Chapter 11: Water and Sewer Infrastructure

A. INTRODUCTION

New York City's water and sewer infrastructure is fundamental to the operation, health, safety, and quality of life of the City and its environment. Ensuring these systems have adequate capacity to accommodate land use or density changes and new development is critical to avoiding environmental and potential public health issues that may arise from water pressure reductions, sewer back-ups, or street flooding.

This chapter therefore 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*.

PRINCIPAL CONCLUSIONS

As summarized below, the Proposed Actions would not result in any significant adverse impacts on the City's water supply, wastewater treatment, or stormwater management infrastructure.

WATER SUPPLY

The Proposed Actions would not result in any significant adverse impacts on the City's water supply system. Projected development under the Proposed Actions is expected to generate an incremental water demand of less than 1 million gallons per day (mgd), which is below the level of significance per *CEQR Technical Manual* guidelines. Existing water mains in the Project Area expected to have sufficient capacity to handle the estimated increase in water demand.

WASTEWATER TREATMENT

The Project Area is served by the Newtown Creek Wastewater Resource Recovery Facility WRRF) and within the Project Area there are five subcatchment drainage areas. Development under the With Action condition is expected to generate a total of approximately 412,326 gallons per day (gpd) of sanitary sewage, which represents an increase of approximately 0.35 mgd over the No Action condition. With an existing flow of 212 mgd (below the maximum dry weather flow permitted capacity of 310 mgd) and the addition of approximately 0.35 mgd on the projected development sites, which represents 0.17 percent of the permitted capacity, the Newtown Creek WRRF would continue to have reserve capacity. Therefore, it is concluded that there would be no significant adverse impacts to the City's wastewater treatment services as a result of the Proposed Actions.

STORMWATER AND DRAINAGE MANAGEMENT

All the projected development sites identified under the Reasonable Worst-Case Development Scenario (RWCDS) are located within five subcatchment areas of the Newtown Creek WRRF. This is a combined sewer service area, and with the proposed project there would be an increase

in sanitary flow from the increased residential, commercial, and community facility populations, as well as an increase in fully impervious rooftop area. These additional flow volumes would be conveyed to the Newtown Creek WRRF, or discharged directly to the Hudson and East Rivers as combined sewer overflow (CSO), depending on rainfall volume and duration. However, with the new development under the Proposed Actions, CSO volumes are expected to decrease as compared with the No Action condition, despite the increase to sanitary flows from new development. This reduction in CSO volumes is attributable to on-site stormwater management volume requirements under the City's pending Unified Stormwater Rule, which increases the total volume of stormwater that must be managed on site with new and redeveloped properties in CSO drainage areas, as well as improvements in the design requirements and performance standards for on-site stormwater management practices that must be implemented in accordance with City regulations, such as the Unified Stormwater Rule, which ensures that redeveloped properties manage stormwater. Finally, because of the available capacity of the Newtown Creek WRRF, the projected increase in sanitary flows would not result in any significant adverse impacts on the WRRF infrastructure. Therefore, it is concluded that the Proposed Actions would not result in any significant adverse impacts related to the City's wastewater conveyance and treatment systems.

B. METHODOLOGY

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 in an area that experiences low water pressure (e.g., areas at the end of the water supply distribution system). The Proposed Actions would result in net water demand of approximately 0.78 mgd (compared with the No Action condition; see **Table 11-4**) and the Project Area is not in an area that experiences low water pressure. Therefore, an assessment of water supply is not warranted.

The *CEQR Technical Manual* states that for wastewater and stormwater conveyance and treatment analyses, a preliminary assessment is needed if a project is in a combined sewer area and would exceed the following incremental development of residential units or commercial space above the No Action condition: (a) 1,000 residential units or 250,000 square feet (sf) of commercial and/or community facility space in Manhattan; or (b) 400 residential units or 150,000 sf of commercial space in the Bronx, Brooklyn, Staten Island, or Queens. Since the Proposed Actions would result in a net increase of more than 1,000 residential units in a section of Manhattan, an assessment of wastewater and stormwater infrastructure was prepared.

To assess the potential impacts of the Proposed Actions on water and sewer infrastructure, this chapter:

- Describes the existing water and sewer infrastructure serving the Project Area;
- Describes planned No Action infrastructure improvements in the Project Area, project components, and current schedules;
- Provides a preliminary analysis which estimates sewage generation on the projected development sites under Existing and No Action conditions based on use generation rates provided in the *CEQR Technical Manual* and the 2016 *East New York Rezoning Proposal Final Environmental Impact Statement (FEIS)*. The preliminary analysis also calculates stormwater runoff and sanitary flows using the DEP Volume Calculation Matrix. The preliminary analysis then forecasts water demand and sewage and stormwater generation by the

projected developments induced by the Proposed Actions under the RWCDS based on *CEQR Technical Manual* guidelines;

- Assesses the effects of the With Action water demand and sewage and stormwater generation on the City's water and sewer infrastructure, and determines if there will be any impact on the sewage conveyance system and/or the operations of the Newtown Creek WRRF serving the Project Area, pursuant to *CEQR Technical Manual* guidelines.

