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Chapter 16: Infrastructure

A. INTRODUCTION

This chapter evaluates the impacts of the Proposed Action on New York City's (the City's) water supply, sanitary sewage treatment, and stormwater management infrastructure. It describes the existing water supply and wastewater infrastructure within the Project Area and identifies changes to water supply, stormwater, and wastewater conditions that would occur with and without the Proposed Action. Impacts of the Proposed Action on other forms of infrastructure are evaluated in separate chapters of this document: municipal and private solid waste management services in Chapter 17, "Solid Waste and Sanitation Services;" gas and electricity services in Chapter 18, "Energy;" roadways and tunnels in Chapter 19, "Traffic and Parking;" and public transit in Chapter 20, "Transit and Pedestrians."

Potential construction impacts to the City's water and sewer infrastructure resulting from the Proposed Action are described in Chapter 23, "Construction Impacts." Potential impacts on the water quality of the receiving water body, flooding, and sedimentation and/or erosion from construction activities and operations are described in Chapter 13, "Natural Resources."

1. Issues

The Proposed Action would result in increased demand for water supply and wastewater treatment compared to existing levels. The capacity of the infrastructure currently serving the Project Area has been assessed to determine whether modifications would be required to meet the incremental demands of the Proposed Action, including the impact of required changes to the MTA Corona Yard in Queens.

2. Principal Conclusions

On a peak day, the Proposed Action in 2025 would require approximately 8.6 million gallons per day (mgd) of potable water and generate an equivalent amount of wastewater. During peak periods of air-conditioning use, an additional estimated 4.5 mgd of water would be required for the Proposed Action. The redevelopment of Hudson Yards anticipated under the proposed rezoning would generate the greatest demand for potable water, sewage treatment, and stormwater management. The projected development of approximately 28 million square feet of commercial office space and approximately 12.6 million square feet of residential space would require approximately 7.3 mgd of potable water and generate an equivalent amount of wastewater. Peak air conditioning usage would require approximately 3.4 mgd of water. There would be no increase in stormwater volumes expected in the Future With the Proposed Action as compared to the volumes expected in the Future Without the Proposed Action, because the amount of impervious surfaces in the Project Area would decrease with the Proposed Action as compared to the amount of impervious surface without the Proposed Action.

The expansion of the Convention Center would result in a net increase in water usage and wastewater generation of approximately 0.3 mgd. The Multi-Use Facility would result in a net increase in potable water demand and wastewater generation of approximately 0.4 mgd. Peak air conditioning operations would occur when the retractable roof is closed, resulting in approximately 0.3 mgd of water usage. These projections assume fully occupied facilities and peak events, which would occur only a limited number of times per year.

Extension of the No. 7 Subway Line would generate an increased demand of approximately 78,000 gallons per day (gpd) for potable water and wastewater generation on a peak day. Most of this

demand would be required for four cooling towers to cool the buildings. Other elements of the Proposed Action (relocation of the MTA Quill Bus Depot, NYPD Tow Pound, and consolidation of DSNY facilities) would not result in significant increases in the demand on infrastructure services relative to existing conditions.

The Proposed Action would require improvements to the existing water and sewer infrastructure of the Project Area. The New York City Department of Environmental Protection (the DEP) is currently developing a Manhattan Trunk Main Master Plan (hereafter referred to as "Trunk Plan"). The Trunk Plan is being developed as an overview of the rehabilitation required to the existing, aging trunk water main system in Manhattan (20 inches and larger). Improvements, mainly connections to Water Tunnel No. 3, which are presently under construction, will be included in this plan. Water supply improvements necessitated by the Proposed Action will be accounted for in this plan and implemented. With the Trunk Plan improvements in place, there would be no significant adverse impacts on water pressure or water availability. The DEP has advised that there will be adequate water supply to accommodate the demand of the Proposed Action and future background growth in 2025.

The City is preparing an Amended Plan that will identify specific upgrades to the combined sewer system to accommodate the Proposed Action Those upgrades would be sufficient to accommodate the Proposed Action. As part of Amended Drainage Plan, the City has identified four sub-drainage areas within the Project Area where storm sewer separation would be implemented. These separate storm sewers would discharge storm water directly to the Hudson River and thus reduce flows being directed to the combined sewer system. In addition, the City would modify, as required, the regulators receiving flow from the Project Area. The DEP has indicated that the existing North River Wastewater Pollution Control Plant (WPCP) would have sufficient capacity to handle the increased wastewater generated by the Proposed Action in 2025.

Changes to the MTA Corona Yard would not result in a significant increase in water demand or the volume of wastewater requiring treatment, since the changes at Corona Yard would be limited to providing increased train storage. The changes in Corona Yard would not result in a significant increase in the volume or rate of stormwater, because the proposed improvements would only minimally increase the amount of impervious surface at the facility.

B. METHODOLOGY

The *CEQR Technical Manual* provides guidance on the methods to be used to assess impacts to the municipal water supply, wastewater treatment, and stormwater management systems. Because of the large scale and extent of the Proposed Action, a full analysis of potential impacts on City infrastructure has been completed in accordance with *CEQR Technical Manual* guidelines.

This chapter describes existing conditions, and examines future conditions with and without the Proposed Action. To determine potential impacts, future conditions with the Proposed Action are compared to future conditions without the Proposed Action.

1. Water Supply

In accordance with the *CEQR Technical Manual*, the study area for the water supply impact assessment includes the entire area serviced by the Croton gravity system in addition to pressure regulators from the Catskill/Delaware System. Water pressure regulators reduce the water pressure within the water mains to levels suitable for public use. The water supply system is a gravity-fed system which relies on the elevation gradient between the heights of Hillview Reservoir in Yonkers for Catskill/Delaware Water and the Jerome Park Reservoir in the Bronx for Croton Water. Average daily water usage for existing and future conditions was calculated using rates given in the *CEQR Technical Manual*.

The Proposed Action was evaluated to determine whether the water demand that would be generated by the Proposed Action would overburden the existing supply system, or require a reconfiguration or modification to the water supply infrastructure

The City has initiated a comprehensive water conservation program with the objective of reducing water use by implementing water metering programs and by requiring that existing and new structures be designed on the basis of low-flow criteria (Local Law No. 29, 1989). Additional measures, including leak detection programs and locking fire hydrants, are also intended to reduce water demand, as are plans by the DEP to meter water usage in all buildings. The *CEQR Technical Manual* suggests conservative water usage rates that do not reflect the effects of these water conservation measures. Therefore, a conservative analysis of water consumption was conducted which does not consider these conservation measures.

