Chapter 9: Water and Sewer Infrastructure

A. INTRODUCTION

This chapter assesses the potential for the Proposed Project to result in significant adverse impacts on the City's water supply and wastewater and stormwater conveyance and treatment infrastructure. According to the 2020 *City Environmental Quality Review (CEQR) Technical Manual*, projects that increase density or change drainage conditions on a large site require a water and sewer infrastructure analysis. As discussed in Chapter 1, "Project Description," the Applicant is requesting a rezoning and other discretionary actions (the "Proposed Actions") to facilitate the construction of the Proposed Project, an approximately 596,200 gross-square-foot (gsf) building on the site of the existing New York Blood Center (NYBC) building at 310 East 67th Street, Block 1441, Lot 40 (the "Development Site"). Block 1441 is bounded by East 66th and East 67th Streets and First and Second Avenues on the Upper East Side in Manhattan. The Development Site is part of a larger Rezoning Area which also includes Block 1441, Lots 1001–1202, and Block 1421, p/o Lot 21.

PRINCIPAL CONCLUSIONS

The analysis finds that the Proposed Project would not result in any significant adverse impacts on the City's water supply or wastewater and stormwater conveyance and treatment infrastructure. The Proposed Project would result in an increase in water consumption and sewage generation on the Development Site as compared with the No Action condition. While the Proposed Project would result in incremental water demand, it would not represent a significant increase in demand on the New York City water supply system. An analysis of water supply is not warranted since it is expected that there would be adequate water service to meet the incremental demand, and there would be no significant adverse impacts on the City's water supply.

The Development Site is located in the service area of the Newtown Creek Wastewater Treatment Plant (WWTP). While the Proposed Project would generate 59,620 gallons per day (gpd) of sanitary sewage, an increase of 36,711 gpd above the No Action condition, this incremental increase in sewage generation would be approximately 0.02 percent of the average daily flow at the Newtown Creek WWTP and would not result in an exceedance of the plant's permitted capacity. Therefore, the Proposed Project would not result in a significant adverse impact to the City's sanitary sewage conveyance and treatment system.

Compared to existing conditions, the Proposed Project would result in an increase in flows to the combined sewer system during wet weather, primarily due to the increase in sanitary flow resulting from the larger development. Because the Development Site is almost entirely covered with rooftop in existing conditions, the Proposed Project would not result in a substantial increase in impervious surface; therefore, there would be a minimal increase in stormwater runoff. In addition, a reduction in stormwater peak flows to the combined sewer system would be achieved with the incorporation of stormwater source control best management practices (BMPs), specifically on-site detention, in accordance with the City's site connection requirements. DEP's detention performance standard

is intended to reduce peak discharges to the City's sewer system during rain events by requiring greater onsite storage of stormwater runoff and slower release to the sewer system. The implementation of DEP's stormwater performance standard over time is expected to provide additional capacity to the existing sewer system, thereby improving its performance.

Therefore, the Proposed Project would not have a significant adverse impact on the City's combined sewer system or the City's sewage treatment system.

B. METHODOLOGY

This analysis follows the *CEQR Technical Manual* guidelines that recommend a preliminary water analysis if a project would result in an exceptionally large demand of water (over 1 million gallons per day [gpd]), or if it is located in an area that experiences low water pressure (e.g., an area at the end of the water supply distribution system, such as the Rockaway Peninsula or Coney Island). The Proposed Project would not generate an incremental water demand of 1 million gpd[1] and is not located in an area that experiences low water pressure; therefore, an analysis of water supply is not warranted since it is expected that there would be adequate water service to meet the incremental water demand and that there would be no significant adverse impacts on the City's water supply.

The *CEQR Technical Manual* indicates that a preliminary analysis of wastewater and stormwater conveyance and treatment is warranted if a project is located in a combined sewer area and would have an incremental increase above the No Action condition of 1,000 residential units or 250,000 sf of commercial, public facility, and institution and/or community facility space in Manhattan. Since the Proposed Project is located in a combined sewer area and would exceed the threshold for commercial/institution space, an analysis of wastewater and stormwater conveyance and treatment was performed.

