RIVER RING
Chapter 11: Water and Sewer Infrastructure

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 2020 *City Environmental Quality Review* (CEQR) *Technical Manual*. As outlined in Chapter 1, "Project Description," the Proposed Actions would facilitate the development of approximately 1.336 million gross square feet (gsf) of mixed-use residential, commercial, and community facility uses (the Applicant's "Proposed Development") in the Williamsburg neighborhood of Brooklyn. In addition to the Applicant's Proposed Development, the reasonable-worst case development scenario (RWCDS) for the Proposed Actions also assumes redevelopment of a separate Projected Development Site within the Project Area (Block 2362, Lot 1) with an additional 1.0 FAR (floor area ratio) of community facility uses compared to No-Action conditions.

B. PRINCIPAL CONCLUSIONS

A preliminary assessment was conducted based on the methodology set forth in the *CEQR Technical Manual*, and determined that the Proposed Actions would not result in a significant adverse impact related to water and sewer infrastructure.

Water Supply

The Proposed Actions would generate an incremental water demand of approximately 213,115 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 to meet the incremental water demand from the Proposed Actions and there would be no significant adverse impacts on the City's water supply.

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 Actions are expected to generate approximately 311,986 gallons per day (gpd) of sanitary sewage, an increase of approximately 257,815 gpd compared to No-Action conditions. This incremental increase in sewage generation is approximately 0.08 percent of the average daily flow at the Newtown Creek Water Resource Recovery Facility (WRRF) and would not result in an exceedance of the plant's permitted capacity of 310 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.

The total With-Action volume to the combined sewer system from the Applicant's Proposed Development (only sanitary) could be between 0.05 and 0.25 mg. Compared to No-Action conditions, this would

represent an increase in combined sewer flows of up to 0.04 mg. Stormwater runoff from the Applicant's Proposed Development Site would be reduced compared to No-Action conditions, and would be discharged via private stormwater outfalls and would not increase combined sewer overflows (CSO). With-Action stormwater runoff from the Proposed Development Site would be treated on-site using treatment methods per DEP-approved Best Management Practices (BMPs) and discharged via private outfalls into the East River after being treated, unlike under existing conditions, where stormwater runoff from the Proposed Development Site is untreated.

The non-applicant-owned Projected Development Site would increase flows to the combined sewer system (stormwater + sanitary) by up to 0.01 mg compared to existing conditions.

Overall, the Proposed Actions would not result in significant adverse impacts on the City's wastewater treatment or stormwater conveyance infrastructure.

Water Quality Assessment

Under the With-Action condition, two private stormwater outfalls to the East River would be constructed in conjunction with the Proposed Development. All stormwater runoff from the Proposed Development Site would be captured, and would not drain into the DEP sewer system. Compared to the No-Action condition, the stormwater discharge in the With-Action condition would have a negative increment of 0.41 mgd, and the sanitary flow would result in an increment of 0.26 mgd. Therefore, the impacts to the DEP sewer system under the With-Action condition would have a net decrease of 0.15 mgd compared to the No-Action condition. In addition to a lower total volume of storm and sanitary flows to the DEP sewer system, the With-Action condition would eliminate the approximately 0.27 mgd of untreated stormwater that currently discharges into the East River from the Proposed Development Site, and instead would capture and treat the runoff per NYSDEC standards prior to discharge into the East River.

In addition, the Proposed Development would enhance and create habitat that would permanently improve the water quality of the East River. Although principles of island biogeography and landscape ecology indicate that larger, rounder habitat patches have greater ecological integrity, resilience, and robustness, these disciplines also provide that smaller patches placed closely together ameliorate the ecological constraints of fragmentation and spatial isolation. This is the paradigm changing assumption that is driving the ecological restoration movement – at least as far as habitat improvements are concerned. In many contexts where opportunities for large wetland restoration projects are limited it is endeavored to maximize restoration of the sites available, small as they may be, understanding that each increment will contribute to a cumulative improvement in habitat and ecological function. The intent of the proposed habitat and other functional improvements proposed as part of the Proposed Development reside in the cumulative added value relative to past and future East River improvements including Brooklyn Bridge Park, Bushwick Inlet, East River State Park, Randalls Island, Domino Park, Hunters Point Park, among others.

The Proposed Development would create new habitat areas including areas of salt marsh, tide pools, coastal scrub shrub, shoreline shallows, and new littoral zone.

The Proposed Development includes a robust program of habitat enhancements and restoration that will serve the community and the City as an ecological and experiential amenity that is integral to the overall design. All of the elements of the proposed habitat mosaic work in unison to transform and restore the shoreline of the Proposed Development Site. In an otherwise homogenous hard shoreline of linear reaches of rip rap, bulkhead, and sheet pile, hard bottom substrate, and unremitting current; it is expected

that more varied, involuted shoreline, a sand, gravel, and cobble bottom substrate, more complex hard vertical structure for epibenthic encrusting organisms and a quiescent water column would result in a much more varied and complex trophic structure ultimately benefitting fin fish possibly including sturgeon and likely striped bass.

