

**A. INTRODUCTION**

This chapter considers the potential for the proposed project to result in a significant adverse impact to the City’s wastewater conveyance and treatment system. As described in Chapter 1, “Project Description,” the applicant, Josif A LLC, is requesting a special permit and an amendment to the City Map to facilitate a retail development located near the intersection of Forest Avenue and South Avenue in Staten Island (Block 1707, Lots 1 and 5). The proposed project would contain approximately 226,000 gross square feet (gsf) of retail uses, and 838 required accessory parking spaces. The project site is located in an area of Staten Island that is served by a separate sewer system.

According to the 2014 *City Environmental Quality Review (CEQR) Technical Manual*, a water and sewer infrastructure analysis is warranted for projects that exceed certain development thresholds, or projects that increase density or change drainage conditions on a large site (i.e., developments that involve changes to sites five acres or larger where the amount of impervious surface would increase). For the project site, which is located in a separately sewered area in a manufacturing zoning district, the relevant development threshold is 100,000 square feet (sf) of commercial space.<sup>1</sup> Developments that would result in an exceptionally large demand for water (more than one million gallons per day [gpd]) or that are in an area that experiences low water pressure require an analysis of potential impacts on the water supply system.

The proposed project would result in the development of an approximately 17-acre portion of the 28.3-acre development site, which is currently vacant land, and would result in an increase in impervious surface by constructing retail buildings and a surface parking lot. Following the guidelines of the *CEQR Technical Manual*, an analysis of the proposed project’s potential impacts on the wastewater and stormwater conveyance and treatment system was performed. As described below, the proposed project does not warrant an analysis of water supply.

**PRINCIPAL CONCLUSIONS**

While the proposed project would result in an increase in water consumption and sewage generation on the project site (which is currently undeveloped and therefore has no demand for water or sewage generation), it would result in a decrease in water consumption and sewage generation as compared with the No Action scenario, as the proposed project would have approximately 2,000 sf less retail space than the No Action development. Based on demand levels, the proposed project would not result in an incremental increase in demand on the New York City water supply system, and it is expected that there would be adequate water service for the proposed project. Similarly, as compared with the No Action scenario, the proposed project would not result in an incremental increase in sanitary wastewater that would affect the sanitary

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<sup>1</sup> See Table 13-1 of the *CEQR Technical Manual*.

sewage conveyance and treatment system, including the Port Richmond Wastewater Treatment Plant (WWTP): the 54,240 gpd of sanitary sewage generated by the proposed project would be less than the sewage generation of the No Action development. Furthermore, sanitary sewage generated by the proposed project would be equivalent to less than 1 percent of the average daily flow at the Port Richmond WWTP, and would not result in an exceedance of the plant's permitted capacity. Although drainage conditions on the project site would be altered with the proposed project, a stormwater management system would be implemented to treat and discharge all stormwater on the project site into the adjacent wetland area. This would include a 0.77-acre Stormwater Management Area (SMA) that would collect all stormwater originating from the proposed project's building and parking lot area. The SMA would attenuate and treat stormwater to meet the New York State Department of Environmental Conservation (NYSDEC) Stormwater Management Design Manual (SMDM) water quality requirements prior to being directed toward the wetland area. Therefore, the proposed project would not result in any increase in stormwater flows to the City's storm sewer system. Overall, the proposed project would not result in a significant increase in water demand or sanitary and stormwater flows to the City's sewer system, and would not result in any significant adverse impacts on the City's water supply or wastewater and stormwater conveyance and treatment infrastructure.

## **B. METHODOLOGY**

### **WATER SUPPLY**

The *CEQR Technical Manual* recommends a preliminary water analysis if a project would result in an exceptionally large demand of water (over one million gpd), or is located in an area that experiences low water pressure (i.e., in an area at the end of the water supply distribution system such as the Rockaway Peninsula or Coney Island). The project site is not in an area that experiences low water pressure. The proposed project would result in a reduction in water demand as compared to the No Action scenario,<sup>2</sup> and would not represent a significant increase in demand on the New York City water supply system. Therefore, an analysis of water supply is not warranted since it is expected that there would be adequate water service to meet the demand of the proposed project, and there would be no significant adverse impacts on the City's water supply.

