A. INTRODUCTION

This chapter analyzes the Proposed Action's potential effects on infrastructure, solid waste, and energy services. Existing utilities and services in the area of the Proposed Action, including water supply, sewage treatment and stormwater management, solid waste collection and disposal, and energy are described, as well as any planned future changes. The Proposed Action's potential impacts to these systems were evaluated using *City Environmental Quality Review (CEQR) Technical Manual* guidelines for infrastructure, solid waste, and energy assessments.

The Proposed Action would require potable water, sanitary and stormwater disposal, solid waste handling services, and energy. However, the potential increases in demand for these services would be incremental and would be handled by the existing infrastructure, solid waste, and energy systems in place.

The Proposed Action is not expected to result in any significant adverse impacts on infrastructure. The water demand expected to result by 2009 from the development program is 70,550 gallons of water per day (gpd). Thus, the Proposed Action would constitute an increase of 70,550 gpd over the existing and future without the project conditions. As compared with the expected demand of 1.2 billion gpd Citywide, and 420 million gpd in Manhattan, this increase would not significantly impact the water supply system. The sanitary sewage generation expected to result from the proposed development program is 38,250 gpd. This incremental increase would not overburden the sewage treatment capacity at the Newtown Creek Water Pollution Control Plant (WPCP). Furthermore, the Proposed Action is not expected to have a significant adverse impact on the New York City combined sewer system or on the water quality of the East River.

In addition, no significant impacts on solid waste handling and disposal services would occur, and the Proposed Action would be compatible with the City's Draft New Solid Waste Management Plan (SWMP). Moreover, the Proposed Action would result in an incremental increase in energy demand, which would be met by the electricity, natural gas, and/or steam supply systems expected to be in place in 2009.

Therefore, there would be no potential for significant adverse impacts on infrastructure, solid waste, and energy systems.

B. EXISTING CONDITIONS

The project site consists of a two-mile-long, City-owned public open space connecting Whitehall Ferry Terminal and Peter Minuit Plaza to the south to East River Park to the north. The project site also includes Piers 15, 35, and 42, a portion of Pier 36, and the vacant New Market Building on the north side of Pier 17. Existing demand for infrastructure, solid waste, and energy services from the project site is minimal.

WATER SUPPLY

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. In 2004, this system, which is under the jurisdiction of the New York City Department of Environmental Protection (DEP), delivered approximately 1.2 billion 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 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 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. The project site is generally served by the Catskill/Delaware systems.

City Tunnel No. 1 serves Lower Manhattan. The tunnel conveys water into shafts that deliver large volumes of potable water to a grid of water mains that distribute the water to individual buildings. According to DEP water main distribution maps, a number of large mains— ranging up to four feet in diameter—run under South Street beneath the project site and under several adjoining streets in the project area. These large mains feed an interconnected grid of 12-inch water lines that run beneath most of the streets in the project area. Such a grid system equalizes water pressure in the area and allows a section to be cut off for repair without affecting users not directly connected to that section. The 12-inch main beneath South Street feeds smaller 4-inch and 8-inch pipes that supply water to some of the piers and individual buildings on the project site and in the vicinity. According to DEP, there are currently no problems with the water distribution system in the area, and water pressure in the area is adequate.

The existing water demand on the project site parcels is negligible, as the parcels are generally vacant or used for passive recreation.

SANITARY SEWAGE

The project site parcels are located within the service area of the Newtown Creek WPCP, which provides modified aeration treatment of the sanitary sewage. This treatment removes at least 60 percent of the biochemical oxygen demand (BOD) and at least 75 percent of the total suspended solids (TSS) in the sewage. This level of treatment does not meet the standards of full secondary treatment. The sludge is further dewatered at another WPCP and is beneficially reused. The wastewater flow, or "effluent," is discharged into the East River.