The existing combined sewer outfall along Metropolitan Avenue would be relocated to North 3rd Street, outside of the protected cove, and would continue to discharge into the East River in a manner similar to existing conditions. Stormwater treated by hydrodynamic separators would be directed into the freshwater wetland, and eventually filtered into the East River.

Wetland restoration in New York City has been an ongoing activity for the past three decades and the chief proponents, including NYC DEP, NYC Parks, NYS DEC, US Army Corps of Engineers, NOAA, and the US National Parks Service have been explicit about the water quality benefits of existing and restored salt marshes. The proposed salt marsh within the inter-tidal zone would provide a habitat and food source for ribbed mussels within decomposed salt marsh codgrass. As filter feeders, ribbed mussels would improve both water quality and nutrient cycling in the local estuarine habitats. The improvements to water quality would improve biodiversity within the Proposed Development Site and support sub-tidal restoration efforts through the implementation of oyster cages. A pilot program would also be implemented for eel grass plantings within the protected cove. If eel grass is not sustainable at this location, the Proposed Development would still result in the net benefit provided by the new shoreline shallows habitat. The greater context for the restoration zone is the US Army Corps Comprehensive Restoration Program Target Ecosystem Characteristic (TEC) Shoreline Shallows.

The East River's water quality would be protected from construction activities by protection measures that follow an approved Stormwater Pollution Protection Plan (SWPPP).

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 Williamsburg neighborhood of Brooklyn Community District (CD) 1 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 Actions would result in an incremental water demand of approximately 213,155 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 to meet the incremental water demand resulting from the Proposed Actions 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 Brooklyn and the RWCDS associated with the Proposed Actions 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 both the Proposed and Projected Development Sites based on use generation rates set forth in Table 13-2 of the *CEQR Technical Manual*, as well as information provided by the Applicant for the Proposed Development. The New York City Department of Environmental Protection'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 on the Proposed and Projected Development Sites. The ability of the City's water and sewer infrastructure to handle the estimated demand/generation that is anticipated from the development resulting from the Proposed Actions 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.

Water Quality Assessment

As the existing combined sewer outfall along Metropolitan Avenue would be relocated to North 3rd Street in conjunction with the Proposed Development, a water quality assessment has been provided to evaluate potential effects on the East River. The assessment compares stormwater runoff from the Proposed Development Site under Existing, No-Action, and With-Action conditions to evaluate the Proposed Development's effects on the City's sewer infrastructure, and provides a qualitative discussion of water quality enhancements resulting from the Proposed Development.

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 Water Resource Recovery Facilities (WRRFs) 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) is conveyed through a network of combined sewers to the WRRF. 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 Newtown Creek WRRF, which is the largest wastewater treatment facility in the City, located approximately 1.4 miles to the northeast, at 320 Freeman Street in Greenpoint, Brooklyn.

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 WRRFs. These large interceptor sewers (often up to ten or twelve feet in diameter) bring the wastewater to the WRRFs for treatment. In the vicinity of the Project Area, there is a 12-inch combined sewer pipe that runs from North 1st Street between Kent Avenue and River Street, north along River Street, and connects to an 18-inch combined sewer pipe that goes to the existing regulator in Metropolitan Avenue. There is also a 60-inch combined sewer pipe in Metropolitan Avenue that carries flow from the east, which discharges to the regulator. A 24-inch branch interceptor sewer carries flow from the regulator back to Kent Avenue where it continues north to the Newtown Creek treatment plant.

At the Newtown Creek WRRF, wastewater is fully treated by physical and biological process before it is discharged into the 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 affects the level of treatment a plant can provide, the maximum permitted capacity for the Newtown Creek WRRF is 310 mgd. As presented in **Table 11-1**, below, the average daily flows to the Newtown Creek WRRF for the 12-month period ending in November 2020 was approximately 193 mgd, which is well below the maximum permitted capacity of 310 mgd.

TABLE 11-1
Existing Newtown Creek WRRF Average Daily Sewer Flows

Year	Month	Average Daily Flows (mgd)
2019	December	228
2020	January	190
	February	204
	March	191
	April	183
	May	164
	June	180
	July	194
	August	195
	September	193
	October	197
	November	191
12-Month Average		***193***

Source: DEP "Monthly Operating Efficiency" tables, December 2019 and November 2020.

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 interceptor sewers to the Newtown Creek WRRF. 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). Within the Project Area, there is one CSO outfall discharging into the East River. This CSO outfall is located at the western terminus of Metropolitan Avenue.

Sanitary Flows

As described in Chapter 1, "Project Description," both the Proposed and Projected Development Sites are currently vacant. As such, they do not generate any sanitary sewage under existing conditions.

