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Chapter 13: Natural Resources

A. INTRODUCTION

This chapter describes the existing conditions of the natural resources[1] within the Project Area and evaluates the potential impacts on the resources by the Proposed Action. The natural resources evaluated include wetlands, water quality, threatened and endangered species, floodplains, and the coastal zone, as well as other ecologically sensitive or significant areas. This chapter also describes the federal, state, and local laws and associated regulations and regulatory programs that may apply to the Proposed Action with respect to water quality, aquatic and terrestrial biota, and aquatic and terrestrial habitats. In addition to assessing potential impacts from the Proposed Action under the two build years in 2010 and 2025, it assesses future water quality, and aquatic and terrestrial natural resources without the Proposed Action. Potential construction impacts to natural resources resulting from the Proposed Action are addressed in Chapter 23, "Construction Impacts."

1. Issues

The Proposed Action could result in additional commercial and residential development within the Project Area as well as track extension at Corona Yard. Potential impacts evaluated include potential increased sewage discharges from increased development, shading on the Hudson River, and wetland impacts at Corona Yard in Flushing, Queens.

2. Principal Conclusions

The Proposed Action would not cause significant adverse impacts to natural resources within the natural resources study area. The construction of the tunnel for the No. 7 Subway extension would not cause significant adverse impacts to natural resources, as construction would occur largely below ground and in bedrock. However, components of the Proposed Action involve activities located near the Hudson River that may affect natural resources through changes in water quality or shading. Because most of the Project Area contains primarily developed and paved properties, potential impacts to natural resources would be limited to:

- Potential increased sewage discharges from treated domestic sewage from increased sanitary flow and combined sewer overflows (CSOs), which may affect water quality in the Hudson River or the Harlem River;
- Shading on Hudson River natural resources and adjacent shoreline area from proposed development, and possible shading from barges that could be used for transporting materials; and
- Wetland impacts from the proposed activities at Corona Yard.

As discussed in the following sections, there would be no significant adverse impacts to these resources. There would be no significant adverse impacts to water quality conditions in the Hudson River due to the small incremental changes to water quality conditions from increased effluent flows from the North River WPCP as a result of the Proposed Action in 2010 and 2025. In addition, there would be no significant adverse impacts to water quality conditions in the Hudson or Harlem Rivers due to the small incremental changes to water quality conditions from CSO discharges as a result of the Proposed Action in 2010 and 2025. As a result of the insignificant changes to water quality, there would be no significant adverse impacts to aquatic biota.

[1] Plant and animal species and any area capable of providing habitat for plant and animal species or capable of functioning to support ecological systems and maintain the City's environmental balance (*CEQR Technical Manual*).

The proposed green roofs and other open spaces would have a positive effect on wildlife in the Hudson Yards Project Area. The additional open space areas would complement those that would be developed as part of the Hudson River Park project in terms of creating additional compatible upland habitat for native plants and wildlife such as birds and butterflies.

B. METHODOLOGY

Given the presence of natural resources within the study area as defined below and the potential for adverse impacts from the Proposed Action, a natural resource assessment was performed following the methods outlined below.

1. Assessment Methods

The methodology outlined in the *CEQR Technical Manual* was used to characterize existing conditions and assess potential impacts to natural resources located throughout the natural resources study area, as defined below. Onsite field reviews, existing reports and literature, and correspondence with federal, State, and local resource agencies were used to describe and characterize the existing conditions of natural resources within the Project Area. The natural resources include floodplains, surface water, groundwater, wetlands, wildlife, and upland resources, as well as significant, sensitive, or designated resources. The current conditions of the resources are compared to anticipated conditions for analysis years 2010 and 2025 both with and without the Proposed Action.

a) Surface Water Quality

In order to assess the water quality impacts due to the Proposed Action, baseline water quality data were obtained from several sources including the New York City Department of Environmental Protection's (NYCDEP) Harbor Survey and the U.S. Environmental Protection Agency (USEPA, 1991). Harbor Survey data collected in 2003 for stations located in the Hudson and Harlem Rivers within the North River Water Pollution Control Plant (WPCP) drainage area were obtained. Effluent data for wastewater flows and pollutant loadings from the North River WPCP for fiscal year 2003 (July 1 – June 30) were also obtained from the NYCDEP. This information represents the most recent data available for the North River WPCP. In addition, CSO pollutant loadings were calculated for CSOs in the Hudson and Harlem Rivers within the WPCP drainage area. A sewer system hydraulic model, Info Works, was used to predict the frequency and volume of CSOs within the entire North River drainage area and to determine effects of potential CSOs on water quality under future conditions. To capture a cumulative assessment of CSOs from the entire North River drainage area, future developments anticipated with and without the Proposed Action were considered within the Project Area, as well as those additional developments anticipated throughout the North River drainage area. Results of these conservative CSO predictions are presented in Appendix N, "Natural Resources". Those predictions overstate the potential impacts because no credits were taken for the benefits realized from the: (1) implementation of the Amended Drainage Plan which would separate sanitary and stormwater in four sub-drainage areas within the Project Area, and (2) regulator upgrades, as described in Chapter 16, "Infrastructure". These separate storm sewers would discharge storm water directly to the Hudson River and thus reduce flows being directed to the combined sewer. Loadings for constituents of concern were calculated and the impacts assessed for the average annual flow scenarios for both 2010 and 2025.

Two flows were used for the analyses (Table 13-1). The average daily flow was used for the evaluation of the potential impact of proposed changes to the North River WPCP on water quality within the Hudson River. The average daily flow includes sanitary flows and also wet weather flows received by the WPCP. For the analysis of potential effects associated with CSOs within the North River WPCP drainage area, the average dry weather flow was used. The dry weather flow only includes sanitary flows received under dry weather conditions. This was used for the analysis of potential CSO effects on the Hudson and Harlem Rivers.

TABLE 13-1
AVERAGE DAILY FLOW CONDITIONS AT NORTH RIVER WPCP USED IN MODELING

Year	Average Daily Flow[1]	Average Dry Weather Flow
2003 - Existing Conditions	132.0 mgd	122.0 mgd
2010		
Future Without Proposed Action	135.5 mgd	125.5 mgd
Future With Proposed Action	137.0 mgd	127.0 mgd
2025		
Future Without Proposed Action	142.9 mgd	132.9 mgd
Future With Proposed Action	150.0 mgd	140.0 mgd

1 Average Daily Flows include stormwater and sanitary volumes.

The conservative analysis of potential impacts is based upon the increases resulting from the Proposed Action on the number of CSO events within the North River drainage area, the CSO volume that could enter the Hudson and Harlem Rivers, and the amount of additional pollutant mass loading for the 2025 Future With the Proposed Action condition.

2010

(a) North River WPCP

The possible water quality impacts with and without the proposed Hudson Yards project were calculated for the year 2010. The North River WPCP has been designed to accept two times dry weather flow, or 340 million gallons per day (MGD). The projected North River WPCP effluent flows were calculated based on the 2003 average daily flow of 132 mgd and the flow projections presented in the "New York City Water Demand and Wastewater Flow Projections" August 1998 report. The average daily flow includes sanitary and stormwater flows received by the WPCP in wet weather. The NYCDEP relies on this report for WPCP flow projections. This report includes a range of high and low flows. An evaluation of existing data since 1998 has demonstrated that the low-end flow projections are a more reliable estimate of actual flows and these projections have, therefore, been used for this analysis. The 2010 Future With the Proposed Action flow was estimated to be 137 mgd based on the estimated 2010 Future Without the Proposed Action flow of 135.5 mgd and the incremental change of 1.5 mgd due to the Proposed Action, as discussed within Chapter 16 - Infrastructure. Future average daily flow predictions are overstated because no credit was taken for the benefits realized from the: (1) implementation of the Amended Drainage Plan which would separate sanitary and stormwater in four sub-drainage areas within the Project Area, and (2) regulator upgrades, as described in Chapter 16, "Infrastructure". These separate storm sewers would discharge storm water directly to the Hudson River and thus reduce flows being directed to the combined sewer. Therefore, the water quality assessment related to the North River WPCP flows is conservative.

(b) North River CSOs

In addition to an assessment of the water quality impacts due to the North River WPCP, potential water quality impacts due to CSOs within the WPCP drainage area were evaluated with and without the Proposed Action. For the analysis of CSOs, the projected North River WPCP effluent flows were calculated based upon the 2003 average dry weather flow of 122 mgd and the projected dry weather flows in the Future Without the Proposed Action as derived from the 1998 NYCDEP report. The projected 2010 Future Without the Proposed Action North River WPCP flow would be 125.5 mgd. Predictions of the potential impacts related to CSOs are overstated because no credit was taken for the benefits realized from the implementation of the Amended Drainage Plan which would separate sanitary and stormwater in four sub-drainage areas within the Project Area, and regulator upgrades, as described in Chapter 16, "Infrastructure". These separate storm sewers would discharge storm water directly to the Hudson River and thus reduce flows being directed to the combined sewer. Therefore, the water quality assessment CSOs within the North River drainage area is conservative.

The 2010 Future With the Proposed Action flow was estimated to be 127 mgd, based upon the incremental change due to the Proposed Action of 1.5 mgd, as presented within Chapter 16, "Infrastructure."

2025

(a) North River WPCP

Potential water quality impacts with and without the proposed Hudson Yards Project were also calculated for the year 2025. The North River WPCP effluent flows were calculated based on the 2003 average daily flow and the projections presented in the "New York City Water Demand and Wastewater Flow Projections" August 1998 report. The estimated 2025 Future Without the Proposed Action North River WPCP flow would, therefore, be 142.9 mgd.

The 2025 Future With the Proposed Action flow was estimated to be 150 mgd based upon the incremental change of 7.1 mgd due to the full implementation of the Proposed Action, as discussed within Chapter 16, "Infrastructure." For the reasons stated previously (under the 2010 North River WPCP assessment), the predicted average daily flows are conservative in nature.

(b) North River CSOs

For the 2025 Future With and Without the Proposed Action analysis of CSOs, the projected North River WPCP effluent flows were calculated based upon the 2003 average dry weather flow of 122 mgd and the projected dry weather flows in the Future Without the Proposed Action as derived from the 1998 NYCDEP report. The projected 2025 Future Without the Proposed Action North River WPCP flow would be 132.9 mgd. For the reasons stated previously (under the 2010 North River CSO assessment), the water quality analysis of CSOs is conservative.

The 2025 Future With the Proposed Action flow was estimated to be 140.0 mgd. This was based upon the estimated Future Without the Proposed Action flow of 132.9 mgd and the incremental change due to the proposed Hudson Yards project of 7.1 mgd, as presented within Chapter 16 – Infrastructure.

Pollutant Loading Estimates

(a) North River WPCP

Effluent pollutant loading data to the Hudson River from the North River WPCP for the various flow scenarios and the 2010 and 2025 Future With and Without the Proposed Action were calculated. The latest available monthly averages from 2003, as reported by the NYCDEP for the North River WPCP, were used along with the projected WPCP flows for both the 2010 and 2025 Future With and Without the Proposed Action to calculate the existing and projected future loadings. The total nitrogen, total phosphorus, total suspended solids, fecal coliforms, copper, lead, and zinc concentration monthly averages were used to calculate the existing and projected future loadings and are presented in Table 13-2. Loadings were calculated for the existing conditions, and for the 2010 and 2025 Future With and Without the Proposed Action. These loadings are presented in Table 13-3.

TABLE 13-2
NORTH RIVER WPCP EFFLUENT PARAMETERS

Month	Effluent Concentrations[1]					
	Cu (µg/L)	Pb (µg/L)	Zn (µg/L)	T-N (mg/L)	T-P (mg/L)	TSS (mg/L)
October	9.0	1.8	42.4	18.6	3.4	13.0
November	19.9	1.4	60.0	19.3	2.5	16.0
December	28.9	2.6	42.7	20.5	3.1	18.0
January	22.6	2.1	89.5	19.7	3.6	13.0
February	31.1	2.3	67.4	21.4	3.0	22.0
March	25.2	1.8	54.5	21.4	3.4	18.0
April	22.4	1.2	37.5	22.2	2.6	20.0
May	17.6	1.9	55.3	22.6	3.1	19.0
June	10.2	1.8	36.8	16.2	2.5	17.0
July	13.5	1.5	34.4	15.3	4.0	10.0
August	12.0	1.4	30.2	16.3	2.7	10.0
September	13.6	2.5	38.5	18.5	4.4	12.0
Average	18.8	1.9	49.1	19.3	3.2	15.7

Source: "Operating Data, Fiscal Year 2003," NYCDEP - Bureau of Wastewater Treatment, Process Engineering Section

Note: 1 Basis - 2003 Simulation Conditions, Non-reactive Substance

TABLE 13-3
2010 AND 2025 FUTURE WITH AND WITHOUT PROPOSED ACTION: SUMMARY OF NORTH RIVER WPCP EXISTING AND PROJECTED FUTURE EFFLUENT DISCHARGES

Parameter	Units	Existing Conditions 2003	Future Without the Proposed Action		Future With the Proposed Action		SPDES Effluent Permit Limit[3]
			2010	2025	2010	2025	
		Average Effluent[2]	Average Effluent	Average Effluent	Average Effluent	Average Effluent	
Average Daily Flow	mgd	132	135.5	142.9	137	150	170
$CBOD_5$	mg/L	16.7	16.7	16.7	16.7	16.7	25
$CBOD_5$	lbs/day	18,358	18,844	19,874	19,053	20,861	35,445
$CBOD_5$ Removal	%	88.4	85-	85	85	85	85
Suspended Solids[1]	mg/L	15.7	15.7	15.7	15.7	15.7	30
Suspended Solids	lbs/day	17,256	17,714	18,681	17,910	19,609	43,000
Suspended Solids Removal	%	89.5	85-	85	85	85	85
Fecal Coliform	MPN/100ml	47	47	47	47	47	200
Organic Nitrogen	lbs/day	4,250	4,363	4,601	4,411	4,829	-
Ammonia	lbs/day	16,825	17,271	18,214	17,462	19,119	-
TKN	lbs/day	21,075	21,633	22,815	21,873	23,948	-
Nitrate	lbs/day	133	137	144	138	151	-
Nitrite	lbs/day	83	85	89	86	94	-
Total Phosphorus	lbs/day	3,509	3,602	3,799	3,642	3,988	-
PO_4	lbs/day	2,465	2,530	2,668	2,558	2,801	-
Copper	lbs/day	20.7	21.3	22.5	21.5	23.6	-
Zinc	lbs/day	54.1	55.5	58.5	56.1	61.4	-
Lead	lbs/day	2.1	2.1	2.2	2.1	2.3	-

(1) 30-day average.
(2) Data from "Operating Data, Fiscal Year 2003," NYCDEP - Bureau of Wastewater Treatment, Process Engineering Section.
(3) Limits set forth in Draft North River WPCP SPDES Permit No. NY-0026247; February, 2004, where a dash (-) appears there are no existing SPDES Effluent Limits

(b) North River CSOs

Pollutant loading data to the Hudson and Harlem Rivers within the North River WPCP drainage area were calculated for the various flow scenarios for the 2010 and 2025 Future With and Without the Proposed Action. Since CSOs are comprised of a mixture of both raw sanitary water and stormwater, the percentage of sanitary water and stormwater were computed for each discharge event and for each individual CSO. The mixture of sanitary water and stormwater was used to calculate the total CSO discharge. However, predictions of the potential impacts related to CSOs are overstated because no credit was taken for the benefits realized from the implementation of the Amended Drainage Plan which would separate sanitary and stormwater in four sub-drainage areas within the Project Area, and regulator upgrades, as described in Chapter 16, “Infrastructure”. These separate storm sewers would discharge storm water directly to the Hudson River and thus reduce flows being directed to the combined sewer. Therefore, the predicted pollutant loadings from CSOs within the North River drainage area is conservative.

Sanitary copper, lead and zinc concentrations used were based on the maximum monthly average concentrations measured in the influent of the North River WPCP and the total nitrogen, phosphorus and suspended solids concentrations were the yearly averages from 2003. The stormwater concentrations are based on historical concentrations as reported in Harbor Estuary Program (HEP) Report 7.1 (1994).

TABLE 13-4
INCREMENTAL CHANGES IN AVERAGE CSO EVENT MASS DISCHARGES

Water Quality Constituent	Changes From the Current Conditions			
	2010 Without Proposed Action	2010 With Proposed Action	2025 Without Proposed Action	2025 With Proposed Action
Total Suspended Solids - TSS	150	212	484	778
BOD-5	90	126	290	466
Total Nitrogen - TN	20.2	28.5	65.3	104.8
Total Phosphorus - TP	3.5	4.9	11.2	18.1
Total Coliform Bacteria	2.6%	3.7%	8.5%	13.6%
Zinc	0.6	0.9	2.0	3.2
Lead	0.1	0.2	0.3	0.6
Copper	0.2	0.3	0.7	1.1

Note: Numbers represent pounds of each constituent per event except for coliform bacteria.

Water Quality Modeling

(a) Land-Side Modeling

As described in Appendix N, InfoWorks is a detailed hydraulic model used to determine runoff flows, water surface elevations and flows within sewers for the evaluation of sewer conditions, for the evaluation of CSO overflows, and for developing pollutant loadings to receiving water quality models. The results of the model simulations were used to determine the annual overflow volumes and pollutant loadings for the CSOs in the North River WPCP drainage area and the Hudson Yards study area for the 2010 and 2025 Future With and Without the Proposed Action. These predictions are conservative because no credit was taken for the benefits realized from the implementation of the Amended Drainage Plan which would separate sanitary and stormwater in four sub-drainage areas within the Project Area, and regulator upgrades, as described in Chapter 16, “Infrastructure”.

(b) Surface Water Modeling

A modeling framework was also used to evaluate the potential impacts of the North River WPCP and the North River CSOs upon water quality for 2010 and 2025 Future With and Without the Proposed Action. The System Wide Eutrophication Model (SWEM), a three-dimensional, time-variable, coupled hydrodynamic/eutrophication model of the New York/New Jersey Harbor – New York Bight system was used for this assessment. Appendix N describes, in more detail, the SWEM model and its current use in the Harbor.

Simulations for all parameters utilized a standardized rainfall condition, specifically 1988. The year 1988 has been chosen as the base year for NYCDEP's Use and Standards Attainment and the Long Term CSO Control Plan projects for all of New York City; has been used as the base year for the Long Island Sound TMDLs; and is being used as the base year for New York Harbor nutrient and pathogen TMDLs. In addition, the New Jersey Department of Environmental Protection requires communities in New Jersey to use 1988 rainfall data to develop their Phase II Long Term CSO Control Plans, including discharges to the Hudson River.

In order to provide for a conservative analysis, total nitrogen, total phosphorus, total suspended solids, copper, lead, and zinc were considered to be non-reactive substances and this assumed that their concentrations would not be reduced by normal chemical, physical and biological interactions. The responses for these conservative substances and total coliforms were calculated using the pathogen model (PATH), which is a model based on SWEM hydrodynamics, that has the capability to include coliform kinetics and trace conservative material. Since the conservative substances and coliform bacteria react linearly (i.e., responses are directly proportional to the input pollutant loads), the analysis was performed by inputting a unit load, calculating the receiving water response, and then proportioning the responses based on the projected incremental loads and flows for each scenario. The incremental responses for each scenario were then compared to existing water quality data.