The New York State Department of Environmental Conservation (DEC) regulates the effluent from the Newtown Creek WPCP through the use of a State Pollutant Discharge Elimination System (SPDES) permit. The Newtown Creek WPCP has a permitted flow capacity of 310 million gallons per day (mgd). For the 12-month period ending in May 2006 (the latest 12-month period for which data from the plant are available), the plant had a daily average actual flow of 229 mgd, well below the permitted level (see Table 12-1). In addition, the Newtown Creek WPCP generally meets its SPDES treatment requirements for removal of BOD and TSS, which are 60 and 75 percent, respectively.

Table 12-1
Daily Average Flows at Newtown Creek WPCP Per Month

Year	Month	Flow (mgd)
2005	June	228
	July	234
	August	230
	September	218
	October	280
	November	225
	December	222
2006	January	227
	February	218
	March	207
	April	229
	May	225
12-month average		**229**

Note: Allowable flow is 310 mgd.
Source: New York City Department of Environmental Protection.

The project site and the surrounding area are serviced by combined sewer lines that run under the streets. Sanitary sewage flows from individual buildings into the combined sewer mains. During dry weather, the combined sewer lines carry only sanitary sewage. Regulators and diversion chambers ensure that all dry weather sanitary flows in the area are diverted to the intercepting sewer beneath South Street. The interceptor sewer flows directly to the Manhattan Pump Station at East 14th Street, and the sewage is then pumped to the Newtown Creek WPCP. The interceptor sewer system is sized to accommodate wastewater flows at the rate of 175 gallons per person per day and to optimally operate at 70 percent of its capacity. The interceptor sewer currently operates well below this design capacity.

However, during and immediately after precipitation, the combined sewer lines convey both sanitary sewage and stormwater. Sometimes the large volumes of combined sewage and stormwater exceed the capacity of the Newtown Creek WPCP. In those situations, the Newtown Creek WPCP treats its maximum volume of combined sewage, and regulators direct the excess sewage, or combined sewer overflow (CSO), into the East River without treatment via outfalls.

Current sewage generation at the project site parcels is negligible.

STORMWATER

Stormwater runoff is generated by rainwater that collects upon the surface of the land or built structures. The runoff generated by these surfaces varies depending upon the type of land cover, which is defined as pervious (pervious surfaces allow more percolation to the ground below and generate less runoff), or impervious (impervious surfaces impede percolation and generate greater runoff). For example, runoff from a suburban yard will percolate into the ground with less runoff to a local street or swale. The runoff coefficient from this type of land surface is typically about 0.20 (20 percent runoff). In contrast, a building roof has no percolation and, therefore, has a runoff coefficient of 1.00 (all runoff). Paved areas (e.g., streets and sidewalks) primarily generate runoff, with some percolation to the ground below (a runoff coefficient of 0.85). Considering the land uses on the project site, the runoff coefficient is estimated to be about 0.85.

The rational formula for calculating runoff is Q = C x I x A where:

"Q" is runoff in cubic feet per second (cfs);

"C" is the runoff coefficient;

"I" is the rainfall intensity in inches per hour; and

"A" is the area in acres.

The area of the project site is approximately 17 acres. The design storm used by DEP is a rainfall intensity of 5.95 inches per hour. Using a runoff coefficient of 0.85, the flow from the project site is about 86 cfs.

Stormwater runoff from the project site parcels flows either through the combined sewer system (described above) and into the East River or it discharges directly into the East River. All of the precipitation that falls on the piers flows off the sides of the piers and into the East River. Stormwater runoff from the elevated Franklin D. Roosevelt Drive is drained by a 48-inch separate storm sewer that discharges directly into the East River. However, precipitation that falls on the remaining project site, including the existing esplanade, the area in front of the Battery Maritime Building (BMB), and along South Street flows into the combined sewer system. Stormwater in the combined sewers is discharged for conveyance either to the Newtown Creek WPCP or to the East River through CSO outfalls located along the waterfront.

