A. INTRODUCTION

This chapter assesses the potential effects of the Proposed Actions on the City's water supply, wastewater treatment, and stormwater management infrastructure in accordance with the ~~2014~~2020 *City Environmental Quality Review* (CEQR) *Technical Manual*. As outlined in Chapter 1, "Project Description," the Proposed Actions would facilitate new construction on the Stevenson Commons site in the Soundview neighborhood of Bronx Community District (CD) 9, which would result in an incremental (net) increase compared to No-Action conditions of approximately 735 affordable dwelling units (DUs), including 621 income-restricted housing units and 114 affordable ~~units~~ independent residences for seniors~~,~~ (AIRS), 33,995 gsf of community facility uses, approximately ~~two~~1.94 acres of publicly accessible open space, and a net decrease of ~~149~~104 accessory parking spaces (the "Proposed Project").

B. PRINCIPAL CONCLUSIONS

An assessment of water and sewer infrastructure determined that the Proposed Actions would not result in significant adverse impacts on the City's water supply or wastewater and stormwater conveyance and treatment.

Water Supply

The Proposed Project would generate an incremental water demand of approximately 198,980 gpd (including water related to sanitary and domestic uses) compared with the No-Action condition. While this would represent an increase in demand on the New York City water supply system, it does not meet the *CEQR Technical Manual* threshold requiring a detailed analysis. Therefore, an analysis of water supply is not warranted as it is expected that there would be adequate water service and existing infrastructure to meet the incremental water demand from the Proposed Project and there would be no significant adverse impacts on the City's water supply. The New York City Department of Environmental Protection (DEP) indicated that existing water infrastructure should be able to handle the estimated increase in water demand, and recommended that, as the Development Site fronts different streets, connections for water service be made to different water mains adjacent to the site.

Wastewater and Stormwater Conveyance and Treatment

Based on preliminary assessment, it was determined that the Proposed Actions would not result in significant adverse impacts on wastewater treatment or stormwater conveyance infrastructure. The Proposed Project is expected to generate an additional 193,200 gallons per day (gpd) of sanitary sewage compared to No-Action conditions. This incremental increase in sewage generation is less than 0.1 percent of the average daily flow at the Hunts Point Wastewater Resource Recovery Facility~~Pollution Control Plant~~ (WRRF~~PCP~~) and would not result in an exceedance of the plant's permitted capacity of 200 million gallons

per day (mgd). Therefore, the Proposed Actions would not result in a significant adverse impact to the City's sanitary sewage conveyance and treatment system.

Depending on the rainfall volume and duration, the total With-Action condition volume to the combined sewer system could be between 0.07 and 1.14 mg. Compared to existing conditions, this would represent an increase in combined sewer flows of up to 0.22 mg, depending on rainfall intensities. With the incorporation of selected stormwater source control best management practices (BMPs) that would be required as part of the site connection approval process, subject to the review and approval of DEP, the peak stormwater runoff rates would be reduced. Overall, the Proposed Project would not result in significant adverse impacts on the City's sewage conveyance and treatment systems.

C. METHODOLOGY

Water Supply

According to the *CEQR Technical Manual*, a preliminary water supply infrastructure analysis is needed if a project would result in an exceptionally large demand for water (e.g., more than one million gallons per day (mgd)) or is located in an area that experiences low water pressure (e.g., areas at the end of the water supply distribution system). The Project Area is located in the Soundview neighborhood of Bronx ~~Community District (~~CD~~)~~ 9 and is not located in an area that experiences low water pressure (i.e., it is not located at the end of the water supply distribution system, such as the Rockaway Peninsula or Coney Island). The Proposed Project would generate an incremental water demand of approximately 198,980 gpd (including water related to sanitary and domestic uses) compared with the No-Action condition. While this would represent an increase in demand on the New York City water supply system, it does not meet the *CEQR Technical Manual* threshold requiring a detailed analysis. Therefore, an analysis of water supply is not warranted as it is expected that there would be adequate water service and existing infrastructure to meet the incremental water demand from the Proposed Project, and there would be no significant adverse impacts on the City's water supply.

