# A. INTRODUCTION

This chapter evaluates the potential for significant adverse impacts on New York City's water supply, wastewater treatment, and stormwater management infrastructure that could result from the proposed rezoning. As discussed in Chapter 1, "Project Description," the RWCDS for future conditions with the proposed rezoning anticipates eight projected development sites, consisting of 1,076 residential units and 81,790 sf of local retail. In addition there are three sites that are considered less likely to be developed, but which are considered potential sites for future development. Compared to future conditions without the proposed rezoning (i.e., the No-Action condition), the incremental change that would result from the Proposed Action at the eight projected development sites is 1,076 residential dwelling units, 74,194 sf of retail space (net) and a decrease of 129,513 of vacant lot area, 53,895 sf of vehicle/open storage/parking, and 79,915 of industrial/manufacturing (mainly accessory manufacturing uses and a vacant manufacturing building). Therefore, new demands would be placed on the City's water and sewer infrastructure network under future conditions with the Proposed Action. Included in this chapter is a description of the existing water supply and wastewater infrastructure in the study area, which identifies changes to water supply, stormwater, and wastewater conditions that could occur in the future with and without the Proposed Action.

# B. PRINCIPAL CONCLUSIONS

**Water Supply**

The eight RWCDS projected development sites occupy 288,711 sf of lot area and are located on approximately six City blocks. The incremental additional water usage on these eight projected development sites as a result of the Proposed Action is expected to total 315,888 gallons per day (gpd), compared to the No-Action condition. This incremental demand would represent less than 1 percent of the City's overall water supply. Changes of this magnitude would not be large enough to have a significant adverse impact on the City's water system.

**Sanitary Sewage**

The rezoning area is served by the Newtown Creek Wastewater Treatment Plant (WWTP), which, in existing conditions, handles an average of approximately 228 millions of gallons per day (mgd) of sewage flow, and is designed to treat a dry weather flow of 310 mgd. The proposed rezoning has the potential to result in an incremental sanitary sewage discharge of just under approximately 316,861 gpd over the No-Action condition. This incremental increase in sanitary flow would not result in significant adverse impacts to the sewage system within the Subcatchment area or to the Newtown Creek WWTP, as it represents approximately 0.1 percent of the facility's current dry weather capacity.

**Stormwater Drainage and Management**

As described in detail below, there would be increases of combined sewer volumes in the area affected by the Proposed Actions, as compared to the No-Action condition. The incremental change in volume to the combined sewer system ranges from approximately 0.05 million gallons (MG) to 0.36 MG for the various rainfall intensity increments.

Based on the analysis pursuant to the *CEQR Technical Manual*, and as described in Section E, with Best Management Practices (BMPs) implemented by the developer of each projected development site, it is concluded that the Proposed Action would not result in significant adverse impacts on the water supply, wastewater or stormwater conveyance and treatment infrastructure.

## C. EXISTING CONDITIONS

### Water Supply

The New York City water supply system comprises three watersheds north and northwest of the City: the Delaware, Catskill, and Croton. From these watersheds, water is conveyed as far as 125 miles to the City via a system of reservoirs, aqueducts, and tunnels. The system has 19 collecting reservoirs, two balancing reservoirs, aqueducts, and tunnels, with several dams, 3 major aqueducts, and 2 large water distribution tunnels, with a third major tunnel under construction and partially in use, and a system of water mains and other facilities. The watersheds of the three systems encompass almost 2,000 square miles, with a storage capacity of about 550 billion gallons. The water flows to the City through aqueducts, reaching most consumers by gravity alone, although some four percent of the City's water must be pumped to its final destination. The current average daily water consumption for the City as a whole is approximately 1.3 billion gallons per day (gpd) according to the New York City Department of Environmental Protection (DEP), the municipal agency that operates the system.

The NYC potable water supply is treated with a variety of chemicals for various reasons, including fluoride added for dental hygiene. DEP conducts regular water quality monitoring to check the levels of treated water and to document compliance with federal and state water quality regulations. The City does not filter its drinking water supply; however, under a consent decree with the US Environmental Protection Agency (EPA) and the NY State Department of Health it is constructing a filtration plant in Van Cortlandt Park in the Bronx to filter water from the Croton system. Currently, the City is not required and is not planning to filter water from the Catskill and Delaware systems.[1]

Within the City, a grid of underground distribution mains brings water to consumers. Large mains—up to 96 inches in diameter—feed smaller mains, such as 8, 12 and 20-inch water-mains, that distribute water to individual locations. These mains also provide water to fire hydrants along many of the City's streets. Pressure regulators control water pressure throughout the City's water supply system.