2. Study Area

The overall study area comprises two major components due to their geographic separation: the Hudson Yards study area in Manhattan; and the Corona Yard study area in Queens. The Hudson Yards study area contains three components: (1) the Project Area as described in Chapter 1, "Project Purpose and Need," (2) the area west of the Hudson Yards Project Area to the Hudson River; and (3) the Hudson River directly west of the Hudson Yards Project Area, within New York State waters extending north to Pier 90 at West 49th Street and south to Pier 59 at West 18th Street. The Corona Yard study area covers the MTA property, adjacent to Flushing Creek, which is characterized by heavy commercial and light industrial uses.

3. Regulations

A number of federal and state agencies have jurisdiction over elements of the aquatic and terrestrial environment. Regulations pertaining to floodplains, wetlands, surface water, groundwater, and ecologically sensitive species/areas are discussed below.

a) Floodplains

Stormwater is conveyed to a receiving body of water via the land's drainage system. An important component of this system is the floodplain, or the area low enough in elevation to hold floodwaters during large storm events. When the banks of rivers or streams overflow during a storm, the wide, flat floodplain disperses the water, reduces its velocity and force, and absorbs water into the soil. The floodplain permits the water to flow more slowly and, in some cases, allows vegetation to remove pollutants. Thus, it is a very important element in protecting water resources.

Regulated floodplain areas are defined by the Federal Emergency Management Agency (FEMA) and include areas that flood during storms that have a one percent chance of occurring in any given year, which is equivalent to the likelihood of a storm occurring once every 100 years (100-year storm). FEMA also maps the 500-year floodplain, but these areas are not regulated. Federal regulations require an analysis of impacts and options to avoid floodplain encroachment. FEMA is responsible for mapping and regulating floodplain areas. Federal regulations stipulate that in the case of a “significant encroachment” on the floodplain by a proposed project, a finding of an “only practicable alternative” is required. While a project may encroach on the 100-year floodplain, this encroachment may not be seen as significant. In addition to federal requirements, the New York State Department of Environmental Conservation (NYSDEC) Environmental Conservation Law regulations (6 NYCRR Part 502) require that State agencies contemplating projects within the floodplain consider the effect of these actions individually as well as cumulatively with other projects in the vicinity.

New York City’s Local Law 33 of 1988 regulates construction in the 100-year floodplain. In all cases, habitable structures must be flood-proofed or raised above the 100-year floodplain. Finally, all federal agencies must comply with Executive Order No. 11988 of May 24, 1977 concerning Floodplain Management, which states that each agency has “a responsibility to evaluate the potential effects of any action it may take on the floodplain; to ensure that its planning programs and budget reflect consideration of flood hazards and floodplain management; and to prescribe procedures to implement the policies and requirements of this Order.”

b) <u>Wetlands</u>

Wetlands are transitional lands between terrestrial and aquatic systems, where the water table is usually at or near the surface, or the land is covered by shallow water. While there are many types of wetlands distinguished by specific ecological characteristics, there are two fundamental wetland types: tidal and freshwater. Freshwater wetlands have no saline input, whereas tidal wetlands can either be saline or freshwater, but are found in areas influenced by tides. Wetlands are a valuable resource, as they can be essential breeding, rearing, and feeding grounds for many species of fish and wildlife. They also perform flood protection and pollution control functions.

Tidal wetlands are regulated by both the NYSDEC and the U.S. Army Corps of Engineers (USACE). In addition to tidal wetland resources within New York City limits, the NYSDEC regulates a protective adjacent area, which extends 150 feet from the regulated wetland boundary. However, as defined by NYSDEC regulation, the seawall edge of existing “functional and substantial fabricated” structures (such as bulkheads, seawalls, rip-rap walls, etc.) that are greater than 100 feet in length may be considered as the limit of the regulated adjacent area. Except for very minor disturbances, activities within wetlands and adjacent areas cannot be undertaken without an appropriate permit from the USACE and/or NYSDEC.

Among other regulations, the USACE must comply with Executive Order No. 11990 concerning the protection of wetlands. This order requires that federal agencies shall avoid undertaking or providing assistance for new construction located in wetlands “unless the head of the agency finds (1) that there is no practicable alternative to such construction and (2) that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use.” The Order also provides that “in making this finding, the agency may take into account economic, environmental and other pertinent factors.” In practice, permission to disturb, fill, or otherwise remove a wetland can only be granted if there is no feasible alternative to avoid such action and if appropriate mitigation, such as replacement wetlands in another location, can be implemented. Activities in the wetland buffer areas are limited to those types of development that would not change natural drainage systems or require removal of vegetative cover.

c) Surface Water

Activities in and discharges to surface waters are regulated by federal, State, and local agencies through a number of permits and approvals, reflecting legislation and regulations promulgated at all levels of government. At the federal level, a number of programs address activities in navigable waters and protect the environment of these waters, such as the federal Clean Water Act of 1987. New York State classifies water quality for its surface water resources; issues permits for discharge to surface waters; identifies and protects wild, scenic, and recreational rivers; and oversees the State's Coastal Zone Management Program. New York City regulates discharges to its sewer system, which discharges to surface water bodies under the auspices of New York State.

d) Groundwater

All of Long Island, including Queens and portions of Brooklyn, is located above an EPA-designated sole source aquifer that supplies drinking water for southeastern Queens and Long Island. In 1984, the EPA designated the aquifer underlying Kings and Queens counties as a sole source aquifer, concluding that the system is the "principal source of drinking water" to the people of the southeastern portion of Queens County, and "there is no alternative source of drinking water supply which would replace these aquifers if they were contaminated" (FR Volume 16, Number 16, p. 2050, January 24, 1984). In addition, the geographic boundaries of Kings and Queens Counties are the recharge zone for the aquifers underlying the southeastern portion of Queens County. As a result, federally funded projects must be reviewed by the EPA to ensure that they do not adversely impact groundwater at this aquifer. This designation is made pursuant to the Safe Drinking Water Act (SDWA), Section 14-24(e).

Groundwater beneath Manhattan is not used for drinking water purposes. It is contained in igneous and metamorphic rock and is isolated geologically from the aquifer underlying Queens and Brooklyn.

e) Essential Fish Habitat

Several laws have been established to protect ecologically sensitive areas. In 1996, amendments to the Magnuson-Stevens Fishery Conservation and Management Act established Essential Fish Habitat (EFH) provisions to protect and enhance important habitats of federally managed marine and anadromous (fish that migrate up rivers from the sea to breed in freshwater) fish species. Congress defined EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity." Fish may change habitats in relation to the various seasons, life history stages, migration and geographic distribution, abundance, and interactions with other species. Federal agencies that fund, permit, or undertake activities that may adversely affect EFH must consult with the National Marine Fisheries Service (NMFS) about the potential impacts of their actions on EFH, and respond in writing to the NMFS's recommendations.

f) Threatened and Endangered Species

The Endangered Species Act of 1973 describes several categories of federal status for plants and animals designated by the Department of the Interior (DOI), Fish and Wildlife Service (USFWS). The regulations for the designations are contained in 50 CFR 17. The USFWS has jurisdiction over terrestrial and freshwater species; the NMFS is responsible for any endangered or threatened marine species found in the study area. Plants and animals can be listed as endangered or threatened, thereby receiving protection under federal law. Picking, damaging, or destroying any protected plants on property not owned by the individual is illegal. Hunting, importing, exporting, or possessing protected animals are also illegal. Under Section 7 of the Endangered Species Act, any federal agency that is sponsoring or assisting a project must coordinate with the DOI for a determination of impacts on protected plants and animals. Similarly, under New York State Environmental Conservation Law, the NYSDEC maintains a list of plant and animal species that are considered rare, threatened, endangered, or of special concern.

g) Migratory Birds

The Migratory Bird Treaty Act (16 USC §§703-712, July 3, 1918, U.S. as amended 1936, 1960, 1968, 1969, 1974, 1978, 1986, and 1989), implements the U.S. commitment to four bilateral treaties, or conventions (between the U.S. and Canada, Japan, Mexico, and the former Soviet Union) for the protection of a shared migratory bird resource. Each of the treaties protects selected species of birds and specifies basic closed and open seasons for hunting game birds. The Act makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase or barter, any migratory bird, or the parts, nests, or eggs of such a bird, except under the terms of a valid permit issued pursuant to federal regulations. Title 50, Section 10.13, of the Code of Federal Regulations (50 CFR 10.13) lists the bird species protected under the Migratory Bird Treaty Act.

h) Coastal Zone and Significant Coastal Fish and Wildlife Habitat Areas

The Federal Coastal Zone Management Act (CZMA) of 1972 was established to support and protect the distinctive character of the waterfront. The CZMA outlines standard policies to assist the states in implementing coastal management programs and in reviewing proposed development projects along coastlines. The New York State Department of State (NYSDOS) administers the Coastal Zone Management Program (CZMP) at the State level, which also provides for local implementation when a municipality adopts a local revitalization program. New York City Department of City Planning (DCP) administers the Local Waterfront Revitalization Program (LWRP) in New York City. Consistency review of the 10 coastal policies of the LWRP is discussed in Chapter 15, "Waterfront Revitalization Program."

C. EXISTING CONDITIONS - HUDSON YARDS STUDY AREA

This section describes the existing conditions of the natural resources of the Hudson Yards study area which includes the three component areas as described above. The majority of the properties that could directly or indirectly be affected by the Proposed Action within the Project Area consist of paved or other impervious areas.

1. Surface Water

a) Hudson River

The Project Area is separated from the Hudson River by Hudson River Park and Route 9A. The Hudson River, which flows roughly north-south, is a regionally significant productive estuary[2] and is one of a few major tidal rivers on the North Atlantic coast of the United States. The portion of the Hudson River located near the Project Area in Manhattan is known as the Lower Hudson Reach, a tidal estuary. The Lower Hudson Reach (Figure 13-1), which has been designated by the NYSDOS as a Significant Coastal Fish and Wildlife Habitat, stretches from the tip of Battery Park in lower Manhattan to the northern extent of Haverstraw Bay at Stony Point in Rockland County. The estuary includes all adjoining riverine and estuarine habitats, including open water and tidal wetlands.

The salinity of the Lower Hudson River Estuary varies twice a day with the tidal cycle and on a seasonal scale with the volume of freshwater entering the system from upstream. Typically, freshwater input is lowest in the summer and early fall, when saline waters extend further upstream. Ristich et al. (1977) classified the Lower Hudson River estuary as polyhaline (salinity in the range of 18 to 30 parts per thousand [ppt]) in late summer and fall and mesohaline (5 to 18 ppt) in the spring and early summer.

[2] An estuary is defined as a water passage where the tide meets a river current. As such, this environment is influenced by both fresh water and sea water.

The Hudson River provides approximately 87 percent of the total riverine flow into New York Harbor. The approximate freshwater flow in the Lower Hudson River is between 19,000 and 20,000 cubic feet per second (cfs), while the average tidal flow of the Hudson River at the Battery is much higher on average, measuring approximately 425,000 cfs. Flushing time, or the length of time it takes for water from the Hudson River to replace water in the estuary, varies from month to month and location to location in the estuary. Based on the ratio of water volume to annual freshwater flow, the NYSDEC estimates that flushing time in the Lower Hudson River Estuary ranges from 15 days during the spring to 45 to 60 days during the summer.

In general, average surface water temperatures within the Lower Hudson River Estuary follow mean air temperature, with temperatures ranging from 32 degrees Fahrenheit (32°F) in the winter to approximately 80°F in the summer. Temperature decreases toward the Battery in the spring and summer as colder saline water enters with the tidal flow.

Water quality in the Hudson River is monitored by the NYCDEP as part of the New York Harbor Water Quality Survey. The Hudson Yards study area includes a portion of the Inner Harbor, which extends from the New York City/Westchester County border through the Battery to the Verrazano Narrows. Several indicators of water quality are used to provide information related to sanitary quality, ability to sustain aquatic life, ecosystem productivity, and aesthetics, including levels of dissolved oxygen (DO – the amount of oxygen dissolved in the water column; needed for respiration of oxygen-based forms of aquatic life), water clarity, coliform bacteria levels (indicative of untreated sewage), plankton concentrations, and the amount of nutrients in the water (e.g., phosphorus and nitrogen). High levels of nutrients have a detrimental effect on water quality, because they result in excess plant growth such as phytoplankton and algal blooms, which adversely affect habitat quality. Illegal connections to the city combined sewer system, equipment malfunction, and CSOs during and immediately after periods of heavy, sustained rainfall are the primary regional sources of fecal coliform for the Inner Harbor area.

Water quality in the Harbor has shown consistent gradual improvement over the past 30 years (NYCDEP 2003). Over the past 10 years, water quality improvements have leveled, with the last significant improvement occurring in 1992 after the 1991 upgrade of the North River Treatment Plant to secondary treatment (NYCDEP 2003). Coliform bacteria and DO levels are used in NYSDEC standards to quantify ecosystem health or degradation. The NYCDEP also measures chlorophyll *a*, a green plant pigment present in phytoplankton, and water clarity as part of their survey.

In 2003, the North River WPCP treated an average daily flow of 132 mgd, which included sanitary and stormwater flows received by the WPCP, and an average dry weather flow of 122 mgd. Table 13-3 includes a summary of the 2003 effluent discharge. In addition, CSOs located within the overall North River WPCP drainage area discharge to the Hudson River and northern portions of the Harlem River above West 190th Street (see Table 13-5, Table 13-6 and Table 13-7).

A review of the most recently available NYSDEC and USEPA databases and the February 2004 Draft (SPDES Permit NY-0026247) for the North River WPCP indicated that there were 40 permitted CSOs outfalls and two permitted industrial discharges to the Hudson River in the North River WPCP drainage area. These are shown in Tables 13-5 and 13-6, respectively, and are illustrated in Appendix N. In addition, 13 CSO outfalls are located within that portion of the Harlem River, which is also within the North River WPCP drainage area. There are no industrial discharges to the Harlem River in the North River WPCP drainage area. The CSOs within the Harlem River are presented in Table 13-7 and are illustrated in Appendix N.

The Hudson River has been classified by the NYSDEC as a Class I water, which indicates water suitable for secondary contact recreation (i.e., fishing and boating). NYCDEP maintains two sampling stations, N-3B and N-4, in the Hudson River for conventional pollutants and additional water quality data as part of its annual harbor survey. Station N-3B is located at West 125th Street and Station N-4 is located at West 42nd Street. In addition, during 1991 as part of a USEPA study (the most recent extensive study of heavy metals in the Hudson), samples for ambient concentrations of several heavy metals were collected from stations throughout the harbor complex including the Hudson River. USEPA stations within the Hudson River include H2 at West 42nd Street, H3 at West 125th Street and H4 at Spuyten Duyvil. The locations of these Hudson River water quality stations are shown in Appendix N. Water quality data for the Hudson River are presented in Table 13-8. The Harbor Survey data in Table 13-8 represent average concentrations for sampling conducted during 2003, the most recent data available, unless otherwise specifically noted. The USEPA 1991 metals data are also presented in Table 13-8. The NYSDEC Class I water quality standards are also presented for comparison.

TABLE 13-5
NORTH RIVER WPCP DRAINAGE AREA: CSOS DISCHARGING TO THE HUDSON RIVER

Outfall Location	Permit Number	County	Receiving Water Body
West 152nd Street	NY0026247-002	New York	Hudson River
West 158th Street	NY0026247-003	New York	Hudson River
West 171st Street	NY0026247-004	New York	Hudson River
West 190th Street	NY0026247-005	New York	Hudson River
Dyckman Street	NY0026247-006	New York	Hudson River
Bank Street	NY0026247-019	New York	Hudson River
Jane Street	NY0026247-020	New York	Hudson River
Gansevoort Street	NY0026247-021	New York	Hudson River
s/o West 17th Street	NY0026247-022	New York	Hudson River
West 18th Street	NY0026247-023	New York	Hudson River
West 21st Street	NY0026247-024	New York	Hudson River
West 23rd Street	NY0026247-025	New York	Hudson River
n/o West 26th Street	NY0026247-026	New York	Hudson River
West 30th Street	NY0026247-027	New York	Hudson River
West 36th Street	NY0026247-028	New York	Hudson River
West 40th Street	NY0026247-029	New York	Hudson River
West 43rd Street	NY0026247-030	New York	Hudson River
West 44th Street	NY0026247-031	New York	Hudson River
West 46th Street	NY0026247-032	New York	Hudson River
West 48th Street	NY0026247-033	New York	Hudson River
West 50th Street	NY0026247-034	New York	Hudson River
West 56th Street	NY0026247-035	New York	Hudson River
West 59th Street	NY0026247-036	New York	Hudson River
West 72nd Street	NY0026247-037	New York	Hudson River
West 80th Street	NY0026247-038	New York	Hudson River
West 91st Street	NY0026247-039	New York	Hudson River
West 96th Street	NY0026247-040	New York	Hudson River
West 106th Street	NY0026247-041	New York	Hudson River
West 115th Street	NY0026247-042	New York	Hudson River
St. Clairs Place	NY0026247-043	New York	Hudson River
West 138th Street	NY0026247-044	New York	Hudson River
West 66th Street	NY0026247-046	New York	Hudson River
West 47th Street	NY0026247-047	New York	Hudson River
West 42nd Street	NY0026247-048	New York	Hudson River
West 14th Street	NY0026247-049	New York	Hudson River
Bloomfield Street	NY0026247-050	New York	Hudson River
West 49th Street	NY0026247-051	New York	Hudson River
West 34th Street	NY0026247-052	New York	Hudson River
West 35th Street	NY0026247-053	New York	Hudson River
West 135th Street	NY0026247-056	New York	Hudson River

TABLE 13-6
NORTH RIVER WPCP DRAINAGE AREA: INDUSTRIAL DISCHARGES TO THE HUDSON RIVER

Point Sources			
Company Name	**Permit Number**	**County**	**Receiving Water Body**
North River WPCP	NY0026247	New York	Hudson River
59th Street Steam Station	NY0005134	New York	Hudson River

TABLE 13-7
NORTH RIVER WPCP DRAINAGE AREA: CSOS DISCHARGING TO THE HARLEM RIVER

Outfall Location	Permit Number	County	Receiving Water Body
West 128th Street	NY0026247-007	New York	Harlem River
West 216th Street	NY0026247-008	New York	Harlem River
West 215th Street	NY0026247-009	New York	Harlem River
West 211th Street	NY0026247-010	New York	Harlem River
West 209th Street	NY0026247-011	New York	Harlem River
West 207th Street	NY0026247-012	New York	Harlem River
West 206th Street	NY0026247-013	New York	Harlem River
West 205th Street	NY0026247-014	New York	Harlem River
West 203rd Street	NY0026247-016	New York	Harlem River
West 201st Street	NY0026247-017	New York	Harlem River
Highbridge Park	NY0026247-018	New York	Harlem River
Academy Street	NY0026247-045	New York	Harlem River
West 207th Street	NY0026247-055	New York	Harlem River

The water quality data for the Hudson River indicate that all of the water quality parameters reported were in compliance with NYSDEC Class I water quality standards and guidance values with the exception of mercury for USEPA stations H2-T, H2-B, H-3T, H-3B, H-4T, and H-4B.

b) Harlem River

CSOs within the North River WPCP drainage area are also located within the Harlem River adjacent to the northernmost portions of upper Manhattan. The Harlem River is also a NYSDEC Class I water, which is suitable for secondary contact recreation. NYCDEP maintains one sampling station, H-3, in the Harlem River for conventional pollutants, and additional water quality data as part of its annual harbor survey. In addition, data concerning ambient concentrations of several heavy metals were collected from stations in Harlem River by USEPA in 1991. These stations are shown in Appendix N. Water quality data for the Harlem River are presented in Table 13-9. The Harbor Survey data in Table 13-9 represent average concentrations for sampling conducted during 2003, unless otherwise specifically noted, and metals data for station E-3 from 1991. The NYSDEC Class I water quality standards are also presented for comparison.

