

## **A. INTRODUCTION**

The new residents, employees, and visitors at Site A and Site B would place greater demands on the City infrastructure serving the sites, including the water supply, sanitary sewage treatment, and stormwater discharge systems. This chapter evaluates the impacts of the proposed actions under the reasonable worst-case development scenario (RWCDs) on New York City's infrastructure.

## **PRINCIPAL CONCLUSIONS**

To support the proposed new development on Site A, the water mains and sewers on the site would be improved. Throughout Site A, a new system of water mains, sanitary sewers, and separate storm water sewers would be installed in accordance with the New York City Department of Environmental Protection (NYCDEP) Amended Drainage Plan. Creation of a new separate sanitary and storm sewer system would be consistent with the City's goals to reduce combined sewer overflow (CSO) events. Use of separate storm sewers would allow rainfall on the project sites to be discharged to the East River and Newtown Creek, reducing the burden on the Bowery Bay Water Pollution Control Plant, the wastewater treatment plant that serves the project sites. It is anticipated that stormwater attenuation and treatment mechanisms will be included in the City's design of the streets and parks within Site A; and that the designs of these systems will be guided by the City's sustainability initiatives described in PlaNYC, Best Management Practices, and CEQR standards to ensure public and environmental health and safety.

Under the proposed actions, water demand on Sites A and B together would increase by 1,517,322 gallons per day (gpd). This additional demand would not result in a significant adverse impact on the City's water supply system. With the proposed improvements, the incremental demand for water supply from the RWCDs would not adversely affect the ability of the existing system to distribute water to, or maintain water pressure for, existing local users.

The RWCDs would result in an increase wastewater flow of 1,508,509 gpd, which would be treated at the Bowery Bay Water Pollution Control Plant (WPCP). This increase would represent a small percentage of the total future flows to the plant, and would not cause the plant to exceed its permitted capacity.

## **B. METHODOLOGY**

In accordance with the methodologies in the 2001 *City Environmental Quality Review (CEQR) Technical Manual*, this chapter assesses the specific potential impacts that would result with the proposed actions under the RWCDs. Infrastructure demands in the vicinity of Sites A and B were ascertained as follows:

## **Hunter's Point South Rezoning and Related Actions FEIS**

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- The water and sewer demands on the project sites were estimated for the existing condition, the future without the proposed actions, and the RWCDs. These estimates were based on water and sanitary sewer generation rates provided in the *CEQR Technical Manual*. The adequacy of the City's water supply and wastewater treatment systems to handle these flows was then determined.
- The existing and future storm water flows at the project sites were calculated. Storm water runoff at the project sites was calculated by applying the "design storm" methodology used by the NYCDEP to determine the total stormwater runoff from a site.

NYCDEP's methodology is based on NYCDEP design guidelines for developed areas with rainfall intensity of 5.95 inches per hour. The methodology accounts for the fact that some precipitation infiltrates into the ground and some becomes surface runoff flow. The amount of surface runoff flow (referred to as the "runoff coefficient") depends on the amount of paved or developed surfaces at a project site. Sites that are undeveloped (e.g., grassy areas) tend to infiltrate most precipitation, whereas those that are covered by buildings would have less infiltration and more surface runoff. For sites with a combination of surfaces (e.g., buildings and lawns), a weighted runoff coefficient is used, based on the amount of the total site area that is covered by each type of surface.

Landside (sewer system) modeling, using the InfoWorks hydraulic model, was conducted to assess the potential effects on the municipal combined sewer system and Bowery Bay WPCP from the discharge of sanitary sewage generated by the proposed actions. The InfoWorks hydraulic model includes components for hydrology (rainfall-runoff) and hydraulics (pipe flow) and was used to determine runoff flows, water surface elevations, and flows within sewers. For hydrology, InfoWorks uses recorded rainfall information.<sup>1</sup> Sewer conditions were evaluated for CSOs. The results of the model simulations were used to estimate the total annual overflow volumes and frequencies for each CSO outfall in the low-level portion of the Bowery Bay WPCP drainage, where the project sites are located, for the 2017 future with and without the proposed actions conditions. The analysis evaluated potential impacts on the Bowery Bay WPCP from increased sewage flow resulting from the proposed actions, from the NYCDEP projection of a future dry weather sewage flow of 120 mgd in 2017 without the proposed actions, and a separate stormwater system in place within the project sites. The separate stormwater system that would be developed as part of the proposed actions would divert an estimated 26 million gallons of stormwater annually from the combined sewer system. Instead, this volume of stormwater would be directed to a separate stormwater management system that comprises catch basins, stormwater best management practices, storm sewers, and new and existing stormwater outfalls to the East River and Newtown Creek. Appendix 11.2 presents a detailed discussion of the methods employed and full results of the modeling.

## **C. EXISTING CONDITIONS**

### **WATER SUPPLY**

New York City obtains its water supply from the Delaware, Catskill, and Croton reservoir systems, operated by NYCDEP. Some residents of southeast Queens obtain their water supply

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<sup>1</sup> NYCDEP has adopted the calendar year 1988 hourly precipitation measured at JFK Airport as the "standard" rainfall record associated with average hydraulic/CSO conditions, for use in hydrologic modeling conducted for various NYCDEP projects (e.g., CSO Long-Term Control Plan).

from New York City's groundwater system beneath Queens. The watersheds of the three reservoir systems extend as far as 125 miles north and west of the City, encompassing several reservoirs and lakes, with a storage capacity of 580 billion gallons. Water is delivered from these watersheds to New York City through a network of reservoirs, aqueducts, and tunnels. Within the City, networks of underground pipes distribute water to consumers.

New York City water systems provide approximately 1.3 billion gallons per day to the five boroughs as well as Westchester, Putnam, Ulster, and Orange Counties.

Queens draws its water supply primarily from watershed areas in the Catskill Mountains via the Catskill and Delaware systems. The Ashokan and Roundout Reservoirs collect water within the system and deliver it through the Catskill and Delaware aqueducts, into the Kensico Reservoir in Westchester County, and then into the Hillview Reservoir in the City of Yonkers. From Yonkers, water is distributed to the City through three tunnels: City Tunnel Nos. 1, 2, and 3. City Tunnel No. 1 delivers water through the Bronx and Manhattan to Brooklyn; City Tunnel No. 2 delivers water through the Bronx, Queens, and Brooklyn to Staten Island; and City Tunnel No. 3 delivers water via the Bronx and Manhattan to Queens. Sites A and B are served by a network of mains that feed directly from City Tunnels No. 2 and No. 3.

Average daily water consumption in Queens is estimated at about 200 million gallons per day (mgd) and the average water pressure at the area surrounding the project site is estimated by the New York City Bureau of Water and Sewer Operations to be 50 to 60 pounds per square inch (psi). A pressure of 20 psi is the minimum water pressure acceptable for uninterrupted service and New York City Fire Department service requirements.

Water service is available to Site A from water mains located beneath 50th Avenue, Center Boulevard and 2nd Street. Service to Site B is available from water mains beneath 54th Avenue and 2nd Street (see **Figure 13-1**). Twelve-inch diameter mains are located beneath 50th, 51st, Borden, and 54th Avenues and 2nd Street, while a 20-inch main is located beneath Center Boulevard. The age of the water mains varies, with some installed as early as 1940 and others as recently as 1997. These mains provide water to the uses on the project sites and to all existing fire hydrants adjacent to Sites A and B. There is a fire hydrant at 50th Avenue and Center Boulevard adjacent to Site A, and on 54th Avenue adjacent to Site B. There are also several fire hydrants along 2nd Street adjacent to both sites.

The existing water demand at Sites A and B was calculated using the water demand rates set forth in the *City Environmental Quality Review (CEQR) Technical Manual*, and is summarized below in **Table 13-1**. The uses at Site A (which include New York Water Taxi's ferry landing and Water Taxi Beach, a tennis facility and associated parking, and a temporary construction storage space) consume an estimated 39,924 gallons of water per day (gpd). Site B's uses, including a distribution facility and television and studio-related operations, consume an estimated 24,880 gpd. In total, therefore, the water consumption on the project sites is an estimated 64,804 gpd.