As described in Chapter 1, "Project Description," the eight identified projected development sites are currently comprised of approximately 79,915 sf of industrial/manufacturing uses and 7,596 sf of retail uses. The remaining lot area of the projected development sites consists of vacant land and vehicle and open storage, which generate minimal to no water demand. Therefore, existing water demand on the eight projected development sites is generated solely by the industrial/manufacturing and retail uses. Based on the *2012 CEQR Technical Manual* water consumption rates, the projected development sites have an estimated water demand of just under approximately 35,046 gpd in existing conditions (refer to Table 9-1). 20,169 gpd of the existing demand is for domestic uses and 14,877 gpd is for air conditioning.

[1] Ascher, Kate, *The Works: Anatomy of a City*, 2005.

**TABLE 9-1**
**Water Consumption and Sewage Generation on the Projected Development Sites– Existing Conditions**

| Land Use | Rate | Area (sf) | Domestic Water/ Wastewater Generation (gpd) | Air Conditioning (gpd) |
|---|---|---|---|---|
| Commercial—Retail | Domestic: 0.24 gpd/sf; A/C: 0.17 gpd/sf | 7,596 | 1,823.0 | 1,291.3 |
| Industrial | Domestic: 10,000 gpd/acre; A/C: 0.17 gpd/sf | 79,915 | 18,346.0 | 13,585.6 |
| Vehicle/Open Storage | N/A | 53,895 | 0.0 | 0.0 |
| Vacant | N/A | 129,513 | 0.0 | 0.0 |
| **Water Consumption Subtotals** | | | **20,169.0** | **14,876.9** |
| **Sewage Generation Subtotal** | | | **20,169.0** | |
| **Total Water Consumption** | | | **35,045.9** | |
| **Total Wastewater Generation** | | | **20,169.0** | |

**Notes:**
1. Use and generation rates from the *CEQR Technical Manual*, unless otherwise noted.
2. Because the *CEQR Technical Manual* does not provide industrial water consumption rates, NYC DEP factors were used in determining industrial domestic water demand. These factors are contained in NYC DEP's *Rules Governing the Design and Construction of Private Sewers or Private Drains*. Industrial air conditioning demand assumes the *CEQR Technical Manual* generation rate.

## Sanitary Sewage

As shown in Figure 9-1, the rezoning area is served by the Newtown Creek WWTP. The majority of the rezoning area is located within Subcatchment area NCB-012, however, small portions of the rezoning area are also located in Subcatchment areas NCB-014 and NCB-015 (see Figure 9-1). Although the rezoning area is located in several Subcatchment areas, the majority of the projected development site area is located within Subcatchment area NCB-012 and therefore it is assumed that all proposed buildings would be served by the NCB-012 Subcatchment area and regulator. The Newtown Creek WWTP is the largest of New York City's 14 wastewater treatment plants with a permitted capacity of 310 million gallons. As shown in Table 9-2, the facility has an average monthly flow (between July 2011 and June 2012) of 228 mgd.

