
Westbound L	C	31.6	C	32.5	D	36.2
OVERALL	**B**	**10.3**	**B**	**11.4**	**B**	**13.4**
Weekday PM Peak Hour						
US ROUTE 9W						
Northbound LTR	A	9.5	B	10.8	B	13.3
Southbound LTR	A	6.5	A	6.9	A	7.9
WEST MAIN STREET						
Eastbound LTR	C	20.3	C	21.2	B	19.4
EAST MAIN STREET						
Westbound TR	B	14.3	B	14.2	B	13.1
Westbound L	C	32.8	C	34.8	D	44.2
OVERALL	**B**	**12.1**	**B**	**13.1**	**B**	**15.7**

Note: Delays are measured in seconds per vehicle.

As shown in the table, the overall intersection delay would increase minimally during the AM and PM peak hours under the Build condition and all approaches and movements would operate at LOS D or better. The estimated change in operating conditions under the Build condition is summarized as follows:

- Weekday AM peak hour
  - The southbound approach would change from LOS A to LOS B, with an increase in delay of 2.9 seconds, from 9.3 seconds to 12.2 seconds.
  - The westbound approach would change from LOS C to LOS D, with an increase in delay of 3.7 seconds, from 32.5 seconds to 36.2 seconds.
- Weekday PM peak hour
  - The left turn movement in the westbound approach would change from LOS C to LOS D, with an increase in delay of 9.4 seconds, from 34.8 seconds to 44.2 seconds.

The delay observed in the southbound approach during the AM peak hour would result from the construction worker trips and truck trips from the north headed to Railroad Avenue to reach the Water Treatment Plant Site. The increase in delay in the westbound approach during the PM peak hour can be attributed to the additional construction worker trips and truck trips coming from the Intake Site east of the intersection.

US Route 9W and Washburns Lane (CR 100)

US Route 9W forms the northbound and southbound approaches of this intersection, and the Washburns Lane forms the eastbound and westbound legs to this four-legged, two-way, unsignalized intersection. The northbound and southbound approaches provide one shared through/right-turn lane and one left-turn only shared travel lane. The eastbound and westbound approaches provide one shared left-turn/through/right-turn lane.

The existing, No Build, and Build capacity analyses are presented in Table 15-7. As shown in the table, the overall intersection delay would minimally increase during the AM and PM peak hours under the Build condition and all movements would operate at LOS D or better. The estimated change in operating conditions under the Build Condition is summarized as follows:

- Weekday AM peak hour: The eastbound approach would change from LOS C to LOS D, with an increase in delay of 6.7 seconds, from 24.2 seconds to 30.9 seconds.
- Weekday PM peak hour: The overall intersection would experience a change from LOS A to LOS B, with an increase in delay of 0.3 seconds, from 2.6 seconds to 2.9 seconds.

Table 15-7

US Route 9W and Washburns Lane (CR 100)—Unsignalized Intersection

Movement	2008 Existing		2015 No Build		2015 Build	
	LOS	Delay	LOS	Delay	LOS	Delay
Weekday AM Peak Hour						
US ROUTE 9W						
Northbound TR	A	0.0	A	0.0	A	0.0
Northbound L	A	9.7	A	9.7	A	9.9
US ROUTE 9W						
Southbound TR	A	0.0	A	0.0	A	0.0
Southbound L	A	8.1	A	8.2	A	8.4
WASHBURNS LANE						
Eastbound LTR	C	21.3	C	24.2	D	30.9
Westbound LTR	C	17.6	C	18.8	C	21.4
OVERALL	**A**	**2.5**	**A**	**2.8**	**A**	**3.8**
Weekday PM Peak Hour						
US ROUTE 9W						
Northbound TR	A	0.0	A	0.0	A	0.0
Northbound L	A	8.8	A	9.0	A	9.3
US ROUTE 9W						
Southbound TR	A	0.0	A	0.0	A	0.0
Southbound L	A	9.1	A	9.3	A	9.5
WASHBURNS LANE						
Eastbound LTR	C	23.4	D	27.0	D	31.8
Westbound LTR	C	20.6	C	22.2	C	24.8
OVERALL	**A**	**2.3**	**a**	**2.6**	**B**	**2.9**

Notes:
Delays are measured in seconds per vehicle.
Overall delay at unsignalized intersection is based upon the critical approach.

US Route 9W and Filors Lane (CR 98)

This four-legged intersection is controlled by an actuated traffic signal. US Route 9W forms the northbound and southbound approaches of this intersection, with the eastbound and westbound formed by Filors Lane. The northbound and southbound approaches provide one shared through/ right-turn lane and a left-turn lane. The eastbound approach provides one shared left-turn/ through lane and a right-turn lane, and the westbound approach provides one shared left-turn/ through/right-turn travel lane.

The existing, No Build, and Build capacity analyses are presented in Table 15-8. As shown in the table, the overall intersection delay would increase minimally during the AM and PM peak hours under the Build condition and all movements would continue to operate at LOS D or better.

Table 15-8
US Route 9W and Filors Lane (CR 98)—Signalized Intersection

Movement	2008 Existing		2015 No Build		2015 Build	
	LOS	Delay	LOS	Delay	LOS	Delay
Weekday AM Peak Hour						
US ROUTE 9W						
Northbound TR	A	6.0	A	6.2	A	6.9
Northbound L	A	4.2	A	4.2	A	4.8
US ROUTE 9W						
Southbound TR	B	10.7	B	13.5	B	15.9
Southbound L	A	3.7	A	3.8	A	3.9
FILORS LANE						
Eastbound LT	C	24.7	C	25.4	C	26.1
Eastbound R	A	8.6	A	8.5	A	8.3
Westbound LTR	B	16.3	B	16.2	B	16.1
OVERALL	**A**	**9.5**	**B**	**10.9**	**B**	**12.3**
Weekday PM Peak Hour						
US ROUTE 9W						
Northbound TR	A	6.9	A	7.4	A	8.0
Northbound L	A	4.6	A	5.0	A	5.8
US ROUTE 9W						
Southbound TR	B	10.6	B	11.3	B	12.8
Southbound L	A	4.6	A	4.7	A	4.7
FILORS LANE						
Eastbound LT	C	34.5	D	37.3	D	37.4
Eastbound R	A	7.9	A	7.8	A	7.8
Westbound LTR	B	15.9	B	16.1	B	16.1
OVERALL	**B**	**10.8**	**B**	**11.5**	**B**	**12.1**

Notes: Delays are measured in seconds per vehicle.

US Route 9W and Railroad Avenue (CR 94)

This four-legged intersection is controlled by a fully actuated traffic signal. US Route 9W forms the northbound and southbound approaches of this intersection, with the eastbound and westbound formed by Railroad Avenue. The northbound and southbound approaches provide one through lane, one left-turn lane and one right-turn lane. The eastbound and the westbound approaches provide one shared through/right-turn lane and a left-turn travel lane.

The existing, No Build, and Build capacity analyses are presented in Table 15-9.

Table 15-9
US Route 9W and Railroad Avenue (CR 94)—Signalized Intersection

Movement	2008 Existing		2015 No Build		2015 Build	
	LOS	Delay	LOS	Delay	LOS	Delay
Weekday AM Peak Hour						
US ROUTE 9W						
Northbound L	C	20.1	C	26.1	C	29.5
Northbound T	B	19.0	C	20.9	C	23.7
Northbound R	B	16.9	B	17.8	C	21.0
US ROUTE 9W						
Southbound L	B	13.0	B	14.3	B	18.9
Southbound T	C	23.7	C	27.6	C	30.6
Southbound R	B	16.8	B	17.5	B	18.2
RAILROAD AVENUE						
Eastbound TR	D	52.2	E	55.0	E	61.4
Eastbound L	C	23.3	C	23.4	C	23.0
Westbound TR	D	51.3	D	46.6	D	46.2
Westbound L	C	30.4	C	31.7	D	36.2
OVERALL	**C**	**30.9**	**C**	**32.6**	**C**	**34.8**
Weekday PM Peak Hour						
US ROUTE 9W						
Northbound L	B	17.4	B	19.5	C	22.5
Northbound T	C	26.3	C	30.2	C	32.4
Northbound R	B	17.9	B	18.6	B	19.5
US ROUTE 9W						
Southbound L	C	21.0	C	26.3	C	30.7
Southbound T	C	22.4	C	23.5	C	26.1
Southbound R	B	17.7	B	18.0	B	18.6
RAILROAD AVENUE						
Eastbound TR	D	46.9	D	47.4	D	47.4
Eastbound L	C	32.4	C	33.5	C	32.0
Westbound TR	E	60.6	E	71.1	F	138.5
Westbound L	C	28.7	C	30.6	D	46.2
OVERALL	**C**	**32.9**	**D**	**36.5**	**D**	**53.2**

Notes: Delays are measured in seconds per vehicle.

As shown in the table, the overall intersection delay would increase moderately during the AM and PM peak hours under the Build Condition. The estimated change in operating conditions under the Build condition is summarized as follows:

- Weekday AM peak hour
  - The northbound right-turn movement would change from LOS B to LOS C, with an increase in delay of 3.2 seconds, from 17.8 seconds to 21.0 seconds.
  - The westbound left-turn movement would change from LOS C to LOS D, with an increase in delay of 4.5 seconds, from 31.7 seconds to 36.2 seconds.

- Weekday PM peak hour
  - The northbound left-turn movement would change from LOS B to LOS C, with an increase in delay of 3.0 seconds, from 19.5 seconds to 22.5 seconds.
  - The westbound through/right-turn movement would change from LOS E to LOS F, with an increase in delay of 52.6 seconds, from 71.1 seconds to 138.5 seconds.
  - The westbound left-turn movement would change from LOS C to LOS D, with an increase in delay of 15.6 seconds, from 30.6 seconds to 46.2 seconds.

The most significant delays would be in the westbound direction during the PM peak hour. It should be noted that the increase in delay is less than one minute and the overall LOS for the intersection would remain LOS D.

Railroad Avenue (CR 94) and Wayne Avenue

Wayne Avenue forms the northbound and southbound approaches of this intersection, and Railroad Avenue forms the eastbound and westbound legs to this four-legged, unsignalized intersection. All approaches provide one shared left-turn/through/right-turn lane. The existing, No Build, and Build capacity analyses are presented in Table 15-10. No Project-related trips were assumed to travel on Wayne Avenue for this analysis, so the intersection would operate at the same level of service (LOS A) in the Build condition as in the No Build condition. This analysis is provided for informational purposes.

Table 15-10
Railroad Avenue and Wayne Avenue—Unsignalized Intersection

Movement	2008 Existing		2015 No Build		2015 Build	
	LOS	Delay	LOS	Delay	LOS	Delay
Weekday AM Peak Hour						
WAYNE AVENUE						
Northbound LTR	A	7.9	A	7.9	A	7.9
Southbound LTR	A	7.3	A	7.3	A	7.3
RAILROAD AVENUE						
Eastbound LTR	A	8.0	A	8.1	A	8.1
Westbound LTR	A	8.0	A	8.0	A	8.0
OVERALL	**A**	**7.8**	**A**	**7.9**	**A**	**7.9**
Weekday PM Peak Hour						
WAYNE AVENUE						
Northbound LTR	A	8.2	A	8.3	A	8.3
Southbound LTR	A	7.4	A	7.5	A	7.5
RAILROAD AVENUE						
Eastbound LTR	A	8.3	A	8.4	A	8.4
Westbound LTR	A	8.0	A	8.1	A	8.1
OVERALL	**A**	**8.1**	**A**	**8.3**	**A**	**8.3**

Notes:
Delays are measured in seconds per vehicle.
Overall delay at unsignalized intersection is based upon the critical approach.

SUMMARY OF IMPACTS AND MITIGATION

Table 15-11 summarizes the results of the capacity analyses conducted for each intersection included in this study.

Table 15-11
Overall Traffic Level of Service Summary

Intersection	Weekday AM Peak Hour (LOS / Delay)			Weekday PM Peak Hour (LOS / Delay)		
	Existing	No Build	Build	Existing	No Build	Build
East Main Street /Grassy Point Road & Ba Mar Drive /Beach Road—Unsignalized	A/8.0	A/8.2	A/9.8	A/9.2	A/9.5	B/11.1
US Route 9W & Main Street—Signalized	B/10.3	B/11.4	B/13.4	B/12.1	B/13.1	B/15.7
US Route 9W & Washburns Lane—Unsignalized	A/2.5	A/2.8	a/3.8	A/2.3	A/2.6	B/2.9
US Route 9W & Filors Lane—Signalized	A/9.5	B/10.9	B/12.3	B/10.8	B/11.5	B/12.1
Railroad Avenue & US Route 9W—Signalized	C/30.9	C/32.6	C/34.8	C/32.9	D/36.5	D/53.2
Railroad Avenue & Wayne Avenue—Unsignalized	A/7.8	A/7.9	A/7.9	A/8.1	A/8.3	A/8.3

Notes:
Delays are measured in seconds per vehicle.
Overall delay at unsignalized intersections is based upon the critical approach.

The results of the capacity analyses indicate that all intersections would operate at an overall acceptable Level of Service of D or better during the construction period (Build condition). However, the following intersection approach movements would experience a drop in LOS:

Signalized Intersections

- The westbound East Main Street left-turn movement at US Route 9W would drop from LOS C (delay = 31.6 seconds per vehicle) to LOS D (delay = 36.2 seconds per vehicle) during the weekday AM peak hour, and from LOS C (delay = 34.8 seconds per vehicle) to LOS D (delay = 44.2 seconds per vehicle) during the weekday PM peak hour.
- The westbound Railroad Avenue shared through/right movement at US Route 9W would drop from LOS E (delay = 71.1 seconds per vehicle) to LOS F (delay = 138.5 seconds per vehicle) during the weekday PM peak hour.

Unsignalized Intersections

- The eastbound Washburns Lane shared left/through/right movement at US Route 9W would drop from LOS C (delay = 24.2 seconds per vehicle) to LOS D (delay = 30.9 seconds per vehicle) during the weekday AM peak hour. This is an unsignalized intersection.

With minor signal retimings and MPT plan measures implemented at the above intersections, acceptable levels of service could be maintained at each intersection during the construction period. Construction traffic would, however, vary over time as different aspects of construction occur, and therefore these conditions are expected to be temporary in duration during the overall construction period. MPT plan measures would be implemented as needed for any partial temporary road closures that are necessary during construction activities.

In addition to these measures, United Water will investigate the possibility of delivering construction materials to the Water Treatment Plant Site via rail, using the adjacent CSX freight rail line. This would reduce the number of truck trips necessary to b ring materials to the Site.

MAINTENANCE AND PROTECTION OF TRAFFIC PLANS

During the three-year-long construction period for Phase 1 of the Proposed Project, Maintenance and Protection of Traffic plans would be in place to manage construction-related traffic. The MPT plans could include such measures as the following:

- Designated routes to be used by construction traffic, to route construction vehicles to the Water Treatment Plant Site via Railroad Avenue west of the Site and to the Intake Site via routes north of that Site. This would avoid any potential conflicts resulting from the combination of the two Project Sites' traffic on Railroad Avenue, and related to traffic on Beach Road where installation of the raw water pipe would be occurring. It would also avoid possible conflicts with Haverstraw Marina.
- Traffic routing on Beach Road when the raw water transmission line is being installed, to maintain traffic on that road.
- Potential monitoring of construction traffic along Railroad Avenue, and if warranted, use of flag personnel to ensure that construction traffic does not block the unsignalized intersections with side streets on Railroad Avenue east of Route 9W.

PUBLIC TRANSPORTATION

As discussed in Chapter 12, bus stops are located along U.S. Route 9W at the southwest and southeast corners of Filors Lane and U.S. Route 9W. With implementation of the MPT plan during construction of the Proposed Project, potential delays to bus traffic would be mitigated.

RAIL TRANSPORTATION

No significant adverse impacts to CSX railroad operations are anticipated as a result of construction activities associated with the Proposed Project. As described earlier in this chapter, at locations where new water mains must cross beneath the CSX railroad right-of-way, it is anticipated that the mains would be laid using "jacking and boring," a construction technique that allows installation of short segments of water mains without excavation. Other construction activities at the Water Treatment Plant Site would not affect operations of the railroad.

WATERBORNE TRANSPORTATION

Construction of the Proposed Project would include a four- to five-month period of in-water construction that could result in minor and temporary re-direction of recreational and commercial vessels. Construction of the raw water intake structure would take place 1,000 to 1,200 feet offshore of the Intake Site. This location would be outside of the Federal Navigation Channel, which is maintained to a depth of 32 feet below mean low water. It is expected that the U.S. Coast Guard would issue a Notice to Mariners during the construction work in the Hudson River. Temporary re-direction of small commercial and recreational vessels away from the in-river construction area is not expected to result in any indirect impacts to navigation in the vicinity of the intake. Recreational vessel traffic into and out of the local marinas in Haverstraw Bay and Minisceongo Creek would not be interrupted as a result of the construction of the intake.

The presence of the in-water construction activities also would not adversely affect U.S. Gypsum's waterborne operations, including the delivery of materials to their pier nearby. Boats arriving at and departing from U.S. Gypsum's pier would not be close enough to the proposed intake location to be adversely affected by it, nor would it be adversely affected by their operations.

NOISE

CONSTRUCTION-RELATED NOISE

Construction of the Proposed Project would result in noise impacts generated by the operation of construction equipment, and from construction-related vehicles and delivery vehicles traveling to and from the Project Sites. Noise levels caused by construction activities can vary widely, depending on the phase of construction and the location of the construction relative to receptor locations. The most significant construction noise sources are expected to be impact equipment such as pile driver cranes, excavators, and paving breakers, as well as the movements of trucks and other construction-related vehicles.

As described earlier in this chapter, construction activities generally would take place in accordance with Town of Haverstraw Zoning Code § 167-40 regulations, which permit construction, blasting, drilling, and demolition between the hours of 7:00 AM and 7:00 PM on weekdays, and from 8:00 AM to 5:00 PM on Saturdays.

Noise Analysis Methodology

A quantified construction noise analysis was performed. This analysis consisted of two parts: one that considered the effects of construction activities on the Project Sites and a second that considered the noise related to construction-generated vehicular traffic. The first part of the analysis was conducted using the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM), Version 1.0,[1] and the second part used proportional modeling techniques.

Noise levels at a given location depend on the kind and number of pieces of construction equipment being operated; the amount of time the equipment is in use; the distance from the construction site to "sensitive" receptors (i.e., noise-sensitive land uses, such as residences, schools, and parks); the effects of topography; and any shielding effects for those sensitive uses due to intervening structures that can block the construction noise. Similarly, noise from "mobile sources"—i.e., from construction-related traffic—depends on the noise emission levels of the type of vehicle (e.g., auto, light-duty truck, heavy-duty truck, bus, etc.), the vehicular speed, the distance between the roadway and the receptor, topography and ground effects; and shielding.

The construction noise analysis looked at "worst-case" conditions (i.e., the conditions which would have the potential for producing the maximum noise levels) for construction of the three primary components of the Proposed Project separately—the intake pumping facility, the raw water transmission line, and the water treatment plant. Noise from the operation of construction equipment on-site at a specific receptor location near a construction site was calculated by computing the sum of the noise produced by all pieces of equipment operating at the construction site. The noise receptor locations evaluated in the analysis are shown in

[1] The RCNM if the Federal Highway Administration's national model for the prediction of construction noise, and is a state-of-the-art analysis for noise analysis.

Figure 15-16. Assumptions about the equipment to be used and their noise generation were provided by Black & Veatch. Noise analyses were performed to determine maximum one-hour equivalent ($L_{eq(1)}$) noise levels that would be expected to occur during construction of each of the three components of Phase 1 of the Proposed Project separately.

The purpose of this analysis was to determine the magnitude of the "worst case" noise produced by construction activities, to determine if these noise levels would result in significant adverse noise impacts, and if so, to examine the feasibility of implementing mitigation measures to reduce or eliminate such impacts.

Construction Noise Impact Criteria

There are no standardized criteria for assessing construction-related noise impacts. The determination of the significance of Project-generated noise depends on the land use affected by the activities, the magnitude of the change in noise level, the existing and resulting noise level, and the duration of the change in noise level. For purposes of this analysis, significant impacts were identified if the same noise criteria as used for operational noise impacts (discussed in Chapter 13, "Noise and Vibration") were predicted to be exceeded for two years or more. Therefore, the impact criteria used in this analysis is as follows: An increase of more than 6.0 dBA in ambient $L_{eq(1)}$ noise levels that produces ambient noise levels of more than 65 dBA at residences or 79 dBA at industrial or commercial areas was considered a significant increase in noise levels; and if this increase would occur for 2 years of more, it would be considered a significant impact.

Construction Noise: Intake Site Construction Activities

The nearest noise-sensitive receptor to the Intake Site is a residence, immediately adjacent to the Site along River Road. As described in Chapter 13, existing daytime $L_{eq(1)}$ noise level at this location during typical construction hours range from approximately 56 to 71 dBA (see Table 13-4 in Chapter 13). Table 15-12, below, provides the predicted noise levels at this noise receptor for the noisiest month during each three-month (quarter) period of the Proposed Project's 18 months of construction on the Intake Site for the river water intake system and intake pumping station. The construction noise levels shown in the table are conservative (i.e., high), because they do not reflect shielding and topographical effects.

As shown in Table 15-12, during the quieter hours of the day, maximum on-site construction activities would significantly increase ambient noise levels and produce noise increases that would, in some cases more than double existing ambient noise levels, and be noisy and intrusive at the nearby residences on Beach Road. However, during hours when ambient noise levels are high and/or at locations further from the Intake Site of construction activities, these same maximum on-site construction activities would result in insignificant noise increases.

During the quieter hours of the day and at the closest receptor location locations, maximum construction activities would produce $L_{eq(1)}$ noise levels which would increase existing ambient noise levels by more than 6 dBA, and increase noise levels at residences to more than 65 dBA, resulting in significant increases. However, these increases would occur for less than two years. Consequently, the activities related to construction on the Intake Site would not result in any significant adverse noise impacts.

MAPS PULLED FROM:

Case: 06-W-0131

Date: 10/2/08 (of)

Specific:

- ☐ Brief
- ☐ Comment
- ☐ Correspondence
- ☐ Exhibit
- ☐ Order
- ☐ Petition
- ☐ Plan
- ☐ Report

Map # 59

Table 15-12
Predicted Maximum $L_{eq(1)}$ Noise Levels (in dBA)
at Nearest Sensitive Receptors
Due to Construction at the Intake Site

Quarter	Maximum Construction $L_{eq(1)}$ [1]	Lowest Ambient $L_{eq(1)}$ [2]	Total $L_{eq(1)}$ [3]	Increase $L_{eq(1)}$ [4]	Highest Ambient $L_{eq(1)}$ [5]	Total $L_{eq(1)}$ [6]	Increase $L_{eq(1)}$ [7]
1	67	56	67	11	71	73	2
2	64	56	64	8	71	72	1
3	69	56	69	13	71	73	2
4	71	56	71	15	71	74	3
5	71	56	71	15	71	74	3
6	72	56	72	16	71	75	4

Notes:
1. The maximum predicted $L_{eq(1)}$ noise levels due to on-site construction activities;
2. The lowest existing ambient $L_{eq(1)}$ noise levels during the hours when construction is taking place;
3. The lowest total $L_{eq(1)}$ noise levels with construction (i.e., the sum of construction and existing lowest noise levels);
4. The increase in $L_{eq(1)}$ noise levels due to construction (i.e., the difference between future total noise levels with construction and existing lowest noise levels);
5. The highest existing ambient $L_{eq(1)}$ noise levels during the hours when construction is taking place;
6. The highest total $L_{eq(1)}$ noise levels with construction (i.e., the sum of construction and existing highest noise levels); and
7. The increase in $L_{eq(1)}$ noise levels due to construction (i.e., the difference between future total noise levels with construction and existing highest noise levels).

Construction Noise: Raw Water Transmission Line

The new raw water transmission line may affect noise sensitive receptors located along its route, which include residences along Beach Road and Haverstraw Bay Park, near Beach Road and Gagan Avenue. The nearest noise-sensitive receptor to the water main construction (approximately 10 feet away) is a residence located on Beach Road at Ecology Lane. Two other noise-sensitive receptors were also considered: the residence on Beach Road just north of the Intake Site and a residence on Benson Street near the corner of Railroad Avenue. (Both of these residences are located further from the route of the proposed raw water transmission line.) As described in Chapter 13, existing daytime $L_{eq(1)}$ noise level at these locations during typical construction hours range from approximately 52 to 61 dBA (see Table 13-4). Analyses were conducted to determine noise-related impacts when the closest piece of construction equipment would be operating adjacent to the residence and when the closest piece of construction equipment is operating at a distance of approximately 300 feet from the residence. The results of the analysis are shown in Table 15-13. The analysis also assumed equipment is spaced at 25-foot intervals and conservatively did not account for shielding and topographical effects.

Table 15-13
Predicted Maximum $L_{eq(1)}$ Noise Levels (in dBA)
at Nearest Sensitive Receptors
Due to Construction of Raw Water Transmission Line

Residence Location	Distance	Maximum Construction $L_{eq(1)}$ [1]	Lowest Ambient $L_{eq(1)}$ [2]	Total $L_{eq(1)}$ [3]	Increase $L_{eq(1)}$ [4]	Highest Ambient $L_{eq(1)}$ [5]	Total $L_{eq(1)}$ [6]	Increase $L_{eq(1)}$ [7]
Beach Rd at Ecology Ln	Adjacent	91	52	91	39	61	91	30
	300 Feet	67	52	67	15	61	68	7
Beach Rd near Intake Site	Adjacent	81	56	81	25	71	81	10
	300 Feet	67	56	67	11	71	72	1
Benson St near Railroad Ave	Adjacent	76	49	77	28	75	79	4
	300 Feet	67	49	67	18	75	76	1

Notes:
1 The maximum predicted $L_{eq(1)}$ noise levels due to on-site construction activities;
2 The lowest existing ambient $L_{eq(1)}$ noise levels during the hours when construction is taking place;
3 The lowest total $L_{eq(1)}$ noise levels with construction (i.e., the sum of construction and existing lowest noise levels);
4 The increase in $L_{eq(1)}$ noise levels due to construction (i.e., the difference between future total noise levels with construction and existing lowest noise levels);
5 The highest existing ambient $L_{eq(1)}$ noise levels during the hours when construction is taking place;
6 The highest total $L_{eq(1)}$ noise levels with construction (i.e., the sum of construction and existing highest noise levels); and
7 The increase in $L_{eq(1)}$ noise levels due to construction (i.e., the difference between future total noise levels with construction and existing highest noise levels).

As shown in Table 15-13, construction for the raw water transmission line result in significant increases to ambient noise levels and produce noise increases that would, in some cases, more than double existing ambient noise levels, and be noisy and intrusive at the nearby residences. In addition, the analysis concludes that even when equipment is located 300 feet from away, during some quiet hours of the day construction activities would produce $L_{eq(1)}$ noise levels that would increase existing ambient noise levels by more than 6 dBA, and increase noise levels at residences to more than 65 dBA. However, these increases would only occur for a very limited time period. When construction activities are more than approximately 500 feet from a residence, at most locations, during most hours of the day the increases would be less than 6 dBA. Construction is expected to progress at approximately 40 feet per day, so that the significant noise increases would last only a limited time at any given location. Consequently, based upon the limited duration of the increased noise levels, activities related to construction of the raw water transmission line would not result in any significant noise impacts.

Construction Noise: Water Treatment Plant Construction Activities

The nearest noise sensitive receptors to the Water Treatment Plant Site are the residences on Benson Street west of the Site, across from the CSX freight line. As described in Chapter 13, existing daytime $L_{eq(1)}$ noise levels during typical construction hours at these residences range from approximately 49 to 75 dBA (see Table 13-4). Table 15-14, below, provides the predicted noise levels at the nearest residence on Benson Street, for the noisiest month during each three-month time (quarter) period of the Proposed Project's three-year construction period. The construction noise levels shown in the table are conservative (i.e., high), because they do not reflect shielding and topographical effects.

Table 15-14
Predicted Maximum $L_{eq(1)}$ Noise Levels (in dBA)
at Nearest Sensitive Receptors
Due to Construction at the Water Treatment Plant Site

Quarter	Maximum Construction $L_{eq(1)}$ [1]	Lowest Ambient $L_{eq(1)}$ [2]	Total $L_{eq(1)}$ [3]	Increase $L_{eq(1)}$ [4]	Highest Ambient $L_{eq(1)}$ [5]	Total $L_{eq(1)}$ [6]	Increase $L_{eq(1)}$ [7]
1	71	49	71	22	75	77	2
2	83	49	83	34	75	84	9
3	83	49	83	34	75	84	9
4	83	49	83	34	75	84	9
5	83	49	83	34	75	83	8
6	69	49	69	20	75	76	1
7	62	49	62	13	75	75	0
8	64	49	64	15	75	75	0
9	63	49	63	14	75	75	0
10	63	49	63	14	75	75	0

Notes:
1 The maximum predicted $L_{eq(1)}$ noise levels due to on-site construction activities;
2 The lowest existing ambient $L_{eq(1)}$ noise levels during the hours when construction is taking place;
3 The lowest total $L_{eq(1)}$ noise levels with construction (i.e., the sum of construction and existing lowest noise levels);
4 The increase in $L_{eq(1)}$ noise levels due to construction (i.e., the difference between future total noise levels with construction and existing lowest noise levels);
5 The highest existing ambient $L_{eq(1)}$ noise levels during the hours when construction is taking place;
6 The highest total $L_{eq(1)}$ noise levels with construction (i.e., the sum of construction and existing highest noise levels); and
7 The increase in $L_{eq(1)}$ noise levels due to construction (i.e., the difference between future total noise levels with construction and existing highest noise levels).

As shown in Table 15-14, throughout the construction period, during the quieter hours of the day, maximum on-site construction activities would significantly increase ambient noise levels and produce noise increases that would more than double existing ambient noise levels and be noisy and intrusive at the nearby residences on Benson Street. However, during hours when ambient noise levels are high and/or at locations further from the Water Treatment Plant Site (during the 1st, 6th, 7th, 8th, 9th, and 10th quarters), these same maximum on-site construction activities, even at location receptor locations close to the construction site, would not result in significant noise increases.

The results indicate that during the quieter hours of the day and at the closest receptor location locations, maximum construction activities would produce $L_{eq(1)}$ noise levels that would increase existing ambient noise levels by more than 6 dBA, and increase noise levels at residences to more than 65 dBA, and these increases would be significant. However, construction activities would increase ambient noise levels by more than 6 dBA and increase noise levels at residences to more than 65 dBA for a limited time period (less than two years). Consequently, the construction activities on the Water Treatment Plant Site would not result in significant adverse noise impacts.

Off-Site Noise Related to Construction Traffic

As described earlier in this chapter, construction activities associated with the Proposed Project would result in increased vehicular trips to and from the locations where construction activities are taking place. These trips would include equipment and material delivery trips as well as employee and visitor delivery trips. The proportional modeling technique described in Chapter 13 was used to determine whether the projected increase in traffic on critical feeder roadways has the potential for significantly increasing noise levels and resulting in a significant noise impact.

The screening analysis indicated that truck delivery trips—and construction worker trips to a lesser degree—associated with construction of all three principal components of the Proposed Project would, during limited time periods, increase noise levels by more than 6 dBA at receptor locations on roadways with light or moderate traffic volumes. Noise from construction-related vehicles would not affect noise levels at receptor locations on heavily traveled roadways, such as Route 9W, particularly those roadways with high truck volumes.

In particular, construction-related truck and worker trips associated with construction on the Water Treatment Plant Site would increase $L_{eq(1)}$ noise levels at receptor locations along Railroad Avenue by more than 10 dBA during hours of peak truck traffic. This would be expected to occur for approximately 18 months (from approximately from month 3 through month 21 of construction). During the remaining period of construction on the Water Treatment Plant Site, the increase in noise levels would be less than 6 dBA. While these increases in noise levels would be noisy, intrusive, and significant, because the increase in noise level along this route would be less than two years, these increases would not be considered to be a significant impact.

Similarly, construction-related truck and worker trips associated with construction on the Intake Site would increase noise levels at receptor locations along East Main Street/Grassy Point Road/ Beach Road en route to the Intake Site and increase noise levels by more than 10 dBA during hours of peak truck traffic. This would be expected to occur for less than 12 months. While these increases in noise levels would be noisy, intrusive, and significant, because the increase in noise level along this route would be less than two years, these increases would not be considered to be a significant impact.

The same would be true for construction-related truck and worker trips associated with construction of the raw water transmission line. While these increased vehicle trips would result in increases in noise levels at receptor locations on roadways with light to moderate traffic volumes, and while these increases in noise levels would be noisy, intrusive, and significant, because these increases would be of limited duration (less than two years), these increases would not be considered to be a significant impact.

Therefore, it can be concluded that off-site vehicular trips associated with Project construction would, at some locations result in significant increases; however, they would not result in any significant adverse noise impacts.

Noise Reduction Measures

As the design of the Proposed Project advances, options will be explored to determine the effectiveness and practicality of implementing measures to reduce the magnitude of predicted increases in noise due to construction activities. In particular two types of mitigation measures will be explored—source controls and path controls.

In terms of source controls (i.e., measures that reduce noise levels at the source), the feasibility of implementing the following types of measures, which go beyond typical construction techniques, will be examined:

- The use of quieter construction equipment:
- The use of quieter construction procedures: and
- The use, as early in the construction period as practicable, of electrical powered equipment to replace diesel or gas-powered equipment;

In terms of path controls (e.g., placement of equipment, implementation of barriers or enclosures between equipment and sensitive receptors), the following measures will be examined:

- The feasibility and practicability of locating noisy equipment away from and shielded from sensitive receptor locations; and
- The use of noise barriers and acoustical curtains to provide shielding.

CONSTRUCTION-RELATED VIBRATION AND GROUND-BORNE NOISE

All construction activities have the potential to result in vibration levels that may in turn result in structural or architectural damage, and/or annoyance or interference with vibration-sensitive activities. In general, vibratory levels at a receiver are a function of the source strength (which in turn is dependent upon the construction equipment and methods utilized), the distance between the equipment and the receiver, the characteristics of the transmitting medium, and the receiver building construction. Construction equipment operation causes ground vibrations that spread through the ground and decrease in strength with distance. Vehicular traffic, even in locations close to major roadways, typically does not result in perceptible vibration levels unless there are discontinuities in the roadway surface. With the exception of fragile and possibly historically significant structures or buildings, generally construction activities do not reach the levels that can cause architectural or structural damage, but can achieve levels that may be perceptible and annoying in buildings very close to a construction site.

In terms of structural or architectural damage, with the exception of construction of the raw water transmission line, the distance between buildings and/or structures and equipment would be great enough that peak particle velocities (the standard measure of vibration) would be well below threshold values typically used for impact assessments. Construction of the raw water transmission line may in some cases result in equipment operating very close to buildings. In such cases, standard precautions would be taken as are typically used for installation or repair of water mains. These include, for example, the use of deep saw cutting prior to any required pavement breaking activities. Where and if necessary, vibration monitoring will be undertaken to ensure that no damage occurs.

In terms of potential annoyance or interference with vibration sensitive activities, again with the exception of construction of the raw water transmission line, the distance between buildings and/or structures and equipment would be great enough that the vibration levels would be well below perceptibility threshold values. Construction of the raw water transmission line may in some cases result in equipment operating very close to buildings. In such cases, for very limited time periods vibration levels may be perceptible. However, construction activities for the raw water transmission line will occur at any location for a very short period of time.

Based upon the above, construction activities would not be expected to result in significant adverse vibration impacts.

AIR QUALITY

Construction of the Proposed Project would generate air pollutants emitted from on-site non-road construction equipment and trucks (primarily diesel-powered and gasoline-powered equipment exhaust). Non-road engines to be used on the Project Sites would include equipment such as excavators, bulldozers, generators, and concrete pumps. In addition to emissions originating from trucks as they arrive and depart, concrete trucks would be required to run their engines continuously during concrete pours in order to keep the concrete mix in motion. (As noted earlier in the description of construction activities, however, it is possible that a concrete batching plant could be used at one of the Project Sites to provide the concrete on-site.)

Minor increases in air emissions would also occur on roadways near the Project Sites, because of the increase in worker vehicles and truck trips. On roads where water mains are installed, the temporary disruption to traffic there could also result in a minor increase in air emissions.

In addition, earthmoving operations would create some fugitive dust emissions, depending on soil moisture conditions. Fugitive dust can be suspended in air by construction activities such as site cleanup and preparation, excavation, and transferring and loading soil or loose material. Fugitive dust can also be re-suspended by construction vehicles traveling on unpaved surfaces and from wind erosion of stockpiled materials. Fugitive dust is mostly larger than the $PM_{2.5}$ size range, and would fall in the PM_{10} range or larger. If a concrete batching plant is used on one of the Project Sites, this would also result in fugitive dust.

Dust control measures would be implemented to ensure that dust emissions from construction activity are limited to the extent practicable. Measures would include the following:

- Washing off trucks and excavation equipment prior to exiting the Project Sites with water;
- Washing the streets near the entrances to the Project Sites at the end of every work day;
- Wetting unpaved truck routes within the Project Sites as needed or, in cases where a route would remain in the same place for an extended duration, stabilizing, covering with gravel, or temporarily paving the route to avoid the resuspension of dust;
- Equipping all trucks hauling loose material with tight fitting tailgates and covering the load prior to leaving the Project Sites;
- Enforcing an on-site vehicular speed limit of 5 mph;
- Using water sprays for all excavation and transfer of spoils to ensure that materials are dampened as necessary to avoid the suspension of dust into the air;
- Wetting or covering loose materials, or stabilizing them with a biodegradable suppressing agent; and
- Monitoring dust during subsurface disturbance (measured as respirable particulate matter of diameter less than 10 microns—PM_{10}). If action levels set forth in the CHASP are exceeded, control measures would be taken.

Overall, while it is possible that the construction activities could exceed certain thresholds used for assessing the potential for significant adverse air quality impacts, any exceedance would be limited in extent, duration, and severity.

CONCLUSIONS

Construction activities for the Haverstraw Water Supply Project would occur on the Intake Site (for the river intake and the intake pumping station); in Beach Road, Ecology Lane, and along the JRSTP and vacant private property nearby (for the raw water transmission line); and at the Water Treatment Plant Site (for the water treatment plant). Some construction activities would also occur nearby for access drives and potable water mains. Construction staging areas and worker parking zones may be established on properties adjacent to or near the Project Sites.

Construction within the Hudson River would be of limited duration (approximately five months) and would largely occur within an enclosed area (cofferdam) to minimize disruption to water quality or aquatic resources.

Construction of Phase 1 of the Proposed Project is anticipated to last 36 months, with construction of Phases 2 and 3 lasting up to a year. If construction of two phases occurs together, the total duration would be shorter.

Construction activities would result in temporary and intermittent disruptions to the surrounding neighborhoods. These would be primarily associated with construction-related traffic and increased noise from that traffic and from the construction activities on the Project Sites. General effects of construction activity would include the following:

- Disruption to nearby land uses, and particularly the residences closest to the Intake Site on Grassy Point Road. For most sensitive land uses, these disruptions would be buffered by distance and intervening structures, vegetation, and topography. Access would be maintained to all land uses throughout construction.
- Temporary changes to some waterfront views, particularly while construction is occurring within the river.
- Disruption to aquatic natural resources. A SWPPP would be implemented to minimize potential impacts to the Hudson River and Minisceongo Creek. The use of trenchless technology to construct the river tunnel and of a cofferdam to enclose the water intake site would minimize potential changes to water quality and impacts to aquatic biota during construction. The period when in-water construction would occur would be based on seasonal limitations developed in coordination with NYSDEC and NYSDOS to avoid adverse impacts to fish spawning and early development. The deep channel habitat preferred by shortnose and Atlantic sturgeon would not be adversely impacted during installation or removal of the sheet pile for the cofferdam, or other in-water construction activities associated with the intake.
- Disruption to terrestrial natural resources. While construction activities would require clearing of the Project Sites, no significant adverse impacts to regional populations of wildlife are expected. Coordination with NYSDEC would be conducted with respect to overwintering bald eagles and use of the Intake Site for perching habitat prior to the anticipated start of intake pumping station and intake structure construction.
- Effects on Haverstraw Bay Significant Coastal Fish and Wildlife Habitat. Construction of the Proposed Project would not result in significant adverse impacts to water quality or to the species identified as important for the Significant Coastal Fish and Wildlife Habitat of Haverstraw Bay.

- A CHASP would be prepared and implemented to address potential issues related to contamination of soil and groundwater near the Project Sites.
- MPT plans would be employed to manage construction-related traffic. The MPT plans would set forth designated routes for construction traffic, to avoid potential conflicts between construction traffic from the different Project Sites and to manage possible conflicts with traffic associated with the Haverstraw Marina. The MPT plans would maintain traffic on roads near the Project Sites throughout the construction period and, if warranted, would use flag personnel to ensure that construction traffic does not block unsignalized intersections near the Water Treatment Plant Site. In addition, minor signal retimings were also identified to address potential traffic impacts during construction.
- Noise levels during construction would exceed ambient noise levels by more than 6 dBA, resulting in significant increases at nearby residences. However, these increases would have a duration of less than two years and therefore were not considered to be significant adverse impacts.
- During construction, a dust suppression program would be in place to minimize dust from earthmoving activities.

*

A. INTRODUCTION

Potential impacts of global climate change on the Proposed Project and potential impact of the project on greenhouse gas (GHG) emissions are analyzed in this chapter. The potential for impacts on the Proposed Project's facilities or operation through changes to the Hudson River water quality or flow and other relevant potential changes due to climate change are discussed first, followed by an assessment of potential GHG emissions resulting from the Proposed Project's construction and operation. Existing scientific studies and information were reviewed and relevant information is presented.

The assessment included impacts in the near future, in the early years of the operation of the facilities, impacts in the 20- to 35-year horizon, and impacts near the end of the century.

This chapter also presents specific actions that United Water New York Inc. (United Water) is committed to undertaking to reduce GHG emissions and reduce the Proposed Project's "carbon footprint." In addition, this chapter discusses a number of actions that United Water is evaluating to further enhance the Proposed Project's environmental sustainability.

This chapter of the DEIS includes the following sections:

Section B: Background.
Section C: Pollutants of Concern.
Section D: Policy, Regulations, Standards, and Benchmarks.
Section E: Methodology.
Section F: Potential Impacts of Global Climate Change on the Proposed Project.
Section G: Potential Impact of the Proposed Project on Greenhouse Gas Emissions.
Section H: References.

B. BACKGROUND

There is general consensus in the scientific community that global climate change is occurring, and will continue to occur as a result of increased concentrations of GHGs in the atmosphere. This increase is associated with emissions of GHGs primarily from combustion of fossil fuels, as well as various other processes. Atmospheric concentrations of GHGs are increasing because these gases have very little chemical removal processes, and the rate of emission exceeds the rate of the various natural processes that remove these gases from the atmosphere. The increase in GHG concentrations, since the beginning of the industrial age, has led to a noticeable warming of the Earth's atmosphere, surface, and oceans, which, in turn, has and will result in myriad climatic changes that will vary by geographic location, including changes in precipitation levels and patterns, changes in oceanic circulation patterns, and the more frequent occurrence of extreme weather events.

Warming of the oceans leads directly to sea level rise due to thermal expansion—a process which is accelerated by the melting of glaciers, ice caps, and sea ice. Sea level rise is predicted to profoundly affect coastal land use and natural environments.

Changes in local climate patterns affect many natural systems and human environments, including drinking water availability and quality, species distribution and extinction, disease patterns and propagation, and many more impacts. Some of these effects could also interact with each other in unexpected ways and accelerate adverse impacts.

Some of the impacts of global climate change may also accelerate global climate change ("positive feedback"). For example, shrinking ice coverage increases surface warming, since the reflectivity (albedo) of land and water are lower than those of ice and snow. Changing of ocean circulation from surface to deep waters could also affect atmospheric temperature.

While the contribution of any single project to climate change is infinitesimal, the combined GHG emissions from all human activity have a severe adverse impact on global climate. The nature of the impact dictates that all sectors address GHG emissions by identifying GHG sources and practicable means to reduce them. Therefore, this chapter does not identify specific contributions of the Proposed Project to climate impacts, but rather addresses the changes in GHG emission associated with the Proposed Project. Potential impacts of future local climate change and of the associated changes in the surrounding environment on the Proposed Project are examined as well.

C. POLLUTANTS OF CONCERN

GHGs are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds. This property causes the general warming of the Earth's atmosphere, or the "greenhouse effect." Water vapor, carbon dioxide (CO_2), nitrous oxide, methane, and ozone are the primary greenhouse gases in the Earth's atmosphere.

Moreover, there are a number of entirely human-made greenhouse gases in the atmosphere, such as the halocarbons and other chlorine- and bromine-containing substances, which are also responsible for damaging of the stratospheric ozone layer (creating the "ozone hole"). Since these compounds are being replaced and phased out from use due to the 1987 Montreal Protocol, there is generally no need to address these chemicals in project-related GHG assessments. Although ozone itself is also a substantial greenhouse gas, long-term project-level impacts on ozone emissions as a greenhouse gas do not need to be analyzed, since ozone is a rapidly reacting chemical, and since efforts are ongoing to reduce the production of ozone as a criteria pollutant (ozone is addressed in Chapter 14, "Air Quality" as a "criteria pollutant," or pollutant for which National Ambient Air Quality Standards (NAAQS) have been established).

Although water vapor is of great importance to global climate change, it is not directly of concern as an emitted pollutant since the miniscule quantities emitted from anthropogenic sources are of no consequence. Global climate change can, however, increase evaporation and thereby, indirectly impact global climate change.