Wastewater and Stormwater Conveyance and Treatment

For wastewater and stormwater conveyance and treatment, a preliminary sewer analysis is warranted if a project site comprises more than five acres and would result in an increase of impervious surfaces on the site, or if a project is located in a combined sewer area and would result in the incremental development of at least 400 residential units or 150,000 sf or more of commercial space in the Bronx, Brooklyn, Staten Island, or Queens or at least 1,000 residential units or 250,000 sf or more of commercial space in Manhattan. As the Project Area is located in a combined sewer area in the Bronx and the Proposed Project would exceed the *CEQR Technical Manual* residential unit threshold, a preliminary assessment of wastewater and stormwater infrastructure is provided.

Existing and future sanitary sewage generation is calculated for the Project Area based on use generation rates set forth in Table 13-2 of the *CEQR Technical Manual*. ~~The New York City Department of Environmental Protection's (DEP's)~~DEP's Volume Calculation Matrix is then used to calculate the overall combined sanitary sewage and stormwater runoff volume discharged to the combined sewer systems for four rainfall volume scenarios with varying durations. Stormwater runoff volumes are determined by estimating the amount of pervious and impervious surfaces in the Project Area. The ability of the City's water and sewer infrastructure to handle the estimated demand/generation that is anticipated from the

Proposed Project is assessed by estimating existing, No-Action, and With-Action water demand and sewage generation. Future With-Action water demand and wastewater generation is compared to the No-Action condition, and future With-Action combined stormwater runoff and wastewater generation volumes are compared to existing conditions.

D. EXISTING CONDITIONS

Wastewater Conveyance System

The majority of New York City's wastewater treatment system is comprised of the sewer network beneath the streets and the fourteen Wastewater Resource Recovery Facilities ~~Pollution Control Plants~~ (WRRF~~PCP~~s) located throughout the City. The majority of New York City's sewers are called combined sewers as they receive sanitary wastewater and stormwater runoff. Wastewater generated in a "drainage basin" (the area served by a WRRF~~PCP~~) is conveyed through a network of combined sewers to the WRRF~~PCP~~. The Project Area is served by combined sewers that collect both sanitary sewage and stormwater. The Project Area is located within the drainage basin for the Hunts Point WRRF~~PCP~~, which is the third largest wastewater treatment facility in the City, located to the southwest of the ~~site~~Project Area in the Hunts Point neighborhood of the Bronx.

Collection sewers can be one to two feet in diameter on side streets, and three or four feet in diameter under larger roadways, which connect to trunk sewers, generally five to seven feet in diameter. During dry weather, regulators built into the combined sewer system direct flows to interceptor sewers leading to the WRRF~~PCP~~s. These large interceptor sewers (often up to ten or ~~twelve~~12 feet in diameter) bring the wastewater to the WRRF~~PCP~~s for treatment. In the vicinity of the Project Area, there is a 24-inch combined sewer pipe under Thieriot Avenue; a 54-inch combined sewer pipe under Lafayette Avenue, which increases to 60 inches east of Underhill Avenue; a 50-inch combined sewer pipe under a portion of White Plains Road, terminating approximately 300 feet to the south of Lafayette Avenue; and a 42-inch combined sewer pipe under Seward Avenue, which increases to 54 inches east of Underhill Avenue.