**TABLE 9-2**
**Monthly Average Dry Weather Flows from the Newtown Creek WWTP**

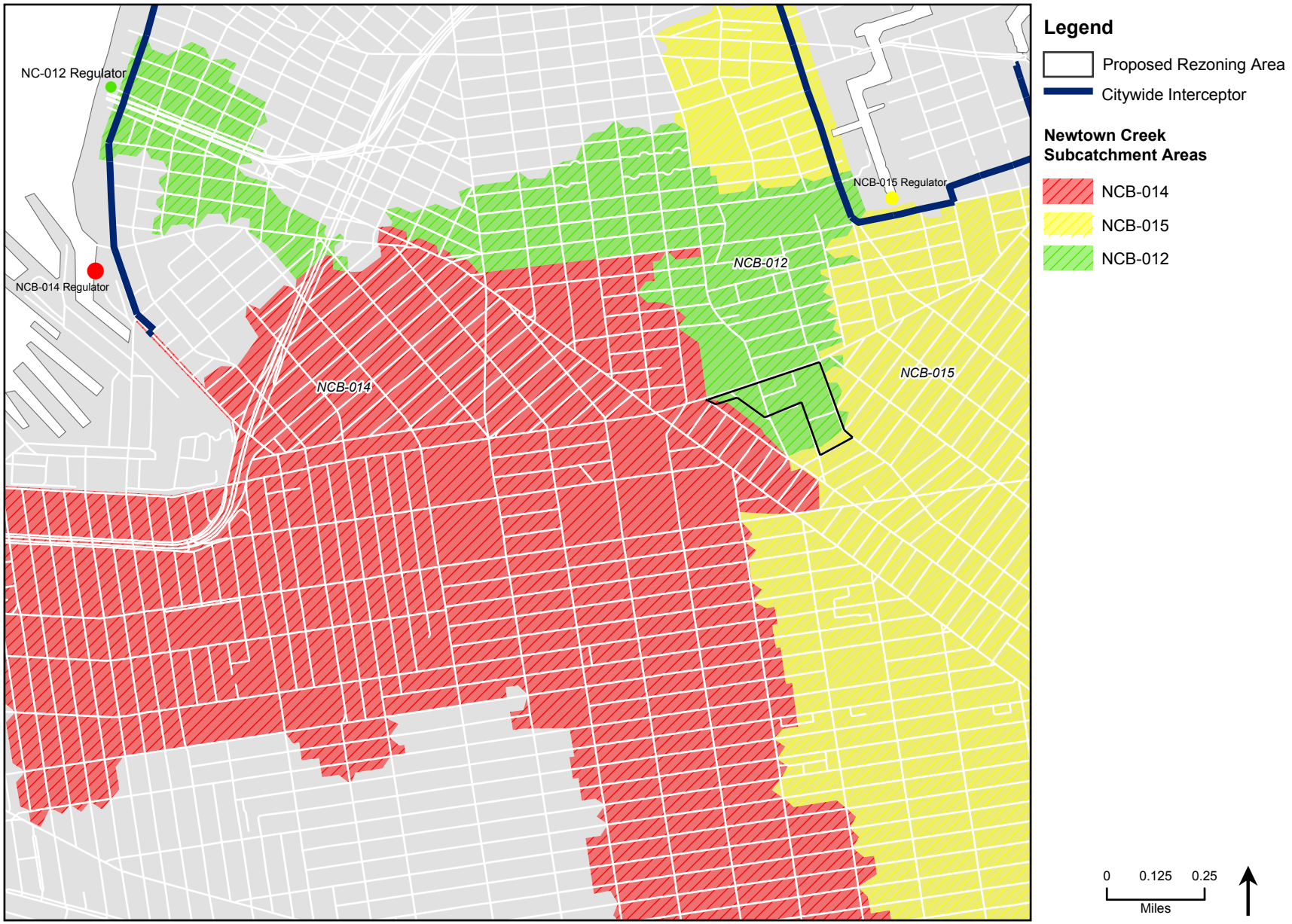
| | Month | Newtown Creek WWTP (mgd) |
|---|---|---|
| 2011 | July | 237 |
| | August | 276 |
| | September | 253 |
| | October | 241 |
| | November | 221 |
| | December | 221 |
| 2012 | January | 215 |
| | February | 207 |
| | March | 197 |
| | April | 205 |
| | May | 227 |
| | June | 237 |
| ***Annual Average*** | | **228.08** |

**Source:** New York City Department of Environmental Protection

The Newton Creek WWTP Upgrade is currently being constructed to bring the plant in compliance with the secondary treatment requirement of the Clean Water Act (85 percent removal of biochemical oxygen demand and total suspended solids.) The proposed upgrade is designed to provide treatment for an annual

**Figure 9-1**

**Newtown Creek Subcatchment Areas**



average flow of 310 mgd and a peak wet weather flow of 700 mgd, and is proposed to be completed by July 2013.

The rezoning area is served by multiple combined sewer lines that connect to the Newtown Creek WWTP. A 15-inch diameter combined sewer flows in a northerly direction along Bushwick Avenue between Arion Place and Montieth Street. A 12-inch diameter combined sewer flows in a northerly direction along Bushwick Avenue between Montieth Street and Flushing Avenue within the vicinity of the rezoning area. There is another 15-inch diameter combined sewer that flows in an easterly direction along Flushing Avenue between Bushwick Avenue and Stanwix Street. This combined sewer continues to flow eastward from Stanwix Street through a 36-inch diameter combined sewer. There is a 24-inch diameter combined sewer that runs in an easterly direction along Montieth Street to Stanwix Street. There is a 12-inch diameter combined sewer that runs along the center of Evergreen Avenue in a northerly direction between George Street and Flushing Avenue. There is a 15-inch diameter combined sewer that flows in an easterly direction along the center of Melrose Street to Evergreen Avenue. Along the demapped portion of Stanwix Street, between Forrest Street and Montieth Street, there is a 12-inch sewer in a permanent sewer easement. Another 12-inch sewer in a permanent sewer easement runs east of Forrest Street between Stanwix Street and Evergreen Avenue.