C. PRELIMINARY ANALYSIS

EXISTING CONDITIONS

WASTEWATER TREATMENT

According to the *CEQR Technical Manual*, wastewater is considered to include sanitary sewage, wastewater generated by industries, and stormwater. Water used for air conditioning generates a negligible amount of wastewater as it recirculates or evaporates in the cooling and heating process. As discussed in Chapter 1, "Project Description," a RWCDS has been developed in conjunction with the Proposed Actions. **Table 11-1** shows the existing uses on the 26 projected development sites and their associated water consumption and wastewater generation rates. Based on the presented water consumption rates, it is estimated that the existing uses on the Projected Development Sites currently consume approximately 120,946 gpd, including approximately 58,577 gpd for domestic uses.

Table 11-1
Existing Water Consumption

Land Use[1]	Water Consumption and Wastewater Generation Rates[2]	Area/Units	Domestic Water/Wastewater Generation (gpd)	Air Conditioning (gpd)
Residential	Domestic: 100 gpd/person[3] A/C: 0.17 gpd/sf	26,163 sf (32 DU)	6,048	4,448
Commercial/Office	Domestic: 0.10 gpd/sf A/C: 0.17 gpd/sf	207,576 sf	20,758	35,288
Retail	Domestic: 0.24 gpd/sf A/C: 0.17 gpd/sf	115,052 sf	27,612	19,559
Community Facility	Domestic: 0.10 gpd/sf A/C: 0.17 gpd/sf	-	-	-
Manufacturing	Domestic: 0.23 gpd/sf[4] A/C: 0.17 gpd/sf	18,084 sf	4,159	3,074
			Project Area—Total Water Demand	**120,946**
			Project Area—Total Wastewater Generation	**58,577**

Notes:
Totals may not sum due to rounding.
gpd = gallons per day; WRRF = Wastewater Resource Recovery Facility; DU = dwelling unit;
1. Projected development sites currently contain approximately 5,000 sf of warehouse uses and approximately 39,000 sf of parking uses in the Existing condition, which are assumed to not consume water or generate wastewater for purposes of analysis. Estimates also do not include vacant properties.
2. Consumption rates from *CEQR Technical Manual* Table 13-2, "Water Usage and Sewage Generation Rates for Use in Impact Assessment," unless otherwise noted.
3. Assumes 1.89 residents per DU (average household size for Manhattan Community District [CD] 2).
4. Based on *East New York Rezoning Proposal FEIS* (equal to 10,000 gpd/acre); calculated based on total building floor area.

Much of New York City's wastewater treatment system comprises the sewer network underneath the streets and the 14 WRRFs throughout the City. Most of the City's sewers are combined sewers that collect both sanitary sewage and stormwater. In periods of dry weather, the combined sewers (sized to convey an amount of sanitary sewage that is based on density levels according to zoning

regulations) convey only sanitary sewage. During and immediately after wet weather, combined sewers can experience a much larger flow due to stormwater runoff collection. To control flooding at the WRRFs, regulators built into the system serve as relief valves, allowing only approximately two times the amount of design dry weather flow into the interceptors (larger sewers that convey wastewater to the WRRFs). The interceptors then take the allowable flow to the WRRFs, while the excess flow is discharged untreated to the nearest waterbody as CSO.

During the 1990s, the City instituted a range of water conservation measures in response to excess flows to the City's WRRFs that exceeded the dry weather flow allowed in accordance with their respective State Pollutant Discharge Elimination System (SPDES) permits. Measures included equipping fire hydrants with locks to prevent illegal uses and requiring that all new plumbing fixtures in the City (including replacements in existing structures and new fixtures in new structures) be of a low-flow design (Local Law No. 29, 1989). The City also implemented a meter program, installing water meters at thousands of properties where water fees had previously been based on property frontage rather than usage. This metering provided a new financial incentive to identify and repair leaks in the water distribution system. These programs have reduced water demand and load at the City's WRRFs. At many WRRFs, this reduction has been in the order of magnitude of several million gpd. Overall, actual water demand is down more than 30 percent since the 1990s, despite population growth. DEP projects that savings from the continued implementation of these and other conservation measures will exceed any increases in water demand from consumers.