At the Hunts Point WRRF~~PCP~~, wastewater is fully treated by physical and biological process before it is discharged into the upper East River. The quality of the treated wastewater (effluent) is regulated by a State Pollutant Discharge Elimination System (SPDES) permit issued by the New York State Department of Environmental Conservation (NYSDEC), which establishes limits for effluent parameters (i.e., suspended solids, fecal coliform bacteria, and other pollutants). As the volume of flow to a WRRF~~PCP~~ affects the level of treatment a plant can provide, the maximum permitted dry weather capacity for the Hunts Point WRRF~~PCP~~ is 200 mgd. As presented in Table 10-1, ~~below,~~ the average daily flows to the Hunts Point WRRF~~PCP~~ for the 12-month period ending in ~~August~~ June 202119 (the latest 12-month period available) was approximately 136~~7~~ mgd, which is well below the maximum permitted capacity of 200 mgd.

TABLE 10-1
Existing Hunts Point WRRF~~PCP~~ Average Daily Sewer Flows

Year	Month	Average Daily Flows (mgd)
2020~~18~~	July	138
	August	138
	September	128~~40~~
	October	131~~0~~
	November	133~~52~~
	December	142~~56~~
2021~~9~~	January	138~~41~~
	February	152~~38~~
	March	137~~5~~
	April	132~~8~~
	May	130~~9~~
	June	128~~3~~
	~~July~~	~~134~~
	~~August~~	~~123~~
12-Month Average		136~~7~~

Source: DEP "Monthly Operating Efficiency" tables, 2020~~18~~ and ~~August~~June 2021~~9~~.

During and immediately after wet weather events, combined sewers can experience a much larger flow due to stormwater runoff collection. Stormwater runoff from impermeable surfaces is collected by catch basins along the street and conveyed by the City's combined sewer system to the Hunts Point WRRF~~PCP~~. During storm events, the regulators built into the system allow only twice the dry weather design flow into interceptor sewers, and any excess flow is directed to outfalls into the local waterway (e.g., the East River, etc.) as combined sewer overflow (CSO). There are no CSO outfalls in the immediate vicinity of the Project Area.

Sanitary Flows

As described in Chapter 1, "Project Description," the Project Area has a lot area of approximately 679,000 sf, and is currently occupied by a nine-building Mitchell-Lama housing development with a total of 990,050 gross square feet (gsf) of built floor area, including approximately 914,634 gsf of residential uses, 10,648 gsf of local retail uses, 36,214 gsf of community facility uses, and at-grade accessory parking spaces. The nine buildings are all located on the eastern portion of the block and are oriented around a central private open space. The western portion of the block is occupied by surface accessory parking spaces and private open spaces encompassing private tennis and handball courts. These private open spaces, which also include passive grassy areas, total approximately 3.1 acres, and are used exclusively by current residents, although the grass field is currently not operational for the tenants due to safety concerns. As presented in Table 10-2, the existing uses are estimated to generate approximately 269,677 gpd of daily sanitary sewage, with a total water demand of approximately 277,643 gpd. Existing sanitary flows generated in the Project area are conveyed to the Hunts Point WRRF~~PCP~~ during dry weather events via the existing combined sewers serving the ~~site~~Project Area.

TABLE 10-2
Existing Water Consumption and Wastewater Generation in the Project Area

Land Use	Rate[1]	GSF or # of Residents[2]	Domestic Water/ Wastewater Generation (gpd)	A/C (gpd)
Residential	100 gpd/person	2,635	263,500	N/A
Community Facility	Domestic: 0.10 gpd/sf; A/C: 0.17 gpd/sf	36,214	3,621	6,156
Retail	Domestic: 0.24 gpd/sf; A/C: 0.17 gpd/sf	10,648	2,556	1,810
Total Water Consumption (Domestic Water + A/C)			***277,643 gpd***	
Total Wastewater Generation			***269,677 gpd***	

Notes:
[1] Based on *CEQR Technical Manual* water demand rates from Table 13-2. Assumes office rates for community facility use.
[2] Number of residents based on 2.78 persons per DU for all family units (2010 Census average household size for Bronx ~~Community District~~CD 9).

