Chapter 9: Water and Sewer Infrastructure

A. INTRODUCTION

This chapter evaluates the potential for the Proposed Actions to result in significant adverse impacts on the City's water supply and wastewater and stormwater conveyance and treatment infrastructure.

The Proposed Project would facilitate the redevelopment and re-tenanting of Industry City (the Project Area) with a mixed-use project containing manufacturing, commercial, retail, hospitality, academic and community facility uses (the Proposed Project). This chapter is analyzed under the Density-Dependent Scenario (the With Action condition). The Density-Dependent Scenario conservatively assumes additional academic/community facility and additional Innovation Economy uses in place of warehouse uses, which do not have high water and wastewater infrastructure demands, and would therefore have a higher overall water demand and wastewater generation than the other scenarios.

Given the proposed development and actions that would lower vacancy within existing buildings, an analysis of the Proposed Project's potential impacts on the wastewater and stormwater conveyance and treatment system was performed, following the guidelines of the 2014 *City Environmental Quality Review (CEQR) Technical Manual*.

PRINCIPAL CONCLUSIONS

This analysis finds that the Proposed Project is not anticipated to result in any significant adverse impacts on the City's water supply, wastewater, or stormwater conveyance and treatment infrastructure.

WATER SUPPLY

By 2027, the With Action condition would generate an incremental water demand of 1,262,165 gallons per day (gpd) as compared to the future without the Proposed Project (the No Action condition). This represents a 0.11 percent increase in demand on the New York City water supply system. Based on the results of hydrants flow tests that were completed in the vicinity of the project, it is expected that there would be adequate water service to meet the incremental water demand with the Density-Dependent Scenario, and there would be no significant adverse impacts on the City's water supply.

SANITARY SEWAGE

By 2027, the With Action condition would generate an incremental 725,465 gpd of sewage over the future without the Proposed Actions. This incremental volume in sanitary flow to the combined sewer system would represent approximately 0.77 percent of the average daily flow to the Owls Head Wastewater Treatment Plant (WWTP). This volume would not result in an exceedance of the Owls Head WWTP's capacity, and is not anticipated to create a significant adverse impact on the City's sanitary sewage treatment system.

STORMWATER

The overall volume of stormwater runoff and the peak stormwater runoff rate from the Project Area is anticipated to increase due to the replacement of paved areas with buildings; however, with the incorporation of selected best management practices (BMPs), the peak stormwater runoff rates would be reduced as compared to existing conditions, and the Proposed Project would not have a significant adverse impact on the downstream City combined sewer system or the City sewage treatment system. Additionally, sites fronting existing high level storm sewers constructed on 1st Avenue and 39th Street would no longer discharge stormwater to the combined sewer 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 gpd), or if it is located in an area that experiences low water pressure (i.e., an area at the end of the water supply distribution system such as the Rockaway Peninsula or Coney Island). The Proposed Project is not located in an area that experiences low water pressure, however it would generate an incremental water demand of 1 million gpd. Two hydrant flow tests (HFTs) were completed by the New York City Department of Environmental Protection (DEP) within the vicinity of the Project Area. Performed in October 2013, the HFT results determined that the average water pressure was 60 pounds per square inch (psi). In a letter dated March 21, 2018, DEP confirmed that the existing water mains are sufficient to supply the increased water demand; therefore, it is anticipated 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 *CEQR Technical Manual* indicates that a sewer analysis is warranted if a project site would involve the development on a site of 1 acre or larger within certain drainage areas where the amount of impervious surface increases. The Proposed Project would develop more than 1 acre of land within the Gowanus Canal drainage area and create more impervious surface than currently exists. Additionally, the Proposed Project would develop more than 100,000 square feet (sf) of mixed-use spaces within an M-zoning district. Therefore, 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 systems was performed.

Existing and future water demand and sanitary sewage generation are calculated based on use rates set by the *CEQR Technical Manual*.[1] The DEP 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 Actions (the No Action condition) and the future with the Proposed Actions (the With Action condition), per *CEQR Technical Manual* methodology.

[1] *CEQR Technical Manual*, March 2014, Table 13-2.

C. EXISTING CONDITIONS

WATER SUPPLY SYSTEM

The New York City water supply system—comprised of three watersheds: the Croton, Delaware, and Catskill—extends as far north as the Catskill Mountains, and delivers on average approximately 1.1 billion gallons of water per day to customers in the five boroughs and Westchester County. From these watersheds, potable water is conveyed to the City via a system of reservoirs, aqueducts, and tunnels. Within the City, a grid of water pipes distributes water to customers. Based on a review of available DEP water system mapping, the Project Area is served by water mains located on 2nd Avenue and 39th Street. These water mains serve the Finger Buildings and the 39th Street Buildings that comprise the Project Area.

