

Greenpoint-Williamsburg Rezoning EIS

CHAPTER 13: INFRASTRUCTURE

A. INTRODUCTION

For CEQR analysis purposes, the City's "infrastructure" comprises the physical systems supporting its population, including water supply, wastewater treatment, and stormwater management. Other infrastructure components, such as solid waste management, energy and transportation, are addressed separately under CEQR and are assessed in separate chapters of this document. Given the size of New York City's water supply system and the City's commitment to maintaining adequate water supply and pressures, few actions have the potential to cause significant adverse impacts on this system.

According to the *CEQR Technical Manual*, actions that could affect water pressure and would therefore need detailed assessment include actions that would have exceptionally large demand for water (power plants, large cooling systems, etc.); large developments (e.g., those that use more than one million gallons per day); or actions taking place in locations that have weaknesses in the local water supply distribution systems (e.g. creating a large draw of water at locations at the end of the water system where water pressure is low or locations near pressure boundaries).

The *CEQR Technical Manual* also states that detailed analysis of wastewater treatment is needed for those actions with very large flows that have the potential for significant adverse impacts on sewage treatment. As such, the proposed action is analyzed for the volumes of wastewater it would generate in relation to the State Pollutant Discharge Elimination System (SPDES) permitted capacity of the water pollution control plant servicing the proposed action area.

The *CEQR Technical Manual* also states that a detailed analysis of stormwater management is warranted if a proposed action involves certain types of industrial activities (e.g., manufacturing, processing, or raw materials storage), actions that would greatly increase the amount of paved area, actions that would be served by a separate storm system and that would involve construction activities, or construction of a new stormwater outfall. As the proposed action may result in an increase in the amount of paved area on the projected development sites, an assessment of stormwater management is also provided in this chapter.

The following assessment will indicate that, in the future with the proposed action, development on the projected development sites by the analysis year of 2013 would be expected to generate net new water usage of approximately 3.8 million gallons per day (gpd) and also more than 2.16 million gpd of net new wastewater flows under Scenario A (for Scenario B, net water usage is estimated at 3.9 mgd and net wastewater flows at 2.22 mgd). Although the projected developments that would likely result from the proposed action would create new demand for water and treatment of sewage, this chapter will detail that the existing municipal services have adequate capacity to meet the increases in these demands. Therefore, no significant adverse impacts are expected to result to these services.

B. EXISTING CONDITIONS

Water Supply

New York City's water supply system consists of an extensive network of reservoirs and aqueducts extending as far north as the Catskill region, and a grid of distribution pipes to deliver water from the primary transportation conduits to points of use. Approximately 1.2 billion gallons of water per day are consumed by New York City through this water supply system. Consumption can reach up to 1.5 billion gallons per day (gpd) during the summer months. Potable water for the proposed action area is provided by the New York City water supply system, which consists of a network of aqueducts that bring water from upstate reservoirs. There are no sole source aquifers beneath this area of Brooklyn and neither the groundwater beneath Brooklyn nor the waters of the East River are used as a source for potable water or other uses, such as irrigation or industrial processes.

Most of New York City obtains water from three surface water supply systems—Delaware, Catskill, and Croton—operated by the New York City Department of Environmental Protection (NYCDEP). These systems form a network of reservoirs, aqueducts, and tunnels extending as far as 125 miles north of the City. The system has 18 collecting reservoirs, 2 balancing reservoirs, several dams, 3 major aqueducts, 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 cover almost 2,000 square miles, with 19 reservoirs and three controlled lakes, which have a storage capacity of 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.

One of the three surface water systems, the Croton system, collects water from watershed areas in Westchester and Putnam Counties and delivers it to the Jerome Park Reservoir in the Bronx. From there, it is distributed to the Bronx and Manhattan through the New Croton Aqueduct via City Tunnel No.1. The remaining two surface water systems, the Delaware and Catskill systems, collect water from watershed areas in the Catskill Mountains and deliver it to the Hillview Reservoir in Yonkers. From there, it is distributed to the City through two tunnels: City Tunnel No. 2, which goes through the Bronx, Queens, and Brooklyn (and from there through the Richmond Tunnel to Staten Island) and City Tunnel No. 3, which currently serves the Bronx, upper Manhattan, and Roosevelt Island. The construction of City Tunnel No. 3 was begun in 1996 and is scheduled for completion in 2020. The addition of City Tunnel No. 3 is intended to improve the City's water supply while allowing for the inspection and repair of Tunnels 1 and 2. City Tunnel No. 3, which will serve Midtown Manhattan, Lower Manhattan, Brooklyn, and Queens, is anticipated to be a supplemental water source to the proposed action area.