### **WASTEWATER AND STORMWATER CONVEYANCE AND TREATMENT**

As described above, the project site is in a separate sewer area in Staten Island. While the proposed project would not exceed the relevant *CEQR Technical Manual* development threshold for a separately sewered area (100,000 sf of incremental commercial space, as compared to the No Action scenario), it would result in the development of a site larger than five acres which would increase the amount of impervious surface. Therefore, this chapter includes an analysis of the proposed project's potential impacts on the wastewater and stormwater conveyance and treatment system. Existing and future water demand and sanitary sewage generation are calculated based on use rates set by the *CEQR Technical Manual*.<sup>3</sup> The DEP Flow Volume Calculation Matrix is used to calculate the overall sanitary sewage and stormwater runoff

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<sup>2</sup> See **Table 6-1 and Table 6-3**, which include calculations of the project site's total water demand in the No Action condition (93,583 gpd) and the With Action condition (92,660 gpd).

<sup>3</sup> *CEQR Technical Manual*, March 2014, Table 13-2.

volume discharged to the 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 comparing these existing rates with the With Action condition, per *CEQR Technical Manual* methodology.

### **C. EXISTING CONDITIONS**

The project site is an approximately 28-acre vacant wooded parcel that contains mapped NYSDEC- and USACE-jurisdictional wetland areas as well as mapped but unbuilt streets. As the project site is undeveloped, there is no existing water demand or sanitary sewage generation. The streets adjacent to the project site contain water distribution and wastewater conveyance infrastructure to which the proposed retail development may connect. Water mains are located along South Avenue to the east of the project site, along Forest Avenue to the north of the project site, and along the built portion of Morrow Street to the west of the project site (two mains leading to the Forest Avenue water main also extend into the project site from the extension of Dwarf Street and in the area between Dwarf Street and Morrow Street).

A sanitary sewer line is located along South Avenue, which primarily serves the residential developments east of the project site: the project site is located within the service area of the Port Richmond Wastewater Treatment Plant (WWTP), which treats sanitary wastewater from much of northern Staten Island by physical and biological process before it is discharged into the Kill Van Kull. The quality of the treated wastewater (effluent) is regulated by a State Pollutant Discharge Elimination System (SPDES) permit issued by 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 Port Richmond WWTP is 60 million gallons per day (mgd). The average monthly flow to the WWTP over the past 12 months is 26 mgd,<sup>4</sup> which is well below the maximum permitted capacity.

Stormwater runoff is the result of rainwater or snowmelt that flows from the surfaces of land or structures. The volume of runoff generated over these surfaces varies depending on permeability factors, which range from pervious (i.e., natural or vegetated surfaces that facilitate percolation to the ground below, generating less runoff), to impervious (i.e., surfaces such as building roofs that do not percolate and just generate runoff). The project site is currently vegetated and is predominantly pervious surface with a low runoff coefficient. Additionally, since the project site is undeveloped, there is also no formal stormwater collection system. What runoff is generated percolates to the ground or drains toward the wetland areas on the project site.<sup>5</sup>

### **D. THE FUTURE WITHOUT THE PROPOSED PROJECT**

As described in Chapter 1, "Project Description," in the future without the proposed project (the No Action scenario), absent the proposed actions the project site is assumed to be redeveloped with a retail center with six new buildings (plus a gas station and automated bank teller) and a

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<sup>4</sup> 12-month period through July 2016.

<sup>5</sup> In addition, a storm sewer is located along South Avenue, which primarily serves the developments to the east of the project site. This storm sewer extends to the south and west along Goethals Road North, where it discharges to an outfall located in the wetland area between Goethals Road North and the Staten Island Expressway.

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parking lot. In accordance with a NYSDEC-approved site plan, the No Action development would not develop a portion of project site, which would be preserved as mapped wetlands, as well as a landscaped buffer between the regulated wetlands and the development area and a stormwater management area.

### CONVEYANCE SYSTEM

The No Action development is expected to include an internal sanitary sewer system to connect the commercial buildings to the existing sanitary sewer line along South Avenue, which would convey sanitary flow from the project site to the Port Richmond WWTP.