Twelve CSO outfalls discharge along the project site's waterfront and are located beneath South Street, as follows:

- M-10 at Broad Street;
- M-11 at the foot of Pier 6;
- M-12 at William Street/foot of Pier 9;
- M-13 at Fletcher Street/foot of Pier 15;
- M-16 at Peck Slip;
- M-17 at Robert F. Wagner Sr. Place;
- M-18 just south of Catherine Slip;
- M-19 at Catherine Slip;
- M-10 at Market Slip;
- M-21 at the foot of Pier 35;
- M-22 at Gouverneur Street; and
- M-23 at Jackson Street.

The East River is not a true river, but rather a tidal strait connecting the western end of Long Island Sound to New York Harbor. The tidal currents are notoriously strong with a maximum velocity of more than 5 nautical miles per hour (knots) and an average velocity of about 4 knots at maximum flow. Being a tidal strait, the water in the East River contains salt. The salinity ranges from about 19.3 to 26.4 parts per thousand. The water temperature ranges from 34 to 80 degrees Fahrenheit. Dissolved oxygen is a measure of the ability to support aquatic life. In the East River, the dissolved oxygen ranges from 3.2 to 4.7 milligrams per liter or parts per million. This level of dissolved oxygen is sufficient to support aquatic life, but is at the low end of the necessary concentration of dissolved oxygen. The tidal data are from the National Oceanic and Atmospheric Administration and the salinity, temperature, and dissolved oxygen data are from DEP.

SOLID WASTE

In the City of New York, residential and institutional refuse is handled by the New York City Department of Sanitation (DSNY), while solid waste from commercial and manufacturing uses is collected by private carters. DSNY collects approximately 16,500 tons per day (tpd) of refuse and recyclables, of which approximately 5,000 tons is recycled (about half is designated curbside recyclables and half other recyclables). DSNY takes approximately 14 percent of the refuse it collects directly to a waste to energy facility in Newark, New Jersey. Approximately 31 percent of the waste that DSNY collects (principally from Staten Island since the fall of 2006, and the Bronx) is transferred to rail cars, not trucks, at present.

Commercial carters collect refuse and source-separated recyclables. Recyclables are delivered to recyclables handling and processing facilities. Private carters handle approximately 36,000 tpd of solid waste of various kinds. In 2003, the most recent year for which figures are available, approximately 7,250 tpd of this commercial waste was refuse, 2,640 tpd was designated recyclables, 8,626 tpd was construction and demolition debris, and 19,069 was dirt, rock, and masonry "clean fill" waste that is typically recycled in the region.

The City's solid waste management services are undertaken in accordance with the existing SWMP, which is the responsibility of DSNY. The current SWMP, adopted by New York City in July 2006 and approved by DEC in October 2006, addresses recycling, residential waste, and commercial waste. The SWMP establishes a hierarchy of preferred solid waste management methods to reduce and process solid waste generated within the City. The objectives of the SWMP are, in order of importance: waste minimization; reuse, recycling, or composting; and export for out-of-City disposal. The SWMP provides in general that solid waste be transferred to solid waste management facilities located in each borough, including special waste collection sites (which receive certain problem waste, notably mercury thermostats, fluorescent bulbs, waste oil, batteries, and latex paint), and composting facilities. Local Law 19 of 1989 requires that DSNY and private carters collect recyclable materials and deliver them to material recovery facilities. New York City residents are required to separate aluminum foil, glass, plastic bottles and jugs, metal containers, and newspapers and other paper wastes from household waste for separate collection. The SWMP also mandates that commercial establishments are subject to recycling requirements. Businesses must source-separate certain types of paper wastes, cardboard, metal items, and construction wastes. Food and beverage establishments must recycle metal, glass, and plastic containers, and aluminum foil, in addition to meeting the commercial recycling requirements.