CONVEYANCE SYSTEM

The Project Area (bounded roughly by 32nd and 39th Streets to the north, 3rd and 2nd Avenues to the east, 37th and 41st Streets to the south, and 2nd Avenue and the Upper New York Bay to the west) is located within a part of Brooklyn that is generally served by a combined sewer system that collects both sanitary sewage and stormwater; however, a portion of the Project Area is also served by a separate high-level storm sewer that conveys stormwater directly into the Upper New York Bay. In periods of dry weather, the combined sewers located in the adjacent streets convey only sanitary sewage. The Project Area currently contains a number of underutilized buildings of Industry City in two primary clusters, which are referred to as the Finger Buildings and the 39th Street Buildings, of which some space is leased to designers, innovators, start-ups, manufacturers, and artists, alongside traditional manufacturing, artisanal craft, and technology sectors. The Project Area is served by a combined sewer running north and south through the center of the Project Area along 2nd Avenue, and a separate storm sewer system in certain areas.

Beneath 1st Avenue and 39th Street adjacent to the 39th Street Buildings, there is a High Level Storm (HLS) sewer system that conveys stormwater to an outfall at the Upper New York Bay. This HLS system serves the portion of the 39th Street Buildings west of 1st Avenue, which is approximately 13 percent (4.12 acres) of the Project Area. The sanitary flow from the buildings is conveyed to a combined sewer that runs along 39th Street to the intersection of 2nd Avenue and 39th Street, and then south and then east to Regulator 7D at the intersection of 43rd Street and 1st Avenue.[2]

Approximately 26 percent (8.30 acres) of the Project Area's sanitary and stormwater flow is conveyed to a combined sewer system serving the portion of the 39th Street Buildings east of 1st Avenue. The combined sewer system runs south along 2nd Avenue, and then east to Regulator 7D. From Regulator 7D, flow is conveyed to an interceptor running along 1st Avenue south to the Owls Head WWTP, located just north of Owls Head Park. The site located adjacent to 1st Avenue also fronts the HLS sewer.

The Finger Buildings are the remaining 62 percent of the Project Area, which is approximately 20.13 acres. The sanitary and stormwater flow is conveyed to the combined sewer in 2nd Avenue to the Bush Terminal Pump Station.

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

At the Owls Head WWTP, wastewater is treated by physical and biological process before it is discharged into the Upper Bay. 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 Owls Head WWTP is 120 million gallons per day (mgd). The average monthly flow over the latest 12-month period for which data are available is 94 mgd,[3] 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 Owls Head 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). The Project Area is located within two CSO drainage areas. In wet weather, sanitary flow and stormwater runoff are conveyed to CSO outfall OH-004, located along the Upper New York Bay, and outfall OH-025, which is located along Gowanus Bay. Additionally, a portion of the Project Area is located adjacent to a separate storm sewer system that flows into the Upper New York Bay.

SANITARY FLOWS

For purposes of analysis, the amount of sanitary sewage is estimated as all water demand generated within the Project Area except water used by air conditioning, which is typically not discharged to the sewer system. **Table 9-1** summarizes the water demand and sewage generation within the Project Area under the existing conditions. The Project Area includes approximately 71,835 sf of retail space, approximately 514,589 sf of office space, approximately 1,543,766 sf of Innovation Economy space, approximately 74,824 sf for the Brooklyn Nets training facility, and approximately 10,000 sf of event space. For the purposes of this analysis, the water demand and sewer generation estimate for the Brooklyn Nets training facility, events space, and academic space are based on retail generation rates found in the *CEQR Technical Manual.* The sanitary sewage generated by the existing conditions is 444,123 gpd, while the water demand is 820,676 gpd.

STORMWATER FLOWS

The Project Area has a combined lot area of approximately 1,417,837 sf (32.55 acres). The Project Area is all paved and/or comprise of existing structures. **Table 9-2** summarizes the surfaces and surface areas, as well as the weighted runoff coefficient (the fraction of precipitation that becomes surface runoff for each surface type). The Project Area is split amongst three stormwater flow areas: approximately 4.12 acres (the portion of the 39th Street Buildings west of 1st Avenue) to a separate storm sewer system, approximately 8.30 acres (the portion of the 39th Street Buildings east of 1st Avenue) in CSO OH-004, and approximately 20.13 acres (the Finger Buildings) in CSO OH-025.