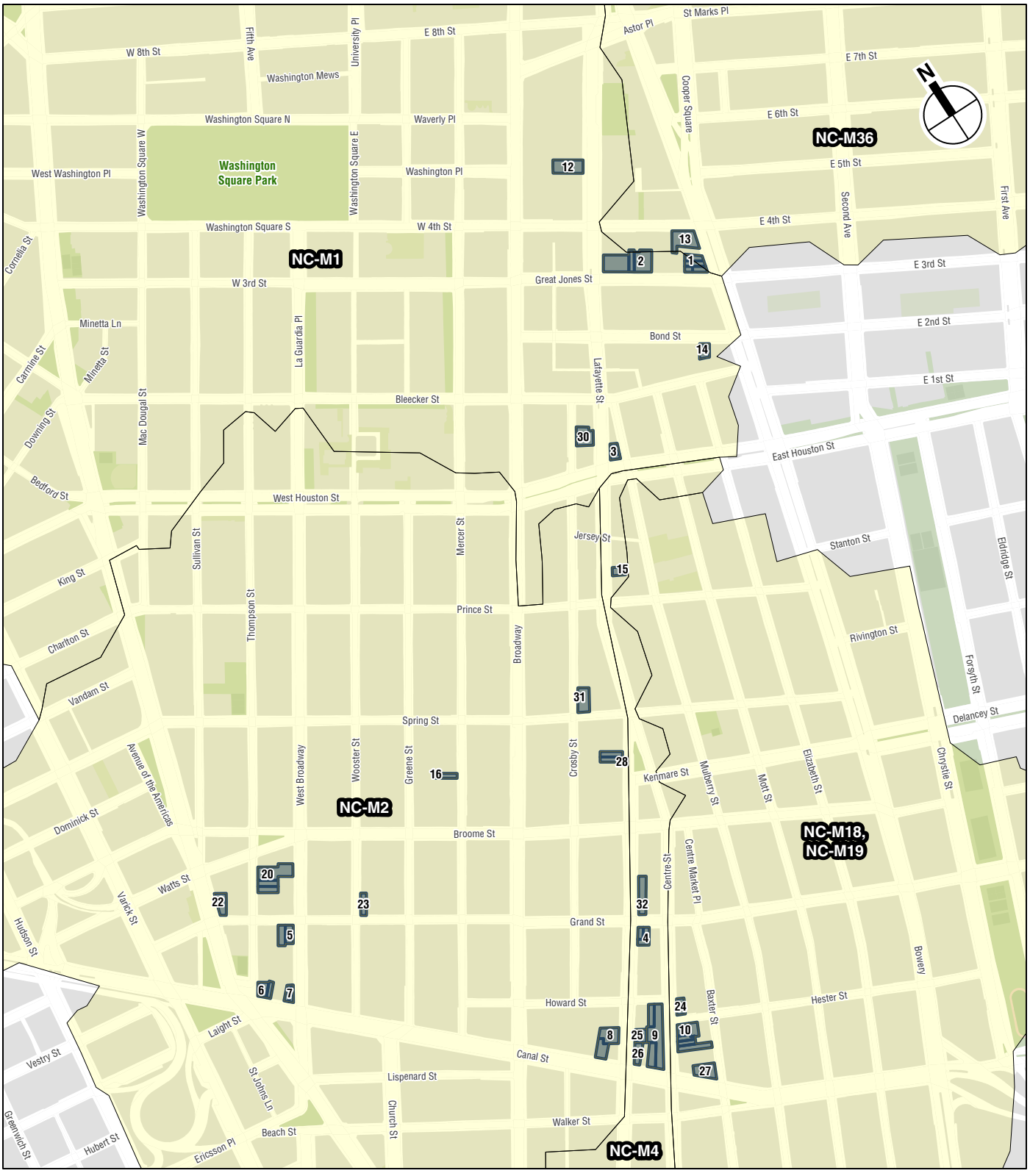
The Project Area is served by combined sewers that convey flows to the Newtown Creek WRRF, the largest of the City's 14 WRRFs. Here, wastewater is fully treated by physical and biological processes before it is discharged as effluent. The quality of the effluent is regulated by a SPDES permit issued by the New York State Department of Environmental Conservation (DEC), which establishes limits for effluent parameters (i.e., suspended solids, fecal coliform bacteria, and other pollutants). Since the volume of flow to a WRRF affects the level of treatment a plant can provide, the SPDES permit also establishes a maximum permitted capacity. For the Newtown Creek WRRF, the maximum permitted capacity is 310 mgd; the average monthly flow to the Newtown Creek WRRF is 212 mgd,[1] which is approximately 68 percent of the permitted capacity.

