Chapter 11: Infrastructure

A. INTRODUCTION

The 2001 *City Environmental Quality Review (CEQR) Technical Manual* outlines the following guidelines for the 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 action (both the project and the projected development under the reasonable worst-case development scenario) would not trigger any of the CEQR thresholds, this chapter simply discloses the proposed action's water demands and wastewater generation. This chapter concludes that because the proposed action would not have an exceptionally large demand for water there would be no potential for significant adverse impacts on infrastructure.

B. EXISTING CONDITIONS

WATER SUPPLY

WATER SUPPLY SYSTEM

New York City gets its water from three watersheds—Croton, Delaware, and Catskill—and a network of reservoirs, aqueducts, and tunnels extending as far as 125 miles north of the city. Within the city, a grid of mains distributes water to individual buildings.

The Catskill and Delaware systems collect water from the Catskill Mountains and deliver it to the Hillview Reservoir in Yonkers. From there, it is distributed to the rest of the city through three tunnels: Tunnel No. 1 carries water through the Bronx and Manhattan to Brooklyn; Tunnel No. 2 travels through the Bronx, Queens, Brooklyn, and then through the Richmond Tunnel to Staten Island; and Tunnel No. 3 goes through the Bronx and Manhattan, terminating in Queens.

The Croton system collects water from Westchester and Putnam Counties and delivers it to the Jerome Park Reservoir in the Bronx. From there, it 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. Any of the three systems can serve the project site.

Croton water mains near the project block include a 36-inch main under West End/Eleventh Avenue, installed in 1897, and a 48-inch main under Amsterdam Avenue (installed before 1870). A 36-inch main (1898) and 20-inch main (before 1870) under Broadway carry water from the Catskill/Delaware system, which also includes a grid of 12-inch mains under West End Avenue, Amsterdam Avenue, Broadway, and virtually every cross street down to the project site and rezoning area except 70th, 71st, and 72nd Streets, which are underlain by 6-inch mains.

WATER CONSUMPTION

Water consumption in the city averages approximately 1.2 billion gallons per day (gpd). In Manhattan, average consumption is approximately 420 million gallons per day (mgd); peak consumption is approximately 500 mgd.

Until recently, the project site contained a mix of uses, including motor vehicle repair shops, surface parking, warehouse, and a commercial use.[*] The additional lots on the zoning lot (Lots 56 and 57) contain residential uses. The additional three lots in the rezoning area contain a motor vehicle repair shop, an automobile dealership, and the Heschel School, a private high school that opened in September 2002. Including the Heschel School and the residential units, about 89 people are employed on-site and in the rezoning area. At an average of 25 gallons per employee per day, they would consume about 2,225 gpd. The Heschel School also has 150 students enrolled for the 2003/2004 school year, whose consumption is estimated at approximately 4,500 gpd. The approximately 40 residential units in the rezoning area consume about 7,600 gpd. Overall, about 14,325 gpd of water is consumed on-site and in the rezoning area, excluding air conditioning.

SANITARY SEWAGE AND STORMWATER DISPOSAL

Sewage on the west side of Manhattan north of Bank Street is conveyed to the North River Water Pollution Control Plant (WPCP), which discharges treated wastewater flows (or effluent) into the Hudson River. A New York State Pollutant Discharge Elimination System (SPDES) permit issued by the New York State Department of Environmental Conservation (NYSDEC) regulates the effluent from this WPCP. The North River WPCP is designed to treat a monthly flow of 170 mgd. The average actual monthly flow rate at the plant for the latest 12 months of records available is shown in Table 11-1. The plant handles greater volumes during storm events due to stormwater inflows to the plant.

[*] The former uses on the project site have been demolished, and the site is now vacant and being remediated under the Brownfields Cleanup Program. However, for this chapter, water demand and wastewater generation, are estimated for the uses that until recently were located on the site.

Table 11-1
Monthly Flows at North River WPCP

Year	Month	Flow (mgd)
2005	February	122
	March	129
	April	128
	May	117
	June	133
	July	134
	August	136
	September	123
	October	154
	November	127
	December	127
2006	January	128
12-month average		**130**
SPDES permit limit		**170**

Note: Allowable flow 170 mgd.
Source: New York City Department of Environmental Protection.