An amended drainage plan was approved in 2002 for an area located just south and west of the rezoning area. The area is approximately bounded by Bushwick Avenue, Flushing Avenue, Stanwix Street, and Melrose Street. The amended drainage plan was prepared in conjunction with the mapping of Noll Street (between Stanwix Street and Bushwick Avenue) and Renaissance Court (a cul-de-sac located to the west of Stanwix Street). This amended drainage plan established 15-inch diameter combined sewers along Forrest Street, Noll Street, and Renaissance Court, between Stanwix Street and Bushwick Avenue. It also established a 15-inch diameter combined sewer along Stanwix Street between Forrest Street and Melrose Street.

According to the *CEQR Technical Manual*, for assessment purposes, estimates of an area's daily sanitary sewage generation are typically equivalent to the domestic water usage rates. Wastewater from air conditioning systems is not included in the overall volumes used for analysis, as minimal volumes of wastewater are generated from the re-circulation and evaporation processes involved in the air-cooling process. Table 9-1 shows the estimated existing sanitary sewage generation for the projected development sites. As shown in the table, the existing uses on the projected development sites are estimated to consume approximately 20,169 gpd for sanitary (domestic) uses.

**Stormwater Drainage and Management**

Stormwater runoff from impermeable surfaces in the proposed rezoning area is collected by catch basins along the street and conveyed by the City's combined sewer system to the Newtown Creek WWTP. During dry weather, regulators built into the combined sewer system direct flows to interceptor sewers leading to the WWTP. However, during storm events, the regulators allow only twice the dry weather design flow into interceptor sewers and the remaining flow is discharged into the East River.

Stormwater runoff is generated by rainwater that collects on the surfaces of land or built structures. The volume of runoff generated by these surfaces varies depending on the type of land cover, which can be pervious (soil or landscaped surfaces that allow more percolation to the ground below, generating less runoff) or impervious (surfaces such as roads and building rooftops, that impede percolation and generate greater runoff). For example, runoff from an undeveloped site (i.e., not consisting of buildings or asphalt) will percolate into the ground with less runoff to a local street, and the runoff coefficient from pervious land surface is typically about 0.20. In contrast, a building roof has no percolation and, therefore, has a runoff coefficient of 1.00. Paved areas (e.g., streets and sidewalks) primarily generate runoff, with some percolation to the ground below (a runoff coefficient of 0.85 percent).

The majority of the projected development sites are currently occupied by buildings or other impervious surfaces (e.g., parking lots, etc.) that have high runoff coefficients. Some parcels, however, are comprised of grassy areas or dirt and gravel-filled areas that are used as surface parking and storage areas. It is assumed that the buildings on the projected development sites pre-date the DEP requirements and therefore do not provide any on-site detention.

Based on a visual inspection of the aerial of existing conditions of the rezoning area, approximately 32 percent of the projected development sites are comprised of roof (approximately 93,717 sf or 2.2 acres); approximately 27 percent paved (approximately 77,608 sf or 1.8 acres); and 41 percent permeable (approximately 117,386 sf or 2.7 acres). Table 9-3 shows a summary of the surface types under existing conditions.

**TABLE 9-3**
**Surface Types on the Projected Development Sites – Existing Conditions**

| Existing Conditions | | | | |
|---|---|---|---|---|
| Weighted Runoff Coefficient, C | | | | |
| Surface Type[1] | Roof[2] | Pavement & Walks | Grass & Softscape | Total |
| Percentage of Total Area | 32% | 27% | 41% | 100% |
| Surface Area (sf) | 93,717 | 77,608 | 117,386 | 288,711 |
| Runoff Coefficient | 1.00 | 0.85 | 0.20 | 0.63 |

**Notes:**
1. Runoff coefficients for each surface type are as per NYC DEP.
2. Total roof areas within the catchment area.

Total combined flows to the combined sewer system were estimated for existing conditions within the rezoning area using the DEP flow calculations matrix. Table 9-4 shows the total volume of combined flows for the projected development sites for different rainfall events. As shown in the table, depending on the rainfall volume and duration, the total volume to the combined sewer system could be between 0.00 and 0.30 MG within the Newtown Creek WWTP Subcatchment area NCB-012.

**TABLE 9-4**
**Combined Stormwater Runoff and Wastewater Generation on the Projected Development Sites – Existing Conditions**

| Rainfall Volume (inches)* | Rainfall Duration (hours)* | Area = 288,711 (6.6 acres) | | |
|---|---|---|---|---|
| | | Runoff Volume to Combined Sewer System (MG) | Sanitary Volume to Combined Sewer System (MG) | Total Volume to Combined Sewer System (MG) |
| 0.00 | 3.80 | 0.00 | 0.003 | 0.00 |
| 0.40 | 3.80 | 0.05 | 0.003 | 0.05 |
| 1.20 | 11.30 | 0.14 | 0.009 | 0.14 |
| 2.50 | 19.50 | 0.28 | 0.016 | 0.30 |

**Notes:**
MG = Million Gallons
* Based on information provided by NYC DEP

# D. THE FUTURE WITHOUT THE PROPOSED ACTION (NO-ACTION CONDITION)

Under this scenario, the projected development sites are assumed to remain unchanged from their existing condition. As such, it is expected that the existing water demand, sewage generation, and stormwater runoff would remain the same in the 2016 No-Action condition.