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

City Tunnel No. 2 currently serves the proposed action area and is sized at 17 feet in diameter in this area. The tunnel feeds a 60-inch trunk main in McGuinness Boulevard, from Jackson Avenue in Queens to Driggs Avenue in Brooklyn; a 60-inch trunk main in Driggs Avenue from McGuinness Boulevard to Leonard Street; a 72-inch trunk main in Leonard Street from Driggs Avenue to Maujer Street; and a 72-inch trunk main in Hooper Street from Maujer Street to the Brooklyn-Queens Expressway and continuing southward into Park Avenue.

The primary water supply to the proposed action area is then furnished by 12- and 20-inch distribution mains which connect to the aforementioned trunk mains. There exists a connection to a 20-inch main in Ash Street at McGuinness Boulevard; a connection to a 20-inch main in McGuinness Boulevard at Calyer Street, which continues into a 20-inch main in Greenpoint Avenue; a connection to a 12-inch main in Metropolitan Avenue at Leonard Street, which is then connected to a 16-inch main in Leonard Street; a connection to a 20-inch main in Driggs Avenue at Leonard Street and a connection to a 20-inch main in South 1st Street at Hooper Street. Buildings drawing upon the water supply would connect to these smaller distribution mains for their water needs.

Table 13-1 presents the estimated water usage and sewage generation at the 76 projected development sites under existing conditions based on usage and generation rates provided in the *CEQR Technical Manual* and *DEP's Draft Rules and Regulations Governing the Construction of Private Sewers & Drains*. As discussed in Chapter 1, "Project Description," the proposed action area is currently occupied by residential, commercial, industrial/manufacturing, institutional, and vehicle and open storage uses, as well as vacant land and vacant buildings. The 76 projected development sites currently contain the following uses: 1,455,168 sf of industrial/manufacturing space, 694,866 sf of vehicle/open storage use, 43,609 sf of automotive use, 122 DUs, and 14,962 sf of commercial use. For the purpose of assessment, usage and generation rates for residential and commercial use were taken from the *CEQR Technical Manual*. All commercial use was conservatively assumed to be retail, as retail uses demonstrate higher water usage and sewage generation rates. Usage and generation rates for industrial/manufacturing uses were adopted from a DEP publication, *DRAFT Rules and Regulations Governing the Construction of Private Sewers & Drains*. Automotive uses, assumed as car repair and service facilities, and vehicle/open storage uses, were subject to the assumptions for industrial/manufacturing uses.

TABLE 13-1
Existing Water Usage/Sewage Generation of Projected Development Sites

Use	Rate ^(1,2)	Area (sf)	Water Usage and Sewage Generation (gpd) ^(1,2)	Air Conditioning (gpd) ^(1,2)
Industrial/Manufacturing	domestic: 10,000 gpd/acre * air conditioning: 0.17 gpd/sf	1,455,168	593,654	247,378
Vehicle/Open Storage	domestic: 10,000 gpd/acre * air conditioning: 0.17 gpd/sf	694,866	300,604	118,127
Automotive	domestic: 10,000 gpd/acre * air conditioning: 0.17 gpd/sf	43,609	13,738	7,414
Residential	domestic: 112 gpd/person ** air conditioning: 0.17 gpd/sf	206,989 [122 DUs]	39,352	35,188
Commercial	domestic: 0.17 gpd/sf *** air conditioning: 0.17 gpd/sf ***	14,962	2,544	2,544
Subtotals ⁽²⁾			949,892 (0.95 mgd)	410,651 (0.41 mgd)
Total All Water Consumption ⁽²⁾			1,360,543 (1.36 mgd)	

⁽¹⁾ gpd = gallons per day; mgd = millions of gallons per day.

⁽²⁾ Usage and generation rates for non-industrial/manufacturing uses from the *CEQR Technical Manual*. Usage and generation rates for industrial/manufacturing uses from DEP's *Draft Rules and Regulations Governing the Construction of Private Sewers and Drains*.

* Industrial/Manufacturing, Vehicle and Open Storage & Automotive Uses: for domestic usage - assume 10,000 gpd per acre multiplied by zoning district factors (1.00 for M1-1, 2.00 for M1-2 and M3-1).