[3] Twelve-month period through March 2017.

Table 9-1
Project Area Water Consumption and Sewage Generation
Existing Conditions

Use	Size/Population	Rate*	Consumption (gpd)
Retail			
Domestic	71,835 sf	0.24 gpd/sf	17,240
Air Conditioning	71,835 sf	0.17 gpd/sf	12,212
Office			
Domestic	514,589 sf	0.10 gpd/sf	51,459
Air Conditioning	514,589 sf	0.17 gpd/sf	87,480
Innovation Economy[1]			
Domestic	1,543,766sf	0.23 gpd/sf	355,066
Air Conditioning	1,543,766sf	0.17 gpd/sf	262,440
Brooklyn Nets Training Facility[2]			
Domestic	74,824 sf	0.24 gpd/sf	17,958
Air Conditioning	74,824 sf	0.17 gpd/sf	12,720
Events[2]			
Domestic	10,000 sf	0.24 gpd/sf	2,400
Air Conditioning	10,000 sf	0.17 gpd/sf	1,700
		Total Water Supply Demand	**820,676**
		Total Sewage Generation	**444,123**

Notes:
* Rates are from the *CEQR Technical Manual* Table 13-2.
[1] Based on East New York Rezoning Proposal FEIS (equal to 10,000 gpd/acre); Includes Manufacturing and Artisanal Manufacturing
[2] Utilizes Retail rates for calculation
Storage/warehouse uses are assumed to not consume water or generate wastewater for purposes of the analysis. Results also do not include vacant properties/spaces. (East Harlem Rezoning FEIS pg. 11-4)

Table 9-2
Existing Surface Coverage

Affected CSO Outfall	Surface Type	Roof	Pavement and Walkways	Other	Grass and Soft Scape	Total
Separate storm sewer	Area (percent)	84%	16%	0%	0%	**100%**
	Surface Area (sf)	150,246	29,250	–	-	**179,496**
	Runoff Coefficient	1.00	0.85	–	-	**0.98***
OH-004	Area (percent)	54%	46%	0%	0%	**100%**
	Surface Area (sf)	195,977	165,713	–	–	**361,690**
	Runoff Coefficient	1.00	0.85	–	–	**0.93***
OH-025	Area (percent)	60%	40%	0%	0%	**100%**
	Surface Area (sf)	522,796	353,856	-	-	**876,652**
	Runoff Coefficient	1.00	0.85	-	-	**0.94***

Notes:
* The Runoff Coefficient is a weighted average. The calculations are based on the DEP Volume Calculation Matrix provided in the *CEQR Technical Manual*, retrieved December 2017.
Totals may not sum due to rounding.

D. THE FUTURE WITHOUT THE PROPOSED ACTIONS

In the No Action scenario, it is expected that no new development would take place within the Project Area. While no new development would take place, it is anticipated that approximately 140,000 gsf of the currently vacant space within the existing building stock at Industry City would be re-occupied by Innovation Economy, storage/warehousing, or retail uses. The reduction in vacancy within the No Action scenario would coincide with an anticipated ten percent increase in Innovation Economy, which would be accommodated by the existing building stock at Industry

City. Some of the currently vacant space in the Finger Buildings at Industry City would be anticipated to be re-occupied by storage/warehousing or Innovation Economy uses.

Together with existing uses that would remain, the No Action condition would comprise of 200,000 gsf of retail space, approximately 559,569 sf of office space, approximately 1,678,707 sf of Innovation Economy space, 74,824 sf for the Brooklyn Nets training facility (unchanged from the existing conditions), and 10,000 sf of event space (unchanged from the existing conditions).

CONVEYANCE SYSTEM

It is expected that the sewers in 39th Street and 1st and 2nd Avenues would continue to be used in the No Action condition, which would convey the sanitary and stormwater flow from the Project Area to the Owls Head WWTP.

SANITARY FLOWS

Table 9-3 summarizes the water demand and sewage generation of the No Action condition of the Proposed Project. The Project Area would be developed under the existing zoning with an increase to retail, office, and Innovation Economy space. As stated above, the water demand and sewer generation estimate for the Brooklyn Nets training facility and events space are based on retail generation rates as found in the *CEQR Technical Manual.* The No Action condition would generate 510,418 gpd of sanitary sewage, while the water demand would be 939,344 gpd.