Stormwater Flows

The Proposed Development Site has an existing total lot area of approximately 156,783 sf (upland lot area plus existing seaward structures), whereas the Projected Development Site has a lot area of approximately 5,862 sf. As noted above, the Proposed Development Site is currently vacant with the upland portion covered in compacted sand and gravel, and some waterfront structures extending seaward with open metal gratings at the surface. As such, the Proposed Development Site is currently comprised of pervious surfaces (vacant portions of upland lot) and surfaces classified as "other" (19,582 sf of waterfront structures as well as gravel-covered areas of upland lot), resulting in an existing runoff coefficient of 0.65 as presented in **Table 11-2**. The Projected Development Site, which is also vacant, in currently unpaved and appears to be undergoing excavation and environmental cleanup. As such, its surface is classified as pervious, resulting in an existing runoff coefficient of 0.20 as presented in **Table 11-2**.

TABLE 11-2
Existing Surface Types on Proposed and Projected Development Sites

	Surface Type	Roof[1]	Pavement and Walks	Other[2]	Grass and Softscape	Total
Proposed Development Site	**Area (%)**	0	0	69	31	100
	Surface Area (sf)	0 sf	0	108,180 sf	48,603 sf	156,783 sf
	Runoff Coefficient[3]	1.0	0.85	0.85	0.20	**0.65**
Projected Development Site	**Area (%)**	0	0	0	100	100
	Surface Area (sf)	0 sf	0	0	5,682	5,682 sf
	Runoff Coefficient[3]	1.0	0.85	0.85	0.20	**0.20**

Notes:
[1] Total roof area on site.
[2] This includes gravel areas of upland lot as well as open metal grating at the surface of waterfront structures on the Proposed Development Site.
[3] 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 for each site, with rainfall ranging from 0.00 inches to 2.50 inches over durations of 3.80 to 19.50 hours. **Table 11-3** shows the combined stormwater runoff and wastewater generation for the Proposed and Projected Development Sites under existing conditions. As indicated in the table, the Proposed Development Site currently generates between 0.00 and 0.16 mg of stormwater runoff for the different rainfall intensities, which are assumed to flow untreated directly to the East River. As also indicated in **Table 11-3**, the Projected Development Site, based on its lot area and standard DEP runoff coefficients, currently does not generate measurable stormwater runoff for any of the rainfall intensities.

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

As described in Chapter 1, "Project Description," in the future without the Proposed Actions, it is anticipated that the Applicant's Proposed Development Site would be developed on an as-of-right basis pursuant to the existing M3-1 zoning district. On an as-of-right basis, the Applicant would construct two buildings, with a total floor area of approximately 621,500 gsf, including approximately 54,500 gsf of office uses, 83,100 gsf of retail uses (60,100 gsf of destination retail and 23,000 gsf of local retail), approximately

68,000 gsf of light manufacturing maker space, an approximately 102,100 gsf last-mile distribution facility (Use Group (UG) 16D), and 94,750 gsf of warehouse uses, as well as 579 accessory parking spaces (202,550 gsf) and 16,500 sf of mechanical space.

TABLE 11-3
Existing Combined Stormwater Runoff and Wastewater Generation

	Rainfall (inches)	Duration (Hours)	Total Area (Acres)	Runoff Coefficient[1]	Stormwater Runoff - Direct Drainage (MG)[2]	Stormwater Runoff to CSS (MG)	Sanitary to CSS (MG)[3]	Total Volume to CSS (MG)
Proposed Development Site	0.00	3.80	3.60	0.65	0.00		0.00	0.00
	0.40	3.80			0.03		0.00	0.01
	1.20	11.30			0.08		0.00	0.03
	2.50	19.50			0.16		0.00	0.07
Projected Development Site	0.00	3.80	0.13	0.20		0.00	0.00	0.00
	0.40	3.80				0.00	0.00	0.00
	1.20	11.30				0.00	0.00	0.00
	2.50	19.50				0.00	0.00	0.00

Notes:
[1] Refer to Table 11-2.
[2] Assumes that all stormwater runoff from the Applicant's Proposed Development Site currently sheet flows directly to the East River, untreated.
MG = million gallons

In addition, as described in Chapter 1, "Project Description," the non-Applicant-owned Projected Development Site is assumed to be redeveloped on an as-of-right basis in the No-Action condition, with a two-story building containing a total of approximately 13,482 gsf, with approximately 6,741 gsf of local retail and 6,741 gsf of warehouse space, as well as 20 accessory parking spaces.

Sanitary Flows

In the future without the Proposed Actions, sanitary discharges resulting from the No-Action uses on the Proposed and Projected Development Sites would be directed to the Newtown Creek WRRF. As indicated in **Table 11-4**, the No-Action uses are expected to generate approximately 54,171 gpd of daily sanitary sewage, with a total water demand of approximately 124,879 gpd. As there is available capacity at the Newtown Creek WRRF for the incremental wastewater flows from the Proposed and Projected Development Sites, the facility would continue to operate within its current design capacities in the 2027 No-Action condition.