Stormwater Flows

The Project Area has a total lot area of approximately 679,000 sf. As noted above, much of the site is currently occupied by existing buildings and paved surfaces (surface parking lots, tennis and handball courts, paved walkways), with the remaining portions of the site occupied by grassy areas. As such, the Project Area has an existing runoff coefficient of 0.66, as presented in Table 10-3.

TABLE 10-3
Existing Surface Types in the Project Area

Surface Type	Roof[1]	Pavement and Walks	Other	Grass and Softscape	Total
Area (%)	16	52	0	33	100
Surface Area (sf)	106,100	350,400	0	222,500	679,000
Runoff Coefficient[2]	1.0	0.85	0.85	0.20	0.66

Notes:
[1] Total roof area on ~~site~~Project Area.
[2] Runoff coefficients for each surface type are as per DEP.

For this analysis, standard DEP runoff coefficients were used to calculate the amount of stormwater runoff for various rainfall intensities and durations, with rainfall ranging from 0.00 inches to 2.50 inches over durations of 3.80 to 19.50 hours. Table 10-4 shows the combined stormwater runoff and wastewater generation for the Project Area under existing conditions. As indicated in the table, the Project Area currently generates between 0.00 and 0.70 mg of stormwater within the Hunts Point WRRF~~PCP~~ for the different rainfall intensities.

TABLE 10-4
Existing Combined Stormwater Runoff and Wastewater Generation

Rainfall (inches)	Duration (Hours)	Total Area (Acres)	Runoff Coefficient[1]	Stormwater Runoff to CSS (MG)[2]	Sanitary to CSS (MG)[3]	Total Volume to CSS (MG)
0.00	3.80	15.59	0.66	0.00	0.043	0.04
0.40	3.80			0.11	0.043	0.15
1.20	11.30			0.34	0.127	0.46
2.50	19.50			0.70	0.219	0.92

Notes:
[1] Refer to Table 10-3.
[2] Conservatively assumes that all stormwater runoff from the Project Area would be conveyed to the combined sewer system, with no direct discharge.
[3] Derived from Table 10-2.
MG = million gallons

E. THE FUTURE WITHOUT THE PROPOSED ACTIONS (NO-ACTION CONDITION)

As described in Chapter 1, "Project Description," no changes to the Project Area would occur in the future without the Proposed Actions, and no new development would occur in the Project Area. As such, the existing dry weather and wet weather flows that are currently generated by the Project Area would remain unchanged in the No-Action condition.

F. THE FUTURE WITH THE PROPOSED ACTIONS (WITH-ACTION CONDITION)

In the 2028 With-Action condition, the Proposed Actions would facilitate the construction of a new approximately 826,209 gsf mixed-use development on the western portion of the Project Area. New development would be spread across six buildings on the Stevenson Commons site and would result in an incremental (net) increase of approximately 735 affordable DUs, including ~~114 affordable~~621 income-restricted housing units ~~for seniors~~and 114 AIRS units, approximately 33,995 gsf of community facility uses (including an approximately 19,879 gsf child care center and approximately 14,116 gsf of indoor recreational space associated with the adjacent tennis courts), and approximately 1.94 acres of publicly accessible open space and an additional 0.68 acres of private open space. The Proposed Project would also provide approximately 4662~~1~~ parking spaces in the Project Area (a net decrease of ~~149~~104 spaces).

Sanitary Flows

As described previously, the Project Area is located in an area served by combined sewers. In the future with the Proposed Actions, wastewater from the Hunts Point WRRF~~PCP~~, which has a SPDES-permitted dry weather flow capacity of 200 mgd. As shown in Table 10-5, in the future with the Proposed Actions, the Project Area would generate approximately 462,877 gpd of sanitary sewage, with a total water demand of approximately 476,623 gpd. This sanitary sewage generation represents a net increase of approximately 193,200 gpd (0.19 mgd) over the No-Action condition. While this represents an increase in sanitary flows, it is equivalent to less than 0.1 percent of the average daily flow at the Hunts Point WRRF~~PCP~~, and would not result in an exceedance of the plant's permitted capacity of 200 mgd.