Table 9-3
Project Area Water Consumption and Sewage Generation
No Action Condition

Use	Size/Population	Rate*	Consumption (gpd)
Retail			
Domestic	200,000 sf	0.24 gpd/sf	48,000
Air Conditioning	200,000 sf	0.17 gpd/sf	34,000
Office			
Domestic	559,569 sf	0.10 gpd/sf	55,957
Air Conditioning	559,569 sf	0.17 gpd/sf	95,127
Innovation Economy[1]			
Domestic	1,678,707sf	0.23 gpd/sf	386,103
Air Conditioning	1,678,707 sf	0.17 gpd/sf	285,380
Brooklyn Nets Training Facility[2]			
Domestic	74,824 sf	0.24 gpd/sf	17,958
Air Conditioning	74,824 sf	0.17 gpd/sf	12,720
Events[2]			
Domestic	10,000 sf	0.24 gpd/sf	2,400
Air Conditioning	10,000 sf	0.17 gpd/sf	1,700
		Total Water Supply Demand	**939,344**
		Total Sewage Generation	**510,418**

Notes:
* Rates are from the *CEQR Technical Manual* Table 13-2.
[1] Based on East New York Rezoning Proposal FEIS (equal to 10,000 gpd/acre); Includes manufacturing and artisanal manufacturing
[2] Utilizes retail rates for calculation
Storage/warehouse uses are assumed to not consume water or generate wastewater for purposes of the analysis. Results also do not include vacant properties/spaces. (East Harlem Rezoning FEIS pg. 11-4)

STORMWATER FLOWS

In the future without the Proposed Project, the one-story building that abuts Building 9 to the west and the former powerhouse at 2nd Avenue and 32nd Street would be demolished. Therefore, surface types and areas would change, affecting the stormwater flows that would be anticipated for the Project Area. The No Action condition would replace approximately 1.85 acres of roof area with paved surface, creating a total of approximately 18.10 acres of roof area and approximately 14.45 acres of paved area (see **Table 9-4**).

Table 9-4
Industry City Development Surface Coverage
No Action Condition

Affected CSO Outfall	Surface Type	Roof	Pavement and Walkways	Other	Grass and Soft Scape	Total
Separate storm sewer	Area (percent)	70%	30%	0%	0%	**100%**
	Surface Area (sf)	150,246	65,306	–	-	**215,552**
	Runoff Coefficient	1.00	0.85	–	-	**0.95***
OH-004	Area (percent)	44%	56%	0%	0%	**100%**
	Surface Area (sf)	144,314	181,320	–	–	**325,634**
	Runoff Coefficient	1.00	0.85	–	–	**0.92***
OH-025	Area (percent)	56%	44%	0%	0%	**100%**
	Surface Area (sf)	493,907	382,745	-	-	**876,652**
	Runoff Coefficient	1.00	0.85	-	-	**0.93***

Notes:
* The Runoff Coefficient is a weighted average. The calculations are based on the DEP Volume Calculation Matrix provided in the *CEQR Technical Manual*, retrieved December 2017.
Totals may not sum due to rounding.

E. THE FUTURE WITH THE PROPOSED ACTIONS

The Proposed Project (Density-Dependent Scenario) would retain approximately 4.8 million sf of existing structure on the Project Area, with one new development site in the 39th Street Buildings area, and two new developments in the Finger Buildings area. These new buildings would replace buildings that are presently located on those sites. The existing and new buildings in the Finger Buildings area located along 2nd Avenue would include approximately 497,911 sf of retail space, approximately 152,543 sf of hotel, approximately 1,913,406 sf of Innovation Economy space, approximately 18,671 sf of event space, and approximately 627,674 sf of academic space.

The 39th Street Buildings east of 1st Avenue would include approximately 363,774 sf of retail space, approximately 134,457 sf of hotel, and approximately 933,860 sf of Innovation Economy space, and would continue to include the existing Brooklyn Nets training facility. Lastly, the 39th Street Buildings west of 1st Avenue would include approximately 900,388 sf of Innovation Economy space, approximately 38,315 sf of retail space, and approximately 24,332 sf of event space. Office space would account for approximately 936,914 sf of the 2,810,742 sf dedicated to Innovation Economy use across Industry City. The With Action condition would result in more water consumption and generate more sewage than the No Action condition. The results of the analysis on water and sewer infrastructure are described in the sections below.