Data for the Harlem River indicate that all of the water quality parameters reported were in compliance with NYSDEC Class I water quality standards and guidance values with the exception of mercury for Station E-3.

TABLE 13-8
HUDSON RIVER WATER QUALITY AND METALS DATA

		Average Concentration								
		Station								NYSDEC Class I Standards
Parameter	Units	N-3B[1]	N-4[2]	H-2T[3]	H-2B[4]	H-3T[5]	H-3B[6]	H-4T[7]	H-4B[8]	
Dissolved Oxygen (surface/minimum)	mg/L	8.69[9]/ 5.51[10]	8.37[9]/ 5.71[10]	--	--	--	--	--	--	> 4.0
Dissolved Oxygen (bottom/minimum)	mg/L	6.95[9]/ 4.69[10]	6.69[9]/ 4.37[10]	--	--	--	--	--	--	> 4.0
BOD (surface)	mg/L	2.0[11]	1.9[11]	--	--	--	--	--	--	--
BOD (bottom)	mg/L	2.7[11]	2.6[11]	--	--	--	--	--	--	--
Total Coliform (surface)	MPN/100 ml	838[12]	1495[12]	--	--	--	--	--	--	< 10,000
Total Coliform (bottom)	MPN/100 ml	1411[12]	1316[12]	--	--	--	--	--	--	< 10,000
Fecal Coliform (top)	MF	94	85	--	--	--	--	--	--	< 2,000
Fecal Coliform (bottom)	MF	35	46	--	--	--	--	--	--	< 2,000
Total Suspended Solids (surface)	mg/L	13.12	12.7	--	--	--	--	--	--	--
Total Suspended Solids (bottom)	mg/L	71.23	42.53	--	--	--	--	--	--	--
Arsenic	µg/L	--	--	--	--	--	--	--	--	< 36 [13,14]
Cadmium	µg/L	--	--	0.08[13]	0.07[13]	0.06[13]	0.07[13]	0.07[13]	0.08[13]	< 7.7[13,14]
Chromium	µg/L	--	--	--	--	--	--	--	--	--
Copper	µg/L	--	--	2.14[13]	1.78[13]	2.00[13]	1.91[13]	1.67[13]	1.86[13]	< 5.6[14,15]
Lead	µg/L	--	--	0.16[13]	0.18[13]	0.13[13]	0.16[13]	0.15[13]	0.21[13]	< 8.0[13,14]
Mercury	µg/L	--	--	0.0053[13]	0.0033[13]	0.0027[13]	0.0033[13]	0.0068[13]	0.0064[13]	< 0.0026[13,14]
Nickel	µg/L	--	--	1.37[13]	1.39[13]	0.98[13]	1.03[13]	0.82[13]	1.14[13]	< 8.2[13,14]
Silver	µg/L	--	--	0.0133[13]	0.0121[13]	.0106[13]	0.0135[13]	0.0178[13]	0.0182[13]	--
Zinc	µg/L	--	--	7.23[13]	7.19[13]	3.76[13]	5.23[13]	5.82[13]	4.89[13]	< 66[13,14]
Cyanide	µg/L	--	--	--	--	--	--	--	--	< 1.0[14]
NH_3-N	mg/L	0.21	0.24	--	--	--	--	--	--	--
$(NO_3 + NO_2)$	mg/L	0.52	0.47	--	--	--	--	--	--	--
Total Phosphorous	mg/L	0.12	0.12	--	--	--	--	--	--	--
Chlorophyll-a	µg/L	6.6	6.3	--	--	--	--	--	--	--

(1) Average concentrations for 2003 NYCDEP Harbor Survey station N-3B, West 125th Street
(2) Average concentrations for 2003 NYCDEP Harbor Survey station N-4, West 42nd Street
(3) Average concentrations for 1991 USEPA Station H-2T, located on the surface at West 42nd Street
(4) Average concentrations for 1991 USEPA Station H-2B, located on the bottom at West 42nd Street
(5) Average concentrations for 1991 USEPA Station H-3T, located on the surface at West 125th Street
(6) Average concentrations for 1991 USEPA Station H-3B, located on the bottom at West 125th Street
(7) Average concentrations for 1991 USEPA Station H4-T, located on the surface at Spuyten Duyvil
(8) Average concentrations for 1991 USEPA Station H4-B, located on the bottom at Spuyten Duyvil
(9) Represents average between January and December 2003
(10) Minimum between June 1, 2003 and September 30, 2003
(11) Latest available data 1997
(12) Latest available data 1996
(13) Guidance values and data are for dissolved metals
(14) NYSDEC Guidance Value (NYSDEC TOGS 1.1.1, June 1998, errata January 1999 and addendum April 2000)
(15) Site specific chronic and acute criteria for dissolved copper in New York/New Jersey Harbor.

TABLE 13-9
HARLEM RIVER WATER QUALITY AND METALS DATA

Average Concentration				
		Station		NYSDEC Class I Standards
Parameter	Units	H3[1]	E3[2]	
Dissolved Oxygen (surface/minimum)	mg/L	7.03[3]/4.34[4]	--	> 4.0
Dissolved Oxygen (bottom/minimum)	mg/L	6.98[3]/4.28[4]	--	> 4.0
BOD (surface)	mg/L	2.3[5]	--	--
BOD (bottom)	mg/L	2.1[5]	--	--
Total Coliform (surface)	MPN/100 ml	1355[6]	--	< 10,000
Total Coliform (bottom)	MPN/100 ml	1244[6]	--	< 10,000
Fecal Coliform (top)	MF	305	--	< 2,000
Fecal Coliform (bottom)	MF	52[7]	--	< 2,000
Total Suspended Solids (surface)	mg/L	18.55	--	--
Total Suspended Solids (bottom)	mg/L	20.95	--	--
Arsenic	µg/L	--	--	< 36 [8,9]
Cadmium	µg/L	--	0.085[8]	< 7.7[8,9]
Chromium	µg/L	--	--	--
Copper	µg/L	--	2.63[8]	< 5.6[9,10]
Lead	µg/L	--	0.265[8]	< 8.0[8,9]
Mercury	µg/L	--	0.0036[8]	< 0.0026[8,9]
Nickel	µg/L	--	1.96[8]	< 8.2[8,9]
Silver	µg/L	--	0.0025[8]	--
Zinc	µg/L	--	10.04[8]	< 66[8,9]
Cyanide	µg/L	--	--	< 1.0[9]
NH_3-N	mg/L	0.306	--	--
(NO_3 + NO_2)	mg/L	0.497	--	--
Total Phosphorous	mg/L	0.162	--	--
Chlorophyll-a	µg/L	3.1	--	--

(1) Average concentrations for 2003 NYCDEP Harbor Survey Station H-3, East 155th Street
(2) Average concentrations for 1991 USEPA Station E-3, East 155th Street
(3) Represents average between January and December 2003
(4) Minimum between June 1, 2003 and September 30, 2003
(5) Latest available data 1997
(6) Latest available data 1996
(7) Latest available data 1999
(8) Guidance values and data are for dissolved metals
(9) NYSDEC Guidance Value (NYSDEC TOGS 1.1.1, updated June 1998)
(10) Site specific chronic and acute criteria for dissolved copper in New York/New Jersey Harbor

The USFWS has identified the Lower Hudson River Estuary area as a regionally significant nursery and wintering habitat for a number of anadromous fish species, including striped bass (*Morone saxatilis*), which require both saline and fresh water during their life cycle. Estuarine species, which can tolerate a wide range of salinities, as well as marine fish species and other aquatic species, also inhabit the area. The estuary also serves as a migratory route and feeding area for birds and fish that feed on the abundant vertebrate and invertebrate resources in this area. The estuary also includes a benthic ecosystem, an assemblage of plants and animals which inhabit the estuary bottom. The Lower Hudson River Estuary supports regionally significant fish populations, as well as populations of wintering and migratory birds that feed on fish and benthic resources. This is a primary nursery and overwintering area for striped bass in the Hudson River estuary. Striped bass from the Hudson River account for a large portion of the total North Atlantic population.

The Lower Hudson Reach estuary zone has characteristics similar to those of a marine habitat, exhibiting very strong semidiurnal (twice daily) tidal currents. This section of the Hudson River has the greatest mixing of river water and ocean water. The salt front, where the ocean water and lower salinity river water meet, also functions as a nutrient and plankton trap, making this zone of the Hudson River the most productive in terms of phytoplankton and zooplankton. Plankton are also carried into the lower estuary with ocean waters during flood tide. High turbidity[3] in this part of the estuary may limit primary productivity,[4] because sunlight can only penetrate the Hudson River's surface down to depths of three to 16 feet.

In the vicinity of the Hudson Yards study area, the Hudson River has an average width of about 5,000 feet, an average depth of approximately 40 feet, and semidiurnal tidal amplitude ranging from four to five feet. Navigable depth is maintained through periodic dredging by the USACE, with a minimum depth in the channel ranging from 30 to 36 feet. There is a narrow band of shallow subtidal flats along the shoreline. Most of the shoreline habitat has been extensively disturbed by bulkheads, piers, and landfill from industrial, commercial and residential development. During the mid-1800s with the advent of steamships and longer vessels requiring deeper berths, an international trade network using the Hudson River waterfront developed. To accommodate the new development, the shoreline was pushed farther west into the Hudson River using fill, debris and other material. In addition, the shoreline has current and historical land use consistent with marine commerce and the associated infrastructure. The Hudson River is classified as a Class I water, saline surface water, which is best suited for fishing and secondary contact recreation and for fish propagation and survival.

2. Groundwater

Groundwater is found in the pore spaces in between soil particles and in fissures and cracks in bedrock. Within the Hudson Yards study area, groundwater is typically found at approximately 10 feet below the ground surface. The groundwater quality is variable; however, groundwater within Manhattan is not used for potable water supply. Reservoirs located in the Croton, Catskill, and Delaware watersheds provide potable water to Manhattan.

3. Floodplains

As shown in Figure 13-4, the western portions of the Project Area are located within the 100-year floodplain. Flooding in this portion of the Project Area may be caused primarily by a combination of climatic conditions that may include abnormally high tides, strong southeasterly winds and abnormally severe precipitation events. The exact combination of climatic events, and the strength

[3] Turbidity is a measure of fine suspended matter in water, usually determined by measurements of light diffraction.

[4] Primary productivity is the quantity of organic matter synthesized from inorganic materials by plants.

and duration of these events, that will cause flooding is unknown. Recent storms which have flooded portions of lower Manhattan have not resulted in flooding of the Project Area.

4. Coastal Resources

The western portion of the Project Area (Figure 13-5) lies within New York City's LWRP (Chapter 15), which is part of the NYSDOS Coastal Zone Management Program (CZMP). This program addresses critical coastal planning issues, including waterfront redevelopment, harbor management, and habitat restoration.

Under 6 NYCRR Part 600, the NYSDOS, Division of Coastal Resources, designated the Hudson River as one of 15 Significant Coastal Fish and Wildlife Habitat areas in New York City. This designation is given to habitats that have been evaluated and rated by the NYSDOS, in cooperation with the NYSDEC, to be "protected, preserved, and, where practical, restored so as to maintain their viability as habitats." As such, land and water uses or development shall not be undertaken if such actions destroy or significantly impair the viability of an area as habitat. Indicators of a significantly impaired habitat include a reduction in carrying capacity, changes in community structure and productivity, and/or an increase in disease and mortality.

5. Wildlife

Wildlife species within the Hudson River study area are predominately aquatic organisms in the Hudson River and migratory species such as birds.

a) Plankton

In the Lower Hudson River Estuary, primary production is moderate and zooplankton populations are extremely variable; both estuarine and marine forms occur. The phytoplankton community is dominated by diatoms (i.e., *Skeletonema costatum* and *Thalassiosira* spp.) in the late winter to early spring. Even with relatively high nutrient concentrations, phytoplankton biomass in the Lower Hudson River Estuary is low (Hudson River Park Trust, 2001). Zooplankton are an important prey for bay anchovy and many juvenile fish in the estuary, including commercially and recreationally important species such as striped bass and white perch. Copepods dominate the zooplankton community throughout the year. Dominant species include: *Eurytemora affinia*, *Acartia* spp., and *Temora longicornis*. Meroplankton, those organisms that spend only part of their life cycle as plankton (i.e., benthic invertebrate larvae and fish larvae), dominate during the summer. Meroplankton are an important seasonal component of the zooplankton community and are important prey items for fish that feed on zooplankton. Zooplankton abundance is highly variable over time and space in the Lower Hudson River Estuary (Hudson River Park, FEIS, 1998). Abundances are generally highest in spring and lowest in mid-fall to early winter.

b) Benthos

The benthic invertebrate assemblages within the Lower Hudson River Estuary are relatively diverse. They live within the sediment and on the surfaces of hard substrates such as pilings, rocks, and debris. Benthic organisms that live on top of the sediment or other surface substrate are epifauna. Organisms that live within the sediment are infauna. Substrate type, including sediment grain size, primarily determines the type of benthic community present, along with current, salinity, and wave energy.

Common macroinvertebrates (i.e., those organisms retained on a 0.5 mm sieve) in the Lower Hudson River include: oligochaetes, polychaetes (dominants include *Streblospio benedicti*, *Scoloplos* spp., *Sabellaria vulgaris*), gastropods (mud dog whelk – *Illyanassa obsoletus*), bivalves (*Mulina lateralis* and *Mya arenaria*), barnacles (*Balanus improvisus*), bryozoans, sea squirts (*Mogula manhattensis*), amphipods, cumaceans, isopods (*Edotea triloba*), crabs (*Callinectes sapidus*, *Cancer irroratus*, and a variety of xanthids or mud crabs), and shrimp (*Palaemonetes* spp., *Crangon septemspinosa*) (Hudson

River Park Trust, 2001). Two marine woodborers are also present and have proliferated, due to the improving water quality in the estuary. The isopod *Limnoria* spp. (gribbles) and bivalve *Teredo* spp. (shipworms) cause severe damage to wooden pilings. These species have been present in the harbor since the 1800s. They may have arrived centuries ago on ships from early European vessels (Carlton 1992). With improving water quality in New York Harbor, these organisms have been able to increase in abundance and infest unprotected wood structures in the Harbor.

Shellfish species are present and include northern quahog (*Mercenaria mercenaria*), soft clam (*Mya arenaria*), and eastern oyster (*Crassostrea virginica*). Shellfish live and feed on the bottom of the waterbody and filter water for sustenance. The waters proximate to the Hudson Yards study area are not certified for human consumption of shellfish.

c) <u>Fish</u>

The Lower Hudson River Estuary contains a diverse population of finfish. A total of 140 fish species has been recorded within the estuary (Everly and Boreman, 1999). Of these, over 70 species have been documented in the Lower Hudson River Estuary (Woodhead, 1988, 1991). Fish populations in the Lower Hudson are relatively stable over time. Fish distribution within the Lower Hudson is affected by structural habitat, salinity, temperatures, and DO levels. Lower salinity regions contain a higher number of estuarine species, the most abundant being hogchoker (*Trinectes maculatus*), mummichog (*Fundulus heteroclitus*), and white perch (*Morone americana*) (Woodhead, 1991). This area is a spawning ground for anadromous fish and is also utilized as a nursery area for a variety of juvenile fish (Duffy-Anderson and Able, 1999).

Anadromous species include striped bass and the commercially important American shad (*Alosa sapidissima*), blueback herring (*Alosa aestivalis*), and alewife (*Alosa pseudoharengus*). Anadromous fish hatch eggs in the freshwater portions of the estuary and migrate to tidal waters. Juvenile stages of striped bass, tomcod, black sea bass, winter flounder, and tautog comprise a significant part of the spring-summer fish community. These five species of marine fish comprised 76 percent of the total catch for a 1994 spring-summer study (Able et al., 1995). It is suspected that portions of the Lower Hudson River provide nurseries for the American eel, striped bass, bluefish, and Atlantic tomcod (*Microgadus tomcod*).

The catadromous species, American eel (*Anguilla rostrata*), is also prevalent. Catadromous fish hatch at sea and migrate to freshwaters of the estuary.

Striped bass are anadromous, spawning in fresh or brackish estuarine waters in spring. Juveniles migrate to coastal waters during summer and fall. The Hudson River is recognized as a significant or potentially significant striped bass spawning area (Fay et al., 1983; Boreman and Austin, 1985; Richards and Deuel, 1987) and supports one of the four principal spawning stocks of this species. Adult striped bass are widely distributed along the Mid-Atlantic continental shelf. However, a substantial portion of the Atlantic coastal striped bass stock does not migrate far from their estuaries of origin (Kohlenstein, 1981; Waldman et al., 1990). Striped bass prey upon a variety of fish and crustaceans during their life cycle.

White perch are closely related to striped bass and are also abundant in estuaries and coastal bays along the Atlantic coast, from Nova Scotia to South Carolina. White perch are harvested commercially and recreationally throughout the New York Bight (the area of the Atlantic Ocean between Long Island and the New Jersey coastline). Spawning takes place in the upper reaches of tidal rivers during spring, and the young-of-year take up residence in tidal creeks and shallows. White perch are considered semi-anadromous; they do not undertake the extensive coastal migrations characteristic of striped bass, and generally remain in the estuary proper (Holsapple and Foster, 1975). White perch prey upon a variety of invertebrates and small fishes.

American eels are a catadromous species, with adults spawning in the central North Atlantic Ocean, and large numbers of larvae metamorphosing into juveniles (elvers) before migrating into estuaries, streams, and rivers along the Atlantic coast (Smith, 1968; Ogden, 1970; Wenner and Musick, 1975). The eels' geographical distribution ranges from Greenland to northern South America (Robins et al., 1986), with population concentrations in the North Atlantic. Eels remain in freshwater for up to 12 years before migrating seaward to spawn. Spawning migration occurs in the autumn, when mature eels begin to metamorphose into the silver eel stage (Kleckner et al., 1983). They then migrate seaward, spawn, and die. Larvae are transported inshore by the current, and elvers migrate upriver and into freshwater systems in late winter and early spring. American eels are primarily bottom-feeders, consuming a variety of benthic invertebrates, amphibians (in freshwater), and small fish. American eels are prey to a variety of larger predatory species, including bluefish and striped bass. American eels represent an important bait fishery resource in the New York Bight and Hudson River.