TABLE 10-5
With-Action Water Consumption and Wastewater Generation in the Project Area

Land Use	Rate[1]	GSF or # of Residents[2]	Domestic Water/ Wastewater Generation (gpd)	A/C (gpd)
Residential	100 gpd/person	4,533	453,300	N/A
Community Facility	Domestic: 0.10 gpd/sf; A/C: 0.17 gpd/sf	70,209	7,021	11,936
Retail	Domestic: 0.24 gpd/sf; A/C: 0.17 gpd/sf	10,648	2,556	1,810
Water Consumption				
Total Water Consumption			***476,623***	
Incremental Water Consumption (Compared to No-Action)			***+198,980***	
Wastewater Generation				
Total Wastewater Generation			***462,877***	
Incremental Wastewater Generation (Compared to No-Action)			***+193,200***	

Notes:
[1] Based on *CEQR Technical Manual* water demand rates from Table 13-2. Assume<u>s</u> office rates for community facility use.
[2] Number of residents based on 2.78 persons per DU for all family units (2010 Census average household size for Bronx ~~Community District~~<u>CD</u> 9).

Connecting to the City's sewer system requires certification from DEP as part of the building permit process, which is not a discretionary approval. The Applicant would be required to file a site connection proposal for approval from DEP to tie into the sewer system. In order to obtain a sewer connection permit from DEP, the Applicant would be required to demonstrate that the existing system could handle the increased flows due to the Proposed Project. As part of the site connection approval process, a hydraulic analysis of the existing sewer system would likely be required to determine whether the existing sewer system is capable of supporting higher density development and the related increase in wastewater flow, or whether there will be a need to upgrade the existing sewer system. In addition, there may be a need to amend the existing drainage plan based on the hydraulic analysis calculations. This analysis would be undertaken prior to construction of the Proposed Project and would be coordinated with DEP for review and approval. In addition, in accordance with the New York City Plumbing Code (Local Law 33 of 2007), while not accounted for in the quantitative analysis, the Proposed Project would be required to utilize low-flow plumbing fixtures, which would reduce sanitary flows to the plant. Therefore, the Proposed Project would not result in a significant adverse impact to the City's sanitary sewage conveyance and treatment.

Stormwater Flows

In the future with the Proposed Actions, the amount of roof area within the Project Area would increase compared to existing conditions, whereas the amount of pavement and walks and grass/softscape would decrease. Table 10-6 shows the surface types that are expected within the Project Area under 2028 With-Action conditions. As presented in Table 10-6, the runoff coefficient for the Project Area would increase to 0.72 in the future with the Proposed Actions, as compared to 0.66 under existing conditions.

TABLE 10-6
With-Action Surface Types in the Project Area

Surface Type	Roof[1]	Pavement and Walks	Other	Grass and Softscape	Total
Area (%)	33	39	0	28	100
Surface Area (sf)	225,500	265,800	0	187,700	679,000
Runoff Coefficient[2]	1.0	0.85	0.85	0.20	0.72

Notes:
[1] Total roof area on ~~site~~Project Area.
[2] Runoff coefficients for each surface type are as per DEP.

Table 10-7 compares the estimated combined flows (stormwater runoff and sanitary flows) to the combined sewer system under existing and With-Action conditions using the DEP Flow Volume Calculation Matrix. As shown in the table, depending on the rainfall volume and duration, the total With-Action volume to the combined sewer system (both stormwater and sanitary) could be between 0.07 and 1.14 mg. Compared to existing conditions, this would represent an increase in combined sewer flows of up to 0.22 mg.