Existing and future water demand and sanitary sewage generation are calculated based on use rates set by the *CEQR Technical Manual*.[2] The New York City Department of Environmental Protection (DEP) Flow Volume Calculation Matrix is then used to calculate the overall combined sanitary sewage and stormwater runoff volume discharged to the combined sewer system for four rainfall volume scenarios with varying durations. The ability of the City's sewer infrastructure to handle the anticipated demand from the Proposed Project is assessed by estimating existing sewage generation rates, and then comparing these existing rates with the future without the Proposed Project (the No Action condition) and the future with the Proposed Project (the With Action condition), per *CEQR Technical Manual* methodology.

C. EXISTING CONDITIONS

CONVEYANCE SYSTEM

The Development Site is located within a part of Manhattan served by a combined sewer system that collects both sanitary sewage and stormwater. In periods of dry weather, the combined sewers located in the adjacent streets convey only sanitary sewage. The Development Site, which is a

[1] As shown in **Table 9-4**, below, as compared to the No Action scenario, the incremental water demand with the Proposed Project is approximately 99,119 gpd.

[2] *CEQR Technical Manual*, 2020, Table 13-2.

through-block site with frontages on East 66th and East 67th Streets, currently contains the existing NYBC facility. Both East 66th and East 67th Streets contain combined sewers serving the Development Site: the sewers start near Second Avenue and run east, where they connect to a combined sewer running south along First Avenue. From First Avenue, the combined sewer runs east along East 63rd Street toward the FDR Drive, where it connects to Regulator M-51.[3] From Regulator M-51, flow is conveyed to an interceptor running south along York Avenue and Sutton Place to the Newtown Creek Waste Water Treatment Plant (WWTP), the largest of the City's 14 WWTPs.

At the Newtown Creek WWTP, wastewater is fully treated by physical and biological process before it is discharged into Newtown Creek. 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). Since the volume of flow to a WWTP affects the level of treatment a plant can provide, the maximum permitted capacity for the Newtown Creek WWTP is 310 million gallons per day (mgd). The average monthly flow over the last 12-month period for which data is available is 212 mgd,[4] which is well below the maximum permitted capacity.

During and immediately after wet weather, combined sewers can experience a much larger flow due to stormwater runoff collection. To control flooding at the Newtown Creek WWTP, the regulators built into the system allow only approximately two times the amount of design dry weather flow into the interceptors. The interceptor then takes the allowable flow to the WWTP, while the excess flow is discharged to the nearest waterbody as combined sewer overflow (CSO). In wet weather, sanitary flow, and stormwater runoff originating on the Development Site is conveyed from Regulator M-51 to a CSO outfall located east of the FDR Drive in the area of East 64th Street, which flows into the East River.

SANITARY FLOWS

For purposes of analysis, the amount of sanitary sewage is estimated as all water demand generated by the existing NYBC facility (approximately 159,347 gsf) except water used by air conditioning, which is typically not discharged to the sewer system. As shown in **Table 9-1**, the amount of daily sanitary sewage generated by the existing facility on Development Site is an estimated 15,935 gpd.

Table 9-1
Existing Water Consumption and Sewage Generation

Use	Size/Population	Rate*	Consumption (gpd)
Domestic	159,347 sf	0.10 gpd/sf	15,935
Air Conditioning	159,347 sf	0.17 gpd/sf	27,089
		Total Water Supply Demand	**43,024**
		Total Sewage Generation	**15,935**

Note:
* Rates are from the *CEQR Technical Manual* Table 13-2; existing NYBC facility assumed to generate water demand and sanitary sewage at the rates of commercial office space for purposes of analysis.

[3] Regulators are structures that control the flow of sewage to interceptors, i.e., larger sewers that connect the combined sewer system to the City's sewage treatment system.

[4] Twelve-month period through March 2017.