Carbon dioxide (CO_2) is the primary pollutant of concern from anthropogenic sources. Although not the GHG with the strongest impact on global climate change for an equal quantity of gas, it is by far the most abundant and, therefore, the most influential GHG. CO_2 is emitted from any combustion process (both natural and anthropogenic), from some industrial processes such as the

manufacture of cement, mineral production, metal production, and the use of petroleum-based products, from volcanic eruptions, and from the decay of organic matter. CO_2 is removed ("sequestered") from in the lower atmosphere by natural processes such as photosynthesis and uptake by the oceans. CO_2 is included in any analysis of GHG emissions.

Methane and nitrous oxide also play an important role since they have limited removal processes and a relatively high impact on global climate change as compared to an equal quantity of CO_2. Methane is emitted from agriculture, natural gas distribution, and landfills. Methane is also released from natural processes that include the decay of organic matter lacking sufficient oxygen, for example, in wetlands. Nitrous oxide is emitted from fertilizer use and fossil fuel burning. Natural processes in soils and the oceans also release nitrous oxide. Emissions of these compounds, therefore, are included in GHG emissions analyses as appropriate.

Some other GHGs may also be of importance for certain processes, including certain Hydrofluorocarbons (HFCs), used as refrigerants, foam blowers, and released as byproducts from the production of other HFCs; some perfluorocarbons (PFCs), produced as byproducts of traditional aluminum production, among other activities; and sulfur hexafluoride (SF_6), used as an electrical insulating fluid in power distribution equipment. These compounds are included in GHG emissions analyses only where relevant, and are not included in the analysis of the Proposed Project, since the Proposed Project would not result in the use of, or processes that emit a significant amount of these GHGs.

In order to present a complete inventory of all GHGs, the various emissions are added together and presented as carbon dioxide equivalent (CO_2e) emissions—a sum which includes the quantity of each GHG weighted by a factor of its effectiveness as a GHG using CO_2 as a reference. This is achieved by multiplying the quantity of each GHG emitted by a factor called global warming potential (GWP). GWPs account for the lifetime and the radiative forcing of each chemical over a period of 100 years (e.g., CO_2 has a much shorter atmospheric lifetime than SF_6, and therefore has a much lower GWP). The GWPs for the main GHGs discussed here are presented in Table 16-1.

Table 16-1
Global Warming Potential (GWP) for Major GHGs

Greenhouse Gas	100-year Horizon GWP
Carbon Dioxide (CO_2)	1
Methane (CH_4)	25
Nitrous Oxide (N_2O)	298
Hydrofluorocarbons (HFCs)	124 to 14,800
Perfluorocarbons (PFCs)	7,390 to 12,200
Sulfur Hexafluoride (SF_6)	22,800
Sources: IPCC, Climate Change 2007—The Physical Science Basis, Contribution of Working Group I to the Fourth Assessment Report, Table 2-14, 2007.	

D. POLICY, REGULATIONS, STANDARDS, AND BENCHMARKS

As a result of the growing consensus that human activity resulting in GHG emissions has the potential to profoundly impact the Earth's climate, countries around the world have undertaken efforts to reduce emissions by implementing both global and local measures addressing energy consumption and production, land use, and other measures. Although the U.S. has not ratified international agreements setting emissions targets for GHGs, the federal government has announced its goal to reduce the national GHG emissions per economic output by 18 percent over the 10-year period from 2002 to 2012. Achieving this goal would result in a smaller increase in GHG emissions in the U.S. than would otherwise occur by 2012. The U.S. Environmental Protection Agency (EPA) has pursued this goal with various voluntary programs to reduce emissions and increase energy efficiency, by financial incentives for the development and deployment of innovative technologies that would result in reduced GHG emissions, and by investing in scientific and technological research. In addition, the Energy Independence and Security Act of 2007 includes provisions for increasing the production of clean renewable fuels, increasing the efficiency of products, buildings, and vehicles, and for promoting research on carbon capture and storage options.

EPA has recently embarked on a few regulatory initiatives related to GHG emissions, including promulgating fuel economy standards for newly manufactured vehicles, regulation of geological sequestration of CO_2 to ensure protection of water sources and the long-term integrity of CO_2 sequestration, and a GHG reporting rule to collect information on GHG emissions as pollutants under the Clean Air Act.

In addition, there are regional, State, and local efforts to reduce GHG emissions. In 2001, New York State Governor Pataki issued Executive Order 111, Green and Clean State Buildings and Vehicles, a directive that set goals for energy-efficient State buildings, the use of energy from renewable sources, and the procurement of energy-efficient products and alternative fuel vehicles. The 2002 New York State Energy Plan included goals to increase the State's use of renewable energy and called for increased energy efficiency with the aim of cutting the State's GHG emissions. The Energy Plan was designed to provide Statewide policy guidance for energy-related decisions by government and private market participants. In 2004, the New York State Public Service Commission voted to adopt a Renewable Portfolio Standard with a goal of increasing the proportion of renewable electricity used by New York consumers from the 2004 baseline of 19.3 percent to at least 25 percent by 2013. In 2005, Executive Order 142 directed State agencies and authorities to diversify transportation, fuel and heating oil supplies through the use of bio-fuels in State vehicles and buildings.

Recently, New York State announced that it would update the plan with goals to reduce electricity use by 15 percent from forecasted levels by the year 2015 through new energy efficiency programs in industry and government, create new appliance efficiency standards and set more rigorous energy building codes, invest in renewable energy projects throughout the state, and propose power plant siting legislation that creates an expedited review process for wind and other energy projects that result in fewer GHG emissions.

New York State has also developed regulations (6 NYCRR Part 242 and amendments to Part 200, and 21 NYCRR Part 507) to cap and reduce CO_2 emissions from power plants, to meet its commitment to the Regional Greenhouse Gas Initiative (RGGI). Under the RGGI agreement, the governors of 10 Northeastern and Mid-Atlantic states have committed to regulate the amount of CO_2 that power plants are allowed to emit. The regional emissions from power plants will be

held constant through 2014, and then gradually reduced to 10 percent below the initial cap by 2019. Each power source with a generating capacity of 25 megawatts or more would need to purchase a tradable CO_2 emission allowance for each ton of CO_2 it emits.

Many local governments are participating in the Cities for Climate Protection™ (CCP) campaign and have committed to adopting policies and implementing quantifiable measures to reduce local GHG emissions, improve air quality, and enhance urban livability and sustainability. The program is run by ICLEI—Local Governments for Sustainability, an international association of local governments and national and regional local government organizations that have made a commitment to sustainable development.

A number of benchmarks for energy efficiency and green building design have also been developed. Leadership in Energy and Environmental Design (LEED) system is a benchmark for the design, construction, and operation of high performance green buildings that can include energy efficiency components. EPA's ENERGY STAR is a voluntary labeling program for major appliances, office equipment, lighting, home electronics, homes, and commercial and industrial buildings designed to identify and promote energy-efficiency and reduce GHG emissions.

To date, there are no specific benchmarks or regulations applicable to GHG emissions levels or impacts from proposed projects which are applicable to environmental impact analysis. The general approach beginning to emerge is that since GHG emissions impact global climate collectively, from all sources, there is no impact threshold for GHGs, and therefore projects should estimate and disclose potential emissions, and assess the various practicable options available for reducing such emissions.

E. METHODOLOGY

The New York State Department of Environmental Conservation (NYSDEC) and other State, federal, and local agencies are actively developing methodologies to assess the impact of climate change on proposed actions, and the impact of proposed actions on GHG emissions. Currently, however, with the exception of those developed for projects undertaken by the New York State Department of Transportation, there are no mandated federal or New York State methodologies or criteria for assessing the significance of GHGs generated due to the construction and operation of a proposed project.

The methodology set forth here incorporates various existing methodologies best suited for analysis of the Proposed Project based on guidance from NYSDEC.

POTENTIAL IMPACTS OF GLOBAL CLIMATE CHANGE

The analysis of impacts of global climate change on the Proposed Project focuses on the potential for impacts on the Proposed Project facilities or operations through changes to the Hudson River quality or flow. Existing scientific studies and information were reviewed and relevant information is presented.

Due to the uncertain nature of the existing predictions for future climate change impacts in the area of the Project Sites and on the Hudson River, a range of possible impacts is presented where information is available, and a qualitative assessment is presented.

The assessment included impacts in the near future, in the early years of the operation of the facilities, impacts in the 20- to 35-year horizon, and impacts near the end of the century. Exact years may vary by study.

POTENTIAL IMPACT ON GREENHOUSE GAS EMISSIONS

EXTENT OF ANALYSIS

Since the impact of GHGs emitted in the troposphere is the same regardless of where they are emitted, the analysis of GHGs addresses emissions resulting from the Proposed Project, regardless of their location. Direct emissions are emissions from sources located on-site, such as construction equipment during the construction period. Indirect emissions are emissions caused indirectly by the Proposed Project, such as vehicle trips associated with the project or emissions associated with electricity consumption. In addition, there are emissions preceding and following the Proposed Project, referred to as upstream and downstream emissions, such as emissions associated with the transport and production of fuels and construction materials, and emissions associated with disposal of materials after their use. The GHG analysis addresses both direct and indirect emissions, and, where practicable and significant, upstream and downstream emissions as well.

TIME SCALES FOR ANALYSIS

Emissions are presented on an average per-year basis and as total lifetime emissions. The lifetime of the Proposed Project is estimated as 50 years. Emissions related to materials and construction would actually occur over a shorter period prior to and during construction. As described above in section C, "Pollutants for Analysis," the time scale of the impact of GHGs is addressed by calculating the GWP of GHGs for 100 years and presenting total estimated CO_2e emissions.

EMISSIONS CALCULATIONS

Emissions related to construction materials and to building heating, ventilation and cooling (HVAC) were calculated based on the methodology used by the King County, Washington, Department of Development and Environmental Services. Since precise building design does not yet exist, this estimate is based on the facilities' size and generic construction emissions. The administration building would be the only space requiring HVAC, with 8,860 square feet (sf) of space requiring heating and cooling.

Emissions from delivery, concrete, and dump truck trips were estimated based on the total number of construction truck trips (see Chapter 15, "Construction Impacts"), an assumed round-trip distance of 70 miles for concrete and dump trucks and 304 miles for all other deliveries, and an emission factor of 1,400 grams of CO_2e per mile. A round trip of 70 miles was assumed for concrete and dump trucks since those would need to be local; the round trip could be less, but this distance was assumed as a conservative estimate. An assumption of 304 miles for other deliveries is the average round-trip distance for all commodities with a destination of New York, assuming trucks return empty, calculated for the 2002 *Commodity Flow Survey* (Bureau of Transportation Statistics). The emission factor was obtained from EPA's MOVES model, for heavy duty single-unit diesel trucks at 40 mph.

Upstream emissions related to the installation of all the treatment systems, pumps, and water transmission lines were estimated based on the expected expenditure related to all systems and

water transmission lines and the associated emissions from producing the materials and products. A simplifying assumption was made that all materials are iron or steel. This results in a somewhat high estimate, since the expenditure would include other materials that are likely to have less embodied energy than iron or steel, but the estimate also does not include the upstream transport of the materials, which would add some emissions.

The expected expenditure on systems and pipes is $10.3M. The embodied emissions were estimated by dividing the emissions from the Steel Products from Purchased Steel sector (NAICS 3312) and the fraction of emissions from the Iron and Steel Mills sector (NAICS 331111) associated with steel products (as estimated by dividing the value of purchased materials for 3312 by the value of shipped product for all 331111) by the total shipped product value of steel products. This ton/$ factor was then multiplied by $10.3M to estimate the total associated CO_2e emissions. Details of this methodology can be found in Appendix 16.1.

Indirect emissions associated with employee trips and deliveries are not included since the number of regular employees and annual deliveries is small enough to render this component negligible. Up to 85 deliveries per year, 3 visitors per month, and 10 employees per day would be expected on average at the Project Sites.

Indirect emissions related to the use of electric power for treatment and pumping systems were calculated by multiplying the estimated average power use by the average emission factor related to power production in New York State in 2013. This was estimated by adjusting the 2006 New York State average emissions, 0.358 metric ton (Mg) of CO_2 per megawatt-hour (MWh), reported by the U.S. Department of Energy's Energy Information Administration, to account for the current commitment by the State to achieve a level of 25 percent of power produced from renewable sources by 2013. The adjustment was approximated by assuming that the ratio of all other sources would remain the same and that the emissions associated with renewable and nuclear energy is negligible. The resulting emission factor for 2013 was 0.349 metric tons CO_2 per MWh.

F. POTENTIAL IMPACTS OF GLOBAL CLIMATE CHANGE ON THE PROPOSED PROJECT

POTENTIAL LOCAL CLIMATE-RELATED IMPACTS—STATE OF CURRENT KNOWLEDGE

The Climate Change Task Force established by the New York City Department of Environmental Protection estimated that there is a high probability (on the order of 60 percent) that annual precipitation in the New York City watersheds will increase between 2.5 and 7.5 percent by the 2050s, and a low probability that it will increase up to 12.5 percent or decrease up to 2.5 percent, relative to the 1980s.

The changes are not expected to be uniform across all seasons. Winter precipitation could increase by 10 to 20 percent by the end of the century. Summer precipitation may remain the same, although current predictions are variable. More precipitation may be expected in the form of rain rather than snow, increasing flows in the Hudson River in winter and decreasing them in spring. Rising winter temperatures may also melt snow faster and earlier, resulting in increased soil moisture and runoff in winter and early spring. Peak river flow may occur up to approximately a week earlier by mid century and up to two weeks earlier by the end of the century.

Severe rainfall events may occur more frequently and be more intense. The number of heavy-precipitation events, when more than 2 inches of rain fall in a period of 48 hours, is projected to increase by 8 percent by mid-century, and 12 to 13 percent by the end of the century. The highest rainfall during any five-day period of each year is predicted to increase by 10 percent by mid-century, and by 20 percent by the end of the century.

Although average precipitation is expected to increase, drought periods may also increase in duration and frequency. Increased drought would change the flow levels in the Hudson River and may affect the location of the saline wedge and the salinity in the Hudson in general. Although low-flow periods in the summer may not change significantly, under a high global emissions scenario it is possible that the lowest flow may decrease by 10 percent and the duration of the summer low-flow period would be extended by several weeks. Eutrophication (excess inputs of organic matter) and primary production (production of organic compounds from atmospheric or aquatic carbon dioxide, principally through the process of photosynthesis) in the Hudson River estuary can increase dramatically in response to lowered freshwater during drought events.

The Hudson River in the area of the Project Sites is an estuary, directly affected by tidal changes. Future increase in sea level would affect both the level of the water in the estuary and its salinity, and is likely to result in saline water reaching farther up the river, resulting in overall increased salinity near the proposed location of the raw water intake in the river. Normally, the location of the salt front (defined as 100 milligrams of chloride per liter) ranges from about River Mile 35, near the Proposed Project, and as far as upper Newburgh Bay, at about River Mile 60, but extreme high freshwater stream flows can push the salt front all the way out of the river and extreme drought conditions can send the salt front past the water intake and as far north as Poughkeepsie. It is unclear at this time, precisely how and to what degree the above mentioned changes in precipitation would impact salinity in the vicinity of the proposed location of the raw water intake in the river, but clearly a wider range of salinity is possible, as is an overall higher level of salinity.

Changes in flow may also lead to changes in sediment deposition and erosion, changing the river bottom of the Hudson River and its banks, but no specific local information is available at this time.

Observed sea level rise in the New York City area in the 20th century ranges from 2 to 4 millimeters (mm) per year, averaging 2.7 mm/year since the 1850s, and a 10 percent higher mean rate for the 20th century alone. This includes coastal subsidence due to geological activity. The Intergovernmental Panel on Climate Change (IPCC)[1] estimates that by the end of this century (2090-2099) global sea levels could rise by 0.18 to 0.59 meters (roughly 7 to 23 inches) above late 20th century levels (1980-1999) An additional 0.14 meters (5.5 inches) of sea level rise is estimated to result by the end of the century due to coastal subsidence (based on the current trend). Therefore, the conservatively low estimate for end of century mean sea level rise

[1] The IPCC is the internationally recognized organization tasked with providing decision-makers and others interested in climate change with an objective source of information about climate change. Its role is to assess on a comprehensive, objective, open and transparent basis the latest scientific, technical, and socioeconomic literature produced worldwide relevant to the understanding of the risk of human-induced climate change, its observed and projected impacts and options for adaptation and mitigation. IPCC reports are neutral with respect to policy, are of high scientific and technical standards, and aim to reflect a range of views, expertise, and wide geographical coverage.

in the New York area is on the order of 0.32 to 0.73 meters (12.5 to 28.5 inches). More importantly, the frequency of flooding is expected to increase due to the higher frequency of severe storms. The 100-year flood level is the level commonly used for planning purposes. This level indicates the level that waters would reach with a probability of 1 percent in any given year, based on historical data. If severe storms occur more frequently in the future, the actual 100-year flood level would be higher, requiring higher design elevations. The stillwater level of the Hudson River would increase with the increase in sea levels, and higher flooding elevations would be added to the above mentioned predicted sea level increase. Although precise flooding predictions for the Hudson River are not available, studies of the frequency of 100-year coastal storms in New York City have shown that such storms could occur with a frequency ranging from 4 to 60 years, depending on the prediction model scenario and the exact location analyzed.

POTENTIAL IMPACTS ON THE PROPOSED PROJECT

The potential vulnerability of the Proposed Project to climate related impacts is mainly related to Hudson River water elevation and quality. It should be noted that the Haverstraw Water Supply Project, as either the Proposed Project or the Ambrey Pond Reservoir Alternative, would serve as adaptation to potential climate change impacts since the project is aimed at meeting future increased demand for water. The Proposed Project is also aimed at reducing the dependence on water reservoirs, which are easily impacted by drought conditions—conditions which may be more frequent and severe in the future.

The potential future climate impacts described above could lead to various changes in Hudson River water properties, including temperature, salinity, turbidity, and possibly water quality impacts. However, the levels or likelihood of precise future water conditions are not currently available. Better information may begin to appear in the coming years, and actual significant changes may not begin to be measurable for decades. Nonetheless, the Proposed Project's advanced water treatment facility, which would utilize raw water from the Hudson, is well suited to deal with a wide range of raw water quality and salinity. Higher salinity, or more frequent or longer events of elevated salinity, would require the water treatment processes to use more electric power than would be required with the current conditions. Increased electricity use would result in additional GHG emissions. Other water quality changes would not be expected to present any particular difficulty to producing the desired high quality potable water. The design of the facilities and process include enough flexibility, such that the facility and/or processes could be adapted should any changes be required when changes begin to appear in the future and/or as better predictions of future conditions become available.

Changes in sea level, which would impact the stillwater level in the Hudson River estuary, and changes in flow levels and storm flooding and flooding frequency, could potentially impact the raw water intake structure. The depth or precise location of the intake itself may need to be adjusted in the future. More importantly, the river water intake and all land-side facilities, including the intake pumping station, will be designed so as to elevate all critical systems above potential flood levels such that the facility can continue to operate during periods of high waters, including periodic storm-related flooding events. This total level would comprise a sea level increase component and a storm flood level component which would likely be higher than the current 100-year flood level as defined by FEMA.

New York State and New York City have each convened a task force to address the issue of predicted climate change-related sea levels rise and storm surge. The City recently launched the Climate Change Adaptation Task Force (City Task Force), which is working to secure the City's

critical infrastructure against rising seas, higher temperatures, and increasing precipitation projected to result from climate change.[1] The City Task Force is composed of over 35 city and State agencies, public authorities, and companies that operate, regulate, or maintain critical infrastructure in New York City. The City Task Force will be assisted by the New York City Panel on Climate Change (NPCC), which is modeled on the IPCC, and includes leading climatologists, sea-level rise specialists, adaptation experts, and engineers, as well as representatives from the insurance and legal sectors. The NPCC will provide the City and City Task Force members with information about climate risks (including climate change projections), adaptation, and risk assessment. The NPCC is expected to issue preliminary climate change projections in late 2008/early 2009.

New York State formed the Sea Level Rise Task Force (Task Force) in 2007 to assess impacts to the State's coastlines from rising seas and to recommend protective and adaptive measures. The Task Force held its first meeting on June 27, 2008 and its report is due to the Legislature by December 31, 2009. United Water will continue to investigate this issue prior to finalizing the design of the Intake Site facilities in order to finalize the determination of appropriate design levels, and will incorporate any specific information or recommendations made by either task force in this regard that are relevant to the Proposed Project.

G. POTENTIAL IMPACT OF THE PROPOSED PROJECT ON GREENHOUSE GAS EMISSIONS

CONSTRUCTION EMISSIONS

The GHG emissions projected to result from the Proposed Project include those emissions generated through the extraction, fabrication, transport, construction, and disposal of building materials, as well as emissions through landscape disturbance during construction. The CO_2 emissions associated with construction materials vary considerably with the type of facility, but have conservatively been estimated for planning purposes as 38.7 metric tons per 1,000 square feet (sf) of floor area. Based on conceptual designs, it is anticipated that the total floor area of proposed buildings associated with the Proposed Project would be approximately 98,466 sf. The CO_2 emissions embodied in the facility structures are therefore on the order of 3,811 metric tons.

Emissions associated with construction truck trips were estimated to be 4,561 metric tons of CO_2e.

The CO_2e emissions embodied in the systems and pipes, calculated as described above, are estimated at 10,405 metric tons.

OPERATIONAL EMISSIONS

HEATING, VENTILATION, AND COOLING (HVAC)

The CO_2e emissions associated with the water treatment plant administration building's HVAC, calculated as described above, are estimated at 263 metric tons per year. This includes a 30 percent reduction associated with energy efficient building design.

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[1] This is in addition to the NYCDEP Climate Change Task Force mentioned above, which focuses on DEP infrastructure.

ELECTRICITY FOR PUMPING AND TREATMENT

Plant operations would have an associated ongoing energy demand. The estimated power consumption for the Proposed Project and the associated GHG emissions are presented in Table 16-2. Of the total estimated annual power consumption and ensuing GHG emissions, 62 percent would be associated with the desalination process due to the high-pressure pumping required to pass the water through the reverse osmosis membranes. The salinity levels of the Hudson River waters at the raw water intake site in the river are known to vary throughout the year based on precipitation and snowmelt patterns. During the months of February through May, the salinity levels are the lowest, and the energy consumption of the reverse osmosis treatment would be reduced, and at times of maximum snowmelt, would be zero..

Table 16-2
Power Consumption and Associated GHG Emissions

	Phase 1 (2.5 mgd)	Phase 2 (5.0 mgd)	Phase 3 (7.5 mgd)
Average Electricity Use (kWh per day)	16,300	24,900	33,200
Normalized Electricity Use (kWh per million gallons)	6,520	4,980	4,427
GHG Emissions (metric tons CO_2e per year)	2,079	3,176	4,235

Sources: Power consumption from Black and Veatch. GHG emissions AKRF based on EIA data (see text for full description).

It should be noted that these represent the estimates for emission levels from electricity generation in New York State in 2013, and future year emissions may be lower. As more renewable electricity production capacity comes on line as a consequence of RGGI and of state renewable energy profiles, the average state-wide emission factor will decrease. Since the precise impact of those actions is not currently known, future estimates are not presented here.

The Proposed Project is expected to use between 4,427 and 6,520 kilowatt hours (kWh) of electricity per million gallons (Mgal) of potable water produced. This is a higher electricity use rate as compared with water treatments other than desalination. For comparison, a study of 137 water utilities across the U.S., sponsored by the New York State Energy Research and Development Authority (NYSERDA), ranked the utilities by their energy efficiency. The 10 highest scoring utilities had much lower normalized electricity use, averaging 324 kWh/Mgal versus 2,360 kWh/Mgal for the 10 lowest scoring utilities. It should be noted that the energy ranking included other factors, such as service utility area, pumping elevations, and length of distribution. Although most of the highest ranking utilities had a very low electricity usage factor, they also did not require much pumping and many were implementing very little treatment (using pre-treated water). It is not known if any desalination facilities were included, but none were presented exclusively. Clearly desalination requires more power, but this comparison alone cannot be used to evaluate the efficiency of the Proposed Project. Since most desalination is from sea water, with higher salinity, most desalination facilities would use more energy per gallon of potable water produced. Since the systems will be designed for maximum efficiency, the Proposed Project would use only the energy required for this type of process, and will seek to reduce energy consumption via energy efficiency measures for the Project as a whole and produce renewable energy where practicable.

SEQUESTRATION

Generally, the elimination of vegetation on a site would accelerate the release of CO_2 sequestered in any vegetation found on the site back to the atmosphere. However, the Water Treatment Plant Site is only partially vegetated. Similarly, the Intake Site is an industrial site with no substantial surface vegetation. As a result, the use of these Sites for the Proposed Project would not constitute a significant change in sequestered carbon.

TOTAL NET PREDICTED EMISSIONS

Since sequestration is not expected to change significantly due to the Proposed Project, net GHG emissions would be the sum of all direct and indirect, upstream and on-site emissions. The emissions from each component, and the total lifetime and annual average emissions are presented in Table 16-3. Note that annual emissions are average for the duration of each component; the facilities are assumed to operate for 50 years; although construction is expected to occur for a total of five years, most activity and associated emissions would be over a three-year period. Upstream emissions associated with embodied energy for materials are assumed to occur over a five year period since they would be spread out throughout the extraction of raw material and production of fabricated products.

Table 16-3
Total GHG Emissions (metric tons CO_2e)

Component	Total Lifetime[1]	Average Per Year
HVAC	13,148	263
Process Electricity[2]	190,580	4,448
Embodied Buildings[3]	3,811	762
Embodied Systems[3]	10,405	2,081
Construction Trips[4]	4,561	1,520
Total	*222,504*	*9,074*

Notes:
1. Lifetime is assumed to be 50 years.
2. Assumes Phase 2 electricity use levels for 20 years and Phase 3 levels for 30 years.
3. Embodied emissions would occur over a period prior to and during construction, assumed to be 5 years.
4. Construction emissions would occur during the construction period only, estimated as 3 years.

Clearly the largest component of the net GHG emissions would be the process electricity, representing 89 percent of the total lifetime emissions associated with the Proposed Project. Although delivery of products was included in the estimate, upstream delivery of products from the country of origin, if outside of the U.S., or from the source of material within the U.S. to the distributer is not included since these origins are unknown at this time.

POTENTIAL EMISSIONS MITIGATION MEASURES

As indicated above, the implementation of the Proposed Project, like all human endeavors, would expend energy and generate GHG emissions. There is no direct causal relationship with the Proposed Project's emissions and a specific climatic event.

It should be noted that the development of a dependable long-term water supply through the application of a desalination technique may in itself be considered a response to the potential effects of climate change on freshwater availability. The Proposed Project serves as adaptation to potential climate change impacts since it is aimed at meeting future increased demand for water, and since it would also reduce the dependence on reservoirs, which can be easily impacted by drought conditions—conditions which may be more frequent and severe in the future.

Nonetheless, there are several aspects of the Proposed Project that serve to moderate or mitigate the Proposed Project's energy use and GHG emissions:

- The Proposed Project's facilities, both at the water pumping station and at the water treatment plant, will be designed to a LEED standard, making maximum use of the facility design to reduce energy consumption, including the use of natural light.
- Heating and cooling will be applied only as necessary to maintain water treatment processes.
- Pump and systems efficiency will be a priority when selecting equipment, e.g., premium efficiency motors will be used exclusively.
- United Water is anticipating production of solar energy on-site via photovoltaic systems installed on approximately 100,000 sf of rooftop area, on water tanks, and as a canopy over parking and entry spaces. Since the system design details are not yet known, this has not been included in the analysis in this chapter.
- As described in Chapter 2, "Project Description," development of the Proposed Project would be phased, so that facilities would be brought on line only as needed to meet the demand for water.

There are some additional measures currently under consideration by United Water that may be incorporated in the final design if found to be practicable:

- The Reverse Osmosis system required for desalination of the raw water is the most energy intensive component of the treatment process due to the need for high-pressure pumps. This system could be bypassed when the raw water does not require desalination, saving considerable energy. This option is currently being investigated and will be included if it is found to be practicable.
- As noted in Chapter 2, depending on final designs, water may be withdrawn from the Hudson River continuously throughout the day or it may be withdrawn only approximately 12 hours a day, when salinity is lower. This would result in reduced energy usage for desalination.
- United Water is currently undertaking a study of efficiency and energy use at all of its facilities to identify further potential energy saving opportunities from existing operations.
- The use of process water for cooling building spaces is being investigated, and will be incorporated in the plans if found to be practicable.
- The use of landfill gas from the adjacent landfill and JRSTP is being investigated as an energy source. It is possible that due to the age of the landfill it may not contain sufficient gas for use. If use of gas from either or both is found to be practicable it may be included.
- The option of on-site wind-power generation is currently being studied. If suitable sites for wind turbines are identified, which do not create an unacceptable visual impact within the waterfront area or other unacceptable impacts, this may be included.

- The option of harvesting rainwater on site for use as raw water is being investigated. This water would have lower salinity and therefore require less energy for treatment. Although the quantity is expected to be small compared to the throughput of the plant, if found to be practicable this may be included.
- The use of water turbines for on-site power production is being considered. If solutions are found that enable operating water turbines without causing unacceptable impacts on fish populations or other aspects of the environment, this option may be included.
- In order to reduce the carbon footprint associated with construction of the proposed facilities, the use of recycled materials and locally produced products will be investigated and used where practicable.

H. REFERENCES

Although many sources were consulted, the main documents consulted were the following:

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*

A. INTRODUCTION

The Project Sites, including the river water intake, the Intake Site, the Water Treatment Plant Site, and the raw water transmission line route and potential potable water main routes, are located in the Coastal Zone designated by New York State, and the Proposed Project requires approvals from federal, State, and local agencies. Therefore, the Proposed Project is subject to the State's Coastal Zone Management Program policies. This chapter examines the compliance of the Proposed Project with those policies.

The federal Coastal Zone Management Act (CZMA) of 1972 was established to encourage coastal states to manage development within the states' designated coastal areas to balance conflicts between coastal development and protection of resources within the coastal zone. Requirements for federal approval of coastal zone management programs and grant application procedures for development of the state programs is included in 15 CFR Part 923, Coastal Zone Management Program Development and Approval Regulations, National Oceanic and Atmospheric Administration (NOAA). The Coastal Zone Management Act requires that federal activities within a state's coastal zone be consistent with that state's coastal zone management program. The New York State Department of State (NYSDOS) administers New York's Coastal Zone Management Program (CMP). The State CMP encourages coordination among all levels of government to promote sound waterfront planning and requires consideration of the program's goals in making land use decisions. In pursuit of this goal, New York State permits any local government that has any portion of its jurisdiction contiguous to the State's coastal waters to submit a Local Waterfront Revitalization Program (LWRP) to NYSDOS for approval.

The Town of Haverstraw currently does not have an adopted or approved LWRP in conformance with the Waterfront Revitalization of Coastal Areas and Inland Waterways Act (Executive Law, Article 42). Because the Town has not adopted an LWRP, agencies proposing actions in the Coastal Zone must make a consistency determination with respect to the State coastal policies and determine whether there will be any reasonably foreseeable coastal effects in areas covered by approved LWRPs. The Proposed Project's consistency with each of the State policies is addressed below. This chapter also considers the Proposed Project's consistency with LWRPs which have been adopted by municipalities within a 5-mile radius of the Project Sites.

B. COASTAL ZONE POLICY ANALYSIS

STATE COASTAL POLICIES

The studies and analyses undertaken for the Proposed Project and described in this DEIS are the primary foundation for the evaluation of consistency with the 44 State coastal policies, each of which is listed below, followed by narrative responses describing the relevance of the policy to the Proposed Project and the Project's consistency with relevant policies.

Policy 1: *Restore, revitalize, and redevelop deteriorated and underutilized waterfront areas for commercial, industrial, cultural, recreational, and other compatible uses.*

The intake pumping station would make use of a currently underutilized and industrial waterfront area for a water-dependent project. The Intake Site is an undeveloped parcel along the shore of Haverstraw Bay adjacent to the U.S. Gypsum Company (USG) gypsum conveyor facility and barge pier. The water treatment plant would be located inland on a portion of the former Town of Haverstraw Landfill. Therefore, the Proposed Project is consistent with this policy.

Policy 2: *Facilitate the siting of water-dependent uses and facilities on or adjacent to coastal waters.*

The Proposed Project is a water-dependent use insofar as it depends on the withdrawal of Hudson River water for treatment and use as a long-term potable water supply. As noted under Policy 1, above, the Intake Site is located on a vacant industrial waterfront site. Therefore, the Proposed Project is consistent with this policy.

Policy 3: *Further develop the State's major ports of Albany, Buffalo, New York, Ogdensburg and Oswego as centers of commerce and industry, and encourage the siting, in these port areas, including those under the jurisdiction of State public authorities, of land use and development which is essential to or in support of the waterborne transportation of cargo and people.*

The Town of Haverstraw waterfront is not one of the State's major ports. Therefore, this policy is not applicable. However, the Intake Site is adjacent to an active USG industrial pier used by ocean-going ships to deliver gypsum materials for processing at the USG Stony Point plant. The Proposed Project would not adversely affect the access to or the operations of this water-dependent shipping operation.

Policy 4: *Strengthen the economic base of smaller harbor areas by encouraging the development and enhancement of those traditional uses and activities which have provided such areas with their unique maritime identity.*

The Proposed Project would introduce a new water intake in Haverstraw Bay and a new intake pumping station on the shoreline adjacent to the Bay. The Proposed Project would not affect the use of the Bay in any manner. At the present time, a portion of the Intake Site is used by the adjacent Haverstraw Marina for the off-season storage of approximately 20 recreational boats. These boats would be relocated to another location in the Marina, which is large enough to accommodate their storage elsewhere. Therefore, the Proposed Project's use of the Intake Site would not affect the traditional uses and activities associated with the harbor area of Haverstraw Bay.

Policy 5: *Encourage the location of development in areas where public services and facilities essential to such development are adequate, except when such development has special functional requirements or other characteristics which necessitates its location in other coastal areas.*

As outlined in Chapter 1, "Purpose and Need," the Proposed Project would provide a new source of water to United Water's water supply system serving Rockland County. The Proposed Project would require the use of public infrastructure, including electrical service, for facility operations. Public utilities are located either directly on or adjacent to the Project Sites, as described in Chapter 11, "Infrastructure." Local community services, such as police and fire services, are also adequate to serve the Proposed Project, as described in Chapter 5,

"Community Facilities." The Proposed Project's water treatment plant would be sited adjacent to the existing Haverstraw Joint Regional Sewage Treatment Plant (JRSTP), which would allow it to take advantage of that existing public facility for disposal of concentrate processed at the water treatment plant. Therefore, the Proposed Project is consistent with this policy.

Policy 6: *Expedite permit procedures in order to facilitate the siting of development activities at suitable locations.*

The proposed facilities are being coordinated at the state, federal and local levels and thus the Proposed Project complies with this policy.

FISH AND WILDLIFE POLICIES

Policy 7: *Significant coastal fish and wildlife habitats, as identified on the coastal area map, shall be protected, preserved, and, where practical, restored so as to maintain their viability as habitats.*

NYSDOS has designated Haverstraw Bay as a Significant Coastal Fish and Wildlife Habitat. According to the NYSDOS, the extensive shallow estuarine habitat areas; the occurrence of commercial and recreational fisheries; the use of the Bay as a nursery, feeding and/or overwintering area for marine and anadromous species; and the presence of vulnerable or sensitive species (i.e., endangered or threatened) qualifies Haverstraw Bay as a Significant Coastal Fish and Wildlife Habitat under the CMP. The Haverstraw Bay Significant Coastal Fish and Wildlife Habitat encompasses the entire river over this approximate six-mile reach, which is the widest section of the Hudson River. This brackish water portion of the river is highly productive and comprises a substantial part of the nursery area for striped bass, American shad, white perch, tomcod, and Atlantic sturgeon. Other anadromous species include blueback herring and alewife spawn in upstream freshwater areas but concentrate here before moving downriver in the fall. The bay is also a major nursery and feeding area for bay anchovy, Atlantic menhaden, and blueclaw crab. Depending on the location of the salt front, a majority of the spawning and wintering populations of Atlantic sturgeon in the Hudson may reside here. The endangered shortnose sturgeon also overwinters here. Large numbers of waterfowl use the area for feeding and resting during spring and fall migrations. Despite various habitat disturbances, Haverstraw Bay possesses a combination of physical and biological characteristics that make it one of the most important fish and wildlife habitats in the Hudson River estuary (NYSDOS Undated).

Haverstraw Bay is also included in the United States Fish and Wildlife Service's (USFWS) "Significant Habitats and Habitat Complexes of the New York Bight Watershed" as "Lower Hudson River Estuary, Complex #21." The Lower Hudson River was selected because it is a regionally significant nursery and wintering habitat for a number of anadromous, estuarine and marine fish species and a migratory and feeding area for birds. The USFWS program encompasses a larger area than the Significant Coastal Fish and Wildlife Habitat designation, but it is a parallel designation recognizing the same significant values of Haverstraw Bay as the Significant Coastal Fish and Wildlife Habitat designation (USFWS 1997).

Haverstraw Bay is also an Essential Fish Habitat (EFH) as designated under the Magnuson-Stevens Fishery Conservation and Management Act [Section 305(b)(2)]. Haverstraw Bay is identified as a mixing zone which is contiguous with coastal waters which have been

designated in the New York Bight area. EFH applies to species for which there are approved management plans. NOAA Fisheries (formerly the National Marine Fisheries Service), the agency which administers the EFH program, has identified Atlantic butterfish, Atlantic herring, bluefish, red hake, summer flounder, windowpane and winter flounder as species having EFH in Haverstraw Bay (see Appendix 9.5, Essential Fish Habitat Assessment).

As discussed in Chapter 9, "Natural Resources," the Proposed Project would not result in significant adverse impacts to water quality during construction or operation, nor would it result in significant adverse impacts to the species identified as important for the Significant Coastal Fish and Wildlife Habitat of Haverstraw Bay due to in-water construction activities.

The intake construction has been designed to minimize effects on the significant habitat. Measures to protect aquatic life and aquatic habitat during construction of the intake in the Hudson River would include the use of a sealed sheet-pile cell that would contain the dredging and all construction work in the river. In addition, as discussed in Chapter 9, the period when in-water construction would occur would be based on seasonal limitations developed in coordination with the New York State Department of Environmental Conservation (NYSDEC) and NYSDOS to avoid adverse impacts to fish spawning and early development. There would be no significant loss of habitat quantity and only a temporary reduction of functional value during and immediately after construction. Restoration of the disturbed area through natural processes would result in a complete restoration of the functional values of the designated habitat. The construction activities would not alter the physical, biological, and chemical processes of Haverstraw Bay; thus the habitat would recover as it has from the previous dredging operations that were not designed and conducted with the care applied to the water treatment plant intake.

Operation of the raw water intake has also been designed to minimize adverse effects on the significant habitat. As described in Chapter 9, the use of the wedge-wire screen with 2-millimeter slot size and a through-screen velocity of 0.5 feet per second (fps) or less with an approach velocity of less than 0.25 fps are considered best technology available for minimizing impingement, and reducing entrainment, would minimize losses to the target fish species, and would not result in significant adverse impacts to regional target species populations, or to regional populations of other fish, plankton or macroinvertebrates. The use of a wedgewire screen intake represents the best technology available to minimize adverse impacts to aquatic life at a water intake of this size. In addition, as described earlier, the discharge of RO concentrate together with treated effluent from the JRSTP through the JRSTP's diffuser into the Hudson River would not adversely affect salinity conditions in the Hudson River.

Early life stages of striped bass, American shad, white perch, tomcod, and Atlantic sturgeon using the Bay as a nursery area would not be significantly impacted by the Proposed Project due to impingement or entrainment. Other anadromous species known to use Haverstraw Bay, including blueback herring and alewife, before moving downriver in the fall would similarly not be significantly affected due to impingement or entrainment, nor would bay anchovy, Atlantic menhaden, or blueclaw crab.

As discussed in Chapter 9, construction and operation of the intake would not result in significant adverse impacts to shortnose or Atlantic sturgeon. The preference of shortnose and Atlantic sturgeons for deep water habitat suggests that it is unlikely that individuals of either species would occur in the vicinity of the intake location except perhaps as occasional transients. Because water quality impacts associated with in-water construction activities for

the Proposed Project would be localized, the deep channel habitat preferred by shortnose and Atlantic sturgeon, would not be adversely impacted during installation or removal of the sheet pile for the cofferdam, or other in-water construction activities associated with the intake. Discharge of the reverse osmosis (RO) concentrate through the JRSTP effluent would not result in significant adverse impacts to water quality of the Hudson River and would not, therefore, have the potential to result in significant adverse impact to sturgeon.

While the construction of the intake has the potential to disturb waterfowl, the in-water construction period would be short and would not affect a large area of the Bay. Therefore, construction of the intake would not be expected to result in significant adverse impacts to waterfowl that use the area for feeding and resting during spring and fall migrations.

Therefore, the Proposed Project is consistent with this policy. For an additional description of the evaluation of project-related effects to the significant coastal fish and wildlife habitats, refer to Appendix 17.1.

Policy 8: *Protect fish and wildlife resources in the coastal area from the introduction of hazardous wastes and other pollutants which bioaccumulate in the food chain or which cause significant sublethal or lethal effects on those resources.*

The RO process used to desalinate water at the water treatment plant would produce a wastewater concentrate requiring disposal. The concentrate would be piped from the Wastewater Treatment Plant Site to the adjacent JRSTP, where it would be combined with the non-saline, treated effluent produced by the sewage plant and discharged into the Hudson River under the JRSTP's State Pollutant Discharge Elimination System (SPDES) permit. As discussed in Chapter 9, "Natural Resources," the resulting combined discharge salinity is well within the range of salinities that occur in Haverstraw Bay. The discharge would, under some conditions, be at or slightly above the concentrations within the Hudson River at the JRSTP diffuser. The JRSTP effluent diffuser is located in about 18 feet of water, approximately 800 feet from the shoreline. The results of hydrodynamic modeling conducted for the Proposed Project in order to select the best location for the raw water intake estimated that on average, the effluent from the JRSTP discharged to the Hudson River through the diffuser is diluted with the Hudson River at a ratio of 278:1. Therefore, during conditions when the salinity of the combined RO concentrate and JRSTP effluent would be higher than the Hudson River water, this high level of dilution achieved at the diffuser would minimize the potential for significant adverse impacts to water quality of the Hudson River.

Policy 9: *Expand recreational use of fish and wildlife resources in coastal areas by increasing access to existing resources, supplementing existing stocks, and developing new resources. Such efforts shall be made in a manner which ensures the protection of renewable fish and wildlife resources and considers other activities dependent on them.*

United Water is considering supplementing existing Hudson River access opportunities by providing a public access point to the Hudson River at the Intake Site.

Policy 10: *Further develop commercial finfish, shellfish and crustacean resources in the coastal area by: (i) encouraging the construction of new, or improvement of existing on-shore commercial fishing facilities; (ii) increasing marketing of the State's seafood products; and (iii) maintaining adequate stocks and expanding aquaculture facilities. Such efforts shall be in a manner which ensures the protection of such renewable fish resources and considers other activities dependent on them.*

The Proposed Project does not include provisions for commercial fishing operations, but would take special care to protect Hudson River fish at its intake structure by use of wedge wire screen intake filtration, and including construction practices to minimize impacts on river biota.

FLOODING AND EROSION POLICIES

Policy 11: *Buildings and other structures will be sited in the coastal area so as to minimize damage to property and the endangering of human lives caused by flooding and erosion.*

The Proposed Project would be covered under the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity Permit No. GP-0-08-001. To obtain coverage under this permit, a stormwater pollution prevention plan (SWPPP) would be prepared and a Notice of Intent (NOI) would be submitted to NYSDEC. The SWPPP would comply with all of the requirements of GP-0-08-001, NYSDEC's technical standard for erosion and sediment control presented in "New York Standards and Specifications for Erosion and Sediment Control," and NYSDEC's technical standard for the design of water quantity and water quality controls (post-construction stormwater control practices) presented in the New York State *Stormwater Management Design Manual*. Implementation of erosion and sediment control measures, and stormwater management measures identified in the SWPPP would minimize potential impacts to tidal wetlands along the edges of the Intake Site and raw water transmission line route associated with discharge of stormwater runoff during land-disturbing activities resulting from construction of the Proposed Project.

Implementation of erosion and sediment control measures (e.g., silt fences and straw bale dikes), and stormwater management measures as part of the SWPPP during construction and operation of the upland elements of the Proposed Project would minimize potential for significant adverse impacts to water quality of the Hudson River and Minisceongo Creek associated with stormwater runoff during land-disturbing activities.

Policy 12: *Activities or development in the coastal area will be undertaken so as to minimize damage to natural resources and property from flooding and erosion by protecting natural protective features including beaches, dunes, barrier islands and bluffs. Primary dunes will be protected from all encroachments that could impair their natural protective capacity.*

The Proposed Project would be constructed on formerly disturbed locations and thus would not affect protective natural features that minimize flooding.

Policy 13: *The construction or reconstruction or erosion protection structures shall be undertaken only if they have a reasonable probability of controlling erosion for at least thirty years as demonstrated in design and construction standards and/or assured maintenance or replacement programs.*

The Proposed Project does not include the construction of erosion protection structures. Therefore, this policy is not applicable.