Stormwater Flows

In the future without the Proposed Actions, stormwater runoff from the Applicant's Proposed Development Site would be collected and directed through the combined sewer system and then conveyed to the Newtown Creek WRRF for treatment. As noted above, it is assumed that two new buildings on the Applicant's Proposed Development Site would be constructed in the No-Action condition. The new development anticipated on the Proposed Development Site under the No-Action condition would result in an increase of the roof area and pavement walks on the Proposed Development Site, with a corresponding decrease in the area comprised of pervious surfaces. As a result, the amount of stormwater runoff generated on the Proposed Development Site would increase, as compared to existing conditions.

TABLE 11-4
No-Action Water Consumption and Wastewater Generation on Proposed and Projected Development Sites

Land Use	Rate[1]	GSF		Domestic Water/ Wastewater Generation (gpd)		A/C (gpd)	
		Proposed Dev't	Projected Dev't	Proposed Dev't	Projected Dev't	Proposed Dev't	Projected Dev't
Commercial Retail	Domestic: 0.24 gpd/sf; A/C: 0.17 gpd/sf	83,100	6,741	19,944	1,618	14,127	1,146
Commercial Office	Domestic: 0.10 gpd/sf; A/C: 0.17 gpd/sf	54,500	-	5,450	-	9,265	-
Light Industrial	Domestic: 0.10 gpd/sf; A/C: 0.17 gpd/sf	264,850	6,741	26,485	674	45,024	1,146
Total Water Consumption (Domestic Water + A/C)				***124,879 gpd***			
Total Wastewater Generation				***54,171 gpd***			

Notes:
[1] Based on *CEQR Technical Manual* water demand rates from **Table 13-2**. Assume office rate for light industrial use.

Similarly, stormwater runoff from the Projected Development Site would be collected and directed through the combined sewer system and then conveyed to the Newtown Creek WRRF for treatment. As noted above, it is assumed that a new building would be constructed on the Projected Development Site in the No-Action condition, which would result in an increase of the roof area on the Projected Development Site, with a corresponding decrease in the area comprised of pervious surfaces. As a result, the amount of stormwater runoff generated on the Projected Development Site would increase, as compared to existing conditions.

Table 11-5 shows the combined stormwater runoff and wastewater generation for the Proposed and Projected Development Sites under No-Action conditions. As indicated in the table, the Proposed Development Site would generate between 0.00 and 0.33 mg of stormwater runoff for the different rainfall intensities, which would be collected and directed through the combined sewer system and then conveyed to the Newtown Creek WRRF for treatment. As also indicated in **Table 11-5**, the Projected Development Site, based on its lot area and standard DEP runoff coefficients, would generate minimal stormwater runoff in the No-Action condition.

TABLE 11-5
No-Action Combined Stormwater Runoff and Wastewater Generation

	Rainfall (inches)	Duration (Hours)	Total Area (Acres)	Runoff Coefficient[1]	Stormwater Runoff to CSS (MG)	Sanitary to CSS (MG)	Total Volume to CSS (MG)
Proposed Development Site	0.00	3.80	3.60	0.99	0.00	0.01	0.01
	0.40	3.80			0.05	0.01	0.05
	1.20	11.30			0.14	0.02	0.16
	2.50	19.50			0.29	0.04	0.33
Projected Development Site	0.00	3.80	0.13	1.00	0.00	0.00	0.00
	0.40	3.80			0.00	0.00	0.00
	1.20	11.30			0.00	0.00	0.01
	2.50	19.50			0.01	0.00	0.01

Notes:
[1] Assumes 90% roof coverage and 10% pavement and walks for Proposed Development Site, and 100% roof coverage for Projected Development Site.
MG = million gallons

It should be noted that DEP has proposed a Unified Stormwater Rule (USWR) that increases the amount of stormwater to be managed on-site as part of new development, and further restricts the release rate for sites that require a connection to a city combined sewer. The proposed DEP USWR would decrease the maximum allowable stormwater release rate from the site to the DEP combined sewer system to 0.1 cfs per acre or 0.046 cfs, whichever is greater, and would also require addressing water quality by managing the water quality volume on-site with DEP-approved BMPs for the retention or detention of at least 1.5 inches. These new rules are expected to be implemented prior to the analysis year of 2027. As a result of these requirements, it is expected that there would be a reduction in stormwater runoff on the Proposed and Projected Development Sites under No-Action conditions. The runoff calculations presented in **Table 11-5** do not reflect the expected reduction in stormwater from new development due to these new on-site stormwater management requirements. However, per the proposed USWR, and using the runoff coefficients shown in **Table 11-5** (which are based on the DEP Flow Volume Calculation Matrix provided in the *CEQR Technical Manual*), it is estimated that the water quality volume to be retained or detained would be approximately 19,110 cubic feet (0.14 mgd) under No-Action conditions for both the Proposed and Projected Development Sites combined (18,442 cubic feet for the Proposed Development Site and 668 for the Projected Development Site).