As shown in **Figure 11-1**, the 26 projected development sites are served by five Newtown Creek WRRF subcatchment areas. **Table 11-2** shows the estimated existing wastewater generated on the projected development sites within each of the affected subcatchment areas.

Table 11-2
Existing Wastewater Generation on the Projected Development Sites by Subcatchment Area

Subcatchment Area	Domestic Water/Wastewater Generated on the Projected Development Sites (gpd)*
NC-M1	6,475
NC-M2	20,657
NC-M4	21,081
NC-M18/19	6,382
NC-M36	3,982
Note: * See **Table 11-1** for domestic water/wastewater generation methodology.	

[1] Average monthly flow for the 12-month period through March 2017, the latest period for which data are available.



WRRF Subcatchment Areas

SOHO/NOHO NEIGHBORHOOD PLAN

Figure 11-1

STORMWATER AND DRAINAGE MANAGEMENT

Stormwater runoff from impermeable surfaces on the projected development sites is collected and conveyed by the City's combined sewer system to the Newtown Creek WRRF. As noted above, regulators allow only twice the dry weather design flow into interceptors. During storm events, excess flow is discharged as CSO. The analysis of stormwater management typically focuses on the body of water into which stormwater is discharged during a CSO event. In this case, CSO from the Project Area is discharged to two bodies of water: CSO generated in subcatchment areas NC-M1, NC-M2, and NC-M4 flows to the west and is discharged through outfalls to the Hudson River, and CSO generated in subcatchment areas NC-M18/19 and NC-M36 flows east and is discharged through outfalls to the East River.

The 26 projected development sites within the Project Area are predominantly a mix of buildings and paved areas (such as surface parking lots). The combined total area of the projected development sites is approximately 4.27 acres. **Table 11-3** summarizes the surfaces and surface areas within each subcatchment area, as well as the weighted runoff coefficient (the fraction of precipitation that becomes surface runoff for each surface type).[2]

Table 11-3
Existing Surface Coverage

Subcatchment Area	Surface Type	Roof	Pavement and Walkways	Other	Grass and Softscape	Total
Red Hook WWTP Service Area						
NC-M1	Area (percent)	26%	74%	0%	0%	100%
	Surface Area (acres)	0.25	0.72	0.00	0.00	0.97
	Runoff Coefficient*	1.00	0.85	0.85	0.20	**0.89**
NC-M2	Area (percent)	75%	25%	0%	0%	100%
	Surface Area (acres)	1.07	0.35	0.00	0.00	1.42
	Runoff Coefficient*	1.00	0.85	0.85	0.20	**0.96**
NC-M4	Area (percent)	90%	10%	0%	0%	100%
	Surface Area (acres)	0.86	0.09	0.00	0.00	0.95
	Runoff Coefficient*	1.00	0.85	0.85	0.20	**0.99**
NC-M18/19	Area (percent)	38%	62%	0%	0%	100%
	Surface Area (acres)	0.20	0.33	0.00	0.00	0.53
	Runoff Coefficient*	1.00	0.85	0.85	0.20	**0.91**
NC-M36	Area (percent)	83%	17%	0%	0%	100%
	Surface Area (acres)	0.33	0.07	0.00	0.00	0.40
	Runoff Coefficient*	1.00	0.85	0.85	0.20	**0.97**

Notes: Totals may not sum due to rounding.
* Weighted Runoff Coefficient calculations based on the Flow Volume Calculation Matrix provided in the *CEQR Technical Manual*.

THE FUTURE WITHOUT THE PROPOSED ACTIONS

In the 2031 future without the Proposed Actions (No Action condition), the projected development sites are assumed to remain unchanged from existing conditions. There would be no change to water demand, sanitary sewage generation, and stormwater flows on the projected development sites, as discussed above.

[2] Lot coverage (rooftop, paved area, and unpaved softscape) for each development site was estimated using City land cover data and aerial photography.

In the No Action condition, independent of the Proposed Actions, DEP is expected to enact amended on-site stormwater management requirements for new and redevelopment projects in combined sewer areas, updating the current regulations (2012 Stormwater Rule[3]) which reduce peak discharges to the city's sewer system during rain events by requiring greater on-site storage of stormwater runoff and slower release to the sewer system. Specifically, DEP is proposing amendments to Chapters 31 and 19.1 of Title 15 of the Rules of the City of New York (RCNY) as part of a Unified Stormwater Rule. The Unified Stormwater Rule, to be administered citywide, will update and align Chapter 31 stormwater quantity and flow rate requirements with Chapter 19.1 Construction/Post-Construction permitting program water quality requirements.