WATER SUPPLY

As shown in **Table 9-5**, the Proposed Project would result in a total water demand of 2,201,509 gpd; this would be an incremental water demand of 1,262,165 gpd as compared to the No Action condition. This incremental increase represents a 0.11 percent increase in demand on the New

York City water supply system compared to the City's average daily water use of approximately 1.1 billion gpd; however, it is expected that there would be adequate water service to meet the incremental water demand with the Proposed Project, and there would be no significant adverse impacts on the City's water supply.

Table 9-5
Industry City
Water Consumption and Sewage Generation

Use	Size/Population	Rate*	Consumption (gpd)
Retail			
Domestic	900,000 sf	0.24 gpd/sf	216,000
Air Conditioning	900,000 sf	0.17 gpd/sf	153,000
Office			
Domestic	936,914 sf	0.10 gpd/sf	93,691
Air Conditioning	936,914 sf	0.17 gpd/sf	159,275
Hotel			
Domestic	420 rooms	120 gpd/person/room[3]	100,800
Air Conditioning	287,000	0.17 gpd/sf	48,790
Innovation Economy[1]			
Domestic	2,810,742 sf	0.23 gpd/sf	646,471
Air Conditioning	2,810,742sf	0.17 gpd/sf	477,826
Brooklyn Nets Training Facility[2]			
Domestic	74,824 sf	0.24 gpd/sf	17,958
Air Conditioning	74,824 sf	0.17 gpd/sf	12,720
Events[2]			
Domestic	43,003 sf	0.24 gpd/sf	10,321
Air Conditioning	43,003 sf	0.17 gpd/sf	7,311
Academic[2]			
Domestic	627,674	0.24 gpd/sf	150,642
Air Conditioning	627,674	0.17 gpd/sf	106,705
		Total Water Supply Demand	**2,201,509**
		Total Sewage Generation	**1,235,882**

Notes:
* Rates are from the *CEQR Technical Manual* Table 13-2
[1] Based on East New York Rezoning Proposal FEIS (equal to 10,000 gpd/acre); includes Manufacturing and Artisanal Manufacturing
[2] Utilizes Retail rates for calculation
[3] Assumes two people per room
Storage/warehouse uses are assumed to not consume water or generate wastewater for purposes of the analysis. Results also do not include vacant properties/spaces. (East Harlem Rezoning FEIS pg. 11-4)

CONVEYANCE SYSTEM

For the With Action condition it is anticipated that the existing combined and HLS sewers in the streets adjacent to the Project Area would be available for connection of buildings proposed for development, and would convey the sanitary and stormwater flow from the Project Area to the Owls Head WWTP.

SANITARY FLOWS

As shown in **Table 9-5**, the Proposed Project is expected to generate 1,235,882 gpd of daily sanitary sewage with a total water demand of 2,201,509 gpd. The incremental sanitary sewage generated by the Proposed Project over the No Action condition would be 725,465 gpd. The incremental increase in sewage generation is approximately 0.77 percent of the average daily flow at the Owls Head WWTP and would not result in an exceedance of the WWTP's permitted

capacity of 120 mgd. In addition, in accordance with the New York City Plumbing Code (Local Law 33 of 2007), the Proposed Project would be required and plan to utilize low-flow plumbing fixtures, which would reduce sanitary flows to the plant for the three new development sites. As previously mentioned, 4.8 million sf of the project site is existing buildings. Therefore, the Proposed Project is not anticipated to result in a significant adverse impact to the City's sanitary sewage conveyance and treatment system.

STORMWATER FLOWS

The amount of impervious surfaces created in the No Action condition would remain the same in the With Action condition. However, the division of impervious surfaces—roof and pavement/walkways—would change from the No Action condition to the With Action condition; therefore, the stormwater flow would change (see **Table 9-6**).

Table 9-6
Industry City Development Surface Coverage
With Action Condition

Affected CSO Outfall	Surface Type	Roof	Pavement and Walkways	Other	Grass and Soft Scape	Total
Separate storm sewer	Area (percent)	84%	16%	0%	0%	**100%**
	Surface Area (sf)	150,246	29,250	–	-	**179,496**
	Runoff Coefficient	1.00	0.85	–	-	**0.98***
OH-004	Area (percent)	69%	31%	0%	0%	**100%**
	Surface Area (sf)	251,021	110,669	–	–	**361,690**
	Runoff Coefficient	1.00	0.85	–	–	**0.95***
OH-025	Area (percent)	62%	38%	0%	0%	**100%**
	Surface Area (sf)	542,862	333,789	-	-	**876,652**
	Runoff Coefficient	1.00	0.85	-	-	**0.94***

Notes:
* The Runoff Coefficient is a weighted average. The calculations are based on the DEP Volume Calculation Matrix provided in the *CEQR Technical Manual*, retrieved December 2017.
Totals may not sum due to rounding.