Existing activities on the project site parcels generate a negligible amount of solid waste compared to the capacity of the system. Recyclable paper collected from the project site is generally picked up by DSNY and processed at the West 59th Street Marine Transfer Station (MTS). The project site is located in DSNY's Manhattan Sanitation Districts 1 and 3.

ENERGY

The New York Power Authority (NYPA) is the governing authority responsible for overseeing power distribution across the state. The deregulation of the energy market across New York State has led to the growth of independently owned energy generators. Con Edison, along with other major utility companies, provides energy to New York City and Westchester in the form of electricity, natural gas, and steam. Electricity is delivered to New York City and almost all of Westchester County. Annual electric sales total nearly 50 billion kilowatt hours (kwh) of electricity supplied to Con Edison's delivery area (New York City and Westchester County). This is equivalent to about 170.75 trillion British Thermal Units (BTUs) and does not include the energy content in the natural gas and other energy sources used in New York City. Con Edison provides natural gas service in Manhattan, the Bronx, and parts of Queens and Westchester. Con Edison also owns and operates the world's largest district steam system, providing steam service in most of Manhattan.

Con Edison distributes power throughout the City through a series of substations and an electric grid. Transmission substations receive electricity from the regional high voltage transmission system and reduce the voltage to a level that can be delivered to area substations. Area substations further reduce the voltage to a level that can be delivered to the distribution system, or street "grid." Within the grid, voltage is further reduced for delivery to customers. Each area substation serves one or more distinct geographic areas, called networks, which are isolated from the rest of the local distribution system. The purpose of the networks is that if one substation goes out of service the problem can be isolated to that network and not spread to other parts of the City. Substations are designed to have sufficient capacity for the network to grow.

Power plants in the five boroughs generate electricity for New York City. According to NYISO's *Locational Installed Capacity Requirements Study* for the 2005-2006 period, New York City has an existing installed generating capacity of 9,887 megawatts (mw [not including Special Case Resources]).[1]

Electrical energy in New York City is generated from a variety of sources that originate both within and outside the City. The sources of this energy include non-renewable sources such as oil, natural gas and coal fuel, and renewable sources such as nuclear, hydroelectric, and, to a much lesser extent, biomass fuels, solar, and wind power. New York City's electrical demands are met by electricity generated within the City, at locations across the Northeast, and from places as far away as Canada. For the more distant sources, once electrical energy is generated as high voltage electrical power, a transmission grid conveys this power to New York City for distribution. An interconnected high voltage power grid extending across New York State and the Northeast allows for power to be imported from other regions as demand requires.

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[1] NYISO Locational Installed Capacity Requirements Study Covering the New York Control Area for the 2005-2006 Capability Year, February 17, 2005, revised March 23, 2005. According to the Study, Special Case Resources (SCRs) are "loads capable of being interrupted, and distributed generators, rated at 100 kw or higher, that are not directly telemetered."

According to the New York Independent System Operator (NYISO) *2005 Load & Capacity Data* report, the peak electrical demand for New York City in summer 2004 was 9,769 mw.[2] Typically, electricity generated within the City is sufficient to satisfy demand. However, during the summer peak demand period, this electricity is often supplemented by the Northeast transmission grid. As a result, there is an ongoing service and distribution improvement program for Con Edison infrastructure that upgrades localized areas that are continually high demand zones. Electricity required for these zones is supplied by other zones in New York City, or from sources elsewhere within the larger grid if necessary.

RECENT ENERGY CONSERVATION DIRECTIVES

In 2001, New York State began taking measures to address the increasing electrical power capacity needs of the metropolitan New York City region. The Governor's Executive Order No. 111 (EO 111) was introduced in June 2001, directing State agencies, State authorities, and other affected entities to address energy efficiency, renewable energy, green building practices, and alternate fuel vehicles. EO 111 identified the New York State Energy Research and Development Authority (NYSERDA) as the organization responsible for coordinating and assisting agencies and other affected entities with their responsibilities. NYSERDA and other utilities have implemented programs to encourage businesses to reduce energy usage and increase energy efficiency. In addition to the energy conservation techniques, in accordance with EO 111, NYPA constructed 11 new 44-mw, natural gas-fired, simple cycle turbine generating units, 10 of which are located within New York City, for emergency power generation (the other facility is on Long Island).