As mentioned above, the Newtown Creek WWTP is currently undergoing a major upgrade, which would bring the plant into compliance with secondary treatment requirements mandated by the Clean Water Act pertaining to wastewater that flows to the plant from the surrounding drainage area. According to DEP, these upgrades are expected to be completed by 2013.

# E. FUTURE WITH THE PROPOSED ACTION (WITH-ACTION CONDITION)

As described in Chapter 1, "Project Description," for conservative analysis purposes, the RWCDS of the Proposed Action would result in the development of 1,076 residential units and 81,790 sf of commercial/retail space on the eight projected development sites.

## Water Supply

In the future with the Proposed Action, it is estimated that the proposed rezoning would result in new water demand. The rezoning and the subsequent development that is expected to occur on the eight projected development sites would add incremental demand to the Subcatchment area. With the anticipated mix of uses that is expected on the projected development sites in the future with the Proposed Action, water consumption would likely increase as compared to the Existing and No-Action condition water demand. As shown below in Table 9-5, the anticipated water demand on the projected development sites is expected to be approximately 337,030 gpd, an increase of 315,888 gpd over water demand in the No-Action and Existing conditions. Future demand from the projected development sites in the With-Action condition would represent less than 1 percent of the City's water supply demand. The incremental demand with the Proposed Action would, therefore, not adversely impact the City's water supply or system water pressure.

### Sanitary Sewage

As indicated above, the anticipated incremental sewage demand as a result of the proposed rezoning would increase by 316,861 gpd from the Existing and No-Action conditions (approximately 20,169 gpd) to the With-Action condition (337,030 gpd). This incremental increase of approximately 316,861 gpd in sanitary flow would not result in adverse impacts to the sewage system within the Newtown Creek WWTP as it is approximately 0.1 percent of the WWTP's current dry weather capacity. The Proposed Action would not adversely affect the treatment efficiencies of the WWTP or cause the plant to not properly treat the wastewater prior to discharge. Overall, the proposed rezoning would not cause significant adverse impacts on the sewer system. Furthermore, this analysis conservatively takes no credit for reductions that would be expected from the water saving features that may be associated with the projected developments (e.g., low-flow fixtures), which would help to reduce sewage generation.

**TABLE 9-5**
**Water Consumption and Sewage Generation on the Projected Development Sites – No- and With-Action Conditions**

| Use | Rate | Conditions in the Future Without the Proposed Action | | | Conditions in the Future With the Proposed Action | | | Incremental Change With the Proposed Action | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Area (sf) | Domestic Water/ Wastewater Generation (gpd) | A/C (gpd) | Area (sf) | Domestic Water/ Wastewater Generation (gpd) | A/C (gpd) | Area (sf) | Domestic Water/ Wastewater Generation (gpd) | A/C (gpd) |
| Residential | Domestic: 100 gpd/person; A/C: 0 gpd/sf | 1,076,074 | 317,400 | 0.0 | 0.0 | 0.0 | 0.0 | 1,076,074 | 317,400 | 0.0 |
| Commercial —Retail | Domestic: 0.24 gpd/sf; A/C: 0.17 gpd/sf | 81,790 | 19,629.6 | 13,904.3 | 7,596 | 1,823.0 | 1,291.3 | 74,194 | 17,806.6 | 12,613 |
| Industrial | Domestic: 10,000 gpd/acre; A/C: 0.17 gpd/sf | 0.0 | 0.0 | 0.0 | 79,915 | 18,346.0 | 13,585.6 | -79,915 | -18,346 | -13,585.6 |
| Vehicle/ Open Storage | N/A | 0.0 | 0.0 | 0.0 | 53,895 | 0.0 | 0.0 | -53,895 | 0.0 | 0.0 |
| Vacant | N/A | 0.0 | 0.0 | 0.0 | 129,513 | 0.0 | 0.0 | -129,513 | 0.0 | 0.0 |
| **Water Consumption Subtotals** | | | **337,029.6** | **13,904.3** | | **20,169.0** | **14,876.9** | | **316,860.6** | **-972.6** |
| **Sewage Generation Subtotal** | | | **337,029.6** | | | **20,169.0** | | | **316,860.6** | |
| **Total Water Consumption** | | | **350,933.9** | | | **35,045.9** | | | **315,888** | |
| **Total Wastewater Generation** | | | **337,029.6** | | | **20,169.0** | | | **316,860.6** | |