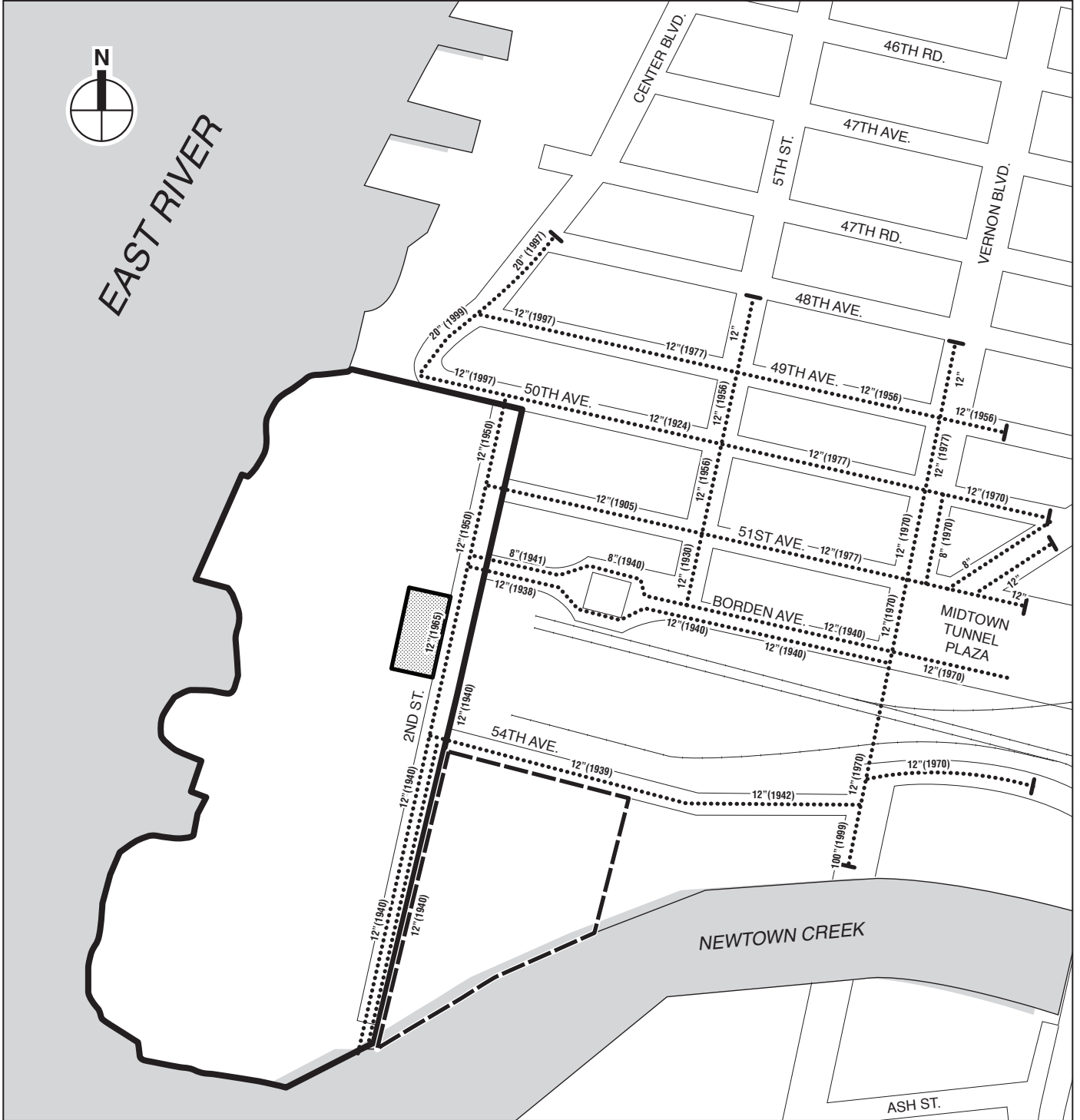
## WASTEWATER TREATMENT





### WATER POLLUTION CONTROL PLANT

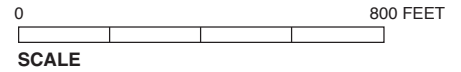
Wastewater from both sites and the surrounding neighborhood is conveyed to and treated at the Bowery Bay WPCP. The Bowery Bay WPCP treats wastewater through full secondary physical and biological processes before it discharges the wastewater into the Rikers Island Channel just



EAST RIVER



-  Site A
-  Not Included in Site A
-  Site B
-  Water Main
- 12" Pipe Dimension
- (1977) Year of Installation



**Table 13-1**  
**Existing Water Consumption on Sites A and B**

| Use                                                                                                                              | Unit          | Rate          | Consumption<br>(gallons per day) |
|----------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|----------------------------------|
| <b>Site A</b>                                                                                                                    |               |               |                                  |
| <b>Public Use</b>                                                                                                                |               |               |                                  |
| Domestic                                                                                                                         | 117,423 sf    | 0.17 gpd/sf   | 19,962                           |
| Air conditioning                                                                                                                 | 117,423 sf    | 0.17 gpd/sf   | 19,962                           |
| <b>Site A Total</b>                                                                                                              |               |               | <b>39,924</b>                    |
| <b>Site B</b>                                                                                                                    |               |               |                                  |
| <b>Commercial Use</b>                                                                                                            |               |               |                                  |
| Domestic                                                                                                                         | 180 (persons) | 25 gpd/person | 6,500                            |
| Air conditioning                                                                                                                 | 183,797 sf    | 0.10 gpd/sf   | 18,380                           |
| <b>Site B Total</b>                                                                                                              |               |               | <b>24,880</b>                    |
| <b>TOTAL Site A and B</b>                                                                                                        |               |               | <b>64,804</b>                    |
| <b>Note:</b> CEQR rates for Public Use were conservatively applied to the existing Water Taxi and TennisPort facility on Site A. |               |               |                                  |
| <b>Source:</b> Rates from <i>CEQR Technical Manual</i> .                                                                         |               |               |                                  |

northwest of La Guardia Airport. Secondary treatment includes the removal of a minimum of 85 percent of biological oxygen demand and total suspended solids in the influent. Effluent from this WPCP is regulated by the State Pollutant Discharge Elimination System (SPDES) permit issued by the New York State Department of Conservation (NYSDEC). The permit specifies the maximum limit for effluent parameters that include suspended solids, fecal coliform, and other pollutants. The SPDES permit specifies that treatment capacity of the Bowery Bay WPCP be limited to a maximum of 150 million gallons per day (mgd). As of August 2007, the latest date for which flows are available, the average monthly flow for the Bowery Bay WPCP over the previous 12-month period was 106 mgd, well below the permitted limit.

The yearly average wastewater flows into the Bowery Bay WPCP for 2001 through 2007 are presented below in **Table 13-2**.

**Table 13-2**  
**Yearly Average Flows at Bowery Bay WPCP**

| Year                  | Average Flow (mgd) |
|-----------------------|--------------------|
| 2001                  | 104                |
| 2002                  | 98                 |
| 2003                  | 111                |
| 2004                  | 118                |
| 2005                  | 120                |
| 2006                  | 109                |
| <u>2007</u>           | <u>105</u>         |
| <b>Source:</b> NYCDEP |                    |

The area surrounding the project sites relies on a combined sewer system (CSS) that conveys both sanitary sewage and stormwater runoff to the Bowery Bay WPCP. As in most of New York City, the sewer system comprises combined sewers (for sanitary sewage and stormwater), interceptor sewers, regulators, weirs, and diversion chambers. Beneath the streets adjacent to both sites, there are both combined and interceptor sewers. During dry weather, this sewer system conveys sanitary sewage to the Bowery Bay WPCP. During and immediately after

precipitation events (e.g., rainfall or snowmelt), the combined sewers carry both sanitary sewage and stormwater. The combined sewers discharge the sanitary sewage and stormwater to regulators. Within the regulator, a diversion chamber diverts two times the dry weather flow to the interceptor. When the combined sewer flow exceeds the two times design dry weather flow regulator capacity, it overflows over a weir in the diversion chamber, and this overflow is discharged to the receiving body, as combined sewer overflow (referred to as CSO). During significant storm events, CSOs within the entire Bowery Bay WPCP service area are discharged to the East River and Flushing Bay.

#### *SEWER SYSTEM AT SITES A AND B*

As shown in **Figure 13-2**, a network of combined sewers is present beneath the built streets at Site A and adjoining Site B. In addition, there are three outfalls to the East River along the water's edge of Site A, at the elongation of 50th, 51st, and 54th Avenues, and one outfall to Newtown Creek at the elongation of 5th Street at Site B.