STORMWATER FLOWS

The Development Site has a lot area of approximately 45,186 sf (1.04 acres) and is fully occupied by the existing NYBC building. The existing building includes four inner courtyards; three of the four courtyards are in-filled with structures, and one (approximately 1,820 sf) is paved. Therefore, with the exception of the one paved courtyard, the majority of the Development Site is fully impervious rooftop area in existing conditions.

Table 9-2 summarizes the existing surfaces and surface areas on the Development Site, as well as the weighted runoff coefficient (the fraction of precipitation that becomes surface runoff for each surface type).

Table 9-2
Existing Surface Coverage

Affected CSO Outfall	Surface Type	Roof	Pavement and Walkways	Other	Grass and Soft Scape	Total
M-51	Area (percent)	96%	4%	0%	0%	**100%**
	Surface Area (sf)	43,366	1,820	0	0	**45,186**
	Runoff Coefficient*	1.00	0.85	0.85	0.20	**0.99**

Notes:
* Weighted Runoff Coefficient calculations based on the DEP Flow Volume Calculation Matrix provided in the *CEQR Technical Manual*, retrieved June 2020.
Totals may not sum due to rounding.

D. FUTURE WITHOUT THE PROPOSED ACTIONS

As described in Chapter 1, "Project Description," in the future without the Proposed Actions (the No Action condition), NYBC will redevelop the Development Site to replace their existing facility and construct a new building as-of-right. The new building will contain approximately 229,092 gsf of laboratory space and other community facility uses (i.e., medical offices).

CONVEYANCE SYSTEM

In the No Action condition, there would be no changes to the wastewater conveyance system serving the Development Site. Wastewater would continue to be conveyed to Regulator M-51 and the Newtown Creek WWTP, and CSO would continue to be discharged to the East River.

SANITARY FLOWS

Table 9-3 summarizes the water demand and sewage generation of the No Action development. The No Action development is expected to generate an estimated 22,909 gpd of daily sanitary sewage with a total water demand of 61,855 gpd.

Table 9-3
No Action Water Consumption and Sewage Generation

Use	Size/Population	Rate*	Consumption (gpd)
Domestic	229,092	0.10 gpd/sf	22,909
Air Conditioning	229,092	0.17 gpd/sf	38,946
		Total Water Supply Demand	**61,855**
		Total Sewage Generation	**22,909**

Notes:
* Rates are from the *CEQR Technical Manual* Table 13-2; No Action development (NYBC facilities and medical office) assumed to generate water demand and sanitary sewage at the rates of commercial office space for purposes of analysis.

STORMWATER FLOWS

As with the existing building, the No Action development will occupy the full Development Site. The No Action development will not contain any courtyards or other paved areas, therefore, in the No Action condition, the Development Site will contain only fully impervious rooftop area. As a result, the weighted runoff coefficient of the Development Site would be the maximum of 1.00, a minor increase as compared to existing conditions.

In addition, DEP requires stormwater detention, in compliance with the applicable drainage plan for new developments if the developed site's storm flow is expected to exceed the allowable flow of the drainage plan. Pursuant to Chapter 31 of Title 15 of the Rules of the City of New York (RCNY), as amended in 2012, for a new development, the stormwater release rate is the greater of 0.25 cubic feet per second (cfs) or 10 percent of the allowable flow. Therefore, any new development requiring a connection to the sewer system is required to achieve the new flow rate. Flexibility in achieving this rate is provided to the development community through a variety of approvable systems, including subsurface and rooftop systems (e.g., green roofs, blue roofs, or detention basins/tanks). Joint DEP and New York City Department of Buildings (DOB) guidelines are available to ensure the proper design and construction in the early stages of site planning and building design. This performance standard allows for a wide range of management techniques, costs, and space considerations. In addition, the City is in the process of responding to the wider issue of stormwater overflow with a new citywide regulation expected to be in effect in 2021 (discussed further below). The 2021 stormwater rule would update the current (2012) stormwater rule and require more stringent retention and detention controls, which would significantly limit the effect of new development on stormwater overflow rates.

As a result of these requirements, given that the existing building on the Development Site most likely does not provide detention, it is expected that there would be a reduction in uncontrolled runoff in the No Action condition with the construction of a new as-of-right building.