DEP's USWR will be implemented in 2022 and will be in effect during the analysis year of 2027. The calculations required under the USWR are:

1. Water quality treatment (retention) volume requirement
2. Peak stormwater discharge limit (peak instantaneous rate of discharge to City Sewer)

These calculations are shown in **Tables 11-6** and **11-7** below for both the No-Action and With-Action conditions.

Table 11-6 below summarizes the retention/detention volume requirement under the USWR, and **Table 11-7** shows the peak allowable stormwater discharge.

TABLE 11-6
Water Quality Treatment Volume

WQV = water quality volume requirement (cubic feet)			
A = contributing area (square feet)			
I = impervious coverage percentage			
RV: runoff coefficient			
RV = 0.05 + 0.009 x I			
WQV = 1.5/12 x A x RV			
	No-Action	With-Action	
Area (acres)	3.73	0.13	
Area (sf)	162,465	5,682	
I	99	100	
RV	0.94	0.95	
WQV (cf)	19,110	675	

TABLE 11-7
Peak Allowable Stormwater Discharge

Q = peak allowable flow (cubic feet per second)			
A = contributory site area (acres)			
Q = 0.1 cfs x A			
	No-Action	With-Action	
Area (acres)	3.73	0.13	
Q (cfs)	0.37	0.01	

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

In the 2027 With-Action condition, the Proposed Development Site would be redeveloped with two buildings totaling 1.336 million gsf. The Proposed Development would include 1,250 residential DUs (approximately 1,120,000 gsf), 23,000 gsf of local retail space, 60,000 gsf of commercial office space, and 50,000 gsf of community facility space. The two buildings comprising the Proposed Development would occupy a portion of the Development Site. As described in Chapter 1, the Proposed Development is anticipated to include approximately 126,308 sf (2.9 acres) of new public open space, approximately 37,370 sf (0.86 acres) of intertidal area, and 101,099 sf (2.32 acres) of secondary contact accessible in-river space, for a total of 264,777 sf (6.08 acres) of new waterfront park. The Proposed Development Site's lot area under With-Action conditions would be 185,899 sf (existing lot area plus portions of Metropolitan Avenue and North 1st Street proposed to be demapped as part of the Proposed Actions).[1]

In the future with the Proposed Actions, it is assumed that stormwater runoff from the Applicant's Proposed Development Site would be treated on-site and discharged directly via private outfalls to the East River after being treated. It should be noted that the Proposed Actions include demapping Metropolitan Avenue and a portion of North 1st Street between River Street and the East River pierhead line, in order to maximize the area of public open space that would be created along the East River as part of the Proposed Development. In conjunction with the proposed demapping, the Applicant proposes to relocate the existing sewer infrastructure which is presently located within this section of Metropolitan Avenue. The Applicant will be coordinating the proposed relocation with DEP. In addition, as described in Chapter 1, "Project Description," the non-Applicant-owned Projected Development Site is assumed to be expanded by one floor of community facility space in the With-Action condition, resulting in a 3-story mixed-use building with approximately 20,223 gsf, comprised of approximately 6,741 gsf of local retail, 6,741 gsf of warehouse space, and approximately 6,741 gsf of community facility space. Combined flow (stormwater runoff and sanitary flows) from the Projected Development Site are assumed to flow to the combined sewer system.

[1] As noted in Chapter 1, "Project Description," the With-Action lot area would be limited to a maximum of 156,783 sf for zoning calculation purposes.

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 Applicant's Proposed Development Site as well as the Projected Development Site would continue to be treated by the Newtown Creek WRRF, which has a SPDES-permitted dry weather flow capacity of 310 mgd. As shown in **Table 11-8**, the RWCDS associated with the Proposed Actions would generate approximately 311,986 gpd of sanitary sewage, with a total water demand of approximately 338,034 gpd. This sanitary sewage generation represents a net increase of approximately 257,815 gpd (0.26 mgd) over the No-Action condition.

It should be noted that it is the Applicant's intent to provide a non-potable water reuse plant on the Proposed Development Site in the future that would allow for on-site treatment of sanitary flows. Under such a scenario, sanitary flows would only discharge into the City CSO system in emergency situations. However, as the design details for this future facility have not been finalized, the analysis in this chapter assumes a city sanitary connection for the purposes of providing a conservative analysis.