In the southern portion of Site A, a 15-inch combined sewer conveys wastewater to Regulator L-22A, on Site A near 2nd Street and 54th Avenue. During low flow, wastewater collected at this regulator is diverted to an existing 54-inch interceptor sewer that conveys flow northerly in 2nd Street before turning east on 51st Avenue and north along 5th Street toward the WPCP. During wet weather, CSO is diverted to an outfall located at the East River and the elongation of 54th Avenue.

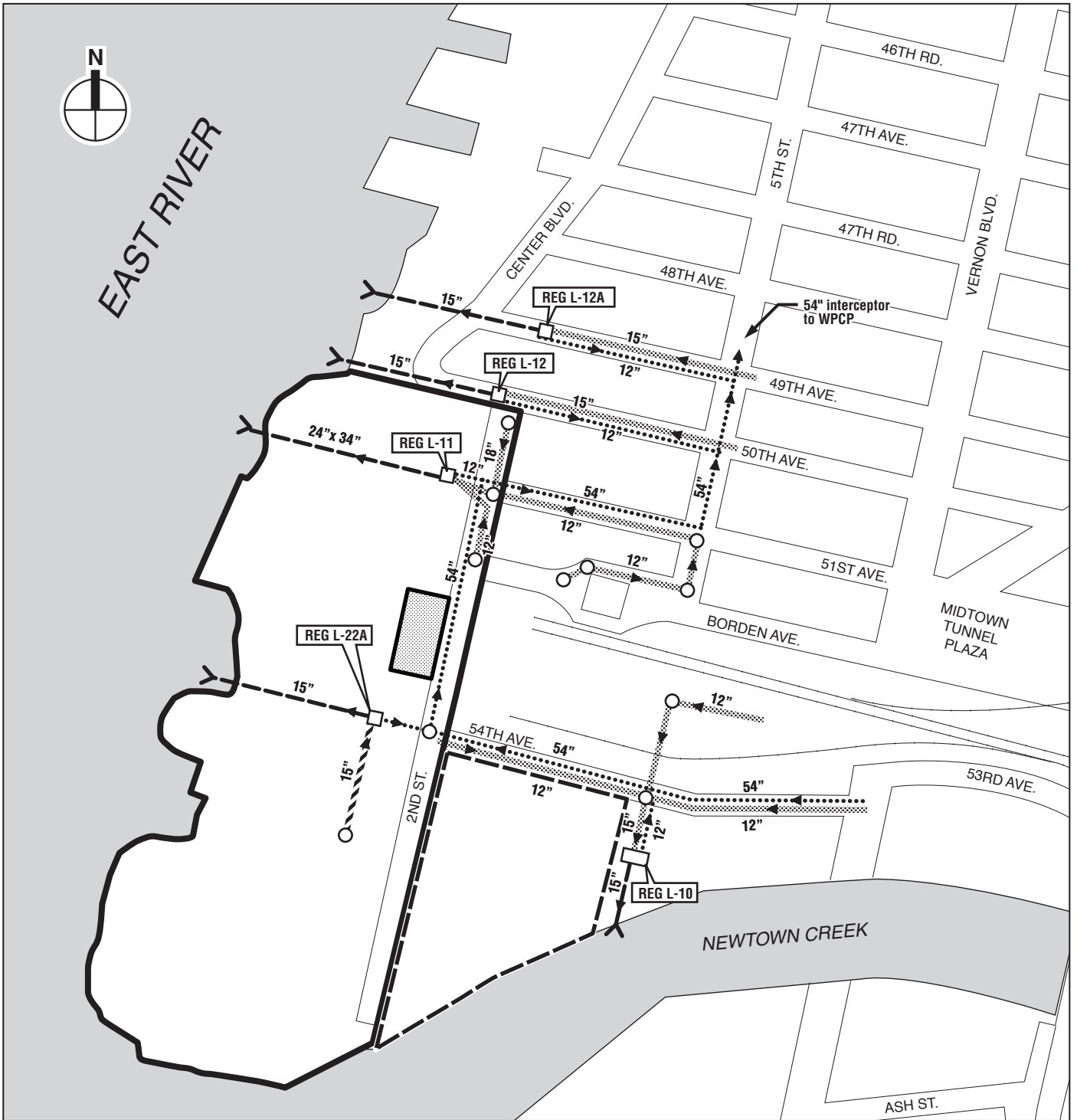
Regulator L-11 at 2nd Street and 51st Avenue drains northern portions of Site A and areas east of Site A. During low flow, wastewater at this regulator flows via a 12-inch branch interceptor into the 54-inch interceptor beneath 51st Avenue. During wet weather, CSO is diverted from Regulator L-11 into the East River via an outfall to the west of 51st Avenue.

Regulator chamber L-12 is located beneath 50th Avenue at 2nd Street. During dry weather, wastewater is conveyed through this regulator into a 12-inch branch interceptor that flows eastward along 50th Avenue until it connects into the existing 54-inch interceptor under 5th Street. During wet weather, Regulator L-12 diverts the CSO to the East River via the 15-inch outfall west of 50th Avenue.

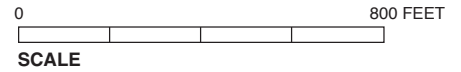
Fronting Site B, one 12-inch combined sewer beneath 54th Avenue conveys wastewater and stormwater runoff to Regulator chamber L-10, located beneath the elongation of 5th Street between 54th Avenue and Newtown Creek. During low flow, this regulator chamber discharges via a 12-inch combined sewer into a 54-inch interceptor under 54th Avenue, which also conveys wastewater from areas farther east and north of Site B. The 54-inch interceptor conveys the flow to the WPCP. During wet weather, Regulator L-10 diverts overflow from areas that include Site B, the property just east of Site B and the adjacent Long Island Rail Road yard through a 15-inch outfall into Newtown Creek at the elongation of 5th Street.

#### *SANITARY SEWAGE*

As noted earlier, the existing uses on Site A consume an estimated 19,962 gpd of potable water, and the uses on Site B consume an estimated 6,500 gpd. Conservatively assuming that sanitary sewage generated on the two sites is equivalent to water demand (excluding air conditioning use), a total of 24,462 gpd of sanitary sewage is generated on Sites A and B in the existing condition.



- Site A
- Not Included in Site A
- Site B
- Combined Sewer
- Sanitary Sewer
- Interceptor
- Regulator
- Manhole
- 12" Pipe Size
- Combined Sewer Outfall
- Direction of Flow



Existing Combined Sewer System  
(Sanitary and Storm)  
**Figure 13-2**

*STORMWATER*

*Project Sites*

As discussed above, Sites A and B are served by combined and interceptor sewers that flow toward the Bowery Bay WPCP. During wet weather events, CSO is diverted by Regulators L-10, L-11, L-12, and L-22 into the East River and Newtown Creek.

Site A, which is approximately 30 acres, currently consists of buildings, vegetated area, paved areas, and roadways. Stormwater runoff from these areas of the site flow overland to the East River or infiltrate the subsurface soils in the undeveloped portions of Site A. Site B, approximately 7.5 acres, consists of buildings and roadway surfaces. As Site B is more developed, the entire site runoff is assumed to be collected on site by catch basins and roof leaders, and conveyed through the 12-inch combined sewer beneath 54th Avenue to Regulator L-10.

As noted earlier, stormwater volumes from Sites A and B were calculated using NYCDEP's "design storm" methodology. Because both sites have a combination of surfaces, a combination runoff coefficient is used, based on the amount of the total site area that is covered by each type of surface. Runoff coefficient values range from 0.2 (for grass) where 20 percent of precipitation becomes surface runoff flow, to 1.0 (for building roofs) where essentially 100 percent of precipitation becomes surface runoff flow. If a site has a combination of surfaces, a weighted runoff coefficient ( $C_w$ ) is used.  $C_w$  is determined by multiplying runoff coefficients by the respective surface areas, and representing the sum of the products as a percentage of the total site area. Runoff rates are presented in cubic feet per second (cfs). The method for calculating runoff uses the "Rational Formula," which is as follows:

$$Q = C_w \times I \times A \text{ where}$$

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

$C_w$  is the weighted runoff coefficient;

I is the rainfall intensity (5.95-inches/hour); and

A is the area in acres.