Policy 14: *Activities and development including the construction or reconstruction of erosion protection structures, shall be undertaken so that there will be no measurable increase in erosion or flooding at the site of such activities or development, or at other locations.*

The Proposed Project does not include the construction of erosion protection structures, nor would the project increase erosion or flooding potential. In compliance with this policy, all

construction would be completed in accordance with applicable permit standards and practices to minimize the potential for erosion and sedimentation.

Policy 15: *Mining, excavation, or dredging in coastal waters shall not significantly interfere with the natural coastal processes which supply beach materials to land adjacent to such waters and shall be undertaken in a manner which will not cause an increase in erosion of such lands.*

The Proposed Project would not interfere with natural coastal processes and thus complies with this policy.

Policy 16: *Public funds shall only be used for erosion protective structures where necessary to protect human life, and new development which requires a location within or adjacent to an erosion hazard area to be able to function, or existing development; and only where the public benefits outweigh the long-term monetary and other costs including the potential for increasing erosion and adverse effects on natural protective features.*

No public funds are expected to be used in the construction or operation of the Proposed Project.

Policy 17: *Whenever possible, use non-structural measures to minimize damage to natural resources and property from flooding and erosion. Such measures shall include: (i) the setback of buildings and structures; (ii) the planting of vegetation and the installation of sand fencing and draining; (iii) the reshaping of bluffs; and (iv) the flood-proofing of buildings or their elevation above the base flood-level.*

The intake pumping facility must be located close to the shoreline to function as a water intake, but would built to prevent flooding of the facility and to prevent an increase of flooding in any adjacent areas. No shoreline fill or any significant structural measures are proposed for the construction and operation of the facility.

Policy 18: *To safeguard the vital economic, social and environmental interests of the State and its citizens, proposed major actions in the coastal area must give full consideration to those interests, and to the safeguards which the State have established to protect valuable coastal resource areas.*

The Proposed Project and its facilities have been designed to minimize adverse effects to coastal resources and economic, social, and environmental interests associated with coastal resources. The intake has been designed to minimize effects on the Significant Coastal Fish and Wildlife Habitat resources and the upland facilities would utilize previously disturbed coastal areas.

PUBLIC ACCESS POLICIES

Policy 19: *Protect, maintain, and increase the level and types of access to public water-related recreation resources and facilities so that these resources and facilities may be fully utilized in accordance with reasonable anticipated public recreation needs and the protection of historic and natural resources. In providing such access, priority shall be given to public beaches, boating facilities, fishing areas and waterfront parks.*

As discussed above under Policy 9, United Water is considering the provision of a public access (e.g., boat or kayak launch) at the Intake Site, thereby providing access to an area of Hudson River shoreline where currently there is limited direct access. The decision to provide such access would be based on a consideration of site design, and factors related to public safety and facility and security, as well as a consideration of effects on adjacent land

uses, such as adjacent residential and industrial uses, including the USG plant and the USG gypsum conveyor.

As described in Chapter 5, "Community Facilities," of the DEIS, several locations near the Intake Site currently provide public access to water-related recreation resources. A waterfront park in Stony Point (Riverfront Park) about 1,000 feet north of the Intake Site has public fishing access as well as beach space (not currently used for swimming), a parking area, a picnic pavilion, and a restroom. Both Riverfront Park, as well as the County owned shoreline along River Road, provide public access to the waterfront in the form of beaches, fishing access, and/or canoe/kayak launching. The Haverstraw Marina also provides a Town of Haverstraw canoe/kayak launch just south of the Intake Site. Access to these facilities would be protected and maintained during construction and operation of the Proposed Project. As described in Chapter 17, "Construction Impacts," a Maintenance and Protection of Traffic plan would be developed and implemented so that Beach Road would remain open to traffic during construction and public access would be maintained at those parks and at the canoe/kayak launch at Haverstraw Marina, during construction in the Hudson River, at the Intake Site, and along Beach Road.

Policy 20: *Access to publicly owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly owned shall be provided, and it should be provided in a manner compatible with adjoining uses. Such lands shall be retained in public ownership.*

As described above in the discussion of Policy 19, public access to the water's edge near the Intake Site would be maintained. The intake pumping station would be located on vacant industrial land that is currently owned by USG. The intake facility would be designed in a manner that consistent with adjacent uses. As proposed, the facility would not conflict with adjoining uses or access to publicly owned shoreline.

RECREATION POLICIES

Policy 21: *Water dependent and water enhanced recreation will be encouraged and facilitated, and will be given priority over non-water related uses along the coast, provided it is consistent with the preservation and enhancement of other coastal resources and takes into account demand for such facilities. In facilitating such activities priority shall be given to areas where access to the recreation opportunities of the coast can be provided by new or existing public transportation services and to those areas where the use of the shore is severely restricted by existing development.*

The Proposed Project is a water-dependent use and would not diminish any existing recreational use of the Hudson River. The predominant water-dependent recreational use of the Hudson River in the vicinity of the proposed facility is boating. There are several large marinas present in the Haverstraw Bay (Haverstraw, Verplanck and Stony Point) which provide dockage, fuel, and pumpout facilities for recreational boaters. Other recreational uses in the vicinity are fishing and crabbing. The Proposed Project would not adversely affect this water-dependent recreational use. As noted earlier, in the discussion of Policy 4, the Proposed Project would require relocation of a small off-season boat storage area from the Intake Site, but adequate room at other locations at the Haverstraw Marina is available for this use. Also as noted in the discussion of Policy 19, access to the canoe/kayak launch and other activities at Haverstraw Marina would be maintained during construction and operation of the Proposed Project.

Policy 22: *Development, when located adjacent to the shore, will provide for water-related recreation, as a multiple use, whenever such recreational use is appropriate in light of reasonably anticipated demand for such activities and the primary purpose of the development.*

See response to Policy 9 and 19.

HISTORIC AND SCENIC RESOURCES POLICIES

Policy 23: *Protect, enhance, and restore structures, districts, areas or sites that are of significance in the history, architecture, archeology or culture of the State, its communities, or the nation.*

As concluded in Chapter 7, "Cultural Resources," the Proposed Action would not have an adverse impact on historic or archaeological resources. The Intake Site, Water Treatment Plant Site, much of the raw water transmission line route, and the potential access roads to the plant have been determined not to be sensitive for archaeological resources. Therefore, construction activities would not adversely affect any archaeological resources at those locations. The Phase 1A archaeological study conducted during preparation of the DEIS identified the western portion of the raw water transmission line route as potentially containing pre-contact (i.e., Native American) archaeological resources. Further investigation of this area in the form of Phase 1B archaeological subsurface testing will be conducted prior to any construction disturbance. The results of the field testing will be submitted to the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) for review. Should archaeological resources be encountered, United Water, in consultation with NYSDEC and OPRHP, would take appropriate measures to identify the significance of such resources and develop mitigation measures if appropriate.

Policy 24: *Prevent impairment of scenic resources of statewide significance, as identified on the coastal area map. Impairment shall include: (i) the irreversible modification of geological forms, the destruction or removal of vegetation, the destruction or removal of structures, whenever the geologic forms, vegetation or structures are significant to the scenic quality of an identified resources; and (ii) the addition of structures which because of siting or scale will reduce identified views or which because of scale, form, or materials will diminish the scenic quality of an identified resource.*

The Proposed Project Sites are not within a NYSDOS-mapped Statewide Area of Scenic Significance (SASS) and no designated scenic resources of statewide significance would be impaired by the Proposed Project. The closest SASS to the Project Sites is the Hudson Highlands SASS. There are some areas within Bear Mountain State Park that are part of the Hudson Highlands SASS and may have views of both the Intake Site and the Water Treatment Plant Site. However, since the Proposed Project would be approximately four miles from the southernmost boundary of the SASS, views of the Project Sites would be limited. At this distance, it would be difficult to distinguish between the proposed buildings and existing buildings due to the effects of atmospheric perspective. Therefore, the Proposed Project would not result in any significant visual impacts to the Hudson Highlands SASS. A more detailed discussion of potential visual impacts is provided in Chapter 4, "Visual Resources."

Policy 25: *Protect, restore, or enhance natural and manmade resources which are not identified as being of statewide significance, but which contribute to the overall scenic quality of the coastal area.*

The Proposed Project would not impair scenic resources because of the limited size and architectural design of the facility, as well as the location, design, and the scenic quality of the exiting adjacent resources. The Intake Site is an existing industrial area characterized by the USG conveyor and shipping pier, and the site has been previously disturbed. These existing industrial uses would remain into the foreseeable future. The intake pumping station building would be of a scale and architectural design that is compatible with nearby residential structures. United Water is committed to designing the building on the Intake Site to be visually compatible with nearby uses, including the existing residential buildings in the area. The new intake pumping station's small size and relatively low height (at 35 feet) would minimize its prominence when viewed from the surrounding area. The intake pumping station building would not impact view corridors for nearby scenic vistas, such as the Hudson River and the Hudson Highlands.

Currently, the Water Treatment Plant Site slopes from an elevation of about 50 feet on the south side to less than 25 feet on the north side. The east and west sides of the Site rise sharply, limiting visibility of the proposed water treatment plant. Even with the limited filling proposed for the Site, the new buildings in the center of the Site would be built on a grade approximately 10 to 15 feet lower than the grade of the adjacent CSX railroad right-of-way to the west of the Site (and even lower relative to the landfill to the east of the Site).

Overall, the new structures added to the Intake Site and Water Treatment Plant Site would have limited visibility from the surrounding areas, because of the buffering effects of topography, vegetation, and existing structures nearby.

AGRICULTURAL LANDS POLICY

Policy 26: *To conserve and protect agricultural lands in the State's coastal area, an action shall not result in a loss, nor impair the productivity, of important agricultural lands, as identified on the coastal area map, if that loss or impairment would adversely affect the viability of agriculture in an agricultural district, or if there is no agricultural district in the area surrounding such lands.*

The Proposed Project does not include agricultural lands. Therefore, this policy is not applicable.

ENERGY AND ICE MANAGEMENT POLICIES

Policy 27: *Decisions on the siting and construction of major energy facilities in the coastal area will be based on public energy needs, compatibility of such facilities with the environment and the facility's need for a shorefront location.*

The Proposed Project does not include major energy facilities. Therefore, this policy is not applicable.

Policy 28: *Ice management practices shall not damage significant fish and wildlife and their habitats, increase shoreline erosion or flooding, or interfere with the production of hydroelectric power.*

Aside from a marker buoy at the intake structure location, approximately 1,000 feet offshore, the Proposed Project does not require ice management practices. The buoy and its mooring would be periodically inspected to ensure its safety during ice-flow events.

Policy 29: *Encourage the development of energy resources on the Outer Continental Shelf, in Lake Erie and in other water bodies, and ensure the environmental safety of such activities.*

The Proposed Project does not include development of relevant energy resources. Therefore, this policy is not applicable.

WATER AND AIR RESOURCES POLICIES

Policy 30: *Municipal, industrial, and commercial discharge of pollutants, including, but not limited to, toxic and hazardous substances, into coastal waters will conform to State water quality standards.*

See Policy 8.

Policy 31: *State coastal area policies and purposes of approved Local Waterfront Revitalization Programs will be considered while reviewing coastal water classifications and while modifying water quality standards; however, those waters already over-burdened with contaminants will be recognized as being a development constraint.*

The waters of the Hudson River in the vicinity of the Proposed Project are classified as SB, which indicates that the water is saline and suitable for primary contact, including swimming. This classification does not represent a constraint for future development that would occur in conformance with the Proposed Project. The Proposed Project is not within the covered by an adopted Local Waterfront Revitalization Program (LWRP), nor would it affect adjacent LWRP communities, as discussed separately at the end of this chapter. The Proposed Project would not affect best usage designations of the Hudson River. Thus the Proposed Project would comply with this policy.

Policy 32: *Encourage the use of alternative or innovative sanitary waste systems in small communities where the costs of conventional facilities are unreasonably high, given the size of the existing tax base of these communities.*

This policy is not applicable to the Proposed Project.

Policy 33: *Best management practices will be used to ensure the control of storm water runoff and combined sewer overflows draining into coastal waters.*

During construction and long-term operation, best management practices would be employed to control stormwater runoff from the Intake Site and Water Treatment Plant Site. The facilities would be constructed in compliance with a NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity, and a SWPPP. See also the discussion of Policy 11.

Policy 34: *Discharge of waste materials into coastal waters from vessels will be limited so as to protect significant fish and wildlife habitats, recreational areas and water supply areas.*

This policy is not applicable to the Proposed Project.

Policy 35: *Dredging and dredge spoil disposal in coastal waters will be undertaken in a manner that meets existing State dredging permit requirements, and protects significant fish and wildlife habitats, scenic resources, natural protective features, important agricultural lands, and wetlands.*

A minor amount of dredging in a designated Significant Coastal Fish and Wildlife Habitat would be needed to install the raw water intake structure in the Hudson River. Dredging

would take place within a temporary sheetpile cofferdam that would protect the surrounding habitat from a dredging plume. See response to Policy 7 in Appendix 17.1 for a detailed discussion of potential effects of intake construction.

Policy 36: *Activities related to the shipment and storage of petroleum and other hazardous materials will be conducted in a manner that will prevent or at least minimize spills into coastal waters; all practicable efforts will be undertaken to expedite the cleanup of such discharges; and restitution for damages will be required when these spills occur.*

As discussed in Chapter 10, "Hazardous Materials," petroleum products (e.g., diesel fuel) may be stored on-site for emergency back-up generation equipment, and the treatment and disinfection of Hudson River water would require the use of various chemicals including granular activated carbon (GAC), carbon dioxide, lime, citric acid, anti-scaling agents, ferric chloride or similar flocculents, and sodium hydroxide. The storage and handling of all chemicals and petroleum-based products would be incorporated into a facility Spill Prevention Control and Countermeasure Plan, Storm Water Pollution Prevention Plan, if needed, and facility operating procedures, in accordance with all applicable federal and state requirements.

Policy 37: *Best management practices will be utilized to minimize the non-point discharge of excess nutrients, organics and eroded soils into coastal waters.*

New York State Best Management Practices would be used to minimize non-point discharge of excess nutrients, organics, and eroded soils. Also see response to Policy 33.

Policy 38: *The quality and quantity of surface water and groundwater supplies will be conserved and protected, particularly where such waters constitute the primary or sole source of water supply.*

The Proposed Project would not impact the quality and quantity of surface water and groundwater supplies since the Proposed Project would not alter the flow patterns or the salinity gradient in the Hudson River. The construction and operation of Proposed Project would have no effect on the quality or quantity of the groundwater at the Proposed Project Sites. At present, there is no potable use of either surface water or groundwater at the Intake or Water Treatment Plant Sites.

Policy 39: *The transport, storage, treatment and disposal of solid wastes, particularly hazardous wastes, within coastal areas will be conducted in such a manner so as to protect groundwater and surface water supplies, significant fish and wildlife habitats, recreation areas, important agricultural lands and scenic resources.*

Wastes (e.g., dewatered sludge) generated by the water treatment plant would be either dewatered on-site and prepared for removal by a licensed waste hauler, or would be treated at the adjacent JRSTP.

Policy 40: *Effluent discharged from major steam electric generating and industrial facilities into coastal waters will not be unduly injurious to fish and wildlife and shall conform to State water quality standards.*

As discussed under Policy 8, above, the water treatment facility would produce a concentrated saline effluent that would be discharged into the Hudson River following dilution by mixing with non-saline effluent discharge from the JRSTP. As discussed under Policy 8, above, this diluted concentrate discharge is not expected to adversely affect the Hudson River or its biotic resources.

Policy 41: *Land use or development in the coastal area will not cause national or State air quality standards to be violated.*

As discussed in Chapter 14, "Air Quality," the Proposed Project would not cause air quality violations.

Policy 42: *Coastal management policies will be considered if the State reclassifies land areas pursuant to the prevention of significant deterioration regulations of the Federal Clean Air Act.*

This policy is not applicable to the Proposed Project.

Policy 43: *Land use or development in the coastal area must not cause the generation of significant amounts of the acid rain precursors: nitrates and sulfates.*

The Proposed Project would not generate significant amounts of nitrates and sulfates. Air quality impacts of the project are addressed in Chapter 14, "Air Quality," and found to be in compliance with federal standards.

Policy 44: *Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.*

The Proposed Project would not affect tidal or freshwater wetlands. Avoidance of wetland resources was considered in the siting and design of the Proposed Project's facilities, as discussed in Chapter 9, "Natural Resources."

LOCAL WATERFRONT REVITALIZATION PROGRAMS

A Local Waterfront Revitalization Program (LWRP) is defined by NYSDOS as both a planning document and a program established to implement the plan. The NYSDOS identifies the following issues as the critical aspects of a comprehensive LWRP:

- Waterfront redevelopment;
- Historic resources;
- Scenic resources;
- Flooding and erosion;
- Water quality;
- Fish and wildlife habitats;
- Public access and recreation;
- Water-dependent uses and harbor management; and
- Agriculture.

Many communities along the Hudson River have adopted LWRPs to create a unified, clear vision for the development and future of the waterfront. Presenting such a vision of the waterfront in the form of an LWRP increases the opportunities for public and private funding for development, the accessibility of technical services to manage the waterfront and implement the plan, and ensures state and federal consistency regarding coastal management.

As noted above, the Town of Haverstraw currently does not have an adopted LWRP. According to the NYS DOS, there are 24 municipalities in the Hudson River Coastal Management Program Region with adopted LWRPs; five LWRP communities are within a five-mile radius of the Proposed Project. These are listed in Table 17-1.

Table 17-1
Local Waterfront Revitalization Programs

Municipality	LWRP Adoption Date	Distance from Project Sites
Village of Croton-on-Hudson	September 1992	~ 3 miles
Village of Haverstraw	May 2004	< 1 mile
Village of Ossining	July 1993	~ 5 miles
City of Peekskill	January 2005	~ 5 miles
Town of Stony Point	February 1995	< 1 mile
Source: NYS DOS Division of Coastal Resources. http://www.nyswaterfronts.com/LWRP_Status.asp		

The Proposed Project is a three to five miles from the LWRP communities on the east side of the Hudson River and therefore would not affect their visions for the future of the Hudson River waterfront. Because of the distance between those LWRP communities and the Project Sites, it would be difficult to distinguish the intake pumping station and water treatment plant from existing industrial uses in Haverstraw. The Proposed Project would be consistent with the visual and scenic preservation goals of the LWRPs and also with the promotion of water-dependent uses.

The Proposed Project is consistent with the LWRPs in the nearby Village of Haverstraw and Town of Stony Point. Objectives of these LWRPs are mostly specific to areas within the Village of Haverstraw and within the Town of Stony Point, and the Proposed Project is consistent with policies that are more broadly applicable and include scenic considerations as well as ensuring adequate infrastructure for waterfront development as well as safeguarding economic, social and environmental interests in the coastal area. The Proposed Project would not impact any historic or archeological resources, which is an important aspect of both LWRPs. The Proposed Project is a forward-thinking endeavor which is aimed at accommodating future projected growth in Rockland County in a sustainable way. Thus the very nature of the Proposed Project is consistent with the future visions presented in the LWRPs in Rockland County. ✳

A. INTRODUCTION

In accordance with the State Environmental Quality Review Act (SEQRA), this chapter presents and analyzes alternatives to the Proposed Project. Under SEQRA, alternatives selected for consideration are generally those within the capabilities of the project sponsor that have the potential to reduce, eliminate, or avoid significant adverse impacts of a proposed action while meeting the purpose and need for and benefits of the action, which in this analysis are described in Chapter 1, "Purpose and Need."

CHAPTER ORGANIZATION

This chapter is divided into the following sections that address each of the alternatives considered:

B. No Action Alternative.
C. Increased Storage Capacity at Lake DeForest.
D. Development of New Groundwater Sources.
E. Reuse of Wastewater.
F. Use of the Suffern Quarry.
G. Ramapo River High Flow Skimming with Off-Stream Storage (New Reservoir).
H. Hudson River Skimming.
I. Hudson River Water Withdrawal: Alternative Intake Sites.
J. Combination of Alternatives.
K. Ambrey Pond Reservoir.

For each alternative considered, the chapter first describes the alternative, and then discusses whether it meets the purpose and need for the Proposed Project. For alternatives that were found to meet the purpose and need of the Proposed Project, the alternative's ability to meet the goals of the Proposed Project and its environmental effects in comparison to those of the Proposed Project are then described.

SUMMARY OF ALTERNATIVES CONSIDERED AND PRINCIPAL CONCLUSIONS

The No Action Alternative considers a future condition in which the Proposed Project is not undertaken, but United Water New York Inc. (United Water) makes the other planned improvements to its water supply and distribution system in Rockland County. Thus, the No Action Alternative includes any ongoing water supply initiatives that United Water is undertaking, and will continue to undertake, with or without the Proposed Project. These actions consist of United Water's Short-Term Water Supply program, as well as its water conservation

programs and ongoing initiatives to maximize existing water supplies and infrastructure. The No Action Alternative would not meet the purpose and need for the Proposed Project, which is to provide a long-term water supply project that increases United Water's safe yield for Rockland County to meet the future needs projected beyond 2015. The public need for, and benefit of, the long-term water supply project is the addition of 7.5 million gallons per day (mgd) to the water supply system's safe yield and the addition of peak day capacity. United Water's projections indicate the need for 2.5 mgd in additional safe yield by 2016, and the need for an additional 2.5 mgd in safe yield by 2021. The need for 7.5 mgd is expected to occur some time after 2021.

Other than the Wastewater Re-use Alternative and the Ambrey Pond Reservoir Alternative, the other alternatives considered would not meet the purpose and need for the project because they would be unable to provide a reliable and sustainable long-term water source for Rockland County. Elements of several of the alternatives that were considered are being undertaken all, or in part, by United Water as part of the Short-Term Water Supply program. In addition to the alternatives discussed in this chapter, other potential water sources were considered but implicate bi-state issues, riparian rights changes and/or conflicts, and are otherwise speculative. Therefore, they were determined to not meet the purpose and need for and benefits of the Proposed Project.

An alternative that re-uses wastewater from a wastewater treatment plant in Rockland County could potentially meet the purpose and need for the Proposed Project but was rejected because of its high cost and the anticipated adverse public response to an alternative involving use of wastewater for drinking water.

The Ambrey Pond Reservoir Alternative consists of construction of a new reservoir and related infrastructure, including three dams and a water treatment plant. This major infrastructure project was originally planned over 40 years ago and was considered to be United Water's long-term water supply project. However, given the purpose and need for the Proposed Project and other considerations, this alternative can no longer be considered the selected action. With a safe yield of less than 4.3 mgd at full completion, it would not provide the required additional safe yield of 7.5 mgd. In addition, given the 3.5-year construction period for this Alternative's first phase and the likely longer period in advance of construction for additional design and permitting, this phase would most likely not be in operation by the end of 2015, as required by a December 14, 2006 Order by the New York State Public Service Commission. It would also be less effective in meeting the goal of the Proposed Project's with respect to reliability, because the water sources feeding this alternative are surface sources, and are therefore limited by watershed capacity, and susceptible to drought conditions, which may be magnified in the future due to climate change. This alternative would require the construction of two major new dam structures and a third, reconstructed dam, and the inundation of approximately 112 acres of existing open space and wildlife habitat immediately adjacent to Harriman State Park. This alternative would require the relocation of segments of two local roadways, and would also displace approximately 20 structures, including occupied residences. In addition, this reservoir would displace Town of Stony Point recreational facilities, including its municipal swimming pool. In comparison to the Proposed Project, the Ambrey Pond Reservoir Alternative would result in more substantial adverse impacts to a greater range of environmental resources, and would therefore provide fewer public benefits than the Proposed Project in respect to mitigating environmental impacts.

B. NO ACTION ALTERNATIVE

In the future, with or without a long-term water supply program, United Water will continue to undertake certain short-term actions and ongoing programs to upgrade and optimize the infrastructure of its existing water supply system and to provide as much water as possible by maximizing the capacities of existing water sources. United Water will also continue to promote a decrease in water consumption by encouraging conservation by its customers. The performance of these short-term actions is a background condition that will occur under any and all alternatives. These actions are discussed in Chapter 1, "Purpose and Need," and are more fully discussed below.

Following the description of the No Action Alternative, its effects are compared to those of the Proposed Project. This includes a comparison of the ability to meet the Project's purpose and need and goals and benefits, as well as a comparison of the environmental effects of the No Action Alternative to those of the Proposed Project. Conditions with the No Action Alternative, but without the Proposed Project, would be the same as those described throughout this DEIS as "The Future Without the Proposed Project."

DESCRIPTION OF THE NO ACTION ALTERNATIVE

The No Action Alternative consists of all the programs being undertaken by United Water to improve its water supply system in Rockland County, independent of the Proposed Project. As discussed below, these include the Short-Term Water Supply program, which is currently under way and is intended to meet United Water's water supply commitments through 2015, as well as other measures to improve the efficiency and operations of the United Water system.

SHORT-TERM WATER SUPPLY PROGRAM AND RELATED IMPROVEMENTS

The short-term actions include a number of different projects and measures to increase available capacity in order to meet United Water's average and peak day demands. The Short-Term Water Supply program emphasizes improvements to existing water supply infrastructure, such as the augmentation of the Ramapo River and Ramapo Valley Well Field with Potake Pond. Some of the major elements of the short-term water supply plan are as follows:

- **Updated and expanded Letchworth Water Treatment Plant.** This improvement has been implemented and provided an additional peak capacity of 2 mgd. The addition of 2 mgd at the Letchworth Water Treatment Plant did not add to the safe yield of the United Water system.
- **Improvement of existing wells.** Construction of air stripping towers to treat gasoline-contaminated water at the Sparkill well field has been implemented for an additional peak capacity of 0.58 mgd (0.4 mgd on-line currently, with an expected additional 0.15 mgd in 2009).
- **Test well conversion to production wells.** This improvement involves the full development of three previously installed test wells. United Water is currently pursuing this option, for between 0.5 and 1.0 mgd of additional capacity.
- **Creation of new wells and purchase of existing private wells for development.** United Water is currently evaluating the feasibility of these options, including potential wells at

Rockland Psychiatric Center, the former St. Agatha Home, and Helen Hayes Hospital. Depending on testing and water quality results, the cumulative increased peak capacity of these wells could be between 1 and 1.5 mgd. New wells will add marginally to the safe yield of the system.

- **Aquifer Storage and Recovery.** This project, currently in the study phase, involves a pilot project to test the viability of aquifer storage and recovery (ASR) options to yield additional capacity. ASR projects involve pumping water into existing aquifers for storage and use later. If feasible, this is likely to provide more value as a way to increase flexibility, although a nominal increase in peaking capacity may also be realized (potentially up to 0.5 mgd).

- **Potake Pond Diversion.** United Water is currently limited to use of 190 million gallons from Potake Pond for flow augmentation in the Ramapo River to extend use of the Ramapo Valley Well Field during dry conditions (when river flows fall below the 8 mgd threshold). The diversion of an additional 110 mgd is under review, and would increase the ability of United Water to meet water demand during dry conditions. A Supplemental Environmental Impact Statement and hydrological study are currently being prepared for this project.

  The use of additional storage in Potake Pond would increase peaking capacity and further extend the period when United Water is able to use the Ramapo Valley Well Field, increasing the flexibility of the United Water system to meet demand during dry conditions. It would not, however, add to the safe yield of the system.

- **Lake DeForest Spill Skimming.** This plan involves the use of water that passes over the Lake DeForest spillway when the reservoir is full instead of water that otherwise would have been drawn from bedrock wells. The additional supply would only be available when the Lake DeForest dam and downstream reservoir dams are all spilling. Lake DeForest Spill Skimming would allow existing groundwater wells to be maintained at higher levels, thereby increasing their reliability.

  Spill skimming would not, however, increase the safe yield of Lake DeForest, because the reservoir does not spill during drought conditions. Nonetheless, with the consent of regulatory agencies, implementation of spill skimming has the potential for a nearly-immediate increase of about 3.5 mgd from March to May, thereby allowing bedrock wells to recharge and retain their capacity for peak demand periods.

In addition to those Short-Term Water Supply program elements, United Water is also undertaking the following:

- **Underground Infrastructure Renewal Program (UIRP).** This program involves cleaning and relining water mains, replacing mains and valves, and replacing hydrants, thereby reducing leaks and frequency of breaks.

- **Integrated Water Resources Management Program.** United Water is aggressively pursuing this program to develop an operations protocol that will integrate United Water's Supervisory Control and Data Acquisition (SCADA) system with varying demands so that water resources are utilized in an optimal manner. The SCADA system is a centralized electronic monitoring system that allows real-time monitoring of United Water's entire water supply system.

REDUCTION OF NON-REVENUE WATER USE

"Non-revenue water" is water supplied to the distribution system that does not provide revenue to the utility. A certain amount of non-revenue water is normal for any water supply system, and reflects water used by the water treatment process and for firefighting and authorized construction use, among other uses. In addition, it also results from leaks in the water system; some leaks are inevitable in any water system. Non-revenue water also includes water that is not metered or not metered accurately, as well as water used without authorization, such as through illegal connections. Any inefficiencies or water lost to leaks is a concern for any water purveyor, because it increases the quantity of water supplied and increases the cost of water without producing corresponding revenue, unfairly placing a burden on legitimate water users. United Water has an ongoing program to reduce the amount of water used in the water treatment process and water lost through leaks in the distribution system.

United Water uses the American Water Works Association (AWWA) water auditing method to track distribution system water losses and evaluate water loss performance compared to other utilities. The water audit provides a picture of how quantities of water flow into and out of the distribution system and to customers. Water losses can be divided into "apparent losses" and "real losses." To address "apparent losses," which include unauthorized water consumption, customer meter inaccuracies, and data handling errors, United Water has a program to recalibrate or replace water meters system-wide on a regularly scheduled basis. Typically, United Water recalibrates or replaces about 7 percent of the meters in its system annually.

The auditing program also identifies "real losses," which include leakage from transmission or distribution mains, leakage or overflows from storage tanks, and leakage from service connections. In 2007, United Water lost a total of 1,521.4 million gallons of water during the course of the year. This equates to a total of 4.17 mgd. However it is important to note that even new water distribution/transmission pipes and service connections leak. Therefore, even if the entire distribution system was new, there would be a certain amount of leakage that would be unavoidable. This leakage is called "Unavoidable Annual Real Losses" (UARL).

The AWWA water audit process provides a method to estimate a system's UARL. This method takes into account the length of the transmission and distribution system piping, the number of service connections, the length of private pipe (i.e., from the curb stop to the customer meter), and the average operating pressure. The UARL for United Water in 2007 was 777.45 million gallons per year, or 2.13 mgd. This is approximately half of the 1,521.4 million gallons (4.17 mgd) of real losses in the United Water system annually.

To address real losses that may be avoidable, United Water has an ongoing program to reduce system water losses, including an underground infrastructure renewal program (UIRP) that consists of rehabilitating and replacing the various components of the United Water's distribution system. The UIRP program includes the system-wide replacement of aging water mains, fire flow improvements, and transmission improvements. Aging main replacements entail methodically replacing aging and deteriorating pipes as they reach the end of their useful lives. United Water replaces about 1 percent of its distribution lines annually. The fire flow improvement project replaces pipes and hydrants that are responsible for less than adequate fire flow capacity. Transmission improvements are systematically undertaken to resolve significant limitations in transmission capacity.

The AWWA water auditing method requires the calculation of what is known as the "Infrastructure Leakage Index" or ILI. The ILI is a measure of how well the water distribution system is being managed for the control of real losses at the current operating pressure. An ILI close to 1.0 demonstrates that all aspects of a successful leakage management policy are being implemented. However, typically it will only be economic to achieve an ILI close to 1.0 if water is very expensive, scarce or both. Economic values of ILI depend upon the system-specific marginal cost of real losses, and typically lie in the range of 1.5 to 2.5 for most systems. United Water's 2007 ILI was 1.95, indicating that the leakage from the United Water system is in line with other well run water distribution systems.

WATER CONSERVATION PROGRAMS

In addition to capital projects, under the No Action Alternative, United Water will also continue its ongoing program to encourage water conservation by customers and to reduce water lost through leaks in the distribution system. United Water is a private company and does not have the regulatory authority to mandate or enforce water conservation by consumers. The company is thereby limited in its ability to rely on conservation as a means to reduce demand or increase available supply. Nonetheless, United Water has implemented a number of measures to encourage water conservation and educate its customers on the benefits and need for water conservation.

In 1992, United Water (then the Spring Valley Water Company) instituted a formal, consumer-based water conservation program that includes customer education and distribution of low-flow devices to residential customers. Since that time, as part of its education program, United Water has disseminated consumer conservation information widely via mailed advertisements, radio ads, cable television, and public events and presentations. Beginning in 2007, United Water has published an "Annual Conservation Guide" in the *Journal News* for customers in Rockland County. Since 2007, the information provided in the print version of the *Annual Conservation Guide* has also been available on the United Water website.

The water conservation program provides recommendations on xeriscaping (low-moisture landscaping), including recommended plant species, use of mulch to reduce water needs; indoor/outdoor water use conservation tips; and instructions on how to detect water leaks. The xeriscaping program is based on selection of appropriate plantings and horticultural/irrigation techniques that make the best use of water. In an effort to reduce unnecessary and excessive lawn irrigation, United Water monitors and disseminates information on regional evapotranspiration rates (ET). ET is the loss of water from the soil through a combination of evaporation and plant transpiration. United Water's ET program was developed in cooperation with the Cornell University Cooperative Extension and the State of New York. As a customer service, United Water provides the current ET Number (how many minutes of lawn/garden water is needed as part of a once-every-four days watering cycle) via telephone, local AM radio (since 1994), and the internet (since 2007). The ET number equates to the number of minutes in an hour that a lawn should be watered under specific conditions of temperature, humidity, wind, rainfall, and solar radiation.

The United Water *Annual Conservation Guide* also provides information on purchase of water-saving kits that can be installed by the consumer to minimize water use. A water-saving device distribution program has been in place at United Water since 1993. Within the first two years of the program (1993-1994) it was estimated that each household in United Water's distribution

network saved approximately 11.2 gallons per day, on average. With 24,000 participants in the first two years of the programs, this equated to an average savings of over 268,000 gallons per day system-wide. Currently, United Water partners with Niagara Conservation to provide the water-saving kits at nominal cost. Indoor kits include a toilet dam, low-flow nozzles and showerheads, and a shower timer. Outdoor kits include a hose timer, moisture meter, a rain gauge, and a low-flow hose nozzle. Over 5,000 Niagara Conservation kits have been purchased by United Water customers in the past two years.

Additional programmatic conservation measures used by United Water have included variable summer/winter rates.

The conservation measures recommended by United Water are entirely voluntary on the part of consumers, and the wise use of water by consumers is entirely beyond the control and capabilities of United Water. Many water conservation measures—such as changes to the local plumbing code to require low-flow fixtures—have already been implemented, and therefore any savings caused by those measures have already occurred. Additional conservation programs will reduce demand, to the extent that they can be implemented.

NO ACTION ALTERNATIVE: ABILITY TO MEET PURPOSE AND NEED AND GOALS AND BENEFITS OF THE PROPOSED PROJECT

The No Action Alternative would not meet the purpose and need for the project, which is to provide a long-term water supply project that increases United Water's safe yield for Rockland County to meet the future needs projected beyond 2015.

As discussed in Chapter 1, "Purpose and Need," over the next 20 years, the population in Rockland County is projected to continue to grow, consistent with current land use planning and zoning. This population growth is projected to occur with or without the Proposed Project, and is therefore a future condition that is anticipated to occur under all alternatives. To meet its water supply commitments through the end of 2015, United Water is implementing a Short-Term Water Supply program to develop new supplies and improve its infrastructure to maximize the use of existing sources of supply. The Short-Term Water Supply program includes a number of measures to increase available capacity in order to meet United Water's supply commitments and average and peak day demands. The Short-Term Water Supply program emphasizes improvements to existing water supply infrastructure, with infrastructure improvements scheduled to continue over the next seven years to meet United Water's needs through the end of 2015. While these improvements suffice for short-term needs, infrastructure improvements that would result in an increase in water supply are limited to small, incremental increases. No measures are available in the No Action Alternative that would increase the safe yield of the United Water system to meet the projected demand beyond the end of 2015. By the end of 2015, United Water will need an additional water supply project to keep pace with demand, and the No Action Alternative would not provide this additional supply.

EFFECTS OF THE NO ACTION ALTERNATIVE IN COMPARISON TO THOSE OF THE PROPOSED PROJECT

The No Action Alternative represents the future conditions if the Proposed Project would not occur. This condition is described throughout the earlier chapters of this DEIS as "the Future without the Proposed Project." Under the No Action Alternative, the Project Sites are expected

to remain undeveloped, and existing levels of activity on and in the vicinity of the Project Sites is expected to remain similar to the current condition. This alternative assumes that the Rockland County population increases as currently projected, and that the total amount of water demand will also increase.

LAND USE, ZONING, AND OTHER PROGRAMS

In the No Action Alternative, land uses on the Project Sites would remain unchanged. The water treatment plant, intake facilities, and the raw water transmission line would not be constructed. Near the Project Sites, little change in land use is expected. Some development projects are proposed in the surrounding area, and these are assumed to occur in the No Action Alternative.

It is not expected that zoning district designations would change in the No Action Alternative. While the Towns of Haverstraw or Stony Point, or the Village of Haverstraw may change their respective zoning codes, there are no known plans to do so at this time.

This alternative would be less effective in addressing the local and county plans that are in place in the Project Area. For example, the projected growth in Rockland County would place demands on the existing water supplies, and would require development of supplemental sources of drinking water. It is expected that over time, the various plans discussing the study area would evolve and be updated, but no significant changes would be expected to occur in the No Action Alternative.

VISUAL RESOURCES

In the No Action Alternative, the visual character of the study area is expected to remain the same as in its current state. There will be no new construction to change views and existing uses on the intake and water treatment sites will remain.

COMMUNITY FACILITIES

In the No Action Alternative, conditions are expected to remain consistent with existing conditions. No construction is expected to occur at the Project Sites. Any development activity that does occur would take place independent of the Proposed Project as a result of the actions of individual property owners or developers. Current levels of water supply and pressure available for fire fighting would remain the same, with the availability of adequate water supplies being potentially diminished during drought conditions absent the reliable supply of water offered by the Hudson River under the Proposed Project.

SOCIOECONOMIC IMPACTS

United Water's short-term actions are expected to supply adequate water to support Rockland County's projected population growth through the year 2015. After that point, it is expected that increased population and housing growth would still place significant demands on the water supply system.

In the No Action Alternative, the Project Sites would remain unchanged and existing levels of economic activity resulting from current levels of site use would remain. It is assumed that the Town-owned Water Treatment Plant Site would remain exempt from property taxes (unlike the Proposed Project, which would generate property taxes at the Water Treatment Plant Site).

CULTURAL RESOURCES

The investigations conducted for this DEIS concluded that with one exception, the Project Sites do not have archaeological "sensitivity"—i.e., they do not have the potential to contain archaeological resources. The western portion of the potential raw water transmission line route does have potential archaeological sensitivity, however. In the No Action Alternative, all potential Project Sites would likely remain unchanged. Therefore, no adverse impacts would occur to any archaeological resources along the raw water transmission line route. In comparison, with the Proposed Project, additional investigation in the form of Phase 1B archaeological investigation would be conducted for the portion of the raw water transmission line identified as archaeologically sensitive and, if necessary, mitigation would be implemented to avoid adverse effects to archaeological resources.

No historic resources were identified on the Project Sites or in the immediate vicinity, and therefore none would be affected by the Proposed Project or the No Action Alternative.

GEOLOGY, SOILS, AND GROUNDWATER

In the No Action Alternative, the Project Sites would likely remain unchanged. As there would be no in-ground disturbance at the Sites, there would be no impacts to geological or soil resources.

If no long-term water supply is developed for Rockland County, it is possible that future residents would rely increasingly on private wells, which raises water quality issues and would add to the demand on the groundwater supply in the County.

NATURAL RESOURCES

In the No Action Alternatives, floodplain, wetlands, and terrestrial resources within the Water Treatment Plant Site, Intake Site, and water transmission line route would remain in their current conditions and would continue to be of limited value to wildlife.

Proposed and ongoing projects aimed at improving water quality and aquatic resources in the Hudson River Estuary have the potential to improve water quality and aquatic habitat in the Hudson River within the study area for the Proposed Project. These projects are independent of the Proposed Project, and the resulting improvements to water quality and aquatic resources will occur without the Proposed Project. The No Action Alternative would not cause any impingement or entrainment of aquatic species into a new water intake. However, with the Proposed Project, the design of the intake would minimize losses to the target fish species, and would not result in significant adverse impacts to regional target species populations, or to regional populations of other fish, plankton or macroinvertebrates.

HAZARDOUS MATERIALS

In the No Action Alternative, it is assumed that the Project Sites will continue in their current uses. Currently, there are no known significant health risks associated with the Project Sites. Likewise, there would be no significant health risks at the Project Sites with the Proposed Project.

INFRASTRUCTURE

As noted earlier, in the No Action Alternative, United Water will continue to implement its Short-Term Water Supply program and related actions, and these changes will increase the efficiency of the United Water water system in Rockland County. Without the Proposed Project, there will be a need to provide an additional source of potable water to meet the needs of the growing population. Since the Proposed Project is intended to ensure adequate long term water supply, some other source of water will be required in the No Action Alternative. If no long-term supply is developed, it is possible that future residents would rely increasingly on private wells, which raises water quality issues and would add to the demand on the groundwater supply in the county.

TRAFFIC AND TRANSPORTATION

In the No Action Alternative, the Project Sites will continue in their current uses, and existing levels of traffic generation would remain at their current levels. Development activity that would generate additional traffic on area roadways would take place independent of the Proposed Project as a result of the actions of individual property owners or developers.

NOISE

Without the Proposed Project, noise levels in the vicinity of the Project Sites would be similar to existing conditions. There would be no appreciable change in noise levels. Future noise levels would be expected to be within 1 dBA of existing noise levels.

AIR QUALITY

Minimal growth and development is expected to occur in the vicinity of the Project Sites under the No Action Alternative. Air quality would likely be very similar to existing conditions.

CONSTRUCTION

The No Action Alternative would not require any construction on the Project Sites; therefore, no construction-related impacts would occur.

GLOBAL CLIMATE CHANGE

In the No Action Alternative, conditions of the Project Sites are expected to remain consistent with existing conditions. No construction or operation of new water supply facilities is expected to occur at the Project Sites, and therefore no increase in greenhouse gas emissions is anticipated to occur. Any development activity that does occur would take place independent of the Proposed Project as a result of the actions of individual property owners or developers. The No Action Alternative also would not introduce a new long-term water supply project to improve the United Water system's reliability during unpredictable weather conditions.

COASTAL ZONE CONSISTENCY

The No Action Alternative would not involve any changes to land or resource uses, including new construction, within the coastal zone boundary of the Hudson River.

C. INCREASED STORAGE CAPACITY AT LAKE DEFOREST

DESCRIPTION OF THE ALTERNATIVE

This alternative would increase the storage capacity of Lake DeForest by increasing the height of the dam. Based on a preliminary evaluation, increasing the dam height by one foot appears to be feasible. Earlier studies performed in the 1970s concluded that raising the dam height more (by five feet) would not be feasible.

To raise the existing reservoir depth by one foot, two options were considered:

1. Adding one foot on to the existing five-foot bascule gates; or
2. Replacing the existing five-foot bascule gates with new six-foot bascule gates.

Of the two methods considered, replacing the existing gates was considered to be the most feasible alternative, pending further structural, safety, and risk analyses.

Raising the dam height by one foot would provide an additional 325 million gallons of storage and approximately 0.3 mgd additional safe yield. The cost of raising Lake DeForest's nominal water surface by one foot is estimated to be $3.8 million dollars.

ALTERNATIVE'S ABILITY TO MEET PURPOSE AND NEED AND GOALS AND BENEFITS OF THE PROPOSED PROJECT

The alternative that would increase storage capacity at Lake DeForest would provide an addition of only 0.3 mgd in safe yield. This would not meet the purpose and need for the Proposed Project.

D. DEVELOPMENT OF NEW GROUNDWATER SOURCES

DESCRIPTION OF THE ALTERNATIVE

As discussed in Chapter 1, "Purpose and Need," United Water has approximately 60 supply wells contributing to its overall water supply system in Rockland County. As described above in the discussion of the No Action Alternative, United Water continues to pursue groundwater as a resource for its Short-Term Water Supply needs. This includes new wells and the development of existing test wells. While sufficient for small, incremental sources of supply over an extended period of time, the development, permitting, engineering, and approval for each well can take up to two years. A new well will likely not provide more than an estimated 0.2 to 0.5 mgd in additional capacity. Most importantly, available well development locations are limited based on the siting requirements and new wells will add only marginally to the safe yield of the system.

Public community water supplies have been developed by United Water over the past 50 years from the glacial sand and gravel (overburden) and bedrock aquifers underlying Rockland County, New York. The overburden aquifers are essentially fully developed as a source of supply for United Water relative to currently available natural recharge. The overburden groundwater supplies developed by United Water consist of the Ramapo Valley Well Field (10 wells), the Ramapo Well Field (two wells), the Catamount Well Field (two wells), and the Piermont Well Field (one well currently inactive). The groundwater supply derived from the bedrock aquifer is pumped from bedrock wells located throughout Rockland County. Unlike the

overburden, the bedrock aquifer system still has potential for supporting limited development of additional ground-water supplies.