The independent, non-profit New York State Reliability Council (NYSRC) has determined that a minimum of 80 percent of the City's peak load must be provided by generating sources within the City in order to maintain compliance with the criteria established by the regional and national reliability councils. Currently, there is sufficient capacity within the City to meet this 80 percent goal. However, as the energy demand increases over time, additional in-City generation may be needed.

Further, the 2002 New York State Energy Conservation Construction Code governs performance requirements of heating, ventilation, and air conditioning systems, as well as the exterior building envelope. The code requires that new buildings (except for low-rise residential buildings) adhere to standards at least as stringent as Standard 90.1-1999, *Energy Standard for Buildings Except Low-Rise Residential Buildings*, developed by the American Society of Heating, Refrigeration, and Air Conditioning Engineers, Inc. (ASHRAE) and the Illuminating Engineering Society of North America (IESNA). Standard 90.1-1999 sets minimum requirements to promote the principles of effective, energy-conserving design for buildings and building systems. Standard 90.1-1999 was revised in 2001 (Standard 90.1-2001).

EXISTING PROJECT SITE DEMAND

Table 3N-1 of the *CEQR Technical Manual* provides energy use rates for different types of facilities using British Thermal Units (BTUs) as a measure of energy. One BTU is the quantity

[2] New York Independent System Operator 2005 Load & Capacity Data, www.nyiso.com/public/webdocs/services/planning/planning_data_reference_documents/2005_GoldBook_Redact.pdf (February 23, 2006)

of heat required to raise the temperature of one pound of water by one degree Fahrenheit. This unit of measurement is often used to compare consumption of energy from different sources, taking into account how efficiently those sources are converted to energy. Use of BTUs avoids the confusion inherent in comparing different measures of output (e.g., horsepower, kwh, etc.) and consumption (e.g., tpd, cubic feet per minute, etc.). In general, 1 kw is equivalent to 3,413 BTUs per hour.

The existing energy use on the project site parcels is minimal.

C. THE FUTURE WITHOUT THE PROPOSED ACTION

In the 2009 future without the Proposed Action condition, it is anticipated that the project site parcels will remain in their existing condition and demand for infrastructure, solid waste, and energy services would remain unchanged.

WATER SUPPLY

In the future without the Proposed Action, local distribution for water supply is not expected to change significantly.

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.

DEP 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 million gpd, with peak use of 500 million gpd.

SANITARY SEWAGE

As discussed above, the Newtown Creek WPCP does not provide full secondary treatment of sanitary sewage, which is required by the Clean Water Act. DEP is currently upgrading the Newton Creek WPCP to bring the plant into compliance, and construction for the long-term WPCP upgrade has been ongoing since 1998 and will continue through 2013. By December 31, 2007, the Newtown Creek WPCP is expected to meet the Clean Water Act requirements. As part of the construction, the Manhattan Pump Station will be reconfigured and reequipped to be able to pump 400 million gpd.

STORMWATER

In the future without the Proposed Action, stormwater flow from the project site is conservatively assumed to be the same as in the existing condition.

SOLID WASTE

In the future without the Proposed Action it is anticipated that demand for solid waste collection and disposal from activities on the project site would remain unchanged.

In October 2004, DSNY developed a Draft New SWMP to address expected future demands for solid waste management for the City. The new SWMP, adopted by New York City in July 2006

and approved by DEC in October 2006, addresses recycling, residential waste, and commercial waste. The new SWMP will be effective for the next 20 years.