Using estimated land coverages at Site A of 10.50 percent building area, 31.30 percent roadway surface and 58.20 percent vegetated and dirt area, results in a weighted stormwater runoff coefficient of 0.49. For Site B, with a 55.76 percent building area and 44.24 percent roadway surface, the weighted stormwater runoff coefficient is 0.93. Therefore, the existing design flow stormwater runoff from Sites A and B is estimated to be 87 cfs and 42 cfs, respectively.

*Bowery Bay Low-Level Drainage Area*

Tables 13-3 and 13-4 summarize sanitary and stormwater flow rates and volumes to the East River, Newtown Creek, or combined sewer system under existing conditions. As presented in Appendix 11.2, for the five combined sewer outfalls that connect to regulators receiving sanitary sewage and stormwater from the projects sites, there were 29 CSO events in 2007. For the remaining 32 combined sewer outfalls within the Bowery Bay WPCP low-level drainage area, there were 54 CSO events in 2007.



**Table 13-3**  
**Sanitary and Stormwater Flow Rates**  
**from Sites A and B to East River, Newtown Creek and CSS**  
**under Existing Conditions**

| Storm Event                      |                                 | By Site               |                     |                       |                                  |
|----------------------------------|---------------------------------|-----------------------|---------------------|-----------------------|----------------------------------|
| Rainfall Return Period (month)*  | Rainfall Intensity Peak (in/hr) | Runoff to River (Mgd) | Runoff to CSS (Mgd) | Sanitary to CSS (Mgd) | Total Combined Flow to CSS (Mgd) |
| <b>Site A</b>                    |                                 |                       |                     |                       |                                  |
| -                                | 0.00                            | 0.00                  | 0.00                | 0.02                  | 0.02                             |
| -                                | 0.10                            | 0.22                  | 0.72                | 0.02                  | 0.74                             |
| -                                | 0.20                            | 0.45                  | 1.43                | 0.02                  | 1.45                             |
| -                                | 1.00                            | 2.25                  | 7.17                | 0.02                  | 7.19                             |
| -                                | 2.00                            | 4.50                  | 14.33               | 0.02                  | 14.35                            |
| 3                                | 2.15                            | 4.83                  | 15.41               | 0.02                  | 15.43                            |
| 6                                | 2.89                            | 6.50                  | 20.71               | 0.02                  | 20.73                            |
| 12                               | 3.61                            | 8.11                  | 25.87               | 0.02                  | 25.89                            |
| <b>Site B</b>                    |                                 |                       |                     |                       |                                  |
| -                                | 0.00                            | 0.00                  | 0.00                | 0.01                  | 0.01                             |
| -                                | 0.10                            | 0.00                  | 0.46                | 0.01                  | 0.46                             |
| -                                | 0.20                            | 0.00                  | 0.91                | 0.01                  | 0.92                             |
| -                                | 1.00                            | 0.00                  | 4.57                | 0.01                  | 4.57                             |
| -                                | 2.00                            | 0.00                  | 9.14                | 0.01                  | 9.14                             |
| 3                                | 2.15                            | 0.00                  | 9.82                | 0.01                  | 9.83                             |
| 6                                | 2.89                            | 0.00                  | 13.20               | 0.01                  | 13.21                            |
| 12                               | 3.61                            | 0.00                  | 16.49               | 0.01                  | 16.50                            |
| <b>Site A &amp; B Combined</b>   |                                 |                       |                     |                       |                                  |
| -                                | 0.00                            |                       |                     |                       | 0.03                             |
| -                                | 0.10                            |                       |                     |                       | 1.20                             |
| -                                | 0.20                            |                       |                     |                       | 2.37                             |
| -                                | 1.00                            |                       |                     |                       | 11.76                            |
| -                                | 2.00                            |                       |                     |                       | 23.49                            |
| 3                                | 2.15                            |                       |                     |                       | 25.25                            |
| 6                                | 2.89                            |                       |                     |                       | 33.94                            |
| 12                               | 3.61                            |                       |                     |                       | 42.38                            |
| <b>Site C</b>                    |                                 |                       |                     |                       |                                  |
| -                                | 0.00                            |                       |                     |                       | 0.00                             |
| -                                | 0.10                            |                       |                     |                       | 0.15                             |
| -                                | 0.20                            |                       |                     |                       | 0.30                             |
| -                                | 1.00                            |                       |                     |                       | 1.51                             |
| -                                | 2.00                            |                       |                     |                       | 3.01                             |
| 3                                | 2.15                            |                       |                     |                       | 3.24                             |
| 6                                | 2.89                            |                       |                     |                       | 4.35                             |
| 12                               | 3.61                            |                       |                     |                       | 5.43                             |
| <b>Site A, B, and C Combined</b> |                                 |                       |                     |                       |                                  |
| -                                | 0.00                            |                       |                     |                       | 0.03                             |
| -                                | 0.10                            |                       |                     |                       | 1.35                             |
| -                                | 0.20                            |                       |                     |                       | 2.67                             |
| -                                | 1.00                            |                       |                     |                       | 13.327                           |
| -                                | 2.00                            |                       |                     |                       | 26.50                            |
| 3                                | 2.15                            |                       |                     |                       | 28.49                            |
| 6                                | 2.89                            |                       |                     |                       | 38.29                            |
| 12                               | 3.61                            |                       |                     |                       | 47.82                            |

**Notes:**

**This table is new for the FEIS.**

CSS = combined sewer system.

Site C is a 2.74-acre area located outside of the proposed new development currently served by the CSS under existing conditions, but that will be served by the proposed storm sewer system.

Assumptions:

The CSS receives all sanitary flow generated from Sites A & B.

The runoff from Sites A, B & C flows to the East River, Newtown Creek, or the CSS.

\* Reference: Intensity Duration Frequency Rainfall Analysis New York City and the Catskill Mountain Water Supply Reservoirs" prepared by Vieux & Associates, Inc. on April 4, 2006

Source: HydroQual, Inc (see Appendix 11.2)

**Table 13-4  
Sanitary and Stormwater Volumes  
from Sites A and B to East River, Newtown Creek, and CSS  
under Existing Conditions**

| Storm Event                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |                        | By Site                     |                           |                             |                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------|-----------------------------|---------------------------|-----------------------------|-----------------------------------|
| Rainfall Return Period (month)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Rainfall Volume (in) | Rainfall Duration (hr) | Runoff Volume to River (Mg) | Runoff Volume to CSS (Mg) | Sanitary Volume to CSS (Mg) | Total Combined Volume to CSS (Mg) |
| <b>Site A</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                      |                        |                             |                           |                             |                                   |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.40                 | 3.8                    | 0.04                        | 0.12                      | 0.003                       | 0.12                              |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1.20                 | 11.3                   | 0.11                        | 0.36                      | 0.009                       | 0.37                              |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.50                 | 19.5                   | 0.24                        | 0.75                      | 0.016                       | 0.77                              |
| <b>Site B</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                      |                        |                             |                           |                             |                                   |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.40                 | 3.8                    | 0.00                        | 0.08                      | 0.001                       | 0.08                              |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1.20                 | 11.3                   | 0.00                        | 0.23                      | 0.003                       | 0.23                              |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.50                 | 19.5                   | 0.00                        | 0.48                      | 0.005                       | 0.49                              |
| <b>Site A &amp; B Combined</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                      |                        |                             |                           |                             |                                   |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.40                 | 3.8                    |                             |                           |                             | 0.20                              |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1.20                 | 11.3                   |                             |                           |                             | 0.60                              |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.50                 | 19.5                   |                             |                           |                             | 1.25                              |
| <b>Site C</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                      |                        |                             |                           |                             |                                   |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.40                 | 3.8                    |                             |                           |                             | 0.03                              |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1.20                 | 11.3                   |                             |                           |                             | 0.08                              |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.50                 | 19.5                   |                             |                           |                             | 0.16                              |
| <b>Site A, B, and C Combined</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                        |                             |                           |                             |                                   |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.40                 | 3.8                    |                             |                           |                             | 0.23                              |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1.20                 | 11.3                   |                             |                           |                             | 0.68                              |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.50                 | 19.5                   |                             |                           |                             | 1.41                              |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                      |                        |                             |                           |                             |                                   |
| <p><b>This table is new for the FEIS.</b><br/>                     CSS = combined sewer system.<br/>                     Site C is a 2.74-acre area located outside of the proposed new development currently served by the CSS under existing conditions, but that will be served by the proposed storm sewer system.</p> <p>Assumptions:<br/>                     The CSS receives all sanitary flow generated from Sites A &amp; B<br/>                     The CSS receives all runoff from impervious areas in Sites A, B &amp; C<br/>                     The runoff from all pervious areas flows to the East River and/or Newtown Creek</p> <p><b>Source:</b> HydroQual, Inc (see Appendix 11.2)</p> |                      |                        |                             |                           |                             |                                   |

**D. THE FUTURE WITHOUT THE PROPOSED ACTIONS**

In the future without the proposed actions, the current uses at Site A are expected to remain; therefore, significant changes in the existing water demand, sewage generation, and stormwater runoff on Site A are not expected. At Site B, the Anheuser-Busch distribution facility would be relocated to a new space in the Hunts Point Food Distribution Center in the Bronx. It is assumed that a use similar to the existing distribution facility and NBC television facility would occupy Site B, with no significant change in the site layout. Therefore, water consumption, sewage generation, stormwater runoff, and CSO volumes at the outfalls are not expected to change significantly from existing conditions.