As part of the Short-Term Water Supply program being undertaken in the No Action Alternative (discussed above), United Water is currently undertaking several projects focused on maximizing the production and efficiency of its wells relative to the available yield of the bedrock aquifer and the respective existing New York State Department of Environmental Conservation (NYSDEC) permitted capacities. The increased capacity is based on improvements to existing infrastructure. Specifically, maximization of the production and efficiency of the wells is being pursued primarily with respect to summertime peaking capacity when well yields are typically at their lowest. As of 2007, the "system well" peaking capacity has been increased from approximately 20 mgd to approximately 22 mgd through infrastructure improvements. The ongoing production and efficiency project efforts are anticipated to result in gains in the safe yield and additional summertime peaking capacity for United Water bedrock wells on the order of 1 to 2 mgd.

The potential for development of additional groundwater supplies from the bedrock aquifer, through the installation and permitting of additional wells, was previously estimated as of 1979 to be in excess of 5 mgd. However, at the time of this projection, the collection of additional data was recommended to be completed prior to the pursuit of additional groundwater supply development. The U.S. Geological Survey (USGS) is currently working on a hydrogeologic evaluation of the bedrock aquifer resources of Rockland County, with the objectives of determining if current pumpage is depleting the local groundwater resources, and what long-term development strategies for the bedrock aquifer may be available. Preliminary results of the USGS study indicate that current withdrawal rates have not depleted the bedrock aquifer. A firm value of the amount of additional groundwater supply that can be withdrawn from this aquifer has not yet been determined.

Given the number of unregulated, private groundwater withdrawals that have been established throughout Rockland County since the 1979 study, it is anticipated that the additional capacity potentially developable from the bedrock aquifer may be less than 5 mgd, and somewhat lesser than that during the crucial summertime peak demand periods. The future development of this potentially available capacity by United Water would most likely be limited further by future logistical, construction and permitting considerations. Specifically, the potential development of an additional 5 mgd (if this capacity is even available) from the bedrock aquifer would most certainly require the installation of additional wells, and could not be obtained from the existing well system or by the installation of a single new well. The hydrogeologic constraints of the bedrock aquifer limit local well yield to a typical range of about 0.50 to 0.25 mgd, and a preferred minimal interference-spacing requirement between wells of at least 1,000 feet. Given the current state of development and open-land availability in Rockland County, the development of the additional capacity (i.e., 5 mgd) would most likely require the installation of at least 10 to 20 wells, which in turn would require a significant expenditure of time to identify and obtain access to the necessary undeveloped land parcels.

Based on these constraints, and based on recent experience pursuant to the development of groundwater resources, the development of new groundwater resources is deemed viable as a short-term resource, but not viable as a long-term, predictable, and developable resource.

ALTERNATIVE'S ABILITY TO MEET PURPOSE AND NEED AND GOALS AND BENEFITS OF THE PROPOSED PROJECT

The development of new groundwater resources is deemed viable as a short-term resource and therefore has been included as part of the Short-Term Water Supply program. However, given the uncertainty of availability of groundwater resources and the lengthy time to develop and obtain approvals for each individual new well, more extensive development of groundwater resources beyond what has been accounted for in the Short-Term Water Supply program may not be feasible. Therefore, development of new groundwater resources would not meet the purpose and need for the Proposed Project, because it could not reliably increase the safe yield as required to meet the projected demand for water at the end of 2015.

E. REUSE OF WASTEWATER

DESCRIPTION OF THE ALTERNATIVE

Continued population growth, contamination of both surface and groundwaters, uneven distribution of water resources, and periodic droughts have forced water companies to search for innovative sources of water supply. Use of highly treated wastewater effluent, now discharged to the environment from municipal wastewater treatment plants, is receiving more attention as a reliable source of water.

There are two methods of wastewater reuse, direct reuse and indirect reuse. The direct reuse of wastewater involves utilizing wastewater, treated to tertiary standards, for irrigation and other non-potable uses. Tertiary treatment of wastewater effluent removes 95 percent or more of the contaminants in the water. In the indirect reuse process, wastewater is also treated to tertiary treatment standards and is then discharged to a water supply reservoir where it is mixed with the water stored in the reservoir and treated by the water treatment facility. This water is then distributed to the customers. The indirect use of wastewater is more widely used throughout the country than direct reuse.

Direct reuse of wastewater is commonly used in Florida, California, and other semi-arid regions of the United States. Direct reuse of wastewater requires the construction and operation of a separate distribution system, since this water is not suitable for human consumption and must be separated from the potable water distribution system.

United Water has evaluated using wastewater indirectly as a drinking water source. A review of the wastewater available for reuse in the County was completed (see Table 18-1) to determine which wastewater treatment facilities produce a sufficient volume of wastewater to provide a safe yield of 7.5 mgd of potable water. The only option with an adequate supply of wastewater available for reuse and with available storage capacity in the United Water system would be the discharge of wastewater effluent into Lake DeForest to increase the safe yield of the reservoir.

Table 18-1
Wastewater Treatment Plants in Rockland County

Plant	Permitted Capacity (mgd)	Location
Western Ramapo AWTP	1.5	Route 17 Village of Hillburn
Haverstraw Joint Regional STP	8	Beach Road Village of West Haverstraw
Stony Point (T) WWTP	1	North Street Stony Point
Orangetown (T) SD No. 2 WWTP	8.5	127 Route 303 Orangeburg (Town of Orangetown)
Rockland County SD No. 1 WWTP	26 (increased from 10 in mid 1980s)	4 Route 340 Orangeburg, NY (Town of Orangetown)
Sloatsburg (V) WWTP	0.03	Lincoln Street, Village of Sloatsburg
Suffern (V) STP	1.8	Ridge Street Village of Suffern

United Water developed a reuse scenario of discharging wastewater from the Rockland County Sewer District No. 1 Wastewater Treatment Plant (RCSD No. 1 WWTP) in Orangeburg into Lake DeForest. This analysis was based on sending sufficient water to Lake DeForest to provide an initial increase in the reservoir's safe yield of 2.5 mgd (ultimately expandable to 7.5 mgd) of finished drinking water. Discharges from the RCSD No. 1 WWTP are generally over 20 mgd, with maximums exceeding 60 mgd. Assuming the reuse plant in this alternative would operate at 85 percent efficiency, there should be ample water supply for the reuse facility.

The RCSD No. 1 WWTP is currently treating wastewater to a secondary level, and this alternative would require upgrading the plant to provide tertiary treatment. In this alternative, tertiary treatment facilities would be located adjacent to the existing RCSD No. 1 WWTP facility and be connected via a pump station and pipeline to Lake DeForest. The water would be added to the water of the reservoir, and would be treated again at the Lake DeForest water treatment plant to meet drinking water standards. Modifications to the Lake DeForest water treatment plant would be required to increase the capacity of the treatment plant.

The estimated costs for the infrastructure improvements required to provide an additional 2.5 mgd of safe yield from Lake DeForest is $99.5 million (in 2006 dollars). Increasing the capacity of this alternative from 2.5 mgd to 7.5 mgd would cost an additional $66.8 million (in 2006 dollars), for a total cost of $166.3 million (in 2006 dollars). These costs would have to be increased to reflect escalation to the mid-point of construction, which would be about 2014 for the first phase of the project and approximately 2020 for the second phase. This alternative was not considered further due to the high project costs and the anticipated adverse public response to an alternative involving use of wastewater for drinking water.

ALTERNATIVE'S ABILITY TO MEET PURPOSE AND NEED AND GOALS AND BENEFITS OF THE PROPOSED PROJECT

An alternative that re-uses wastewater from the RCSD No. 1 WWTP could potentially meet the purpose and need for the Proposed Project but was rejected because of its high cost and the anticipated adverse public response to an alternative involving use of wastewater for drinking water.

F. USE OF THE SUFFERN QUARRY

DESCRIPTION OF THE ALTERNATIVE

In 2004 and 2005, United Water and Rockland County evaluated the use of the Suffern Quarry as a water source. Under this option, water would be diverted from the Mahwah River during periods of high river levels, and sent to the quarry for storage. The water would then be treated on-site and introduced into the United Water distribution system.

In this alternative, an intake from the Mahwah River would allow water to partially fill the Suffern Quarry to an elevation of 290 feet (about 305 million gallons of storage). A raw water pump station would be used to fill the quarry to an elevation of 320 feet (about 500 million gallons of storage). A new water treatment plant would be constructed to treat the water stored in the quarry. In addition, significant new distribution system requirements would be required, potentially including several miles of new distribution mains. The Suffern Quarry Alternative would provide an additional safe yield of 3 mgd. Initial cost estimates for this alternative were $45 million.

This approach would potentially conflict with the possible use of Suffern Quarry as flood mitigation, which is currently under consideration by the U.S. Army Corps of Engineers (USACE). The conflict arises because using the quarry as a flood mitigation reservoir means that the water level of the quarry needs to be as low as possible to receive water diverted from the Mahwah River during flood events, whereas its use as a water supply source requires it to be as full as possible all of the time.

ALTERNATIVE'S ABILITY TO MEET PURPOSE AND NEED AND GOALS AND BENEFITS OF THE PROPOSED PROJECT

This alternative would not meet the stated purpose and need for the Proposed Project, which is for the addition to the water supply system's safe yield of 7.5 mgd. Moreover, this new reservoir would conflict with possible use of the quarry for flood mitigation by USACE.

G. RAMAPO RIVER HIGH-FLOW SKIMMING WITH OFF-STREAM STORAGE (NEW RESERVOIR)

DESCRIPTION OF THE ALTERNATIVE

This alternative was considered in the 1979 DEIS prepared for the Ambrey Pond Reservoir (discussed later in this chapter). It would require the construction of a 40 mgd pumping station on the Ramapo River either in Suffern or Hillburn, with a raw water transmission line delivering the water to a new 400-acre reservoir to be constructed in Ladentown (Catamount). The

reservoir would, in 1979, have displaced about 50 homes and utility transmission and gas lines, as well as inundated extensive wetland areas. A new water treatment plant would also be required. This alternative to the Ambrey Pond Reservoir would have resulted in a peaking capacity approximately equal to that from the Ambrey Pond Reservoir. The feasibility of this alternative hinged on foundation conditions and the local availability of satisfactory soils for dam and road construction. Because of the differences in elevation between the point of origin and the areas of need, especially Stony Point-Haverstraw, all water would have to be pumped.

This alternative was not selected during preparation of the Ambrey Pond Reservoir DEIS. Since that time, development has occurred in the area where the reservoir would have been built, making future development of this reservoir more difficult and costly, with greater environmental impact.

ALTERNATIVE'S ABILITY TO MEET PURPOSE AND GOALS AND BENEFITS OF THE PROPOSED PROJECT

This alternative was rejected during preparation of the 1979 DEIS because of its high cost and environmental impacts. It would involve a similar construction project to the Ambrey Pond Alternative (discussed below), but at greater cost and with greater impact.

H. HUDSON RIVER FLOOD SKIMMING

DESCRIPTION OF THE ALTERNATIVE

The use of Hudson River water as a long-term water supply was also considered as an alternative to the Ambrey Pond Reservoir in the 1979 analysis. At that time, the USACE was conducting analyses of the Hudson River as a water source to satisfy future demands in New York City and Long Island. In the late 1970s, the potential for this USACE-led initiative as a long-term water supply seemed likely and the DEIS indicated that adding Rockland County's demand to the demands of New York City and Long Island would add only a small increment to the project being considered. The USACE, however, subsequently abandoned this plan and it was not subject to further consideration.

This alternative would involve collecting water from the Hudson River for treatment and storage elsewhere, most likely in a new or existing reservoir. At the time of the 1979 DEIS, the use of reverse osmosis for desalination was extremely limited and quite costly, and was not considered as part of this alternative. Therefore, this alternative involved collecting freshwater flows from the Hudson River through the use of a floating pump. The collected freshwater would have to be transmitted via new mains and stored elsewhere in the United Water system. However, there is no reservoir with additional storage capacity in Rockland County where the water could be stored and therefore this alternative is not feasible.

A preliminary study was also completed in 2002 on the potential for using the Hudson River as a supplemental source of water supply to Lake DeForest Reservoir. This would involve diverting untreated, brackish water from the Hudson River to be mixed with the fresh water from Lake DeForest, either in the reservoir or at the intake to the Lake DeForest Water Treatment Plant, to maintain acceptable concentrations of total dissolved solids in the drinking water. Discharge of untreated Hudson River water into Lake DeForest may produce long-term environmental impacts associated with the transfer of organisms from the Hudson River to the Hackensack River system. In addition, the study indicates that routine use of untreated Hudson River water in

this way would require highly sophisticated forecasting of precipitation months in advance to avoid wasting freshwater that would otherwise be retained in Lake DeForest. As a result, use of untreated, brackish Hudson River water as a supplemental source of supply for Lake DeForest is considered an emergency measure for use during a drought more severe than the one used as the basis for the design of Lake DeForest Reservoir.

ALTERNATIVE'S ABILITY TO MEET PURPOSE AND GOALS AND BENEFITS OF THE PROPOSED PROJECT

Collection of freshwater from the Hudson River for storage in a reservoir in the United Water system would be similar to the Proposed Project, in that it would involve water collection from the Hudson River. However, there is no reservoir with additional storage capacity in Rockland County where the water could be stored and therefore this alternative is not feasible.

I. HUDSON RIVER WATER WITHDRAWAL: ALTERNATIVE INTAKE SITES

DESCRIPTION OF THE ALTERNATIVE

As discussed in this DEIS in Chapter 9, "Natural Resources," the area of the Hudson River where the Proposed Project's water intake would be located has been designated as part of the Haverstraw Bay Significant Coastal Fish and Wildlife Habitat (SCFWH). This area extends from Rockland Lake State Park on the south to Stony Point (just north of the Stony Point State Park) on the north. Chapter 9 of this DEIS concludes that construction and operation of the Proposed Project would not result in significant adverse impacts to water quality, nor to the species identified as important for the Haverstraw Bay SCFWH. The Proposed Project would not result in significant adverse impacts to regional target species populations, or to regional populations of other fish, plankton or macroinvertebrates.

SITE SELECTION PROCESS

United Water completed a rigorous site selection process in order to find a suitable location for the proposed water treatment plant and intake pumping station. A number of factors were considered in the site selection process, such as required site footprint, utilities required, the sizing and route of the raw and finished water mains, permit requirements, possible contaminated site issues, and sensitive environmental conditions. A number of sites in both Haverstraw (e.g., a parcel at Bowline Generating Plant, Hornick's Manfacturers near Bowline Pond, Keahon Auto Salvage on Beach Road, etc.) and Stony Point (Lovett Power Generating Station, Kay-Fries property, the site of the former Stony Point Water Treatment Plant on Cedar Pond Brook, the site of the Stony Point Wastewater Treatment Plant, etc.) were identified. The proposed intake and water treatment plant locations were selected after a careful review of the screening criteria discussed above. Major advantages of the proposed facility locations include: close proximity between the water treatment facility and the intake pumping station, reasonable raw water transmission line route from the intake pump station to the water treatment plant, willing sellers of both the intake and water treatment plant properties, close proximity to a wastewater treatment facility so that a separate outfall into the Hudson River for the wastewater discharge from the water treatment plant would not be needed, minimal impact to the river viewshed since only the intake pump station would be located along the bank of the river, and

minimal effects to community character, because of the generally industrial nature of the surroundings and the buffering effect of natural topography.

ALTERNATIVE SITE FOR WATER INTAKE

This alternative considers the potential to avoid any construction or permanent placement of a water intake in the Haverstraw Bay SCFWH. Because the southern boundary of the SCFWH is more than four miles south of the Project Sites, an alternative location beyond the northern boundary was sought instead. The water intake would be located in the Hudson River north of Stony Point State Park.

The shoreline intake pumping station in this alternative would be located near the CSX freight tracks just north of Stony Point State Park. In this area, the CSX tracks run alongside the water; immediately inland of the tracks, the shoreline has a steep slope rising sharply above the tracks. The land at the top of the slope is currently in use by an active quarry and it is unknown whether any land is available for an intake pumping station there.

If a suitable site could be identified for an intake pumping station north of Stony Point State Park, the raw water would be drawn from the river through the intake pumping station and then piped to a water treatment plant. Based on the site selection study conducted for the Proposed Project, however, it does not appear that adequate land is available for a water treatment plant north of Stony Point State Park or between the quarry and the Haverstraw Landfill to the south. Therefore, this alternative assumes that the water treatment plant would be located on the same site as for the Proposed Project, referred to throughout this DEIS as the Water Treatment Plant Site. The raw water would have to be piped from the intake pumping station south to the water treatment plant. Based on the presence of Stony Point State Park as well as extensive grade changes near the shoreline, the raw water transmission line would most likely have to be routed along the CSX right-of-way to the Water Treatment Plant Site. Running the raw water transmission line for two miles alongside the CSX tracks would be logistically difficult and potentially infeasible, given the narrowness of the right-of-way, which is surrounded by park and residential uses. Moreover, it would most likely be infeasible to install the 36-inch raw water transmission main without significant disruptions to CSX's freight operations, and it appears that inadequate space is available for placement of this transmission main alongside the rail right-of-way in some locations along the route. Therefore, this alternative is not considered feasible.

ALTERNATIVE'S ABILITY TO MEET PURPOSE AND NEED AND GOALS AND BENEFITS OF THE PROPOSED PROJECT

This alternative was rejected because it does not appear to be feasible.

J. COMBINATION OF ALTERNATIVES

DESCRIPTION OF THE ALTERNATIVE

The purpose and need for the Proposed Project is to provide a long-term water supply project that increases United Water's safe yield for Rockland County to meet the future needs projected beyond 2015. The No Action Alternative cannot contribute any additional safe yield beyond 2015, because it already incorporates all measures identified by United Water to increase safe yield, and it cannot meet the demand beyond 2015.

Many of the other alternatives considered above (in sections C through I) were not considered feasible, or were too expensive to warrant further study given their benefits and environmental impacts. Some were feasible, but did not meet the purpose and need for the Proposed Project because they did not increase safe yield enough. This alternative considers the potential of implementing a combination of the feasible alternatives that by themselves would not increase safe yield of United Water's system enough to meet the purpose and need for the Proposed Project. The alternatives that could potentially be combined in this way are listed in Table 18-2.

Table 18-2
Potential Alternatives for Combination

Alternative	Potential Increase to Safe Yield Beyond No Action Alternative (mgd)
C. Increased Storage Capacity at Lake DeForest	0.3
D. Development of New Groundwater Resources beyond the No Action Alternative	Unknown
F. Use of the Suffern Quarry	3.0
TOTAL	**3.3**

As shown in the table, the alternatives suitable for inclusion in the Combination Alternative are the Lake DeForest alternative (Alternative C), with an additional safe yield of only 0.3 mgd; the groundwater alternative (Alternative D), with an unknown additional safe yield; and the Suffern Quarry alternative (Alternative F), with an additional safe yield of 3 mgd. These alternatives in combination would not meet the Proposed Project's purpose and need, since they would provide additional safe yield of only 3.3 mgd.

ALTERNATIVE'S ABILITY TO MEET PURPOSE AND NEED AND GOALS AND BENEFITS OF THE PROPOSED PROJECT

The Combination Alternative would not meet the Proposed Project's purpose and need, since it would provide additional safe yield of only 3.3 mgd.

K. AMBREY POND RESERVOIR ALTERNATIVE

BACKGROUND AND DEVELOPMENT OF AMBREY POND RESERVOIR ALTERNATIVE

As early as the 1960s, the Spring Valley Water Company (the predecessor to United Water) identified the need for a new source of drinking water to meet the projected demand anticipated in Rockland County. At that time, Rockland County water demand projections indicated a need for a new long-term water supply that could deliver up to 12.5 mgd. The development of a conventional surface water reservoir was then thought to be the most reasonable approach to meeting this projected demand. A candidate location for a new reservoir was selected, and the reservoir, to be located in the Town of Stony Point, was to be called the Ambrey Pond Reservoir. Based on a peaking demand projection of 12.5 mgd, and taking into consideration then-available water treatment technology, this planned reservoir was sized to hold a total of 2 billion gallons of water.

The planning for the Ambrey Pond Reservoir progressed as far as the completion of an Environmental Impact Statement (EIS). It was expected that building the reservoir would require eight years of heavy construction, and would have inundated approximately 200 acres of land. The EIS analyzed the reservoir project's anticipated impacts, including impacts on fisheries and wetlands, and cited the seismic risks associated with constructing dams in close proximity to the Ramapo Fault.

In 1987, following the completion of the EIS, the NYSDEC granted the Spring Valley Water Company conditional approval for a water supply permit. The permit allowed the creation of a 2 billion gallon reservoir with a dam spillway elevation of 316 feet. It was anticipated that the planned reservoir could provide up to 12.5 mgd at times of peak demand, but its safe yield (the amount of potable water it could reliably provide during the drought of record) was only 5 mgd. Since gaining the NYSDEC conditional approval, United Water continued to study the Ambrey Pond Reservoir, and over the years has purchased almost all the land that would be necessary to construct the reservoir.

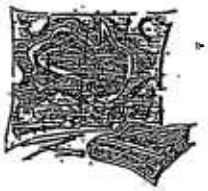
Despite the advanced planning, United Water was able to postpone the construction of the reservoir due to efficiency improvements made elsewhere in its water supply system that enabled it to meet short-term demands. These improvements were similar to those discussed as part of the Short-Term Water Supply program under the No Action Alternative (section B), above, but also included flow augmentation initiatives for the Ramapo River, to improve operations of the Ramapo Valley Well Field. In addition to system improvements, water conservation programs were implemented by local municipalities through amendments to local building and plumbing codes, and United Water undertook an aggressive program to encourage water conservation by its customers. These conservation efforts contributed to reductions in water demand. In light of these improvements, United Water revised its demand projections and determined that a smaller reservoir would meet Rockland County's water supply need.

In light of these changes, United Water revised its long-term water demand projections from the original 12.5 mgd to 5 mgd by 2021. The need for 7.5 mgd is expected to occur some time after 2021. At this level of demand, United Water's engineering studies indicated that the reservoir capacity could be reduced from 2 billion gallons (with a dam elevation of 316 feet) to 600 million gallons (with a dam elevation of 290 feet). Reducing the reservoir capacity would also greatly reduce the extent of flooding and related environmental impact of the Ambrey Pond Reservoir Alternative. However, even with this reduction in capacity and area, given the purpose and need for the Proposed Project and other considerations, this alternative can no longer be considered the selected action.

DESCRIPTION OF THE AMBREY POND RESERVOIR ALTERNATIVE

Under the Ambrey Pond Reservoir Alternative, United Water would develop a 600-million gallon pumped-storage reservoir, a raw water pump station and pipeline, and a new water treatment plant in the Town of Stony Point. The alternative would be constructed in phases so that the water production rates can be developed in 2.5 mgd increments. As with the Proposed Project, each phase would be developed to keep pace as Rockland County's water demands increase. Figure 18-1 shows the location of the Ambrey Pond Reservoir Alternative.

The Ambrey Pond Reservoir would be located at the site of two existing natural ponds within the lower reaches of the Timp Mountain Brook watershed, which is a tributary to Cedar Pond



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Map # 60

Brook. The reservoir site is bounded by Cedar Flats Road to the west and Bulsontown Road to the east. The reservoir would be created by the construction of a Main Dam for the initial project phase to create a 300-million gallon reservoir with a reservoir pool elevation of 280 feet. Later, as demand rises, an Auxiliary Dam would be constructed to bring the reservoir pool to elevation 290 feet to create the full reservoir capacity of 600 million gallons, capable of yielding 7.5 mgd of potable water during periods of peak demand.

In addition to the Ambrey Pond Reservoir dams, another dam located on Cedar Pond Brook would be needed to create an impoundment for water withdrawal. This run-of-the-river dam located on the lower reach of Cedar Pond Brook would provide a back-water pool to facilitate the diversion of raw water from Cedar Pond Brook, either for direct use in the water treatment plant or for pumping and storage in the Ambrey Pond Reservoir. An existing dam, know as the Stony Point Dam, would be rehabilitated for this purpose. The Stony Point Dam is located in the Town of Stony Point just south of West Main Street and downstream of the point where Reservoir Road crosses Cedar Pond Brook.

The Ambrey Pond Reservoir would capture runoff from the Timp Mountain Brook watershed and would also provide a storage area for water that is withdrawn from Cedar Pond Brook and pumped uphill to the reservoir via a raw water diversion pipeline. The reservoir would function as a combined natural runoff and pumped-storage reservoir capturing runoff from nearly the entire Cedar Pond Brook watershed, even though it would be located on a tributary to Cedar Pond Brook.

A water treatment plant and pump station would be located adjacent to the impoundment created by the rehabilitated Stony Point Dam and would draw water directly from Cedar Pond Brook. The treatment plant would develop potable water using conventional water supply treatment processes. When the rate of flow in Cedar Pond Brook is sufficient, additional water would be withdrawn and pumped to the Ambrey Pond Reservoir for later use. When water from the Ambrey Pond Reservoir is needed to augment supplies, reservoir releases would allow water to be conveyed to the Cedar Pond Brook withdrawal site via natural stream channels.

AREA DESCRIPTION

The Ambrey Pond Reservoir would be located in a relatively undeveloped area consisting of upland, mixed woodlands, and wetlands adjacent to the existing Upper and Lower Ambrey Ponds, as well as Timp Mountain Brook. As noted above, United Water (and its predecessor, the Spring Valley Water Company) has been acquiring property in the Ambrey Pond area, and at the present time nearly all of the prospective reservoir site and buffer area is now owned by United Water. Some of the parcels are still occupied by active uses, including residences and a Town of Stony Point recreation facility (see Figure 18-2).

The Stony Point Dam and impoundment area are located on Cedar Pond Brook and are surrounded by suburban areas of the Town. The Stony Point Dam and impoundment area have existed at this site since the late 1800s and the river bank has adapted to the presence of these man-made artifacts, with vegetation consisting of deciduous woodlands and wetland areas. The water treatment plant and pump station would be adjacent to the Stony Point Dam site located on the former site of a 1.0 mgd water treatment plant.

As previously noted, when sufficient flow in Cedar Pond Brook is present, water would be pumped via a raw water diversion pipeline to the Ambrey Pond Reservoir. The pipeline would

be predominantly buried within existing streets. The precise alignment of the raw water transmission line would be subject to further design, but for the purposes of this analysis, it is anticipated that the route would follow West Main Street, Wayne Avenue, and Bulsontown Road (County Road 65). New finished water mains would also be required to connect the water treatment plant to the existing distribution system. These pipes would be installed in existing roadway right-of-ways, adjacent to the water treatment plant site.

As noted previously, natural drainage ways below the Ambrey Pond Reservoir would be used to convey water back to Cedar Pond Brook and the water withdrawal site at Stony Point Dam. Timp Mountain Brook is located immediately below the Ambrey Pond Reservoir Alternative's main dam. The brook passes through upland, forested reaches and includes a wetland area. Downstream from the wetland area, it falls at a steep gradient to the confluence with Cedar Pond Brook.

The location of the major elements of the Ambrey Pond Reservoir Alternative are shown in Figure 18-2.

AMBREY POND AREA ACCESS

Access to construct the Ambrey Pond Reservoir and associated dams would require the development of construction roadways on United Water property. These roads would be accessed from existing public roadways, including Cedar Flats Road and Bulsontown Road. Following construction, access roads no longer required would be abandoned and the roadway sites would be restored with native vegetation. Access roads required for the project operation and maintenance would be retained and accessed from Cedar Flats Road and Bulsontown Road.

Access to the Stony Point Dam site and the site of the water treatment plant/pump station would be via existing rights-of-way from West Main Street, the adjacent existing public roadway. Construction entrances would need to be developed and permanent access driveways would be required for the finished site development.

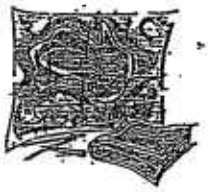
During construction, access to the raw water diversion pipeline and the finished water main construction sites would be via the adjacent, existing public rights-of-way, primarily West Main Street, Wayne Avenue, and Bulsontown Road (County Road 65). No routine access would be necessary following construction.

CONSTRUCTION PHASING

The Ambrey Pond Reservoir Alternative would be implemented in incremental stages to keep pace with water demands. Initially, the reservoir and treatment facilities would have a delivery capacity of 2.5 mgd. The yield of the reservoir system would be increased in phases over time in response to water demands based on population projections, and the Ambrey Pond Reservoir Alternative (i.e., the water treatment plant) would eventually provide a peak capacity of 7.5 mgd.

For the purposes of analysis, it is assumed that the project would be phased as follows:

- **Phase 1:** Acquisition of any remaining land needed to construct the Ambrey Pond Reservoir and construction of Ambrey Pond dam across Timp Mountain Brook, which would results in a 300-million gallon reservoir at an elevation of 280. A portion of Bulstontown Road (County Road 65) would have to be relocated outside the area to be inundated. In addition, the existing Stony Point Dam would be reconstructed to create an impoundment that would



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Map # 61

allow for withdrawal of water from Cedar Pond Brook, a 2.5-mgd water treatment plant would be constructed at the former Stony Point Water Treatment Plant site, and the raw water diversion main from Cedar Pond Brook would be installed. Phase 1 is expected to require about 3.5 years for completion.

- **Phase 2:** In Phase 2, the water treatment plant would be upgraded from 2.5 mgd to 5.0 mgd in capacity. This phase would take about 1.7 years for completion.
- **Phase 3:** This phase would involve acquisition of necessary land required to finish the reservoir construction. The height of the Stony Point Dam would be increased to elevation 290, which would increase the capacity of the Ambrey Pond Reservoir to 600 million gallons. A second auxiliary dam would be necessary to achieve this capacity. In addition, several roads would be relocated due to inundation, and the water treatment plant would be expanded to 7.5 mgd. This phase is expected to require about 2.8 years to complete, for a total of approximately 8 years for completion of the full reservoir.

For purposes of analysis, the final phase of the reservoir is used to define the affected area, since its perimeter is more expansive and would result in the largest Ambrey Pond Reservoir area (112 acres). The effect of the first phase of the reservoir (elevation of 280 feet) encompassing a 75-acre area is also considered and compared to the effect of the reservoir's larger second and final phase where applicable. In either phase of the Ambrey Pond Reservoir Alternative, a 500-foot buffer is assumed as a water quality protection feature.

OPERATION

The Ambrey Pond Reservoir Alternative would operate on a continuous, 24-hour per day, 365-day per year basis, although actual throughput of the facility would vary according to demand.

Operation of the system dams and associated reservoirs and impoundments would require routine inspection visits by United Water personnel and seasonal landscaping/forestry activities to maintain the United Water property and the perimeter fencing.

The details of the water treatment plant and pump station operations have not been finalized, but it is anticipated that round-the-clock operation would require one to two on-site operators during Phase 1, increasing to a maximum of four during Phase 3 operations. The role of these personnel would primarily be maintenance during daytime hours. The plant itself is expected to operate in an automated, unmanned mode round-the-clock, except as needed for maintenance activities. The plant would require on-site storage and daytime delivery of water treatment chemicals about every two weeks. The chemicals would include the following:

- Coagulant (e.g., ferric chloride);
- Sodium hydroxide (for pH control);
- Sodium hypochlorite (chlorine, for disinfection); and
- Corrosion control chemicals (e.g., SeaQuest).

The raw water transmission line, potable water main, and the natural drainage downstream of the Ambrey Pond Reservoir dam would not require routine on-site operation activities.

AMBREY POND RESERVOIR ALTERNATIVE'S ABILITY TO MEET THE NEED AND GOALS AND BENEFITS OF THE PROPOSED PROJECT

As stated in Chapter 1, "Purpose and Need," the public need for, and benefit of, the long-term water supply project is for the addition to the water supply system's safe yield of 7.5 mgd. Further, United Water's projections indicate the need for 2.5 mgd in additional safe yield by 2016, and the need for 5 mgd in additional safe yield by approximately 2021.

Phase 1 of the Ambrey Pond Reservoir Alternative would provide a safe yield of 3.7 mgd, but given the 3.5-year construction period for Phase 1 and the likely longer period in advance of construction for additional design and permitting, this phase would most likely not be in operation by the end of 2015, as required by a December 14, 2006 Order by the New York State Public Service Commission (PSC). Phase 2 would upgrade the water treatment plant capacity to 5 mgd, but would not increase the reservoir's safe yield beyond 3.7 mgd. At Phase 3, the fully built-out Ambrey Pond Reservoir would have a safe yield of 4.3 mgd, and would therefore fall short of the required 7.5 mgd safe yield for the Proposed Project.

In addition to its ability to provide sufficient safe yield, a suitable long-term water supply project must also meet public need and benefits standards in several other critical areas, as discussed below.

ABILITY TO BE IMPLEMENTED IN STAGES

To meet future demands for water supply as they develop over time, the long-term water supply project should have the ability to be implemented in stages. Like the Proposed Project, the Ambrey Pond Reservoir could be implemented in three separate stages as demand for water increases. The initial two phases would create a reservoir with a safe yield of 3.7 mgd, and a treatment capacity capable of meeting peak demands of 2.5 mgd and 5 mgd, respectively. The third phase would increase the reservoir's safe yield to 4.3 mgd, and would expand its peak treatment capacity to 7.5 mgd. Because this alternative could be developed in stages, both the Proposed Project and the Ambrey Pond Reservoir Alternative would satisfy this goal and public benefit. However, as noted above, the first phase of the Ambrey Pond Reservoir Alternative would not be completed as quickly as the first phase of the Proposed Project.

RELIABLE SUPPLY

The new long-term water supply project must improve the reliability of the water supply system while meeting future demands by introducing a supply that is less dependent on localized precipitation conditions. The Northeast experiences short-term droughts (i.e., a drought with a duration of one to three months) every one to three years on average, and experiences longer droughts (i.e., greater than three months) once every 20 to 30 years. There is increasing concern that global climate change may bring greater fluctuations in weather conditions, including more frequent or severe drought conditions or more frequent storm events.

Although the Ambrey Pond Reservoir could provide adequate water during normal periods of peak demand at the rate of 7.5 mgd, the safe yield that alternative could provide during longer-term drought events is only 4.3 mgd. Therefore, the safe yield of this alternative does not meet the minimum 5 mgd safe yield as projected for the year 2021, and falls further below United Water's target safe yield of 7.5 mgd. In contrast to the Proposed Project, which would provide a

safe yield of 7.5 mgd, this alternative does not provide the dependability required to provide a drought-tolerant water supply source.

Because this alternative contemplates a surface water reservoir, its safe yield and replenishment capacity is limited by the size of its watersheds that serve as the rainwater catchment basins. The watershed areas from which Ambrey Pond water would be derived total approximately 3.4 square miles. As a consequence of this constraint, this alternative would provide a maximum safe yield of 4.3 mgd. As a result, this alternative does not provide the degree of drought tolerance necessary for a sustained supply of safe potable water yield. In comparison, the Proposed Project would rely on the Hudson River as a source of water. The Hudson River watershed upstream of the Proposed Project is approximately 13,400 square miles. The Proposed Project would be designed to withdraw enough water from the Hudson to establish an ultimate safe yield of 7.5 mgd. Further, the amount of water withdrawn for the Proposed Project would represent a minute fraction of the total freshwater flow of the Hudson River. Therefore, in comparison to the Proposed Project, this alternative provides a less sustainable water supply of limited ultimate safe yield.

MITIGATE ENVIRONMENTAL IMPACTS

A key goal for the long-term water supply project is to mitigate the potential environmental impacts of the Proposed Project to the maximum extent practicable given the other goals and objectives for the Proposed Project and the capabilities of the Project sponsor. This includes environmental impacts that would potentially occur as a consequence of both the construction and operation of the Proposed Project.

Under this alternative, the ecological communities in the Ambrey Pond Reservoir area would be completely and permanently inundated by the reservoir construction. The reservoir is expected to result in impacts to numerous species, including species of concern. On balance, however, this alternative's open water reservoir is expected to provide productive fisheries habitat for many species already present in the ponds that would be inundated by the reservoir. In addition, the threatened bald eagle may benefit from the expansive open water and shorelines created by the reservoir.

Operations of the reservoir could, however, have additional adverse impacts on terrestrial and aquatic life, including fisheries. In particular, the aquatic life in the reservoir and in Cedar Pond and Tiorati Brooks would be adversely affected during dry years when water draw-down would be the greatest. In contrast, the Proposed Project would not result in adverse effects to flora and fauna on the Project Sites. Any adverse impacts to aquatic resources in the Hudson River related to entrainment and impingement of fish at the intake structure would be minimized by the application of best technologies available, such as the use of a wedge wire screen intake and low approach velocity intake rates.

In addition, the Ambrey Pond Reservoir Alternative would require that approximately 20 buildings be vacated and demolished, including occupied homes from which residents would be displaced. The alternative would also result in the displacement of the Town of Stony Point's municipal swimming pool, which is located on United Water land within the reservoir buffer area.

In comparison to the Proposed Project, the Ambrey Pond Reservoir Alternative would result in more substantial adverse impacts to a greater range or environmental resources, and would

therefore provide fewer public benefits than the Proposed Project in respect to mitigating environmental impacts.

COST-EFFECTIVENESS

As a public utility, United Water has a responsibility to its customers (i.e., the rate-payers) to develop a cost-effective project to address the need for new water supply. The Ambrey Pond Reservoir Alternative is estimated to require a total capital investment of $193 million. In comparison, the Proposed Project would require a capital investment of approximately $112.4 million.

In comparison to the Proposed Project, the Ambrey Pond Reservoir Alternative would be more expensive to build. This alternative, therefore, would not meet the public need and benefit of being cost effective.

EFFECTS OF THE AMBREY POND RESERVOIR ALTERNATIVE IN COMPARISON TO THOSE OF THE PROPOSED PROJECT

The Ambrey Pond Reservoir Alternative involves the construction of a 600-million gallon pumped-storage reservoir, a raw water pump station and diversion pipeline, and a new water treatment plant in the Town of Stony Point. The alternative would be constructed in phases so that the water treatment and production rates can be developed in 2.5 mgd increments. At full capacity, the reservoir would comprise approximately 112 acres, plus a 500 foot buffer area. The reservoir contemplated in this alternative would affect different sites than those of the Proposed Project. As a result, the existing and future baseline conditions differ from those of the Proposed Project.

This section of the DEIS describes the effects of the Ambrey Pond Reservoir Alternative as compared to the Proposed Project based on a detailed analysis of the affected Ambrey Pond sites. Table 18-3, below, summarizes the effects of this alternative in comparison to those of the Proposed Project.

Table 18-3
Effects of the Ambrey Pond Reservoir Alternative in Comparison to the Proposed Project

Impact Area	Ambrey Pond Reservoir Alternative	Proposed Project: Haverstraw Water Supply Project
Safe Yield	• Phase 1: 3.7 mgd • Phase 2: 3.7 mgd • Phase 3: ≤4.3 mgd	• Phase 1: 2.5+ mgd • Phase 2: 5+ mgd • Phase 3: 7.5+ mgd
Treatment Capacity	• Phase 1: 2.5 mgd • Phase 2: 5 mgd • Phase 3: 7.5 mgd	• Phase 1: 2.5 mgd • Phase 2: 5 mgd • Phase 3: 7.5 mgd
Operating Cost per 1,000 gallons potable water*	• Phase 1: $1.98 • Phase 2: $1.37 • Phase 3: $1.30	• Phase 1: $2.44 • Phase 2: $1.65 • Phase 3: $1.51
Capital Cost (Construction Cost)*	• Phase 1: $115.8 million • Phase 2: $15.7 million • Phase 3: $61.5 million • Total: $193 million	• Phase 1: $79.1 million • Phase 2: $11.5 million • Phase 3: $21.8 million • Total: $112.4 million
Land Use	• Project area consists of open, forested and wetland areas in an area characterized by low-density residential and public parkland uses. • 112 acres would be flooded, and 20 structures, including occupied homes, would be inundated or otherwise displaced. • Segments of existing roadways to be relocated due to inundation. • Displacement of Town of Stony Point municipal swimming pool complex. • Construction of water treatment plant and pump station in a predominantly residential neighborhood along West Main Street.	• Construction of treatment plant adjacent to Haverstraw Landfill, wastewater treatment plant, industrial uses, and freight railroad right-of-way. • Construction of intake pumping station on former industrial Hudson River waterfront site (Intake Site) adjacent to active industrial US Gypsum Company plant and conveyor, and adjacent to residential and commercial marina uses.
Visual	• Views would change from undeveloped vegetated land or residential property to open reservoir water surface. • Views of water treatment plant and pump station along West Main Street.	• Some visibility of newly constructed buildings. • Intake pumping station would be visible from Hudson River vantages.
Community Facilities	• Potential changes in emergency services response times due to relocated roadways. • Displacement of Town of Stony Point municipal swimming pool complex.	• No new demand for community services.
Socioeconomics	• Displacement of residential and recreational uses. • Creation of fewer than 10 full-time jobs. • Direct capital investment (construction cost) of $193,000,000.	• No direct displacement. • Creation of fewer than 10 full-time jobs • Direct capital investment (construction cost) of $112,400,000.

Table 18-3 (cont'd)
Effects of the Ambrey Pond Reservoir Alternative in Comparison to the Proposed Project

Impact Area	Ambrey Pond Reservoir Alternative	Proposed Project: Haverstraw Water Supply Project
Cultural Resources	• Potential inundation of archaeological (Native American Village) site.	• No known archaeological or cultural resources would be affected.
Geology, Soils, and Groundwater	• Re-grading for dam and access road construction. • Potential changes to the accumulation of sediments at the reservoir floor. • Dams would be constructed in vicinity of Ramapo and Ambrey Pond Faults.	• No impacts, since Project Sites have been affected and disturbed by past uses.
Natural Resources	• Inundation of 112 acres, including 85 acres of forestland, wetlands, riparian habitat, and open pond areas by reservoir construction. • Disturbance of existing fish and wildlife habitat within the area of the reservoir, along the pipeline to Lake Tiorati Brook, and along the Brook as a result of water withdrawals. • No significant adverse impacts on threatened or endangered species, although timber rattlesnake habitat disturbance likely. • Creation of 112-acre water body that would provide fisheries habitat for some existing pond fish species • Open water area and shoreline would benefit nearby bald eagle populations. • Operations would not result in significant adverse impacts to birds and other wildlife using the existing habitats adjacent to the project sites.	• No significant adverse impacts on terrestrial plant communities or wildlife, or on threatened or endangered species, floodplains, wetlands, water quality, or aquatic biota in the Hudson River and Minisceongo Creek. • Minimal potential impacts to aquatic resources of the Hudson River during construction due to directional drilling and coffer dam. • Minimal potential impacts to wetlands and aquatic resources associated with discharge of stormwater runoff with implementation of stormwater pollution prevention plan. • Loss of approximately 3 acres of disturbed vegetated habitat on Water Treatment Plant Site, which would not result in significant adverse impacts to terrestrial plant communities or wildlife resources. • Discharge of diluted reverse osmosis concentrate to the Hudson River would not result in adverse impacts to water quality or aquatic biota. • Potential impacts to fisheries and macroinvertebrates resulting from withdrawal of 10 to 20 mgd of Hudson River water have been minimized through use of best technology available, such as wedge wire screen intake structure and low approach velocity intake design. • Operations would not result in significant adverse impacts to birds and other wildlife using the existing habitats adjacent to the Project Sites.

Table 18-3 (cont'd)
Effects of the Ambrey Pond Reservoir Alternative in Comparison to the Proposed Project

Impact Area	Ambrey Pond Reservoir Alternative	Proposed Project: Haverstraw Water Supply Project
Hazardous Materials	• Potential exposure to hazardous materials that may exist on site, such as septic leach fields and underground tanks. • Potential contamination of reservoir water with hazardous materials. • Use and storage of petroleum and chemicals necessary for treatment processes at treatment plant site.	• Potential disturbance to known subsurface hazardous materials. • Use and storage of petroleum and chemicals necessary for treatment processes at Water Treatment Plant Site.
Infrastructure	• Increased demand for electricity to operate dams, pumps and treatment facilities. • Construction of an underground raw water diversion pipeline. • New pipes to distribute treated water.	• Increased demand for electricity to operate pumps and treatment facilities. • Construction of an underground raw water transmission pipe. • New pipes to distribute potable water.
Traffic	• Minimal increases in traffic from reservoir and treatment plant operations. • Sections of Bulsontown Road, Cedar Flats Road, and Mott Farm Road to be displaced and realigned due to inundation by reservoir.	• Minimal increases in traffic from Intake Site and Water Treatment Plant Site from operation of the Proposed Project.
Noise	• Noise impacts during construction. • Minimal impacts from ventilation systems and new truck traffic.	• Noise impacts during construction. • Minimal impacts from ventilation systems and new truck traffic.
Air Quality	• Minor increases in air emissions would occur on roadways near the Project Sites due to increase in worker vehicles and truck trips.	• Minor increases in air emissions would occur on roadways near the project sites due to increase in worker vehicles and truck trips.

Note:
* All capital and operating costs shown in 2008 dollars.

LAND USE, ZONING, AND OTHER PROGRAMS

Land Use

Land uses in the vicinity of the Ambrey Pond Reservoir Alternative are low-density residential and open space, including a Town of Stony Point municipal swimming pool complex. The potential reservoir site is comprised of large tracts of mostly undeveloped forested and open pond areas owned by United Water. Similarly vegetated and open land under the jurisdiction of the Palisades Interstate Park Commission abuts the reservoir site. In addition, the surrounding area contains segments of Bulsontown Road, Cedar Flats Road, and Mott Farm Road. A high tension transmission line also traverses the southern extension of the surrounding area.

The 600-million gallon reservoir would inundate an area of approximately 112 acres, permanently changing the land use and character of the affected area. As shown in Figure 18-3, there are approximately 20 properties with structures that would be affected by the reservoir. These properties consist primarily of private residences. However the Town of Stony Point's municipal swimming pool complex is among the properties that would be displaced. United

Water owns the parcel on which the Town pool is located. This property is leased to the Town on a year-to-year basis; it is anticipated that the lease would be terminated upon construction of this reservoir.