UNIFIED STORMWATER RULE

In the No Action condition, independent of the Proposed Project, 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) 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 square feet or more of soil or increase impervious surfaces by 5,000 square feet or more will also be required to manage the Water Quality Volume (WQv), currently defined as 1.5" over the lot area, 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, 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 be 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 portion of Manhattan that contains the Development Site, the Unified Stormwater Rule is expected to lead to a reduction in CSO volume as more lots redevelop over time. The Unified Stormwater Rule is not presented as part of this analysis; the analysis is more conservative as the USR would require SMPs that are more stringent.

E. FUTURE WITH THE PROPOSED ACTIONS

As described above, the Proposed Project would be a new building of approximately 596,200 gsf, split between 206,400 gsf of NYBC space and 389,800 gsf of laboratories and related uses for NYBC partners. The With Action condition would produce more water consumption and generate more sewage than the existing condition and No Action condition. The results of the analysis on water and sewer infrastructure are described in the sections below.

CONVEYANCE SYSTEM

As described in the existing condition, there are combined sewers on both frontages of the Development Site (East 66th and East 67th Streets) that are expected to be available for connection. These sewers would convey the sanitary and stormwater flow from the Proposed Project to Regulator M-51 and the Newtown Creek WWTP.

SANITARY FLOWS

As shown in **Table 9-4**, the Proposed Project is expected to generate 59,620 gpd of daily sanitary sewage (with a total water demand of 160,974 gpd[5]). As compared to the No Action condition, the incremental sanitary sewage generated by the Proposed Project would be 36,711 gpd. The incremental increase in sewage generation is approximately 0.02 percent of the average daily flow at the Newtown Creek WWTP and would not result in an exceedance of the WWTP's permitted capacity of 310 mgd. In addition, in accordance with the New York City Plumbing Code (Local Law 33 of 2007), 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 system.

Table 9-4
With Action Water Consumption and Sewage Generation

Use	Size/Population	Rate*	Consumption (gpd)
Domestic	596,200	0.10 gpd/sf	59,620
Air Conditioning	596,200	0.17 gpd/sf	101,534
		Total Water Supply Demand	**160,974**
		Total Sewage Generation	**59,620**
		Incremental Water Supply Demand**	**99,119**
		Incremental Sewage Generation**	**36,711**

Notes:
* Rates are from the *CEQR Technical Manual* Table 13-2; proposed NYBC space, laboratories and related uses are assumed to generate water demand and sanitary sewage at the rates of commercial office space for purposes of analysis.
** Incremental increase from No Action water demand and sewage generation shown in **Table 9-3.**

STORMWATER FLOWS

The Proposed Project would occupy the full Development Site and, as with the No Action development, would not include any courtyards or other paved areas. Therefore, as in the No Action condition, the Development Site would contain only fully impervious rooftop area in the With Action condition, and the weighted runoff coefficient of the Development Site would remain at the maximum of 1.00 (see **Table 9-5**).

Table 9-5
With Action Surface Coverage

Affected CSO Outfall	Surface Type	Roof	Pavement and Walkways	Other	Grass and Soft Scape	Total
M-51	Area (percent)	100%	0%	0%	0%	**100%**
	Surface Area (sf)	45,186	0	0	0	**45,186**
	Runoff Coefficient*	1.00	0.85	0.85	0.20	**1.00**

Notes:
* Weighted Runoff Coefficient calculations based on the DEP Flow Volume Calculation Matrix provided in the *CEQR Technical Manual*, retrieved June 2020.
Totals may not sum due to rounding.

[5] As compared to the No Action scenario, the incremental water demand with the Proposed Project is approximately 99,119 gpd, which is below the *CEQR Technical Manual* threshold of 1 million gpd which warrants a detailed water supply analysis.