## **WATER SUPPLY**

In the future without the proposed actions, no change in future water demand is expected. The uses at Site A would continue to consume an estimated 39,924 gpd, and on Site B, uses would continue to consume an estimated 24,880 gpd. In addition, no major improvements to the water supply system are planned by the City near the project sites in the future without the proposed actions.

## **SANITARY SEWAGE**

In the future without the proposed actions, the Bowery Bay WPCP is being upgraded, which entails replacement of several WPCP components. This upgrade will be completed by 2009 and will not result in a change in the capacity of the plant. Wastewater flows from Sites A and B are not expected to change in the future without the proposed actions, and would continue to generate approximately 19,962 gpd on Site A and approximately 6,500 gpd on Site B. The NYCDEP wastewater dry weather flows to the Bowery Bay WPCP are projected to be approximately 119 mgd in 2015 and 120 mgd in 2017, well below the permitted limit of 150 mgd.

## **STORMWATER**

### *PROJECT SITES*

Stormwater runoff amounts from both Sites A and B (86 cfs and 42 cfs, respectively) are not expected to change in the future without the proposed actions.

### *BOWERY BAY LOW-LEVEL DRAINAGE AREA*

As presented in Appendix 11.2, the frequency of CSO events for the five combined sewer outfalls connected to regulators receiving sanitary sewage and stormwater from the project sites would not change from the existing condition in 2017 in the future without the proposed actions (i.e., remain at 29 events). However, for the entire Bowery Bay low-level drainage area, the number of CSO events would increase by 1 event in 2017 when compared to the existing condition—(i.e., from 54 events in 2007 to 55 events in 2017 in the future without the actions). The projected CSO volumes discharged to the East River, Newtown Creek, and Dutch Kills (tributary to Newtown Creek) in 2017 without the proposed actions were estimated at approximately 1,321 mgd, an increase of about 104 mgd from the existing CSO discharge of 1,217 mgd, or an increase of 8.5 percent. Of the 37 combined sewer outfalls within the Bowery Bay low-level drainage, 14 are expected to increase by at least 0.5 mgd, with two outfalls to Dutch Kills, a tributary to Newtown Creek, representing over half of the overall increase. This represents a small change in the frequency and volume of CSO events and would not be expected to result in a significant adverse impact to the East River, Newtown Creek, or Dutch Kills.

Because of the adverse effect that CSO events have on the water quality of the City's water bodies, NYCDEP entered into an Administrative Consent Order in 2004 that requires NYCDEP to plan, design, and construct more than 30 CSO abatement projects Citywide. These projects include off-line retention tanks, sewer separation, flushing tunnels, throttling facilities, and numerous other projects designed to optimize the operation of the sewer collection system, pumping stations, and treatment plants during wet weather events. Overall objectives are to provide more treatment for wet weather flow than required under a 1992 Administrative Consent

Order. Benefits include water quality improvements and removal of “floatables” (e.g., street litter and other items that enter the City’s water bodies in stormwater flows). This is expected to result in 90 percent removal efficiency for floatables. In the long term, it is expected that these projects would result in improved water uses and continued improvements in the water quality of New York City’s waterways.

## **E. PROBABLE IMPACTS OF THE PROPOSED ACTIONS**

### **INFRASTRUCTURE IMPROVEMENTS**

To support the proposed new development on Site A, the water mains and sewers on the site would be improved. Throughout Site A, a new system of water mains, sanitary sewers, and storm water sewers would be installed, as discussed below.

#### *WATER SUPPLY*

Throughout Site A, new water lines would be laid beneath the new public street system. The extended network would be constructed in accordance with NYCDEP standards. Once built, NYCDEP would be the responsible agency for maintaining and operating the network. Siting of fire hydrant locations would be coordinated with the New York City Fire Department (FDNY).

#### *SANITARY SEWERAGE, STORM WATER, AND COMBINED SEWER OUTFALLS*

The northern portion of Site A and all of Site B are currently supported by a combined sewer and sanitary wastewater system, but the southern portion of Site A currently lacks sewer service. Upon finalization of the amendments to the City Map, an Amended Drainage Plan would be developed in coordination with NYCDEP. The Amended Drainage Plan would identify the drainage area for Hunter’s Point South, including the sewers and other drainage elements to be installed.

In accordance with the Amended Drainage Plan, a new sewer system would be constructed on Site A that would separate stormwater and sanitary sewage flow. The system would collect stormwater from individual parcels, park areas, and the new roadway right-of-ways and discharge it directly into the East River via new stormwater outfalls. It is anticipated that stormwater attenuation and treatment mechanisms will be included in the City’s design of the streets and parks within Site A; and that the designs of these systems will be guided by the City’s sustainability initiatives described in PlaNYC, Best Management Practices, and CEQR standards to ensure public and environmental health and safety. Stormwater discharged into the East River and Newtown Creek via separate storm sewers would be treated to ensure compliance with the NYSDEC standards, including the SPDES General Permit for Construction Activity, GP-0-08-001 requirements for the development of a stormwater pollution prevention plan (SWPPP), that would include post-construction stormwater management practices. NYCDEP would also review the SWPPP for consistency with NYCDEP requirements related to sizing stormwater management controls based on the 10-year storm event. In accordance with the City’s goals to reduce CSO events, use of separate storm sewers would allow rainfall on Site A and Site B to be discharged to the East River and Newtown Creek, reducing the burden on the Bowery Bay Water Pollution Control Plant during wet weather.

On Site B, it is expected that the existing combined sewer would be available for sanitary sewer connection for the proposed development. At Site B, stormwater runoff would be conveyed to a new separate storm sewer system that would discharge to:

- A new stormwater outfall on Newtown Creek, or
- The combined sewer system, if NYCDEP determines, based on the Amended Drainage Plan and Site B's development plans, that the site design would incorporate appropriate stormwater best management practices (e.g., on-site detention) to meet its stormwater discharge rate requirements.

Alternatively, the stormwater runoff from Site B could be conveyed to the separate storm sewer system to be developed on Site A under the new Amended Drainage Plan.

As part of any new development on Site B, the developer would request a new sewer connection, and that connection must be made in accordance with NYCDEP regulations, standards, and specifications. The design and construction of the connection to the existing CSS would be in accordance with NYCDEP standards.

Any new outfall locations for development on Site A or Site B would be designed in compliance with NYSDEC and NYCDEP requirements and would require authorization from NYSDEC and USACE.

The new storm and sanitary sewer systems would be designed in accordance with the NYCDEP Amended Drainage Plan and built to meet all NYCDEP requirements. Once built, NYCDEP would be the responsible agency for maintaining and operating the system.

## **WATER SUPPLY**

**Table 13-5** summarizes the expected water demand for Sites A and B with the RWCDS. As shown in the table, the RWCDS is expected to increase water usage on Site A from 39,924 gpd to 1,209,470 gpd—an increase of 1,169,546 gpd over the future without the proposed actions. On Site B, the RWCDS is expected to increase water usage from 24,880 gpd to 372,656 gpd—an increase of 347,776 gpd over the future without the proposed actions. The total water demand for the two sites together, 1,582,126 gpd, would be an increase of 1,517,322 gpd over the future without the proposed actions.

The combined water demand of 1,582,126 gpd generated by the RWCDS on Sites A and B would represent less than 0.01 percent of the total daily water consumption in Queens of 200 mgd, a minimal increase.

An existing 12-inch water main runs the full length of 2nd Street, turning west beneath 50th Avenue and connects into an existing 20-inch water main that flows north beneath Center Boulevard. The proposed water distribution network would extend the existing water service as required throughout the site. The design and construction of this system would be in accordance with NYCDEP standards. With the new water supply lines, local water pressure is not expected to be affected by the additional demand by the project.