In addition, portions of three roadways, Bulsontown Road, Cedar Flats Road, and Mott Farm Road would also be inundated and would require a realignment to allow for a continuing flow of traffic. Finally, portions of the high tension electric utility lines running through the area would require some reconfiguration to maintain its capabilities.

It is expected that the Ambrey Pond Reservoir Alternative would be secured by chain-link fence running around the perimeter of the area. The fence would be visible, as well as would inhibit access by the general public, and would represent a perceptual change in the area's land use. In addition, while the open water reservoir could be construed by some as a compatible land use, during periods of reservoir drawdown, the lowered water level would expose a shoreline comprised predominately of bottom silt. To the extent that it would be visible, the reservoir during drawdown periods would appear as an unnatural landscape element in an area that is predominately undeveloped and dominated by natural landscape features.

Zoning

The majority of the area that would be affected by this alternative is currently zoned as the Ambrey Pond Reservoir Protection (APRP). The alternative's reservoir use would therefore be compatible with the current zoning district. The water treatment plant site is zoned Residential (R-1), and is therefore a use that is inconsistent with currently allowed uses.

Other Programs

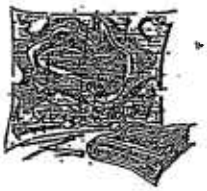
The 1995 Town of Stony Point Master Plan cites the Ambrey Pond Reservoir site for potential reservoir development, and references the need for a new community water supply. The reservoir site and the surrounding area are zoned specifically for Ambrey Pond Reservoir Protection.

Both the Proposed Project and Ambrey Pond Reservoir Alternative are generally consistent with and would not result in significant adverse impacts to land use, zoning, and other programs.

VISUAL RESOURCES

During periods when the water level of the Ambrey Pond Reservoir is high, the reservoir would present a compatible visual feature in the landscape, since it would change, but would not fundamentally alter the undeveloped and rural character of the affected landscape. At times of reservoir drawdown, however, the reservoir would present a shoreline above the water level characterized by non-vegetated bottom sediments. At these times, the reservoir would appear as an unnatural feature in an otherwise natural-appearing vegetated landscape. It is anticipated that the reservoir would also be surrounded by a chain-link security fence that would be somewhat visible from surrounding public roadways.

In some instances the character of the area would change as a result of the demolition of existing structures, including residences, returning them to a more natural character. While this would represent a minor change to the character of the area, it would not result in any adverse visual impacts. The surrounding vegetation would provide screening of the reservoir, and where visibility would be possible, the reservoir would provide long views of vegetated shorelines over



MAPS PULLED FROM:

Case: 06-W-0131

Date: 10/2/08 (of)

Specific:

- ☐ Brief
- ☐ Comment
- ☐ Correspondence
- ☐ Exhibit
- ☐ Order
- ☐ Petition
- ☐ Plan
- ☐ Report

Map # 62

open water. These views might be considered by some to be attractive improvements to more densely vegetated and forest lands. The pump station and treatment plant are likely to be visible from the areas in the immediate vicinity of the treatment plant site, and are not expected to adversely affect the visual character of their environs.

In light of the above, the Ambrey Pond Reservoir Alternative is not expected to result in a significant adverse impact to visual resources.

COMMUNITY FACILITIES

Schools

The Ambrey Pond Reservoir Alternative would result in the creation of fewer than 10 new full-time jobs, and potentially result in the in-migration of two households into the Stony Point vicinity. As a consequence, the alternative would not be expected to generate significant increases in school enrollment. The reservoir construction would, however displace residents, resulting in minor changes to school enrollment should any displaced households with school-age children relocate out of the affected school districts.

Fire, Police, and Emergency Services

The construction phase of the Ambrey Pond Reservoir Alternative is expected to result in increased demands on local police services. The relocation of segments of Bulsontown, Cedar Flats, and Mott Farm Roads would result in temporary disruption to traffic patterns, and would require traffic management by local police services. In addition, other localized construction activities associated with this alternative would be expected to require temporary traffic management services. Once constructed, the operational phase of this alternative is not expected to generate any significant increases in the demand for fire, police, or emergency services.

To the extent that the reservoir would cause the relocation of several area roads, response time to portions of the service area may be affected. This may cause adjustments to response procedures to maximize efficiency.

The Town of Stony Point's municipal swimming pool complex is located along Bulsontown Road, on a parcel of land owned by United Water. The pool is available to Town residents, and consists of an Olympic-size swimming pool, a wading pool for small children, basketball courts, a picnic area, and streamside fishing. The pool complex site lies within the Reservoir's 500-foot buffer area, and would therefore be displaced upon the implementation of this alternative, thereby resulting in a significant adverse negative impact to the Town's recreational facilities. The reservoir would, however, be expected to provide limited public access for fishing.

Therefore, like the Proposed Project, the Ambrey Pond Reservoir Alternative would not result in significant adverse impacts on schools, fire, police, or emergency services. The Ambrey Pond Reservoir Alternative would, however, have a significant adverse impact on a public recreational area.

SOCIOECONOMIC IMPACTS

The Ambrey Pond Reservoir Alternative would displace 20 buildings that are located either within the area that would be inundated or within the 500-foot buffer area. Among these are occupied residences, and the municipal swimming pool complex. The displacement of

households and residents could result in a loss of population to the Town of Stony Point. The displacement of these residences would result in a net loss of housing units in the Town. Although the displacements would result in adverse impacts to the affected households, due to the small numbers of households affected (fewer than 20), no significant adverse impact to the Town's population or socioeconomic composition is anticipated to occur.

The Ambrey Pond Reservoir Alternative area comprises 34 tax parcels currently owned by United Water. The total 2007/2008 tax generation for the Ambrey Pond parcels is $1.04 million. Under the Ambrey Pond Reservoir Alternative, it is anticipated that the Town of Stony Point and other relevant taxing jurisdictions, including Rockland County and the North Rockland Central School District would continue to apply a taxable valuation to the parcels that would be inundated by the flooding of the reservoir parcels. In addition, the improvements of other parcels as a result of the construction of the water treatment plant would be expected to result in increase assessments and correspondingly increased tax revenues to the taxing jurisdictions.

The construction of the Ambrey Pond Reservoir Alternative is expected to result in an investment of $193 million into the local, regional, and Statewide economies. This capital investment would result in direct and indirect economic benefits in the form of business and economic stimulation. In addition, the construction of the reservoir and associated facilities would result in the generation of wages and salaries, as well as corporate and personal income taxes and sales tax revenues.

The construction is expected to generate a significant number of construction-related jobs during the eight-year construction period. The construction workers would be expected to generate substantial localized economic activity in the Town of Stony Point, particularly in respect to purchases of meals and fuel for vehicles. These construction jobs would not represent permanent jobs that would remain in the vicinity of the reservoir construction area. The operational period of this alternative is expected to generate fewer than 10 new full-time jobs to operate and maintain the reservoir and associated pumping and treatment facilities.

Therefore, like the Proposed Project, the Ambrey Pond Reservoir Alternative is not expected to have a significant adverse impact on the socioeconomic composition of the local community, and would be expected to have an overall positive effect on the local, regional, and statewide economies. This alternative would, however, result in a significant adverse impact on residents that would be displaced by reservoir construction.

CULTURAL RESOURCES

An archeological investigation of the Ambrey Pond Reservoir Alternative was conducted by Dumont Archeological Surveys in 1978 and in 1979.[1] The investigations identified 16 prehistoric sites, four historic homesteads, and two apparently previously identified prehistoric sites: an "Indian village site" and "Indian Rock House." It is possible that additional resources are present in the Ambrey Pond Reservoir site and 500-foot buffer area. The archaeological potential of the water transmission route, road realignment areas, and water treatment, and pumping station site has not been evaluated yet. If resources determined to be eligible for the

[1] *Stage 1B Cultural Resource Survey of the Ambrey Pond Project*, Stony Point, New York. August 1, 1979. Prepared by Dumont Archeological Surveys, Monroe, New York.

State or National Register of Historic Places (S/NR) are identified in these areas, inundation or disturbance through subsurface excavation would be considered adverse impacts.

Of the 20 buildings on the reservoir site and in the 500-foot buffer area, there are no known historic resources. None of these buildings appear to meet criteria for S/NR listing. However, there is one potential historic resource on the reservoir site, two-story farmhouse with an outbuilding located along Bulsontown Road, that appears to date from ca. early- to mid-19th century and appears to meet criteria for S/NR listing in terms of age and historic significance. There are no structures situated on the raw water diversion main route or on the water treatment plant and pump station site. Therefore, apart from the farm house and outbuilding, there are no other potential historic resources on the Ambrey Pond Reservoir Alternative sites.

In contrast to the Proposed Project, the Ambrey Pond Reservoir Alternative is expected to result in significant adverse impacts on archaeological resources, and could potentially result in significant adverse impacts on historic resources either through direct disturbance or alternations to their context and setting.

GEOLOGY, SOILS, AND GROUNDWATER

Geology

The construction of the Ambrey Pond Reservoir Alternative would involve significant disturbances to the land surface, particularly in the immediate vicinity of the dams to be constructed or reconstructed. Once operational, the Ambrey Pond Reservoir Alternative would cause limited environmental impacts on site geology after the construction phase is completed.

The Ramapo Fault alignment is within a close proximity to the Ambrey Pond Reservoir Alternative area. In addition, a sub-parallel fault to the Ramapo Fault, named the Ambrey Pond Fault, runs within the immediate area of Ambrey Pond. Recent studies by Columbia University's Lamont-Dorothy Earth Observatory raise the possibility that these active structures will fracture in a large damaging earthquake, and note that damaging earthquakes have occurred in the Northeast several times in the last three centuries, indicating that this is a distinct possibility.

Soils

The soils in and immediately surrounding the area of the Ambrey Pond Reservoir Alternative have been mapped and described by the U.S. Department of Agriculture (USDA) Soil Conservation Service in the Soil Survey of Rockland County, New York, and the USDA Natural Resources Conservation Service National Cooperative Soil Survey. The major soil units at Ambrey Pond are primarily comprised of well decomposed organic material (Carlisle Complex).

The construction of the reservoir and its associated facilities would not be expected to result in any significant impact on soil resources, although significant soil movement and flooding would be necessary due to grading at dam site locations and reservoir inundation. Existing exposed soil would be covered by water, so there may be accumulation of sediments at the reservoir floor with insignificant changes in the soil properties.

Groundwater Resources

Groundwater resources in the vicinity of the Ambrey Pond Reservoir site, including the reservoir and water treatment plant, exist primarily in the bedrock aquifer and, to a lesser extent, in the till

and isolated stratified drift deposits (sand and gravel) found in the area. No long-term significant impacts to the local groundwater resources as a result of implementing this alternative are anticipated.

The creation of the reservoir would, however, raise the natural groundwater levels and recharge to the overburden and bedrock aquifer in the immediate vicinity of the reservoir. Measurable changes would likely be isolated to currently undeveloped parcels, a majority of which are already owned by United Water. During periods of high surface water flow, it is not anticipated that groundwater recharge downstream of the Ambrey Pond or Stony Point Reservoirs would be significantly impacted. During periods of low surface water flow, conditions near the stream area below the proposed reservoirs may exhibit lower groundwater recharge if the current natural surface water flow is lowered as part of the overall operation.

Currently there are no United Water public water supply wells in service or off-line within one mile of the area affected by this alternative. The closest such wells are more than a mile away, and include Thiells #50, Thiells #51, and the off-line Garnerville #46. Private wells are, however, present in the vicinity of this alternative. One community public water supply system associated with the Cedar Brook Mobile Home Park is located southwest of the reservoir along Cedar Flats Road near the site of the proposed Auxiliary Dam. No long-term significant impacts to these local groundwater resources as a result of is alternative are anticipated.

The Ambrey Pond Reservoir Alternative would not result in discharges to the bedrock aquifer within the vicinity of the reservoir site. Therefore, this alternative would not result in significant adverse impacts to groundwater quality for the United Water bedrock supply wells closest to the reservoir site discussed above, to the Cedar Brook Mobile Home Park community water supply located southwest of the Ambrey Pond Reservoir (although it is unknown whether this system is operational), or to other wells in the vicinity of the reservoir site.

Therefore, like the Proposed Project, the Ambrey Pond Reservoir Alternative would not result in significant adverse impacts geology, soils, or groundwater resources. The Ambrey Pond Reservoir Alternative, however, is situated in the vicinity of the Ramapo and Ambrey Pond Faults, which could exhibit seismic (e.g., earthquake) activity, thereby creating vulnerabilities for dam and reservoir security.

NATURAL RESOURCES

Floodplains

The Ambrey Pond Reservoir Alternative would be located within the Cedar Pond Brook Watershed, and includes the following surface water features: Lake Tiorati Brook (including its continuance as Cedar Pond Brook), Timp Mountain Brook, Lower Ambrey Pond, and Upper Ambrey Pond. The sites of the Ambrey Pond reservoir and finished water transmission lines/Cedar Pond Brook Diversion are located mostly within the 100-year floodplain; however, the raw water diversion line route is located immediately outside the 500-year floodplain.

Access to construct the Ambrey Pond Reservoir Alternative and associated dams would require the development of construction roadways on United Water property and within both the 500- and 100-year floodplains. These roads would be accessed from existing public roadways, including Cedar Flats Road and Bulsontown Road. The project would result in the permanent inundation of the floodplain within the footprint of the Ambrey Pond Reservoir. The peak

stormwater flow from the Ambrey Pond site would not be increased by the Ambrey Pond Reservoir Alternative during and after construction, and therefore, the floodplain downstream of the Reservoir would not be increased in size. This alternative would not be expected to result in increased flooding of areas outside the project area. The relocated roadways would be sited outside of the floodplain. Roadways lying within the inundated area would be relocated outside the 100-year floodplain.

Wetlands

The Ambrey Pond Reservoir Alternative site contains extensive areas of NYSDEC mapped freshwater wetlands and wetlands mapped by the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI). Most of these wetlands were a result of the two existing low dams that created the Upper and Lower Ambrey Ponds.

The Ambrey Pond Reservoir Alternative would not impact wetlands during construction of the Stony Point Dam, but may disturb wetlands within the area of Lower Ambrey Pond during the construction of the Main Dam. The creation of the Ambrey Pond Reservoir would result in the loss of 0.56 acres of riverine, 5.93 acres of emergent, and 17.85 acres of palustrine forested and shrub wetlands, and creation of a primarily deep-water lacustrine (lake-oriented) system. The functions and values of these existing wetland systems would be adversely impacted. The NYSDEC wetland would be inundated; resulting in the permanent loss of vegetated wetland habitat for terrestrial wildlife (i.e., birds, mammals, reptiles, amphibians, insects). The unavoidable adverse impacts to the approximately 24 acres of vegetated wetlands (on the basis of the NWI mapping), would be offset through mitigation measures developed in consultation with NYSDEC and the USACE.

Over time, there may be some small vegetated wetland areas created along the shorelines of the Ambrey Pond Reservoir and within the littoral zone, however the extent and persistence of these areas would likely be limited for the following reasons:

- Steep slopes found along most of this alternative's reservoir bed would limit the size of any new wetlands;
- Increases in open water and a lack of nearshore shallow water would result in unattenuated wave action reducing the persistence of rooted aquatic vegetation; and
- Draw downs from the reservoir would result in nearshore and shoreline areas that are normally inundated and occasionally dry—a reversal of the conditions in natural ponds.

Water Quality

Lake Tiorati Brook at the point of diversion for the reservoir is classified by NYSDEC as a Class B(T) stream. The best usages of Class B waters are for primary and secondary contact recreation and fishing. These waters shall be suitable for fish propagation and survival. The "(T)" denotes that it is classified as a trout water.

The potential impact of the Ambrey Pond Reservoir Alternative on water quality is primarily attributable to the impoundment of water formed by the reservoir. The increased detention time provided by the proposed reservoir would decrease the elevated total suspended solids (TSS) concentrations and turbidity levels that occur during and after storms. Water in the reservoir may stratify due to vertical temperature gradients that may occur during late spring, summer and early fall. This has a greater likelihood in Phase 3 than in Phases 1 and 2 because the dam

spillway elevation would be increased from 280 feet to 290 feet in Phase 3. The potential nutrient levels, sunlight penetration and detention time in the proposed reservoir may promote the growth of algae in the summer. Updated water quality sampling data and a more detailed account of the proposed reservoir operation would be needed to perform a quantitative assessment of water quality.

Water quality in Cedar Pond Brook downstream of the Stony Point Dam is not expected to be adversely impacted because the stream gradient and velocity of the brook foster favorable recreation and temperature conditions.

Aquatic Biota

The existing Upper Ambrey Pond and Lower Ambrey Pond are shallow impoundments on Timp Mountain Brook that support typical warmwater fish communities that are adapted to slow water. The fish communities in these ponds are likely to contain largemouth bass, bluegill sunfish, pumpkinseed sunfish, yellow perch, chain pickerel, bullheads, common shiner and other minnow species. Virtually all of these species would be expected to occupy the proposed reservoir that would encompass both existing ponds.

Creation of the reservoirs would displace stream-specialized fish and invertebrate species from the portions of the Ambrey Pond Reservoir area that are free-flowing, resulting in the loss of individuals unable to move upstream to available suitable habitat. The loss of some individuals would not be expected to result in significant adverse impacts to regional populations of species expected to reside in the flowing portions of Timp Mountain Brook. A number of generalist species that currently exist in the system would be expected to inhabit the reservoir. Regulation of the reservoirs would have the potential to result in significant adverse impacts to individual fish inhabiting the reservoir and downstream stream segments should operation fail to maintain minimum flows within stream reaches downstream of both impoundments, and to time reservoir drawdowns outside of spawning and rearing periods (early spring through July) so as not to affect recruitment[1]. The loss of some individuals would not be expected to result in significant adverse impacts to regional populations of these generalist species, and populations of most species could likely recover after a single year of poor recruitment. However, repeated disturbance associated with low flows or low reservoir levels during spawning could result in significant adverse impacts to the fish community inhabiting the reservoir and Timp Mountain Brook below the dams.

American eel are present in both Timp Mountain Brook and Cedar Pond Brook. Although this species is not protected, it is increasingly being recognized as a species of concern. Activity that inhibits passage to upstream habitat would have the potential to adversely impact regional populations of American eel.

Construction and operation of the reservoir would have the potential to adversely impact aquatic biota in the reservoir and in Timp Mountain and Cedar Pond Brooks. The magnitude of potential impacts due to reservoir operation would vary from year to year depending on the occurrence of drought conditions and the demand for water in Rockland County. Adverse impacts would be greater in dry years than wet years.

[1] Fish born into a population within an area.

Terrestrial Resources

The ecological communities within the Ambrey Pond Reservoir area would be completely and permanently inundated as a result of this alternative. The impact on the terrestrial environment from this alternative would significantly change the character of these communities mostly replacing wetland and a variety of terrestrial communities with an open water community.

The construction of the treatment plant would also impact ecological communities, primarily successional northern hardwoods. The installation of the raw water transmission route and tie in would impact primarily the paved road/path cover type. A total of eight acres of paved road/path within the raw water transmission route area would be impacted by construction activity.

Wildlife

Wildlife or evidence of wildlife observed during field investigations on May 16, 2008 included 69 species (12 species of mammals, 48 birds, 2 reptiles, and 7 amphibians) in or near the reservoir site. Existing ecological communities are represented by relatively unfragmented habitats that have been disturbed and/or modified previously. Evidence of recent disturbance includes numerous well worn all terrain vehicle (ATV) trails, evidence of hunting and fishing, and old fire pits in the vicinity of the ponds and at rocky outcrops at the higher elevations. Past disturbance and/or modification include existing impoundments and abandoned home sites. Despite past disturbance and habitat modification, the site supports a variety of wildlife.

The Ambrey Pond Reservoir Alternative would have the potential to result in adverse impacts to terrestrial wildlife due to the reduction of habitat for wildlife species requiring upland or shallow wetland habitats for reproduction or overwintering (e.g., reptile and amphibian species) that would be lost through the development of the reservoir, and direct loss of individual wildlife that are less mobile (e.g., small mammals, turtles, snakes, salamanders, frogs, and toads), due to collision with construction equipment, or flooding.

Since the filling of the reservoir would be a gradual process, it is likely that highly mobile wildlife individuals (i.e., birds, most mammals, some reptiles and amphibians) would likely move to nearby suitable habitats in response to disturbance and habitat loss in the Ambrey Pond Reservoir Alternative site, if construction activities and flooding occurred during an active period of a particular species' life cycle. However, wildlife individuals unable to find suitable habitat nearby, less mobile species, and species for which the construction or flooding occurred during a period of seasonal inactivity (i.e., hibernation, torpor) in winter months, such as mammals present in underground burrows or snakes present in hibernacula, would be lost. Also, filling during the peak of breeding activity may impact wildlife reproduction by causing the mortality of young, mainly for species breeding close to the ground or underground. While the loss of some individuals would be adverse, it would not be expected to result in significant adverse impacts to regional populations of these species.

The Ambrey Pond Reservoir Alternative would have the potential to benefit wildlife species that depend on open-water aquatic habitats. Aquatic birds such as ducks, geese, loons, cormorants and others, and certain mammals that frequent large open water habitats (i.e., muskrat) may benefit from the creation of open-water foraging habitat.

Rare, Special Concern, Threatened and Endangered Species

The Ambrey Pond Reservoir Alternative has the potential to positively impact the bald eagle. They rarely roost or forage in the upland forests or wetlands. They do, on occasion, congregate along inland lakeshores during the winter. In this respect, this alternative may actually provide additional roosting and fishing habitat during part of the winter. The reservoir site was identified as being located within 1.5 miles of three timber rattlesnake den sites. This alternative has the potential to impact timber rattlesnake populations during the construction phase of the project. Construction in the Reservoir Project site can result in direct short-term impacts resulting from encounters with construction equipment traffic. Once the project is complete, long-term indirect impacts could result from flooding if the area is used for foraging.

In addition to the species listed by NYSNHP, other New York State listed special concern species, including the small-footed bat identified in the Hudson Highlands; whip-poor-will, golden-winged warbler, cerulean warbler, red-shouldered hawk, Cooper's hawk, and sharp-shinned hawk identified during NY Breeding Bird Atlas surveys; and marbled salamander, southern leopard frog, Jefferson salamander, blue-spotted salamanders, spotted turtle, wood turtle, eastern box turtle, hognose snake, and eastern worm snake were identified in the nearby Hudson Highlands during NY Herp Atlas Program surveys. With the exception of marbled salamanders and sharp-shinned hawks, spotted turtles and eastern box turtles, none of the other New York special concern species are known to have been identified on the reservoir site.

HAZARDOUS MATERIALS

There are three primary concerns regarding hazardous materials associated with the Ambrey Pond Reservoir Alternative. These concerns include existing land uses and fuel oil storage tanks or septic systems and leach fields associated with those uses; potential spills of fuel and chemicals during construction; runoff during wet weather; and storage of chemicals on site during operation.

During construction, chemical bulk storage and petroleum bulk storage can create a potential concern. Heavy machinery operation will include on-site refueling and possible temporary storage of diesel and gasoline fuel as well as automotive fluids and grease. Incidental or accidental chemical and or petroleum spills may occur during maintenance of these vehicles during construction.

As with the Proposed Project, any potential contaminants and bulk storage facilities create a contamination concern. However, with the implementation of a variety of measures, no significant adverse impacts related to hazardous materials would be expected to occur as a result of the construction of the Proposed Project or the Ambrey Pond Reservoir Alternative. Both the Proposed Project and Ambrey Pond Reservoir Alternative would use a variety of chemicals and petroleum products and would generate residual solids and liquids in the filtration process, the storage, use, and disposal of these are subject to strict regulation and, as such, would not be expected to present the potential for significant adverse impacts during operation of either treatment facility.

INFRASTRUCTURE, UTILITIES, AND STORMWATER

Sanitary Sewage Facilities

Sanitary sewer service in the Town of Stony Point is comprised of both individual septic systems and municipal sanitary sewers. Residences and other uses within the Ambrey Pond Reservoir Alternative area do not appear have connections to the Town's sanitary sewer system and are expected to rely on individual septic systems as the means for sewage treatment and disposal. Sewerage facilities would therefore not be significantly affected by this alternative.

Water Supply

Once in operation, this alternative is anticipated to have minimal demands on the water distribution system. Anticipated demand on potable water is expected to be primarily for miscellaneous usage at the Stony Point Water Treatment Plant.

Stormwater

Stormwater control in the area of the Ambrey Pond Reservoir Alternative area is composed of an intricate network of ditches and swales located along the side of local roads to control runoff. These existing drainage facilities discharge into local streams that ultimately flow into the Hudson River. Aside from stormwater runoff that may flow into the reservoir, storm water would continue to discharge into the existing drainage system of local streams that ultimately flow into the Hudson River.

The existing impervious surface area on this alternative's sites is approximately 30,000 square feet. Under this alternative, the total impervious surface area of the affected sites would increase to approximately 100,000 sq feet. It would be expected that a stormwater management plan consisting of best management practices (BMPs) would be developed in accordance with the New York State *Stormwater Management Design Manual*. As a result, it is not expected that the peak stormwater flow from the site would be increased by this alternative.

Electric and Telephone

An electrical transmission line belonging to Orange & Rockland Utilities, Inc. (O&R) traverses the southern portion of the expanded reservoir site. A portion of an existing access road along this utility line right of way would be inundated by the reservoir. However, based upon conversations with O&R Utilities documented in the 1979 DEIS, the towers would remain accessible for maintenance, and as a result there are no foreseen significant adverse impacts resulting from the loss of this access road portion.

Energy requirements for this alternative have been calculated for the three phases for the Stony Point water treatment plant operation, and it was assumed that energy consumption for the dams and other accessory items associated with this alternative can be considered negligible. As show below, in Table 18-4, 6,858 kilowatt hours per day (kWh/day) of electrical service would be required during the operational period of this alternative.

Table 18-4
Power Consumption (KwH/Day)

Energy Requirements	Phase 1 (2.5 mgd)	Phase 2 (5.0 mgd)	Phase 3 (7.5 mgd)
Intake Pumps	755	1,511	2,266
Flocculation	50	99	149
DAF Recycle	242	484	725
DAF Blowers	124	248	372
MF/UF Feed Pumps	574	1,148	1,722
MF/UF Backwash Pumps	11	22	33
SUBTOTAL	**1,756**	**3,512**	**5,268**
Other/Contingency (30%)	527	1,054	1,580
TOTAL	**2,283**	**4,566**	**6,848**

Source:
Table 5-1: Energy Requirements for Stony Point Water Treatment Plant, Ambrey Pond Reservoir Alternative, Black & Veatch, as converted to kWh/day.

Natural Gas

The Algonquin Gas Line lies near the southern border of the reservoir area. This gas line would not be affected by this alternative.

Therefore, like the Proposed Project, the Ambrey Pond Reservoir Alternative would not result in significant adverse impacts on infrastructure supply or demand.

TRAFFIC AND TRANSPORTATION

Construction Period

A capacity analysis was conducted to assess the impacts associated with construction of the Ambrey Pond Reservoir Alternative. The analysis was conducted for the weekday AM and PM peak hours to assess project-related traffic impacts during the construction period. For informational purposes, a capacity analysis was also provided for the Saturday midday peak hour. However, no construction activity would be anticipated for the weekend periods.

As discussed above, the Ambrey Pond Reservoir Alternative is not expected to generate a significant volume of site-generated traffic once operational. Estimates indicate the water treatment plant and pump station would generate fewer than 10 employee trips in each peak hour on a daily basis, with occasional visitors and deliveries. Greater traffic impacts are anticipated during the construction of the proposed development. On this basis, this section provides an assessment and capacity analysis of the temporary traffic impacts generated due to projected construction process.

Table 18-5, below, summarizes the projected site-generated traffic for the construction efforts. Most likely, construction-related deliveries would be scheduled to avoid peak traffic conditions; however, for the analysis, it was assumed that 20 percent would arrive during the peak hour.

Table 18-5
Site-Generated Construction Traffic Projections

Item	Phase 1	Phase 2	Phase 3
Schedule	900 days	450 days	720 days
Delivery Truck	52 per day (32 per day avg.)	3 per day (1 per day avg.)	13 per day (8 per day avg.)
Concrete Truck	48 per day max. (22 per day avg.)	4 per day max. (1 per day avg.)	5 per day max. (3 per day avg.)
Dump Truck	42 loads per day (22 per day avg.)	2 loads per day (1 per day avg.)	31 loads per day (9 per day avg.)
Total Truck Trips	142 per day	9 per day	49 per day
Peak Hour Trips – One-way (assume 20 percent)	28 trucks peak hour	2 trucks peak hour	10 trucks peak hour
Peak Hour Truck Trips - Roundtrip	56 trucks peak hour	4 trucks peak hour	20 trucks peak hour
Construction Worker Trips	90 worker peak hour	15 worker peak hour	20 worker peak hour
Total Trips	**146 trips**	**19 trips**	**40 trips**

Typically, construction workers are on-site before the regular commuter peak hour and frequently work a 7:00 AM to 4:00 PM shift; however, in an effort to be conservative we assumed that all workers would arrive during the early shoulder of the morning peak hour (7:00 AM to 8:00 AM) and depart during the afternoon peak hour (5:00 PM to 6:00 PM). No construction activity would be anticipated during the weekend periods.

The full Traffic Impact Study in Appendix 18.2 provides a detailed description of the site-generated construction traffic volumes.

Project site-generated traffic for the construction period during the AM and PM peak hours are approximately 146 trips. Distribution patterns for the proposed development are based on an evaluation of current traffic patters in the immediate vicinity of the subject property. Based on this evaluation, it is estimated that approximately 65 percent of the total truck site-generated traffic would have an origin/destination to the south via U.S. Route 9W, and 35 percent arriving/departing to the north via U.S. Route 9W. Similarly, approximately 33 percent of the total construction worker site-generated traffic would have an origin/destination to the south via U.S. Route 9W, 33 percent arriving/departing to the north via U.S. Route 9W, and 34 percent utilizing local roadways and the Palisades Parkway.

It is anticipated that all commercial truck and heavy vehicle traffic would be directed to avoid local roadways and follow designated truck routes such as U.S. Route 9W and County Route 106.

The results of the capacity analysis indicate under the Build Condition all signalized intersections will operate at an acceptable Level of Service "D" or better, meaning that the delay for signalized intersections will be less than or equal to 55 seconds and the delay for unsignalized intersections will be less than or equal to 35 seconds. Table 18-6 summarizes the results of the capacity analyses conducted for each intersection included in this study. Level of Service and average delay (expressed in seconds per vehicle) are also provided.

Table 18-6
Overall Level Of Service and Delay Summary

INTERSECTION	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
	Existing	No Build	Build	Existing	No Build	Build
U.S. Route 202/9W and West Main St. (CR 108)	B/10.3	B/11.5	B/11.6	B/12.5	D/35.4	D/38.2
U.S. Route 202/9W and Central Drive (CR 106)/Shopping Center Dr.	B/14.0	B/15.0	B/16.1	C/20.8	D/46.1	D/47.0
Central Drive (CR 106) and Reservoir Rd.	c/24.3	d/29.7	A/7.6*	f/73.0	f/>99.9	B/12.1*
Central Drive (CR 106) and Old Route 202/ Pyngyp Rd.	b/14.6	c/15.4	A/7.6*	f/86.9	f/>99.9	B/12.6*
Central Drive (CR 106) and Cedar Flats Rd. (CR 69)	b/14.9	c/15.9	c/16.2	b/13.9	c/16.1	c/16.8
Queensboro Rd. (CR 69A) and Bulsontown Rd. (CR 65)/Mott Farm Rd.(CR 118)	a/8.7	a/8.7	a/8.7	a/8.7	a/8.7	a/8.7
W.Main Street and Site Driveway	N/A	N/A	b/10.4	N/A	N/A	b/10.8
Bulsontown Rd and Site Driveway	N/A	N/A	a/8.5	N/A	N/A	a/8.7

Notes:
* With mitigation
Signalized intersections are denoted by uppercase letters.
Unsignalized intersections are denoted by lowercase letters.
Overall delay at unsignalized intersections is based upon the critical approach.

The unsignalized intersections of Central Drive (CR 106) with both Reservoir Road and Old Route 202 will operate at a Level of Service F during the PM peak existing, No Build and Build conditions, indicating that a delay of more than 50 seconds is expected to occur at these intersections during project construction. A temporary traffic signal or a traffic control officer to direct traffic (which measures should be implemented and whether the traffic signal would be temporary or permanent to be determined by the County) would reduce these impacts during the peak hours of Phase 1 construction.

Construction of the Ambrey Pond Reservoir would require the permanent relocation of portions of Cedar Flats Road and Bulsontown Road onto undeveloped lands adjacent to the Reservoir. These realignments are not expected to cause an increase in traffic delays.

As described above, traffic impacts during the construction phase are expected to be negligible. Buses may experience minor delays during the construction phase. However, no adverse significant impacts to public transportation are anticipated during the construction phase.

Operational Period

The Ambrey Pond Reservoir Alternative would not generate a significant volume of traffic once the site is operational. Once operational, preliminary estimates indicate the water treatment plant and pump station would generate four to six employee trips on a daily basis with occasional visitors and deliveries. Due to this low volume of site-generated traffic, the proposed project is

not expected to create a significant impact on traffic conditions on the local roadways during the operation phase.

The Ambrey Pond Reservoir would require the permanent relocation of portions of Cedar Flats Road and Bulsontown Road onto undeveloped lands adjacent to the Reservoir. These realignments are not expected to cause an increase in traffic delays.

Because the Ambrey Pond water treatment plant and pump station would have a minimal number of employees, no adverse significant impacts to public transportation are anticipated during the operation phase.

Therefore, like the Proposed Project, the Ambrey Pond Reservoir Alternative would not result in significant adverse impacts on traffic and transportation.

NOISE

Temporary noise impacts to sensitive receptors are predicted to occur due to a significant increase in noise levels during construction of the reservoir and water treatment plant, especially during peak construction periods. The operation this alternative is expected to result in minor increases in noise levels mainly due to the operation of roof top ventilation systems for the new buildings. The operation of the Cedar Pond Brook Dam and the Stony Point water treatment plant has the potential to affect the same noise sensitive receptors. However, each of these facilities in would be designed to be in compliance with any applicable Town of Stony Point noise codes.

Vehicles accessing the Cedar Pond Brook Dam and the Stony Point Water Treatment Plant have the potential to affect the same noise sensitive receptors along West Main Street. Based on the existing traffic volume, during certain hours, an increase in the existing traffic by even one heavy truck may cause an increase in noise levels 3 dBA or greater at the nearest noise sensitive receptors. However, when feasible, the potential for an adverse noise impact would be minimized by limiting the trucks entering the Cedar Pond Brook and/or Stony Point Water Treatment Plant to one per hour.

Therefore, like the Proposed Project, the Ambrey Pond Reservoir Alternative would not result in significant adverse noise impacts.

AIR QUALITY

The operation of the Ambrey Pond Reservoir Alternative would result in a minor increase in stationary source air emissions. Air emissions generated by the operation of the Alternative would mainly consist of trucks delivering chemicals and other materials, trucks removing sludge from the water treatment plant site, and a small number of employee and visitor vehicles. Emergency generators would occasionally create some minor point source emissions, but these would occur over very short durations for periodic testing purposes, or in the event of a power disruption. However, these activities are not expected to have a measurable impact on air quality in the local area or in the region.

Therefore, like the Proposed Project, the Ambrey Pond Reservoir Alternative would not result in significant adverse air quality impacts.

GLOBAL CLIMATE CHANGE

An estimate of the consequence of the Ambrey Pond Reservoir Alternative, with respect to greenhouse gas (GHG) emissions is provided below. For the purposes of providing a conservative analysis, the final phase of the reservoir with the largest surface area is assumed.

The GHG emissions projected to result from this alternative include those emissions generated through the extraction, fabrication, transport, construction, and disposal of building materials, as well as emissions through landscape disturbance during construction. Transportation to and from the plant by employees, for the delivery of materials would add to the overall GHG emissions implications.

The elimination of vegetation on the site, would reduce the ability of the landscape to sequester GHG, particularly CO_2, since trees detain CO_2 in their wood, and serve, on balance, as a net sink for this GHG. The inundation for the Ambrey Pond Reservoir would inundate approximately 112 acres of land, effectively removing them as a potential sink for CO_2. However, only a portion of the site serves as productive forest. Of the total amount, approximately 20 acres is mature forest, while 65 acres is successional forest habitat. Carbon detained in the existing forest is approximately 2,600 metric tons, a portion of which would likely be released subsequent to land clearing. The yearly reduction in the sequestration value of these forests based on the rate of carbon uptake for these types of forested areas is approximately 4.6 metric tons.

Because the facilities that would be constructed under this alternative have not been identified or designed, there would be additional GHG emissions resulting from the expenditure of energy used to fabricate the materials and to construct the facilities. The quantities of these GHG emissions are not known.

Plant operations would also have an associated direct and on-going energy demand. Upon completion of the 600 million gallon reservoir and the treatment plant producing 7.5 mgd of potable water, this alternative would create an energy demand of approximately 6,848 kWh/day. At this rate, the operational energy consumption and resultant GHG emissions would be less than those generated by the Proposed Project.

COASTAL ZONE CONSISTENCY

The Ambrey Pond Reservoir Alternative would occur outside the coastal zone of the Town of Stony Point, and outside the area of effect of the Town's Local Waterfront Revitalization Program (LWRP), and beyond the area of concern of LWRPs of surrounding towns or the New York Department of State's coastal policies. In addition, there are no LWPRs of surrounding or nearby communities that would affect or be affected by this alternative. Therefore this alternative is neither consistent nor inconsistent with coastal policies that may otherwise apply.

ENVIRONMENTAL JUSTICE

Based upon a screening of salient demographic characteristics, this analysis concludes that the Ambrey Pond Reservoir Alternative area does not have concentrations of minority or low-income populations that would be disproportionately affected by this alternative.[1] Therefore,

[1] http://www.dec.ny.gov/docs/permits_ej_operations_pdf/rocklandco.pdf

Ambrey Pond Reservoir Alternative would not result in disproportionate impacts to minority or low-income populations.

CUMULATIVE IMPACTS

Cumulative effects or impacts would occur from the incremental impact of implementing this alternative when added to other past, present, and reasonably foreseeable future actions. The cumulative effects may not be detectable in the individual context of direct and even indirect impacts, but nevertheless when added to other actions can eventually lead to measurable environmental change. It is not anticipated that the Ambrey Pond Reservoir Alternative would result in any cumulative impacts on account of the low level of development activity anticipated to occur in the immediate area. In addition, the park and open space uses of the public lands to the west of the reservoir site ensure the stability of the current land uses on these adjacent properties.

✷

A. INTRODUCTION

This chapter addresses the potential cumulative effects associated with the Haverstraw Water Supply project, including all Project components (e.g., the raw water intake, intake pumping station, raw water transmission line, water treatment plant and access roads, and potable water transmission mains). Cumulative effects or impacts result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. The cumulative effects of an action may be undetectable when viewed in the individual context of direct and even indirect impacts, but nevertheless when added to other actions can eventually lead to measurable environmental change.

The analysis presented in this chapter places project-specific impacts of the Proposed Project into a broader context that takes into account the full range of impacts from actions currently taking place or planned within the area of the Project Sites and surrounding region at the same time as construction or operation of the Proposed Project (i.e., projects occurring along or near the Hudson River in the vicinity of the Haverstraw/Stony Point border).

B. POTENTIAL CUMULATIVE EFFECTS OF THE PROPOSED PROJECT WITH OTHER PROJECTS AND ACTIVITIES

2015 ANALYSIS YEAR

This DEIS considers the impacts of the proposed Haverstraw Water Supply Project by evaluating conditions in the future with the Proposed Project in place in comparison to expected conditions without the Project. The future conditions without the Project (also referred to as "No Build" conditions) include known development projects and other future conditions currently anticipated. By including those projects in the future background condition, the analysis of the Proposed Project's impacts considers the cumulative effects of those other projects with those of the proposed Haverstraw Water Supply Project.

The future background conditions assumed for the analyses in this EIS are described in Chapter 2 of this DEIS, "Project Description," in the discussion of analysis framework provided in section I of that chapter. As discussed there, the following are anticipated to occur in the future by the end of 2015, which is the analysis year in this DEIS:

- United Water New York Inc. (United Water) will continue implementation of its Short-Term Water Supply program as well as other activities to improve its infrastructure, such as the Underground Infrastructure Renewal Program.
- Harbors at Haverstraw, a residential development located approximately two miles south of the Project Sites, with approximately 800 units, of which 250 dwellings have recently been constructed.

- Relocation of the ferry terminal currently located in the Village of Haverstraw on Dr. Grilling Drive near the Rockland Bergen Boat Club to Main Street in the heart of the Harbors at Haverstraw community.
- Local retail space, a CVS pharmacy and Providence Bank, in the Town of Stony Point at the intersection of US Route 9W and Filors Lane.
- A new ShopRite supermarket in the Town of Stony Point on Kay Fries Drive and US Route 9W. This development is currently under the review of the planning board.

In addition, other potential developments may occur farther from the Project Sites, such as the redevelopment of the former Letchworth Village psychiatric hospital. This is unlikely to have cumulative impacts with those of the Proposed Project, because of its distance from the Project Sites and because it would most likely be under construction and then completed after the Proposed Project is complete.

OTHER ONGOING AND LONG-TERM ACTIVITIES

In addition to the initiatives to be undertaken by United Water and the known development projects that are expected to occur in the area near the Project Sites, the assessment of cumulative impacts also considers the ongoing operation of the Proposed Project together with other activities that will occur in the Hudson River nearby.

U.S. GYPSUM DREDGING

U.S. Gypsum performs maintenance dredging for its access channel on a regular basis (approximately once every five years) to remove an accumulation of silty material. The most recent maintenance dredging permit was issued in 2006 following an assessment of the effects of contaminants in the dredging material on biota at the disposal site. The U.S. Gypsum dredging material was placed at the offshore Historic Area Remediation Site (HARS) to remediate former degradation by contaminated sediments. In order to qualify for ocean placement, U.S. Gypsum sediments were tested in bioassay and bioaccumulation studies with live organisms following EPA protocols. The U.S. Gypsum sediments passed the screening criteria which categorized them as suitable for HARS placement.

Based on recent dredging activities, this dredging typically removes approximately 90,000 cubic yards of material from an existing access channel at the U.S. Gypsum Company dock site, adjacent to the proposed site of the Haverstraw Water Supply Project's raw water intake in the Hudson River. During the dredging, sediments would be removed using a clamshell bucket dredge, to a maximum depth of 31 feet below mean low water (MLW). Dredged material removed from the channel would be transported by barge to the Historic Area Remediation Site (HARS), located in the New York Bight. The primary impact associated with this activity would be an increase in suspended sediments in the water column during the construction phase of the dredging project. It is expected that appropriate controls/containment will be utilized in compliance with federal, state and local permit conditions.

The analysis provided in Chapter 9 of this DEIS, "Natural Resources," concludes that long-term impacts to aquatic biota would not result from temporary increases in suspended sediment resulting from in-water construction activities for the Proposed Project. This conclusion remains true when taking into consideration the combined effect of dredging at U.S. Gypsum's dock and the construction activity at the proposed raw water intake site for the Proposed Project. Moreover, periodic maintenance dredging at U.S. Gypsum's dock would not result in a

cumulative effect with the proposed withdrawal of raw water by the Proposed Project from the wedge-wire screen water intake.

WITHDRAWAL OF RIVER WATER

As discussed in Chapter 9, "Natural Resources," when considering the potential impact on aquatic resources of the withdrawal of water for the proposed water treatment plant, the combined effect of the Proposed Project in addition to existing nearby facilities that withdraw water from the Hudson River was considered. Two power generating plants are located within the area. The Bowline power plant, located just south of the project area, withdraws an average of 543,500 gallons of water per minute (782.6 mgd), while Indian Point Energy Center, located north of the Project Area, removes an average 1,297,700 gallons per minute (1,868.6 mgd). The analysis concludes that the amount of Hudson River water withdrawn by the water treatment plant when operating would represent a fraction of the total amount of Hudson River water withdrawn for industrial purposes in Haverstraw Bay, and with appropriate siting analyses used to optimize the intake and wastewater discharge location, any impact associated with the proposed withdrawal of Hudson River water for the water treatment plant would be minimal.

As noted in Chapter 9, the amount of water withdrawn for the Proposed Project would represent a minute fraction of the total freshwater flow of the Hudson River as it passes the Intake Site. According to USGS estimates, the annual mean flow rate of freshwater in the river as it passed Poughkeepsie in the years 1995 through 2004 ranged from a low of 12,000 cfs (5,385,970 gpm) to a high of 26,700 cfs (11,983,800 gpm) This does not account for the additional effect of saline water associated with tidal activity. ✱

A. INTRODUCTION

The term "growth-inducing aspects" generally refers to the potential for a proposed action to trigger additional development in areas outside of a project site that would not have experienced such development without the project. Such induced growth can include growth of physical development, population increases in the surrounding community, increases in economic activity, and/or social or cultural expansion. Generally, projects that add substantial new land use, new residents, or new employment could induce additional development of a similar kind, or of support uses (e.g., stores to serve new residential uses).

Actions that introduce or greatly expand infrastructure capacity (e.g., sewers, central water supply) might induce growth in areas that are not currently served by such infrastructure. For this reason, the following section addresses whether the Proposed Project could induce growth which in turn could lead to significant adverse environmental impacts.