2. Wastewater

In conformance with the *CEQR Technical Manual*, the study area for the wastewater analysis is the entire area served by the North River WPCP. Consistent with *CEQR Technical Manual* guidance, the amount of wastewater from the Project Area to be treated at the North River WPCP is assumed to be equal to the projected volume of potable water demand for the Project Area. Wastewater generated from air-conditioning use is minimal because of the recirculation and evaporation processes of water cooling systems, and is therefore not included in the overall wastewater volumes. The analysis includes an evaluation of whether the increased volume of wastewater flows with the Proposed Action to the North River WPCP would be within the limits of the State Pollutant Discharge Elimination System (SPDES) permit. The SPDES permit is issued by the New York State Department of Environmental Conservation (NYSDEC). An adverse impact would occur if the Proposed Action would result in a volume of wastewater that would exceed the limits of the SPDES permit. North River WPCP's current permitted flow limit is 170 mgd based on a 12-month rolling average, with a maximum acceptable flow of 340 mgd during wet weather events.

3. Stormwater

The *CEQR Technical Manual* requires an assessment of the potential impact of the additional volume of stormwater on the receiving water body, in this case the Hudson River. During wet weather events in the Hudson Yards area, excess diluted wastewater (stormwater and sewage) flows or Combined Sewer Overflows (CSOs) could be discharged into the Hudson River via outfalls under existing conditions. Impacts would occur if the Proposed Action would result in significant degradation to the water quality of the Hudson River, increase the frequency or extent of flooding, or increase the levels of erosion and sedimentation from construction and operations activities. To determine effects of potential CSOs on water quality under future conditions, a sewer system hydraulic model, InfoWorks*, was used to predict the frequency and volume of CSOs within the entire North River drainage area. 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 (see Figure 16-1 for the North River WPCP drainage area map). Results of the 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 separation of sanitary and stormwater to be implemented as part of the Amended Drainage Plan and regulator upgrades. Potential impacts to water quality are assessed in Chapter 13, "Natural Resources."

C. EXISTING CONDITIONS

1. Water Supply

The City water supply system is operated and maintained by the DEP. The City's domestic drinking water supply is provided by reservoirs in the Catskill, Delaware, and Croton watersheds in Upstate New York. Water is conveyed to the City from these watersheds via a series of reservoirs, aqueducts, and tunnels, over a distance of approximately 125 miles. Water from the Catskill/ Delaware System is conveyed by Water Tunnel No. 1, which provides water to the Boroughs of the Bronx, Manhattan, and Brooklyn, and Water Tunnel No. 2, which serves the Bronx, Queens, Brooklyn, and Staten Island. Water from the Croton System is conveyed from Westchester and Putnam Counties via the New Croton Aqueduct to the Bronx and Manhattan.

A third tunnel, Water Tunnel No. 3, originating at Hillview Reservoir in Yonkers, is under construction. Water Tunnel No. 3 is intended to improve the City's water supply, and allow for the inspection and necessary repair of the century-old Water Tunnels No. 1 and No. 2. The first phase of Water Tunnel No. 3 has been constructed, a portion of which now serves the Bronx, upper Manhattan, and Roosevelt Island. Phase 2 of Water Tunnel No. 3, currently under construction, is intended to provide service to Midtown and Lower Manhattan, Brooklyn, and Queens. It is anticipated that it will become fully operational in 2020 and provide a supplemental water source to the Project Area.

Manhattan, including the Project Area, is served by the Catskill/Delaware System via Water Tunnel No. 1 and the Croton System. Within the Project Area, there are three water pressure zones: the Low, Low Intermediate, and Middle Intermediate Pressure Zones. The Low Pressure Zone is located between Tenth and Twelfth Avenues, primarily fed by the Croton System, but also uses Catskill/Delaware System regulators located at 135th Street as backup feeds; the Low Intermediate Zone, located between Ninth and Seventh Avenues between West 33rd and West 28th Streets, is usually fed from Water Tunnel No. 1 through regulators along Fifth Avenue and supplemented with Croton water when the 40th Street pumping station is online; the Middle Intermediate Zone, located between Eighth and Seventh Avenues between West 43rd and West 33rd Streets, is usually fed through multiple regulators along Sixth Avenue from Water Tunnel No. 1. The Hudson Yards Project Area between Eighth and Tenth Avenues is a patchwork of all three water pressure zones. The gravity-fed system provides an average of 40 to 45 pounds per square inch (psi) of water pressure within the trunk mains supplying the Project Area. Slight variations in pressure can occur during peak use periods and while fire hydrants are in use. In the vicinity of the Project Area, Water Tunnel No. 1 is located several hundred feet below Sixth Avenue and Broadway. Water Tunnel No. 1 ranges between ten and fourteen feet in diameter. Water ascends from Water Tunnel No. 1 through shafts at 42nd and 23rd Streets to trunk mains ranging between 20 inches and 48 inches in diameter, running four feet below grade. The trunk mains that would serve the Proposed Action run north-to-south. These include a 48-inch main under Ninth Avenue; a 36-inch main along Tenth Avenue, from West 42nd Street to West 34th Street, that reduces to a 20-inch main south of West 34th Street; a 20-inch main under Eleventh Avenue between West 43rd and West 38th Streets; and two 20-inch mains under Route 9A. The trunk mains feed distribution mains which run east-to-west: below 29th Street between Broadway and Twelfth Avenue; below West 30th Street between Eleventh and Twelfth Avenues; below West 34th Street between Eleventh and Twelfth Avenues; below West 38th Street between Broadway and Eleventh Avenue; and below West 42nd Street between Broadway and Tenth Avenue. Because the Amtrak Empire Line, between Tenth and Eleventh Avenues, constrains water connections to the west, two 20-inch trunk mains have been installed along Route 9A to provide service for Eleventh and Twelfth Avenues. Individual smaller mains (12-inch and 20-inch) branch out from the trunk mains to provide water sources to individual buildings and fire hydrants.

On average, the City currently consumes approximately 1.2 billion gallons of water each day, of which Manhattan consumes approximately 322 mgd. Based on the *CEQR Technical Manual*, existing uses in the Project Area currently consume approximately 1.1 mgd of domestic water each day. An additional 0.5 mgd of water is currently used for air conditioning in the Project Area (Table 16-1).