Under Chapter 31 amendments, the Unified Stormwater Rule increases the amount of stormwater required to be managed on-site and further restricts the release rates for all new and redevelopment projects that require a DEP house or site connection proposal. Additionally, under Chapter 19.1 amendments, sites that disturb 20,000 sf or more of soil or increase impervious surfaces by 5,000 sf or more will also be required to manage the Water Quality Volume (WQv), currently defined as 1.5", using stormwater management practices (SMPs) dictated by DEP SMP hierarchies. DEP has developed hierarchies for both combined and separate sewer areas. The SMP hierarchies prioritize vegetated retention SMPs for both drainage areas with stormwater volume control and stormwater treatment communicated as the underlying goals for combined and separate sewer areas, respectively. For sites that trigger the Chapter 19.1 component of the Unified Stormwater Rule, the hierarchy is mandatory, meaning that developers must start with the most preferred SMP and provide documentation of site constraints that prevent implementation in order to move to the next SMP.

In August 2020, New York City Council passed Intro No. 1851,[4] enabling DEP to move forward with the Chapter 19.1 amendments necessary to package the Unified Stormwater Rule amendments. Draft rules are anticipated to be published in Spring 2021 and in effect in 2022. A new New York City Stormwater Management Guidance Manual will accompany the Unified Stormwater Rule to provide clear guidance on requirements and design options. The draft manual will be published along with the draft rules in Spring 2021.

The Unified Stormwater Rule is expected to lead to a substantial improvement in the way that individual new and redeveloped properties manage stormwater compared to the 2012 Stormwater Rule. In some cases, stormwater will be entirely prevented from entering the city sewer system through retention and, in most cases, stormwater that does enter the system will be reduced and/or treated and released at a much lower rate, allowing the system to operate more efficiently during peak wet weather events. In combined sewersheds, such as the portion of Manhattan that contains the Project Area, the Unified Stormwater Rule is expected to lead to a reduction in CSO volume as more lots redevelop over time.[5]

THE FUTURE WITH THE PROPOSED ACTIONS

In the 2031 With Action condition, under the Proposed Actions, the total development expected to occur on the 26 projected development sites would consist of approximately 2,191,275 gsf of built

[3] Chapter 31 of Title 15 of the Rules of the City of New York, Rule Governing House/Site Connections to the Sewer System Standards for Release Rates

[4] Int 1851-2020 https://nyc.legistar.com/LegislationDetail.aspx?ID=4313347&GUID=37C19DB2-25C0-4D86-8231-50B86C3CB717&Options=&Search=%20November%2018,%202020,%2012:51%20PM

[5] More details on the Unified Stormwater Rule and forthcoming outreach can be found on DEP's website: https://www1.nyc.gov/site/dep/water/unified-stormwater-rule.page

floor area, including approximately 1,861 DUs, a substantial proportion of which are expected to be affordable, 176,841 gsf of retail space (local and destination retail, supermarket), and 20,778 gsf of community facility uses. The With Action condition would also include approximately 160,765 gsf of office, which would be a reduction in office space as compared to the existing condition.

WASTEWATER TREATMENT

In the With Action condition, wastewater from the projected development sites would continue to be treated at the Newtown Creek WRRF. The capacity of the plant would not change as a result of the Proposed Actions, and the facility would continue to operate within its SPDES-permitted dry weather flow capacity (310 mgd).

As shown in **Table 11-4**, under the RWCDS, development on the projected development sites is expected to generate a total of approximately 412,326 gpd of sanitary sewage, divided among the five affected subcatchment areas (summarized in **Table 11-5**).

Table 11-4
With Action Condition Water Consumption

Land Use[1]	Water Consumption and Wastewater Generation Rates[2]	Area/Units	Domestic Water/ Wastewater Generation (gpd)	Air Conditioning (gpd)
Residential	Domestic: 100 gpd/person[3] A/C: 0.17 gpd/sf	1,832,891 sf (1,861 DU)	351,729	311,591
Commercial/Office	Domestic: 0.10 gpd/sf A/C: 0.17 gpd/sf	160,765 sf	16,077	27,330
Retail	Domestic: 0.24 gpd/sf A/C: 0.17 gpd/sf	176,841 sf	42,442	30,063
Community Facility	Domestic: 0.10 gpd/sf A/C: 0.17 gpd/sf	20,778 sf	2,078	3,532
Manufacturing	Domestic: 0.23 gpd/sf[4] A/C: 0.17 gpd/sf	-	-	-
			Project Area—Total Water Demand	**784,842**
			Project Area—Total Wastewater Generation	**412,326**
			Project Area—Incremental Water Demand (No Action to With Action)[5]	**663,896**
			Project Area—Incremental Wastewater Generation (No Action to With Action)[5]	**353,749**