**Table 13-5**

**Projected Water Consumption on Sites A and B with Reasonable Worst-Case Development Scenario**

| Use                                                                                                                                                                                                                                                                                                                                 | Unit                       | Rate            | Consumption (gallons per day) |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------|-------------------------------|
| <b>Site A</b>                                                                                                                                                                                                                                                                                                                       |                            |                 |                               |
| <b>Residential Use<sup>1</sup></b>                                                                                                                                                                                                                                                                                                  | 9,750 (people)             | 112 gpd/person  | 1,092,000                     |
| <b>Retail/ Public Use</b>                                                                                                                                                                                                                                                                                                           |                            |                 |                               |
| Domestic                                                                                                                                                                                                                                                                                                                            | 90,500 sf                  | 0.17 gpd/sf     | 15,385                        |
| Air conditioning                                                                                                                                                                                                                                                                                                                    | 90,500 sf                  | 0.17 gpd/sf     | 15,385                        |
| <b>Community Facility<sup>2</sup></b>                                                                                                                                                                                                                                                                                               |                            |                 |                               |
| Domestic                                                                                                                                                                                                                                                                                                                            | 45,000 sf                  | 0.17 gpd/sf     | 7,650                         |
| Air conditioning                                                                                                                                                                                                                                                                                                                    | 45,000 sf                  | 0.17 gpd/sf     | 7,650                         |
| <b>School</b>                                                                                                                                                                                                                                                                                                                       |                            |                 |                               |
| Domestic                                                                                                                                                                                                                                                                                                                            | 1,600 (seats) <sup>3</sup> | 30 gpd/seats    | 53,400                        |
| Air conditioning                                                                                                                                                                                                                                                                                                                    | 180,000 sf                 | 0.10 gpd/sf     | 18,000                        |
| <b>Site A Total</b>                                                                                                                                                                                                                                                                                                                 |                            |                 | <b>1,209,470</b>              |
| <b>Site B</b>                                                                                                                                                                                                                                                                                                                       |                            |                 |                               |
| <b>Residential Use*</b>                                                                                                                                                                                                                                                                                                             | 3,218 (persons)            | 112 gpd/ person | 360,416                       |
| <b>Retail/ Public Use</b>                                                                                                                                                                                                                                                                                                           |                            |                 |                               |
| Domestic                                                                                                                                                                                                                                                                                                                            | 36,000 sf                  | 0.17 gpd/sf     | 6,120                         |
| Air conditioning                                                                                                                                                                                                                                                                                                                    | 36,000 sf                  | 0.17 gpd/sf     | 6,120                         |
| <b>Site B Total</b>                                                                                                                                                                                                                                                                                                                 |                            |                 | <b>372,656</b>                |
| <b>TOTAL Site A and B</b>                                                                                                                                                                                                                                                                                                           |                            |                 | <b>1,582,126</b>              |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                       |                            |                 |                               |
| <sup>1</sup> Residential rate assumes no central air conditioning provided. Population estimates are from socioeconomic analysis in Chapter 3 of this EIS.                                                                                                                                                                          |                            |                 |                               |
| <sup>2</sup> Assessment for community facility space based on retail/public use consumption rates.                                                                                                                                                                                                                                  |                            |                 |                               |
| <sup>3</sup> <u>Based on ongoing coordination with the School Construction Authority since issuance of the DEIS, the proposed school is now anticipated to contain 1,250 seats. The Infrastructure analysis conservatively assumed that the proposed school would accommodate 1,600 seats, as originally described in the DEIS.</u> |                            |                 |                               |
| <b>Source:</b> Rates from <i>CEQR Technical Manual</i> .                                                                                                                                                                                                                                                                            |                            |                 |                               |

## SANITARY SEWAGE

The sewage generated on Sites A and B by the RWCDs over the future without the proposed actions is conservatively assumed to be the same as the estimated water demand, excluding the water used for air conditioning, which evaporates rather than entering the sewer system. Therefore, the RWCDs would generate an estimated 1,534,971 gpd of sanitary sewage, an increase of approximately 1,508,509 gpd over the future without the proposed actions. This amount would represent an increase of 1.3 percent over the estimated future flows to the Bowery Bay WPCP, which are predicted to be 120 mgd in the future without the proposed actions in 2017. With this increase, the plant would remain within its SPDES limit. This increase in sewage generation would not affect the overall sewage treatment capacity at the Bowery Bay WPCP.

The proposed infrastructure on Site A would include a new sanitary sewer system that is separate from the stormwater system. The northern portion of Site A would be served by a new network of sanitary sewers that would connect into the existing 54-inch interceptor sewer in 51st Avenue, while the southern portion of Site A would be served by a new network of sanitary sewers that would connect into the existing 54-inch interceptor in 54th Avenue adjacent to the site. The additional sanitary flow into these interceptors would continue northerly to the WPCP.

During wet weather, stormwater runoff from Site A would be discharged into the East River by the existing outfalls at 51st and 54th Avenues and two new proposed outfalls.

It is expected that the existing combined sewer in 54th Avenue adjacent to Site B would be available for a sanitary sewer connection for development on Site B. The design and construction of the connection to the existing CSS would be in accordance with NYCDEP standards. As noted previously, an ADP would be developed in coordination with NYCDEP and would identify specific upgrades to the sewer and sanitary storm system.

## **STORMWATER**

The proposed infrastructure and drainage design plan would include separate storm and sanitary sewer systems. Stormwater generated on Site A would be collected from individual parcels, park areas, and roadways and discharged into Newtown Creek and the East River via two existing and two new storm sewer outfalls. As stated previously, it is anticipated that stormwater attenuation and treatment mechanisms will be included in the City's design of the streets and parks within Site A; and that the designs of these systems will be created around the Office of Mayor's PlaNYC Sustainability Initiatives, NYCDEP's guidance on Best Management Practices, and CEQR standards to ensure public and environmental health and safety. Stormwater discharged into the East River and Newtown Creek via separate storm sewers would be treated to ensure compliance with the NYSDEC standards, including the SPDES General Permit for Construction Activity, GP-0-08-001 requirements for the development of a SWPPP, that would include post-construction stormwater management practices. NYCDEP would also review the SWPPP for consistency with NYCDEP requirements related to sizing stormwater management controls based on the 10-year storm event, and to ensure that the stormwater volumes, and release rates where detention controls are proposed, account for stormwater falling on all surface areas that are part of the proposed actions, and not just the individual lot fronting the street or comprising the waterfront park or open space areas.

Stormwater from the northernmost portion of Site A would be collected on-site, conveyed through a network of separate storm sewers to be located in adjacent streets and discharged into the East River via a new storm outfall to be located between 50th and 51st Streets on the waterfront. Stormwater from the central portion of Site A would be collected on-site and conveyed by separate storm sewers and discharged into the East River via the existing outfall in 54th Avenue. Stormwater from the southern portion of Site A would also be collected on-site, conveyed by separate storm sewers and discharged via a new stormwater outfall in 2nd Street into Newtown Creek.

At Site B, stormwater runoff would be conveyed to a new separate storm sewer system that would discharge to:

- A new stormwater outfall on Newtown Creek, or
- The combined sewer system, if NYCDEP determines, based on the Amended Drainage Plan and Site B's development plans, that the site design would incorporate appropriate stormwater best management practices (e.g., on-site detention) to meet its stormwater discharge rate requirements.

Alternatively, the stormwater runoff from Site B could be conveyed to the separate storm sewer system to be developed on Site A under the new Amended Drainage Plan.

## **Hunter's Point South Rezoning and Related Actions FEIS**

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As part of any new development on Site B, the developer would request a new sewer connection, and that connection must be made in accordance with NYCDEP regulations, standards, and specifications. The design and construction of the connection to the existing CSS would be in accordance with NYCDEP standards.

Any new outfall locations for development on Site A or Site B would be designed in compliance with NYSDEC and NYCDEP requirements and would require authorization from NYSDEC and USACE.

Prior to discharge to the East River or Newtown Creek, stormwater would be treated to ensure compliance with the NYSDEC standards, including the SPDES General Permit for Construction Activity, GP-0-08-001 requirements for the development of a SWPPP, that would include post-construction stormwater management practices. NYCDEP would also review the SWPPP for consistency with NYCDEP requirements related to sizing stormwater management controls based on the 10-year storm event.