TABLE 16-1
EXISTING CONDITIONS WATER USAGE IN THE PROJECT AREA

Use	Water/Sewage (gpd)	Air Conditioning (gpd)
Rezoning Area		
Office	185,900	185,900
Retail	14,100	28,800
Other Commercial	93,300	93,300
Residential	145,400	---
Hotel	---	---
Industrial/Manufacturing	76,200	76,200
Institutional	43,900	43,900
Madison Square Garden (MSG)	97,500	100,000
Subtotal	*656,300*	*528,100*
Convention Center*	**478,500***	**---**
Total	**1,134,800 (1.1 mgd)**	**528,100 (0.5 mgd)**

Source: Refer to Chapter 4, "Land Use, Zoning, and Public Policy."
Notes:
Water and sewage volumes of the Rezoning Area are calculated based on rates provided in the CEQR Technical Manual. Water usage for the Convention Center was provided by the Jacob Javits Convention Center Operating Corporation (2003).
* peak event day

a) Rezoning Area

Water is supplied to the Project Area by a 48-inch trunk main under Ninth Avenue, a 20-inch trunk main under Eleventh Avenue between West 43rd Street and West 38th Street, a 36-inch main under Tenth Avenue north of West 34th Street, and a 20-inch main under Tenth Avenue south of West 34th Street. Based on water usage rates provided in the *CEQR Technical Manual*, the current average daily water volume consumed by the existing developments located within the proposed Rezoning Area is approximately 0.7 mgd, as shown in Table 16-1.

b) Convention Center

Currently, water is supplied to the Convention Center by two 20-inch water mains under Route 9A, and one 20-inch water main under Eleventh Avenue. Peak water use occurs during the Auto Show, when approximately 70,000 patrons visit the Convention Center each day. Peak usage over one day is approximately 478,500 gpd of domestic water usage. A negligible volume of water is used for air conditioning, since the Convention Center is cooled using an air-cooled system (see Table 16-1).

2. Wastewater

Most sanitary sewage in the City is collected and conveyed through a combined sewer system operated and maintained by the DEP. This system receives sanitary sewage from residences, businesses, and municipal buildings, as well as stormwater accumulated in catch basins along the streets, from where the combined flow is sent for treatment at one of the City's WPCPs. The Project Area is served by the North River WPCP, located between 135th and 145th Streets along the Hudson River. The treated wastewater effluent from the facility is discharged into the Hudson River (Figure 16-1). The North River WPCP is regulated by a SPDES permit issued by the NYSDEC. The SPDES permit restricts the daily flow at North River WPCP to 170 mgd, based on a 12 month rolling average. The current North River WPCP SPDES permit was issued as a draft in 2003 and remains as

a draft. The most recent 12 month period (October 2002 to September 2003) daily flow averaged 132 mgd, well below the 170 mgd permitted limit, according to Table 16-2. During storm events, the North River WPCP is capable of processing up to a maximum of 340 mgd of wastewater.

TABLE 16-2
NORTH RIVER WPCP SEWAGE FLOWS BETWEEN OCTOBER 2002 AND SEPTEMBER 2003

Month	Year	Sewage Flow	
		Daily (mgd)	Dry (mgd)
October	2002	140	121
November	2002	130	118
December	2002	128	120
January	2003	125	119
February	2003	129	125
March	2003	130	122
April	2003	134	128
May	2003	129	122
June	2003	149	130
July	2003	129	124
August	2003	129	120
September	2003	132	122
	Average	**132**	**122**

Source: DEP (2003).
Notes:
"Daily" flow is an average daily flow that includes stormwater and sanitary volumes.
"Dry" flow includes sanitary volumes only during dry weather conditions.

The sewer system within the Project Area consists of combined sewers, regulators, and interceptors. Each trunk sewer feeds into the interceptor sewer through a "regulator" chamber that controls the flow from the trunk sewer to the interceptor. Generally, the wastewater within the Project Area flows westerly in collector and trunk sewers towards the intercepting sewer under Twelfth Avenue. The purpose of a regulator is to divert sanitary flow from the existing combined sewers to the intercepting sewer during normal flow periods (dry weather), and limit the flow to the intercepting sewer to twice dry weather flow during storm periods (wet weather). The existing tide gates placed on the combined sewer outfall (CSO) downstream of the regulators are designed to keep tide water from entering the existing combined sewers and the intercepting sewer. Tide gates can be part of the regulator structure or stand alone chambers. The intercepting sewer (under Twelfth Avenue) serving the Project Area is an 8' x 8' sewer between West 26th Street and West 40th Street, an 8'-6" x 8'-6" sewer between West 40th Street and West 49th Street, and a 10'-6" x 10'-6" sewer between West 49th Street and West 52nd Street. Flow into the intercepting sewer is controlled by regulators at West 30th Street (N-45), West 36th Street (N-43), West 40th Street (N-42), and West 43rd Street (N-39). There are tidegate chambers at West 33rd Street (N-44) and at West 42nd Street (N-41 and N-40). Sewage flows generated from the eastern portion of the Project Area, Tenth Avenue, and areas east of Tenth Avenue are channeled to the interceptor at West 49th Street (through regulator N-33).

The Twelfth Avenue interceptor sewer conveys the wastewater of the Project Area to the North River WPCP. Wastewater is conveyed by gravity from the Project Area to the North River WPCP. Most of the sewers serving the area were installed between the 1840s and 1940s. The sewer is constructed of brick or concrete in various sizes and shapes ranging from elliptical to circular, and is generally located between 8 and 16 feet below the surface.

Based on rates provided in the *CEQR Technical Manual* and information provided by the Jacob K. Javits Convention Center Operating Corporation, the current amount of sewage generated in the Project Area is estimated to be approximately 1.0 mgd (see Table 16-1). This volume is included in the total average estimated daily combined flow of 132 mgd treated at the North River WPCP.

3. Stormwater

Stormwater runoff is collected in catch basins along the streets, and channeled to the combined sewer system. A typical outfall has regulators that divert the wastewater flow to interceptor sewers, which deliver wastewater to the WPCP. The regulators are designed to allow two times the mean dry-weather flow into the interceptor. Thus, in dry weather, all sewage from the trunk sewers flows into the interceptor. During storm events, twice the mean dry weather sewage is diverted to interceptors. Excess diluted combined flows divert to the CSOs, which discharge directly to the Hudson River. Within the Project Area, a large storm event could result in excess wastewater flows (combined sewer overflow) to be discharged into the Hudson River via outfalls located at West 30th, West 36th, West 40th, and West 43rd Streets. In the Project Area, most stormwater runoff is channeled to the City's combined sewer system, because the area is almost entirely covered with impervious surface consisting of pavement, concrete, and rooftops. Additionally, Caemmerer Yard is constructed on a concrete slab west of Eleventh Avenue and on a thin layer of ballast over concrete east of Eleventh Avenue. Stormwater runoff from Caemmerer Yard is collected and conveyed to the Hudson River. Overflows to the Hudson River are relatively sporadic and result primarily from wet weather events, systems/equipment malfunctions, or a combination of both. CSO events depend on the proper functioning of regulators and combined sewers as well as other factors such as system configuration, regulator weir elevations, and the wet weather pumping operations at North River WPCP. As a result, some outfalls are subject to more combined sewer overflow events than others in the North River drainage area. CSOs located within the North River WPCP drainage area discharge to the Hudson River and northern portions of the Harlem River above 190th Street. Within the Project Area, CSOs occur approximately once per month, on average (see Appendix N, Natural Resources). The effects of CSOs on the Hudson River water quality are further described in Chapter 13, "Natural Resources."