TABLE 10-7
Existing and With-Action Combined Stormwater Runoff and Wastewater Generation

Rainfall (inches)	Duration (Hours)	Existing Conditions			With-Action Condition			Increased Total Volume to CSS (MG)
		Stormwater Runoff to CSS (MG)	Sanitary to CSS (MG)	Total to CSS (MG)	Stormwater Runoff to CSS (MG)	Sanitary to CSS (MG)	Total to CSS (MG)	
0.00	3.80	0.00	0.043	0.04	0.00	0.073	0.07	0.03
0.40	3.80	0.11	0.043	0.15	0.12	0.073	0.20	0.05
1.20	11.30	0.34	0.127	0.46	0.37	0.218	0.58	0.12
2.50	19.50	0.70	0.219	0.92	0.76	0.376	1.14	0.22

Notes:
MG = million gallons

The Project Area is located in an area that is well-served by combined sewer infrastructure. As previously noted, the wastewater collection system adjacent to the Project Area consists of a 24-inch combined sewer pipe under Thieriot Avenue; a 54-inch combined sewer pipe under Lafayette Avenue, which increases to 60 inches east of Underhill Avenue; a 50-inch combined sewer pipe under a portion of White Plains Road, terminating approximately 300 feet to the south of Lafayette Avenue; and a 42-inch combined sewer pipe under Seward Avenue, which increases to 54 inches east of Underhill Avenue. Given the size of the combined sewer facilities in the vicinity of the Project Area, it is anticipated that there is ample capacity in the adjacent sewer infrastructure to accommodate the additional combined flows generated by the Proposed Project. As noted above, the Applicant would be required to file a site connection proposal for approval from DEP to tie into the City's sewer system. As part of the site connection approval process, a stormwater analysis would be required in order to ensure that the Proposed Project complies with the required stormwater release rate.

Stormwater Best Management Practices

The Flow Volume Matrix calculations do not reflect the use of any sanitary and stormwater source control BMPs to reduce sanitary flow and stormwater runoff volumes to the combined sewer system. Stormwater BMPs would be required as part of the DEP site connection approval process in order to bring the Proposed Project into compliance with the required stormwater release rate. Based on the DEP Guidelines for Detention Facility Design, dated November 19, 2012, for discharge to a combined sewer system, the maximum stormwater release rate for the Proposed Project is restricted to the greater of 0.25 cubic feet per second (cfs) or ten percent of the allowable flow. Specific BMP methods will be determined with further refinement of the buildings' design and in consultation with DEP.

A broad range of BMPs could be implemented on the portion of the Project Area to be developed, to facilitate stormwater source controls and limit the stormwater release rate to the required 0.25 cubic feet per second (cfs) or ten percent of the allowable flow per the drainage plan, whichever is greater. The implementation of low-flow fixtures, as per the New York City Plumbing Code, Local Law 33 of 2007, and the U.S. Environmental Protection Agency's WaterSense Program, would help control sanitary flows. To further offset these increases, on-site stormwater control measures of BMPs could be implemented to retain or slowly release stormwater runoff with controlled discharge rates to the City's combined sewer system.

The following typical BMP measures could be used to help manage stormwater flows: the implementation of BMPs described in the New York City Green Infrastructure Plan and/or green technologies, such as blue and green roofs, subsurface detention and infiltration, porous pavement, enhanced tree pits, and rain cisterns, depending on site conditions. The design of detention tanks, green roofs, and/or other chosen

stormwater control BMPs, would be required to meet the release rate of 0.25 cfs or ten percent of DEP's allowable flow rate (whichever is greater) from the site to be developed.

Therefore, with the incorporation of appropriate BMPs that would be required as part of the site connection approval process to be reviewed and approved by DEP, the overall volume of sanitary sewer discharge and stormwater runoff, as well as the peak stormwater runoff rate, would be reduced. Sewer conveyance near the Project Area and the treatment capacity at the Hunts Point WRRF~~PCP~~ is sufficient to handle wastewater flow resulting from the Proposed Project. Therefore, there would be no significant adverse impacts on wastewater treatment or stormwater conveyance infrastructure as a result of the Proposed Actions.