The new SWMP addresses recycling, residential waste, and commercial waste. The new SWMP introduces a shift from the current mode of truck-based export to export by barge and/or rail. The City will commit to a long-term (20 year) contract with the Hugo Neu Corporation for the processing and marketing of metal, glass, and plastic (MGP). An MGP processing facility will be developed in the City at the 30th Street Pier in the South Brooklyn Marine Terminal. The plant will be barge-fed from Hugo Neu Corporation sites in Queens and the Bronx and a potential DSNY location in Manhattan.

The new SWMP includes a Long Term Export Program for residential waste. The City's Long Term Export Program is anticipated to be implemented through: (1) the development of four converted marine transfer stations; (2) the award of up to five contracts with private transfer stations for barge or rail export of DSNY-managed waste for disposal; and (3) an intergovernmental agreement to dispose of a portion of Manhattan's DSNY-managed waste at a Port Authority waste-to-energy facility in New Jersey. The new SWMP will mandate the use of up to nine converted MTS facilities and private transfer stations within the five boroughs at which solid waste would be consolidated, containerized, and barged or railed out of the City. The barges currently used at MTS facilities will be replaced or retrofitted with new sealed containers or "intermodal containers" capable of being transported on barge or rail. The four converted MTS facilities will be designed to each process at least 4,290 tpd and accommodate 30 collection vehicles per hour. In the interim, approximately half of DSNY-collected post-recycling MSW will continue to be delivered to transfer stations in the city for further transport from the city by tractor trailer truck.[3]

The new SWMP also proposes three broad categories of action to address traffic issues associated with commercial waste handling as follows: (1) improve conditions at and around transfer stations; (2) facilitate a transition from a network heavily reliant on trucks to one that relies primarily on barge and rail; and (3) redistribute private transfer capacity from a small number of communities that have the largest proportion of the system's impacts.

The new SWMP requires all municipal waste generated from the proposed project site to be trucked to the Essex County Resource Recovery Facility in Newark, New Jersey, where waste would be received and processed.

ENERGY

In the future without the Proposed Action it is anticipated that energy demand on the proposed project site would remain unchanged.

In June 2002, the New York State Energy Planning Board released the New York State Energy Plan and Final Environmental Impact Statement, which sets forth the State of New York's energy policies and objectives for the next five years. The plan is to promote competition in the energy industries, secure reliable and reasonably priced energy supplies, reduce environmental impacts associated with energy generation and consumption, reduce vehicular congestion, and preserve energy-related public benefits programs. These are continuations of the policies developed in the 1998 Energy Plan that are currently in operation. Therefore, no large-scale changes in energy generation and consumption policies are foreseen over the next few years.

[3] DSNY, Solid Waste Management Plan Final Environmental Impact Statement.

A number of power plant and transmission projects are planned or currently under way. While not all of the projects will likely be constructed, it is anticipated that sufficient additional generating capacity will be built to meet New York City's projected future demand for energy.[4]

D. PROBABLE IMPACTS OF THE PROPOSED ACTION

This section discloses the anticipated future demand for infrastructure, solid waste, and energy services as a result of the Proposed Action for the 2009 Build year. The infrastructure, solid waste, and energy assessments apply *CEQR Technical Manual* methodology.

As discussed in Chapter 1, "Project Description," the Proposed Action would include pavilions totaling up to 150,000 gross square feet (gsf) for community, cultural, and commercial uses; passive recreational/open space uses totaling approximately 17 acres; and replacement of the existing New Market Building with a two-story, approximately 40,000-gsf building for community, cultural, or commercial uses. For the purposes of these infrastructure, solid waste, and energy assessments, it is estimated that of the new floor area, 100,000 square feet (sf) would be for retail use and 90,000 sf would be dedicated to community or cultural uses.

WATER SUPPLY

As shown in Table 12-2, the proposed development program would generate an estimated demand of about 70,550 gpd of water for consumption and air cooling purposes.