During dry weather, sewer lines convey only sanitary sewage and carry it to the North River WPCP. However, during and immediately after precipitation, such as rain and snow, the sewer lines convey both sanitary sewage and stormwater. The large volumes of stormwater exceed the capacity of the North River WPCP. In those situations, the North River WPCP treats its maximum volume of combined sewage, and the excess combined sewage overflows into the Hudson River without treatment at controlled points known as regulators. The project site is mostly built, and therefore almost all of the runoff from impervious areas flows through the combined system and is discharged into the Hudson River.

The State Pollution Discharge Elimination System (SPDES) permit for the North River WPCP contains limits on biochemical oxygen demand (BOD) and total suspended solids (TSS); both are measures of the organic strength of the sewage. The organic content of the sewage impairs water quality by using oxygen in the receiving water, in this case the Hudson River. The degree of removal of BOD and TSS is mandated by the Federal Clean Water Act at a minimum of 85 percent, or resulting in a maximum 30-day average concentration of 30 milligrams per liter of effluent (mg/l).

The permit further specifies a maximum mass loading discharge allowable for BOD and TSS. The limitations on BOD and TSS in the SPDES permit are set based on achieving water quality standards in the Hudson River.

As shown on Table 11-1 actual average monthly flows to the plant average about 130 mgd, well within the plant's design and permit capacity of 170 mgd. In addition, on a monthly basis, the North River WPCP meets or exceeds its permit limitations for removing BOD and TSS. The existing uses on the project site generate approximately 143,000 gpd of sanitary sewage. The water used by air conditioning evaporates into the air and does not become sanitary sewage.

C. THE FUTURE WITHOUT THE PROPOSED ACTION

As discussed above, in the future without the proposed action the project site will be remediated under the Brownfield Cleanup Program. Therefore, the site will be vacant.

WATER SUPPLY

Because its water supply is finite, the 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 and retrofits of existing fixtures (Local Law No. 29, 1989). Other measures, including leak detection programs and locking fire hydrant caps, are aimed at further reducing the city's water needs.

The New York City Department of Environmental Protection (NYCDEP) projects that the savings from these conservation measures will, over the next decade, exceed any increase in water demand from added consumers—i.e., population and employment growth. Future water use for the entire Borough of Manhattan is conservatively projected to remain at or below the current average use of 420 mgd, with peak use of 500 mgd.

The existing high school on the project site is expected to increase its enrollment to 300 students by the 2005/2006 school year. This will cause a minimal increase in water demand on the project site of approximately 450 gpd.

SANITARY SEWAGE

In the future without the proposed action, it is expected that the North River WPCP will continue to treat to full secondary treatment levels wastewater from the WPCP's service area. In addition, it is expected that the North River WPCP will continue to meet or exceed its permit limitations for removing BOD and TSS. The increased enrollment at the Heschel School on the project site will cause a minimal increase in the generation of sewage.

D. PROBABLE IMPACTS OF THE PROPOSED ACTION

The proposed action's new residential, school, retail, and medical office uses would place new demands on the city's infrastructure. This section discloses the approximate anticipated future demand of the proposed project and development under the reasonable worst-case development program.

WATER SUPPLY

As shown on Table 11-2, water demands under the proposed action have been projected using the rates outlined in the *CEQR Technical Manual*. Based on these rates, the proposed project and projected development under the reasonable worst-case development scenario would result in a total average water use of 178,974 gpd. This represents approximately 0.04 percent of the average water consumption in Manhattan, an insignificant increase. As a result, it would not be expected that this added demand would overburden the city's water supply or the local conveyance system. The proposed project would also comply with the water conservation measures of the city as mandated by Local Law 19.

Table 11-2
Estimated Water Demand

Use	Size	Domestic demand (gpd)	Air Conditioning (gpd)	Total (gpd)
Residential	881 units	156,016	0	156,016
Medical Office	4.420 gsf (10 employees)	250	442	692
Retail	10,340 gsf (34 employees)	1,758	1,758	3,516
School	375 students	11,250	7,500	18,750
Total	*NA*	**169,274**	**9,700**	**178,974**

Note: gsf = gross square feet
Source: Usage rates from *CEQR Technical Manual*.

WASTEWATER TREATMENT

The proposed action is assumed to generate wastewater at a rate commensurate with domestic water consumption, or about 169,274 gpd. This amount of wastewater, representing about 0.1 percent of the North River WPCP's permitted capacity, is not expected to affect the WPCP's capacity or its treatment efficiency. Likewise, the proposed action is not expected to overburden the local or interceptor conveyance 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. ✷