

A. INTRODUCTION

This chapter considers the proposed project's potential effects on infrastructure. The 2001 *City Environmental Quality Review (CEQR) Technical Manual* outlines the following guidelines for an infrastructure assessment:

- *Water Supply.* An analysis of an action's impact on the New York City water supply system should be conducted only for actions that would have exceptionally large demand for water, such as power plants, very large cooling systems, or large developments (e.g., those that use more than 1 million gallons per day). In addition, actions located at the extremities of the water distribution system should be analyzed.
- *Sanitary Sewage and Wastewater Disposal.* Because the City is committed to adequately treating all wastewater generated in the City and to maintaining its wastewater treatment plants at or below the capacity permitted by applicable state and federal permits, orders, and decrees, only unusual actions with very large flows could have the potential for significant impacts on sewage treatment.

Because the proposed 53 West 53rd Street project would not exceed any of the CEQR thresholds, this chapter discloses the proposed project's water demands and wastewater generation.

As detailed in this chapter, there would be no potential for significant adverse impacts on infrastructure because the proposed project would not have an exceptionally large incremental demand for water or requirement for sanitary sewage and wastewater disposal when compared with either of the two as-of-right development scenarios that could be built in the future without the project.

B. EXISTING CONDITIONS**WATER SUPPLY***WATER SUPPLY SYSTEM*

New York City's water supply system comprises three watersheds—the Croton, Delaware, and Catskill—and a network of reservoirs, aqueducts, and tunnels extending as far as 125 miles north of the City. The Delaware and Catskill systems collect water from the Catskill Mountains and deliver it to Kensico Reservoir in Westchester County. From there, water is conveyed to the Hillview Reservoir in Yonkers, which balances the daily fluctuations in water use.

Water is then distributed to the City through three tunnels: City Tunnel Nos. 1, 2, and 3. City Tunnel No. 1 carries water through the Bronx and Manhattan to Brooklyn; City Tunnel No. 2 passes through the Bronx, Queens, and Brooklyn, and then through the Richmond Tunnel to

Staten Island; and City Tunnel No. 3 goes through the Bronx and Manhattan, terminating in Queens. An extension of Tunnel No. 3 is currently being built in Queens and Brooklyn.

The Croton system collects water from Westchester and Putnam Counties and delivers it to the Jerome Park Reservoir in the Bronx. From that point, water is distributed to the Bronx and Manhattan through the New Croton Aqueduct, which travels beneath the Bronx and Manhattan. The Croton system has lower pressure than the Delaware and Catskill systems and supplies domestic uses primarily in the lower elevations of Manhattan and the Bronx. The higher-pressure Delaware and Catskill systems serve all five boroughs and higher elevations where the water pressure of the Croton system would be inadequate. The Croton system supplies on average about 10 percent of the City's water needs, and the Catskill/Delaware systems supply the rest. However, depending on conditions, the Croton system can supply up to 40 percent of the City's needs.

WATER CONSUMPTION

In 2004, New York City's water system, which is under the jurisdiction of the New York City Department of Environmental Protection (DEP), delivered approximately 1.2 billion gallons per day (gpd) to the City's five boroughs and Westchester County. In Manhattan, average consumption is approximately 420 million gpd; peak consumption is approximately 500 million gpd.

The development site consists of seven vacant lots. Therefore, the site has no current demand for water. The development site is serviced by a network of 12-inch water mains forming an interconnected loop service. These water mains run along West 54th and West 53rd Street, and connect to a 48-inch water main along Fifth Avenue.

SANITARY SEWAGE AND STORMWATER DISPOSAL

The project site is located on the border of the service areas of the North River and Wards Island water pollution control plants (WPCPs). Generally, the portion of the development site along West 54th Street is served by Wards Island WPCP and the portion along West 53rd Street is served by the North River WPCP. These WPCPs discharge treated wastewater flows, or "effluent," into the Hudson and East Rivers. Effluent discharged from these WPCPs is regulated by State Pollutant Discharge Elimination System (SPDES) permits issued by the New York State Department of Environmental Conservation (DEC). The SPDES permit limit for flow at the North River WPCP is 170 million gallons per day (mgd) and the Wards Island WPCP is 275 mgd.

As shown in **Table 11-1**, at the North River WPCP, the 12-month average dry weather flow for the most recent 12-month period for which data are available is 127 mgd, which is approximately 75 percent of the plant's treatment capacity. At Wards Island, the 12-month average dry weather flow is 219 mgd, which is approximately 81 percent of the plant's treatment capacity.

The development site is vacant and does not generate sanitary sewage.

Table 11-1
Average Daily Flows by Month at the
North River and Wards Island WPCPs

Year	Month	North River Flow (mgd)	Wards Island Flow (mgd)
2008	July	126	211
2008	June	126	218
2008	May	123	199
2008	April	123	216
2008	March	129	235
2008	February	133	227
2008	January	122	217
2007	December	129	227
2007	November	122	211
2007	October	129	214
2007	September	125	206
2007	August	137	243
12-Month Average		127	219
Source: DEP, September 2008.			

C. THE FUTURE WITHOUT THE PROPOSED PROJECT

As described in greater detail in Chapter 1, “Project Description,” in the future without the proposed project the development site would be developed with one of two scenarios: the Previously Approved Project or the Expanded Development Scenario. Each scenario’s infrastructure demands are described in detail below.

PREVIOUSLY APPROVED PROJECT

WATER SUPPLY

In the future without the proposed project, local distribution for water supply is not expected to change significantly. New York City has initiated a comprehensive water conservation program that seeks to reduce water use by implementing metering and requiring low-flow fixtures in all new development projects, as well as retrofits of existing fixtures (Local Law No. 29, 1989). Other measures, including leak detection programs and locking fire hydrant caps, will further reduce the City’s water needs.