With separate storm sewers, stormwater runoff from Site A and Site B would not contribute to the flow being directed to the Bowery Bay WPCP. The only discharges to the Bowery Bay collection system would be from the sanitary sewage generated on Site A and Site B.

Table 13-6 presents the area of roof, paved and pervious surfaces under the existing and RWCDs, and where stormwater from each of these areas drains to under the existing and RWCDs scenario. With the RWCDs, Site A would include approximately 32.2 percent roof areas, 29.8 percent roadway pavement, and 38.0 percent landscaped and pervious open space areas. Site B would include approximately 52.3 percent roof area, 13.2 percent roadway pavement and 34.5 percent landscaped and pervious open space areas. Based on this assumption, the runoff coefficients for Site A and B are estimated to be 0.65 and 0.80, respectively. The estimated design stormwater runoff for Sites A and B would be 134.40 cfs and 35.98 cfs respectively, an increase of 47.4 cfs and a decrease of 6.05 cfs, respectively, compared with the future without the proposed actions. No additional impacts due to stormwater generation are expected to occur. Development on Site A would include 11 acres of mapped parkland, while Site B would include a 40-foot-wide publicly accessible waterfront esplanade, as well as publicly accessible open space along the south side of 55th Avenue. The pervious surfaces in these open spaces and in landscaped areas along the sidewalks on Site A would retain and infiltrate rainfall on-site. Runoff generated on Site A would be discharged to the East River and Newtown Creek via new and existing storm outfalls, while stormwater runoff generated on Site B will be discharged to the East River or Newtown Creek via the new or existing storm outfalls, as described above.

Table 13-7 summarizes sanitary and stormwater runoff flow rates from Sites A and B into the East River and CSS the RWCDs. A summary of sanitary and stormwater runoff flow rates under existing conditions is provided in Table 13-3.



**Table 13-6**  
**Area of Roof, Paved, and Pervious Surfaces and**  
**Destination of Stormwater From Each Area**  
**Under the Existing Condition and RWCDs**

| Location                                                                                                                                                                                                                                                                                                                                                                                                   | Area Type          |                                |                    |                                |                                          |                                                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------------------|--------------------|--------------------------------|------------------------------------------|-------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                            | Roof (acres)       |                                | Paved (acres)      |                                | Pervious (acres)                         |                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                            | Existing Condition | RWCDs                          | Existing Condition | RWCDs                          | Existing Condition                       | RWCDs                                           |
| Site A (30.0 acres)                                                                                                                                                                                                                                                                                                                                                                                        | 3.1                | 9.7                            | 9.4                | 8.9                            | 17.4                                     | 11.0 <sup>(1)</sup>                             |
| Site B (7.5 acres)                                                                                                                                                                                                                                                                                                                                                                                         | 4.2                | 3.9                            | 3.4                | 1.0                            | 0.0                                      | 2.4 <sup>(2)</sup>                              |
| Destination of Stormwater Runoff                                                                                                                                                                                                                                                                                                                                                                           | CSS                | River via separate storm sewer | CSS                | River via separate storm sewer | Infiltration and river via overland flow | Infiltration and river via separate storm sewer |
| <b>Notes:</b> This table is new for the FEIS<br>(1) Pervious areas include landscaped and other pervious open space areas. Includes 11 acres of mapped parkland.<br>(2) Pervious areas include 40-foot-wide public esplanade and publicly accessible open space along the south side of 55th Avenue. It is anticipated that esplanade would comprise an even mix of pervious surface and landscaped areas. |                    |                                |                    |                                |                                          |                                                 |

Under the RWCDs, the total runoff to the CSS from Sites A, B and C (a 2.74 acre area located outside of the proposed project currently served by the CSS under existing conditions, and to be served by the proposed storm sewer system) would be directed to the East River and Newtown Creek via existing and proposed outfalls on Site A, while the sanitary flows from Sites A and B would be discharged into the CSS. Based on **Tables 13-3** and **13-7**, the decrease in stormwater runoff, under the rainfall events evaluated, would offset the increase in sanitary flows for both Sites A and B, resulting in an overall decrease in the total combined flows to the CSS from Sites A and B during moderate and intense rainfall events. However, separating stormwater runoff from the CSS would not offset the increase in sanitary flows under the RWCDs for less intense storm events (i.e., 0.10 inches per hour). Under these rainfall conditions, flow to the CSS would increase from 1.2 mgd under the existing condition, to 1.53 mgd under the RWCDs (i.e., an increase of 0.33 mgd).

**Table 13-8** summarizes the sanitary and stormwater runoff volumes from Sites A and B under the RWCDs. A summary of sanitary and stormwater runoff volumes under existing conditions is provided in **Table 13-4**. Under the RWCDs, there would be an increase in the sanitary flow volume and a reduction in stormwater volume to the CSS from the sites collectively. The expected increase in sanitary flow volume would be greater than the reduction in stormwater volume; however, the difference represents a very small percentage increase in the total combined flow volume under existing conditions and only during the least intense rainfall return periods (3- and 6-month) analyzed. During the most intense rainfall return period (12-month), there would be a significant percentage reduction in the combined flow volume to the CSS (1.25 Mg) compared to that of existing conditions (1.41 Mg).

As mentioned, to accommodate the increased sanitary flow volume, a new separate storm and sanitary sewer system would be designed and constructed to meet NYCDEP requirements. In addition, an Amended Drainage Plan would be prepared in accordance with NYCDEP guidelines, prior to the construction of the new storm and sanitary sewer system.

**Table 13-7  
Sanitary and Stormwater Flow Rates  
from Sites A and B to East River, Newtown Creek, and CSS  
under the Reasonable Worst-Case Development Scenario**

| Storm Event                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                 | By Site               |                     |                       |                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------|---------------------|-----------------------|----------------------------------|
| Rainfall Return Period (month)*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Rainfall Intensity Peak (in/hr) | Runoff to River (Mgd) | Runoff to CSS (Mgd) | Sanitary to CSS (Mgd) | Total Combined Flow to CSS (Mgd) |
| <b>Site A</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                 |                       |                     |                       |                                  |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.00                            | 0.00                  | 0.00                | 1.17                  | 1.17                             |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.10                            | 1.26                  | 0.00                | 1.17                  | 1.17                             |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.20                            | 2.52                  | 0.00                | 1.17                  | 1.17                             |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1.00                            | 12.58                 | 0.00                | 1.17                  | 1.17                             |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.00                            | 25.16                 | 0.00                | 1.17                  | 1.17                             |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.15                            | 27.04                 | 0.00                | 1.17                  | 1.17                             |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.89                            | 36.35                 | 0.00                | 1.17                  | 1.17                             |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3.61                            | 45.41                 | 0.00                | 1.17                  | 1.17                             |
| <b>Site B</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                 |                       |                     |                       |                                  |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.00                            | 0.00                  | 0.00                | 0.37                  | 0.37                             |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.10                            | 0.34                  | 0.00                | 0.37                  | 0.37                             |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.20                            | 0.69                  | 0.00                | 0.37                  | 0.37                             |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1.00                            | 3.45                  | 0.00                | 0.37                  | 0.37                             |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.00                            | 6.89                  | 0.00                | 0.37                  | 0.37                             |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.15                            | 7.41                  | 0.00                | 0.37                  | 0.37                             |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.89                            | 9.96                  | 0.00                | 0.37                  | 0.37                             |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3.61                            | 12.44                 | 0.00                | 0.37                  | 0.37                             |
| <b>Site A &amp; B Combined</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                 |                       |                     |                       |                                  |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.00                            |                       |                     |                       | 1.53                             |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.10                            |                       |                     |                       | 1.53                             |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.20                            |                       |                     |                       | 1.53                             |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1.00                            |                       |                     |                       | 1.53                             |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.00                            |                       |                     |                       | 1.53                             |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.15                            |                       |                     |                       | 1.53                             |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.89                            |                       |                     |                       | 1.53                             |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3.61                            |                       |                     |                       | 1.53                             |
| <b>Site C</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                 |                       |                     |                       |                                  |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.00                            | 0.00                  | 0.00                |                       | 0.00                             |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.10                            | 0.15                  | 0.00                |                       | 0.00                             |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.20                            | 0.30                  | 0.00                |                       | 0.00                             |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1.00                            | 1.51                  | 0.00                |                       | 0.00                             |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.00                            | 3.01                  | 0.00                |                       | 0.00                             |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.15                            | 3.24                  | 0.00                |                       | 0.00                             |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.89                            | 4.35                  | 0.00                |                       | 0.00                             |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3.61                            | 5.43                  | 0.00                |                       | 0.00                             |
| <b>Site A, B, and C Combined</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                 |                       |                     |                       |                                  |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.00                            |                       |                     |                       | 1.53                             |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.10                            |                       |                     |                       | 1.53                             |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.20                            |                       |                     |                       | 1.53                             |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1.00                            |                       |                     |                       | 1.53                             |
| -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.00                            |                       |                     |                       | 1.53                             |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.15                            |                       |                     |                       | 1.53                             |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.89                            |                       |                     |                       | 1.53                             |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3.61                            |                       |                     |                       | 1.53                             |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                 |                       |                     |                       |                                  |
| <p><b>This table is new for the FEIS.</b><br/>                     CSS = combined sewer system.<br/>                     Site C is a 2.74 acre area located outside of the proposed new development currently served by the CSS under existing conditions, but that will be served by the proposed storm sewer system.</p> <p>Assumptions:<br/>                     The CSS receives all sanitary flow generated from Sites A &amp; B, but no runoff from sites A, B &amp; C<br/>                     The runoff from Sites A, B &amp; C flows to the East River and/or Newtown Creek either directly or via the new storm sewer system</p> <p>* Reference: Intensity Duration Frequency Rainfall Analysis New York City and the Catskill Mountain Water Supply Reservoirs" prepared by Vieux &amp; Associates, Inc. on April 4, 2006</p> <p>Source: HydroQual, Inc (see Appendix 11.2)</p> |                                 |                       |                     |                       |                                  |