Notes:
Totals may not sum due to rounding.
gpd = gallons per day; WWTP = wastewater treatment plant; DU = dwelling unit;
1. Projected development sites currently contain approximately 5,000 sf of warehouse uses and approximately 39,000 sf of parking uses in the Existing condition, which are assumed to not consume water or generate wastewater for purposes of analysis. Estimates also do not include vacant properties.
2. Consumption rates from *CEQR Technical Manual* Table 13-2, "Water Usage and Sewage Generation Rates for Use in Impact Assessment," unless otherwise noted.
3. Assumes 1.89 residents per DU (average household size for Manhattan Community District [CD] 2).
4. Based on *East New York Rezoning Proposal FEIS* (equal to 10,000 gpd/acre); calculated based on total building floor area.
5. See **Table 11-1** for Existing Condition water demand and wastewater generation.

Table 11-5
With Action Condition Wastewater Generation on the Projected Development Sites by Subcatchment Area

Subcatchment Area	Domestic Water/Wastewater Generated on the Projected Development Sites (gpd)*
NC-M1	77,813
NC-M2	131,185
NC-M4	95,987
NC-M18/19	61,055
NC-M36	46,286

Note: * See **Table 11-4** for domestic water/wastewater generation methodology.

The With Action sanitary sewage generation (approximately 412,326 gpd) would represent an increase of approximately 353,749 gpd (approximately 0.35 mgd) over the No Action condition (see **Table 11-4**). With an existing flow of 212 mgd (below the maximum permitted dry weather flow capacity of 310 mgd) and the addition of approximately 0.35 mgd on the projected development sites, the Newtown Creek WRRF would continue to have reserve capacity. Pursuant to *CEQR Technical Manual* guidelines, as the demand associated with the Proposed Actions would be well within the capacity of the affected treatment plant, the preliminary analysis finds that no significant adverse impacts to the capacity of the City's wastewater treatment services would occur as a result of the Proposed Actions.

STORMWATER AND DRAINAGE MANAGEMENT

In the With Action condition, it is anticipated that the amount of surface area comprised of roofs would increase over the No Action condition as vacant lots and underutilized properties are developed. As shown in **Table 11-6**, roof area is estimated to comprise 99 to 100 percent of the projected development sites' surface areas in the five affected subcatchment areas. Although some or all of the projected developments may feature landscaped areas, the amount and location of landscaped areas is not known at this time; therefore, for the purposes of a conservative analysis, all lot area on the development sites that is not rooftop area (such as side and rear yards) is assumed to be pavement area, which features a higher runoff coefficient than landscaped area (aka softscape).

Table 11-6
With Action Surface Coverage

Subcatchment Area	Surface Type	Roof	Pavement and Walkways	Other	Grass and Softscape	Total
Red Hook WWTP Service Area						
NC-M1	Area (percent)	95%	5%	0%	0%	100%
	Surface Area (acres)	0.92	0.05	0.00	0.00	0.97
	Runoff Coefficient*	1.00	0.85	0.85	0.20	**0.99**
NC-M2	Area (percent)	95%	5%	0%	0%	100%
	Surface Area (acres)	1.35	0.07	0.00	0.00	1.42
	Runoff Coefficient*	1.00	0.85	0.85	0.20	**0.99**
NC-M4	Area (percent)	95%	5%	0%	0%	100%
	Surface Area (acres)	0.90	0.05	0.00	0.00	0.95
	Runoff Coefficient*	1.00	0.85	0.85	0.20	**0.99**
NC-M18/19	Area (percent)	94%	6%	0%	0%	100%
	Surface Area (acres)	0.49	0.03	0.00	0.00	0.53
	Runoff Coefficient*	1.00	0.85	0.85	0.20	**0.99**
NC-M36	Area (percent)	100%	0%	0%	0%	100%
	Surface Area (acres)	0.40	0.00	0.00	0.00	0.40
	Runoff Coefficient*	1.00	0.85	0.85	0.20	**1.00**

Notes: Totals may not sum due to rounding.
* Weighted Runoff Coefficient calculations based on the Flow Volume Calculation Matrix provided in the *CEQR Technical Manual*.

As a result of these anticipated surface area changes, the weighted runoff coefficients for the projected development sites within the affected subcatchment areas are expected to increase. As shown in **Table 11-6**, the subcatchment areas are expected to have weighted runoff coefficients of 0.99 to 1.00 in the With Action condition. However, as the runoff coefficients are currently at or above 0.90 in these areas, the increase in runoff coefficients is minor as compared to the No Action condition.