DEP projects that the savings from the conservation measures described above will, over the next decade, exceed any increase in water demand from added consumers (i.e., population and employment growth). Future water use for Manhattan is conservatively projected to remain at or below the current average use of 420 million gpd, with peak use at 500 million gpd.

Based on the water consumption rate of 25 gallons per day (gpd) per commercial office employee and 0.17 gpd per square foot of retail and museum space, which are presented in Table 3L-2 of *CEQR Technical Manual*, the Previously Approved Project would have a demand for 44,624 gpd of water (see **Table 11-2**).

Table 11-2

**Projected Water Demand in the Future Without the Proposed Project
Previously Approved Project**

Use	Size	Domestic demand (gpd)	Air Conditioning (gpd)	Total (gpd)
Museum	68,097 sf	11,576	11,576	23,152
Commercial office	180,000 sf (720 employees)	18,000	72	18,072
Ground-floor retail	10,000 sf	1,700	1,700	3,400
Total	250,097	31,276	13,348	44,624
Note: sf = square feet; gpd = gallons per day				
Source: 2001 <i>CEQR Technical Manual</i> , Table 3L-1, "Water Usage and Sewage Generation Rates for Use in Impact Assessment."				

SANITARY SEWAGE

Assuming that sewage generation is the same as water usage, the Previously Approved Project would generate an estimated 44,624 gpd of sanitary sewage. This development would cause a minimal increase in sewage generation, and the WPCPs' overall capacity would be maintained below its permitted limit. Overall, this amount of sewage generated would not be significant. The WPCPs serving the development site would have sufficient capacity to handle the sanitary sewage generated by the Previously Approved Project.

EXPANDED DEVELOPMENT SCENARIO

WATER SUPPLY

As shown in **Table 11-3**, the Expanded Development Scenario would generate a demand for approximately 103,214 gpd of water. This estimate is based on the water consumption rate of 0.17 gpd per square foot of museum space, 150 gpd per hotel per occupant, and 112 gpd per resident. This analysis assumes that each of the 105 hotel rooms is occupied and that the residential component would generate 462 residents. The latter assumption is based on full occupancy and 1.54 residents per residential unit, which is the average household size for Manhattan Community District 5.

Table 11-3

**Projected Water Demand in the Future Without the Proposed Project,
Expanded Development Scenario**

Use	Size	Domestic demand (gpd)	Air Conditioning (gpd)	Total (gpd)
Museum	68,097 sf	11,576	11,576	23,152
Hotel	125,679 sf (up to 105 rooms)	15,750	12,568	28,318
Residential	314,236 sf (up to 300 units)	51,744	0	51,744
Total	508,012	79,070	24,144	103,214
Note: sf = square feet; gpd = gallons per day				
Source: 2001 <i>CEQR Technical Manual</i> , Table 3L-2, "Water Usage and Sewage Generation Rates for Use in Impact Assessment."				

SANITARY SEWAGE

Assuming that sewage generation is the same as water usage, the Expanded Development Scenario would generate an estimated 103,214 gpd of sanitary sewage. This development would cause a minimal increase in sewage generation, and the overall capacity at both WPCPs would be maintained below its permitted limit.

D. PROBABLE IMPACTS OF THE PROPOSED PROJECT

The proposed project would include museum, residential, retail, and restaurant uses. Each of these uses would place new demands on the City’s infrastructure. This section discusses the approximate total future demand on water use and sanitary sewage that would be created by the proposed project. It then compares the proposed project’s demand on infrastructure services to the demand that would result from each of the as-of-right scenarios described above.

WATER SUPPLY

As shown on **Table 11-4**, the proposed project would generate a total demand for 131,436 gpd of water. The museum component would generate water demand for approximately 23,152 gpd, the hotel would demand 45,050 gpd, the residential component would demand 51,744 gpd, and the restaurant component would demand 11,490 gpd.

**Table 11-4
Proposed Project’s Estimated Water Demand**

Use	Size ¹	Domestic demand (gpd) ²	Air Conditioning (gpd)	Total (gpd)
Museum	68,097 sf	11,576	11,576	23,152
Hotel	200,000 sf (up to 167 rooms)	25,050	20,000	45,050
Residential	up to 618,465 sf (up to 300 units)	51,744	0	51,744
Restaurant	7,000 sf	10,300	1,190	11,490
Total	786,562	98,670	32,766	131,436

Notes:
 1. sf = square feet
 2. gpd = gallons per day
Source: 2001 *CEQR Technical Manual*, Table 3L-2, “Water Usage and Sewage Generation Rates for Use in Impact Assessment.”

Compared with the Previously Approved Project, the proposed project would create an incremental demand for 86,812 gpd. Compared with the Expanded Development Scenario, the proposed project would create an incremental demand for 28,222 gpd. Overall, the proposed project’s incremental demand for water would represent an insignificant increase in the total demand in Manhattan. The total projected water demand represents an insignificant increase in the total demand or water consumption in Manhattan. As a result, this added demand would not overburden the City’s water supply or the local conveyance system. The proposed project would also comply with the City’s water conservation measures as mandated by Local Law 19.

WASTEWATER TREATMENT

The proposed project is assumed to generate wastewater at a rate commensurate with domestic water consumption, or about 131,436 gpd. This amount of wastewater would not cause the North River and Wards Island WPCPs to exceed their design capacities or SPDES permit flow limit. Likewise, the proposed project would not overburden the local or interceptor conveyance

53 West 53rd Street

system. There would be no increase in stormwater flows as the project site is currently either paved or occupied by buildings, and there would be no increase in the impervious surface area with the proposed project. *