**Table 13-8  
Sanitary and Stormwater Volumes  
from Sites A and B to East River, Newtown Creek, and CSS  
under the Reasonable Worst-Case Development Scenario**

| Storm Event                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                      |                        | By Site                     |                           |                             |                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------|-----------------------------|---------------------------|-----------------------------|-----------------------------------|
| Rainfall Return Period (month)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Rainfall Volume (in) | Rainfall Duration (hr) | Runoff Volume to River (Mg) | Runoff Volume to CSS (Mg) | Sanitary Volume to CSS (Mg) | Total Combined Volume to CSS (Mg) |
| <b>Site A</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                      |                        |                             |                           |                             |                                   |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.40                 | 3.8                    | 0.21                        | 0.00                      | 0.185                       | 0.19                              |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1.20                 | 11.3                   | 0.63                        | 0.00                      | 0.550                       | 0.55                              |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2.50                 | 19.5                   | 1.32                        | 0.00                      | 0.949                       | 0.95                              |
| <b>Site B</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                      |                        |                             |                           |                             |                                   |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.40                 | 3.8                    | 0.06                        | 0.00                      | 0.058                       | 0.06                              |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1.20                 | 11.3                   | 0.17                        | 0.00                      | 0.173                       | 0.17                              |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2.50                 | 19.5                   | 0.30                        | 0.00                      | 0.298                       | 0.30                              |
| <b>Site A &amp; B Combined</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |                        |                             |                           |                             |                                   |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.40                 | 3.8                    |                             |                           |                             | 0.24                              |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1.20                 | 11.3                   |                             |                           |                             | 0.72                              |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2.50                 | 19.5                   |                             |                           |                             | 1.25                              |
| <b>Site C</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                      |                        |                             |                           |                             |                                   |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.40                 | 3.8                    |                             |                           |                             | 0.00                              |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1.20                 | 11.3                   |                             |                           |                             | 0.00                              |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2.50                 | 19.5                   |                             |                           |                             | 0.00                              |
| <b>Site A, B, and C Combined</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                      |                        |                             |                           |                             |                                   |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.40                 | 3.8                    |                             |                           |                             | 0.24                              |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1.20                 | 11.3                   |                             |                           |                             | 0.72                              |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2.50                 | 19.5                   |                             |                           |                             | 1.25                              |
| <b>Notes:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                      |                        |                             |                           |                             |                                   |
| <p><b>This table is new for the FEIS.</b><br/>                     CSS = combined sewer system.<br/>                     Site C is a 2.74 acre area located outside of the proposed new development currently served by the CSS under existing conditions, but that will be served by the proposed storm sewer system for Site A.</p> <p>Assumptions:<br/>                     The CSS receives all sanitary flow generated from Sites A &amp; B<br/>                     The separate storm sewer system receives all runoff from impervious areas in Sites A, B &amp; C<br/>                     The runoff from all pervious areas flows to the East River and/or Newtown Creek</p> <p><b>Source:</b> HydroQual, Inc (see Appendix 11.2)</p> |                      |                        |                             |                           |                             |                                   |

Based on the InfoWorks hydraulic model, presented in **Appendix 11.2**, the frequency of CSO events for the five combined sewer outfalls connected to regulators receiving sanitary sewage and stormwater from the project sites would decrease by 1 event in 2017 under the RWCDs, as compared to the existing condition and the future without the proposed actions. However, for the entire Bowery Bay low-level drainage area, the frequency of CSOs would increase by 2 events when compared to the existing condition (i.e., increase from 54 events to 56 events), but would increase by only 1 event when compared to the 2017 future without the project (i.e., increase from 55 events to 56 events). The projected CSO volumes discharged to the East River, Newtown Creek, and Dutch Kills, in 2017 with the proposed actions were estimated at approximately 1,323 mgd, an increase of about 106 mgd from the existing CSO discharge of 1,217 mgd, or an increase of 8.7 percent. This percentage increase is only 0.1 percent greater than under the 2017 future condition without the proposed actions. Of the 37 combined sewer

## **Hunter's Point South Rezoning and Related Actions FEIS**

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outfalls within the Bowery Bay low-level drainage area, only 2 outfalls, both of which discharge to Dutch Kills (Newtown Creek tributary) are projected to have increased CSO volume of more than 0.5 mgy, and the total increase to Dutch Kills is about 4 mgy. CSO volumes to Newtown Creek and the East River are projected to decrease by about 2.4 mgy (4 percent) and 0.1 mgy, respectively. At the combined sewer outfall located at Site B, CSO volumes are projected to decrease by 1.74 mgy under the RWCDS when compared to the future without the proposed actions, a decrease of 39 percent. The projected small change in the frequency and volume of CSO events and would not be expected to result in a significant adverse impact to the East River, Newtown Creek, or Dutch Kills. Under the RWCDS the new separate storm sewers system would collect stormwater from the sites and therefore, not contribute to CSO events.

The project sites and area within ¼ mile of the sites have a known history of flooding/sewer backups (NYCDEP 2008). Existing complaint data<sup>1</sup> for the period between 2000 and 2007, suggest flooding occurs within and just outside of Site A, but that sewer backups may not be occurring. Flooding and sewer backups have been reported within a ¼-mile of Sites A and B. The increased volumes that would be discharged to the CSS under the RWCDS during some rainfall events (see Table 13-8) may exacerbate sewer backups and/or flooding in the vicinity of Sites A and B. As mentioned, the capacity of the existing combined sewer to adequately collect the incremental flows due to the proposed project under the RWCDS would be addressed by an Amended Drainage Plan which will be prepared in accordance with NYCDEP requirements. The new separate storm and sanitary sewer system will be designed and built in accordance with the Amended Drainage Plan.

In sum, runoff in the future on Site A would be greater than in the future without the proposed actions, and will be discharged to the East River and Newtown Creek via a new storm sewer system with existing and new outfalls, and not to the City combined sewer system. However, with implementation of the proposed improvements and the development of the proposed open space resources, this impact is expected to be negligible. Runoff from Site B in the future would be less than in the future without the proposed actions, and is anticipated to be conveyed to a new storm sewer system that would discharge to the East River or Newtown Creek via the new or existing storm outfalls on Site A, and not to the combined sewer system.

### **CONCLUSION**

In conclusion, with implementation of the proposed improvements to the existing infrastructure network, the water and sewer demands of the proposed actions would be met, and no significant adverse impacts to the existing water supply, water pressure, sewage treatment, or stormwater discharge systems would result. \*

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<sup>1</sup> Sewer backup and flooding occurrences are based upon citizen complaints called into the NYCDEP 311 hotline, and do not represent a complete dataset of all flooding or sewer backup occurrences during the 2000 to 2007 timeframe.