The shortnose sturgeon (*Acipenser brevirostrum*) historically supported a significant fishery in the New York Bight and was an important natural resource for indigenous populations along much of the U.S. east coast (Smith *et al.* 1984). The shortnose sturgeon is federally listed as an endangered species and is present from Nova Scotia to Florida (Gilbert 1989). It is anadromous, exhibiting a marked preference for freshwater habitats. In the Hudson River, the shortnose sturgeon spawns from April to May. Adult shortnose sturgeon migrate upriver from their mid-Hudson overwintering areas to freshwater spawning sites north of Coxsackie, New York. Spawning is not a yearly event for most shortnose sturgeon. Males spawn every other year and females every third year. Following spawning, spent adults move downriver, and enter coastal waters. Adults migrate upstream again in late fall to overwinter in deep river channels (Gilbert 1989). Sturgeon are well-adapted for feeding in soft sediments, using their barbels and "vacuuming" the substrate with their protruding mouths. Principal prey items include mollusks, polychaetes, crustaceans, and small demersal fishes, such as the sand lance.

d) <u>Amphibians and Reptiles</u>

Herpetiles are generally less common in estuarine waters than in freshwater systems. As such, amphibians and reptiles are generally uncommon in the Lower Hudson River Estuary. Potential occurrences include the estuarine northern diamondback terrapin (*Maclemys t. terrapin*) and four species of threatened or endangered marine turtles, including the loggerhead *(Caretta caretta)*; green *(Chelonia mydas)*; leatherback *(Dermochelys coriacea)*; and Kemp's Ridley (*Lepidochelys kempi*). The northern diamondback terrapin feeds and nests in salt marshes and adjacent uplands in the general New York Harbor area. This habitat is not present within the Project Area.

e) <u>Mammals</u>

Mammals existing along the shores of the Hudson River may include the white-footed mouse (*Peromyscus leucopus*), muskrat (*Ondatra zibenthica*), river otter (*Lutra canadensis*), meadow mole (*Talipae* spp.), Norway rat (*Rattus norvegicus*), short-tailed shrew (*Blarina brevicauda)*, and the mink (*Mustela vison*). A majority of these mammals use the waters of the New York Bight and occasionally migrate into the New York Harbor, but are not commonly observed in the Lower Hudson River Estuary.

Marine mammals are uncommon in the Lower Hudson River Estuary. The harbor seal (*Phoco vitulina*) is the most likely to be observed, with occasional sightings of the grey seal (*Halichoerus grypus*) (Hudson River Park Trust 2001). Occasional sightings of whales and porpoises usually indicate unhealthy or injured individuals. Historic records indicate that harbor porpoise may have been a regular visitor to the harbor.

f) Avian Species

This section of the Hudson River has significant concentrations of wintering waterfowl, including a large number of Canvasback (*Aythya valisneria*), with lesser numbers of Scaup (*Athya* spp.), Mergansers (*Mergus* spp.), Mallard (*Anas platyrhynchos*), and Canada Goose (*Branta canadensis*). Bald Eagles (*Haliaeetus leucocephalus*) have recently been observed wintering along the Lower Hudson Reach, with roost sites in the Palisades.

Aquatic birds commonly observed on the Hudson River include geese, swans, and surface-feeding ducks such as Mallards, Black Ducks (*Anas rubripes*), and Wood Ducks *(Aix sponsa)*. Also observed are diving ducks such as Scaups, Canvasbacks, Buffleheads *(Bucephala albeola)*, and Mergansers. Waterfowl located in the Study Area include Mallard, Black Duck, Canada Goose, and Gadwall *(Anas strepera)*. Barn Swallows *(Hirundo rustica)* have been observed breeding under the piers in the lower Hudson. The primary use of the New York Harbor as a wintering area occurs during fall migration, when some waterfowl species migrate south along the Hudson River and along the Atlantic Coast. Bird species depend on the food resources of New York Harbor. Common shorebirds near the Project Area include Killdeer *(Charadrius vociferous)*, Spotted Sandpiper *(Actitis macularia)*, Least Sandpipers (*Calidris minutilla*), Greater Yellowlegs (*Tringa melanoleuca*), Snowy Egret *(Egretta thula)*, Least Bittern *(Ixobrychus exilis)*, Green Heron *(Butorides virescens)*, and Great Blue Heron *(Ardea herodias)*. However, shorebirds are not commonly observed foraging in the study area, due to the proximity of better habitat present within the lower New York Harbor.

Within the New York Harbor area and Manhattan, known nesting populations include Peregrine Falcon *(Falco peregrinus)*, heron, gull, geese, waders, and the Common Barn Owl (*Tyto alba*). The Short-eared Owl (*Asio flameus*) and Long-eared Owl (*Asio otus*) also overwinter in the area and can be found along the Hudson River.

In addition, New York City is within an important migration corridor and provides stopover habitat for Neotropical migrant songbirds (migratory bird species that nest in North America north of the U.S.-Mexico border and Caribbean and winter in the Neotropical region south of the continental U.S.) in the New York Bight watershed. Surveys of migrating birds in open spaces in the New York City metropolitan area have revealed a high abundance and diversity of such birds. A large number of migratory birds are funneled through the City by the coastline orientation as well as other geographic features. Common species (exclusive of pigeons and mourning doves) present within the project area include House Wren (*Troglodytes aedon*), Yellow Warbler (*Dendroica petechia*), Song Sparrow (*Melospiza melodia*), American Robin (*Turdus migratorius*), Gray Catbird (*Dumatella carollinensis*), Black-throated Blue Warbler (*Dendroica caerulescens*), Oven Bird (*Seiurus aurocapillus*), White-throated Sparrow (*Zonotrichia albicollis*), Dark-eyed Junco (*Junco hyemalis*), Black-and-white Warbler (*Mniotilta varia*), Common Yellowthroat (*Geothlypis trichas*), and Blackpoll Warbler (*Dendroica striata*).

6. Wetlands

a) Freshwater Wetlands

There are no freshwater wetlands located within the Hudson Yards study area.

b) Tidal Wetlands

A portion of the Hudson River included in the Hudson Yards study area is mapped by the NYSDEC as a Tidal Wetland Littoral Zone (LZ - all lands under tidal water less than six feet deep at mean low water).

7. Upland Resources

Upland resources include all natural areas that are not water or wetland resources. Upland resources encompass a variety of habitats and are generally defined by their vegetation. The Project Area supports little vegetation, as most of the area has been developed or is comprised of impervious surfaces. Similar to conditions in other sections of Manhattan, existing vegetation includes predominately ornamental and invasive tree/shrub species and does not provide habitats for wildlife species other than typical urban species (e.g., mice, rats, pigeons).

8. Built Resources

The entire shoreline near the Project Area is man-made. Bulkhead types along the Hudson River include concrete or granite vertical walls rising from the mudline to the bulkhead, and a platform with piles extending from the mudline of the low-tide water line. Rip-rap (large stones) protects portions of the shoreline, including the area south of Pier 76 at approximately West 34th Street. There are a number of piers/platforms present within the study area, several of which are operational, while some are in disrepair.

The existing operational and deteriorated piers provide habitat and protective structure for certain marine species, including algae, mussels, and barnacles, as well as clams, striped bass, winter and summer flounder, American eel, Atlantic herring, white perch, bay anchovy, and other species. In addition, the older piers may provide habitat for a number of bird and other wildlife species, due to the lack of human activity in the area and their proximity to water.

9. Significant, Sensitive, or Designated Resources

The Lower Hudson Reach, which extends from Battery Park to Stony Point, was designated as a significant habitat in August 1992. This designation requires a coastal consistency review for proposed projects within the designated area pursuant to the CZMA.

All coastal resources are considered important by New York State and New York City, and are protected by the State’s Coastal Management Program and the City’s Local Waterfront Revitalization Program. The western portion of the proposed Project Area along the Hudson River lies within the coastal zone, as shown in Figure 13-3.

The Lower Hudson Reach, located near the Project Area, has been designated as one of 15 Significant Coastal Fish and Wildlife Habitat areas in New York City. This designation is given to habitats that have been evaluated and rated by NYSDOS, in cooperation with NYSDEC, to be “protected, preserved, and, where practical, restored so as to maintain their viability as habitats.”

A portion of Hudson River Park has been designated as the Hudson River Park Estuarine Sanctuary. It encompasses all of the inter-pier and under-pier marine environments of the Hudson River located from Battery Park City to Pier 99 at West 59th Street and from the onshore bulkhead of the Park to the offshore pier-head line. The approximately 400-acre sanctuary represents over 70 percent of Hudson River Park’s surface area.

The Estuarine Sanctuary was established by the Hudson River Park Act in 1998 as part of Hudson River Park. The legislature required an Estuarine Sanctuary Management Plan (ESMP) addressing issues in environmental education and research, public recreation and water use, and environmental protection and monitoring.[5] The Hudson River Park Trust (HRPT) Board of Directors approved the ESMP on September 26, 2002. The plan is subject to continual review, with specific updates every three years.

[5] www.hudsonriverpark.org/policies/sanctuary.html

a) <u>Threatened & Endangered Species/Protected Species</u>

The USFWS, NYSDEC Region 2, and NYSDEC Natural Heritage Program were contacted regarding the presence of federally and State-listed or proposed rare, threatened, or endangered species in the vicinity of the Project Area. The NMFS was also contacted regarding endangered or threatened marine species within the vicinity of the study area. Agency correspondence is provided in Appendix N.

Correspondence with representatives of USFWS indicated that no known federally listed or proposed endangered or threatened species exist in the Project Area, except for occasional transient individuals. In addition, no habitat within the study area, under provisions of the Endangered Species Act and under the jurisdiction of the USFWS, is designated or proposed as a critical habitat. The peregrine falcon (*Falco peregrinus*), which nests in Manhattan but not within the Project Area, is listed by the State of New York as endangered, but is not listed as threatened or endangered by the USFWS.

According to the NMFS, federally listed endangered species in New York that may exist in the Hudson River include the shortnose sturgeon, the leatherback turtle, the hawksbill turtle *(Eretmochelys imbricata)*, and the Atlantic Ridley turtle. In addition, threatened marine species in the study area may include the green turtle and the loggerhead turtle. Of the species listed above, the shortnose sturgeon is the only species known to occur in the Hudson River, with the remaining species being only transient through the area.

b) <u>Essential Fish Habitat</u>

Current fishery management plans (FMPs) of the Mid-Atlantic Fishery Management Council (MAFMC) and the New England Fishery Management Council (NEFMC) designate essential fish habitat (EFH) for the vast majority of federally regulated species occurring within the New York Bight and Harbor area. The Sustainable Fisheries Act of 1996 (SFA) requires the appropriate fishery councils to identify these EFHs within their jurisdiction to better manage and conserve each species. For the New England and Mid-Atlantic regions, EFH has been identified for a total of 59 federally managed species covered by 14 FMPs, under the auspices of the NEFMC, MAFMC, South Atlantic Fishery Management Council, or NMFS.

NMFS, in its letter dated May 21, 2003 (Appendix N), noted that portions of the Hudson Yards study area have been designated as EFH for one or more species, but did not provide specific indications as to which species are included. Based on a review of existing information, it appears that the Hudson River adjacent to Hudson Yards may provide EFH for several species, including winter flounder, summer flounder, scup, Atlantic herring, and red hake. A specific description and identification of EFH is provided below.

The study area includes a portion of the Hudson River Estuary that has been identified as an EFH for 15 species of fish. The species and life stages for the Lower Hudson River are shown in <u>Table 13-10</u>.

TABLE 13-10
LIFE STAGES OF FISH SPECIES WITH DESIGNATED ESSENTIAL FISH HABITAT IN THE LOWER HUDSON RIVER

Species	Eggs	Larvae	Juveniles	Adults
Red Hake (*Urophycis chuss*)		x	x	x
Winter Flounder (*Pleuronectes americanus*)	x	x	x	x
Windowpane Flounder (*Scopthalmus aquosus*)	x	x	x	x
Atlantic Sea Herring (*Clupea harengus*)		x	x	x
Bluefish (*Pomatomus saltatrix*)			x	x
Atlantic Butterfish (*Peprilus triacanthus*)		x	x	x
Atlantic Mackerel (*Scomber scombrus*)			x	x
Summer Flounder (*Paralichtys dentatus*)		x	x	x
Scup (*Stenotomus chrysops*)	x	x	x	
Black Sea Bass (*Centropristus striata*)			x	x
King Mackerel (*Scomberomorus cavalla*)	x	x	x	x
Spanish Mackerel (*Scomberomorus maculatus*)	x	x	x	x
Cobia (*Rachycentron canadum*)	x	x	x	x
Sand Tiger Shark (*Odontaspis taurus*)		x		
Sandbar Shark (*Charcharinus plumbeus*)		x		x

Source: National Marine Fisheries Service (NMFS). "Summary of Essential Fish Habitat (EFH) Designation" at www.nero.noaa.gov/ro/STATES4/new_jersey/40407400.html

Note: NMFS 10' x 10' square with coordinates (North) 40o50.0' N, (East) 74o00.0' W, (South) 40o40.0' N, (West) 74o10.0' W.

D. 2010 FUTURE WITHOUT THE PROPOSED ACTION

Chapter 3, "Analytical Framework," provides a description of the 2010 Future Without the Proposed Action. Absent the Proposed Action, conditions are generally anticipated to remain the same as existing conditions; however, some commercial and residential development is anticipated, as described in Chapter 2, "Description of Proposed Action." Renovations to Hudson River Park are anticipated and include pier restoration as described in Table 13-11.

1. Surface Water

Based on the results of water quality monitoring conducted throughout the Harbor, including the Hudson Yards study area, recent trends in the improvement of water quality would continue (NYCDEP 2003), even with ongoing and planned activities within the Hudson River. There are periodic maintenance dredging projects within the Lower Hudson River to maintain water depths at a variety of pier berthing areas. In addition, there are proposed submarine infrastructure projects for the installation of power cables and other infrastructure that will likely be constructed by 2010. The Hudson River Park Trust (HRPT) also proposes to revitalize a number of the piers for park use and make modifications to others to serve ecological functions. Table 13-11 presents the condition, current use, and proposed future use of the piers within the study area. These projects would produce short-term impacts and are not expected to significantly impact the natural resources within the Lower Hudson River.

TABLE 13-11
CONDITION AND CURRENT USES OF PIERS 63 TO 83 WITH FUTURE USES PROPOSED BY HUDSON RIVER PARK TRUST

Pier	Cross Street(s)	Condition	Current Use	Future Use (HRP)
63	W. 22nd/23rd Streets	Two-story building on pier. Pier is constructed on timber and concrete piles.	Basketball City and Equestrian Center; Pier 63 Maritime - Historic Frying Pan Ship (NR) and Historic John J. Harvey Fireboat (NR)	Future Chelsea Waterside Park – would be a public park pier.
64	W. 24th Street	Deteriorated; closed to public.	Condemned/pier shed is empty.	Future Chelsea Waterside Park - would be a public park pier.
66a	W. 26th Street	Structure is partially submerged and deteriorating.	Baltimore and Ohio Railroad Float Transfer Bridge - NR and SR - listed (historic)	HRPT is currently restoring the structure - would be open to public in future.
66	W. 26th/27th Streets	Partially collapsed wooden deck.	Vacant/unstable due to pier condition	Would be rebuilt to provide public boat dock, boathouse, and viewing and sunning areas.
Heliport located between West 29th and 30th Streets along bulkhead.				
72	W. 32nd Street/Railyard	Partially collapsed wooden deck.	Condemned	Pier would be removed; its pilings would be retained to support wildlife.
76	W. 34th to 37th Streets (Across from Convention Center)	Pier is supported by concrete-encased pilings.	NYPD Tow Pound	At least 50 percent of Pier 76 would become part of HRP, after NYPD Tow Pound is relocated. The remainder would remain under City control and would likely be used for commercial purposes.
78	W. 37th/38th Streets	Privately owned.	NY Waterway Ferry Terminal and Bus service	Use to remain as NY Waterway Ferry Terminal.
79	W. 38th/40th Streets	Pile repairs and slips would need construction.	Lincoln Tunnel Vent Shaft bldgs. and bus garage for NY Waterway Ferry	Would become a ferry terminal and would include public access and viewing areas.
81	W. 41st Street	Tour boat traffic.	World Yacht and Circle Line	Future use to remain the same.
83	W. 42nd/43rd Streets	Tour boat traffic.	World Yacht and Circle Line	Future use to remain the same.

Source: Hudson River Park Trust, 2003

a) North River WPCP

Under the 2010 Future Without the Proposed Action, flows to the North River WPCP would continue to increase. An average daily flow of 135.5 mgd, which would include sanitary and stormwater flows accepted by the WPCP during wet weather, was projected for the North River WPCP without the Proposed Action. The average dry weather flow would be projected to be 125.5 mgd.

The estimated 2010 Future Without the Proposed Action of the North River WPCP is presented in Table 13-12 for the average effluent. As shown on Table 13-3, the SPDES permit limits would continue to be met for the average effluent month under the 2010 Future Without the Proposed Action for those parameters that have a limit under the current SPDES permit.

Utilizing the projected pollutant loadings from the North River WPCP for the 2010 Future Without the Proposed Action, the potential effects of the increased flows to the North River WPCP upon water quality within the Hudson River were calculated. These effects were evaluated through the use of the SWEM. The predicted concentrations for the maximum 24-hour condition and the maximum 30-day condition in the Hudson River for the 2010 Future Without the Proposed Action are presented in Table 13-12. The maximum 24-hour condition represents the maximum hourly concentration in the North River WPCP outfall receiving water segment. The maximum 30-day condition is the maximum monthly concentration in the North River WPCP outfall receiving water segment. These maximum values were selected as they would present a conservative assessment of the potential effects of the WPCP upon surface water quality.

Table 13-12 shows the incremental change in water quality concentrations and the projected water quality resulting from the projected 2010 Future Without the Proposed Action flow of 135.5 mgd. Dissolved oxygen levels in both the bottom and surface layers within the Hudson River near the North River WPCP would be predicted to decrease by between 0.005 to 0.006 mg/L for the maximum 24-hour condition and the maximum 30-day condition. This would largely represent no change in dissolved oxygen levels as a result of the increased flow. Since the predicted incremental change in dissolved oxygen is only on the order of six to seven thousandths of a mg/l, this level of change would fall within the range of instrument measurement error, and would essentially be non-detectable. Projected dissolved oxygen water quality concentrations would be predicted to remain above the NYSDEC Class I water quality standard of 4.0 mg/L.

In addition, the incremental change in total nitrogen, total phosphorus and total suspended solids concentrations would also be insignificant. Total nitrogen was calculated to increase by approximately 0.01 mg/L for both the maximum 24-hour and 30-day conditions, while total phosphorus and total suspended solids concentrations would remain the same.