TABLE 11-8
With-Action Water Consumption and Wastewater Generation on the Proposed and Projected Development Sites

Land Use	Rate[1]	Area (gsf)		Domestic Water/ Wastewater Generation (gpd)		A/C (gpd)	
		Proposed Dev't	Projected Dev't	Proposed Dev't	Projected Dev't	Proposed Dev't	Projected Dev't
Residential	100 gpd per resident	1,200,000 (2,925 residents)	-	292,500	-	-	-
Commercial Retail	Domestic: 0.24 gpd/sf; A/C: 0.17 gpd/sf	23,000	6,741	5,520	1,618	3,910	1,146
Commercial Office	Domestic: 0.10 gpd/sf; A/C: 0.17 gpd/sf	60,000	-	6,000	-	10,200	-
Community Facility	Domestic: 0.10 gpd/sf; A/C: 0.17 gpd/sf	50,000	6,741	5,000	674	8,500	1,146
Light Industrial	Domestic: 0.10 gpd/sf; A/C: 0.17 gpd/sf	-	6,741	-	674	-	1,146
Water Consumption							
Total Water Consumption				***338,034***			
Incremental Water Consumption (Compared to No-Action)				***+213,155***			
Wastewater Generation							
Total Wastewater Generation				***311,986***			
Incremental Wastewater Generation (Compared to No-Action)				***257,815***			

Notes:
[1] Based on *CEQR Technical Manual* water demand rates from **Table 13-2** unless otherwise noted. Assume office rate for light industrial and community facility uses.

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 applicants for the Proposed Development and Projected Development 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 for the Proposed Development would be required to demonstrate that the existing system could handle the increased flows due to the Proposed Development. As part of the site connection approval process, a hydraulic analysis of the existing sewer system may 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 will likely be a

need to prepare a drainage plan based on the demapping of Metropolitan Avenue west of River Street as part of the Proposed Actions. These efforts would be undertaken prior to construction of the Applicant's Proposed Development 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, both the Proposed Development and the Projected Development would be required to utilize low-flow plumbing fixtures, which would reduce sanitary flows to the plant. Therefore, the Proposed Actions 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 existing vacant Proposed Development Site would be improved by the two buildings comprising the Proposed Development, and would have a lot area of 185,899 sf under With-Action conditions. As discussed above, the Proposed Development is anticipated to include approximately 2.9 acres of new waterfront public open space, 2.32 acres of secondary contact accessible in-river space, and 0.86 acres of intertidal area, which would include paved walkways, intertidal areas, and other softscape surfaces. In the future with the Proposed Actions, it is assumed that stormwater runoff from the Applicant's Proposed Development Site would be treated on-site and discharged directly via private outfalls to the East River after being treated. **Table 11-9** shows the surface types that are expected on the Proposed Development Site under 2027 With-Action conditions. As presented in **Table 11-9**, the runoff coefficient for the Proposed Development Site would be 0.58 in the future with the Proposed Actions, as compared to 0.65 under existing conditions.

For the non-Applicant-owned Projected Development Site, stormwater runoff is assumed to continue to flow to the City's combined sewer system. **Table 11-9** also shows the surface type and runoff coefficient for the Projected Development Site under 2027 With-Action conditions. As presented in **Table 11-9**, the runoff coefficient for the Projected Development Site would be 1.0 in the future with the Proposed Actions, as compared to 0.20 under existing conditions.

TABLE 11-9
With-Action Surface Types on the Development Site

	Surface Type	Roof[1]	Pavement and Walks	Other	Grass and Softscape	Total
Proposed Development Site	**Area (%)**	22	31	0	47	100
	Surface Area (sf)	41,582	56,920	0	87,396	185,899
	Runoff Coefficient[2]	1.0	0.85	0.85	0.20	**0.58**
Projected Development Site	**Area (%)**	100	0	0	0	100
	Surface Area (sf)	5,862	0	0	0	5,862
	Runoff Coefficient[2]	1.0	0.85	0.85	0.20	**1.0**

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

Table 11-10 compares the estimated combined flows (stormwater runoff and sanitary flows) to the combined sewer system under No-Action conditions for both the Proposed and Projected Development Sites, as well as the estimated combined and direct discharge flows for both sites under With-Action conditions, using the DEP Flow Volume Calculation Matrix. As shown in the table, the total With-Action volume to the combined sewer system (only sanitary) from the Proposed Development could be between

0.05 and 0.25 mg. Compared to No-Action conditions, this would represent a maximum increase in combined sewer flows of up to 0.04 mg from the Applicant's Proposed Development, while stormwater runoff would decrease compared to No-Action conditions. As shown in **Table 11-10**, stormwater runoff from the Proposed Development Site would be discharged via private outfalls and would not increase CSOs. In the future with the Proposed Actions, stormwater runoff from the Proposed Development Site would be treated on-site and discharged into the East River after being treated, unlike under existing conditions, where stormwater runoff from the Proposed Development Site is untreated.