Using the sanitary and stormwater flow calculations, the Flow Volume Calculation Matrix was completed for the existing conditions and the With Action condition for each subcatchment area. The calculations from the Flow Volume Calculation Matrix help to determine the change in

wastewater flow volumes to the combined sewer system from existing conditions to With Action conditions, and include four rainfall volume scenarios with varying durations. The summary tables of the Flow Volume Calculation Matrices are included in **Table 11-7**.

Table 11-7
Flow Volume Matrix: Existing and With Action Volume Comparison

Subcatchment Area	Total Area (Acres)	Rainfall Volume (in.)	Rainfall Duration (hr.)	Weighted Runoff Coefficient	Runoff Volume to Direct Drainage (MG)	Runoff Volume to CSS (MG)*	Sanitary Volume to CSS (MG)	Total Volume to CSS (MG)	Weighted Runoff Coefficient	Runoff Volume to River (MG)	Runoff Volume to CSS (MG)*	Sanitary Volume to CSS (MG)	Total Volume to CSS (MG)	Increased Total Volume to CSS (MG)*
				Existing					With Action					
NC-M1	0.97	0.00	3.80	0.89	0.00	0.00	0.00	**0.00**	0.99	0.00	0.00	0.01	**0.01**	0.01
		0.40	3.80		0.00	0.01	0.00	**0.01**		0.00	0.01	0.01	**0.02**	0.01
		1.20	11.30		0.00	0.03	0.00	**0.03**		0.00	0.03	0.04	**0.07**	0.04
		2.50	19.50		0.00	0.06	0.01	**0.06**		0.00	0.07	0.06	**0.13**	0.06
NC-M2	1.42	0.00	3.80	0.96	0.00	0.00	0.00	**0.00**	0.99	0.00	0.00	0.02	**0.02**	0.02
		0.40	3.80		0.00	0.01	0.00	**0.02**		0.00	0.02	0.02	**0.04**	0.02
		1.20	11.30		0.00	0.04	0.01	**0.05**		0.00	0.05	0.06	**0.11**	0.05
		2.50	19.50		0.00	0.09	0.02	**0.11**		0.00	0.10	0.11	**0.20**	0.09
NC-M4	0.95	0.00	3.80	0.99	0.00	0.00	0.00	**0.00**	0.99	0.00	0.00	0.02	**0.02**	0.01
		0.40	3.80		0.00	0.01	0.00	**0.01**		0.00	0.01	0.02	**0.03**	0.01
		1.20	11.30		0.00	0.03	0.01	**0.04**		0.00	0.03	0.05	**0.08**	0.04
		2.50	19.50		0.00	0.06	0.02	**0.08**		0.00	0.06	0.08	**0.14**	0.06
NC-M18/19	0.53	0.00	3.80	0.91	0.00	0.00	0.00	**0.00**	0.99	0.00	0.00	0.01	**0.01**	0.01
		0.40	3.80		0.00	0.01	0.00	**0.01**		0.00	0.01	0.01	**0.02**	0.01
		1.20	11.30		0.00	0.02	0.00	**0.02**		0.00	0.02	0.03	**0.05**	0.03
		2.50	19.50		0.00	0.03	0.01	**0.04**		0.00	0.04	0.05	**0.09**	0.05
NC-M36	0.40	0.00	3.80	0.97	0.00	0.00	0.00	**0.00**	1.00	0.00	0.00	0.01	**0.01**	0.01
		0.40	3.80		0.00	0.00	0.00	**0.00**		0.00	0.00	0.01	**0.01**	0.01
		1.20	11.30		0.00	0.01	0.00	**0.01**		0.00	0.01	0.02	**0.02**	0.02
		2.50	19.50		0.00	0.03	0.00	**0.03**		0.00	0.03	0.03	**0.04**	0.04

Notes:
* Assumes no on-site detention or BMPs for purposes of calculations.
CSS = Combined Sewer System; MG = Million Gallons.
Totals may not sum due to rounding.