** Assumes 2.88 residents per DU.

*** Commercial Use: all assumed as retail (to be conservative):

As shown in Table 13-1, the existing uses on the 76 projected development sites in the proposed action area are estimated to currently consume approximately 950,000 gallons of domestic water usage (sinks and toilets) and 411,000 gallons of water for air conditioning use each day. The estimated total water usage for the 76 projected development sites is approximately 1,360,000 gallons per day.

Sanitary Sewage and Wastewater Treatment

According to the *CEQR Technical Manual*, for assessment purposes, estimates of an area's daily sanitary sewage generation is 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 recirculation and evaporation processes involved in the air cooling process. As noted earlier in Table 13-1, based on current domestic wastewater flows, the existing uses on the projected development sites currently generate approximately 950,000 gallons of sanitary sewage per day (0.95 mgd).

New York City's sewer system consists of a grid of sewers beneath the streets that send wastewater flows to 14 different treatment plants, known as "water pollution control plants," or "WPCPs," which have a combined capacity to treat a total of approximately 1.77 billion gallons of sewage per day. The areas served by each of these plants are called "drainage basins." Most of this system is a "combined" sewer system—it carries both sanitary sewage from buildings and stormwater collected in catch basins and storm drains. However, some areas of the City, primarily in Queens and Staten Island, operate with separate systems for sanitary sewage and stormwater. In addition, small areas of Staten Island, Brooklyn, and Queens use septic systems to dispose of sanitary sewage. Also, some developments in Staten Island also use small privately owned and operated sewage treatment plants to treat sanitary sewage.

Sewers beneath the City's streets collect sewage from the buildings along the streets. Collection sewers can be one to two feet in diameter on side streets, and three or four feet in diameter under larger roadways. They connect to trunk sewers, generally five to seven feet in diameter, which bring the sewage to interceptor sewers. These large interceptor sewers (often up to 10 or 12 feet in diameter) bring the wastewater collected from the various smaller mains to the water pollution control plants for treatment.

The proposed action area is served by combined sewers that collect both "dry-weather" wastewater (primarily sanitary sewage as well as wastewater from industries) and stormwater. During dry weather, combined sewers function as sanitary sewers, conveying all flows to the WPCPs for treatment. During wet weather, however, large volumes of rainfall runoff (10 to 50 times the dry-weather flow) can enter the system through catch basins along the City's streets. If this water were conveyed to the treatment plants, it would exceed their design capacity, as the plants are designed to handle only twice their average design dry-weather flow for limited periods. To avoid flooding the plants, "regulators" are built into the combined sewers to act as relief valves. These are chambers set to allow two times the average design dry-weather flow into the interceptor. During storms, if a greater amount of wastewater reaches the regulator, the excess is directed to outfalls into the nearest waterway (e.g., the Hudson River, East River, etc.). In the vicinity of the proposed action area there are combined sewer overflow outfalls into the East River. During such overflow periods, a portion of the sanitary sewage entering or already in the combined sewers discharges into the waterway along with the stormwater and debris washed from the streets. This untreated overflow is known as "combined sewer overflow," or "CSO." Combined sewer overflow is a concern because it contains oil and gasoline from street traffic, floating debris (also called "floatables," and usually consisting primarily of street litter), various pollutants from industrial facilities (both

pollutants discharged into the sewer system and pollutants in the runoff from these facilities), and untreated sewage.

The proposed action area is located within the drainage basin for the Newtown Creek Water Pollution Control Plant (WPCP), located at 320 Freeman Street in Greenpoint, Brooklyn. The Newtown Creek WPCP serves northern Brooklyn, a small area of northeastern Queens, as well as Lower Manhattan and part of Manhattan's East Side. The Newtown Creek WPCP is presently fed by two interceptor sewers, one in Kent Avenue with the other in Morgan Avenue. Wastewater generated in the proposed action area flows via the Kent Avenue interceptor into the City's sewer system and is treated at the Newtown Creek WPCP, which then outlets to the East River. The Newtown Creek WPCP is the largest wastewater treatment facility in the City, with a State Pollutant Discharge Elimination System (SPDES) permitted capacity of 310 million gallons per day (mgd). SPDES permits are issued by the New York State Department of Environmental Conservation (NYSDEC). The average actual monthly flow rate at the plant for the latest 12 months of records available (January to December 2003) are shown in Table 13-2. As shown in the table, the average actual monthly flow rate is 236 mgd, which is approximately 76% of the treatment capacity of the plant. The plant handles greater volumes during storm events due to stormwater inflows to the plant.