In accordance with the NYSDEC-approved site plan, stormwater on the project site would be collected through an internal storm sewer system that would drain into a stormwater management area located within the preserved area on the southern portion of the project site. The stormwater management system would include measures to treat stormwater collected from the No Action development's building rooftops and parking lot area before it is discharged into the wetland area. The system would be similar to the stormwater management system that would be implemented with the proposed project, discussed further below.

### SANITARY FLOWS

**Table 6-1** summarizes the water and sewage generation of the No Action development. For purposes of analysis, the amount of sanitary sewage is estimated to be equal to the entire water demand generated by the development except for water used by air conditioning, which is typically not discharged back into the sewer system. Although a portion of the No Action development's commercial space may be utilized as office space, for the purposes of analysis the full approximately 228,250 gsf development was assumed to generate water demand and sanitary sewage at the rate of retail space, which features a higher sanitary sewage generation rate than office space. The No Action development is expected to generate an estimated 54,780 gpd of daily sanitary sewage with a total water demand of 93,583 gpd. In addition, the New York City Plumbing Code (Local Law 33 of 2007) requires all projects to utilize low-flow plumbing fixtures; with the incorporation of low-flow fixtures, the No Action development would result in less sanitary sewage generation than presented here.

**Table 6-1**  
**No Action Water Consumption and Sewage Generation**

Use	Floor Area (gsf)	Rate*	Consumption (gpd)
<b>Retail</b>			
Domestic	228,250	0.24 gpd/sf	54,780
Air Conditioning	228,250	0.17 gpd/sf	38,803
<b>Total Water Supply Demand</b>			<b>93,583</b>
<b>Total Sewage Generation</b>			<b>54,780</b>
<b>Notes:</b> * Rates are from the <i>CEQR Technical Manual</i> , Table 13-2.			

### STORMWATER FLOWS

The No Action development would result in an increase in impervious surface on the project site, which is currently undeveloped, due to the fully impervious rooftop area and semi-impervious parking lot area. A portion of the project site would remain undeveloped (i.e., the preserved wetland, landscaped buffer, and stormwater management area); in addition, the No

Action development would include landscaped areas within the parking lot, such as planters along the parking aisles. Although the DEP Flow Volume Calculation Matrix considers changes from the existing surface coverage and does not account for changes that may occur in the No Action scenario, for informational purposes the estimated surface area coverage and the resulting stormwater runoff coefficient in the No Action scenario are presented in **Table 6-2**.

**Table 6-2  
No Action Scenario Surface Coverage**

Affected CSO Outfall	Site	Roof	Pavement and Walkways	Other	Grass and Soft Scape	Total
N/A <sup>1</sup>	Total Surface Area (acres)	4.59	11.95	0	11.74 <sup>3</sup>	<b>28.27</b>
	Area (percent)	16%	42%	0%	42%	<b>100%</b>
	Runoff Coefficient <sup>2</sup>	1.00	0.85	0.85	0.20	<b>0.60</b>
<b>Notes:</b>						
Totals may not sum due to rounding.						
<sup>1</sup> The project site is located in a separated sewer area; stormwater is directly discharged to nearby waterbodies and does not flow through a Combined Sewer Overflow (CSO) outfall.						
<sup>2</sup> Weighted Runoff Coefficient calculations based on the DEP Flow Volume Calculation Matrix provided in the <i>CEQR Technical Manual</i> .						
<sup>3</sup> Includes approximately 10.82 acres of preserved wetland, landscaped buffer, and stormwater management area as well as approximately 0.92 acres of landscaped area within the parking lot.						