B. POTENTIAL GROWTH-INDUCING IMPACTS OF THE PROPOSED PROJECT

In the future with or without the Proposed Project, the projected population growth in Rockland County will create an additional demand on infrastructure, including water supply. As discussed in Chapter 1, "Purpose and Need," the average daily demand for water for United Water New York Inc. (United Water) customers in Rockland County is 31.4 million gallons per day. The demand for water is increasing as the County's population increases, and the existing water supply system has limited ability to provide the additional water needed over the long-term to meet the projected demand. Projections for future water demand over the next two decades indicate that within that timeframe, the demand for water will outpace the available supply if no new water supply is developed.

United Water's short-term plan to develop new water supplies and optimize use of existing water supply sources is expected to satisfy projected peak demands through 2015. United Water's long-term plan, consisting of the Proposed Project, is designed to meet the projected system demands beyond 2015, when the short-term plan will no longer be adequate.

The Proposed Project will be executed in stages to keep pace with projected growth. The Proposed Project would tie into the existing water distribution system, and would not extend the existing water supply network into undeveloped areas. Rather, the new water infrastructure would support new uses that are expected to occur in the existing service area irrespective of the Proposed Project. The Proposed Project is not intended to accommodate additional growth beyond that which is already forecast for Rockland County. In addition, as discussed in Chapter 5, "Land Use, Zoning, and Other Programs," the Proposed Project would not result in any adverse land use effects that would affect growth patterns. Therefore, the Proposed Project would not induce new residential or commercial growth in Rockland County.

As discussed in Chapter 15, "Construction Impacts," constructing the Proposed Project is expected to take up to a total of 5.5 years spread over three phases. Overall, the construction would result in the direct employment of approximately 127 construction workers per year. The construction workers working at the Project Sites would likely spend money in the local economy through their visits to area businesses. It is not possible to determine exactly where the workers may conduct business, but it is likely that they would visit gas stations, convenience stores, and restaurants. In addition to worker spending, capital expenditures on building materials and supplies would be made during the construction period. The construction jobs and the capital expenditures would have a short-term beneficial effect on the local economy. However, these effects would be temporary, and limited to the duration of the construction period. Therefore, the construction of the Proposed Project would not likely induce either permanent or significant growth in the surrounding area.

During its operational phase, the Proposed Project would create fewer than 10 full-time jobs. It is expected that these jobs would be filled by workers already in the existing labor pool, and that the workers would commute to the job sites from their existing residences. Therefore, employment directly generated by the Proposed Project would not result in growth that is not already accounted for by existing growth projections.

The overall conclusion is that the Proposed Project is not expected to significantly increase development or growth in Rockland County, and that no significant adverse environmental impacts are anticipated due to induced growth. The Proposed Project is part of United Water's overall long-range plan to meet the projected water supply needs of Rockland County, as well as comply with the requirements of the New York State Public Service Commission to ensure a safe and reliable water source. ✷

Chapter 21: Irreversible and Irretrievable Commitment of Resources

A. INTRODUCTION

Irreversible and irretrievable commitment of resources refers to both the built and natural resources that would be expended in the construction and operation of a proposed project.

B. PROBABLE IMPACTS OF THE PROPOSED PROJECT

There are a number of resources, both natural and built, that would be expended in the construction and operation of the Proposed Project. These resources include the materials used in construction (e.g. glass, wood, metal, plastics, etc.); energy in the form of fuel and electricity consumed during construction and operation of the Proposed Project; and the human effort (time and labor) required to develop, construct, and operate various components of the Proposed Project. They are considered irretrievably committed because their reuse for some purpose other than the Proposed Project would be highly unlikely.

The Proposed Project would not require a significant commitment of natural resources in the form of vegetative cover or plant and animal habitat and is not expected to have impacts on water quality or habitat. The Proposed Project's intake facility would withdraw Hudson River water through a wedge wire screen intake structure. This withdrawal would result in some loss of aquatic organisms entrained at the intake. Such losses would be minimized by incorporating the wedge wire screen design parameters determined by the US Environmental Protection Agency (EPA) to constitute best technology available for minimizing impingement at intake structures, and recognized as effective for reducing entrainment. As a result, no significant adverse impact on aquatic organism populations is expected to occur.

The water treatment plant would be located on a reclaimed site that is part of the former Haverstraw Landfill, while the intake pumping station would be located in an area that is currently partially covered with gravel. These areas were found not to contain sensitive habitats or valuable natural resources and no significant adverse impacts to natural resources are expected. Similarly, the permanent loss of acreage for Proposed Project is not expected to have a significant adverse impact.

Construction materials may include glass, wood, steel, concrete and other materials. Once committed to the construction of the Proposed Project, these materials may not be reusable.

These commitments of land and human resources and materials should be weighed against the public purpose and need for the Proposed Project to provide a reliable source of potable water to meet projected population growth. ✳

A. INTRODUCTION

Unavoidable adverse impacts occur when a proposed project results in significant adverse impacts for which there are no reasonable or practicable solutions, and for which there are no reasonable alternatives that would meet the purpose and need of the action and objectives and capabilities of the project sponsor, that would eliminate the impact and not cause other or similar significant adverse impacts.

B. PROBABLE IMPACTS OF THE PROPOSED PROJECT

As detailed throughout this DEIS, the Proposed Project would not result in permanent significant adverse environmental impacts. However, the Proposed Project would have a construction period of three or more years and at times during the construction period would result in short-term adverse construction effects. As described below, in some cases, the Proposed Project's potential construction impacts would not be fully abated. It should be noted that construction effects are temporary and for this and certain other stated reasons are therefore not considered significant.

Short-term impacts resulting from constructing the Proposed Project are discussed in detail in Chapter 15, "Construction Impacts." Following are the short-term impacts anticipated as a result of construction of the Proposed Project:

- Increased traffic on local roadways from trucks and equipment; and
- Localized impacts to adjacent neighborhoods resulting from increased noise due to construction activities and construction vehicles and equipment.

These construction-related impacts would be avoided and mitigated to the extent possible. As discussed in Chapter 15, "Construction Impacts," signal retimings and construction traffic management measures would be employed to minimize construction traffic impacts; however, it is anticipated that levels of service of affected roadways may be temporarily reduced for short durations during the construction period.

As also discussed in Chapter 15, noise generated during the construction process would be discernible to residents in the nearby neighborhoods. In the residential area immediately north of the Intake Site and the residential neighborhoods close to the Water Treatment Plant Site, construction activities would produce noise levels that would increase ambient noise levels by more than 6 dBA and increase noise levels at residences to more than 65 dBA, which together constitute the threshold used for identifying significant noise impacts. However, these increases would occur for less than two years and therefore would not be considered significant adverse noise impacts. ✱

A. INTRODUCTION

OVERVIEW

An environmental justice analysis was prepared to identify and address any potential disproportionate adverse impacts on minority or low-income populations that could result from a proposed project. The concept of performing an environmental justice analysis is related to the establishment of Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations* (February 11, 1994). Certain state agencies, such as the New York State Department of Environmental Conservation (NYSDEC), have developed their own policies for incorporating environmental justice concerns into environmental review. NYSDEC, pursuant to *Commissioner's Policy (CP)-29 Environmental Justice and Permitting* (the EJ Policy), requires consideration of environmental justice concerns in projects subject to the State Environmental Quality Review Act (SEQRA) where NYSDEC has a Lead Agency role. As such, this environmental justice analysis has been prepared to address the Proposed Project's potential to cause disproportionate adverse impacts on minority or low-income populations.

This chapter of the DEIS includes the following sections:

Section B: Methodology.
Section C: Identification of Potential Environmental Justice Areas.
Section D: Analysis of Existing Environmental Burdens in the Study Area.
Section E: Analysis of the Potential for Adverse Impacts from the Proposed Project.
Section F: Public Participation.
Section G: Conclusions.

The analysis of environmental justice concluded that most of the study area is not considered a potential environmental justice area. However, the area south of Railroad Avenue and west of the CSX railroad right-of-way is a potential environmental justice community. No significant adverse environmental impacts would occur to this or the other study area communities during operation of the Haverstraw Water Supply Project. During construction, potential traffic and noise impacts could occur. Any disruption would be mitigated to the extent practicable. Moreover, any disruption would also occur to the portions of the study area that are not potential environmental justice communities, and therefore would not occur disproportionately to the environmental justice community in the study area. In addition, consistent with NYSDEC's EJ Policy, United Water New York Inc. (United Water) is conducting an extensive public outreach program related to the Proposed Project.

B. METHODOLOGY

This environmental justice analysis follows NYSDEC's guidance and methodology for incorporating environmental justice concerns into environmental review. On March 19, 2003, NYSDEC issued its EJ Policy to address environmental justice concerns and ensure community participation in the NYSDEC environmental permit review process and the NYSDEC application of SEQRA. The EJ Policy is intended to encourage meaningful public participation by minority or low-income communities in the environmental review process and to assist NYSDEC in addressing any adverse impacts on minority and low-income communities.

As set forth in the EJ Policy, "Environmental justice means the fair treatment and meaningful involvement of all people regardless of race, color, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences."

Following NYSDEC guidance, this environmental justice analysis involved identifying potential adverse environmental impacts and the area to be affected (i.e., establishing a study area) and determining whether potential adverse environmental impacts are likely to affect a potential environmental justice area (i.e., assessing whether low-income and/or minority communities are present in the study area). In addition, in accordance with the EJ Policy, existing sources of pollution or similar facility types in the study area were analyzed in order to establish the baseline conditions against which impacts of the Proposed Project were assessed. Further, the assessment of potential impacts from the Proposed Project involved a determination of whether those impacts in combination with existing environmental burdens in the study area would affect minority and low-income populations disproportionately. In addition, a summary of the Proposed Project's public participation program to date is included at the end of this chapter.

DELINIATION OF STUDY AREA

The study area for this environmental justice analysis was defined to include all census block groups within the 1,000-foot land use study area, expanded to include several adjacent block groups, or the area where any potential impacts resulting from operation or construction of the Proposed Project could occur. The study area for this environmental justice analysis incorporates a substantially larger area than could actually be affected by the potential impacts of the Proposed Project, but nevertheless serves as the basis for a conservative analysis. The nine census block groups in the environmental justice study area for the Proposed Project are shown in Figure 23-1, and include Census Tract (CT) 101.02 Block Group (BG) 1, CT 101.02 BG 2, CT 101.02 BG 3, CT 102 BG 1, CT 102 BG 2, CT 102 BG 3, CT 106.01 BG 1, CT 106.02 BG 1, and CT 106.02 BG 2.

IDENTIFY POTENTIAL ENVIRONMENTAL JUSTICE AREAS

The next step in the analysis was to determine whether low-income or minority communities ("potential environmental justice areas") are present in the study area. Following NYSDEC's methodology, to identify significant minority and low-income populations within the study area, demographic information was obtained from the U.S. Census Bureau's *Census 2000*. Demographic data including total population, race and ethnicity, and poverty status were compiled at the census block group level for each census block group in the environmental

9.8.08

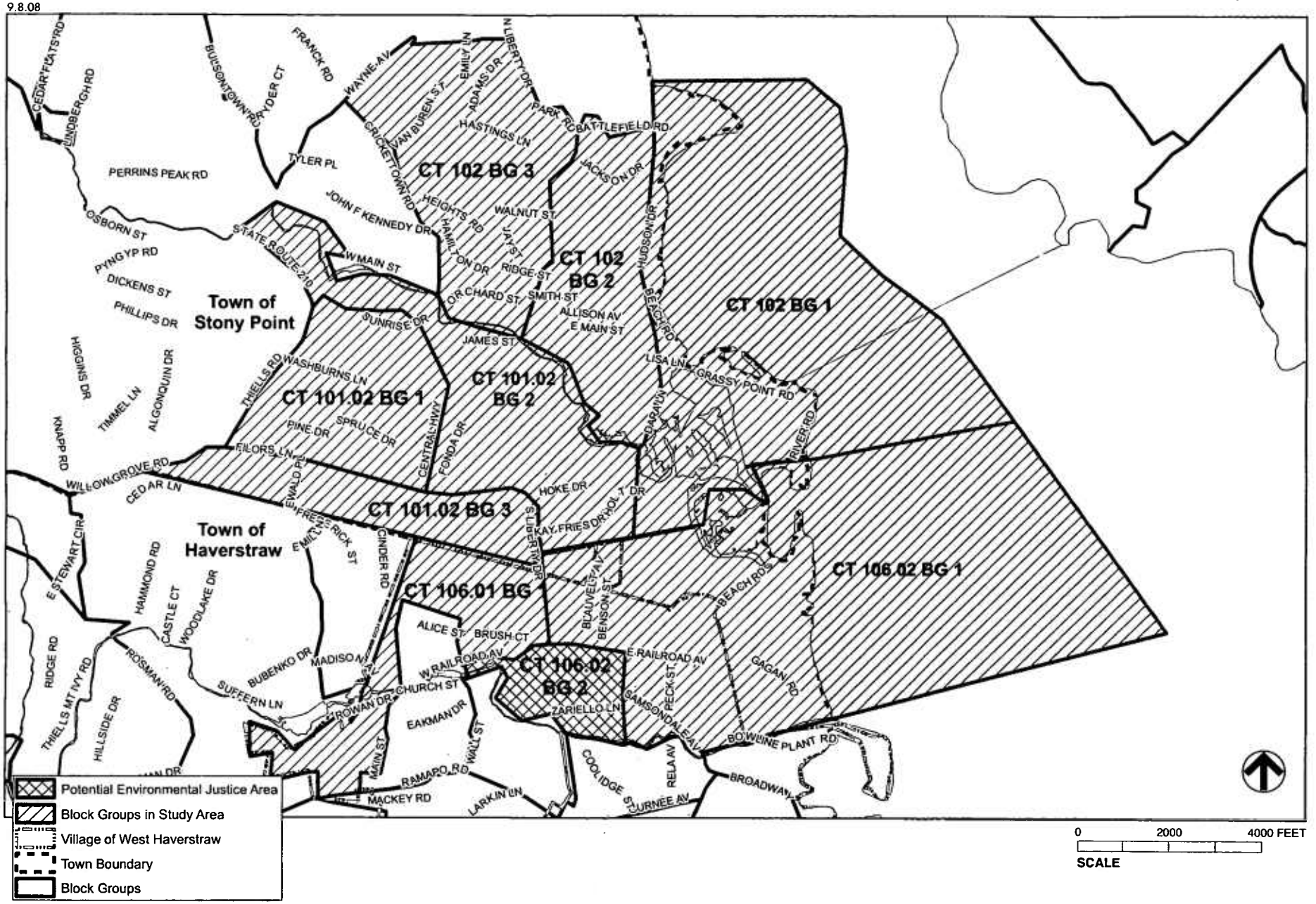


Figure 23-1

Environmental Justice Study Area

justice study area. In addition, data were compiled for Rockland County as a whole to allow for a comparison of study area characteristics to a larger reference area.

According to the EJ Policy, potential environmental justice areas include minority or low-income communities. Those communities are defined as follows:

- *Minority communities:* NYSDEC's EJ Policy defines minorities to include Hispanics, African-Americans or Black persons, Asian Americans and Pacific Islanders, and American Indians. This environmental justice analysis also considers minority populations to include Alaskan Natives as well as persons who identified themselves as being either "some other race" or "two or more races" in *Census 2000*. Following NYSDEC guidance, a minority community is a census block group, or contiguous area with multiple census block groups, having a minority population equal to or greater than 51.1 percent of the total population in an urban area and 33.8 percent of the total population in a rural area. The environmental justice study area is located within an urban area, as established by the U.S. Census Bureau. Therefore, any census block group with a minority population equal to or greater than 51.1 percent was considered to be a potential environmental justice area.
- *Low-income communities:* The EJ Policy defines a low-income population as a population with an annual income below the poverty threshold as defined by the U.S. Census Bureau. The poverty threshold depends on the size of the household and the age of the principal householders; it is not adjusted to account for regional differences in the cost of living. For each census block group in the study area, data were compiled on the percentage of persons living below the poverty threshold. The EJ Policy defines a low-income community to be any area where the low-income population (i.e., persons living below the poverty threshold) is equal to or greater than 23.59 percent of the total population.

C. IDENTIFICATION OF POTENTIAL ENVIRONMENTAL JUSTICE AREAS

Table 23-1 presents the population and economic information for the study area and Rockland County. As shown in the table, using the methodology described above in section B, the study area and eight of its nine census block groups do not meet the thresholds for a potential environmental justice area. Each of these eight block groups and the study area as a whole have minority populations that do not exceed NYSDEC's 51.1 percent threshold. Moreover, the study area's total minority population (22.5 percent) was lower than that of Rockland County's (28.3 percent).

However, CT 106.02 BG 2, on the south side of Railroad Avenue, has a minority population totaling 51.9 percent, which is greater than NYSDEC's 51.1 percent threshold, and is therefore considered a potential environmental justice area. As shown in Figure 23-1, this block group encompasses the area on the south side of Railroad Avenue west of the CSX railroad right-of-way. The block group extends past Route 9W as far west as Bridge Street .

None of the study area's block groups, or the study area as a whole, have low-income populations in excess of NYSDEC's 23.59 percent threshold for identifying low-income communities. The greatest low-income population (13.16 percent) occurred in CT 106.02 BG 1. The low-income population of the study area (6.40) is substantially lower than that of Rockland County (9.51 percent).

Table 23-1
Environmental Justice Study Area
Population and Economic Characteristics

Census Block Groups	2000 Total	White		Black		Asian		Other		Hispanic		Total Minority (%)	Individuals Below Poverty Level (%)**
		No.	%	No.	%	No.	%	No.	%	No.	%		
CT 101.02 - BG 1	1,605	1,467	91.4	11	0.7	32	2.0	13	0.8	82	5.1	8.6	1.63
CT 101.02 - BG 2	1,730	1,524	88.1	29	1.7	7	0.4	11	0.6	159	9.2	11.9	3.18
CT 101.02 - BG 3	1,372	1,254	91.4	10	0.7	14	1.0	18	1.3	76	5.5	8.6	5.70
CT 102 - BG 1	564	442	78.4	8	1.4	0	0.0	24	4.3	90	16.0	21.6	9.76
CT 102 - BG 2	1,600	1,431	89.4	14	0.9	13	0.8	18	1.1	124	7.8	10.6	5.11
CT 102 - BG 3	2,465	2,239	90.8	23	0.9	31	1.3	17	0.7	155	6.3	9.2	4.80
CT 106.01 - BG 1	1,387	983	70.9	55	4.0	33	2.4	29	2.1	287	20.7	29.1	4.54
CT 106.02 - BG 1	2,425	1,390	57.3	135	5.6	28	1.2	48	2.0	824	34.0	42.7	13.16
CT 106.02 - BG 2	**1,838**	**884**	**48.1**	**263**	**14.3**	**71**	**3.9**	**58**	**3.2**	**562**	**30.6**	**51.9**	**8.92**
Study Area	14,986	11,614	77.5	548	3.7	229	1.5	236	1.6	2,359	15.7	22.5	6.40
Rockland County	286,753	205,653	71.7	30,139	10.5	15,707	5.5	6,072	2.1	29,182	10.2	28.3	9.51

Notes:

Bold indicates environmental justice population. Environmental justice populations are defined as those with a minority population of 51.1 or greater and/or a low-income population of 23.59 percent or greater.

Population data are for the year 2000; economic data are for the year previous to the census, i.e., 1999.

* The racial and ethnic categories provided are further defined as: White (White alone, not Hispanic or Latino); Black (Black or African American alone, not Hispanic or Latino); Asian (Asian alone, not Hispanic or Latino); Other (American Indian and Alaska Native alone, not Hispanic or Latino; Native Hawaiian and Other Pacific Islander alone, not Hispanic or Latino; Some other race alone, not Hispanic or Latino; Two or more races, not Hispanic or Latino); Hispanic (Hispanic or Latino; Persons of Hispanic origin may be of any race).

** Percent of individuals with incomes below established poverty level. The U.S. Census Bureau's established income threshold for poverty level defines poverty level.

Source: U.S. Census Bureau, Census 2000.

As another layer of review, NYSDEC's data on potential environmental justice areas throughout the State was assessed to confirm the non-presence of minority or low-income communities within the study area. NYSDEC has examined the most recent census data and has identified and mapped areas of the State that may qualify as potential environmental justice areas. Consistent with the findings above, CT 106.02 BG 2 is the only block group in the study area identified by NYSDEC as having characteristics that would warrant further environmental justice analysis.[1] As indicated on Figure 23-2, this block group is located on the south side of Railroad Avenue in the Village of West Haverstraw.

D. ANALYSIS OF EXISTING ENVIRONMENTAL BURDENS IN THE STUDY AREA

In accordance with the EJ Policy, existing sources of pollution in the study area should be considered in order to establish the baseline conditions against which project impacts are assessed.

As discussed in Chapter 3, "Land Use, Zoning, and Other Actions, and Chapter 10, "Hazardous Materials," the Project Sites are located in an area with industrial uses, including the Haverstraw Joint Regional Sewage Treatment Plant (JRSTP) and the former Town of Haverstraw Landfill. Just outside the study area boundaries, the Bowline Generating Plant is located to the south and southeast of the Project Sites, just south of Railroad Avenue on the Hudson River shoreline. (In addition, Indian Point Energy Center is located north of the Project Sites, on the other side of the Hudson River.)

The traffic analysis conducted for the Proposed Project (see Chapter 12, "Traffic and Transportation") documents the existing and anticipated future traffic conditions in the study area. As discussed there, the local roadways near the Project Sites are not heavily trafficked. Route 9W, which is a major arterial road, sees heavy traffic volumes during the peak hours.

In terms of noise, much of the study area is relatively quiet, but areas near the CSX rail right-of-way have higher ambient noise levels due to the frequent passage of freight trains through the area. Activities at the Haverstraw Marina, JRSTP and other industrial activities contribute to the ambient noise levels, as does traffic on roadways in the study area.

E. ANALYSIS OF THE POTENTIAL FOR ADVERSE IMPACTS FROM THE PROPOSED PROJECT

The technical analyses included in other chapters of this DEIS analyze the potential impacts of the Proposed Project in combination with conditions expected in the surrounding area in the future condition without the Proposed Project, including the existing environmental burdens presented above. These analyses therefore consider the cumulative, or combined, effects of the Proposed Project together with the baseline condition, which includes other sources of pollution and similar facility types in the study area. This is consistent with the requirements of NYSDEC's EJ Policy, which notes that under existing regulations, NYSDEC must consider other sources of pollution or similar facility types in order to establish the baseline conditions against which project impacts will be assessed.

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[1] NYSDEC's website at http://www.dec.ny.gov/docs/permits_ej_operations_pdf/rocklandco.pdf, accessed on July 11, 2008.

Overall, the study area as a whole and eight of nine of its census block groups are not considered potential environmental justice areas. The study area includes one minority community (the census block group, Block Group 2 of Census Tract 106.02, that is located south of Railroad Avenue and west of the CSX railroad right-of-way in the southern portion of the study area).

Based on a review of the technical chapters included in this DEIS, operation of the Proposed Project is not expected to result in any significant adverse impacts on the study area, including this potential environmental justice community and the other neighborhoods in the study area.

During construction of the Proposed Project, there is the potential for some localized adverse traffic impacts and noise impacts during the construction phase, which would be temporary and mitigated to the fullest extent practicable.

The construction-related traffic and noise impacts could potentially affect all portions of the study area, including the potential environmental justice community as well as the non-environmental justice communities. However, because of the distance from the Water Treatment Plant Site to the block group identified as a potential environmental justice community neighborhood, significant noise impacts are unlikely there.

In terms of traffic impacts, as described in Chapter 15 of this DEIS, "Construction Impacts," during the three-year-long construction period for Phase 1 of the Proposed Project, a Maintenance and Protection of Traffic (MPT) plan would be in place to manage construction-related traffic and traffic-related detours. The MPT would include measures to maintain traffic flows on local roadways, including Railroad Avenue. Other construction phases would see less traffic, but would also include MPT plans as appropriate.

Overall, the potential environmental justice community located on the south side of Railroad Avenue west of the CSX railroad right-of-way could experience some disruption during construction of the Proposed Project, but any disruption would be mitigated to the extent practicable. Moreover, any disruption would also occur to the portions of the study area that are not potential environmental justice communities, and therefore would not occur disproportionately to the environmental justice community in the study area.

Moreover, as discussed below, United Water is conducting an extensive public outreach program related to the Proposed Project, which will provide opportunities for participation and comment by the affected communities, including minority and low-income populations in the study area (see "Public Participation," below).

F. PUBLIC PARTICIPATION

In accordance with NYSDEC'S EJ Policy, United Water is conducting an extensive public and agency outreach and participation process in association with the Proposed Project. During preparation of the DEIS in accordance with the State Environmental Quality Review Act (SEQRA), the Project-related documents will be made available to the public via United Water's website (www.unitedwater.com/uwny). Meetings with involved regulatory agencies, public officials, and interested organizations have been and will continue to be held to seek input and provide information throughout the environmental review process.

G. CONCLUSIONS

The analysis of environmental justice concluded that most of the study area is not considered a potential environmental justice area. However, the area south of Railroad Avenue and west of

MAPS PULLED FROM:

Case: 06-W-0131

Date: 10/2/08 (of)

Specific:

- ☐ Brief
- ☐ Comment
- ☐ Correspondence
- ☐ Exhibit
- ☐ Order
- ☐ Petition
- ☐ Plan
- ☐ Report

Map # 63

the CSX railroad right-of-way is a potential environmental justice community. No significant adverse environmental impacts would occur to this or the other study area communities during operation of the Haverstraw Water Supply Project. During construction, potential traffic and noise impacts could occur. Any disruption would be mitigated to the extent practicable. Moreover, any disruption would also occur to the portions of the study area that are not potential environmental justice communities, and therefore would not occur disproportionately to the environmental justice community in the study area. In addition, consistent with NYSDEC's EJ Policy, United Water is conducting an extensive public outreach program related to the Proposed Project. ✷

617.20
Appendix A
State Environmental Quality Review
FULL ENVIRONMENTAL ASSESSMENT FORM

Purpose: The full EAF is designed to help applicants and agencies determine, in an orderly manner, whether a project or action may be significant. The question of whether an action may be significant is not always easy to answer. Frequently, there are aspects of a project that are subjective or unmeasureable. It is also understood that those who determine significance may have little or no formal knowledge of the environment or may not be technically expert in environmental analysis. In addition, many who have knowledge in one particular area may not be aware of the broader concerns affecting the question of significance.

The full EAF is intended to provide a method whereby applicants and agencies can be assured that the determination process has been orderly, comprehensive in nature, yet flexible enough to allow introduction of information to fit a project or action.

Full EAF Components: The full EAF is comprised of three parts:

Part 1: Provides objective data and information about a given project and its site. By identifying basic project data, it assists a reviewer in the analysis that takes place in Parts 2 and 3.

Part 2: Focuses on identifying the range of possible impacts that may occur from a project or action. It provides guidance as to whether an impact is likely to be considered small to moderate or whether it is a potentially large impact. The form also identifies whether an impact can be mitigated or reduced.

Part 3: If any impact in Part 2 is identified as potentially large, then Part 3 is used to evaluate whether or not the impact is actually important.

THIS AREA FOR LEAD AGENCY USE ONLY
DETERMINATION OF SIGNIFICANCE - Type 1 and Unlisted Actions

Identify the Portions of EAF completed for this project: ■ Part 1 ☐ Part 2 ☐ Part 3

Upon review of the information recorded on this EAF (Parts 1 and 2 and 3 if appropriate), and any other supporting information, and considering both the magnitude and importance of each impact, it is reasonable determined by the lead agency that:

☐ A. The project will not result in any large and important impact(s) and, therefore, is one which will not have a significant impact on the environment, therefore **a negative declaration will be prepared.**

☐ B. Although the project could have a significant effect on the environment, there will not be a significant effect for this Unlisted Action because the mitigation measures described in PART 3 have been required, therefore **a CONDITIONED negative declaration will be prepared.***

■ C. The project may result in one or more large and important impacts that may have a significant impact on the environment, therefore **a positive declaration will be prepared.**

*A Conditioned Negative Declaration is only valid for Unlisted Actions.

Haverstraw Water Supply Project
Name of Action

Name of Lead Agency

Print or Type Name of Responsible Officer in Lead Agency

Title of Responsible Officer

Signature of Responsible Officer in Lead Agency

Signature of Preparer (if different from responsible officer)

Date

PART 1 - PROJECT INFORMATION
Prepared by Project Sponsor

NOTICE: This document is designed to assist in determining whether the action proposed may have a significant effect on the environment. Please complete the entire form, Parts A through E. Answers to these questions will be considered as part of the application for approval and may be subject to further verification and public review. Provide any additional information you believe will be needed to complete Parts 2 and 3.

It is expected that completion of the full EAF will be dependent on information currently available and will not involve new studies, research or investigation. If information requiring such additional work is unavailable, so indicate and specify each instance.

NAME OF ACTION Haverstraw Water Supply Project		
LOCATION OF ACTION Town of Haverstraw, Rockland County, New York		
NAME OF APPLICANT/SPONSOR United Water New York Inc.	BUSINESS TELEPHONE 845 – 620 -3350	
ADDRESS 360 West Nyack Road		
CITY/PO West Nyack	STATE NY	ZIP CODE 10994
NAME OF OWNER (if different) Same as above	BUSINESS TELEPHONE	
ADDRESS		
CITY/PO	STATE	ZIP CODE

DESCRIPTION OF ACTION
The Proposed Project is the Haverstraw Water Supply Project, consisting of a water intake, intake pumping station, water treatment plant, and transmission and distribution mains to be located in the Town of Haverstraw, Rockland County, New York. The Proposed Project would draw and treat water from the Hudson River and deliver up to 7.5 million gallons per day of potable water to the existing United Water New York Inc. (United Water) distribution system serving Rockland County. The action is being undertaken in accordance with the New York State Public Service Commission Order in Case No. 06-W-0131.

A. SITE DESCRIPTION

Physical setting of overall project, both developed and undeveloped areas.

1. Present Land Use: ☐ Urban ■ Industrial ■ Commercial ■ Residential ☐ Rural (non-farm)
   ☐ Forest ☐ Agricultural ■ Other: Recreation

2. Total acreage of project area: ±10 acres

APPROXIMATE ACREAGE	PRESENTLY	AFTER COMPLETION
Meadow or Brushland (Non-Agricultural)	±3.00 acres	±6.5 acres
Forested	±0.13 acres	±0 acres
Agricultural (includes orchards, cropland, pasture, etc.)	acres	acres
Wetland (freshwater or tidal as per Articles 24, 25 of ECL)	acres	acres
Water Surface Area	acres	acres
Unvegetated (rock, earth fill, gravel)	± 6.87 acres	acres
Roads, buildings and other paved surfaces	acres	±2.5 acres
Other (Indicate type: lawn/landscaped areas)	acres	± 1 acres
Other: (See note, below)	acres	acres

The 7,500 foot long raw water transmission pipe route lies mostly within existing roadway rights-of-way. In addition, the 9-acre Water Treatment Plant Site accounted for in the above table is a reclaimed area located within the boundary of the now closed Haverstraw Landfill.

3. What is predominant soil type(s) on project site: Udorthents
   a. Soil drainage: ■Well drained ±48% of site ■ Moderately well drained ±12% of site
      ■ Poorly drained ±40% of site
   b. If any agricultural land is involved, how many acres of soil are classified within soil group 1 through 4 of the NYS Land Classification System? 0 acres (see 1 NYCRR 370)

4. Are there bedrock outcroppings on project site? ☐Yes ■ No

a. What is depth to bedrock? Over five feet feet

5. Approximate percentage of proposed project site with slopes: ■ 0-10% ±85 % ■ 10-15% ±10%
■ 15% or greater ±5%

6. Is project substantially contiguous to or contain a building site, or district, listed on the State or National Registers of Historic Places? ☐ Yes ■ No

The Project Sites and adjacent areas are not listed on or determined eligible for the State and National Registers of Historic Places. The National Register-listed M/V Commander (a historic watercraft) is moored at the adjacent Haverstraw Marina, but is not in close proximity to the Project Sites.

A Phase 1A archaeological resources assessment was conducted for the Project Sites in summer 2008 and additional study, a Phase 1B assessment, was conducted for the Intake Site. These investigations concluded that no further studies were warranted for the Intake Site, Water Treatment Plant Site, or most of the raw water treatment line. For the western portion of the raw water treatment line, additional archaeological investigation was recommended.

7. Is project substantially contiguous to a site listed on the Register of National Natural Landmarks? ☐ Yes ■ No

Based on a review of National Natural Landmarks (www.nature.nps.gov/nnl/).

8. What is the depth of the water table? ±0 - 10 (in feet)

9. Is site located over a primary, principal, or sole source aquifer? ☐Yes ■ No

Based on a review of the EPA website (www.epa/gov/region02/water/aquifer).

10. Do hunting, fishing or shell fishing opportunities presently exist in the project area? ■ Yes No

The location of the intake pumping station is a one-acre Hudson River waterfront site.

11. Does project site contain any species of plant or animal life that is identified as threatened or endangered? ■ Yes ☐No

Data according to NYSDEC Natural Heritage File Search results of May 29, 2008.

Identify each species: *shortnose sturgeon, spongy arrowhead, and heartleaf plantain, catfoot, bald eagle*

12. Are there any unique or unusual land forms on the project site? (i.e. cliffs, dunes, or other geological formations) ☐Yes ■ No

13. Is the project site presently used by the community or neighborhood as an open space or recreation area? If yes, explain: *The intake site is located adjacent to the Hudson River.* ■ Yes ☐No

14. Does the present site include scenic views known to be important to the community? ■ Yes ☐No

The Intake Site is located adjacent to the Hudson River.

15. Streams contiguous to the project area:
    a. Name of Stream and name of River to which it is tributary: *Hudson River and Minisceongo Creek*

16. Lakes, ponds, wetland areas within or contiguous to project area: *A potential wetland (a depressed area/stormwater basin) exists on the reclaimed site adjacent to the Haverstraw Landfill where the water treatment plant would be sited.*
    a. Name: b. Size (in acres): ±0.2 acres

17. Is the site served by existing public utilities? ■ Yes ☐No
    a. If Yes, does sufficient capacity exist to allow connection? ■ Yes ☐No
    b. If Yes, will improvements be necessary to allow connection? ■Yes ☐No

18. Is the site located in an agricultural district certified pursuant to Agriculture and Markets Law 25-AA, Section 303 and 304? ☐Yes ■ No

19. Is the site located in or substantially contiguous to a Critical Environmental Area designated pursuant to Article 8 of the ECL, and 6 NYCRR 617? ☐Yes ■ No

According to the list of Critical Environmental Areas on the NYSDEC website (www.dec.state.ny.us/website/dcs/seqr/cea/cearockland.html).

20. Has the site ever been used for the disposal of solid or hazardous waste? ■ Yes ☐No

B. PROJECT DESCRIPTION

1. Physical dimensions and scale of project (fill in dimensions as appropriate):

a. Total contiguous acreage owned or controlled by project sponsor 0 acres
b. Project acreage to be developed: +/- 10 acres initially; _____ acres ultimately.
c. Project acreage to remain undeveloped: 0 acres.
d. Length of project in miles: *±7,500' (±1.4 miles) of water transmission lines, located mostly within public roadway rights-of-way.*
e. If the project is an expansion, indicate percent of expansion proposed: N/A %.
f. Number of off-street parking spaces existing: *Unknown number of unstructured parking at Intake Site*
Proposed: 10
g. Maximum vehicular trips generated per hour: 10 P.M. peak (upon project completion)
h. If residential, number and type of housing units: N/A

	One Family	Two Family	Multiple Family	Condominium
Initially	_____	_____	_____	_____
Ultimately	_____	_____	_____	_____

i. Dimensions (in feet) of largest proposed structure: 12 height; 96 ft width; 124 ft length
j. Linear feet of frontage along a public thoroughfare project will occupy is: ±250/TBD feet

2. How much natural material (i.e. rock, earth, etc.) will be removed from the site? *± 49,000 cubic yards.*

3. Will disturbed areas be reclaimed? _____ ■ Yes ☐ No
a. If Yes, for what intended purpose is site being reclaimed? *Re-use on-site.*
b. Will topsoil be stockpiled for reclamation? ■ Yes ☐ No
c. Will upper subsoil be stockpiled for reclamation? ■ Yes ☐ No

4. How many acres of vegetation (trees, shrubs, ground covers) will be removed from site? ±3.13 acres.

5. Will any mature forest (over 100 years old) or other locally important vegetation be removed from site? ☐ Yes ■ No

6. If single-phase project, anticipated period of construction: N/A months (including demolition).

7. If multi-phased: ±36 months
a. Total number of phases anticipated: 3 (number).
b. Anticipated date of commencement of phase one: Spring 2013 *(Anticipated completion of Phase 1 in December 2015).*
c. Approximate completion date of final phase: 2030. *(Dependent upon future water demand)*
d. Is phase one functionally dependent on subsequent phases? ☐ Yes ■ No

8. Will blasting occur during construction? _____ ☐ Yes ■ No

9. Number of jobs generated - during construction: *±130 direct construction jobs annually during construction period (3 years)*; after project is complete: *Less than 10.*

10. Number of jobs eliminated by this project: 0

11. Will project require relocation of any projects or facilities? ■ Yes ☐ No
If Yes, explain: *Existing utility lines may be relocated for the placement of the raw water transmission line from the intake pumping station to the water treatment plant.*

12. Is surface liquid waste disposal involved? ■ Yes ☐ No
a. If Yes, indicate type of waste (sewage, industrial, etc.) and amount: *Sewage generation from employees, and concentrate resulting from reverse osmosis treatment process (brine).*
Name of water body into which effluent will be discharged: *Concentrate discharge would mix with fresh water effluent discharge of adjacent Joint Regional Sewage Treatment Plant (JRSTP) for ultimate discharge to the to Hudson River.*

13. Is subsurface liquid waste disposal involved? ☐ Yes ■ No

14. Will surface area of an existing body of water increase or decrease by proposal? ☐ Yes ■ No
If Yes, explain:

15. Is project or any portion of project located in a 100-year floodplain? ■ Yes ☐ No

16. Will project generate solid waste? ■ Yes ☐ No
a. If Yes, what is the amount per month? *TBD*
b. If Yes, will an existing solid waste facility be used? ■ Yes ☐ No
c. If Yes, give name: _____ location: _____
d. Will any wastes not go into a sewage disposal system or into a sanitary landfill? ■ Yes ☐ No

If Yes, explain: *Solids removed during water treatment (residuals) would either be dewatered on-site for proper disposal, or piped to the adjacent JRSTP for dewatering together with the sludge already being treated at the JRSTP.*

17. Will project involve the disposal of solid waste? *See above.* ☐ Yes ■ No
    a. If Yes, what is the anticipated rate of disposal? _____ tons/month
    b. If Yes, what is the anticipated site life? _____ Years

18. Will project use herbicides and pesticides? ☐Yes ■ No

19. Will project routinely produce odors (more than one hour per day)? ☐Yes ■ No

20. Will project produce operating noise exceeding the local ambient noise levels? ☐Yes ■ No

21. Will project result in an increase in energy use? ■ Yes ☐No
    If Yes, indicate type(s): *The treatment process is expected to use between ±4,427 and ±6,520 kWh of electricity per million gallons of potable water produced.*

22. If water supply is from wells, indicate pumping capacity: N/A gallons/minute

23. Total anticipated water usage per day: *±1,000 gallons per day, based on less than 10 employees*

24. Does project involve Local, State or Federal funding? ☐Yes ■No
    If Yes, explain: _____

25. Approvals Required:

City, Town, Village, Board	■ Yes	☐ No	
City, Town, Village, Planning Board	■ Yes	☐ No	
City, Town Zoning Board	■ Yes	☐ No	
City, County Health Department	■ Yes	☐ No	
Other Local Agencies	■ Yes	☐ No	Architectural Review Board, Bldg. Dept., Sewer Board, Rockland County Highway Dept.
Other Regional Agencies	■ Yes	☐ No	
State Agencies	■ Yes	☐ No	NYSDEC, NYSDOH, NYSDOS, NYSPSC, NYSOGS
Federal Agencies	■ Yes	☐ No	USACE, USCG, NOAA

C. ZONING AND PLANNING INFORMATION

1. Does proposed action involve a planning or zoning decision? ■ Yes ☐No
   If Yes, indicate decision required:
   ☐ zoning amendment ■ zoning variance ■ special use permit ■ subdivision ■ site plan
   ☐ new/revision of master plan ☐ resource management plan ☐ other

2. What is the zoning classification(s) of the site? *The Intake and Water Treatment Plant Sites are in Planned Industrial Office (PIO) and CR Commercial Recreation (CR) zoning districts. In addition, the 7,500 foot raw water transmission line route traverses areas zoned CR, Commercial (C), Waterfront Recreation Development District (WRD) and PIO in the Town of Haverstraw and Planned Light Industrial (PLI) and Residence District (R-3) in the Village of West Haverstraw.*

3. What is the maximum potential development of the site if developed as permitted by the present zoning? The Maximum *FAR for the PO zone is 25%. The 9 acre Treatment Plant Site could allow a building approximately 93,600 square feet.*

4. What is the proposed zoning of the site? N/A

5. What is the maximum potential development of the site if developed as permitted by the proposed zoning? N/A

6. Is the proposed action consistent with the recommended uses in adopted local land use plans? ■ Yes ☐No

7. What are the predominant land uses and zoning classifications within one-quarter mile? *Mix of industrial, railroad, closed landfill, residential, and marina/recreational uses.*

8. Is the proposed action compatible with adjoining/surrounding land uses within a quarter mile? ■ Yes ☐No

9. If the proposed action is a subdivision of land, how many lots are proposed? n/a
   What is the minimum lot size proposed? n/a

10. Will proposed action require any authorization(s) for the formation of sewer or water districts? ☐Yes ■ No

11. Will proposed action create a demand for any community provided services (recreation, education, police, fire protection)? ☐Yes ■ No
    a. If Yes, is existing capacity sufficient to handle projected demand? ☐Yes ☐No

12. Will proposed action result in the generation of traffic significantly above present levels? ☐Yes ■ No
    a. If yes, is the existing road network adequate to handle the additional traffic? ☐Yes ☐No

The levels of service (LOS) at two unsignalized intersections is expected to be affected by construction traffic during the construction period. Temporary signalization is expected to mitigate these impacts and restore acceptable LOS.

D. INFORMATION DETAILS

Attach any additional information as may be needed to clarify your project. If there are or may be any adverse impacts associated with your proposal, please discuss such impacts and the measures which you propose to mitigate or avoid them.

The submission of this EAF is accompanied by a draft environmental impact statement and appendices that address all categories of potential impacts enumerated in this EAF.

E. VERIFICATION

I certify that the information provided here is true to the best of my knowledge.

Applicant/Sponsor Name: Michael J. Pointing Date: September 26, 2008

Signature: M. Pointing Title: General Manager/ Vice President

If the action is in the Coastal Area, and you are a state agency, complete the Coastal Assessment Form before proceeding with this assessment.

The accompanying DEIS, Chapter 17, "Coastal Zone Consistency," addresses matters of coastal consistency.

JOINT APPLICATION FOR PERMIT
PROPOSED UNITED WATER NEW YORK INC.
HAVERSTRAW WATER SUPPLY PROJECT FOR
LONG TERM WATER SUPPLY PROJECT
TOWN OF HAVERSTRAW, ROCKLAND COUNTY, NEW YORK

Submitted to:

New York State
Department of Environmental Conservation
Division of Environmental Permits

and

United States Army Corps of Engineers
New York District

Prepared for:

United Water New York Inc.
360 West Nyack Road
West Nyack, New York 10994

Prepared by:

Henningson, Durham & Richardson
Architecture & Engineering, P.C.
In association with
HDR Engineering, Inc.

September 2008

JOINT APPLICATION FOR PERMIT
PROPOSED UNITED WATER NEW YORK INC.
HAVERSTRAW WATER SUPPLY PROJECT FOR
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Architecture & Engineering, P.C.
In association with
HDR Engineering, Inc.

September 2008

SAMEET MASTER
Project Manager

UNITED WATER
700 Kinderkamack Road, Oradell, NJ 07649
Tel: 201.634.4232 • Fax: 201.225.5125
sameet.master@unitedwater.com

United Water
SUEZ

VIA FEDEX

September 26, 2008

Mr. Jeremy Rosenthal
Project Manager
Division of Environmental Permits
New York State
Department of Environmental Conservation
625 Broadway
Albany, New York 12233

Reference: United Water New York
Joint Application for Permit
Haverstraw Water Supply Project

Dear Mr. Rosenthal,

United Water New York Inc. ("United Water") respectfully submits for your review the Joint Application for Permit for the proposed Haverstraw Water Supply Project ("Proposed Project"). In addition to your Department, we are coordinating this permit application with the New York State Department of State, the New York State Office of General Services and the United States Army Corps of Engineers. We have prepared and attached permit applications including various informational materials (hardcopy) and two (2) hardcopies of the Project Draft Environmental Impact Statement ("DEIS") as well as two (2) copies of the version on CD-ROM.

United Water is a public utility providing a public water supply, including drinking water, to approximately 90 percent of the residents and businesses in Rockland County, New York. The Proposed Project is to develop an additional, sustainable water supply that will increase the "safe yield" of the United Water system to meet the growing needs for water in Rockland County over the next 20 years. Development of a long-term water supply project is critical to United Water's ability to continue to provide water as needed for Rockland County, including providing adequate quantity, quality, and water pressure to meet the projected future demands for County residents, businesses, and firefighting capabilities.