TABLE 11-10
Existing and With-Action Combined Stormwater Runoff and Wastewater Generation[1]

			No-Action Conditions				With-Action Condition				Increased
	Rainfall (inches)	Duration (Hours)	Stormwater Runoff - Direct Drainage (MG)	Stormwater Runoff to CSS (MG)	Sanitary to CSS (MG)	Total to CSS (MG)	Stormwater Runoff - Direct Drainage (MG)	Stormwater Runoff to CSS (MG)	Sanitary to CSS (MG)	Total to CSS (MG)	Total Volume to CSS (MG)
Proposed Development Site	0.00	3.80		0.00	0.01	0.01	0.00		0.049	0.05	0.04
	0.40	3.80		0.05	0.01	0.05	0.03		0.049	0.05	0.00
	1.20	11.30		0.14	0.02	0.16	0.08		0.145	0.15	- 0.01
	2.50	19.50		0.29	0.04	0.33	0.17		0.251	0.25	- 0.08
Projected Development Site	0.00	3.80		0.00	0.00	0.00		0.00	0.000	0.00	0.00
	0.40	3.80		0.00	0.00	0.00		0.00	0.000	0.00	0.00
	1.20	11.30		0.00	0.00	0.01		0.00	0.001	0.01	0.01
	2.50	19.50		0.01	0.00	0.01		0.01	0.002	0.01	0.01

Notes:
MG = million gallons
[1] Under With-Action conditions, it is assumed that stormwater runoff from the Applicant's Proposed Development Site would be treated on-site and discharged directly to the East River after being treated

Sewer Infrastructure

In conjunction with the Applicant's Proposed Development, the existing sewer infrastructure (combined sewers, intercepting sewer, regulator, and combined sewer overflow outfall) located between the East River and River Street in Metropolitan Avenue would be removed. A new sewer chamber would be built in the intersection of River Street and Metropolitan Avenue which would collect the flows from the existing 60-inch, 18-inch, and 12-inch combined sewers into a new 66-inch combined sewer that would run north in River Street and turn west on North 3rd Street towards the East River. A new CSO regulator and CSO outfall would be located at the end of North 3rd Street. A new 24-inch branch intercepting sewer would run adjacent to the new 66-inch combined sewer and tie into the existing interceptor in the intersection of North 3rd Street and Kent Avenue.

The new combined sewer facilities in the vicinity of the Proposed Development Site will be designed to accommodate the sanitary flows generated by the Proposed Development. The stormwater flows from the Proposed Development Site will be treated on-site using DEP-approved treatment methods and discharged via private outfalls to the East River, subject to review and approval by NYSDEC, the United States Army Corps of Engineers (USACE) and DEP, as applicable. 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.

Stormwater Best Management Practices

The Flow Volume Matrix calculations do not reflect the use of any source control BMPs to reduce sanitary flow to the combined sewer system. Specific BMP methods will be determined with further refinement of the building design and in consultation with DEP. In addition, as noted above, stormwater runoff from the Proposed Development Site would be treated on-site and discharged via private outfalls into the East River.

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 from the Proposed Development. In addition, the following typical BMP measures could be used to help manage stormwater flows from the Proposed Development Site: the implementation of BMPs described in the New York City Green Infrastructure Plan and/or green technologies, such as blue and green roofs, infiltration, porous pavement, enhanced tree pits, and rain cisterns, depending on site conditions.

Sewer conveyance near the Project Area and the treatment capacity at the Newtown Creek WRRF is sufficient to handle wastewater flow resulting from the Proposed Actions. In addition, as noted above, stormwater flows from the development resulting from the Proposed Development Site will be treated on-site using DEP-approved treatment methods before being discharged via private outfalls to the East River, and would therefore not increase the combined sewer flows. Therefore, there would be no significant adverse impacts on wastewater treatment or stormwater conveyance infrastructure as a result of the Proposed Actions.

Water Quality Assessment for Proposed Development Site

The Proposed Development Site area is 156,783 sf, or 3.60 acres. Per the U.S. Department of Agriculture's TR-55 for *Urban Hydrology for Small Watersheds*, the 5-year 24-hour rainfall total is 4.25 inches. Under existing conditions, given the predominantly gravel surface and resulting runoff coefficient of 0.65, the stormwater runoff volume from the Proposed Development Site is 0.27 mgd. As noted in Section D above, this runoff currently sheet flows directly into the East River, untreated.

Under the No-Action condition, the Proposed Development Site would be redeveloped pursuant to existing zoning, and stormwater from the developed site would drain to the DEP combined sewer system with a runoff coefficient of 0.99, as shown in **Table 11-5**, resulting in a total stormwater runoff volume of 0.41 mgd. As shown in Table 11-4 above, sanitary flow from the Proposed Development would be approximately 0.05 mgd. As such, the total impacts to the DEP sewer system would result in a net increase of 0.46 mgd under No-Action conditions. The proposed DEP Unified Stormwater Rule (USWR) noted above would decrease the maximum allowable stormwater release rate from the site to the DEP combined sewer system to 0.1 cfs per acre or 0.046 cfs, whichever is greater and would also require the retention or detention of at least 1.5 inches via DEP-approved BMPs. The USWR would only reduce the total 0.41 mgd volume of stormwater discharge to the DEP sewer system with implementation of a retention system, because with a detention system the total volume of discharge is not restricted by the USWR.