D. 2010 FUTURE WITHOUT THE PROPOSED ACTION

The anticipated growth that would occur in the Future Without the Proposed Action would add new demand for water supply, sewage treatment, and stormwater management services. As identified in Chapter 3, "Analytical Framework," a combination of known residential and commercial projects and sites with prior development proposals have been identified as likely to be developed by 2010.

There are several projects within the Project Area that would be expected to be completed by 2010 in the event that the Proposed Action does not go forward. The projected water usage in the Project Area is listed in Table 16-3. These projects include new or expanded theater, residential, and commercial space.

TABLE 16-3
WATER USAGE AND SEWAGE GENERATION WITHIN THE REZONING AREA,
2010 FUTURE WITHOUT THE PROPOSED ACTION

Use	Water/Sewage (gallons per day)	Air Conditioning (gallons per day)
Rezoning Area		
Office	163,500	163,500
Retail	18,300	37,400
Other Commercial	92,300	92,300
Residential	526,700	---
Hotel	---	---
Industrial/Manufacturing	76,200	76,200
Institutional	43,400	43,400
MSG	97,500	100,000
Subtotal	*941,700 (0.9 mgd)*	*512,800 (0.5 mgd)*
Convention Center*	**478,500* (0.5 mgd)**	**---**
Total	**1,420,200 (1.4 mgd)**	**512,800 (0.5mgd)**

Source: NYCDCP (2003).
Notes: Water and sewage volumes based on rates provided in the CEQR Technical Manual.
* Peak event day.

1. Water Supply

Table 16-3 shows that the water usage would be approximately 1.4 mgd with an additional 0.5 mgd for air conditioning in the 2010 Future Without the Proposed Action. This would result in an additional demand of approximately 0.3 mgd of potable water usage compared to existing conditions. Water usage and sewage generation of the Convention Center would remain unchanged.

The DEP has indicated that this future demand would not cause adverse impacts to the existing water supply infrastructure. The existing water mains within the Project Area would continue to provide adequate water pressure under this future condition. Also, the DEP's Trunk Plan would provide additional water services.

2. Wastewater

Estimated sewage flows in the 2010 Future Without the Proposed Action would be approximately 1.4 mgd. Assuming further implementation of the DEP water conservation measures, described in Section 16.B.1, and the installation of water meters, sewage flows from the Project Area are not expected to increase significantly.

3. Stormwater

The Project Area currently contains virtually no parkland or other pervious surfaces. It is almost entirely covered with impervious surfaces of streets, parking lots, and rooftops. In the 2010 Future Without the Proposed Action, the impervious coverage would not change under the existing zoning.

Infrastructure is sized to accommodate the Project Area under the existing zoning, it would continue to serve the Project Area in the 2010 Future Without the Proposed Action.

Under the 2010 Future Without the Proposed Action, flows to the North River WPCP, encompassing the entire North River WPCP service area, would be an average daily flow of 135.5 mgd. The average dry weather flow would be projected to be 125.5 mgd. Based upon the results of the model analysis, the projected annual CSO volumes would increase approximately three percent, compared to

Existing Conditions. The number of CSO events within the Project Area would remain approximately one event per month.

E. 2010 FUTURE WITH THE PROPOSED ACTION

By 2010, the No. 7 Subway Extension, Convention Center Expansion, and the Multi-Use Facility would be complete and operating, and a small portion of the commercial and residential development allowed under the proposed rezoning of the Hudson Yards would be constructed. Completion of the Convention Center Expansion and No. 7 Subway Extension was assumed for a reasonable worst-case scenario in 2010. As a result, the Proposed Action would increase demands on existing water supply and wastewater infrastructure. This section discusses future conditions in 2010 with the Proposed Action.

1. Water Supply

By 2010, the Proposed Action would generate an estimated peak demand of 2.8 mgd for domestic consumption and 1.9 mgd for air-cooling uses, as indicated in Table 16-6. This demand is not expected to significantly affect the local water pressures. The increased demand resulting from the Proposed Action would represent a small addition (less than one percent) to the 322 million gpd currently consumed by Manhattan and, as determined by DEP, would not present any issues respecting available water supply.

The western portion of the Project Area, between Eleventh and Twelfth Avenues, would generate the most significant increase in water usage compared to the Future Without the Proposed Action in the Project Area. This portion of the Project Area would contain the Convention Center Expansion, Multi-Use Facility, No. 7 Subway Extension, and a small portion of the projected residential developments (West 42nd to West 43rd Streets, Eleventh to Twelfth Avenues) allowed under the proposed rezoning. This portion of the Project Area is within a DEP Low Pressure Zone, fed primarily by the New Croton Aqueduct.

The Proposed Action would require the installation of a new water main along Eleventh Avenue between West 38th and West 29th Streets and upgrades to the water main along Tenth Avenue (a 36-inch main from West 42nd Street to West 34th Street that reduces to a 20-inch main south of West 34th Street), West 34th Street, and West 42nd Street. These potential impacts would be addressed through the DEP's Trunk Plan, which would incorporate these needed modifications to the water distribution system to accommodate the Proposed Action in 2010 and 2025. The DEP is currently preparing the Trunk Plan considering the full-build of the Proposed Action in 2025. The Trunk Plan will identify necessary modifications to water supply infrastructure serving the Project Area.

Water Tunnel No. 3 would continue to be under construction in 2010. It is unlikely that the segment passing through the Project Area under Tenth Avenue would be available to provide additional water supply. However, the Trunk Plan will include plans for connections to Water Tunnel No. 3, and open sections of Tunnel No. 3 would provide additional capacity north of the Project Area.

a) No. 7 Subway Extension

The principal need for potable water associated with the No. 7 Subway Extension would be to serve the Terminal and Intermediate subway stations. These two new stations would have only minimal water requirements. There are no plans for public bathrooms within the subway stations, and the employee bathrooms and janitor closets would use minimal (700 gpd) amounts of water per day. The employee spaces would have "DX" air conditioning units, an air-cooled coil system that does not require water. The proposed systems and ventilation buildings associated with the subway extension would include four cooling towers that would generate a combined demand of 77,700 gpd of water (Table 16-5). The cooling towers would be needed to cool the temperatures generated in the systems buildings.