Table 12-2
Water Usage for the Proposed Action

Use	Size	Domestic Usage Rate	Air Conditioning Water Usage Rate (gpd/sf)	Domestic Usage (gpd)	Air Conditioning Usage (gpd)	Total Water Usage (gpd)
Retail/Commercial/Cultural/ Community Facility	190,000 gsf	0.17 gpd/gsf	0.17	32,300	32,300	64,600
Open Space	17 acres	5 gpd/ visitor	N/A	5,950	N/A	5,950
Total				**38,250**	**32,300**	**70,550**

Notes: Open space use assumes 70 visitors per acre per peak weekend day.
Source: Usage rates from the *City Environmental Quality Review (CEQR) Technical Manual* (2001). Domestic usage rate for open space use is from *Brooklyn Bridge Park FEIS*, Chapter 13: Infrastructure (December 2005).

The projected demand would represent a negligible amount compared with the 1.2 billion gpd of water consumed in New York City, or 0.02 percent of the 420 million gpd consumed in Manhattan. As a result, it is not expected that this added demand would overburden the City's water supply or the local conveyance system, and no significant adverse impacts are anticipated. The Proposed Action would also comply with the water conservation measures of the City as mandated by Local Law 29 of 1989.

[4] Sources include: *Proposed Sale of Con Edison First Avenue Properties to FSM East River Associates, LLC. Final Generic EIS*, Case No. 01-E-0377, January 2004, Chapter 11: Infrastructure, Solid Waste, and Energy; *Brooklyn Bridge Park Final EIS*, December 2005, Chapter 13: Infrastructure; *Downtown Brooklyn Development Final EIS*, April 2004, Chapter 13: Energy.

SANITARY SEWAGE

Project-generated sewage would be treated at the Newtown Creek WPCP. Conservatively assuming that all water consumed on-site other than that used for air conditioning enters the sewer system, the Proposed Action would generate approximately 38,250 gpd of sewage (see Table 12-2).

This amount of wastewater, representing approximately 0.01 percent of the Newtown Creek WPCP's permitted capacity, is not expected to adversely affect the WPCP's capacity or its treatment efficiency. Likewise, the Proposed Action is not expected to overburden the local or interceptor conveyance systems.

STORMWATER

The Proposed Action is expected to use the existing combined and separate storm sewers to discharge stormwater into the East River. Flows from the proposed project site parcels would be conveyed through new or existing on-site pipes to the existing sewers. No new outfalls are expected to be built as part of the project. Because the construction of the BMB Plaza would require moving the entrance to the Battery Park Underpass approximately 350 feet to the northeast, the CSO outfall at Broad Street would be relocated during the construction of the plaza. Relocation of this outfall would be coordinated with DEP and DEC.

With the Proposed Action, the project site overall would not include more impervious surface than exists currently. In fact, with the proposed plantings and beach at Pier 42, the proposed project would result in decreased stormwater flow from the project site due to less impervious coverage, which would have beneficial effects on the stormwater system. Therefore, no significant adverse impacts on the New York City sewer system or on the water quality of the East River are anticipated. Moreover, the Proposed Action would introduce new opportunities for rain water capture on-site to decrease project-generated flows to the East River.

SOLID WASTE

As shown in Table 12-3, the Proposed Action would generate solid waste at a rate of 32,350 pounds (approximately 16.2 tons) per week. Ultimately, the amount of project-generated solid waste that would be handled by DSNY versus private carters would depend on the specific type of uses implemented on the project site. It is estimated that of the total amount of solid waste expected from the Proposed Action, about 4.3 tons per week would be handled by DSNY, and private carters would handle about 11.9 tons per week. This represents an incremental increase in New York City's waste stream (less than 0.01 percent of the weekly amount currently handled by DSNY, and approximately 0.02 percent of the weekly amount handled by private carters, assuming a six-day work week). Given that a truck can haul about 12.5 tons of solid waste, the proposed project would require about 2 truck trips per week (one for municipal waste and one for commercial waste).