**Notes:**
1. Use and generation rates from the *CEQR Technical Manual*, unless otherwise noted.
2. Because the *CEQR Technical Manual* does not provide industrial water consumption rates, NYC DEP factors were used in determining domestic industrial water demand. These factors are contained in NYC DEP's *Rules Governing the Design and Construction of Private Sewers or Private Drains*. Industrial air conditioning demand assumes the *CEQR Technical Manual* generation rate.
3. Residential calculation assumes 2.95 persons per DU, per the 2010 Census information for a half-mile radius around the rezoning area.

### Stormwater Drainage and Management

In the future with the Proposed Action, the projected development sites would continue to contain impervious surfaces such as roofs or asphalt. Table 9-6 shows the surface types that are anticipated on the eight projected development sites under future With-Action conditions. As indicated below, the future With-Action conditions are expected to result in increased roof areas and decreased asphalt and pervious areas.

**TABLE 9-6**
**Surface Types on the Projected Development Sites – With-Action Condition**

| Weighted Runoff Coefficient, C | | | | |
|---|---|---|---|---|
| Surface Type[1] | Roof[2] | Pavement & Walks | Grass & Softscape | Total |
| Percentage of Total Area | 69% | 16% | 15% | 100% |
| Surface Area (sf) | 199,793 | 44,795 | 43,139 | 288,711 |
| Runoff Coefficient | 1.00 | 0.85 | 0.20 | 0.86 |

**Notes:**
1. Runoff coefficients for each surface type are as per NYC DEP.
2. Total roof areas within the catchment area.

Table 9-7 shows the estimated combined flow volumes (stormwater runoff and sanitary flows) to the combined sewer system. As shown in the table, depending on the rainfall volume and duration, the total volume to the combined sewer system could be between 0.05 and 0.66 MG within the Newtown Creek WWTP Subcatchment area NCB-012.

**Table 9-7**
**Combined Stormwater Runoff and Wastewater Generation on the Projected Development Sites – With-Action Condition**

| Rainfall Volume (inches)* | Rainfall Duration (hours)* | Area = 288,711 sf (6.6 Acres) | | |
|---|---|---|---|---|
| | | Runoff Volume to Combined Sewer System (MG) | Sanitary Volume to Combined Sewer System (MG) | Total Volume to Combined Sewer System (MG) |
| 0.00 | 3.80 | 0.00 | 0.050 | 0.05 |
| 0.40 | 3.80 | 0.06 | 0.050 | 0.11 |
| 1.20 | 11.30 | 0.18 | 0.159 | 0.34 |
| 2.50 | 19.50 | 0.39 | 0.274 | 0.66 |

**Notes:**
MG = Million Gallons
* Based on information provided by NYC DEP

The incremental increase over No-Action and Existing conditions, shown below in Table 9-8, indicates that the Proposed Action has the potential to result in incremental increases within the Subcatchment area, with each analyzed scenario indicating an incremental increase of between 0.05 and 0.36 MG for the various rainfall volumes and duration.

**TABLE 9-8**
**Incremental Increase in Combined Stormwater Runoff and Wastewater Generation Flow Volumes to Combined Sewer System on the Projected Development Sites**

| **Rainfall Volume (inches)*** | **Rainfall Duration (hours)*** | **Total Volume to Combined Sewer System (MG)** | | |
|---|---|---|---|---|
| | | **Existing/No-Action Conditions** | **With-Action Conditions** | **Increment** |
| 0.00 | 3.80 | 0.00 | 0.05 | 0.05 |
| 0.40 | 3.80 | 0.05 | 0.11 | 0.06 |
| 1.20 | 11.30 | 0.14 | 0.34 | 0.20 |
| 2.50 | 19.50 | 0.30 | 0.66 | 0.36 |

**Notes:**
MG = Million Gallons
* Based on information provided by NYC DEP

New flows and volumes would be introduced to the combined sewer system as a result of the Proposed Action. These increased volumes and flows would be conveyed to the Newtown Creek WWTP. As such, a BMPs concept plan would be developed to illustrate the opportunities for development lots within the rezoning area to incorporate on-site stormwater source controls during site planning and building design phases of project development.