Using these sanitary and stormwater flow calculations, the DEP Volume Calculation Matrix was completed for the existing conditions and the Proposed Project. The calculations from the Volume Calculation Matrix help to determine the change in wastewater volumes to the combined sewer system from existing conditions to With Action condition, and include four rainfall runoff volume scenarios with varying durations. The summary tables of the Volume Calculation Matrix are included in **Table 9-7**.

As shown in **Table 9-7**, the total rainfall volume would increase for CSO outfalls OH-004 and OH-025. The increase in volume is attributable to the increase in the roof surface area resulting from new proposed buildings under the With Action condition as compared with the existing conditions.

The Volume Matrix calculations do not reflect the use of any sanitary and stormwater source control BMPs to reduce sanitary volume and stormwater runoff volumes to the combined sewer system. As noted above, the Proposed Project would incorporate low-flow plumbing fixtures to reduce sanitary flow as required by the New York City Plumbing Code. In addition, stormwater BMPs would be required as part of the DEP site connection approval process for new construction that is making new connections to the city sewer system. Per DEP, existing buildings constructed prior to 2012—where there is neither an increase in roof area nor a change to impervious surfaces within the tax lot and do not require a new/upsized sewer connection(s)—are not required to meet the required stormwater release rate. Specific BMP methods for the sites that would be required

to meet the release rate would be determined with further refinement of the building design and in consultation with DEP, but may include green and blue roofs, stormwater detention tanks, and rainwater reclamation systems**.**

Table 9-7
DEP Volume Matrix: Existing and Build Volume Comparison

Rainfall Volume (in)	Rainfall Duration (hr)	Runoff Volume to SS(MG)	Runoff Volume to CSS (MG)*	Sanitary Volume to CSS (MG)	Total Volume to CSS (MG)	Runoff Volume to SS (MG)	Runoff Volume to CSS (MG)*	Sanitary Volume to CSS (MG)	Total Volume to CSS (MG)	Increased Total Volume to CSS (MG)*
OH-004		Existing				With Action				**OH-004 Increment**
		8.30 acres to CSS; 4.12 acres to storm sewer								
0.00	3.80	0.00	0.00	0.03	0.03	0.00	0.00	0.08	0.08	0.05
0.40	3.80	0.04	0.08	0.03	0.11	0.04	0.09	0.08	0.17	0.06
1.20	11.30	0.13	0.25	0.08	0.33	0.13	0.26	0.24	0.50	0.17
2.50	19.50	0.27	0.52	0.14	0.66	0.27	0.54	0.40	0.94	0.28
OH-025		Existing				With Action				**OH-025 Increment**
		20.13 acres								
0.00	3.80	0.00	0.00	0.01	0.01	0.00	0.00	0.03	0.03	0.02
0.40	3.80	0.00	0.21	0.01	0.21	0.00	0.21	0.03	0.24	0.03
1.20	11.30	0.00	0.62	0.03	0.64	0.00	0.64	0.08	0.72	0.08
2.50	19.50	0.00	1.28	0.05	1.33	0.00	1.33	0.13	1.47	0.14

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

In addition, any development site greater than one acre which discharges into the separated sewer system would be subject to the requirements of the NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-15-002) within the Project Area. A SWPPP containing both temporary erosion and sediment controls and permanent water quality controls would be required to be prepared before commencing any construction activities on any such sites that would convey stormwater flow to a separate storm sewer.

Per DEP, due to the increase in sanitary flow, a hydraulic analysis of the existing sewer system may be required at the time of the site connection proposal application 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 might be a need to amend the existing drainage plan based on the hydraulic analysis calculations. Sewer improvements and/or incorporation of BMPs may be required of the applicant at the time of the site connection proposal, to accommodate the proposed flows.

With the incorporation of the appropriate sanitary flow and stormwater source control BMPs, as well as any sewer improvements that would be required as part of the DEP site connection approval process, it is anticipated that there would be no significant adverse impacts on wastewater treatment or stormwater conveyance infrastructure. ✷