## E. THE FUTURE WITH THE PROPOSED PROJECT

In the future with the proposed project (the With Action scenario), the proposed project would be constructed on the project site, which would include a retail development similar to the No Action development described above, located within the same development footprint set by the NYSDEC-approved site plan. The proposed project would include approximately 226,000 gsf of total commercial space (approximately 2,000 gsf less than the No Action development). In addition, as a result of the proposed mapping of a 7,721-sf street area at the northwest corner of the project site along Morrow Street, which would accommodate the realignment of the intersection of Morrow Street and Forest Avenue, as well as a 1,102-sf street area at the southern terminus of the street to provide a cul-de-sac on the City map, approximately 8,823 sf (0.20 acres) on the project site would become part of the mapped right-of-way. Therefore, in the With Action scenario, the development area controlled by the applicant would be reduced to 1,222,786 sf (approximately 28.07 acres), as compared with 1,231,609 sf (approximately 28.27 acres) in both the existing and No Action scenarios. As with the No Action development, the proposed project would not develop the portion of project site that would be preserved as mapped wetlands, a landscaped buffer area, and a stormwater management area, in conformance with the NYSDEC-approved site plan.

### CONVEYANCE SYSTEM

The proposed project would utilize an internal sanitary sewer system to convey sanitary flows to the sanitary sewer line along South Avenue and the Port Richmond WWTP, similar to the system utilized by the No Action development. The proposed project would also use a similar internal storm sewer system that would collect and treat stormwater collected on the project site before discharging it into the wetland area, described below.

In addition, in accordance with DEP rules and regulations, any existing water mains within the project site will be abandoned, cut, and plugged. To reflect the change in the City map with the proposed actions (in particular the demapping of portions of Garrick Street, Amador Street,

Albany Avenue, and Morrow Street located on the project site), the City’s drainage plan will be amended to remove any planned sanitary and storm sewers located along the streets to be demapped.<sup>6</sup>

**SANITARY FLOWS**

The proposed project’s estimated water demand and sewage generation is shown in **Table 6-3**. The full approximately 226,000-gsf development was assumed to generate water demand and sanitary sewage at the rate of retail space. The proposed project would result in an estimated total water demand of 92,660 gpd (923 gpd less than the No Action development) and an estimated sanitary sewage generation of 54,240 gpd (540 gpd less than the No Action development).

**Table 6-3  
With Action Water Consumption and Sewage Generation**

Use	Floor Area (gsf)	Rate*	Consumption (gpd)
<b>Retail</b>			
Domestic	226,000	0.24 gpd/sf	54,240
Air Conditioning	226,000	0.17 gpd/sf	38,420
<b>Total Water Supply Demand</b>			<b>92,660</b>
<b>Total Sewage Generation</b>			<b>54,240</b>
<b>Note:</b>			
* Rates are from the <i>CEQR Technical Manual</i> , Table 13-2.			

The 54,240 gpd of sanitary sewage generated by the proposed project would be equivalent to less than 1 percent of the average daily flow of the Port Richmond WWTP (26 mgd), and would not result in an exceedance of the plant’s permitted capacity of 60 mgd (as noted above, the existing flows to the Port Richmond WWTP are well below the permitted capacity). As noted above, the total sanitary sewage would be a reduction in flows to the plant as compared to the No Action scenario (which would result in 54,780 gpd of sanitary sewage, shown in **Table 6-2**), as a result of the reduction of retail space with the proposed project. In addition, as with the No Action development, the proposed project would be required to utilize low-flow plumbing fixtures in accordance with the New York City Plumbing Code (Local Law 33 of 2007), which would further reduce sanitary flows to the plant. Therefore, as compared to the No Action scenario, the proposed project would not result in an incremental increase in sanitary wastewater flows to the City’s sewers, and would not result in a significant adverse impact to the City’s sanitary sewage conveyance and treatment system.

**STORMWATER FLOWS**

As noted above, as a result of the mapping of portions of Morrow Street the development area controlled by the applicant would be reduced to approximately 28.07 acres. **Table 6-4** summarizes the surface area coverage of the proposed project and the resulting runoff coefficient. The proposed project would be largely similar to the No Action development, but would result in a slight increase in fully impervious rooftop area and a slight decrease in semi-

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<sup>6</sup> The project site’s tax map includes notations of easements related to the mapped but unbuilt streets, but a title search of the property confirmed that these do not represent easements of record. As such, there are no easements (including sewer easements) on the project site.

impervious paved area (the proposed project would provide an equal amount of undeveloped preserved area but would provide more landscaped area within the parking lot). However, these changes in surface coverage would not substantially increase the runoff coefficient: the proposed project would have a coefficient of 0.59, a slight decrease from the No Action development (0.60).