According to the *CEQR Technical Manual*, the City's SWMP is based on projected rates of growth in the generation of solid waste. The measures proposed to be implemented by the City pursuant to the SWMP are therefore designed to meet the goals of the SWMP notwithstanding further development within certain defined future conditions. In other words, the solid waste handling system assumed to be in place in the future analysis year was designed to accommodate future growth in the generation of solid waste, which includes growth from the proposed project.

Table 12-3
Solid Waste Generation for the Proposed Action

Use	Size	Generation Rate (pounds per week)	DSNY (pounds per week)	Private Carters (pounds per week)	Total (pounds per week)
Retail/ Commercial	100,000 gsf	79 per employee[1]	0	23,700	23,700
Cultural/ Community Facility	90,000 gsf	0.03 per square foot[2]	2,700	0	2,700
Open Space	17 acres	5 per visitor[3]	5,950	0	5,950
Total			**8,650**	**23,700**	**32,350**

Notes:
[1]Number of retail employees assumes 3 employees per 1000 square feet of retail space.
[2]Because the CEQR Technical Manual does not provide a rate for community facility use, the government office was applied as a conservative measure.
[3]Number of open space visitors is assumed at 70 per peak weekend day.
Source: *City Environmental Quality Review (CEQR) Technical Manual* (2001).

Under the new SWMP, new development at the project site would be served by existing DSNY collection routes, with DSNY adjusting appropriate collection levels to service the community. As stated above, the new SWMP would require all municipal waste generated from the project site to be trucked to the Essex County Resource Recovery Facility in Newark, New Jersey, where waste will be received and processed. This facility is expected to have sufficient capacity to accommodate the incremental increase in municipal waste generated by the Proposed Action.

The Proposed Action would comply with the City's recycling program. The project would be designed to accommodate source separation of recyclables in conformance with City recycling regulations. This would include recycling paper, glass, metals, and certain plastics. With an effective recycling program, it is estimated that the waste stream could be reduced by up to 25 percent. As a result, the Proposed Action is not expected to have a significant adverse impact on solid waste handling and disposal methods or recycling in the City.

ENERGY

All proposed buildings would comply with the 2002 Energy Conservation Construction Code. In compliance with the code, the Proposed Action would incorporate all required energy conservation measures.

Energy demand for the buildings consists of loads for heating, ventilation, air conditioning, lighting, and auxiliary equipment, such as elevators and pumps. The projected energy demand from the Proposed Action was calculated by applying energy use rates from the *CEQR Technical Manual*. It is conservatively estimated that the Proposed Action would generate a demand of approximately 11,457 million BTUs per year, which is equivalent to 3,359,000 kwh (see Table 12-4). Additionally, a small amount of energy would be required to accommodate the lighting proposed for the Recreation Zone. The anticipated overall project consumption represents a very small amount compared with New York City's existing and projected future energy demands. Consumption at this level would not result in a significant adverse impact on the energy supply systems. Moreover, this consumption level is considered conservative, since

the Proposed Action would implement a number of energy conservation measures to meet the requirements of EO 111, and be more energy efficient than shown by this analysis.

Table 12-4
Energy Usage for the Proposed Action

Use	Size (gsf)	Usage Rate (BTUs/sf/year)	Usage Rate (kwh/sf/year)	Energy Usage (Million BTUs per year)	Equivalent kwh
Retail/ Commercial	100,000	55,800	16.4	5,580	1,640,000
Cultural/ Community Facility	90,000	65,300	19.1	5,877	1,719,000
Total				**11,457**	**3,359,000**

Source: *City Environmental Quality Review (CEQR) Technical Manual* (2001).

Electricity, natural gas, and steam are available energy sources at the proposed project site parcels. Electricity could be used for lighting, and gas and steam could possibly be used to provide heating and cooling to the buildings on the parcels. However, the Lower Manhattan Development Corporation would make the choice of energy sources at the time of development, based on system capacity, energy source, cost, and compatibility with the development. ✷