**Stormwater Best Management Practices Concept Plan**

The following BMP Concept Plan illustrates opportunities for development lots within the proposed rezoning area to incorporate on-site stormwater source controls during site planning and building design phases of project development and help achieve a target stormwater release rate of 0.25 cfs or 10 percent of the allowable flow per the drainage plan, whichever is greater. Refer to Figure 9-2 for the Stormwater BMP Concept Plan showing the potential onsite stormwater source controls.

The increased flows to the combined sewer within the affected CSO Subcatchment area is a direct result of the increased densities and sanitary flows associated with the Proposed Action. The implementation of low-flow fixtures, as per the New York City Plumbing Code, Local Law 33 of 2007 and the US Environmental Protection Agency's WaterSense Program, will help to control sanitary flows. To further offset these increases, onsite stormwater source controls or BMPs would be implemented to retain or slowly release stormwater runoff with controlled discharge rates to the City's combined sewer system.

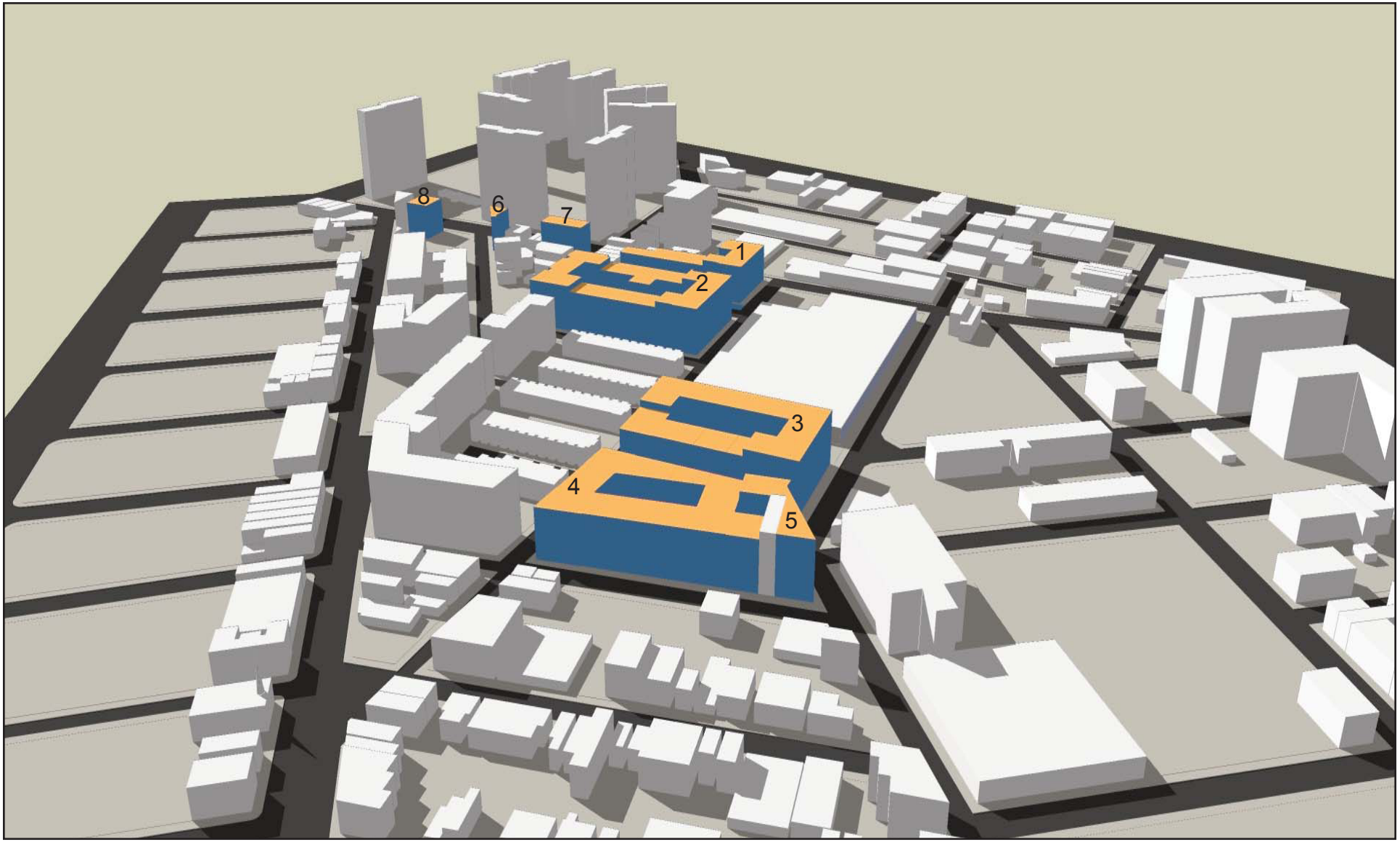
Enhanced stormwater management throughout the City is consistent with recent policies including the *NYC Green Infrastructure Plan* and Mayor Bloomberg's *PlaNYC 2030* and *Sustainable Stormwater Management Plan*. The *NYC Green Infrastructure Plan*, released September 2010, includes a goal of capturing the first inch of rainfall on 10 percent of the impervious areas in combined sewer watersheds through detention or infiltration techniques over 20 years.