When the No. 7 Subway Extension design is complete, the MTA will submit "site tapping applications" to the DEP to connect the Intermediate Station, Terminal Station, and associated systems buildings to water supply infrastructure. The No. 7 Subway Extension would not create a significant adverse impact on the DEP's water distribution system.

Construction activities at the Terminal Station, Intermediate Station, and tunnel access shafts would encounter existing water supply infrastructure, and possibly require temporary and permanent relocations. Careful coordination between the No. 7 Subway Extension designers and the DEP Bureau of Water and Sewer Operations (the DEP-BWSO) would be required through the end of construction in areas containing water infrastructure. Specific construction methods to avoid and minimize impacts to the City infrastructure and private utilities are discussed in Chapter 23, "Construction Impacts."

b) Rezoning Area

By 2010, only a relatively small portion of the development permitted under the rezoning would be in place. Assuming that MSG is relocated to Projected Development Site 34 (west side of Ninth Avenue between West 31st and West 33rd Streets), approximately 2.0 million square feet of new office and 2.3 million square feet of residential developments would likely occur by 2010. As listed in Table 16-4, the Rezoning Area would generate approximately 1.6 mgd of domestic water use and 0.7 mgd of air conditioning use.

TABLE 16-4
WATER USAGE AND SEWAGE GENERATION WITHIN THE REZONING AREA,
2010 FUTURE WITH THE PROPOSED ACTION

Projected Sites	Units/ Size/FA	Person/ Employees/ Students	GPD for Domestic/ Air Conditioning Use	Water/Sewage (gpd)	Air Conditioning (gpd)
Rezoning Area					
Office	3,767,644	15,071	25/employee, 0.1/sf	376,800	376,800
Retail	237,966	793	25/employee,0.17/sf	19,800	40,500
Other Commercial	908,989	3,636	25/employee, 0.1/sf	90,900	90,900
Residential	3,082	7,921	112/resident	887,100	----
Hotel	0	0	150/occupant, 0.17/sf, 0.1/sf	----	----
Ind/Man	762,058	3,048	25/employee, 0.1/sf	76,200	76,200
Institutional	433,628	1,445	30/seat, 0.1/sf	43,400	43,400
MSG	1,000,000	19,500	30/seat, 0.1/sf	97,500	100,000
			2010 Rezoning Area Total	**1,591,700 (1.6 mgd)**	**727,800 (0.7 mgd)**

Notes:
1. Household size is based on an average of 2.57 persons/household in the proposed rezoning area.
2. Water generation rates are based on the CEQR Technical Manual. For office employees, an estimated rate of 1 employee/250 sf was used and for retail employees, a rate of 1 employee/300 sf was used.

sf = square feet

The anticipated residential and office development would require the installation of a new water main along Eleventh Avenue. Potential upgrades to Tenth Avenue, West 42nd Street, and West 34th Street water distribution lines could also be necessary. As mentioned previously, the DEP is developing a new Trunk Plan to provide adequate water supplies to serve the development that would ultimately be in place in 2025.

c) Convention Center Expansion

It is anticipated that the Convention Center expansion would be completed and in operation by 2010. On a peak event day, the expanded Convention Center's overall demand for water and sewer services,

including the existing convention space, would be 0.8 mgd in domestic water use and 0.8 mgd in air conditioning use, according to projections provided by the Convention Center (Table 16-5). This expansion would generate a total net increase in domestic water usage of 0.3 mgd and 0.6 mgd to cool the function space on a peak day (Table 16-5). The DEP has indicated that this increased demand for water usage could be provided by the two existing 20-inch water mains along Route 9A.

The Convention Center expansion would occupy West 39th, West 40th, and West 41st Streets between Eleventh and Twelfth Avenues, which would require the distribution mains in these streets to be capped and abandoned. To compensate for the water mains being abandoned and for anticipated demands, the DEP has also recommended that 20-inch mains be installed around the perimeter of the expanded facility. Portions of the 20-inch main currently exist: along Route 9A and along Eleventh Avenue between West 43rd Street and West 38th Street. Specifically, a 20-inch water main on Eleventh Avenue between West 38th and West 34th Street would be needed, and the existing 12-inch water mains along West 34th Street and West 42nd Street would be replaced with 20-inch mains.

To facilitate the needed infrastructure improvements for the Convention Center expansion, the CCOC will provide the DEP with site "tapping applications" including conceptual connection plans and projected water loads, as well as plans for the abandoned infrastructure under West 39th, West 40th, and West 41st Streets.

TABLE 16-5
WATER USAGE AND SEWAGE GENERATION WITHIN THE PROJECT AREA,
2010 FUTURE WITH THE PROPOSED ACTION

Project Element	Units/ Size/FA	Person/ Employees/ Students	GPD for Domestic/Air Conditioning Use	Water/ Sewage (gpd)	Air Conditioning (gpd)
Rezoning Area in 2010				1,591,700	727,800
No. 7 Subway Extension					
2 Stations with F/T employees		26	25/employee	700	---
Cooling towers (300 tons each)	4		19,440/tower (operating 3 months)		77,800
Total				*700*	*77,800*
Multi-Use Facility*					
Patrons (peak: 12 events/year)		75,000	5/patron	375,000	---
F/T employees		2,503	25/employee, 0.1/sf	50,000	---
Cooling towers (events with closed roof)			288,000/day	---	288,000
Total				*425,000**	*288,000**
Jacob K. Javits Convention Center Expansion*					
Total function and support space, with patrons (peak)	5,600,000	110,000	5/patron, 0.17/sf	550,000	641,000
Convention employees and contractors		1,812	20/employee	36,200	----
Hotel (1.2 million sf)	1,200,000	1,500	150/occupant, 0.17/sf, 0.1/sf	225,000	134,400
Hotel employees		800	20/employee	16,000	----
Total				*827,200*	*775,400*
			2010 Total	**2,844,600* (2.8 mgd)**	**1,869,000* (1.9 mgd)**

Notes:
1. Household units are based on an average of 2.57 persons/household in the proposed rezoning area.
2. The No. 7 Subway, and Rezoning Area water usage calculations are based on the CEQR Technical Manual. For office employees, an estimated rate of 1 employee/250 sf was used and for retail employees, a rate of 1 employee/300 sf was used.

* Peak event volumes for the Convention Center and Multi-Use Facility were provided by designers of those facilities.
sf = square feet

d) Multi-Use Facility

It is anticipated that the Multi-Use Facility would be completed and open for use by 2010. An event that would capture the peak capacity of the Multi-Use Facility would be a sold-out New York Jets football game with 75,000 patrons. Using rates provided by the New York Jets, a peak event would generate a maximum 0.4 mgd in domestic water use by patrons and employees (Table 16-5). During a summer event, when the retractable roof is closed, the Multi-Use Facility would use 0.3 mgd for cooling. The DEP has indicated that these volumes of water could be supplied by the two existing 20-inch mains under Route 9A. The Multi-Use Facility may incorporate a 150,000 gallon storage tank that would collect stormwater and use the recycled water or "gray water" for the facilities cooling tower make up water. During years with typical rainfall volume and frequency, this gray water system would satisfy approximately 25% of the Multi-Use Facility's annual cooling tower make up requirement. It is anticipated that these water conservation measures would significantly reduce the water demand.