Under the 2010 Future Without the Proposed Action condition, total coliforms were predicted to increase by one MPN/100mL for both the maximum 24-hour and the maximum 30-day conditions. Total coliforms would remain below the NYSDEC Class I water quality standard of 10,000 MPN/100ml.

Incremental changes in copper, lead and zinc concentrations within the Hudson River were also predicted to be insignificant with incremental changes of 0.03 μg/L or less. Projected copper, lead and zinc water quality concentrations would be expected to remain below the NYSDEC Class I water quality standards.

TABLE 13-12
2010 FUTURE WITHOUT THE PROPOSED ACTION: WATER QUALITY PREDICTIONS IN THE HUDSON RIVER NEAR THE NORTH RIVER WPCP

Parameter	Units	Existing Conditions 2003 (1)	2010 Future Without the Proposed Action: Maximum 24-Hour Change(8) Incremental(7) Change	2010 Future Without the Proposed Action: Maximum 24-Hour Change(8) Projected Water(10) Quality	2010 Future Without the Proposed Action: Maximum 30-Day Change(9) Incremental(7) Change	2010 Future Without the Proposed Action: Maximum 30-Day Change(9) Projected Water(10) Quality	NYSDEC Standard Class I Waters
Dissolved Oxygen (surface)(2)							
Summer Average(3)	mg/L	7.50	-0.005	7.50	-0.006	7.49	> 4.0
Absolute Minimum	mg/L	5.51	-0.005	5.51	-0.006	5.50	> 4.0
Dissolved Oxygen (bottom)(2)							
Summer Average(3)	mg/L	5.67	-0.005	5.66	-0.006	5.66	> 4.0
Absolute Minimum	mg/L	4.69	-0.006	4.68	-0.007	4.68	> 4.0
Total Nitrogen	mg/L	1.49	0.007	1.50	0.008	1.50	--
Total Phosphorus	mg/L	0.12	0.001	0.12	0.001	0.12	--
Total Suspended Solids	mg/L	71	0.006	71	0.009	71	--
Total Coliform(4)	MPN/100ml	1087	1	1088	1	1088	< 10,000
Copper(5,6)	µg/L	1.95	0.007	1.96	0.012	1.96	< 5.6
Lead (5,6)	µg/L	0.147	0.001	0.148	0.001	0.148	< 8
Zinc(5,6)	µg/L	4.49	0.018	4.51	0.026	4.52	< 66

(1) NYCDEP Harbor Survey Station N-3B - West 125th Street
(2) Dissolved oxygen data for 2003
(3) Summer average - June 1 to September 30
(4) Total coliform data for 1996
(5) USEPA Survey Station H3; 1991
(6) Existing conditions and standards for metals for dissolved form
(7) Incremental changes were calculated through the use of SWEM
(8) Maximum 24-hour change represents the maximum hourly change in the North River WPCP outfall receiving water segment
(9) Maximum 30-day change represents the maximum monthly change in the North River WPCP outfall receiving water segment
(10) Projected water quality due to incremental change represents the projected water quality concentration derived from the increase or decrease of the calculated incremental change from existing conditions

b) North River WPCP

In addition to an assessment of the potential effect of increased flows to the WPCP under the 2010 Future Without the Proposed Action, the potential effects upon CSOs and water quality were evaluated. The predicted concentrations for the maximum CSO effects to the Hudson and Harlem Rivers for the 2010 Future Without the Proposed Action were calculated with the SWEM and are presented in Table 13-13. The maximum CSO effect was defined as the maximum effect in the Hudson and Harlem Rivers within the North River WPCP drainage area. All other calculated effects to water quality were less than the value that has been presented in Table 13-13. The projected additional CSO volumes under the 2010 Future Without the Proposed Action would be 22 million gallons (mg) per year. Based upon the results of the model analysis, the maximum CSO incremental effects would occur within the Hudson River and these results are presented within Table 13-13. Table 13-13 shows the maximum incremental effects of the CSOs resulting from the projected 2010 CSO volumes, and the projected water quality concentrations based upon measured existing conditions.

Dissolved oxygen levels in both the bottom and surface layers within the Hudson River would be predicted to not change. Projected dissolved oxygen water quality concentrations would be predicted to remain above the NYSDEC Class I water quality standard of 4.0 mg/L. Incremental changes in total nitrogen, total phosphorus and total suspended solids concentrations due to CSOs in the 2010 Future Without the Proposed Action are also predicted to be insignificant.

The incremental maximum change in total coliforms was calculated to increase by less than 1 MPN/100ml and the total value would remain below the NYSDEC Class I water quality standard of 10,000 MPN/100ml.

The incremental maximum change in the copper concentration was calculated to be 0.03 μg/L. The incremental change to lead concentrations would be approximately 0.016 μg/L and for zinc 0.09 μg/L. The total copper, lead, and zinc water quality values would remain below the NYSDEC Class I water quality standard.

2. Wildlife

a) North River WPCP Discharges

As described above, in 2010 Without the Proposed Action there would be no significant changes in water quality conditions from North River WPCP discharges from current conditions. Therefore, aquatic biota community composition and characteristics in 2010 are expected to be similar to current conditions.

b) CSO Discharges

As described above, in 2010 Without the Proposed Action there would be no significant changes in water quality conditions from CSO discharges from current conditions. Therefore, aquatic biota community composition and characteristics in 2010 are expected to be similar to current conditions.

c) Shadows

In the Future Without the Proposed Action in 2010, the increment shadow duration from existing conditions within the study area portion of the Hudson River would range from over one and a half hours in the spring to over three and a half hours in the winter.

TABLE 13-13
2010 FUTURE WITH AND WITHOUT THE PROPOSED ACTION: WATER QUALITY PREDICTIONS OF THE POTENTIAL IMPACT OF NORTH RIVER WPCP CSOS

Parameter	Units	2003[1] Existing Conditions	Future Without Proposed Action: Incremental[7] Change	Future Without Proposed Action: Projected Water[9] Quality	Future With Proposed Action: Incremental[10] Change Due to Proposed Action	Future With Proposed Action: Projected Water[9] Quality	NYSDEC Standard Class I Waters
Dissolved Oxygen (surface)[2]							
Summer Average[3]	mg/L	7.5	-0.001	7.50	-0.001	7.50	> 4.0
Absolute Minimum	mg/L	5.51	-0.001	5.51	-0.001	5.51	> 4.0
Dissolved Oxygen (bottom)[2]							
Summer Average[3]	mg/L	5.67	-0.002	5.67	-0.001	5.67	> 4.0
Absolute Minimum	mg/L	4.69	-0.002	4.69	-0.001	4.69	> 4.0
Total Nitrogen	mg/L	1.49	0.003	1.49	0.001	1.49	--
Total Phosphorus	mg/L	0.12	0.001	0.12	0.000	0.12	--
Total Suspended Solids	mg/L	71	0.023	71	0.010	71	--
Total Coliform[4]	MPN/100ml	1087	4	1091	1	1092	< 10,000
Copper[5,6]	µg/L	1.95	0.035	1.98	0.014	2.00	< 5.6
Lead[5,6]	µg/L	0.147	0.017	0.164	0.007	0.17	< 8
Zinc[5,6]	µg/L	4.49	0.099	4.59	0.040	4.63	< 66

(1) NYCDEP Harbor Survey Station N-3B - West 125th Street
(2) Dissolved oxygen data for 2003
(3) Summer average - June 1 to September 30
(4) Total coliform data for 1996
(5) USEPA Survey Station H3; 1991
(6) Existing conditions and standards for metals for dissolved form
(7) Incremental changes were calculated through the use of SWEM
(8) Maximum impact represents the maximum impact in the Hudson and Harlem Rivers
(9) Incremental change plus existing represents the projected water quality concentration derived from the increase or decrease of the calculated incremental change from existing conditions
(10) Incremental change resulting solely from the implementation of the Proposed Action in 2010

E. 2010 FUTURE WITH THE PROPOSED ACTION

By 2010, it is expected that the No. 7 Subway Extension, Convention Center Expansion, and the Multi-Use Facility would be completed and some moderate levels of commercial and residential development would have occurred, as described in Chapter 2, “Description of the Proposed Action.” Completion of Phase II of the Convention Center Expansion is assumed for this analysis to capture the relative worst-case scenario in 2010. There would be no construction within the Hudson River under the Proposed Action in 2010.

1. Surface Water

a) North River WPCP

Under the 2010 Future With the Proposed Action, the estimated impact on the North River WPCP was calculated. The average effluent flow for the North River WPCP under the 2010 Future With the Proposed Action is presented in Table 13-3. Table 13-3 also shows the pollutant loadings for constituents of concern associated with this effluent flow. As shown on Table 13-3, the SPDES permit limits for the North River WPCP would be met for the average effluent flow under the 2010 Future With the Proposed Action for the parameters specified therein. For the reasons stated previously in the Methodology section, the predicted average daily flows to North River WPCP and the predicted CSOs are conservative and do not take credit for the benefits realized from the implementation of the Amended Drainage Plan which would separate sanitary and stormwater in four sub-drainage areas within the Project Area, and planned regulator upgrades.

For the 2010 Future With the Proposed Action, potential water quality impacts of additional effluent flows from the North River WPCP were assessed with the SWEM. Projected average daily effluent flows for the 2010 Future With the Proposed Action would be 137.0 mgd. This would include the 2010 Future Without the Proposed Action flow of 135.5 mgd, and the addition of the increment due to the Proposed Action of 1.5 mgd. Predicted water quality for 2010 Future With the Proposed Action is shown in Table 13-14.

The decrease in dissolved oxygen in the Hudson River due to the Proposed Action for both the maximum 24-hour impact and maximum 30-day impact would be less than the practical limits of quantification. Projected dissolved oxygen concentrations were predicted to remain above the NYSDEC Class I Water Quality Standard of 4.0 mg/L.

Total coliforms were predicted to remain constant for both the daily average and maximum monthly and would be below the NYSDEC Class I water quality standard of 10,000 MPN/100ml.

The incremental changes in total nitrogen, total phosphorus, total suspended solids, copper, lead and zinc concentrations in the Hudson River due to the proposed action were predicted to be insignificant. Projected water quality concentrations for these substances in the Hudson River would remain constant and below the NYSDEC Class I water quality standards.

b) North River CSO

A conservative evaluation of the potential impacts of CSOs within the North River drainage area for 2010 Future With the Proposed Action upon surface water quality was conducted. The potential effects were calculated through the SWEM and involved the evaluation of the maximum CSO impact upon water quality within the Hudson and Harlem Rivers adjacent to the North River WPCP drainage area. This analysis indicated that the maximum impact would occur within the Hudson River.

TABLE 13-14
2010 FUTURE WITH THE PROPOSED ACTION: WATER QUALITY PREDICTIONS IN THE HUDSON RIVER NEAR THE NORTH RIVER WPCP

Parameter	Units	2003[1] Existing Conditions	2010 Future With the Proposed Action: Maximum 24-Hour Impact[8]			2010 Future With the Proposed Action: Maximum 30-Day Impact[9]		NYSDEC Standard Class I Waters
			Incremental[7] Change	Incremental[11] Change Due to Proposed Action	Projected Water[10] Quality	Incremental[11] Change Due to Proposed Action	Projected Water[10] Quality	
Dissolved Oxygen (surface)[2]								
Summer Average[3]	mg/L	7.50	-0.007	-0.002	7.49	-0.002	7.49	> 4.0
Absolute Minimum	mg/L	5.51	-0.006	-0.001	5.50	-0.002	5.50	> 4.0
Dissolved Oxygen (bottom)[2]								
Summer Average[3]	mg/L	5.67	-0.007	-0.002	5.66	-0.003	5.66	> 4.0
Absolute Minimum	mg/L	4.69	-0.008	-0.003	4.68	-0.003	4.68	> 4.0
Total Nitrogen	mg/L	1.49	0.010	0.003	1.50	0.004	1.50	--
Total Phosphorus	mg/L	0.12	0.002	0.001	0.12	0.001	0.12	--
Total Suspended Solids	mg/L	71	0.008	0.002	71	0.004	71	--
Total Coliform[4]	MPN/100ml	1087	1	0	1088	0	1088	< 10,000
Copper[5,6]	µg/L	1.95	0.010	0.003	1.96	0.005	1.97	< 5.6
Lead [5,6]	µg/L	0.147	0.001	0.000	0.148	0.000	0.148	< 8
Zinc[5,6]	µg/L	4.49	0.026	0.008	4.52	0.011	4.53	< 66

(1) NYCDEP Harbor Survey Station N-3B - West 125th Street
(2) Dissolved oxygen data for 2003
(3) Summer average - June 1 to September 30
(4) Total coliform data for 1996
(5) USEPA Survey Station H3; 1991
(6) Existing conditions and standards for metals for dissolved form
(7) Incremental changes were calculated through the use of SWEM
(8) Maximum 24-hour impact represents the maximum hourly impact in the North River WPCP outfall receiving water segment
(9) Maximum 30-day impact represents the maximum monthly impact in the North River WPCP outfall receiving water segment
(10) Projected water quality due to incremental change represents the projected water quality concentration derived from the increase or decrease of the calculated incremental change from existing conditions.
(11) Incremental change resulting solely from the implementation of the Proposed Action in 2010

For 2010 With the Proposed Action, the number of CSO events would not be increased, the volume of CSO would increase by approximately 1.2%, and the incremental additional pollutant mass loadings would increase approximately by 1.1% from the total projected CSO overflows for the entire drainage area in the 2010 Future Without the Proposed Action. These changes would be insignificant for the water quality parameters described below.

The predicted concentrations for the maximum CSO impact for the 2010 Future With the Proposed Action are presented in Table 13-13. Incremental changes in concentrations from existing conditions due to the Proposed Action are also shown in Table 13-13. The incremental change for the 2010 Future With the Proposed Action and the corresponding projected water quality concentrations based upon existing condition and the Proposed Action increment are also illustrated in Table 13-13.

Decreases in dissolved oxygen concentrations in the Hudson River under the 2010 Future With the Proposed Action for the maximum CSO impact are shown in Table 13-13 and were predicted to be below current detection abilities. Dissolved oxygen concentrations would be predicted to remain above the NYSDEC Class I water quality standard of 4.0 mg/L.

Total coliforms were also predicted to remain the same for the maximum CSO impact in 2010 Future With the Proposed Action. Water quality conditions would continue to be below the NYSDEC Class I water quality standard of 10,000 MPN/100ml.

The predicted incremental changes in the total nitrogen, total phosphorus and total suspended solids within the Hudson River for the 2010 Future With the Proposed Action would also be insignificant.

Copper concentrations due to the maximum CSO impact in the Hudson River were calculated to increase by 0.01 μg/L for the 2010 Future With the Proposed Action. Likewise, lead and zinc concentrations would be predicted to increase by 0.007 μg/L and 0.04 μg/L, respectively, as a result of the Proposed Action. The projected water quality concentrations in the Hudson River for copper, lead and zinc due to these incremental increases would continue to remain below NYSDEC Class I water quality standards.

During construction, design requirements would limit the amount of dewatering allowed. Water from dewatering operations would likely be discharged to the existing sewer system. The water will be tested prior to discharge to the sewer to determine the presence and levels of potential contaminants. If contaminants exceed acceptable thresholds, the water will be disposed of in an acceptable manner in accordance with relevant regulations and criteria.

2. Groundwater

Groundwater resources in Manhattan are not used for potable water and would not be adversely affected by construction of either the No. 7 Subway Extension, Multi-Use Facility, Convention Center Expansion, or residential and commercial development. Designs for subsurface features of the Proposed Action would be developed to protect adjacent structures from changes in groundwater flow and elevation.

3. Floodplains

The western portion of the Project Area is situated in the 100-year floodplain. However, it is not within an area classified as floodway. Structures planned for this area would not be considered a significant encroachment and would not result in any increases in flood levels in surrounding areas. The area is currently occupied by mainly impervious development; therefore, the Proposed Action would not eliminate existing primary beneficial floodplain characteristics.

4. Wildlife

The Proposed Action would not result in any significant adverse impact to wildlife within the Project Area, and the increase in green space would have a positive effect. The additional open space areas would complement those that would be developed as part of the Hudson River Park project in terms of creating additional compatible upland habitat for native plants and wildlife such as birds and butterflies.

a) North River WPCP Discharges

As described above, the decrease in the dissolved oxygen in the Hudson River due to the Proposed Action for both the maximum 24-hour impact and maximum 30-day impact would be below what can be detected. As a result, there will be no significant adverse impacts on aquatic biota in the river.

The incremental changes in total nitrogen and total phosphorus, were predicted to be insignificant. Projected water quality concentrations of these substances in the Hudson River would be predicted to remain constant. As a result there would be no significant adverse impact, in the form of euthrophication or algal blooms, to the river.

Total coliforms were predicted to remain constant for both the daily average and maximum month. As a result, there will be no significant adverse impacts on aquatic biota, such as shellfish, in the river.

The incremental changes in copper, lead and zinc concentrations in the Hudson River due to the Proposed Action were predicted to be insignificant. Projected water quality concentrations in the Hudson River would be predicted to remain constant. The concentrations for each of the three metals are far below the NYSDEC water standard for Class I waters, which provides protection for fish propagation. As a result, there will be no significant adverse impacts on aquatic biota in the river.

b) CSO Discharges

As described in Section E.1.b) “North River CSO,” CSO events that may occur under the Future With Proposed Action Condition in 2010 would not be expected to result in significant adverse impacts to water quality in the river.

Decreases in dissolved oxygen concentrations in the Hudson River under the 2010 Future With the Proposed Action scenario for the maximum CSO impact are shown in Table 13-13 and were predicted to be below current detection abilities. As a result, there will be no significant adverse impacts on aquatic biota in the river.

The predicted incremental changes in the total nitrogen, total phosphorus and total suspended solids within the Hudson River for the 2010 Future With the Proposed Action would also be insignificant. As a result, there would not be a significant adverse impact, in the form of euthrophication or algal blooms, to the river.

Total coliforms were also predicted to remain the same for the maximum CSO impact in 2010 Future With the Proposed Action. As a result, there will be no significant adverse impacts on aquatic biota.

Copper concentrations due to the maximum CSO impact in the Hudson River were calculated to increase by 0.01 μg/L for the 2010 Future With the Proposed Action. Likewise, lead and zinc concentrations would be predicted to increase by 0.007 μg/L and 0.04 μg/L, respectively, as a result of the Proposed Action. The projected water quality concentrations in the Hudson River for copper, lead and zinc due to these incremental increases would continue to remain below NYSDEC Class I water quality standards which provide protection for fish propagation. As a result, there will be no significant adverse impacts on aquatic biota in the river.