The typical BMP measures described would help to avoid an exacerbation of existing CSOs. These measures may include the implementation of BMPs described in the NYC Green Infrastructure Plan, including blue and green roofs, subsurface detention, porous pavement, enhanced tree pits, rain gardens or infiltration swales and rain cisterns.

Self-certification of house or site connection proposals will not be permitted by the Department of Buildings or DEP in connection with any proposed new developments or expansions of existing development as per the Rules of the City of New York, Title 15, Chapter 31, "Rule Governing House / Site Connections to the Sewer System." 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, proposed rezoning may result in development that is inconsistent with the design of the existing built sewer system.

For applicant-owned properties, once there is a specific development plan and site characteristics are better defined, BMP selection and design could take place in coordination with DEP. Non-applicant owned properties would be subject to DEP regulations at the time of the site connection application. The applicant would incorporate BMPs to achieve a 0.25 cfs release rate (or 10 percent of the allowable flow, whichever is greater) from the site to the sewer system. To achieve this release rate, the applicant will manage stormwater by utilizing one or more detention or infiltration techniques identified in the *NYC Green Infrastructure Plan*, which may include on-site detention facilities (roof detention, underground storage tanks or tanks within the buildings) or other stormwater source controls, which would be required as part of the DEP site connection approval process. Green roofs and blue roofs would be suitable for retaining or releasing stormwater with slowed discharge rates to control peak run-off rates. On-site detention would be used to store water for gradual release during rain events, freeing up capacity in combined sewers. BMPs that would reduce sanitary sewage volumes such as gray water reuse and low-flow fixtures could also be implemented.

In addition, onsite rain gardens, infiltration swales and stormwater detention may be included in site design. Subsurface detention and infiltration, stone beds, stormwater chambers, and perforated pipes would also allow stormwater to seep into the ground, where site conditions allow, and would store water for gradual release during rain events, freeing up capacity in combined sewers. Walkways, courtyards and other paved areas onsite could be constructed with permeable pavement or porous asphalt to allow for




*For Illustriative purposes only, subject to change based on final design*

Area For Potential Roof Detention

Projected Development

1 Development Site Number

Notes:
1. Sites with subsurface areas have the potential for tanks within subsurface areas of the building.
2. Non-applicant owned properties would be subject to DEP regulations at the time of the site connection application.

infiltration, which would decrease the overall volume of stormwater runoff. These green technologies would retain or release stormwater with slowed discharge rates to control peak runoff rates. Trees planted per NYC's street tree requirements could also be utilized to capture and store water below an enhanced tree pit.

Based on the analysis described above, conducted pursuant to *CEQR Technical Manual* methodologies, and in concert with the measures described above, it is concluded that the Proposed Action would not result in significant adverse impacts to local water supply or wastewater and stormwater conveyance and treatment infrastructure with the above measures in place.

## Street Mapping

The proposed mapping action would result in the mapping of a new section of Stanwix Street from Montieth Street to Forrest Street and Noll Street from Stanwix Street to Evergreen Avenue. The two new streets segments would be paved and open to public traffic, they would also accommodate new public infrastructure. Stanwix Street would have a mapped width of 50 feet, including a 30-foot travel way and two 10-foot sidewalks. Noll Street would also have a width of 50 feet, including a 30-foot travel way and two 10-foot sidewalks. These widths are consistent with the adjacent streets connecting to these newly mapped street segments. The NYC Department of City Planning and NYC Department of Transportation have consulted on the area's circulation plan and recommended the opening of these newly mapped streets.

As the Proposed Action includes the mapping of City streets, an amended drainage plan is required by DEP to be prepared. An amended drainage plan would be prepared by the Applicant and submitted to DEP for review and approval. It is expected that as part of the Proposed Action, a 15-inch diameter combined sanitary sewer would be required within the proposed mapped portion of Noll Street. Any infrastructure improvements required to be provided by the Applicant would be included in the mapping agreement. The drainage plan will determine the required stages of the sewers to serve the area. Should any of the existing adjacent built sewers need to be upgraded to meet the project demands, this would be undertaken at that time. The new sewers would be designed in accordance with the DEP amended drainage plan for the area and will be built to meet all DEP requirements.