As shown in **Table 11-7**, in all rainfall volume scenarios flow to the combined sewer system would increase as compared to the existing condition. The largest increase would occur within subcatchment area NC-M2 (up to 0.09 million gallons during storm events with up to 2.5 inches of rainfall).[6] The increases in flow are primarily attributable to the increase in sanitary flow resulting from denser development (particularly residential development) on the projected development sites with the Proposed Actions. As shown in **Table 11-7**, there would a comparatively smaller increase in stormwater flows to the system as compared to the existing condition. In all of the subcatchment areas, the With Action weighted runoff coefficient (which is related to the amount of pervious/impervious surface on each projected development site) would be equal to or slightly greater than the existing weighted runoff coefficient. Increased volumes and flows would be conveyed to the Newtown Creek WRRF or discharged directly to the Hudson and East Rivers, depending on rainfall volume and duration. However, the table does not account for the DEP-regulated stormwater flow rate: in particular, as described in greater detail below, DEP requires substantial stormwater detention for developments or building alterations if the developed sites' storm flows exceed the allowable flow of the drainage plan. As a result of these requirements, given that the existing development sites are unlikely to provide significant

[6] Totals represent the incremental increase in total volume discharged to the combined sewer system (CSS) during the largest storm scenario represented in the Flow Volume Calculation Matrix.

detention, it is expected that there would be an increase in on-site detention and retention as a result of the Proposed Actions.

As described above, DEP is proposing amendments to Chapters 31 and 19.1 of Title 15 of the RCNY as part of a Unified Stormwater Rule. In August 2020, New York City Council passed Intro No. 1851, enabling DEP to move forward with the Chapter 19.1 amendments necessary to package the Unified Stormwater Rule amendments. Draft rules are anticipated to be published in 2021 and in effect in 2022. The Unified Stormwater Rule is expected to introduce new on-site stormwater management volume requirements, which increase the total volume of water that must be managed on new and redeveloped properties as well as updates the type and performance of on-site stormwater management practices that must be implemented. In the rezoning area, the Unified Stormwater Rule ensures that redeveloped properties manage more total stormwater and manage it more efficiently than prior to redevelopment. This improved on-site stormwater management on the redeveloped properties is substantial enough that it is expected to offset the increase in sanitary flow, so CSO volumes would decrease overall.

Following the guidelines of the *CEQR Technical Manual*, a detailed analysis is warranted when the preliminary assessment finds that there would be a significant increase in sanitary or stormwater discharges which may impact capacity in the existing sewer system, exacerbate CSO volumes and/or frequencies, or contribute greater pollutant loadings in combined sewage discharged to receiving waterbodies. Based on the preliminary analysis of increased flows to the combined sewer system presented in the Flow Volume Calculation Matrix, and in consideration of the on-site stormwater management volume requirements expected to be in enacted independent of the Proposed Actions, it is concluded that the projected increased flows to the combined sewer system would not have a significant adverse impact on water quality, and detailed analysis is not warranted..

STORMWATER BEST MANAGEMENT PRACTICES

Because the City's sewers are sized and designed based on the designated zoning of an area, and related population density and surface coverage characteristics, the proposed rezoning may result in development that is inconsistent with the design of the existing built sewer system. It is expected that an Amended Drainage Plan (ADP) will be prepared for the rezoning area.

The proposed rezoning would result in increased development and population density which could require a hydraulic analysis of the existing sewer system when applicants seek sewer connections. The hydraulic analysis would be required prior to the submittal of a Site Connection Proposal (SCP) application to determine whether the existing sewer system is capable of supporting new development and related increase in wastewater flow. As part of the SCP permit approval processes, developments must be in compliance with the required on-site stormwater volume requirements and stormwater release rate as detailed in the Unified Stormwater Rule. Upgrades to the sewer system may also be required of the applicant at the time of the SCP in accordance with the ADP.

Each development site, regardless of lot size, will trigger Chapter 31 of the proposed Unified Stormwater Rule and will be required to implement slow-release drainage controls to meet the updated on-site release rate and volume requirements. There is no available waiver to the SMP hierarchy and documentation must be provided to move from a higher tier to a lower tier of the SMP hierarchy. The Unified Stormwater rule therefore ensures that redeveloped properties manage more total stormwater and manage it more efficiently than under pre-development (No Action) conditions.

Enhanced stormwater management throughout the City is consistent with recent policies, including the NYC Green Infrastructure Plan and OneNYC. The NYC Green Infrastructure Plan, released in September 2010, includes a goal of reducing CSOs by 1.67 billion gallons per year by 2030 through the implementation of retention or detention practices. 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 (EPA's) WaterSense Program, would also help to control sanitary flows.

The projected growth under the Proposed Actions would increase sanitary flows to the City's combined sewer system. However, it is expected that there would be a decrease in the volume of CSO discharge during rain events as a result of the increased detention of stormwater runoff to be implemented with the new development in accordance with the proposed Unified Stormwater Rule. Because of the available treatment capacity at the Newtown Creek WRRF, the projected increase in sanitary flows would also not result in any significant adverse impact on that WRRF. For these reasons, it is concluded that the Proposed Actions would not result in significant adverse impacts to local water supply or wastewater and stormwater conveyance and treatment infrastructure. ✷