Construction of the Convention Center truck marshalling facility, just north of the Multi-Use Facility, would occupy West 33rd Street between Eleventh and Twelfth Avenues, which would require the existing water infrastructure to be capped and abandoned. To compensate for the water mains being abandoned and for anticipated demands, the DEP has recommended that 20-inch mains be installed around the perimeter of the Multi-Use Facility to provide adequate water service and fire protection. This would require the installation of an Eleventh Avenue trunk main between West 34th Street and West 30th Street and the replacement of the existing 12-inch water mains under West 34th Street and West 30th Street between Eleventh and Twelfth Avenues with 20-inch mains. Currently, two 20-inch water mains exist along Route 9A.

As requested by the DEP, the New York Jets will provide site "tapping applications" and plans for the infrastructure that would be abandoned under West 33rd Street.

2. Wastewater

The Project Area would continue to be served by the North River WPCP in 2010. Under peak conditions, the combined sewage generated by the Proposed Action in 2010 would total approximately 2.8 mgd (see Table 16-5). This would represent a relatively small increase in demand (2 percent) compared to the overall flow to the North River WPCP (approximately 123 mgd on an average day). Water conservation measures set forth by the DEP would further reduce the potential sewage generated in the future across the City and are not reflected in the *CEQR Technical Manual* sewage generation rates. These additional sanitary volumes would still allow the North River WPCP to operate within the permitted limit of 170 mgd.

In 2010, the Proposed Action could require improvements to the sewer main along Eleventh Avenue between West 42nd and West 30th Streets, Tenth Avenue, West 34th Street, and West 42nd Street. Modifications to DEP infrastructure would require DEP-approved amendments to the New York City Drainage Plan, as well as regulator upgrades to avoid significant adverse impacts to wastewater service in the vicinity of the Project Area.

The City is preparing amendments to the Drainage Plan to identify necessary infrastructure improvements. These improvements would be carried out pursuant to the DEP design specifications and sewer guidelines. This process, completion of which is necessary to permit the public and private developments included in the Proposed Action to be built, would avoid any significant adverse impacts to the City's sewer system. The DEP has indicated that the existing North River Wastewater Pollution Control Plant (WPCP) would have sufficient capacity to handle the increased wastewater generated by the Proposed Action in 2025.

a) No. 7 Subway Extension

The No. 7 Subway Extension would become operational in 2010. The two new stations would require treatment of only minimal quantities of sewage and wastewater. Because there are no plans for public bathrooms within the subway stations, the employee bathrooms and janitor closets would generate relatively insignificant amounts of wastewater per day—approximately 700 gpd (Table 16-7). The four cooling towers required for the proposed systems and ventilation buildings associated with the Subway Extension would produce 77,800 gpd of wastewater on an average day.

Once the No. 7 Subway Extension design is complete, MTA will submit "site connection proposals" to the DEP to connect the proposed Intermediate Station, Terminal Station, and associated systems buildings to wastewater infrastructure. The operations of the No. 7 Subway Extension would not create a significant adverse impact on the City's sewer system.

Construction activities at the Terminal Station, Intermediate Station, and tunnel access shafts would encounter sewer infrastructure, and possibly require temporary and permanent relocations of City sewer lines. The DEP-BWSO and No. 7 Subway Extension designers would coordinate construction activities in these areas to avoid any significant adverse impacts to DEP infrastructure. Construction methods to avoid and minimize impacts to infrastructure are discussed in Chapter 23, "Construction Impacts."

b) Rezoning Area

Anticipated development from the proposed rezoning of the Hudson Yards area by 2010 would generate approximately 1.6 mgd of sewage. The proposed residential and commercial office developments would likely require modifications to the sewer infrastructure in the vicinity of Eleventh Avenue, Tenth Avenue, West 42nd Street, and West 34th Street. As mentioned previously, the City would develop amendments to the Drainage Plan that would provide adequate sewer drainage for the entire Proposed Action (i.e., 2025 Future With the Proposed Action).

c) Convention Center Expansion

Expansion of the Convention Center would result in a total net peak day increase in sewage of 0.3 mgd, on a peak day. The resultant total demand for sewer services, including the existing convention space, would be 0.8 mgd in sewage, considering a peak event.

DEP's Drainage Plan amendment would account for the abandoned infrastructure under the closed streets between Eleventh and Twelfth Avenues: West 33rd, West 39th, West 40th, and West 41st Streets. A site connection proposal will be submitted to the DEP for approval and then incorporated into the Drainage Plan.

d) Multi-Use Facility

During a peak capacity event at the Multi-Use Facility (i.e., a sold-out 75,000 seat event), the sewage produced by the patrons and employees would be approximately 0.4 mgd (see Table 16-5). Wastewater volumes would be reduced further with installation of low-flow fixtures planned for the Multi-Use Facility.

The New York Jets will provide a Site Connection Proposal for sewer connections. The amended Drainage Plan will include adequate wastewater service for the Multi-Use Facility.

3. Stormwater

During storm events, there is the potential that the combined sewer system would trigger CSO discharges into the Hudson River. Under the 2010 Future With the Proposed Action, flows to the North River WPCP would continue to increase. Considering the projected developments within the Project Area and the entire North River WPCP service area, an average daily flow of 137 mgd,

including sanitary and stormwater flows accepted by the WPCP during wet weather, was projected for the North River WPCP. The average dry weather flow would be approximately 127 mgd. Based upon the results of the model analysis, the average annual CSO volumes would increase approximately one percent, compared to 2010 Future Without the Proposed Action. The number of CSO events within the Project Area would remain approximately one event per month. These predictions overstate the potential impacts because no credits were taken for the benefits realized from the separation of sanitary and stormwater as part of the Amended Drainage Plan and regulator upgrades.

In the 2010 Future With the Proposed Action, the amount of pervious or absorptive surfaces would change compared to the existing condition (the area is currently almost entirely covered with impervious surfaces). By 2010, there would be approximately 871,200 square feet of open space or impervious cover on the Convention Center roof and 156,816 square feet (approximately 3.6 acres) for the full block public open space between West 33rd and West 34th Streets from Eleventh to Twelfth Avenues. In addition, the Multi-Use Facility may incorporate a 150,000 gallon storage tank that would collect stormwater and use the recycled water or "gray water" for the facility's cooling tower make up water. During years with typical rainfall volume and frequency, this gray water system would satisfy approximately 25 percent of the Multi-Use Facility's annual cooling tower water make up requirement.