As noted above, the attached DEIS, which has been prepared in accordance with the New York State Environmental Quality Review Act ("SEQRA"), contains further details on the Proposed Project. Furthermore, while an environmental assessment form ("EAF") appears obviated by our filing of the DEIS, we enclose a full EAF in case the Department desires to use one.

If you have any questions please call me at (201) 634-4232 or you can e-mail me at Sameet.Master@UnitedWater.com.

Sincerely,

Sameet Master

Sameet Master, P.E.
Project Manager

Cc: R. Alessi, Esq.
G. Nieves, USACE
M. Duke, NYSDEC Region 3
M. Pointing
File

SAMEET MASTER
Project Manager

UNITED WATER
700 Kinderkamack Road, Oradell, NJ 07649
Tel: 201.634.4232 • Fax: 201.225.5125
sameet.master@unitedwater.com

United Water
SUEZ

VIA FEDEX

September 26, 2008

Mr. George Nieves
Chief - Eastern Permits Section
USACE NYD
Floor 19 – Room 1937
Jacob K. Javits Federal Building
26 Federal Plaza
New York, New York 10278-0090

Reference: Untied Water New York
Joint Application for Permit
Haverstraw Water Supply Project

Dear Mr. Nieves,

United Water New York Inc. ("United Water") respectfully submits for your review the Joint Application for Permit for the Haverstraw Water Supply Project ("Proposed Project"). In addition to your Department, we are coordinating this permit application with the New York State Department of Environmental Conservation, the New York State Department of State and the New York State Office of General Services. We have prepared and attached permit applications including various informational materials (hardcopy) and a hardcopy of the Project Draft Environmental Impact Statement ("DEIS") as well as a version on CD-ROM.

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As noted above, the attached DEIS, which has been prepared in accordance with the New York State Environmental Quality Review Act (SEQRA), contains further

details on the Proposed Project. Furthermore, while a state environmental assessment form ("EAF") appears obviated by our filing of the DEIS, we enclose a state full EAF in case the Army Corps desires to use one.

If you have any questions please call me at (201) 634-4232 or you can e-mail me at Sameet.Master@UnitedWater.com.

Sincerely,

Sameet Master

Sameet Master, P.E.
Project Manager

Cc: R. Alessi, Esq.
J. Rosenthal, NYSDEC
M. Duke, NYSDEC – Region 3
M. Pointing
File

SAMEET MASTER
Project Manager

UNITED WATER
700 Kinderkamack Road, Oradell, NJ 07649
Tel: 201.634.4232 • Fax: 201.225.5125
sameet.master@unitedwater.com

United Water
SUEZ

VIA FEDEX

September 26, 2008

Ms. Margaret Duke
Regional Permit Administrator
New York State
Department of Environmental Conservation - Region 3
21 South Putt Corners
New Paltz, NY 12561

Reference: United Water New York
Joint Application for Permit
Haverstraw Water Supply Project

Dear Ms. Duke,

United Water New York Inc. ("United Water") respectfully submits for your review the Joint Application for Permit for the proposed Haverstraw Water Supply Project ("Proposed Project"). In addition to your Department, we are coordinating this permit application with the New York State Department of State, the New York State Office of General Services and the United States Army Corps of Engineers. We have prepared and attached permit applications including various informational materials (hardcopy) and two (2) hardcopies of the Project Draft Environmental Impact Statement ("DEIS") as well as four (4) copies of the version on CD-ROM.

United Water is a public utility providing a public water supply, including drinking water, to approximately 90 percent of the residents and businesses in Rockland County, New York. The Proposed Project is to develop an additional, sustainable water supply that will increase the "safe yield" of the United Water system to meet the growing needs for water in Rockland County over the next 20 years. Development of a long-term water supply project is critical to United Water's ability to continue to provide water as needed for Rockland County, including providing adequate quantity, quality, and water pressure to meet the projected future demands for County residents, businesses, and firefighting capabilities.

As noted above, the attached DEIS, which has been prepared in accordance with the New York State Environmental Quality Review Act ("SEQRA"), contains further

details on the Proposed Project. Furthermore, while an environmental assessment form ("EAF") appears obviated by our filing of the DEIS, we enclose a full EAF in case the Department desires to use one.

If you have any questions please call me at (201) 634-4232 or you can e-mail me at Sameet.Master@UnitedWater.com.

Sincerely,

Sameet Master, P.E.
Project Manager

Cc: R. Alessi, Esq.
G. Nieves, USACE
M. Duke, NYSDEC Region 3
M. Pointing
File

JOINT APPLICATION FOR PERMIT
PROPOSED UNITED WATER NEW YORK, INC.
HAVERSTRAW WATER SUPPLY PROJECT FOR
LONG TERM WATER SUPPLY PROJECT
TOWN OF HAVERTRAW, ROCKLAND COUNTY, NEW YORK

Submitted to:

New York State
Department of Environmental Conservation
Division of Environmental Permits

and

United States Army Corps of Engineers
New York District

Prepared for:

United Water New York Inc.
360 West Nyack Road
West Nyack, New York 10994

Prepared by:

Henningson, Durham & Richardson
Architecture & Engineering, P.C.
In association with
HDR Engineering, Inc.

September 2008

JOINT APPLICATION FOR PERMIT

JOINT APPLICATION FORM

New York State

For Permits/Determinations to undertake activities affecting streams, waterways waterbodies, wetlands, coastal areas and sources of water supply.

Separate Permits/Determinations must be obtained from each involved agency prior to proceeding with work. Please read all instructions.

US Army Corps of Engineers (USACE)

1. Check All That Apply:

NYS Department of Environmental Conservation

- [x] Stream Disturbance
- [x] Excavation and Fill in Navigable Waters
- [ ] Docks, Moorings or Platforms
- [ ] Dams and Impoundment Structures
- [x] 401 Water Quality Certification
- [ ] Freshwater Wetlands
- [ ] Tidal Wetlands
- [ ] Coastal Erosion Management
- [ ] Wild, Scenic and Recreational Rivers
- [x] Water Supply
- [ ] Long Island Well
- [ ] Aquatic Vegetation Control
- [ ] Aquatic Insect Control
- [ ] Fish Control

US Army Corps of Engineers

- [x] Section 404 Clean Water Act
- [x] Section 10 Rivers and Harbors Act
- [x] Nationwide Permit(s) - Identify Number(s): 12

Preconstruction Notification - [x] Y / [ ] N

NYS Office of General Services (State Owned Lands Under Water)

- [x] Utility Easement (pipelines, conduits, cables, etc.)
- [ ] Docks, Moorings or Platforms

NYS Department of State

- [x] Coastal Consistency Concurrence

2. Name of Applicant (use full name): United Water New York Inc.

Applicant must be (check all that apply): [ ] Owner [x] Operator [ ] Lessee

Street Address: 360 West Nyack Road

Taxpayer ID (If applicant is NOT an individual): 13-1732578

Post Office City	State	Zip Code	Telephone (daytime)	Email
West Nyack	NY	10994	(845) 620-3350	Sameet.Master@UnitedWater.com

3. Name of Facility or Property Owner, if different than Applicant: United States Gypsum Company-Intake Site; Town of Haverstraw-Plant Site

Street Address: 70 Grassy Point Road; P.O. Box 711, Stony Point, NY 10980 — 1 Rosman Road, Garnerville, NY 10923

Post Office City	State	Zip Code	Telephone (daytime)	Email

4. Contact/Agent Name: Sameet Master

Company Name: United Water New York Inc.

Street Address: 700 Kinderkamack Road

Post Office City	State	Zip Code	Telephone (daytime)	Email
Oradell	NJ	07649	(201) 634-4232	Sameet.Master@UnitedWater.com

5. Project / Facility Name: Haverstraw Water Supply Project

Property Tax Map Section / Block / Lot Number: See Question 5 of the attachment

Project Location - Provide directions and distances to roads, bridges and bodies of waters:
The Proposed Project would occupy five parcels in the Town of Haverstraw, in Rockland County, NY. See DEIS Chapter 2, Section B for project location.

Street Address, if applicable: N/A. See Chapter 2, Section B of attached DEIS for project location.

Post Office City	State	Zip Code	Telephone, if applicable	Email
Haverstraw	NY	10927	N/A	

Town / Village / City: Haverstraw

County: Rockland

Name of USGS Quadrangle Map: Haverstraw, New York

Stream/Water Body Name: Hudson River

Location Coordinates: Enter NYTMs in kilometers, **OR** Latitude/Longitude in degrees, minutes, seconds

NYTM-E	NYTM- N	Latitude	Longitude
		41°13' 13.846"N	73°57' 52.453"W

6. If applicant is not the owner, both must sign the application. I hereby affirm that information provided on this form and all attachments submitted herewith is true to the best of my knowledge and belief. False statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law. Further, the applicant accepts full responsibility for all damage, direct or indirect, of whatever nature, and by whomever suffered, arising out of the project described herein and agrees to indemnify and save harmless the State from suits, actions, damages and costs of every name and description resulting from said project. In addition, Federal Law, 18 U.S.C., Section 1001 provides for a fine of not more than $10,000 or imprisonment for not more than 5 years, or both where an applicant knowingly and willingly falsifies, conceals, or covers up a material fact; or knowingly makes or uses a false, fictitious or fraudulent statement.

Signature of Applicant	Printed Name	Title	Date
M. Pointing	MICHAEL POINTING.	Vice President	9/25/08
Signature of Owner	Printed Name	Title	Date
See attached affidavit from U.S. Gypsum			
Signature of Agent	Printed Name	Title	Date
S. Master	Sameet Master	Project Manager	9/25/2008

For Agency Use Only DEC Application Number: USACE Number:

JOINT APPLICATION FORM - PAGE 2 OF 2

Submit this completed page as part of your Application.

7. **Project Description and Purpose:** Provide a complete narrative description of the proposed work and its purpose. Attach additional page(s) if necessary. Include: description of current site conditions and how the site will be modified by the proposed project; structures and fill materials to be installed; type and quantity of materials to be used (i.e., cubic yds or square ft of fill material below ordinary high water, or of structures below mean high water); area of excavation or dredging, volumes of material to be removed and location of dredged material disposal or use; work methods and type of equipment to be used; pollution control methods and mitigation activities proposed to compensate for resource impacts; and where applicable, the phasing of activities.

The Haverstraw Water Supply Project is an advanced water treatment plant to be located in the Town of Haverstraw, Rockland County, New York. The Proposed Project entails the development and operation of a new water intake, intake pumping station, water treatment facility, and transmission mains. The Proposed Project would collect and treat water from the Hudson River and deliver up to 7.5 million gallons per day of potable water to the existing United Water distribution system serving the County, for the exclusive use of United Water's Rockland County customers. The Proposed Project is required to meet the need for increased water supply in Rockland County beyond 2015. United Water must develop a long-term water supply project that increases the safe yield of the water supply system in Rockland County to meet the County's future needs, as required by a December 14, 2006 Public Service Commission Order.

Refer to Chapter 1 (Purpose and Need) and Chapter 2 (Project Description) of the attached DEIS for further information.

Proposed Use: ☐ Private ☑ Public ☑ Commercial

Will Project Occupy Federal, State or Municipal Land? ☒ Yes ☐ No
If yes, please specify. See Attachment

Has Work Begun on Project? ☐ Yes ☒ No If Yes, explain.

Proposed Start Date: Spring 2013

Estimated Completion Date: Late 2015

8. List Previous Permit / Application Numbers (if any) and Dates:

9. Will this project require additional Federal, State, or Local Permits ☒ Yes ☐ No If Yes, please list:
Including zoning changes?
The Proposed Project would require permits and approvals from federal, state, and local agencies. For a comprehensive list of approvals, refer to Chapter 2, Section G of the attached DEIS.

10. Based on the permits and determinations requested and project location, check all the boxes corresponding to each of the Agencies and Offices to which you are filing an application. For Agency addresses and areas covered, refer to the Agency Contact Information on the Application Instructions - Page 2.

☑ **NYS Department of Environmental Conservation**

- ☐ REGION 1 Stony Brook
- ☐ REGION 2 Long Island City
- ☑ REGION 3 New Paltz
- ☐ REGION 4 Schenectady
- ☐ REGION 4 Stamford Sub-Office
- ☐ REGION 5 Ray Brook
- ☐ REGION 5 Warrensburg Sub-Office
- ☐ REGION 6 Watertown
- ☐ REGION 6 Utica Sub-Office
- ☐ REGION 7 Syracuse
- ☐ REGION 7 Cortland Sub-Office
- ☐ REGION 8 Avon
- ☐ REGION 9 Buffalo
- ☐ REGION 9 Allegany Sub-Office

☑ **US Army Corps of Engineers**

- ☑ NY District, NYC
- ☐ NY District, Watervliet
- ☐ Buffalo District

☑ **NYS Department of State**

☑ **NYS Office of General Services**

For Agency Use Only

DETERMINATION OF NO PERMIT REQUIRED

Agency Project Number _____

_____ (Agency Name) has determined that No Permit is required from this Agency for the project described in this application.

Agency Representative: Name (printed) _____ Title _____

Signature _____ Date _____

New York State
Department of Environmental Conservation

PERMISSION TO INSPECT PROPERTY

The applicant (or the agent of the applicant), by submitting an application for a permit to the Department of Environmental Conservation ("DEC") and by signing this permission form, consents to inspection by DEC staff of the project site or facility for which a permit is sought and, to the extent necessary, the property owned by the applicant adjacent to the project site or facility. This consent allows DEC staff to enter upon and pass through such property in order to inspect the project site or facility, without prior notice, between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday. If DEC staff should wish to conduct an inspection at any other times, DEC staff will so notify the applicant and will obtain a separate consent for such an inspection.

Inspections may take place as part of the application review prior to a decision to grant or deny the permit(s) sought. By signing this consent form, the applicant agrees that this consent remains in effect as long as the application is pending, and is effective regardless of whether the landowner or agent are present at the time of the inspection. In the event that the project site or facility is posted with any form of "posted" or "keep out" notices, or fenced in with an unlocked gate, this permission authorizes DEC staff to disregard such notices or unlocked gates at the time of inspection.

The applicant further agrees that during an inspection in connection with this application, among other things, DEC staff may take measurements, may analyze physical characteristics of the site including, but not limited to, soils and vegetation (and may take samples for analysis), and may make drawings and take photographs.

Failure to grant consent for an inspection can be grounds for, and may result in, denial of the permit(s) sought by the application.

M. Pointing	MICHAEL POINTING.	9/25/08
Signature of Applicant or Agent	Printed Name	Date

ATTACHMENT

JOINT APPLICATION FOR PERMIT FORM

PROPOSED UNITED WATER NEW YORK INC.
HAVERSTRAW WATER SUPPLY PROJECT FOR
LONG-TERM WATER SUPPLY PROJECT
TOWN OF HAVERSTRAW, ROCKLAND COUNTY, NEW YORK

1. **U. S. Army Corps of Engineers**

Individual Permit

3. **Name of Facility or Property Owner,** if different than Applicant:

Intake Site (one (1) tax parcel):

Name:	United States Gypsum Company
Mailing Address:	P.O. Box 711; 70 Grassy Point Road
Post Office:	Stony Point
State:	New York
Zip Code:	10980
Telephone Number (day time):	(845) 942-7019

Water Treatment Facility Site (four (4) tax parcels):

Name:	Town of Haverstraw
Mailing Address:	1 Rosman Road
Post Office:	Garnerville
State:	New York
Zip Code:	10923
Telephone Number (day time):	(845) 429-2200

5. **Project/Facility Name:**

Project Location *(Provide directions and distances to roads, bridges and bodies of waters)*: The Haverstraw Water Supply Project ("the Proposed Project") would consist of two sites, an Intake Site and a Water Treatment Facility Site. The Intake Site would consist of a water intake pipe in the Hudson River located 1,000 to 1,200 feet from a shore-line pump station. The Intake Site (intake pipe and pump station) would be connected to the Water Treatment Facility Site via a 1.4 mile raw water transmission line. The Intake Site is accessible via a driveway from Beach Road. The Water Treatment Facility Site is currently not accessible via direct roadways. Both Sites are accessible from Grassy Point Road off Route 9W. Site maps and Facility figures are provided in the Draft Environmental Impact Statement ("DEIS"), Figures 2-1 through 2-11. A copy of the DEIS on compact disk in pdf format is attached to this application. Additional information for each site is provided below:

Intake Site (one (1) tax parcel):

County:	Rockland
Town/City/Village:	Haverstraw
Tax Map Section/Block/Lot Number:	21.09-2-1
Location:	710 Beach Road Town of Haverstraw Rockland County New York
Telephone Number:	N/A
Post Office:	Town of Haverstraw
State:	New York
Zip Code:	10927
Name of USGS Quad Map:	Haverstraw, New York
Location Coordinates:	4,563,753 N / 586,791 E (pump station) 4,563,773 N / 587,088 E (Hudson River Intake Pipe opening)

Water Treatment Facility Site (four (4) tax parcels):

County:	Rockland
Town/City/Village:	Haverstraw
Tax Map Section/Block/Lot Number:	Parcel 1) 20.16-2-1 Parcel 2) 20.16-2-2.1 (555-571 Beach Rd.) Parcel 3) 20.16-2-2.2 Parcel 4) 20.16-2-5
Location:	North end of Carol Avenue Town of Haverstraw Rockland County New York
Telephone Number:	N/A
Post Office:	Town of Haverstraw
State:	New York
Zip Code:	10927
Name of USGS Quad Map:	Haverstraw, New York
Location Coordinates:	4,563,125 N / 585,684 E

6. If applicant is not the owner, both must sign the application

The applicant, United Water New York Inc. ("UWNY"), is not the owner of the Project Sites. The U.S. Gypsum Company ("U.S. Gypsum") and the Town of Haverstraw are the owners of the proposed intake and water treatment plant sites respectively, and have granted permission to UWNY to prepare the subject Application and perform the work described herein. (See the attached Affidavit of Ownership/Owner's Consent). UWNY expects to purchase these sites from the owners and is in active negotiations with them to do so.

7. Project Description and Purpose:

Proposed Use:

Public and Commercial: The water treatment plant facility would be owned and operated by UWNY who would sell potable water, through the public water supply system, to Rockland County residents.

Will Project Occupy Federal, State, or Municipal Land?

Yes. The Proposed Project would occupy several State and Municipal lands. The intake pipe system would be located partially within the lands underwater leased by U.S. Gypsum from the New York State Office of General Services ("NYSOGS") and partially within lands underwater owned by the State of New York for which UWNY is applying to the NYSOGS for an interest in that real property. The 1.4 mile raw water transmission line would be installed under various roads owned by the State of New York. In addition, the Water Treatment Facility would be located on the Haverstraw Landfill Site presently owned by the Town of Haverstraw.

16. Will this Project Require Additional Federal, State, or Local Permits?

The Proposed Project would require permits and approvals from federal, state, and local agencies. Anticipated permits and approvals are provided in Chapter 2, Section G of the accompanying DEIS.

17. If applicant is not the owner, both must sign the application

The applicant, UWNY, is not the owner of the proposed project sites (intake site and water treatment plant site). U.S. Gypsum and the Town of Haverstraw are the owners of the proposed intake and water treatment plant sites respectively, and have granted permission to UWNY to prepare the subject Application and perform the work described herein.

AFFIDAVIT OF OWNERSHIP/OWNER'S CONSENT

AFFIDAVIT OF OWNERSHIP/OWNER'S CONSENT

State of New York)
County of Rockland.) ss.:

I, Mark S. Hagerman, being duly sworn, hereby depose and say that:

1. I am the Plant Manager of United States Gypsum Company ("U.S. Gypsum").

2. My business address is 70 Grassy Point Rd, Stony Point.

3. I am authorized to sign this Affidavit on behalf of U.S. Gypsum.

4. U.S. Gypsum owns the property located at 710 Beach Road in the Town of Haverstraw, New York described in a certain deed of said premises recorded in the Rockland County Clerk's Office in Liber 604 of conveyances, page 596.

5. A list of all directors, officers and stockholders owning more than 5% of any class of stock of U.S. Gypsum is attached hereto as Exhibit A.

6. Said premises have been in U.S. Gypsum's possession since 1955. Said premises are also known and designated on the Town of Haverstraw Tax Map as: Section 21.09; Block 2; Lot(s) 1.

7. U.S. Gypsum is supportive of United Water New York Inc.'s ("United Water") long-term water supply project and is willing to enter into an agreement with United Water regarding a section of land near the U.S. Gypsum dock and Haverstraw Marina.

8. U.S. Gypsum hereby authorizes United Water to make any and all applications for the long-term water supply project, including but not limited to United Water's Pilot Plant, that involve U.S. Gypsum property. This authorization includes but is not limited to the within application.

9. The statements of fact contained in said application are true and correct to my knowledge, information and belief.

10. U.S. Gypsum hereby agrees to be bound by the determination of the board relative to the aforementioned application.

On Behalf of U.S. Gypsum

Name: Mark S. Hagerman

Title: Plant Manager

Mailing Address 70 Grassy Point Rd.
Stony Point, NY 10980

7/8/08

Sworn to before me this
8th day of July, 2008.

Megan Carey
Notary Public

MEGAN CAREY
NOTARY PUBLIC, STATE OF NEW YORK
NO. 01CA6104289
QUALIFIED IN ROCKLAND COUNTY
COMMISSION EXPIRES JANUARY 20, 2012

EXHIBIT A TO AFFIDAVIT OF OWNERSHIP/OWNER'S CONSENT

The following directors. officers and stockholders own more than 5% of any class of stock of U.S. Gypsum:

Berkshire Hathaway – 17.2%
Knauf International – 14.9%
Fairholme Capital – 8.7%
Third Avenue – 6.1%

ENVIRONMENTAL QUESTIONNAIRE

ENVIRONMENTAL QUESTIONNAIRE

This is intended to supplement ENG Form 4345, Application for Department of the Army Permit, or the Joint Application for Permit used in the State of New York. Please provide complete answers to all questions below that are relevant to your project. Any questions may be continued on separate sheet(s) of paper to be attached to this form.

PRIVACY ACT STATEMENT

The purpose of this form is to provide the Corps of Engineers with basic information regarding your project. This information will be used to facilitate evaluation of your permit application and for public dissemination as required by regulation. Failure to provide complete information may result in your application being declared incomplete for processing, thereby delaying processing of your application.

GENERAL – APPLICABLE TO ALL PROJECTS

1. Explain the need for, and purpose of, the proposed work.

As a public utility, United Water is required to meet statutory, regulatory, and Public Service Commission (PSC)-ordered mandates with regard to supply water. United Water is regulated principally by the PSC, with additional regulatory oversight provided by New York State Department of Health, Rockland County Department of Health, and New York State Department of Environmental Conservation (NYSDEC).

Pursuant to New York State Public Service Law (PSL) § 89-b, United Water must provide safe and adequate service to its New York State customers. This obligation is underscored by a December 14, 2006 PSC Order ("PSC"), which adopted a three-year rate plan for United Water (the Rate Case). In particular, the Joint Proposal, which was filed in the Rate Case and adopted as part of the PSC's Order, commits United Water to, among other things, increasing the average water supply to Rockland County by a total of 1.5 million gallon per day ("mgd") and the peak supply by a total of 7.5 mgd by the end of 2015. Therefore, the purpose of the Proposed Project is to develop an additional, sustainable water supply that will increase the safe yield of the United Water system to meet the growing needs for water in Rockland County over the next 20 years.

The Proposed Project is an advanced water treatment plant to be located in the Town of Haverstraw, Rockland County, New York to meet the need for increased water supply beyond 2015. United Water must develop a long-term water supply project that increases the safe yield of the water supply system in Rockland County to meet the County's future needs, as required by the PSC Order. This will address the need for water during peak summer months and, particularly, during future drought conditions. Development of a long-term water supply project is critical to United Water's ability to continue to provide water as needed for Rockland County, including providing adequate quantity, quality, and water pressure to meet the projected future demands for County residents, businesses, and firefighting capabilities.

The Proposed Project would allow UWNY to increase its average water supply to Rockland County by a total of 1.5 mgd and to increase the peal supply by a total of 7.5 mgd by the end of 2015. The Proposed Project will treat water from the Hudson River, and will increase the supply of treated, potable water to the existing UWNY distribution system serving Rockland County.

The Proposed Project would draw water through an intake structure in Haverstraw Bay in the Hudson River, through a pumping station, to an advanced water treatment plant located adjacent to the Haverstraw Landfill. At the water treatment plant, water would be filtered and treated to remove impurities and salt. The treated, potable water would be sent via underground water transmission lines to new connections in UWNY's existing water distribution network. The impurities and salt filtered out of the water would be processed and disposed of in accordance with applicable laws and regulations.

The Proposed Project would consist of the following elements:

- Water intake located in the Hudson River.
- Pumping station to draw water from the intake.
- Advanced water treatment plant where the water would be treated to remove impurities and salinity.
- Piping for transmission of water between project elements, including piping between the pumping station and the water treatment plant; piping to transmit wastewater to the Haverstraw Joint Regional Sewage Treatment Plant (JRSTP); and piping to convey clean, filtered water to the existing UWNY water distribution system.
- Potential upgrades to the JRSTP to increase effluent capacity.

The purpose of the proposed long-term water supply project is to develop an additional, sustainable water supply that will increase the safe yield of the United Water system to meet the growing needs for water in Rockland County over the next 20 years. The Proposed Project is being designed to treat and deliver up to 7.5 mgd of potable water at full build. When the facility opens for operation, it would treat and deliver less water, potentially 2.5 to 5 mgd. As Rockland County's population grows and demand increases, the Proposed Project would be expanded to meet that demand, with the design capacity of 7.5 mgd. For a full description of the operations and facilities associated with the Proposed Project, refer to Chapter 2, Section D of the accompanying DEIS.

2. **Provide the names and address of property owners adjacent to your work site (if not shown on the application form or project drawings).**

Intake Site:

North and West of Site:

United States Gypsum Company
P.O. Box 711
70 Grassy Point Road
Stony Point, New York 10980

South and West of Site:

Town of Haverstraw Marina
600 Beach Road
West Haverstraw, New York 10993

East of Site:

Hudson River (Haverstraw Bay)

Water Treatment Facility Site:

North:

KBT Properties Ltd.
45 Kay Fries Drive
Stony Point, NY 10980
Tax Map Section/Block/Lot Number: 20.04-11-3 (17.26 acres)

Insul-X Products Corp (secondary owner: County of Rockland IDA)
45 Holt Drive, Stony Point, NY 10980
Tax Map Section/Block/Lot Number: 20.02-11-25 (15.18 acres)

East and South:

Haverstraw Landfill (closed)

West:

CSX Corporation-owned railroad right-of-way

(Please note that depending on the nature and extent of your projects, you may be requested to provide the names and addresses of additional property owners proximate to your site to ensure proper coordination.)

3. **Photographs of the project site should be submitted. For projects in tidal areas, photographs of the waterway should be taken at low tide. Using a separate copy of the plan view, indicate the location and direction of each photograph as well as the date and time at which the photograph was taken. Provide a sufficient number of photographs so as to provide a clear understanding of conditions on and proximate to your project site.**

   Photographs of the Project Sites are provided in the accompanying DEIS, Chapter 4 – Visual Resources.

4. **Provide a copy of any environmental impact statement, or any other environmental report that was prepared for your project.**

   The DEIS is provided with this submittal and has been prepared in accordance with the New York State Environmental Quality Review Act (SEQRA). In addition,

UWNY has completed an Essential Fish Habitat (EFH) study that encompasses the Intake Site. A copy of the EFH generated as part of this effort has also been included as Appendix 9.5 to the DEIS. Two analyses were conducted to estimate fish losses associated with entrainment at the intake. These analyses are included as Appendices 9.1 and 9.2 of the DEIS.

5. **Provide a thorough discussion of alternatives to your proposal. This discussion should include, but not necessarily be limited to, the "No Action" alternative and alternative(s) resulting in less disturbance to waters of the United States. For filling projects in waters of the United States, including wetlands, your alternatives discussion should demonstrate that there are no practicable alternatives to your proposed filling and that your project meets with current mitigation policy (i.e. avoidance, minimization and compensation).**

Many alternative water supplies were considered and evaluated, and a full analysis of these alternatives (including the no-action alternative) is provided in Chapter 18 of the accompanying DEIS. However, other than the creation of a reservoir (Ambrey Pond Reservoir Alternative) the other alternatives considered would not meet the purpose and need for the Proposed Project because they would be unable to provide a reliable, acceptable and sustainable long-term water source for Rockland County.

The Ambrey Pond Reservoir Alternative consists of construction of a new reservoir and related infrastructure, including three dams and a water treatment plant. This major infrastructure project was originally planned over 40 years ago and was considered to be UWNY's long-term water supply project. While the Ambrey Pond Reservoir Alternative has the potential to provide adequate safe yield to serve as a long-term water supply source, it was not selected as the Proposed Project because it would have far higher costs and, as a major civil works project, far greater environmental impacts than those of the Haverstraw Water Supply Project. This alternative would require the construction of two major dam structures and the inundation of approximately 112 acres of existing open space, state and federally regulated wetlands, and wildlife habitat immediately adjacent to Harriman State Park. This alternative would require the relocation of segments of two local roadways, and would also displace approximately 20 structures, including occupied residences. In addition, this reservoir would displace Town of Stony Point recreational facilities, including its municipal swimming pool.

DREDGING PROJECTS

Answer the following if your project involves dredging.

- **Indicate the estimated volume of material to be dredged and the depth (below mean low water) to which dredging would occur. Would there be overdepth dredging?**

  Activities associated with the Intake Site would involve dredging. The proposed work would involve installing, under portions of Haverstraw Bay, a 36-inch diameter pipe inside a 60-inch diameter tunnel, extending approximately 1,000 to 1,200 feet from the shore line into the Hudson River. The intake pipe system would be located partially within the lands underwater leased by U.S. Gypsum from the NYSOGS, and within a new interest in land underwater be obtained by UWNY from NYSOGS. The tunnel would not be installed by excavating an open trench in the river bottom instead it would be installed through a trenchless tunneling operation from the shoreline, to avoid the need to disturb the river bottom and aquatic environment. The tunnel most likely would be constructed using either horizontal directional drilling or microtunneling. A 30-foot diameter Tremie Sealed Cofferdam (coffer cell) would be installed in the Hudson River to facilitate the installation of the water intake (wedge wire screen) and connection to the intake pipe. Sediment would be dredged to a depth of approximately 47 feet below the river bed. The estimated volume of material to be removed is 1,200 cubic yards. Excavated material at the intake screen location (for coffer cell) and from below the river bed (for tunnel) would be removed and disposed of per local and state requirements. Refer to the accompanying DEIS, Chapter 15 – Construction Impacts for additional details. There would be no overdepth dredging.

- **You can apply for a ten-year permit for maintenance dredging. If you wish to apply for a ten-year permit, please provide the number of additional dredging events during the ten-year life of the permit and the amount of material to be removed during the future events.**

  Not applicable.

- **Indicate on your drawings the dewatering area (if applicable) and disposal site for the dredge material (except landfill sites). Submit a sufficient number of photographs of the dewatering and disposal sites as applicable so as to provide a clear indication of existing conditions. For ten-year maintenance dredging permits, indicated the dewatering/disposal sites for future dredging events, if known.**

  Under the current plan, all material from inside the coffer cell (down to bedrock) would be removed by clamshell bucket, loaded onto the scow, and transported to shore for disposal. Concrete would then be tremied from bedrock (elevation minus 67.0) up to top of foundation (elevation minus 21.0).

- **Describe the method of dredging (i.e. clamshell, dragline, etc.) and the expected duration of dredging.**

  Dredging within the coffer cell would be accomplished using a clamshell bucket. The coffer cell would be in place for approximately ten (10) weeks.

- **Indicate the physical nature of the material to be dredged (i.e. sand, silt, clay, etc.) and provide estimated percentages of the various constituents if available. For beach nourishment projects, grain size analysis is required.**

  The material to be dredged during installation of the intake structure consists of 95% sand and 5% silt and clay (based on the sediment analysis from the adjacent U. S. Gypsum channel dredging U. S. Army Corps of Engineers permit number 2005 00053).

- **Describe the method of dredged material containment (i.e. hay bales, embankment, bulkhead, etc.) and whether return flow from the dewatering/disposal site would reenter any waterway. Also indicate if these would be any barge overflow.**

  Material dredged from within the coffer cell would be loaded onto the scow and transported to the shore for disposal. A small portion of the dredged material would be stored and replaced within the coffer cell to create a sediment substrate on top of the concrete. The dredged material would be replaced prior to removal of the sheetpile cell. Coffer cell dewatering would involve the utilization of dewatering pumps which would pump through a filter system prior to discharging into the Hudson River. Materials would be permanently removed and stored at the intake pump station site until disposal per local and state requirements. There would be no barge overflow during dredging or during storage of the material.

MOORING FACILITIES

Answer the following questions if your project includes the construction or rehabilitation of recreational mooring facilities.

1. **It is generally recommended that any fixed pier and walk ramps be limited to four feet in width, and that floats be limited to eight feet in width and rest at least two feet above the waterway bottom at mean low water. Terminal floats at private, non-commercial facilities should be limited to 20 feet in length. If you do not believe your proposal can meet with these recommendations, please provide the reason(s).**

   Not applicable. The Proposed Project does not involve the temporary or permanent installation of any fixed piers or walk ramps.

2. **Using your plan view, show to scale the location(s), position(s), and size(s) (including length, beam and draft) of vessel(s) to be moored at the proposed facility, including those of transient vessel(s) if known.**

   Four (4) Shugart barges, each 10'-4" x 7'-0" high x 41'-4", would be temporarily moored and linked together to form a 41'-4" x 41'-4" work area at the location of the intake structure while the coffer cell and intake are installed. Barge draft would be 16.5' with no load and 5' with a 59 ton load. The barges would be in place for approximately 10 weeks. A 26' x 12' x 4' scow with a one–foot no load draft and a 30" 12 ton load draft would be temporarily moored, for approximately ten weeks, at the location of the intake to contain material dredged from within the coffer cell (see attached Preliminary Site Plan Intake Pumping Station). Approximately 75 cubic yards of material would be loaded onto the scow for each trip to the shoreline.

3. **For commercial mooring sites such as marinas, indicate the capacity of the facility and indicated on the plan view the location(s) of any proposed fueling and/or sewage pumpout facilities. If pumpout facilities are not planned, please discuss the rationale below and indicate the distances to the nearest available pumpout station.**

   Not applicable. The Proposed Project does not involve a commercial mooring site, or any fueling or pumpout facilities.

4. **Indicate on your plan view the distance to adjacent marine structures, if any are proximate and show the locations and dimensions of such structures.**

   The nearest marine structure to the proposed intake location is the existing U. S. Gypsum dock and conveyor which is located approximately 240 yards south from the intake (see attached Preliminary Site Plan Intake Pumping Station)..

5. **Discuss the need for wave protection at the proposed facility. Please be advised that if a permit is issued, you would be required to recognize that the mooring facility may be subject to wave action from wakes of passing vessels, whose operations would not be required to be modified. Issuance of a permit would not relieve you of ensuring the integrity of the authorized structure(s) and vessel(s) moored thereto from wakes from passing vessels.**

Not applicable. There would be no need for wave and or wake protection for the Intake Site. The intake would be affixed to the river bottom and the intake pipe would be directionally drilled beneath the river bed. There would be no permanent disturbance within the intertidal area of the Hudson River shoreline.

BULKHEAD/BANK STABILIZATION/FILLING ACTIVITIES

Answer the following if your project includes construction of bulkheading (also retaining walls and seawalls) with backfill, filling of waters/wetlands, or any other bank stabilization fills such as rip rap, revetments, gabions, etc.

1. **Indicate the total volume of fill (including backfill behind a structure such as a bulkhead) as well as the volume of fill to be placed into waters of the United States. The amount of fill in waters of the United States can be determined by calculating the amount of fill to be placed below the plane of spring high tide in tidal areas and below ordinary high water in non-tidal areas.**

   The permanent fill of Waters of the United States associated with the Proposed Project would be the volume displaced by the water intake (wedge wire screen) for the water treatment facility. The intake would occupy approximately 11 cubic yards of open water. Approximately 79 square yards of existing river bottom/benthic habitat would be occupied by the footing for the intake structure.

2. **Indicate the source(s) and type(s) of fill material.**

   See above. The proposed permanent in-water fill consists of the prefabricated (wedge wire) intake structure (11 cubic yards).

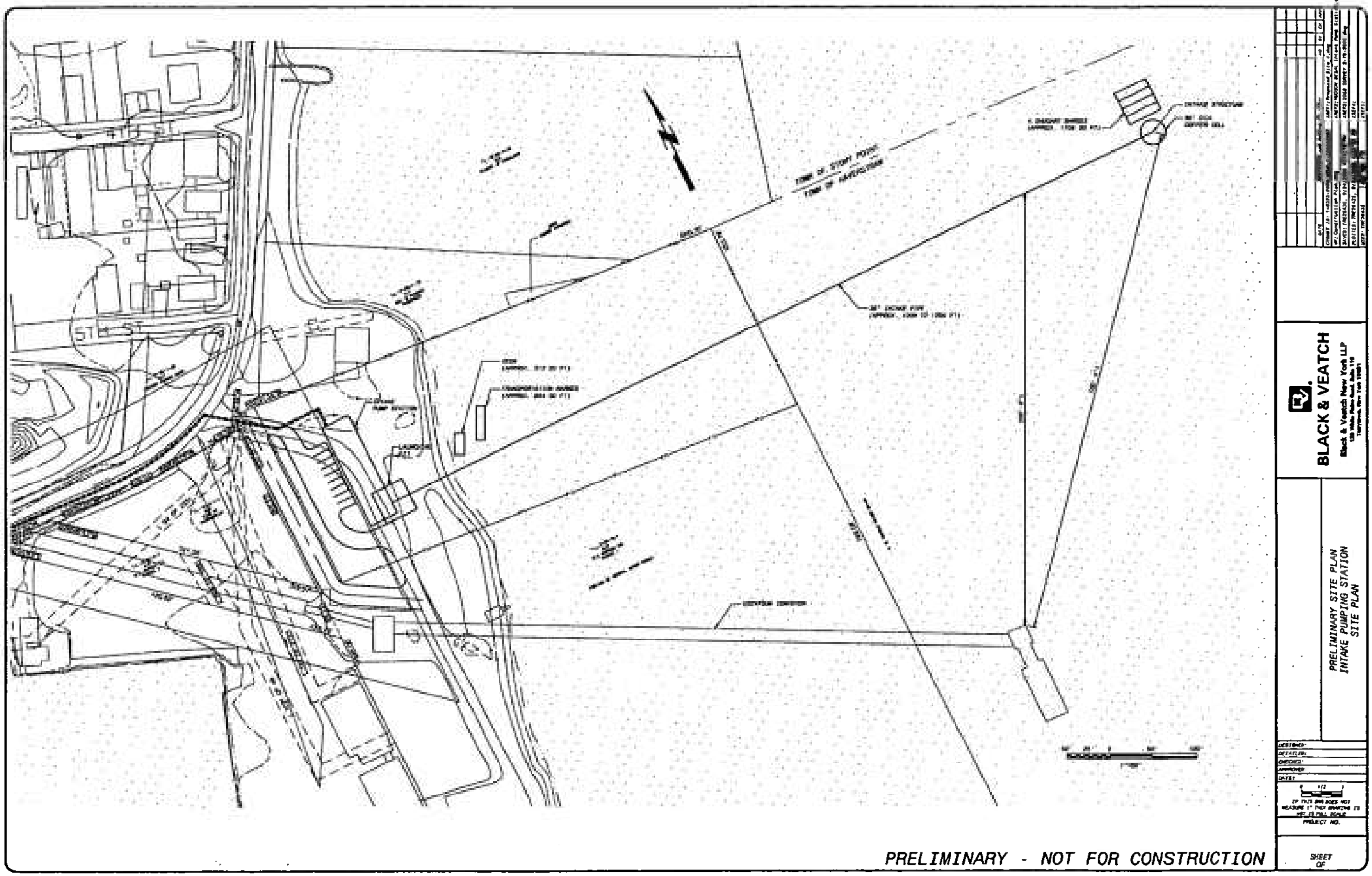
3. **Indicate the method of fill placement (i.e. by hand, bulldozer, crane, etc.). Would any temporary fills be required in waterways or wetlands to provide access for construction equipment? If so, please indicate the area of such waters and/or wetlands to be filled, and show on the plan and sectional views.**

   A permanent fill in the form of a concrete filled 30-foot diameter, 47-foot deep coffer cell river bed section would be needed for construction access to install the water intake structure and make connection to the directionally-drilled intake pipeline. Assuming a water depth of 20 feet, the total temporary displacement associated with the coffer cell would be approximately 530 cubic yards. The coffer cell is expected to be in place for approximately 10 weeks during installation.

The foregoing requests the basic information on the most common types of projects requiring Department of the Army permits. It is intended to obviate or reduce the need for requesting additional information; however, additional information may be requested above and beyond what is requested in this form.

Please feel free to add any additional information regarding your project which you believe may facilitate our review.

PRELIMINARY SITE PLAN
INTAKE PUMPING STATION



PRELIMINARY - NOT FOR CONSTRUCTION

SAMEET MASTER
Project Manager

UNITED WATER
700 Kinderkamack Road, Oradell, NJ 07649
Tel: 201.634.4232 • Fax: 201.225.5125
sameet.master@unitedwater.com

United Water
SUEZ

VIA FEDEX

September 26, 2008

Mr. Jeremy Rosenthal
Project Manager
Division of Environmental Permits
New York State
Department of Environmental Conservation
625 Broadway
Albany, New York 12233

Reference: United Water New York
6 NYCRR Part 601 Water Supply Permit Application
Haverstraw Water Supply Project

Dear Mr. Rosenthal,

United Water New York Inc. ("UWNY") respectfully submits four (4) signed copies of Water Supply Application (Supplement W-1 for Public Water Supply Permit including maps, plans, exhibits, etc.), Joint Application for Permit Application and Water Conservation Program Form for the Haverstraw Water Supply Project ("Proposed Project"). In addition to the New York State Department of Environmental Conservation ("Department"), we are coordinating this and other permit applications with the New York State Department of State, New York State Office of General Services and the United States Army Corps of Engineers. We have prepared and attached permit applications including various informational materials (hardcopy) and under separate cover submitted two (2) hardcopies of the Project Draft Environmental Impact Statement ("DEIS") as well as two (2) copies of the version on CD-ROM.

United Water is a public utility providing a public water supply, including drinking water, to approximately 90 percent of the residents and businesses in Rockland County, New York. The Proposed Project is to develop an additional, sustainable water supply that will increase the "safe yield" of the United Water system to meet the growing needs for water in Rockland County over the next 20 years. Development of a long-term water supply project is critical to United Water's ability to continue to provide water as needed for Rockland County, including providing adequate quantity, quality, and water pressure to meet the projected future demands for County residents, businesses, and firefighting capabilities.

As noted above, the attached DEIS, which has been prepared in accordance with the New York State Environmental Quality Review Act ("SEQRA"), contains further details on

the Proposed Project. Furthermore, while an environmental assessment form ("EAF") appears obviated by our filing of the DEIS, we enclose a full EAF in case the Department desires to use one.

As required by the 6 NYCRR Part 601 (Public Water Supply) permitting process, please note the following project specific information:

1. Name and location of a suitable place in which to hold a public hearing should one prove necessary:

   Town of Haverstraw
   Haverstraw Town Hall
   1 Rosman Road
   Garnerville, New York 10923
   (845) 429-2200

   Village of Haverstraw
   40 New Main Street
   Haverstraw, New York 10927
   (845) 429-0300

   Town of Stony Point
   74 East Main Street
   Stony Point, New York 10980
   (845) 786-2716

   Local newspaper of record (published daily) is the Rockland County edition of the Journal News.

2. Names, titles, mailing addresses, and phone numbers of other concerned officials, including:

   <u>Applicant:</u>
   United Water New York Inc.
   360 West Nyack Road
   West Nyack, New York 10994
   Contact: Sameet Master, P. E., Project Manager
   (845) 620-3300, ext. 4232

   <u>Applicant's Attorney:</u>
   Dewey & LeBoeuf, LLP
   99 Washington Avenue, Suite 2020
   Albany, New York 12210
   Contact: Robert Alessi, Partner

(518) 626-9000

Applicant's Engineer:
Black & Veatch New York LLP
120 White Plains Road, Suite 110
Tarrytown, New York 10591
Contact: Janine Witko, P.E.
(914) 524-8316

Applicant's Permitting Consultant:
Henningson, Durham & Richardson Architecture and Engineering, P.C.
In Association with HDR Engineering, Inc.
One Blue Hill Plaza, 12th Floor
P. O. Box 1509
Pearl River, New York 10965
Contact: Michael Principe, Ph. D.
(845) 735-8300, ext. 303

Municipality Chief Executive Officer:
Town of Haverstraw
1 Rosman Road
Garnerville, New York 10923
Contact: Hon. Howard T. Phillips, Jr., Supervisor
(845) 429 - 2200

Hudson River – Governing Authority:
New York State Department of State
Division of Coastal Resources
41 State Street
Albany, New York 12231 – 0001
Contact: Jeffrey Zappieri, Coastal Resources Specialist
(518) 473 - 2476

3. List of Maps and Exhibits:

- Exhibit A Project Justification;
- Water Supply Application Supplement W-1;
- Water Conservation Program Form;

- Project Facility Description (see DEIS Chapter 2 – Project Description, and the Engineer's Report);
- Site Maps (see DEIS Figures, Chapter 2: Figure 2-1 Project Location; Figure 2-2 Project Site Boundaries; Figure 2-3 Water Treatment Plant Site; Figure 2-4 Potential Potable Water Main Routes; Figure 2-6 Conceptual Site Plan – Intake Site; and Figure 2-8 Conceptual Site Plan – Water Treatment Plant);
- UWNY's Rockland County Service Area Map (See Figure 1, attached);
- Cedar Pond Brook Watershed Map (see Figure 2, attached);
- Water Treatment Facility Profile Map (see DEIS, Chapter 2 – Project Description, Figure 2-10 Water Treatment Plant Cross Section – Conceptual Design); and
- Contractor Plans and Specifications (to be provided upon completion of the design).