Temporary, localized changes in water quality that may occur as a result of a CSO event would not be expected to result in significant adverse impacts to aquatic biota. Life stages of estuarine-dependent and anadromous fish species, bivalves and other macroinvertebrates are fairly tolerant varying environmental conditions that are typical of estuarine environments and have developed behavioral and physiological mechanisms for dealing with these variations (Birtwell et al. 1987, Dunford 1975, Levy and Northcote 1982 and Gregory 1990 in Nightingale and Simenstad 2001a, LaSalle et al. 1991). Fish are mobile and generally avoid unsuitable conditions in the field such as increases in suspended sediment, noise and low dissolved oxygen (Clarke and Wilber 2000), and 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 to unsuitable conditions by closing valves or reducing pumping activity. More mobile benthic invertebrates that occur in estuaries have been found to be tolerant of elevated suspended sediment concentrations. In studies of the tolerance of crustaceans to suspended sediments that lasted up to two weeks, nearly all mortality was caused by extremely high suspended sediment concentrations (greater than 10,000 mg/L) (Clarke and Wilber 2000), that would be unlikely to occur from CSO events.

c) Shadows

There would be no incremental difference between shadows cast on the Hudson River in spring and winter under the 2010 Future With the Proposed Action versus the Future Without the Proposed Action. In the summer, the Hudson River would experience an additional one and one-half hours of shadow from structures constructed under the Proposed Action by 2010 (see Chapter 8, "Shadows"). The maximum shadow footprint for the Proposed Action in 2010 would be approximately 715,000 square feet in the spring and 1,480,000 square feet in the winter, when shadows are longer, but move faster. The structures would reduce the light available for plant photosynthesis within the footprint of the shadows. However, because the structures are not built directly over the Hudson River, the shadows generated by the proposed buildings would be diffused. Height above the water is an important factor in determining the shadow footprint and reduction in light intensity that a structure casts over submerged habitats (Nightingale & Simenstad 2001b).

The decrease in light intensity could effect primary productivity within the study area, but the largest shadow footprint and longest shadow duration on the Hudson River would occur in the wintertime, when primary productivity and most biological activity are at their lowest levels. Primary productivity within the study area is generated mainly from phytoplankton. There are some benthic macroalgae present which are primarily limited to hard surfaces such as pilings and bulkheads, and there is no submerged aquatic vegetation present. Light requirements for phytoplankton are low (Strickland 1958; Parsons, Takahashi, & Hargrave 1977; Dennison et al. 1993). Therefore, the reduction in light within the shadow footprint would have a negligible impact on phytoplankton populations. In addition, the phytoplankton communities would be carried by the Hudson River and tidal currents, and would be exposed to the shadows for relatively short periods of time, and would move with the current through the study area and out of the building shadows.

The shadows cast on the Hudson River would not have a significant adverse impact on fish communities. The Proposed Action would not result in new structures built directly over the water and shadows cast by upland structures would have a negligible effect on fish communities. Similarly, there would not be adverse impacts on benthic communities, as the majority of species are not visual feeders, but filter food particles out of the water column or deposit feed on surrounding sediments. Therefore, the shadows generated under the Proposed Action in 2010 would not have significant adverse impacts on the biotic communities in the Hudson River.

Barges could be used to transport excavation material and would produce temporary shadows during the time they are moored and utilized during construction. The shadows produced by the barges, approximately 8,500 square feet (190 feet by 45 feet) for inland barges and 17,700 square feet (282 feet by 62 feet) for ocean barges, would cover a small surface area relative to the surface area of the Project Area. The small shadow footprint caused by the barges would not result in a significant decrease in primary productivity in the Hudson River. The barges would be moving in and out of the waterways during transport operations and would not create permanent coverage. There is no proposed construction of additional piers in the Hudson River to accommodate the barging of excavated material.

Any permits required for barging within the Hudson River would be coordinated with the USACE and NYSDEC.

d) Potential Effects of Tall Structures on Migratory Birds

Avian nighttime collisions with buildings and towers are more common than daytime collisions. Most species of migratory birds use the stars to navigate at night, and brightly illuminated buildings and broadcast towers can attract birds, particularly when poor weather conditions cause birds to fly at lower altitudes. The height or altitude of migration is an important factor in the determination of the potential for collisions with structures. Migration altitudes vary depending on species, location, geographic features, season, time of day, and weather (Ogden, 1996). According to published reports, approximately 75 percent of neotropical migratory birds fly at altitudes between 500 and 6,000 feet during migration (Able, 1999). Shorebirds generally migrate at altitudes of between 1,000 and 13,000 feet.

Tall buildings (ranging up to 800 feet high) are proposed to be constructed within Hudson Yards by 2025. These structures could result in a strike hazard for migratory birds. Development under the Proposed Action would result in increased collisions of migrating birds over those realized under current conditions and the Future Without the Proposed Action scenario. The number of collisions and resulting bird mortality is expected to be insignificant when compared to the total numbers of birds migrating along the Atlantic Flyway. During migration, over 50 million birds have been documented via radar flying north and passing over the southern U.S. over the course of a few hours (Ogden, 1996).

5. Wetlands

a) Freshwater Wetlands

There are no freshwater wetlands within the Project Area, therefore no freshwater wetland impacts would occur.

b) Tidal Wetlands

Although none are anticipated, if impacts to tidal wetlands are necessary, the USACE and the NYSDEC would be contacted and the appropriate permit applications would be submitted. Appropriate mitigation strategies would be developed in cooperation with all regulatory agencies.

6. Built Resources

Existing structures along the waterfront include bulkheads, piers, and platforms. These structures provide habitat for both marine and terrestrial species adapted for these areas. No modifications to the existing waterfront structures are proposed with the Proposed Action. Therefore, there would be no significant adverse impacts to natural resources associated with modification of these structures. The potential use of barging to transport spoil may require modification to waterfront structures. Potential impacts resulting from barging are addressed in Chapter 23, "Construction Impacts."

The Hudson River Park Project (FEIS 1998) includes the development of a beach and rocky shoreline adjacent to the Hudson River south of Pier 76. The development of the beach will not require filling of the Hudson River. The Proposed Action would not have a significant adverse impact on the natural resources of the proposed beach since there are no vegetation plantings proposed at the beach, and since no in-water construction is proposed as part of the Proposed Action.

7. Significant, Sensitive or Designated Resources

a) Coastal Resources

As stated above, the Project Area is near the Lower Hudson Reach, which extends from Battery Park to Stony Point. The Lower Hudson Reach was designated a significant habitat in August 1992. This designation requires a coastal consistency review pursuant to the Coastal Zone Management Act. As habitat protection is fundamental to assuring the survival of wildlife and fish populations, proposed activities within this area must be consistent with New York State Coastal Policies, and should not result in the destruction or significant impairment of the habitat area. The DCP administers the LWRP in New York City. Consistency review of the 10 coastal policies of the LWRP is discussed in Chapter 15, "Waterfront Revitalization Program."

b) Threatened and Endangered Species

No construction activity in the Hudson River is proposed and no significant adverse impacts to surface water quality due to North River effluent discharges and CSO discharges are anticipated. As a result, no significant adverse impacts to the shortnose sturgeon or marine turtles would result from the Proposed Action.

The federally-listed and state-listed endangered shortnose sturgeon is an anadromous bottom-feeding fish that can be found in the Hudson River system. Shortnose sturgeon spawn, develop, and overwinter well upriver of the Project Area, and prefer colder, deeper waters for all lifestages. Individuals are only expected to use the lower Hudson River when traveling to or from the upriver spawning, nursery and overwintering areas. The Hudson River below Tappan Zee is not considered optimal shortnose sturgeon habitat (Bain 2004).

The Hudson River shortnose sturgeon population was recently estimated to contain approximately 61,000 fish (Peterson and Bain 2002). These studies show that the population has increased approximately 450 percent since the 1970s. Although larvae can be found in brackish areas of the river, the juveniles (fish ranging from two to eight years old) are predominately confined to freshwater reaches above the downstream saline area (Haley et al. 1996; NMFS 1998). The primary summer habitat for shortnose sturgeon in the middle section of the Hudson River Estuary (far upriver of the project area) is the deep river channel (13 to 42 meters deep, 43 to 138 feet).

Long-term Hudson River monitoring data, collected by the New York Utilities and others since the 1970s, have also indicated that shortnose sturgeon inhabit deep-water habitats, and occur in greatest abundance north of the Tappan Zee Bridge. Hoff et al. (1988 in Bain 1997) reported most captures of adult shortnose sturgeon occurred between river kilometers (km) 38 to 122 (from near the New York/New Jersey border up to near Poughkeepsie). Distribution of egg, embryo and larva is similarly well upriver of the Project Area. EEA (1988) and EA (1990) did not collect any shortnose sturgeon during multi-year sampling of interpier and underpier habitats in the lower Hudson River. No sturgeon were found in interpier areas of the Hudson River Park, sampled between June 2002 and March 2004 (Meixler et al. 2003, Cornell University 2004).

Four species of marine turtles, all state and federally listed, can occur in New York Harbor. Juvenile Kemp's ridley and large loggerhead turtles enter the New York Harbor and bays in the summer and fall. The other two species, green sea turtle and leatherback sea turtle, are usually restricted to the higher salinity areas of the Harbor (USFWS 1997). In general, however, these four turtle species mostly inhabit Long Island Sound and Peconic and Southern Bays. They neither nest in the New York Harbor Estuary, nor reside there year-round (Morreale and Standora 1995). Turtles leaving

Long Island Sound for the winter usually do so by heading east to the Atlantic Ocean before turning south (Standora et al. 1990). It is unlikely that these turtle species would occur in the lower Hudson River except as occasional transients.

c) Essential Fish Habitat

With no construction within the Hudson River proposed, there would be no direct impact on Essential Fish Habitat (EFH). In addition, as discussed above, there would be no significant adverse impacts to EFH due to CSO discharges or shadows.

F. 2025 FUTURE WITHOUT THE PROPOSED ACTION

Chapter 3, "Analytical Framework," provides a description of the Future without the Proposed Action in 2025. Absent the Proposed Action, existing trends in commercial and residential development are anticipated to continue within the Project Area, as described in Chapter 2, "Description of Proposed Action."

1. Surface Water

It is anticipated that, with continued and increased water conservation measures, upgraded sewage treatment plants, and implemented preservation and protection measures by the HRPT, recent trends in water quality improvements in the Lower Hudson River Estuary would continue and result in improved aquatic habitat and utilization by aquatic fauna. As described in the 2010 Future Without the Proposed Action analysis, it is expected that there would be periodic maintenance dredging projects within the Lower Hudson River to maintain water depths at a variety of piers. In addition, there would likely be submarine infrastructure projects (such as power and fiber optic cables) installed by 2025 to service anticipated population growth in the City. These projects would produce short-term impacts and are not expected to significantly impact the natural resources within the Lower Hudson River.

a) North River WPCP

Under the 2025 Future Without the Proposed Action, wastewater flows to the North River WPCP would continue to increase due to changes in population and anticipated new developments within the drainage area. The projected average daily flow to the WPCP would be 142.9 mgd under the 2025 Future Without the Proposed Action. The average dry weather flow would be 132.9 mgd.

The estimated effect of the 2025 Future Without the Proposed Action flows upon effluent pollutant loadings from the North River WPCP is presented in Table 13-3 for the average effluent. As shown on Table 13-3, the WPCP SPDES permit limits would be met for the average effluent under the 2025 Future Without the Proposed Action scenario for those parameters specified therein.

The WPCP pollutant loadings for the 2025 Future Without the Proposed Action were then used to assess the potential effects of these upon water quality in the Hudson River. The predicted concentrations in the Hudson River for the 2025 Future Without the Proposed Action are presented on Table 13-15. Table 13-15 shows the maximum 24-hour and maximum 30-day concentrations Hudson River water quality parameters. These are shown as the incremental changes in concentrations resulting from the projected 2025 Future Without the Proposed Action flow of 142.9 mgd and the projected water quality.

Dissolved oxygen levels in both the bottom and surface layers within the Hudson River near the North River WPCP under the 2025 Future Without the Proposed Action were predicted to decrease by a maximum of 0.02 mg/L, which is less than the current level of measurement accuracy, when compared to existing conditions. The predicted incremental change in dissolved oxygen in the Hudson River would not be detectable. Dissolved oxygen water quality concentrations would be predicted to remain above the NYSDEC Class I water quality standard of 4.0 mg/L.

TABLE 13-15
2025 FUTURE WITHOUT THE PROPOSED ACTION: WATER QUALITY PREDICTIONS IN THE HUDSON RIVER NEAR THE NORTH RIVER WPCP

Parameter	Units	2003 [1] Existing Conditions	2025 Future Without the Proposed Action				NYSDEC Standard Class I Waters
			Maximum 24-Hour Change[8]		Maximum 30-Day Change[9]		
			Incremental[7] Change	Projected Water[10] Quality	Incremental[7] Change	Projected Water[10] Quality	
Dissolved Oxygen (surface)[2]							
Summer Average[3]	mg/L	7.5	-0.015	7.49	-0.018	7.48	> 4.0
Absolute Minimum	mg/L	5.51	-0.015	5.50	-0.018	5.49	> 4.0
Dissolved Oxygen (bottom)[2]							
Summer Average[3]	mg/L	5.67	-0.016	5.65	-0.018	5.65	> 4.0
Absolute Minimum	mg/L	4.69	-0.018	4.67	-0.021	4.67	> 4.0
Total Nitrogen	mg/L	1.49	0.022	1.51	0.026	1.52	--
Total Phosphorus	mg/L	0.12	0.004	0.12	0.004	0.12	--
Total Suspended Solids	mg/L	71	0.018	71	0.027	71	--
Total Coliform[4]	MPN/100ml	1087	1	1088	1	1088	< 10,000
Copper[5,6]	µg/L	1.95	0.021	1.97	0.038	1.99	< 5.6
Lead [5,6]	µg/L	0.147	0.002	0.149	0.003	0.150	< 8
Zinc[5,6]	µg/L	4.49	0.056	4.55	0.082	4.57	< 66

(1) NYCDEP Harbor Survey Station N-3B - West 125th Street
(2) Dissolved oxygen data for 2003
(3) Summer average - June 1 to September 30
(4) Total coliform data for 1996
(5) USEPA Survey Station H3; 1991
(6) Existing conditions and standards for metals for dissolved form
(7) Incremental changes were calculated through the use of SWEM
(8) Maximum 24-hour change represents the maximum hourly change in the North River WPCP outfall receiving water segment
(9) Maximum 30-day change represents the maximum monthly change in the North River WPCP outfall receiving water segment
(10) Projected water quality due to incremental change represents the projected water quality concentration derived from the increase or decrease of the calculated incremental change from existing conditions.

In addition, the incremental changes in total nitrogen, total phosphorus and total suspended solids concentrations from existing conditions would also be insignificant. The total nitrogen concentration in the Hudson River was predicted to increase by 0.02 mg/L for the maximum 24-hour condition and 0.03 mg/L for the maximum 30-day condition. Total phosphorus and total suspended solids concentrations within the Hudson River would also be predicted to remain the same under the 2025 Future Without the Proposed Action.

Total coliforms would be predicted to increase by one MPN/100ml for both the maximum 24-hour and maximum 30-day concentrations and remain below the NYSDEC Class I water quality standard.

Incremental changes in copper, lead and zinc concentrations were also calculated to be insignificant with incremental changes of 0.08 μg/L or less. The projected copper, lead and zinc water quality concentrations would be expected to remain below the applicable NYSDEC Class I water quality standard.

b) North River CSOs

Potential effects of CSOs within the North River WPCP drainage area upon surface water quality were also evaluated under the 2025 Future Without the Proposed Action. The potential effects were evaluated with the SWEM and considered the maximum CSO effect upon water quality within the Hudson and Harlem Rivers. The analysis indicated that the maximum calculated water quality effect would occur in the Hudson River.

The predicted concentrations for the maximum CSO effect for the 2025 Future Without the Proposed Action are presented in Table 13-16. The projected additional CSO volumes under the 2025 Future Without the Proposed Action would be 71 mg per year. Table 13-16 also shows the incremental change in concentrations that would result from the maximum effect of the projected 2025 Future Without the Proposed Action CSO volumes, as well as the projected water quality. Dissolved oxygen levels in the surface layer of the Hudson River would be predicted to remain constant. Bottom layer dissolved oxygen concentrations would be predicted to decrease by approximately 0.01 mg/L. The predicted incremental changes in dissolved oxygen within the Hudson River, however, would not be detectable. The projected dissolved oxygen concentrations within the Hudson River would be predicted to remain above the NYSDEC Class I water quality standard of 4.0 mg/L.

The maximum incremental changes to total phosphorus and total suspended solids concentrations as shown in Table 13-16 were projected to be insignificant and would remain unchanged under the 2025 Future Without the Proposed Action condition. Total nitrogen was calculated to increase by approximately 0.01 mg/L under the 2025 Future Without the Proposed Action.

The maximum incremental change to total coliforms was predicted to increase by approximately one MPN/100ml under the 2025 Future Without the Proposed Action condition. The total coliform count would be below the NYSDEC Class I water quality standard of 10,000 MPN/100ml.

The maximum CSO incremental change in copper concentrations was predicted to be 0.11 μg/L. The maximum incremental change for lead was predicted to be 0.05 μg/L and for zinc 0.31 μg/L. The changes in copper, lead, and zinc concentrations within the Hudson River would not result in a contravention of NYSDEC Class I water quality standards.

TABLE 13-16
2025 FUTURE WITH AND WITHOUT PROPOSED ACTION: WATER QUALITY PREDICTIONS OF THE POTENTIAL IMPACT OF NORTH RIVER WPCP CSOS

Parameter	Units	2003[1] Existing Conditions	Future Without Proposed Action		Future With Proposed Action Maximum Impact[8]		NYSDEC Standard Class I Waters
			Incremental[7] Change	Projected Water[9] Quality	Incremental[10] Change Due to Proposed Action	Projected Water[9] Quality	
Dissolved Oxygen (surface)[2]							
Summer Average[3]	mg/L	7.5	-0.005	7.50	-0.003	7.49	> 4.0
Absolute Minimum	mg/L	5.51	-0.005	5.51	-0.003	5.50	> 4.0
Dissolved Oxygen (bottom)[2]							
Summer Average[3]	mg/L	5.67	-0.007	5.66	-0.004	5.66	> 4.0
Absolute Minimum	mg/L	4.69	-0.007	4.68	-0.004	4.68	> 4.0
Total Nitrogen	mg/L	1.49	0.011	1.50	0.006	1.51	--
Total Phosphorus	mg/L	0.12	0.002	0.12	0.001	0.12	--
Total Suspended Solids	mg/L	71	0.076	71	0.046	71	--
Total Coliform[4]	MPN/100ml	1087	13	1100	9	1109	< 10,000
Copper[5,6]	µg/L	1.95	0.112	2.06	0.068	2.13	< 5.6
Lead[5,6]	µg/L	0.147	0.055	0.202	0.033	0.230	< 8
Zinc[5,6]	µg/L	4.49	0.318	4.81	0.193	5.00	< 66

(1) NYCDEP Harbor Survey Station N-3B - West 125th Street
(2 Dissolved oxygen data for 2003
(3) Summer average - June 1 to September 30
(4) Total coliform data for 1996
(5) USEPA Survey Station H3; 1991
(6) Existing conditions and standards for metals for dissolved form
(7) Incremental changes were calculated through the use of SWEM
(8) Maximum impact represents the maximum impact in the Hudson and Harlem Rivers
(9) Projected water quality due to incremental change represents the projected water quality concentration derived from the increase or decrease of the calculated incremental change from existing conditions
(10) Incremental change resulting solely from the implementation of the Proposed Action in2025

2. Wildlife

a) North River WPCP Discharges

As described above, in 2025 Without the Proposed Action there would be no significant changes in water quality conditions from North River WPCP discharges from current conditions. Therefore, aquatic biota community composition and characteristics in 2025 are expected to be similar to current conditions.

b) CSO Discharges

As described above, in 2025 Without the Proposed Action there would be no significant changes in water quality conditions from CSO discharges from current conditions. Therefore, aquatic biota community composition and characteristics in 2025 are expected to be similar to current conditions.

c) Shadows

Under the 2025 Future Without the Proposed Action, shadow duration on the Hudson River within the study area would not change from the 2010 Future Without the Proposed Action.