Under the Proposed Action, DEP-approved improvements to wastewater infrastructure would occur, and stormwater volumes would not increase. Therefore, significant adverse impacts related to stormwater are not expected.

F. 2025 FUTURE WITHOUT THE PROPOSED ACTION

1. Water Supply

The development anticipated to occur in the 2025 Future Without the Proposed Action would be primarily residential, retail, and office space developments. Based on rates provided in the *CEQR Technical Manual*, approximately 1.8 mgd of potable water and 0.7 mgd for air conditioning would be consumed in the Project Area in 2025 under peak conditions. This demand would not create a significant adverse impact on the DEP's water supply infrastructure. Also, by 2025, implementation of the Trunk Plan would provide sufficient water supply to serve this future condition.

TABLE 16-6
WATER USAGE AND SEWAGE GENERATION WITHIN THE REZONING AREA,
2025 FUTURE WITHOUT THE PROPOSED ACTION

Use	Water/Sewage (gpd)	Air Conditioning (gpd)
Rezoning Area		
Office	290,400	290,400
Retail	27,700	56,600
Other Commercial	92,300	92,300
Residential	707,000	---
Hotel	---	---
Industrial/Manufacturing	76,200	76,200
Institutional	43,400	43,400
MSG	97,500	100,000
Subtotal	*1,334,500 (1.3 mgd)*	*658,900 (0.7 mgd)*
Convention Center*	**478,500* (0.5 mgd)**	**---**
Total	**1,813,000 (1.8 mgd)**	**658,900 (0.7mgd)**

Note: Water and sewage volumes calculated based on rates provided in the CEQR Technical Manual.
* Peak event day

2. Wastewater

Sewage generation from development in the 2025 Future Without the Proposed Action would total approximately 1.8, and would not create a significant adverse impact on the North River WPCP or the City sewer system.

3. Stormwater

As in the Future Without the Proposed Action in 2010 scenario, the Project Area currently contains virtually no parkland or other pervious surfaces. It is almost entirely covered with impervious surfaces of streets, parking lots, and rooftops. As in the Future Without the Proposed Action in 2010 scenario, impervious coverage would not change under the 2025 Future Without the Proposed Action, due to the existing zoning.

The infrastructure is sized to accommodate the Project Area under the existing zoning, it would continue to serve the Project Area in the 2025 Future Without the Proposed Action.

Wastewater flows to the North River WPCP would continue to increase under the 2025 Future Without the Proposed Action. Considering the projected developments within the Project Area and the entire North River WPCP service area, an average daily flow of 142 mgd, including sanitary and stormwater flows accepted by the WPCP during wet weather, was projected for the North River WPCP. The average dry weather flow would be approximately 132 mgd. Based upon the results of the model analysis, the average annual CSO volumes would increase approximately six percent, as compared to 2010 Future Without the Proposed Action. The number of CSO events within the Project Area would remain approximately one event per month.

G. 2025 FUTURE WITH THE PROPOSED ACTION

By 2025, it is assumed that the proposed redevelopment of the Project Area would be essentially complete, and would include the No. 7 Subway Extension, the Convention Center Expansion, the Multi-Use Facility, about 12.6 million square feet of residential development, and roughly 28 million square feet of commercial office and retail space. These developments would increase the demand for the City's infrastructure services.

1. Water Supply

It is assumed that by 2025, the remainder of the proposed commercial, retail, and residential development allowed under the proposed rezoning would be in place. As outlined in Table 16-7, the water usage of the projected development would be nearly the same whether MSG relocates to Projected Development Site 34 or remains at its present location (Projected Development Site 45). If a full build-out of the projected sites occurs, there would be approximately 28 million square feet of office space, 0.5 million square feet of retail, 12.6 million square feet of residential space, and 1.5 million square feet of hotel space constructed. These combined developments would produce a demand of approximately 7.3 mgd in domestic water use and 3.4 mgd in air conditioning uses under the scenario in which MSG is relocated.

TABLE 16-7
WATER USAGE FOR PROJECTED DEVELOPMENT SITES,
2025 FUTURE WITH THE PROPOSED ACTION

Project Element	Units/ Size/FA	Person/ Employees/ Students	GPD for Domestic/Air Conditioning Use	Water/ Sewage (gpd)	Air Conditioning (gpd)
No. 7 Subway Extension				700	77,800
Multi-Use Facility*				425,000*	288,000*
Convention Center Expansion*				827,200*	775,400*
2025 Projected Development within the Rezoning Area					
2025 With Relocation of MSG					
Office	29,245,812	116,983	25/employee, 0.1/sf[1]	2,924,600	2,924,600
Retail	1,106,128	3,687	25/employee,0.17/sf	92,200	188,000
Other Commercial	0	0	25/employee, 0.1/sf	----	----
Residential	12,887	33,120	112/resident	3,709,400	----
Hotel	1,500,000	3,000	150/occupant, 0.17/sf, 0.1/sf	450,000	150,000
Ind/Man	56,963	228	25/employee, 0.1/sf	5,700	5,700
Institutional	397,086	1,324	30/seat, 0.1/sf	39,700	39,700
MSG	1,000,000	23,000	5/patron 0.1/sf	115,000	100,000
			Subtotal	*7,336,600*	*3,408,000*
			Proposed Action in 2025	**8,589,500 (8.6 mgd)**	**4,549,200 (4.5 mgd)**

Notes:
1. Household units are based on an average of 2.57 persons/household in the proposed rezoning area.
2. For office employees, an estimated rate of 1 employee/250 square feet was used and for retail employees, a rate of 1 employee/300 square feet was used. The No. 7 Subway and Rezoning Area water usage calculations are based on the CEQR Technical Manual.

* Peak event volumes for the Convention Center and Multi-Use Facility rates were provided by designers of those facilities.
sf = square feet.

Table 16-7 summarizes projected water usage in the 2025 Future With the Proposed Action. These projections incorporate the effect of considering the overall net reductions in industrial, manufacturing, and institutional space that would occur under the proposed rezoning. These projected volumes are based on rates provided in the *CEQR Technical Manual* and do not consider the anticipated reductions in water use and sewage generation that would occur with the DEP mandated water conservation measures.

The estimated peak water usage of the 2025 Future With the Proposed Action would be 8.6 mgd, and 4.5 mgd for air conditioning. Table 16-8 provides a comparison of the 2010 and 2025 Future With the Proposed Action and the Future Without the Proposed Action. The 2025 Future With the Proposed Action would increase the demand for domestic water by approximately 7 mgd compared to the Future Without the Proposed Action.