**Table 6-4  
With Action Surface Coverage**

Affected CSO Outfall	Site	Roof	Pavement and Walkways	Other	Grass and Soft Scape	Total
N/A <sup>1</sup>	Total Surface Area (acres)	5.04	10.51	0	12.52 <sup>3</sup>	<b>28.07</b>
	Area (percent)	18%	37%	0%	45%	<b>100%</b>
	Runoff Coefficient <sup>2</sup>	1.00	0.85	0.85	0.20	<b>0.59</b>

**Notes:**  
<sup>1</sup> The project site is located in a separated sewer area; stormwater is directly discharged to nearby waterbodies and does not flow through a CSO outfall.  
<sup>2</sup> Weighted Runoff Coefficient calculations based on the DEP Flow Volume Calculation Matrix provided in the *CEQR Technical Manual*.  
<sup>3</sup> Includes approximately 10.82 acres of preserved wetland, landscaped buffer, and stormwater management area as well as approximately 1.70 acres of landscaped area within the parking lot.

Using the sanitary and stormwater flow calculations, the DEP Flow Volume Calculation Matrix was completed for the existing conditions and the proposed project (the With Action condition). According to the *CEQR Technical Manual*, the goal of the Flow Volume Calculation Matrix is to determine storm water volumes entering the sewer system and compare those to existing conditions. If the matrix analysis shows an increase of 5 percent or more for any rainfall event, further analysis may be warranted, subject to the review of DEP.<sup>7</sup> The calculations from the Flow Volume Calculation Matrix include four rainfall volume scenarios with varying durations. The summary table of the Flow Volume Calculation Matrix is included in **Table 6-5**.

**Table 6-5  
DEP Flow Volume Matrix: Existing and With Action Comparison**

Rainfall Volume (in.)	Rainfall Duration (hr.)	Runoff Volume to Direct Drainage	Runoff Volume to SS (MG)	Sanitary Volume to SS (MG)	Total Volume to SS (MG)	Runoff Volume to Direct Drainage	Runoff Volume to SS (MG)	Sanitary Volume to SS (MG)	Total Volume to SS (MG)	Increased Total Volume to SS (MG)
		Existing				With Action				
		28.27 Acres				28.07 Acres				
0.00	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.40	3.80	0.06	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00
1.20	11.30	0.18	0.00	0.00	0.00	0.54	0.00	0.00	0.00	0.00
2.50	19.50	0.38	0.00	0.00	0.00	1.12	0.00	0.00	0.00	0.00

**Notes:** SS = Storm Sewer; MG = Million Gallons.  
 The Flow Volume Matrix typically assesses the increase in total wastewater flow to a combined sewer system; because the project site is in a separated sewer area, the Matrix summary has been modified to show only the increase in stormwater flows to the sewer system during the four rainfall events.

The proposed project would include a 0.77-acre SMA located to the south of the retail buildings that would collect all stormwater originating from the proposed project’s building and parking lot area (subject to the NYSDEC-approved site plan, the SMA would also be provided with the

<sup>7</sup> For certain drainage areas, such as the Jamaica Bay watershed, an increase of 2 percent or more may warrant additional analysis.

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No Action development). The SMA would include a stormwater basin designed to retain and release stormwater at the same rates that current conditions allow, thus preventing the potential for erosive discharges. The SMA would attenuate and treat stormwater to meet the NYSDEC SMDM water quality requirements prior to being directed toward the wetland area. In addition, green infrastructure would be implemented to manage stormwater on the project site: in particular, stormwater best management practices (BMPs), such as bioswales, would be implemented in the planted areas in the proposed project's parking lot.

With the implementation of a stormwater management system, which would treat and discharge stormwater on the project site into the adjacent wetland area, the proposed project would not result in any increase in stormwater flows to the City's storm sewer system, and would therefore not exceed the *CEQR Technical Manual* threshold warranting additional analysis. Overall, the water supply and sewer system in the area of the project site would be sufficient to handle the increased water demand and wastewater flow resulting from the proposed project, and the proposed project would not result in any significant adverse impacts to water and sewer infrastructure. \*