G. 2025 FUTURE WITH THE PROPOSED ACTION

By 2025, it is assumed that the remaining development generated as a result of the Proposed Action would have occurred, as described in Chapter 2, "Description of the Proposed Action." The Intermediate Station for the No. 7 Subway Extension located at West 41st Street and Tenth Avenue, would be open.

1. Surface Water

a) North River WPCP

Under the 2025 Future With the Proposed Action, effluent loads from the North River WPCP would continue to increase as a result of projected increases in overall flows to the WPCP. For 2025 Future With the Proposed Action, average daily flow to the WPCP would increase to 142.9 mgd. Additional flows from the proposed action in 2025 would be 7.1 mgd for a total projected average daily flow of 150 mgd. For the reasons stated previously in the Methodology section, the predicted average daily flows to North River WPCP and the predicted CSOs are conservative and do not take credit for the benefits realized from the implementation of the Amended Drainage Plan which would separate sanitary and stormwater in four sub-drainage areas within the Project Area, and planned regulator upgrades.

The potential impact of the 2025 Future With the Proposed Action flows upon effluent pollutant loadings from the North River WPCP are presented in Table 13-3 for the average effluent. WPCP performance was assumed to remain the same in 2025. As shown on Table 13-3, the WPCP SPDES permit limits would be met for the average monthly effluent under the 2025 Future With the Proposed Action scenario for the parameters shown for the average effluent month.

The WPCP effluent pollutant loadings for the 2025 Future With the Proposed Action were utilized to evaluate potential impacts to water quality within the Hudson River. The incremental changes and projected water quality concentrations in the Hudson River for the 2025 Future With the Proposed Action are presented in Table 13-17. Table 13-17 provides the calculated maximum 24-hour and 30-day impacts to Hudson River water quality. These are shown as the calculated incremental change and the change in projected water quality due to the Proposed Action, which demonstrate that the Proposed Action would not have a significant adverse effect on water quality.

The calculated incremental decrease in dissolved oxygen in the Hudson River due to the Proposed Action for both the maximum 24-hour and 30-day impacts would be approximately 0.01 mg/l.

Dissolved oxygen water quality concentrations in the Hudson River due to this incremental change would remain above the NYSDEC Class I water quality standard of 4.0 mg/L.

Total coliforms were predicted to remain the same for the maximum 24-hour impact and would increase by 1 MPN/100ml for the maximum 30-day impact. Total coliforms, however, would remain below the NYSDEC Class I water quality standard of 10,000 MPN/100ml.

As shown in Table 13-17, total nitrogen concentrations under the 2025 Future With the Proposed Action for the maximum 24-hour and maximum 30-day impact were predicted to increase by less than 0.01 mg/L from the 2025 Future Without the Proposed Action incremental change. The total suspended solids concentrations within the Hudson River were predicted to remain the same.

Predicted incremental increases in copper concentrations within the Hudson River for 2025 Future With the Proposed Action would be 0.02 μg/L for both the maximum 24-hour and 30-day impact. Lead concentrations were predicted to increase by 0.001 μg/L for the maximum 24-hour impact and 0.002 μg/L for the maximum 30-day impact. The increase in zinc concentration due to the proposed action was predicted to be 0.03 μg/L for the maximum 24-hour impact and 0.04 μg/L for the maximum 30-day impact. The projected water quality concentrations for copper, lead and zinc due to the projected incremental increases in Hudson River water quality would remain below the NYSDEC Class I water quality standards. The Proposed Action would therefore not have a significant adverse impact on water quality.

b) North River CSOs

As described in Chapter 16 and detailed conservative analyses in Appendix N, the Proposed Action would result in minor increases in CSO events, CSO volumes and pollutant loadings. In the 2025 Future With the Proposed Action, the number of CSO events would increase over the 2025 Future Without the Proposed Action by approximately 4.5 percent, the volume of CSO discharges would increase by approximately 5.4 percent, and pollutant mass loadings would increase by approximately 5.2 percent. These changes would be insignificant for the water quality parameters described below and would have no significant adverse impacts on water quality.

The predicted concentrations for the maximum impact of the CSOs in the Hudson River for 2025 Future With the Proposed Action are presented in Table 13-16. Although CSOs within the North River WPCP drainage area are located within the Hudson and Harlem Rivers, the maximum CSO impact was noted to occur within the Hudson River. Calculated incremental changes from the existing conditions and projected water quality in the Hudson River due to the Proposed Action are shown in Table 13-16.

Calculated incremental decreases in dissolved oxygen within the Hudson River due to the Proposed Action as a result of the maximum CSO impact were predicted to be 0.003 mg/L. The incremental change in dissolved oxygen in the Hudson River would be insignificant and not be detectable. The predicted water quality concentration for dissolved oxygen provided within Table 13-16 would remain above the NYSDEC Class I water quality standard of 4.0 mg/L.

For 2025 Future With the Proposed Action, total coliforms were predicted to increase by 9 MPN/100 ml. The predicted incremental increase in total coliforms would not result in contravention of the NYSDEC Class I water quality standard of 10,000 MPN/100 ml.

The incremental changes in total phosphorus and total suspended solids concentrations in the Hudson River due to the Proposed Action were predicted to remain unchanged. The total nitrogen concentration was calculated to increase by approximately 0.01 mg/L under the 2025 Future With the Proposed Action scenario. These changes would not be anticipated to result in adverse impacts upon water quality within the Hudson River.

TABLE 13-17
2025 FUTURE WITH THE PROPOSED ACTION: WATER QUALITY PREDICTIONS IN THE HUDSON RIVER NEAR THE NORTH RIVER WPCP

Parameter	Units	2003[1] Existing Conditions	2025 Future With the Proposed Action: Maximum 24-Hour Impact[8]			2025 Future With the Proposed Action: Maximum 30-Day Impact[9]		NYSDEC Standard Class I Waters
			Incremental[7] Change	Incremental[11] Change Due to Proposed Action	Projected Water[10] Quality	Incremental[11] Change Due to Proposed Action	Projected Water[10] Quality	
Dissolved Oxygen (surface)[2]								
Summer Average[3]	mg/L	7.5	-0.025	-0.010	7.48	-0.011	7.47	4.0
Absolute Minimum	mg/L	5.51	-0.024	-0.010	5.49	-0.011	5.48	4.0
Dissolved Oxygen (bottom)[2]								
Summer Average[3]	mg/L	5.67	-0.026	-0.010	5.64	-0.012	5.64	4.0
Absolute Minimum	mg/L	4.69	-0.030	-0.012	4.66	-0.013	4.66	4.0
Total Nitrogen	mg/L	1.49	0.036	0.014	1.53	0.017	1.53	--
Total Phosphorus	mg/L	0.12	0.006	0.002	0.13	0.003	0.13	--
Total Suspended Solids	mg/L	71	0.030	0.012	71	0.017	71	--
Total Coliform[4]	MPN/100ml	1087	1	0	1088	0	1088	10,000
Copper[5,6]	µg/L	1.95	0.035	0.014	1.99	0.025	2.01	5.6
Lead [5,6]	µg/L	0.147	0.004	0.001	0.151	0.002	0.152	8
Zinc[5,6]	µg/L	4.49	0.092	0.036	4.58	0.053	4.63	66

(1) NYCDEP Harbor Survey Station N-3B - West 125th Street
(2) Dissolved oxygen data for 2003
(3) Summer average - June 1 to September 30
(4) Total coliform data for 1996
(5) USEPA Survey Station H3; 1991
(6) Existing conditions and standards for metals for dissolved form
(7) Incremental changes were calculated through the use of SWEM
(8) Maximum 24-hour impact represents the maximum hourly impact in the North River WPCP outfall receiving water segment
(9) Maximum 30-day impact represents the maximum monthly impact in the North River WPCP outfall receiving water segment
(10) Projected water quality due to incremental change represents the projected water quality concentration derived from the increase or decrease of the calculated incremental change from existing conditions.
(11) Incremental change resulting solely from the implementation of the Proposed Action in 2025

The incremental change in the concentration of copper in the Hudson River under the 2025 Future With the Proposed Action condition was predicted to increase by 0.07 μg/L. Lead concentrations were predicted to increase by 0.03 μg/L and zinc was predicted to increase by 0.19 μg/L. The incremental changes in the concentrations of copper, lead and zinc and the projected water quality within the Hudson River would not affect compliance with the applicable NYSDEC Class I water quality standard.

2. Groundwater

Groundwater resources in Manhattan are not used for potable water and would not be adversely affected by construction of the associated development.

3. Floodplains

The western portion of the Project Area is situated in the 100-year floodplain. However, it is not within an area classified as floodway. Structures planned for this area would not be considered a significant encroachment and would not result in any increases in flood levels in surrounding areas. The area is currently occupied by mainly impervious development; therefore, the Proposed Action would not eliminate existing primary beneficial floodplain characteristics.

4. Wildlife

Redevelopment of the Project Area would not have a significant adverse impact on wildlife resources. The proposed green roofs and other open spaces would have a positive effect on wildlife in the Project Area. The additional open space areas would complement those that would be developed as part of the Hudson River Park project in terms of creating additional compatible upland habitat for native plants and wildlife such as birds and butterflies. However, the construction of several buildings adjacent to the waterfront has the potential to create shadows on the Hudson River. Construction of tall buildings within the Project Area may also have impacts on migratory bird species.

a) North River WPCP Discharges

The calculated incremental decrease in dissolved oxygen in the Hudson River due to the Proposed Action for both the maximum 24-hour and 30-day impacts would be approximately 0.01 mg/l. As a result, there will be no significant adverse impacts on aquatic biota in the river.

Total nitrogen concentrations under the 2025 Future With the Proposed Action for the maximum 24-hour and maximum 30-day impact were predicted to increase by less than 0.04 mg/L from the 2025 Future Without the Proposed Action incremental change. Total phosphorus concentrations under the 2025 Future With the Proposed Action for the maximum 24-hour and maximum 30-day impact were predicted to increase by less than 0.003 mg/L from the 2025 Future Without the Proposed Action incremental change. These increases would not result in a significant adverse impact, in the form of euthrophication or algal blooms, to the river.

Total coliforms were also predicted to remain the same for the maximum 24-hour impact and would increase by one MPN/100ml for the maximum 30-day impact. As a result, there will be no significant adverse impacts on aquatic biota.

Predicted incremental increases in copper concentrations within the Hudson River for 2025 Future With the Proposed Action would be 0.014 μg/L for the maximum 24-hour impact and 0.03 μg/L for the 30-day impact. Lead concentrations were predicted to increase by 0.001 μg/L for the maximum 24-hour impact and 0.002 μg/L for the maximum 30-day impact. The increase in zinc concentration due to the proposed action was predicted to be 0.04 μg/L for the maximum 24-hour impact and 0.05 μg/L for the maximum 30-day impact. The projected water quality concentrations for copper, lead and zinc due to the projected incremental increases in Hudson River water quality would remain below the NYSDEC Class I water quality standards. As a result, there will be no significant adverse impacts on aquatic biota in the river.

b) CSO Discharges

Since the number of CSO events would increase by approximately 4.5 percent, the volume of CSO discharges would increase by approximately 5.4 percent, and the additional pollutant mass loading would increase by approximately 5.2 percent, CSO events that may occur under the Future With Proposed Action Condition in 2025 would not be expected to result in significant adverse impacts to water quality in the river.

Calculated incremental decreases in dissolved oxygen within the Hudson River due to the Proposed Action as a result of the maximum CSO impact were predicted to be 0.003 mg/L. The incremental change in dissolved oxygen in the Hudson River would be insignificant and not be detectable. As a result, there will be no significant adverse impacts on aquatic biota.

The incremental changes in total phosphorus and total suspended solids concentrations in the Hudson River due to the Proposed Action were predicted to remain unchanged. The total nitrogen concentration was calculated to increase by approximately 0.01 mg/L under the 2025 Future With the Proposed Action scenario. These increases would not result in a significant adverse impact, in the form of euthrophication or algal blooms, to the river.

Total coliforms were predicted to increase by 9 MPN/100 ml. As a result, there will be no significant adverse impacts on aquatic biota.

The incremental change in the concentration of copper in the Hudson River under the 2025 Future With the Proposed Action condition was predicted to increase by 0.07 µg/L. Lead concentrations were predicted to increase by 0.03 µg/L and zinc was predicted to increase by 0.19 µg/L. The incremental changes in the concentrations of copper, lead and zinc and the projected water quality within the Hudson River would not affect compliance with the applicable NYSDEC Class I water quality standards which provide protection for fish propagation. As a result, there will be no significant adverse impacts on aquatic biota.

As discussed previously in Section E.4, life stages of estuarine-dependent and anadromous fish species, bivalves and other macroinvertebrates are fairly tolerant varying environmental conditions that are typical of estuarine environments and have developed behavioral and physiological mechanisms for dealing with these variations. Therefore, temporary, localized changes in water quality that may occur as a result of a CSO event would not be expected to result in significant adverse impacts to aquatic biota.

c) Shadows

Shadow duration on the Hudson River within the Hudson Yards study area as a result of structures constructed by 2025 would be similar to 2010, but the maximum shadow footprint would be larger (approximately 1,848,125 square feet in the spring and 3,770,625 square feet in the winter). As discussed above in the 2010 analysis, increased shading would not have a significant adverse effect on Hudson River biota.

d) Potential Effects of Tall Structures on Migratory Birds

Avian nighttime collisions with buildings and towers are more common than daytime collisions. Most species of migratory birds use the stars to navigate at night, and brightly illuminated buildings and broadcast towers can attract birds, particularly when poor weather conditions cause birds to fly at lower altitudes. The height or altitude of migration is an important factor in the determination of the potential for collisions with structures. Migration altitudes vary depending on species, location, geographic features, season, time of day, and weather (Ogden, 1996). According to published reports, approximately 75 percent of neotropical migratory birds fly at altitudes between 500 and 6,000 feet during migration (Able, 1999). Shorebirds generally migrate at altitudes of between 1,000 and 13,000 feet.

Tall buildings (ranging up to 800 feet high) are proposed to be constructed within Hudson Yards by 2025. These structures could result in a strike hazard for migratory birds. Development under the Proposed Action would result in increased collisions of migrating birds over those realized under current conditions and the Future Without the Proposed Action scenario. The number of collisions and resulting bird mortality is expected to be insignificant when compared to the total numbers of birds migrating along the Atlantic Flyway. During migration, over 50 million birds have been documented via radar flying north and passing over the southern U.S. over the course of a few hours (Ogden, 1996).

5. Wetlands

a) Freshwater Wetlands

There are no freshwater wetlands within the Project Area, therefore no freshwater wetland impacts would occur.

b) Tidal Wetlands

Although no impacts are anticipated, if impacts to tidal wetlands should become expected, the USACE and the NYSDEC would be contacted and the appropriate permit applications would be submitted. Appropriate mitigation strategies would be developed in cooperation with all regulatory agencies.

6. Built Resources

Existing structures along the waterfront include bulkheads, piers, and platforms. These structures provide habitat for both marine and terrestrial species adapted for these areas. No modifications to the existing waterfront structures are proposed with the Proposed Action. Therefore, there would be no significant adverse impacts to natural resources associated with modification of these structures. The potential use of barging to transport spoil may require modification to waterfront structures. Potential impacts resulting from barging are addressed in Chapter 23, "Construction Impacts."

The Hudson River Park Project (FEIS 1998) includes the development of a beach and rocky shoreline adjacent to the Hudson River south of Pier 76. The development of the beach will not require filling of the Hudson River. The Proposed Action would not have a significant adverse impact on the natural resources of the proposed beach since there are no vegetation plantings proposed at the beach, and since no in-water construction is proposed as part of the Proposed Action.

7. Significant, Sensitive or Designated Resources

a) Coastal Resources

As stated above, the Project Area is near the Lower Hudson Reach, which extends from Battery Park to Stony Point. The Lower Hudson Reach was designated a significant habitat in August 1992. This designation requires a coastal consistency review pursuant to the Coastal Zone Management Act. As habitat protection is fundamental to assuring the survival of wildlife and fish populations, proposed activities within this area must be consistent with New York State Coastal Policies, and should not result in the destruction or significant impairment of the habitat area. DCP administers the LWRP in New York City. Consistency review of the 10 coastal policies of the LWRP is discussed in Chapter 15, "Waterfront Revitalization Program."

b) Threatened and Endangered Species

No construction activity in the Hudson River is proposed and no significant adverse impacts to surface water quality due to North River effluent discharges and CSO discharges are anticipated. Accordingly, no significant adverse impacts to the shortnose sturgeon or marine turtles would result from the Proposed Action.

The federally-listed and state-listed endangered shortnose sturgeon is an anadromous bottom-feeding fish that can be found in the Hudson River system. Shortnose sturgeon spawn, develop, and overwinter well upriver of the project area, and prefer colder, deeper waters for all lifestages. Individuals are only expected to use the lower Hudson River when traveling to or from the upriver spawning, nursery and overwintering areas. The Hudson River below Tappan Zee is not considered optimal shortnose sturgeon habitat (Bain 2004).

The Hudson River shortnose sturgeon population was recently estimated to contain approximately 61,000 fish (Peterson and Bain 2002). These studies show that the population has increased approximately 450 percent since the 1970s. Although larvae can be found in brackish areas of the river, the juveniles (fish ranging from two to eight years old) are predominately confined to freshwater reaches above the downstream saline area (Haley et al. 1996; NMFS 1998). The primary summer habitat for shortnose sturgeon in the middle section of the Hudson River Estuary (far upriver of the project area) is the deep river channel (13 to 42 meters deep, 43 to 138 feet).

Long-term Hudson River monitoring data, collected by the New York Utilities and others since the 1970s, have also indicated that shortnose sturgeon inhabit deep-water habitats, and occur in greatest abundance north of the Tappan Zee Bridge. Hoff et al. (1988 in Bain 1997) reported most captures of adult shortnose sturgeon occurred between river kilometers (km) 38 to 122 (from near the New York/New Jersey border up to near Poughkeepsie). Distribution of egg, embryo and larva is similarly well upriver of the project area. EEA (1988) and EA (1990) did not collect any shortnose sturgeon during multi-year sampling of interpier and underpier habitats in the lower Hudson River. No sturgeon were found in interpier areas of the Hudson River Park, sampled between June 2002 and March 2004 (Meixler et al. 2003, Cornell University 2004).