Under the With-Action condition, two private stormwater outfalls to the East River would be constructed in conjunction with the Proposed Development. All stormwater runoff from the Proposed Development Site would be captured, and would not drain into the DEP combined sewer system. As shown in **Table 11-11**, compared to the No-Action condition, the stormwater discharge in the With-Action condition would have a negative increment of 0.41 mgd, and the sanitary flow would result in a positive increment of 0.26 mgd. Therefore, the impacts to the DEP sewer system under the With-Action condition would have a net decrease of 0.15 mgd compared to the No-Action. In addition to a lower total volume of flows to the DEP combined sewer system, the With-Action condition would eliminate the approximately 0.27 mgd of untreated stormwater that currently discharges into the East River, and instead would capture and treat the runoff per NYSDEC standards prior to discharge into the East River.

TABLE 11-11
Water Quality Assessment

		NO-ACTION		WITH-ACTION INCREMENT COMPARED TO NO-ACTION	
	EXISTING	**With Detention**	**With Retention**	**With No-Action Detention[1]**	**With No-Action Retention[1]**
Stormwater runoff vol	0.27 mgd	+ 0.41	+ 0.27	- 0.41	- 0.27
Sanitary Flow	0 mgd	+ 0.05	+ 0.05	+ 0.26	+ 0.26
DEP Sewer Impacts	-	+ 0.46	+ 0.32	- 0.15	- 0.01
		Net Increase	**Net Increase**	**Net Decrease**	**Net Decrease**

[1] the values shown represent the net change between the With-Action and No-Action conditions, and are not intended to represent the values for the Proposed Development.

It should be noted that the USWR requirement for the treatment of water quality volume can be achieved through retention or detention, depending on site conditions. As the design for the No-Action condition is not known, both retention and detention assumptions are shown in **Table 11-11**. For the With-Action condition, where all stormwater runoff from the applicant's Proposed Development Site would be directly discharged to the East River, the State SPDES permit program contains multiple options for treating the required water quality volume: retention (cisterns, tree pit/planting, drywells, etc.); detention (basins, vegetated swales, etc.); and flow-based treatment practices (hydrodynamic separators, etc.). If it is determined that the Proposed Development is subject to oversight of the City MS4 program, the retention options will be evaluated in accordance with the hierarchy and protocol of the MS4 program.

Table 11-11 shows that water quality conditions would improve under With-Action conditions irrespective of whether retention or detention is used in the No-Action. The benefit of the USWR is that it reduces the discharge from sites to the combined sewer system. However there is still discharge to the sewer during rainfall events beyond the design storm requirements in the USWR. The Proposed Development would eliminate the contributory storm drainage area to the combined sewer system. Reducing the volume to combined sewers has many environmental benefits stated elsewhere in this chapter, including less burden on the infrastructure, less contribution to CSO events, and better water quality.

The Proposed Development Site has been participating in the Citizen's Water Quality Testing Program to understand existing conditions at the proposed public shoreline and beach area.[2] As discussed in Chapter 9, "Natural Resources," the results of the Citizen's Water Quality Testing Program demonstrate that the percentage of testing days resulting in water that is "unacceptable" for swimming per DOH standards was lower than other East River beaches to the north and south of the Proposed Development Site, including the Hunter's Point 2nd Street kayak launch and the Dumbo Cover Beach. It should be noted that, per DOH regulations, bathing is prohibited within 750 feet of a CSO outfall, and therefore signage would be provided throughout the proposed waterfront open space indicating that swimming is prohibited. The Applicant will continue to conduct water quality testing on site and work on establishing a notification system in the future for park users to be aware of CSO overflow events.

The Proposed Development would enhance and create habitat that would permanently improve the water quality of the East River. The Proposed Development would create new habitat areas including

[2] The beach is designed to provide secondary contact recreation access, and per NYS Department of Health regulations, swimming will be prohibited. Signage will be provided on-site to indicate that swimming is prohibited.

6,049 sf of freshwater wetlands that would include native species on the upland portion of the open space as well as areas of salt marsh, tide pools, coastal scrub shrub, shoreline shallows, and new littoral zone, all improvements that would ameliorate the water quality adjacent to the Proposed Development Site. In addition, a pilot program would also be implemented for eel grass plantings within the protected cove. More details regarding the benefits of the new habitat creation within the inter-tidal zones are provided in Chapter 9, "Natural Resources."

As discussed above, the existing combined sewer outfall along Metropolitan Avenue would be relocated to North 3rd Street, outside of the protected cove, and would continue to discharge into the East River in a manner similar to existing conditions. Stormwater treated by DEP-approved treatment methods would be directed into the freshwater wetland, and eventually filtered into the East River. The East River's water quality would be protected from construction activities by protection measures that follow an approved Stormwater Pollution Protection Plan (SWPPP). The SWPPP would address erosion control measures during construction, as well as post-development water quality treatment in accordance with DEP and NYSDEC regulations. Because construction activities would be subject to an approved SWPPP and the Proposed Development would significantly improve the water quality of the East River in the Proposed Development Site, the Proposed Development would not result in significant adverse water quality impacts.