If you have any questions please call me at (201) 634-4232 or you can e-mail me at Sameet.Master@UnitedWater.com.

Sincerely,

Sameet Master

Sameet Master, P.E.
Project Manager

Cc: R. Alessi, Esq.
M. Duke, NYSDEC Region 3
M. Pointing
File

SAMEET MASTER
Project Manager

UNITED WATER
700 Kinderkamack Road, Oradell, NJ 07649
Tel: 201.634.4232 • Fax: 201.225.5125
sameet.master@unitedwater.com

United Water
SUEZ

VIA FEDEX

September 26, 2008

Ms. Margaret Duke
Regional Permit Administrator
New York State
Department of Environmental Conservation - Region 3
21 South Putt Corners
New Paltz, NY 12561

Reference: United Water New York
6 NYCRR Part 601 Water Supply Permit Application
Haverstraw Water Supply Project

Dear Ms. Duke,

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As noted above, the attached DEIS, which has been prepared in accordance with the New York State Environmental Quality Review Act ("SEQRA"), contains further details on the Proposed Project. Furthermore, while an environmental assessment form ("EAF")

appears obviated by our filing of the DEIS, we enclose a full EAF in case the Department desires to use one.

As required by the 6 NYCRR Part 601 (Public Water Supply) permitting process, please note the following project specific information:

1. Name and location of a suitable place in which to hold a public hearing should one prove necessary:

   Town of Haverstraw
   Haverstraw Town Hall
   1 Rosman Road
   Garnerville, New York 10923
   (845) 429-2200

   Village of Haverstraw
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   Haverstraw, New York 10927
   (845) 429-0300

   Town of Stony Point
   74 East Main Street
   Stony Point, New York 10980
   (845) 786-2716

   Local newspaper of record (published daily) is the Rockland County edition of the Journal News.

2. Names, titles, mailing addresses, and phone numbers of other concerned officials, including:

   Applicant:
   United Water New York Inc.
   360 West Nyack Road
   West Nyack, New York 10994
   Contact: Sameet Master, P. E., Project Manager
   (845) 620-3300, ext. 4232

   Applicant's Attorney:
   Dewey & LeBoeuf, LLP
   99 Washington Avenue, Suite 2020
   Albany, New York 12210
   Contact: Robert Alessi, Partner
   (518) 626-9000

Applicant's Engineer:
Black & Veatch New York LLP
120 White Plains Road, Suite 110
Tarrytown, New York 10591
Contact: Janine Witko, P.E.
(914) 524-8316

Applicant's Permitting Consultant:
Henningson, Durham & Richardson Architecture and Engineering, P.C.
In Association with HDR Engineering, Inc.
One Blue Hill Plaza, 12th Floor
P. O. Box 1509
Pearl River, New York 10965
Contact: Michael Principe, Ph. D.
(845) 735-8300, ext. 303

Municipality Chief Executive Officer:
Town of Haverstraw
1 Rosman Road
Garnerville, New York 10923
Contact: Hon. Howard T. Phillips, Jr., Supervisor
(845) 429 - 2200

Hudson River – Governing Authority:
New York State Department of State
Division of Coastal Resources
41 State Street
Albany, New York 12231 – 0001
Contact: Jeffrey Zappieri, Coastal Resources Specialist
(518) 473 - 2476

3. List of Maps and Exhibits:

- Exhibit A - Project Justification;
- Water Supply Application Supplement W-1;
- Water Conservation Program Form;
- Project Facility Description (see DEIS Chapter 2 – Project Description, and the Engineer's Report)

- Site Maps (see DEIS Figures, Chapter 2: Figure 2-1 Project Location; Figure 2-2 Project Site Boundaries; Figure 2-3 Water Treatment Plant Site; Figure 2-4 Potential Potable Water Main Routes; Figure 2-6 Conceptual Site Plan – Intake Site; and Figure 2-8 Conceptual Site Plan – Water Treatment Plant) ;

- UWNY's Rockland County Service Area Map (See Figure 1, attached);

- Cedar Pond Brook Watershed Map (see Figure 2, attached);

- Water Treatment Facility Profile Map (see DEIS, Chapter 2 – Project Description, Figure 2-10 Water Treatment Plant Cross Section – Conceptual Design); and

- Contractor Plans and Specifications (to be provided upon completion of the design).

If you have any questions please call me at (201) 634-4232 or you can e-mail me at Sameet.Master@UnitedWater.com.

Sincerely,

Sameet Master, P.E.
Project Manager

Cc: R. Alessi, Esq.
J. Rosenthal, NYSDEC
M. Pointing
File

Public Water Supply Permit (6NYCRR Part 601) Application for United Water New York, Inc.'s Proposed Haverstraw Water Supply Project Water Treatment Facility

EXHIBIT A

This section summarizes the required Permit Application materials, their source, responsible party and status. The outline follows the "Application for a Permit" list of exhibits and attachments in 6NYCRR Part 601 "Water Supply Applications". As cited in Part 601.5, four copies of all application materials must accompany the "Joint Application for Permit" Form for circulation and review by NYSDEC.

(a) *Project Authorization.* This document was prepared pursuant to Section XI, paragraph 3 of the Joint Proposal approved by the New York State Public Service Commission ("PSC") on December 14, 2006, as part of a three-year rate plan for United Water New York, Inc. ("UWNY") in Case 06-W-0131 (the "Rate Case"). As part of the Joint Proposal, UWNY agreed to submit, on or before September 30, 2008, a Draft Environmental Impact Statement ("DEIS") and all required environmental permit applications for its Haverstraw Water Supply Project. A copy of the DEIS and Appendices are enclosed on Compact Disk for your review and distribution.

(b) *General Map.* Figure 1 shows the extent of the UWNY service area in Rockland County. Chapter 2 of the DEIS provides a series of general maps showing the project areas (see Figures 2-1 through 2-8).

(c) *Watershed Map.* The proposed locations for the water treatment facility works are entirely within the Cedar Pond Brook watershed, which is located within the Haverstraw, New York United States Geological Survey (USGS) quadrangle map (see attached Figure 2).

(d) *Profiles.* A Profile of the proposed water treatment facility is provided in Chapter 2 – Project Description (Figure 2-10 Water Treatment Plant Cross Section Conceptual Design). A copy of the DEIS and Appendices are enclosed on Compact Disk for your review and distribution.

(e) *Contract Plans* and *Specifications.* As is typical of projects of this nature, this project is in the conceptual design stage. As such, this information has not been prepared at this time; however, when it is available it will be submitted as a supplement to this permit application.

(f) *Engineer's Report.* The Engineer's Report is presented as an attachment as a CD-ROM.

(g) *Acquisition* Maps. Not applicable. An application for a lease-of-lands underwater grant has been prepared for filing with the New York State Office of

General Services.

(h) *Cost Estimate*. This project is in the conceptual design stage. As such, a detailed cost estimate has not been prepared; however, Table 18-3 of the DEIS provides a preliminary cost estimate for the proposed project. As the project design is advanced, a more detailed cost estimate will be prepared and will be submitted as a supplement to this permit application.

(i) *Water Analysis*. The water quality tables in Appendix 2.1 of the attached DEIS summarize the 2007 water quality analyses with comparisons to applicable (Class SB) water classification criteria and New York State Department of Health (NYSDOH) drinking water criteria. The proposed water treatment facility process will provide potable water that will meet or exceed drinking water standards. Please see subsection (k) below.

(j) *Treatment Methods*. The methods of treatment for the Hudson River water consist of a multi-step approach (*e.g.*, clarification, filtration, reverse osmosis, granulated activated carbon, and post-treatment including disinfection). A full description of the water treatment process is provided in Chapter 2, Section D of the attached DEIS.

(k) *Project Justification*:

(1) *The need for any reasons why the proposed source was selected among alternative supplies which are or may become available.*

As Rockland County's population grows, the need for water is also increasing. In the Joint Proposal approved by the PSC on December 14, 2006, filed as part of the Rate Case, which was adopted as part of the PSC's Order in the Rate Case, United Water committed to increase the average water supply by a total of 1.5 mgd and the peak supply by a total of 7.1 mgd by the end of 2015. United Water's Short-Term Water Supply program will provide adequate capacity to meet average annual and peak-day demands through the end of 2015.

However, United Water currently relies on local water resources that are finite in their capacity to provide a safe supply of drinking water to its customers, and the Short-Term Water Supply program can provide only modest increases to the system's safe yield. Implementing these improvements will allow United Water to meet projected demands for water through 2015. Beyond 2015, a new water supply is needed to meet the future water demands projected for the United Water service area in Rockland County. This long-term supply is needed to increase the system's safe yield to meet projected future demands.

The Joint Proposal therefore also commits United Water to identify a long-term water supply plan that can provide additional capacity beyond what can be provided by the Short-Term Water Supply program. The Joint Proposal

represents an agreement among all parties to the Rate Case that the fulfillment of these commitments will "increase supply, meet the supply needs of the County, and specifically consider the development allowed under current land use control throughout the County. . . "
Therefore, the purpose of the proposed long-term water supply project is to develop an additional, sustainable water supply that will increase the safe yield of the United Water system to meet the growing needs for water in Rockland County over the next 20 years. This new water supply should have the ability to be implemented in stages to provide additional supply as the increase in demand is realized. The long-term water supply project should enable United Water to satisfy the health, safety, and quality of life water needs of its Rockland County customers by providing a safe, reliable, resilient, and cost-effective source of water for decades to come. Additional details on the purpose and need of the Proposed Project are provided in Chapter 1 – Purpose and Need, of the DEIS.

As a regulated public utility, UWNY is required to meet statutory, regulatory, and PSC-ordered mandates with regard to supply water. UWNY is regulated principally by the PSC, with additional regulatory oversight provided by NYSDOH, RCDOH, and NYSDEC.

Pursuant to New York State Public Service Law (PSL) § 89-b, UWNY must provide safe and adequate service to its New York State customers. This obligation is underscored by a December 14, 2006 PSC Order, which adopted a three-year rate plan for UWNY (the Rate Case). In particular, the Joint Proposal, which was filed in the Rate Case and adopted as part of the PSC's Order, commits UWNY to, among other things, increasing its average water supply to Rockland County by a total of 2 mgd by the end of 2015.

Many alternative water supplies were considered and evaluated, and a full description of these alternatives (including the no-action alternative) is provided in Chapter 18 of the attached DEIS. However, other than the creation of a reservoir (Ambrey Pond Reservoir Alternative) the other alternatives considered would not meet the purpose and need for the project because they would be unable to provide a reliable and sustainable long-term water source for Rockland County.

The Ambrey Pond Reservoir Alternative consists of construction of a new reservoir and related infrastructure, including three dams and a water treatment plant. This major infrastructure project was originally planned over 40 years ago and was considered to be UWNY's long-term water supply project. While the Ambrey Pond Reservoir Alternative has the potential to provide adequate safe yield to serve as a long-term water supply source, it was not selected as the Proposed Project because it would have far higher costs and, as a major civil works project, far greater environmental

impacts than those of the Haverstraw Water Supply Project. This alternative would require the construction of two major dam structures and the inundation of approximately 112 acres of existing open space and wildlife habitat immediately adjacent to Harriman State Park. This alternative would require the relocation of segments of two local roadways, and would also displace approximately 20 structures, including occupied residences. In addition, this reservoir would displace Town of Stony Point recreational facilities, including its municipal swimming pool.

(2) *The provision of proper and safe construction of all phases of the project.* The proposed construction and operation of the water treatment plant and intake structure would follow all applicable health and safety standards [*e.g.*, federal Occupational Safety and Health Administration (OSHA) regulations].

(3) *The provision of adequate protection of the water supply and watershed from contamination.* To protect the water supply, the Haverstraw Water Supply Project would include an early warning system to detect any significant change in river water quality before it is processed at the water treatment plant. Early warning system monitoring systems for source waters can provide rapid detection of accidental spills originating from nonpoint sources or point sources such as wastewater treatment plants, transportations incidents, and deliberate contamination events. UWNY's proposed early warning system would include real-time (or continuous) monitoring equipment located in the river, at the intake, and at the raw water pumping station. Plant operators would be able to monitor any changes in river water quality and make any necessary adjustments to the processes to account for these changes. Also, in the event of a spill, the plant operator would be able to note any unusual change in water quality and shut down the intake until the spill passes by. For further information on the monitoring system, refer to Chapter 2, Section D of the attached DEIS.

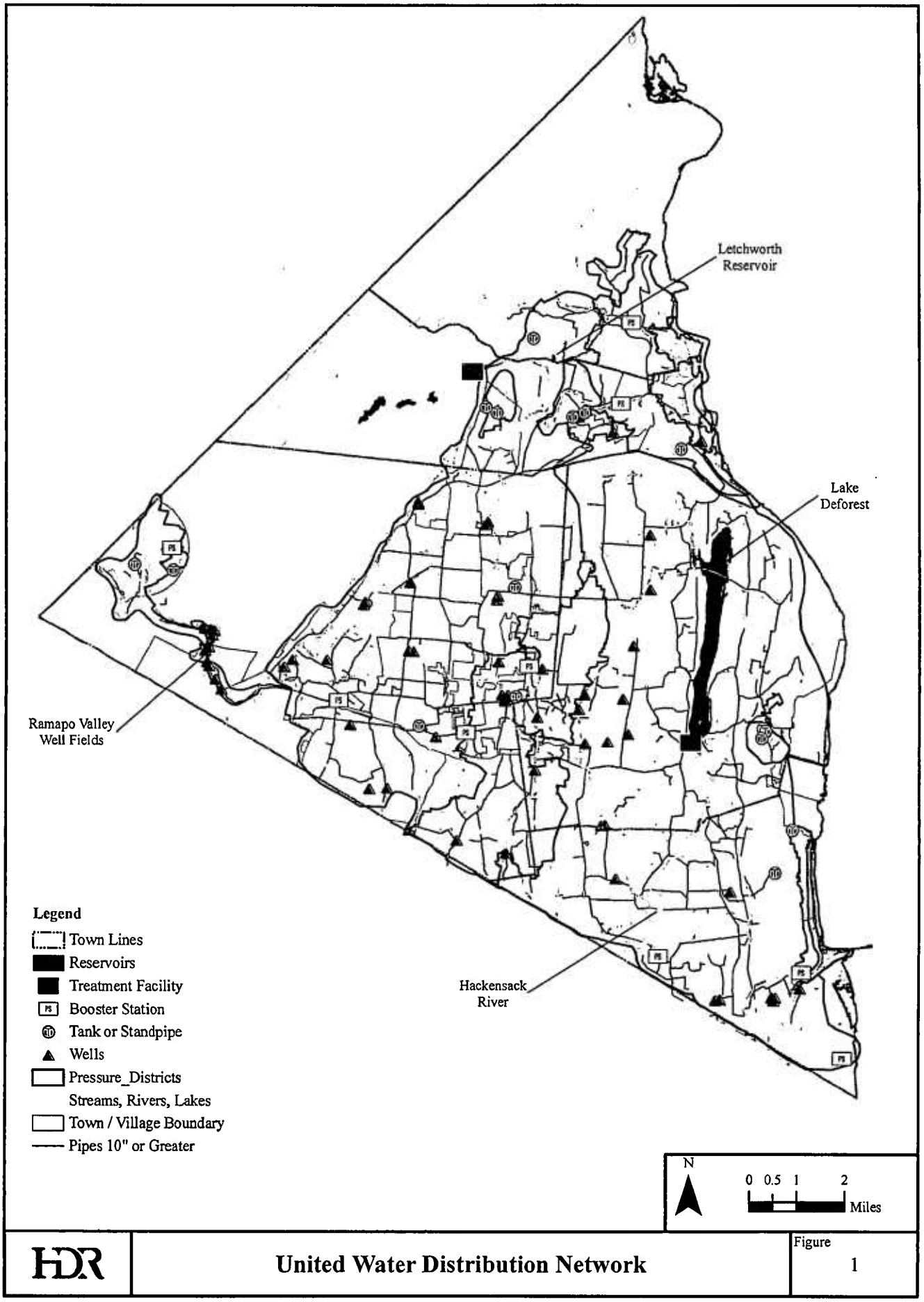
(4) *The proper treatment of the water supply.* The water supply would be treated to meet or exceed drinking water standards through the use of various conventional and advanced treatment processes, such as coagulation, flocculation, clarification, filtration, reverse osmosis, and granular activated carbon adsorption. For a full description of the treatment process, refer to Chapter 2, Section D of the attached DEIS.

(5) *The adequacy of the water supply to meet the demands of the service area.* The water source is an essentially unlimited supply that also reduces dependence on existing water sources.

(6) *The proposed project is just and equitable to other municipalities or civil divisions of the state.* The proposed project would not deny a water supply to any municipality or other water purveyor.

(7) *Proposed method to determine and provide proper compensation for any direct or indirect legal damages to persons or property that may result from the acquisition of any lands in connection with the project.* The proposed project would use currently available land for the plant construction and installation of the intake line from the Hudson River. No takings or damage to private property is anticipated.

FIGURE 1 – UNITED WATER DISTRIBUTION NETWORK

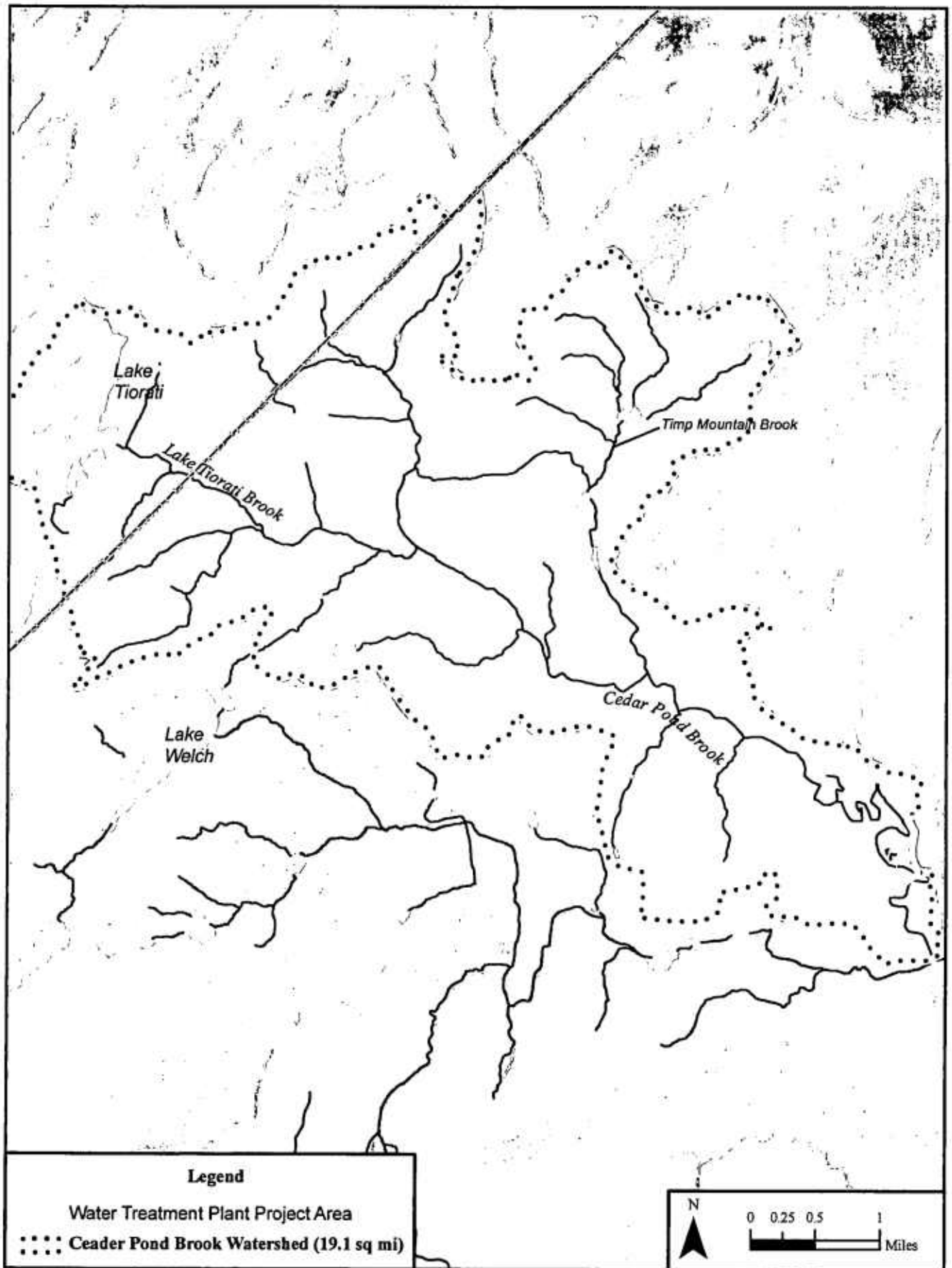


HDR

United Water Distribution Network

Figure 1

FIGURE 2 – CEDAR POND BROOK WATERSHED



HDR

Cedar Pond Brook Watershed

Figure 2

95-19-4 (JULY 2000)

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
ALBANY, NEW YORK, 12233-0001

WATER SUPPLY APPLICATION
Supplement W-1 for Public Water Supply Permit

READ THE INSTRUCTIONS ON PAGE 2 BEFORE COMPLETING THIS FORM

FOR DEPARTMENT USE ONLY
APPLICATION NUMBER
WSA NUMBER

PLEASE TYPE OR PRINT CLEARLY IN INK

1. PROJECT DESCRIPTION (INCLUDE LOCATION - for multiple well heads, identify and attach additional coordinates)

Construction and operation of a water treatment facility on the Hudson River in Rockland County, New York by United Water New York, Inc. The proposed project would occupy five parcels in the Town of Haverstraw. See DEIS Chapter 2, Section B for project location.

COORDINATES
NYTM-E 587,088
NYTM-N 4,563,773

2. PROJECT PURPOSE

The purpose of the proposed Haverstraw Water Supply Project is to develop an additional sustainable water supply that will increase the safe yield of the United Water system to meet the growing needs for water in Rockland County over the next 20 years.

3. THIS PROJECT INVOLVES: (Check all that apply and, for each item checked, provide a brief description or identification)

- ☐ ACQUISITION of existing facilities _____
- ☑ INSTALLATION of new facilities Construction of a water treatment facility and intake.
- ☐ CHANGES in capacities of existing facilities _____
- ☐ ABANDONMENT of existing facilities _____

4. This project will involve the taking of up to 7.5M ☐ gallons of water ☐ (per minute) ☑ (per day) from Hudson River (Name of source)

Figure given represents ☐ increase in taking, ☑ total taking.

5. If certain exhibits are omitted or reduced in scope because of reference to documents submitted with prior applications, list the exhibits so affected, identify the prior application (by Water Supply Application Number and name of applicant) and specify the document(s) to be referenced.

EXHIBIT	WSA NO.	APPLICANT'S NAME	REFERENCED DOCUMENT(S)

6. PROJECT AUTHORIZATION

This application must be accompanied by proof of adequate authorization for the proposed project. List below all exhibits documenting such authorization, such as resolutions, certificates of incorporation, contracts, referendum results, etc. (See *Public Water Supply Program, Applicant's Guide* for further details.)

7. PROJECT JUSTIFICATION

By the act of signing this application, the applicant certifies that each of the following statutory conditions is or will be satisfied, AND that a proper justification for each is given in the specified exhibits attached to this application:

A.	The proposed project is justified by the public necessity	See Exhibit(s) A
B.	The proposed project takes proper consideration of other sources of supply that are or may become available.	See Exhibit(s) A
C.	All work and construction connected with the proposed project will be proper and safe	See Exhibit(s) A
D.	The supply will be adequate	See Exhibit(s) A
E.	There will be proper protection of the supply and watershed or proper treatment of any additional supply.	See Exhibit(s) A
F.	The proposed project is just and equitable to all affected municipalities and their inhabitants and in particular with regard to their present and future needs for sources of water supply	See Exhibit(s) A
G.	There is provision for fair and equitable determinations of and payments of any direct and indirect legal damages to persons or property that will result from the acquisition of any lands in connection with the proposed project or from the execution of the proposed project	See Exhibit(s) A
H.	The applicant has developed and implemented a water conservation program in accordance with local water resource needs and conditions	See Exhibit(s) A

8. SEQR STATUS

Type 1 - DEIS attached.

9. SIGNATURE M. Pointing — Vice President and General Manager UWNY

10 DATE 9/26/08

WATER CONSERVATION PROGRAM FORM

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

WATER CONSERVATION PROGRAM FORM

(Revised - May 2006)

(A PDF version of this form is available at: http://www.dec.ny.gov/docs/permits_ej_operations_pdf/program.pdf)

TO BE COMPLETED AND SUBMITTED AS PART OF A NYSDEC WATER SUPPLY PERMIT APPLICATION
- SEE PAGE 6 FOR FURTHER INTRODUCTION AND INSTRUCTION REGARDING THIS FORM -

If your water system already has its own written water conservation program, please feel free to submit it as a supplement to this WCPF. If your system is new, please indicate the water conservation measures that will be taken when the system is completed (e.g., all sources of supply and customers will be 100% metered).

I. GENERAL SYSTEM INFORMATION

Name of Applicant: United Water New York Inc.		**DEC No.**
Street Address: 360 West Nyack Road		**WSA No.**
Post Office: West Nyack	**County:** Rockland	**State & ZIP:** NY 10994
Name & Title of Contact: Sameet Master, Project Manager		
Street Address: 360 West Nyack Road		
Post Office: West Nyack	**State & ZIP:** NY 10994	
Applicant Telephone: (845) 620-3350	**Contact Telephone:** (845) 620-3350 x. 4232	

II. SOURCES OF WATER SUPPLY

Please give amounts in gallons per minute (**gpm**), per day (**gpd**) or million gallons per day (**mgd**).

Source Type: **S** = Surface supply, **G** = Ground supply, **P** = Purchased supply
Source Status: **R** = Regular use, **S** = Standby use, **E** = Emergency use

Name of Source	Source Type	Source Status	Tested Capacity	Actual Current Withdrawal	Start-up Year
Lake DeForest Reservoir	S	R	20 mgd	10 mgd	1956
Letchworth Reservoirs	S	S	3 mgd	1 mgd	2006
Ramapo Valley Well Field	G	R	10 mgd	7 mgd	
Bedrock Wells	G	R	21.5 mgd	15 mgd	

Name of Applicant: United Water New York Inc.	WSA No.

III. WATER USAGE AND METERING

The water production data requested in this section should be available from the monthly "Water System Operation Reports" required by the State or Local Department of Health.

For unmetered systems, please provide your best estimates for water production and/or consumption.

Are all sources of supply (including major interconnections) equipped with master meters? Yes			
What percentage of your system is metered? 100%		How often are they read? Residential: Quarterly Commercial: Monthly	
Number of service connections? 71,453		Total population served? 274,883	
How many meters are recalibrated and/or replaced each year? 7%			
Water Production for calendar year 2007		**Water Consumption for calendar year** 2007	
Total metered water production :	11,472 mg	Total metered water consumption:	9,145 mg
Average day production (total/365):	31.43 mgd	Average day consumption (total/365):	25.2 mgd
Peak day production (largest single day):	45.24 mgd	Per capita usage per day (avg. day/pop. served):	91.6 (gpcd)

What are your future goals and schedule for water system metering? Production well meters tested and calibrated every two years. Plant meters tested and calibrated annually.

Recommendations:

* 100% metering of all water system connections, including public buildings.

* Master meters should be tested and calibrated annually.

* Customer meters should be recalibrated or replaced at least once every 15 years or in accordance with an optimum meter replacement schedule developed using the American Water Works Association (AWWA) Manual M6.

* Quarterly meter reading and prompt billing with rates that reflect amount of water used.

Name of Applicant:	United Water New York Inc.	WSA No.

IV. WATER SUPPLY AUDIT

Do you conduct a system water audit at least once each year? Yes.
If yes, please submit a copy of your latest audit in addition to completing the following section.

**** Water Supply Audit for Calendar Year** 2007 (based on PSC submittal)

Total metered water production (from previous section)		Total	11,472 mg	% of Total
Total metered water consumed (from previous section)		subtract	9,145 mg	80
Authorized unmetered usage		subtract	46 mg	
e.g. Unmetered public bldgs. Firefighting & training Main flushing Street cleaning		subtract		
		subtract		
		subtract		
Water lost to leaks that have since been repaired		subtract		
TOTAL UNACCOUNTED-FOR WATER		Sub-total	2,281 mg	19.9
Unaccounted-for water breakdown	Meter under-registration	subtract		
	Unrepaired leakage	subtract		
	Other:	subtract		

** Water measurement and accounting techniques are available in NYSDEC's January 1989, (re-printed February 1998) Water Conservation Manual.

0

What are your future goals for water system auditing? UWNY provides annual reports to the PSC including unaccounted-for water, consumption categories and authorized unmetered water use. UWNY has developed internal guidelines to reduce unaccounted-for water. (Continued below).

Recommendations:

* At least once each year, a system water audit should be conducted using metered water production and consumption data to determine unaccounted-for water.

* Quantify all authorized water uses by consumption categories (e.g. residential, industrial, municipal etc.).

* Keep accurate estimates of authorized unmetered water use (e.g. firefighting, main flushing, etc.).

(Continued) UWNY's distribution inspectors conduct daily sounding of hydrants, valves and services as part of a routine leak survey. UWNY recently installed acoustic monitors for continuous monitoring.

Name of Applicant: United Water New York Inc.	WSA No.

V. LEAK DETECTION AND REPAIR

Do you regularly survey your system for leaks with listening equipment?

Total miles of distribution pipe	Percent of system surveyed each year	Miles of pipe surveyed each year	Listening equipment used	Year of last survey	Number of leaks found	Number of leaks repaired
1,066	Continuous	Continuous	HL 90 HL 400 PAL 300	Continuous	336 (Main Breaks found and repaired) 103 (Service Leaks found and repaired)	

Do you have a regular water system rehabilitation program? Yes.

If yes, give details: UWNY conducts an annual flushing program. Additionally, UWNY has an Underground Infrastructure Replacement Program approved by PSC as part of UWNY's 2006 rate settlement.

What are your future goals for water system leak detection and repair? Leak Detection/Monitoring will be enhanced through the use of Permaloggers. Presently UWNY has 60 loggers installed as part of a pilot study. If successful, UWNY will expand year to year with more loggers. (Continued below.)

Recommendations:

* Check at least one third of your water distribution system for leaks each year.

* Fix every detectable leak as soon as possible.

* Have an on-going system rehabilitation program.

(Continued from above)

Distribution Inspectors will continue to conduct leak surveying on a daily basis as they move from job to job.

Repairs of leaks are made within three days or less.

Name of Applicant: United Water New York Inc.	WSA No.

VI. WATER USE REDUCTION

Have you distributed information to residential customers on household water saving devices and ways to reduce water use? Yes.

Have you distributed water conservation information to industrial and commercial customers that promotes recycling and reuse? Yes.

Do you have a program to retrofit public buildings with water savings fixtures and encourage the private sector to do the same? Yes. UWNY will continue its ongoing program to encourage water conservation by customers and to reduce water lost through leaks in the distribution system.

Do you have lawn sprinkling time restrictions during the summer or periods of peak demand? No.
If yes, please describe: UWNY has enabled public access to an evapotranspiration (ET) tool for optimal watering times.

Do you have a plan that takes progressive steps to further reduce outdoor water use during drought conditions with a procedure to assure compliance? Yes. If yes, please describe:
UWNY follows the Rockland County Department of Health's protocol for water use restrictions during droughts.

What are your future goals for reducing water usage? In 1992, UWNY (then the Spring Valley Water Company) instituted a formal, consumer-based water conservation program that includes customer education and distribution of low-flow devices to residential customers. Since that time, as part of its education program, UWNY has disseminated consumer (Continued below)

Recommendations:

* Carry out a public information program that promotes water conservation practices by all categories of water users (e.g. residential, commercial, industrial, etc.).

* Retrofit public buildings with water saving fixtures and encourage the private sector to do the same.

* Use lawn sprinkling time restrictions (e.g. Odd/even days, morning and evening hours) during the summer and outdoor water use bans during times of drought.

* Adopt a procedure to be followed in times of drought that calls for a progression of restrictions on water use specifying: who will reduce, how, and by how much, along with actions to be taken to assure compliance.

(continued) conservation information widely via mailed advertisements, radio ads, cable television, and public events and presentations. The UWNY *Conservation Guide* also provides information on purchase of water-saving kits that can be installed by the consumer to minimize water use.

Name of Applicant: United Water New York Inc.	WSA No.

VII. CERTIFICATION OF WATER CONSERVATION PROGRAM:

To be signed by the owner or official of the municipality or corporation operating this water system.

I hereby affirm that the information provided on this form is true to the best of my knowledge and belief. False statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the Penal Law.

Date: 9/26/08 Signature: M. Pointing Title: Vice President and General Manager, UWNY

DISCUSSION:

Effective January 1, 1989, New York State Environmental Conservation Law (ECL 15-1501) has required that all new applications for a NYSDEC Public Water Supply Permit include a water conservation program. This Water Conservation Program Form (WCPF) is intended to be a guide in completing this requirement.

The WCPF has been set up to cover the following basic elements of a water conservation program: Source Water Inventory, Water Usage and Metering, Water Supply Auditing, Leak Detection/Repair and Water Use Reduction. The recommended actions listed at the bottom of each page represent DEC water conservation policy objectives and should be factored into your program development. Additional water conservation measures such as increasing block water rate structuring, non-residential water use reduction or water efficient landscaping may also play an important role in your system's program and should certainly be considered when applicable.

Water supply permit applicants can consult the NYSDEC publication entitled, "Water Conservation Manual For Development of a Water Conservation Plan", January, 1989 (Re-printed February 1998) for details regarding the development of these water conservation practices. A PDF version of this manual is available on our website at: http://www.dec.ny.gov/docs/permits_ej_operations_pdf/program.pdf Copies can also be obtained through your DEC Regional Offices.

The American Water Works Association (AWWA) is also an excellent source of information regarding water conservation and public water supply systems in general. Information ranging from technical manuals to public education bill stuffers are available from AWWA at reasonable cost by calling 1-800-926-7337.

As a final note, the former "Bureau of Water Resources" has been incorporated into the "Bureau of Water Resource Management" and can now be contacted at (518) 402-8099.

2007 Water Audit

AWWA WLCC Water Audit Software: Water Balance

Water Audit Report For:	Report Yr:
United Water New York	2007

Own Sources (Adjusted for known errors) 11,623.5	Water Exported 0.0	Billed Water Exported			
	Water Supplied 11,623.5	Authorized Consumption 9,233.1	Billed Authorized Consumption 9,187.0	Billed Metered Consumption (inc. water exported) 9,187.0	Revenue Water 9,187.0
				Billed Unmetered Consumption 0.0	
			Unbilled Authorized Consumption 46.1	Unbilled Metered Consumption 0.3	Non-Revenue Water (NRW) 2,436.5
				Unbilled Unmetered Consumption 45.8	
		Water Losses 2,390.4	Apparent Losses 869.0	Unauthorized Consumption 581.0	
				Customer Metering Inaccuracies 288.0	
				Data Handling Errors 0.0	
Water Imported 0.0			Real Losses 1,521.4	Leakage on Transmission and/or Distribution Mains Not broken down	
				Leakage and Overflows at Utility's Storage Tanks Not broken down	
				Leakage on Service Connections Not broken down	

SAMEET MASTER
Project Manager

UNITED WATER
700 Kinderkamack Road, Oradell, NJ 07649
Tel: 201.634.4232 • Fax: 201.225.5125
sameet.master@unitedwater.com

United Water
SUEZ

VIA FEDEX

September 26, 2008

Mr. Jeff Zappieri
Coastal Resources Specialist
New York State Department of State
Division of Coastal Resources
41 State Street
Albany, New York 12231-0001

Reference: United Water New York
Coastal Zone Consistency Certification and Supporting Information
Haverstraw Water Supply Project

Dear Mr. Zappieri,

United Water New York Inc. ("United Water") respectfully submits for your review the Coastal Zone Management Program Federal Consistency Assessment Form and Supporting Information for the proposed Haverstraw Water Supply Project ("Proposed Project"). In addition to your Department, we are coordinating the filing of permit applications with the New York State Department of Environmental Conservation, the New York State Office of General Services and the United States Army Corps of Engineers. We have prepared and attached permit applications including various informational materials (hardcopy) and a hardcopy of the Project Draft Environmental Impact Statement ("DEIS") as well as a version on CD-ROM.

United Water is a public utility providing a public water supply, including drinking water, to approximately 90 percent of the residents and businesses in Rockland County, New York. The Proposed Project is to develop an additional, sustainable water supply that will increase the "safe yield" of the United Water system to meet the growing needs for water in Rockland County over the next 20 years. Development of a long-term water supply project is critical to United Water's ability to continue to provide water as needed for Rockland County, including providing adequate quantity, quality, and water pressure to meet the projected future demands for County residents, businesses, and firefighting capabilities.

As noted above, the attached DEIS, which has been prepared in accordance with the New York State Environmental Quality Review Act ("SEQRA"), contains further details on the Proposed Project. Furthermore, while an environmental assessment form ("EAF") appears obviated by our filing of the DEIS, we enclose a full EAF in case the Department desires to use one.

If you have any questions please call me at (201) 634-4232 or you can e-mail me at Sameet.Master@UnitedWater.com.

Sincerely,

Sameet Master

Sameet Master, P.E.
Project Manager

Cc: R. Alessi, Esq.
G. Nieves, USACE
J. Rosenthal, NYSDEC
M. Duke, NYSDEC – Region 3
M. Pointing
File

NEW YORK STATE DEPARTMENT OF STATE
COASTAL MANAGEMENT PROGRAM

Federal Consistency Assessment Form

NEW YORK STATE DEPARTMENT OF STATE
COASTAL MANAGEMENT PROGRAM
Federal Consistency Assessment Form

An applicant, seeking a permit, license, waiver, certification or similar type of approval from a federal agency which is subject to the New York State Coastal Management Program (CMP), shall complete this assessment form for any proposed activity that will occur within and/or directly affect the State's Coastal Area. This form is intended to assist an applicant in certifying that the proposed activity is consistent with New York State's CMP as required by U.S. Department of Commerce regulations (15 CFR 930.57). It should be completed at the time when the federal application is prepared. The Department of State will use the completed form and accompanying information in its review of the applicant's certification of consistency.

A. APPLICANT (please print)

1. Name: United Water New York Inc.

2. Address: 360 West Nyack Road, West Nyack, NY 10993

3. Telephone: Area Code (845) 620-1500

B. PROPOSED ACTIVITY

1. Brief description of activity:

United Water New York Inc. ("United Water") respectfully submits this application for Coastal Zone Consistency to build and operate a water treatment plant ("WTP") and intake structure (the "Haverstraw Water Supply Project") in the Town of Haverstraw, Rockland County, New York. The Intake location is currently owned by the U. S. Gypsum Corporation and the Facility site is owned by the Town of Haverstraw; United Water is in active negotiations to purchase the location and site from the current owners. The proposed facility will consist of an intake structure in the Hudson River that will withdraw water from the Hudson River; a directionally drilled intake line from the intake to an on-shore pumping station, which will pump Hudson River water to the WTP via a raw water pipeline.

Further details on the Proposed Project can be found in Chapter 2 – Project Description, of the attached draft environmental impact statement ("DEIS") submitted with this form.

2. Purpose of activity:

The Haverstraw Water Supply Project is a part of United Water's long term water supply project the purpose of which is to develop an additional. Sustainable water supply that will increase the safe yield of the United Water system to meet the growing needs for water in Rockland County over the next 20 years. United Water seeks to construct the water treatment plant using Hudson River water to supply up to 7.5 million gallons per day of potable water (at full build-out projected to be reached in 2030) to its distribution area.

Further details on the Proposed Project can be found in Chapter 1 – Purpose and Need, of the accompanying DEIS.

3. Location of activity:

Rockland	Haverstraw	Grassy Point Road
County	City, Town, or Village	Street or Site Description

4. Type of federal permit/license required: USACE – Individual Permit (Joint Application)

5. Federal application number, if known: To be issued

6. If a state permit/license was issued or is required for the proposed activity, identify the state agency and provide the application or permit number, if known: NYSDEC (Region 3) 401 Water Quality Certification, Protection of Waters, and Water Supply Application, NYSDOH Application for Approval of Plans for Public Water Supply Improvements.

C. COASTAL ASSESSMENT Check either "YES" or "NO" for each of these questions. The numbers following each question refer to the policies described in the CMP document (see footnote on page 2) which may be affected by the proposed activity.

1. Will the proposed activity result in any of the following:	YES	NO
a. Large physical change to a site within the coastal area which will require the preparation of an environmental impact statement? (11, 22, 25, 32, 37, 38, 41, 43)	X	
b. Physical alteration of more than two acres of land along the shoreline, land under water or coastal waters? (2, 11, 12, 20, 28, 35, 44)	X	
c. Revitalization/redevelopment of a deteriorated or underutilized waterfront site? (1)		X
d. Reduction of existing or potential public access to or along coastal waters? (19, 20)		X
e. Adverse effect upon the commercial or recreational use of coastal fish resources? (9,10)		X
f. Siting of a facility essential to the exploration, development and production of energy resources in coastal waters or on the Outer Continental Shelf? (29)		X
g. Siting of a facility essential to the generation or transmission of energy? (27)		X
h. Mining, excavation, or dredging activities, or the placement of dredged or fill material in coastal waters? (15, 35)	X	
i. Discharge of toxics, hazardous substances or other pollutants into coastal waters? (8, 15, 35)		X
j. Draining of stormwater runoff or sewer overflows into coastal waters? (33)	X	
k. Transport, storage, treatment, or disposal of solid wastes or hazardous materials? (36, 39)		X
l. Adverse effect upon land or water uses within the State's small harbors? (4)		X

2. Will the proposed activity affect or be located in, on, or adjacent to any of the following:	YES	NO
a. State designated freshwater or tidal wetland? (44)		X
b. Federally designated flood and/or state designated erosion hazard area? (11, 12, 17,)	X	
c. State designated significant fish and/or wildlife habitat? (7)	X	
d. State designated significant scenic resource or area? (24)		X
e. State designated important agricultural lands? (26)		X
f. Beach, dune or barrier island? (12)		X
g. Major ports of Albany, Buffalo, Ogdensburg, Oswego or New York? (3)		X
h. State, county, or local park? (19, 20)		X
i. Historic resource listed on the National or State Register of Historic Places? (23)		X

3. Will the proposed activity require any of the following:	YES	NO
a. Waterfront site? (2, 21, 22)	X	
b. Provision of new public services or infrastructure in undeveloped or sparsely populated sections of the coastal area? (5)		X
c. Construction or reconstruction of a flood or erosion control structure? (13, 14, 16)		X
d. State water quality permit or certification? (30, 38, 40)	X	
e. State air quality permit or certification? (41, 43)		X

4. Will the proposed activity occur within and/or affect an area covered by a State approved local waterfront revitalization program? (see policies in local program document) X

D. ADDITIONAL STEPS

1. If all of the questions in Section C are answered "NO", then the applicant or agency shall complete Section E and submit the documentation required by Section F.

2. If any of the questions in Section C are answered "YES", then the applicant or agent is advised to consult the CMP, or where appropriate, the local waterfront revitalization program document*. The proposed activity must be analyzed in more detail with respect to the applicable state or local coastal policies. On a separate page(s), the applicant or agent shall: (a) identify, by their policy numbers, which coastal policies are affected by the activity, (b) briefly assess the effects of the activity upon the policy; and, (c) state how the activity is consistent with each policy. Following the completion of this written assessment, the applicant or agency shall complete Section E and submit the documentation required by Section F.

E. CERTIFICATION

The applicant or agent must certify that the proposed activity is consistent with the State's CMP or the approved local waterfront revitalization program, as appropriate. If this certification cannot be made, the proposed activity shall not be undertaken. If this certification can be made, complete this Section.

"The proposed activity complies with New York State's approved Coastal Management Program, or with the applicable approved local waterfront revitalization program, and will be conducted in a manner consistent with such program."

Applicant/Agent's Name: Mr. Michael J. Pointing, General Manager/V.P.
United Water New York Inc.

Address: 360 West Nyack Road, West Nyack, NY 10994

Telephone: Area Code (845) 623-1500

Applicant/Agent's Signature: M. Pointing Date: 9/26/08

F. SUBMISSION REQUIREMENTS

1. The applicant or agent shall submit the following documents to the New York State Department of State, Division of Coastal Resources, One Commerce Plaza, 99 Washington Avenue, Albany, New York 12231-001.

   a. Copy of original signed form.
   b. Copy of the completed federal agency application.
   c. Other available information which would support the certification of consistency.

2. The applicant or agent shall also submit a copy of this completed form along with his/her application to the federal agency.

3. If there are any questions regarding the submission of this form, contact the Department of State at (518) 474-6000.[1]

NEW YORK STATE DEPARTMENT OF STATE
COASTAL MANAGEMENT PROGRAM
Coastal Zone Policy Analysis

SEE DEIS CHAPTER 17 COASTAL ZONE CONSISTENCY, SECTION B