Four species of marine turtles, all state and federally listed, can occur in New York Harbor. Juvenile Kemp's ridley and large loggerhead turtles enter the New York Harbor and bays in the summer and fall. The other two species, green sea turtle and leatherback sea turtle, are usually restricted to the higher salinity areas of the Harbor (USFWS 1997). In general, however, these four turtle species mostly inhabit Long Island Sound and Peconic and Southern Bays. They neither nest in the New York Harbor Estuary, nor reside there year-round (Morreale and Standora 1995). Turtles leaving Long Island Sound for the winter usually do so by heading east to the Atlantic Ocean before turning south (Standora et al. 1990). It is unlikely that these turtle species would occur in the lower Hudson River except as occasional transients.

c) Essential Fish Habitat

With no construction within the Hudson River proposed, there would be no direct impact on Essential Fish Habitat (EFH). In addition, as discussed above, there would be no significant adverse impacts to EFH due to CSO discharges or shadows.

H. EXISTING CONDITIONS - CORONA YARD STUDY AREA

The Proposed Action in the Corona Yard area includes a track extension for additional train storage for the expanded No. 7 Subway Line (Figure 13-4). The proposed construction would be located within MTA property adjacent to Flushing Creek, which is partly developed by heavy commercial and light industrial uses. The discussion below describes the existing conditions of natural resources within and adjacent to the area encompassed by the Proposed Action.

Major land uses located in the vicinity of the site include Shea Stadium to the northwest and Flushing Meadows Corona Park and the National Tennis Center to the south. The area across Roosevelt Avenue to the north of the site contains industrial, automotive repair, junkyards, and warehouse uses. The Casey Stengel Bus Depot and the existing Corona Yard and Maintenance Facility occupy adjacent uses to the south, and are owned by the MTA.

1. Surface Water

Corona Yard is located on the west side of Flushing Creek, a tidally influenced tributary to Flushing Bay. Flushing Bay is contiguous with the East River and Long Island Sound. The bay is home to various fish and wildlife, including numerous migratory waterfowl and resident shorebirds.

The tidal range in Flushing Creek is approximately seven feet. In general, water quality within Flushing Creek is considered to be poor. CSO discharges contribute to high bacteria levels and sediment loads, resulting in low ambient dissolved oxygen levels.

Flushing Bay and Creek form a tributary to the East River. Flushing Creek extends from the mouth of the creek adjacent to La Guardia Airport, to the head of the creek within Flushing Meadows Corona Park. The tributary is classified by the NYSDEC as a Class 1 saline surface water, with suitable uses identified as secondary contact recreation and fishing.

The width of the creek varies greatly from about 400 feet wide near Corona Yard to approximately 3,000 feet across at La Guardia Airport in the bay. The water quality of both Flushing Bay and Flushing Creek has been degraded over time due to sewage runoff.

Efforts to clean the Bay and Creek include DEP's development of a 28-million gallon tank (plus an additional 15 million gallon in-line capacity) to collect excess sewage during heavy rainfalls. During most storm events, all of the combined sewage and stormwater goes to a sewage treatment plant, but heavy rains may cause the sewer pipes to fill and induce overflows through outfalls into receiving waters. CSOs help prevent backups into homes and businesses, and flooding in city streets.

2. Groundwater

All of Long Island, including Queens and portions of Brooklyn, is located above an EPA-designated sole source aquifer that supplies drinking water for southeastern Queens and Long Island. In 1984, the EPA designated the Lloyd Aquifer underlying Kings and Queens counties as a sole source aquifer, concluding that the system is the "principal source of drinking water" to the people of the southeastern portion of Queens County, and "there is no alternative source of drinking water supply which would replace these aquifers if they were contaminated" (FR Volume 16, Number 16, p. 2050, January 24, 1984). In addition, the geographic boundaries of Kings and Queens Counties are the recharge zone for the aquifers underlying the southeastern portion of Queens County. As a result, federally funded projects must be reviewed by EPA to ensure that they do not adversely impact groundwater in this aquifer. This designation is made pursuant to the Safe Drinking Water Act (SDWA), Section 14-24(e).

Based on the regional geology/hydrogeology information from USGS publications (Soren 1978, Cartwright 2002), geotechnical borings advanced at Corona Yard (SM&E 1997, PBQD 2003), and site investigation results, the stratigraphy underlying the Corona Yard consists of Holocene and Upper Pleistocene deposits (Upper Glacial aquifer) from grade to the bedrock and that the Lloyd Sand member (Lloyd aquifer) is not present beneath the site. The advancement of geotechnical borings at the site confirm this conclusion.

A USGS-NYCDEP report shows that the vicinity of the Corona Site had elevated chloride concentrations from past saltwater intrusion in the Upper Glacial aquifer (in the order of 500 milligrams per liter [mg/L]), and probably, Lloyd aquifer (in the order of 1,000 mg/L) in the 1980s

(Cartwright 2002). However, the concentration in the Upper Glacial aquifer has declined subsequently and as of 1996, the chloride concentration (69 mg/L) was well below the NYSDEC groundwater standard for chloride (250 mg/L). A subsurface investigation report conducted by Fanning, Phillips, and Molnar (1998) showed chloride concentrations of 350-630 mg/L in groundwater samples collected from the Upper Glacial aquifer near the proposed piling locations, which may be due to saltwater-derived chloride or surface-derived chloride (mostly road salting).

3. Floodplains

The site topography is relatively flat, with elevations ranging up to approximately 15 feet above sea level and is located within the 100-year flood zone.

4. Coastal Resources

As discussed above, activities in New York State coastal areas are regulated under New York State's Coastal Consistency Program. Flushing Bay connects to the East River, and the East River is a designated coastal water body under DCP's Waterfront Revitalization Program (1999-2000) and is within the coastal zone as designated within NYSDOS's Coastal Consistency Program. DCP administers the LERP in New York City.

Consistency review of the 10 coastal policies of the LWRP is discussed in Chapter 15, "Waterfront Revitalization Program".

5. Wildlife

There is limited wildlife use on the project site due to the site's proximity to human activity. Various mammals are present on the site, including the white-footed mouse, raccoons, skunks, opossums, and Norway rat. A pack of feral dogs has also been known to live on the site. Some avian species may utilize the nearby Flushing Creek, but not a significant number. Canada Geese and Mallards have also been observed in the area.

6. Wetlands

Fringes of tidal emergent wetlands exist in various locations along Flushing Creek, including the edges of the Corona Yard (Figure 13-4). In addition to the tidal fringe wetlands along Flushing Creek, there are a few high marsh tidal wetland areas and freshwater wetland areas found within Corona Yard. In general, the tidal areas receive tidal inundation twice daily while the high marsh wetland areas receive irregular tidal inundation of waters on high spring tides twice a month or during storm events. Activities on the adjacent property west of the site have resulted in sediment being deposited within some of the existing tidal wetland areas. These areas are still vegetated with hydrophytic shrubs and grasses, but appear to be covered with approximately six inches of sediment.

The tidal wetlands within the project site function to prevent flooding, retain sediments and nutrients, provide habitat for fish, shellfish, avian and wildlife species, protect from erosion and storm surges, and improve water quality. Although the tidal wetlands are small and have been degraded due to pollution and nearby development, these wetlands are important to the local area due to the relative rarity of these habitats within the area.

The freshwater wetland areas located on-site consist of depressed pockets with impermeable soils lying beneath. These areas collect surface water runoff and hold the waters until they evaporate or slowly drain into the subsoils. In addition, the freshwater wetlands located at the edge of the parking lot were inadvertently created by the development of the parking lot; the soils were compacted during construction and stormwater directed to the area from the parking lot now collects in the compacted depressions.

The freshwater wetlands located on the site function to retain storm water, improve water quality, retain sediment and nutrients, prevent flooding of the nearby upland areas, and provide potential habitat for avian and wildlife species. Due to the surrounding development, the water quality within the wetlands is not high. However, these wetlands are important to the local area due to the relative rarity of these habitats within this area.

The tidal wetland areas that exist on-site, both low and high marsh, have been mapped by the NYSDEC. No freshwater wetlands have been mapped by the NYSDEC or appear on the USFWS National Wetlands Inventory maps. The tidal wetland areas are under the jurisdiction of both the NYSDEC and the USACE, but the freshwater wetlands are only under the jurisdiction of the USACE. The freshwater wetlands are small and are not considered to be unique or exceptional. The NYSDEC has jurisdiction over wetlands 12.4 acres in size or greater, if they are determined to be unique or exceptional.

Flushing Bay and Flushing Creek are the subject of an ecosystem restoration project under the authorization of USACE - New York District. Tidal and freshwater wetlands restoration is one of a range of measures that would contribute to ecosystem restoration in the area.

7. Upland Resources

Upland resources that exist on the site (i.e., all natural areas that are not water or wetland resources) are characterized as meadows and old fields vegetated with pioneer/invasive species typical of highly disturbed sites. This upland area was previously filled with coal ash. The site is currently dominated by early successional invasive species, including grasses and other herbaceous species. Groundsel bush (*Baccharis halmifolia*) shrubs occur in small patches throughout, along with small trees and saplings.

As described in Chapter 14 “Hazardous Materials”, it is possible that portions of the site have been contaminated from the fill material, or past history/activity on the site and in the area.

8. Built Resources

As with much of the surrounding land before 1928, the MTA property was formerly used as an ash dump. Since the NYCT Corona Rail Maintenance Facility was constructed in 1928, portions of the Yard have functioned as a rail maintenance shop and yard. The Corona Rail Maintenance Facility is adjacent to the open space and wetland areas, and includes a yard, car washing facility, and the Casey Stengel Bus Depot and maintenance facility. There are also several heavy commercial and light industrial uses leased by MTA on its property. There are no piers or waterfront structures along the shoreline.

9. Significant, Sensitive, or Designated Resources

a) <u>Coastal Zone and Significant Coastal Fish and Wildlife Habitat Areas</u>

All coastal resources are considered important by New York State and New York City, and are protected by the State’s Coastal Management Program and the City’s Waterfront Revitalization Program.

Because the Corona Yard Project Area is situated on lands designated as a coastal zone, the Proposed Action requires a coastal consistency review pursuant to the Coastal Zone Management Act. The DCP administers the LWRP in New York City. Consistency review of the 10 coastal policies of the LWRP is discussed in Chapter 15, “Waterfront Revitalization Program.”

Tidal wetland areas are also an important water resource protected under State and federal law. The tidal fringe wetlands located along the eastern edge of the site are designated as tidal wetland littoral zone and adjacent areas, and are therefore subject to the jurisdiction of NYSDEC under Parts 660 and 661 of Title 6 (6 NYCRR) and of the USACE under Section 404 and 401 of the Clean Water Act.

b) Threatened & Endangered Species/Protected Species

Correspondence with the USFWS and the NYSDEC Natural Heritage Program confirmed that there are no known federal, State-listed or proposed threatened or endangered species within the Corona Yard Project Area. In addition, there is no known federally designated or proposed Critical Habitat within the Corona Yard area.

I. 2010 FUTURE WITHOUT THE PROPOSED ACTION

At the present time, there are no planned projects for the Corona Yard area. By 2010, NYCT would have completed a wetlands restoration project south of the viaduct in conjunction with the Casey Stengel Bus Depot improvements, and the existing Corona Yard and Maintenance Facility would be modernized and expanded. As a result, natural resources within the Corona Yard area would be similar to those under existing conditions. The environment for these resources would be enhanced and assumed to function more effectively.

J. 2010 FUTURE WITH THE PROPOSED ACTION

The Proposed Action includes the extension of storage tracks from the existing NYCT Corona Rail Yard Facility north under the Roosevelt Avenue Viaduct, where storage tracks would be located (Figure 13-4). Approach tracks, located west of Flushing Creek and east of the existing Casey Stengel Bus Depot parking lot, would carry trains to the new storage tracks. The approach tracks leading to the storage tracks would be constructed on an open deck supported by steel girders and driven piles. The storage tracks, depending on geotechnical characteristics of the soils, would either be placed over ballast on the surface or constructed on driven piles which support a platform or an open deck. In addition to the approach tracks and storage tracks, a fire access road would be constructed north of and parallel to the approach and storage tracks in order to provide emergency access.

The approach tracks would pass through the freshwater wetlands which are contiguous to tidal wetlands as depicted on Figure 13-4. In addition, the approach tracks would be placed within NYSDEC-wetland regulated adjacent area (Figure 13-4). The fire access road would be constructed outside of any wetland and adjacent areas. The final design of the approach and storage tracks will include a program to further avoid and minimize potential impacts to the wetlands and adjacent area. Potential impacts to the wetland areas and adjacent areas could be avoided or minimized by using permeable surfaces, where appropriate, and by constructing the tracks on pilings. Sediment control and soil erosion control techniques would be employed during construction to prevent any tidal wetland areas from becoming silted in, and existing wetland areas that have been silted in would be restored to their natural conditions.

The storage tracks are proposed with the yard lead track as an open deck track on a pile-supported structure south of Roosevelt Avenue. Construction of the yard lead track, refuse track and maintenance-of-way tracks north of Roosevelt Avenue could be constructed either as a pile-supported structure or on stabilized earth. A watertight “bathtub” structure could be appropriate beneath the bridge in order to accommodate the limited vertical clearance. The specific type of structure would be determined based on existing geotechnical, hydrological, and environmental conditions.

Similarly, the specific pile type and required pile depth would be determined following subsurface investigations. Alternate pile spacing and configurations, as well as the use of friction-type piles, would be considered as a means of reducing the required pile depth.

1. Water Resources

Impacts to the site's water resources could negatively affect the overall water quality, as well as flood storage and stormwater control capacities. The current pattern of stormwater drainage and runoff would be modified as a result of project construction. Stormwater impacts as they relate to water quality and wetlands are discussed in this section.

a) Wetlands and Flushing Creek

As discussed above, the proposed approach tracks would encroach on the freshwater wetlands which are contiguous to tidal wetlands as depicted on Figure 13-4 and NYSDEC-regulated adjacent area. Based on the most recent wetland delineation conducted in the fall of 2003, the project will permanently impact approximately 3,000 square feet (0.069 ac) of wetlands and approximately 3,500 square feet (0.08 ac) of NYSDEC-regulated adjacent area. These areas were calculated using the length and width of the tracks crossing through the wetlands and adjacent area and are conservative estimates. They include the area potentially impacted by shading from the track deck and the footprints of the pilings. Shading impacts will be minimized through an open deck design. The project will require submittal of a joint USACE-NYSDEC permit application. Given the amount of wetlands potentially affected, the project would appear to qualify for a USACE Nationwide Permit (NWP) under NWP 14 (Linear Transportation Projects) and 25 (Structural Discharges) and would not represent a significant adverse impact to wetlands.

Through consultation with NYSDEC and USACE, construction methods would be employed to minimize adverse effects to the wetlands and adjacent area. Driven piles minimize the area directly affected and result in minimal effect on the site's existing hydrology, as stormwater runoff could continue to flow from impervious areas into unaffected portions of the freshwater wetlands and adjacent upland areas. Although direct impacts to the wetlands and wetland adjacent area would be minimized by the use of pile supports, indirect impacts would include shading from the tracks overhead. However, these impacts are expected to be minimal, because sunlight would penetrate the open deck which would support the approach tracks.

Temporary disruption to the wetland adjacent area would result from construction and pile driving activity. Some surface preparation would be required to provide proper operating conditions for the pile driving machinery. To minimize impacts to the wetland adjacent area, construction activity in this area would be limited to the fall and winter seasons, and the surface topography would be restored to pre-construction conditions. In addition, best management practices would be followed, as described below.

Site-specific techniques and safeguards would be utilized throughout all construction areas to protect water quality in the event of materials, oil, or fuel spills from construction equipment, as well as for soil erosion and sedimentation control. Best management practices would include the installation of silt fences, hay bales, filter fabric, dewatering, and/or the utilization of sedimentation basins. A specific Stormwater Pollution Protection Plan, focusing on the protection and improvement of site water quality, would be developed.

b) Groundwater

The existing available data indicate that there is some level of contamination present at the site. Construction and design of the storage tracks will be based on environmental, geotechnical, and hydrological conditions. Based on the results of the Phase I ESA and additional investigation completed for the site, management measures would be implemented during construction (see Chapter 14 "Hazardous Materials" for more details). The final design, number, location and type of piles, etc., would be determined following the geoteochnical investigations. The site would be evaluated by a contractor hired by NYCT prior to completing final design. Since the Lloyd Aquifer is not present beneath the site, no specific management measures would be required to protect the aquifer.

Corona Yard and neighboring sites have been used for railroad and other industrial or heavy commercial purposes for many years. The site has also been constructed on fill material. Investigation of Corona Yard has revealed the presence of VOCs, SVOCs, and metals, all of which are typically associated with historical uses such as rail yards, factories and other industrial facilities (Chapter 14 "Hazardous Materials). Management measures would be developed to address these contaminants and any required action or management would be conducted in accordance with applicable law, any additional regulatory requirements of NYSDEC, as appropriate.

c) Floodplains

Corona Yard is located within the 100-year floodplain. Construction within the floodplain is regulated by federal and State agencies under Federal Executive Order 11988 and the National Flood Insurance Program (NFIP). The NFIP was created in 1968 as a collaborative effort between the federal and local governments to alleviate some of the problems associated with flooding. NYSDEC, Division of Water serves as the administrator for NFIP in New York State. The facility design would adhere to all relevant design criteria, and necessary permits would be obtained prior to construction.

2. Wildlife

The loss of upland and/or wetland habitat due to construction would impact wildlife utilizing the site. However, as noted above, there is not a significant amount of wildlife habitat on the site, and no known threatened or endangered species occupy the site.

3. Significant, Sensitive, or Designated Resources

a) Coastal Resources

Corona Yard is located within the Coastal Zone Boundary of New York City, as indicated on the 1982 sectional maps delineating the boundaries of New York City's coastal zone included in the New Waterfront Revitalization Program. Initial investigations suggest that the proposed additional train storage tracks at Corona Yard would be consistent with the Coastal Consistency Program. DCP administers the local Waterfront Revitalization Program in New York City. Consistency review of the 10 coastal policies of the LWRP is discussed in Chapter 15, "Waterfront Revitalization Program."

b) Threatened or Endangered Species

According to the USFWS and NYSDEC, no federal- or State-listed threatened or endangered species are known to occur within the Project Area. Therefore, no impacts to threatened or endangered species would occur as a result of the Proposed Action.

K. 2025 FUTURE WITHOUT THE PROPOSED ACTION

At the present time, there are no additional projects planned for the Corona Yard area through 2025. As a result, natural resources within the Corona Yard area would be similar to those under existing conditions.

L. 2025 FUTURE WITH THE PROPOSED ACTION

Modifications within Corona Yard would be completed prior to 2010, and no further work in this area after 2010 is planned. ❖