Residential and commercial development in the Proposed Action between 2010 and 2025 would require further modifications to existing DEP infrastructure. The Trunk Master Plan currently being prepared by the DEP will consider potential improvements that would accommodate the Proposed Action. The DEP has advised that there will be adequate water supply to accommodate the demand of the Proposed Action and future background growth in 2025.

2. Wastewater

Sewage generated in 2025 by the Proposed Action would be approximately 8.6 mgd under peak conditions (Table 16-7). The sewage generated from the Proposed Action would be treated prior to release into the Hudson River, except during major storm events. The increase in wastewater volumes resulting from the Proposed Action would still allow the North River WPCP to operate within its present permitted limits, and therefore would not result in a significant adverse impact.

The estimated combined demand of the No. 7 Subway Extension, a peak event at the Multi-Use Facility, peak event at the an expanded Convention Center, and build-out of the projected 28 million square feet of commercial development and 12.6 million square feet of residential development would be 8.6 mgd in sewage. In 2025, as in 2010, DEP-mandated water conservation measures would be in effect, which would further reduce the sewage volumes projected using the *CEQR Technical Manual*. Table 16-8 provides a comparison of the 2010 and 2025 Future With the Proposed Action and the Future Without the Proposed Action. The 2025 Future With the Proposed Action would increase the sewage generated by approximately 7 mgd compared to the Future Without the Proposed Action.

TABLE 16-8
2010 AND 2025 COMPARISON OF THE FUTURE WITH AND WITHOUT THE PROPOSED ACTION

Project Element	Existing Conditions (2003) Water/Sewage (gpd)	2010 Without Proposed Action Water/Sewage (gpd)	2010 With Proposed Action Water/Sewage (gpd)	2025 Without Proposed Action Water/Sewage (gpd)	2025 With Proposed Action Water/Sewage (gpd)
No. 7 Subway Extension	---	---	700	---	700
Multi-Use Facility*	---	---	425,000*	---	425,000*
Convention Center Expansion*	478,500*	478,500*	827,200*	478,500*	827,200*
Rezoning Area					
Office	185,900	163,500	376,800	290,400	2,924,600
Retail	14,100	18,300	19,800	27,700	92,200
Other Commercial	93,300	92,300	90,900	92,300	---
Residential	145,400	526,700	887,100	707,000	3,709,400
Hotel	---	---	---	---	450,000
Ind/Man	76,200	76,200	76,200	76,200	5,700
Institutional	43,900	43,400	43,400	43,400	39,700
MSG	97,500	97,500	97,500	97,500	115,000
Rezoning Area Subtotal	*656,300*	*941,700*	*1,591,700*	*1,334,500*	*7,336,700*
Total	**1,134,800 (1.1 mgd)**	**1,420,200 (1.4 mgd)**	**2,844,600 (2.8 mgd)**	**1,813,000 (1.8 mgd)**	**8,589,500 (8.6 mgd)**

Notes:
1. Household units are based on an average of 2.57 persons/household in the proposed rezoning area.
2. For office employees, an estimated rate of 1 employee/250 square feet was used and for retail employees, a rate of 1 employee/300 square feet was used. The No. 7 Subway and Rezoning Area water usage calculations are based on the CEQR Technical Manual.

* Peak event volumes for the Convention Center and Multi-Use Facility rates were provided by designers of those facilities.

Residential and commercial developments of the Proposed Action between 2010 and 2025 would require further modifications to existing sewer system serving the Rezoning Area. The Drainage Plan will consider improvements to accommodate the Proposed Action, and necessary improvements will be made.

Sewer segments that would need upgrading to accommodate the estimated wastewater flows of the Proposed Action would be reflected in the amended Drainage Plan, which will be prepared by the

City. This amended Drainage Plan would identify sewer upgrades and relocations according to the DEP design specifications and sewer guidelines. Once the DEP has approved the amended Drainage Plan which would support the Proposed Action, modifications to the City infrastructure could occur. This process, completion of which is necessary to permit the public and private developments included in the Proposed Action to be built, would avoid creating significant adverse impacts to the City's sewer system

3. Stormwater

Wastewater flows to the North River WPCP would continue to increase under the 2025 Future With the Proposed Action. Considering the projected developments within the Project Area and the entire North River WPCP service area, an average daily flow of 150 mgd, including sanitary and stormwater flows accepted by the WPCP during wet weather, was projected for the North River WPCP. The average dry weather flow would be approximately 140 mgd. Based upon the results of the model analysis, the average annual CSO volumes would increase approximately 5 percent. The number of CSO events would increase by approximately 5 to 6 percent, compared to 2025 Future Without the Proposed Action. The analysis of the incremental effect of CSOs to water quality is discussed in Chapter 13, "Natural Resources." Those predictions overstate the potential impacts because no credit is taken for the benefits realized from the separation of sanitary and stormwater as part of the Amended Drainage Plan and regulator upgrades.

In the 2025 Future With the Proposed Action, the amount of impervious surfaces would decrease from existing levels, due to the development of approximately 871,200 square feet of open space or impervious cover on the Convention Center roof; approximately 3.6 acres for the full block public open space between West 33rd and West 34th Streets from Eleventh to Twelfth Avenues; approximately 8 acres of public open space constructed by the City within the Midblock Park and Boulevard System and on Block 675 (West 29th to West 30th Streets, Eleventh to Twelfth Avenues); and approximately 7.5 acres of public open space on the eastern portion of Caemmerer Yard. In addition, the stormwater retention and recycling systems of the Multi-Use Facility could be in operation. As a result, it is anticipated that the stormwater discharge to the sewer system would be reduced in the 2025 Future With the Proposed Action.

Under the Proposed Action, no significant adverse impacts related to stormwater are anticipated because stormwater generation would not increase and the DEP approved infrastructure would be in place.

H. CORONA YARDS

1. Water Supply

Modification of the storage and operating space at the Corona Yards facility needed to maintain acceptable operations with the No. 7 Subway Extension would not require any significant increase in water usage. The additional cars planned for the No. 7 Subway Extension would be washed and cleaned at the existing Corona Yards Maintenance Shop and Car Washer facility. This car washer facility uses a recycled water system, which further reduces water usage. Therefore, no significant adverse impacts would occur.

2. Wastewater

The additional wastewater that would be produced if the Corona Yards were modified would be from the water expended from washing the additional cars in the No. 7 fleet. The Corona Yards car washer incorporates a gray water system, which reduces the wastewater generated significantly. The only additional volume of wastewater generated would be from washing 11 trains, a negligible amount, and no significant adverse impacts would result. ❖