Using these sanitary and stormwater flow calculations, the DEP Flow Volume Calculation Matrix was completed for the existing conditions and the Proposed Project. The calculations from the Flow Volume Calculation Matrix help to determine the change in wastewater flow volumes to the combined sewer system from existing condition to With Action condition, and include four rainfall volume scenarios with varying durations. The summary tables of the Flow Volume Calculation Matrix are included in **Table 9-6**.

Table 9-6
DEP Flow Volume Matrix: Existing and Build Volume Comparison

Rainfall Volume (in)	Rainfall Duration (hr)	Runoff Volume to Direct Drainage (MG)	Runoff Volume to CSS (MG)*	Sanitary Volume to CSS (MG)	Total Volume to CSS (MG)	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)*
M-51		Existing				With Action				**M-51**
		45,186 sf / 1.04 acres				45,186 sf / 1.04 acres				
0.00	3.80	0.00	0.00	0.00	**0.00**	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	0.01	**0.04**	0.00	0.03	0.03	**0.06**	0.02
2.50	19.50	0.00	0.07	0.01	**0.08**	0.00	0.07	0.05	**0.12**	0.04

Notes:
*Assumes no on-site detention or Best Management Practices (BMPs) for purposes of calculations
CSS = Combined Sewer System; MG = Million Gallons

As shown in **Table 9-6**, the total rainfall volume flow would marginally increase in all rainfall scenarios shown in the Flow Volume Matrix. The increase in flow is largely attributable to the sanitary flows resulting from the larger development on the Development Site. As compared to the existing conditions, in which the Development Site is almost entirely covered with rooftop, the Proposed Project would not result in a substantial increase in impervious surface area; therefore, there would be a minimal increase in stormwater runoff.

The Flow Volume Matrix calculations do not reflect the use of any sanitary and stormwater source control Best Management Practices (BMPs) to reduce sanitary flow and stormwater runoff volumes to the combined sewer system in accordance with DEP regulations, in particular the stormwater control rules found in Chapter 31 of Title 15 of RCNY. The Proposed Project would be required to incorporate BMPs to limit stormwater from the Development Site to the sewer system. In particular, stormwater detention would be required as part of the DEP Site Connection Proposal (SCP) application process for new buildings connecting to the City's sewer system. 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. The performance standard is intended to reduce peak discharges to the City's sewer system during rain events by requiring greater onsite storage of stormwater runoff and slower release to the sewer system. The implementation of DEP's stormwater performance standard over time is expected to provide additional capacity to the existing sewer system, thereby improving its performance. The performance standard is a key element of the New York City Green Infrastructure Plan to promote green infrastructure and improve water quality in the City's surrounding waterbodies.

To achieve the current and future required release rate, stormwater could be managed by utilizing one or a combination of detention or infiltration techniques identified in the NYC Green Infrastructure Plan. Specific BMP measures for the Proposed Project to retain or release stormwater with slowed discharge rates to control peak runoff rates would be determined in the

future in consultation with DEP when specific designs are advanced, and may include stormwater detention tanks, and rainwater reclamation systems. Trees planted per the City's street tree requirement could also be utilized to capture and store water below an enhanced tree pit. In addition, as noted above, the Proposed Project would incorporate low-flow plumbing fixtures to reduce sanitary flow in accordance with the New York City Plumbing Code.

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. In addition, DEP has determined that a hydraulic analysis of the existing sewer system will likely be required as part of the SCP permit approval process, due to the projected increase in sanitary flow from the Proposed Project. The hydraulic analysis calculations will inform the ADP process as necessary. Sewer improvements and/or incorporation of BMPs may also be required of the applicant at the time of the site connection proposal.

The Proposed Project would result in marginally increased flows to the City's combined sewer system that may be discharged as CSOs during rain events. Because of the available capacity of the Newtown Creek WWTP, the projected increased flows to the combined sewer system would not have a significant adverse impact on water quality. In addition, with the incorporation of BMP measures to meet the City site connection requirement, the Proposed Project would not result in a significant increase in stormwater runoff or CSO volumes/frequencies. Therefore, it is concluded that the Proposed Project would not result in significant adverse impacts to local water supply or wastewater and stormwater conveyance and treatment infrastructure. ✷