TABLE 13-2
2003 Monthly Flows at Newtown Creek WPCP

Month	Total Flow (mgd)
January	223
February	224
March	240
April	228
May	219
June	259
July	233
August	258
September	253
October	232
November	235
December	233
12-month average	236
SPDES permitted limit	310
<u>Source:</u> NYC Department of Environmental Protection (NYC DEP)	

In order to limit stormwater flows to the capacity of the existing sewer system's allowable flow, NYCDEP requires stormwater detention for all existing and proposed developments connecting to the combined sewer system if the developed site's storm flow exceeds the allowable flow. Storm water generated by a new development on the waterfront could be discharged directly into the East River, subject to any and all NYSDEC and NYCDEP requirements, without detention.

As discussed in Chapter 10, the increased dry weather sewage resulting from the proposed action would increase the frequency and volume of CSO discharges. An assessment was conducted to predict the

increased frequency and volume of CSOs within the entire Newtown Creek drainage area resulting from the additional dry weather sanitary flows, and the associated changes in pollutant mass loadings. Results of the predictions are presented in Appendix K, and showed that increased CSO frequency, volume, and pollutant mass loadings resulting from the increased dry weather sewage flows were insignificant. Those predictions conservative due to the fact that no credit was taken for the additional open space under the proposed action or the additional on-site stormwater detention discussed above.

The 52-acre Newtown Creek WPCP 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 NYCDEP, these upgrades are expected to be completed by 2013. The upgrades include three new chlorine contact tanks and a chlorination building, which would provide year-round disinfection to meet standards for treated wastewater. The facility would also include a truck unloading station and a new multi-story building which would house personnel facilities, administrative offices, a central lab and a shop area. The facility would also include two public art projects commissioned by the NYC Department of Cultural Affairs' Percent for Art Program, which are intended to enhance the plant.

Recent Capital Projects

Improvements to Sewer System

The City of New York has undertaken a variety of long-term capital projects to mitigate CSOs and has also studied others. Some of these projects represent direct attempts to mitigate CSOs, while other projects are intended primarily to mitigate other related problems, such as increased demand for city water. The following is intended to summarize briefly those projects.

Tide gates and regulator valves have been repaired and updated citywide. A malfunctioning tide gate, for instance, may be stuck in the open or closed position, in either case hampering the stormwater system's ability to properly manage flow. Sewers have been inspected for structural integrity. Normally, sewers exceeding four feet in diameter are given a walk-through inspection, while smaller lines are videotaped from a camera on a pulley. Sewer lines could be compromised if groundwater infiltrates the pipes, further taxing the treatment plants and the system as a whole. Thermometers are used as well to check for groundwater infiltration, since groundwater tends to be about 55 degrees Fahrenheit, a considerably colder temperature than that of typical sanitary sewage. Where a sewer has been compromised, several options are available for repair. Sewers can be completely replaced, spot repaired, or a new lining can be provided. A commonly used method for lining sewers is gunite, a form of concrete that is applied to sewer pipes as a spray.

Sewer repair and replacement is commonly coordinated with major roadway reconstruction, as reconstruction activities are generally coordinated with the various utilities located beneath the roadway to avoid the inconvenience and expense of repeated street excavation. One ongoing project in the area is the reconstruction of Kent Avenue/Franklin Street by the New York City Department of Design and Construction (NYCDDC) on behalf of the New York City Department of Transportation (NYCDOT). This reconstruction project spans Franklin Street from its intersection with Commercial Street in Greenpoint to its intersection (as Kent Avenue) with the Brooklyn-Queens Expressway in Williamsburg and is aimed to enhance the development of the surrounding properties by being able to better handle traffic. In conjunction with the repaving and resurfacing of Kent Avenue/Franklin Street, this project would provide sidewalk, sewer, water, lighting, and traffic control improvements. The sewer work

primarily consists of local street drainage improvements, while the water main work includes upgrading the 20-inch main in Kent Avenue. This project is scheduled for completion in 2008. In addition, NYCDEP will undertake the additional improvements set forth in page 15 of Appendix K. Many of these upgrades are required by the 2005 CSO Consent Order between NYCDEP and NYSDEC.

Water Conservation

During the 1990s, the city's various water pollution control plants came under increased scrutiny from federal and state agencies with oversight powers, primarily because the plants exceeded the dry weather flow allowed in their respective state pollutant discharge elimination system (SPDES) permits. As a result, the City instituted a variety of water conservation measures intended to reduce dry weather flow to these facilities. Fire hydrants opened by neighborhood residents in the summer for use as makeshift sprinklers were equipped with locks. All new fixtures in the City, in existing and new structures, are required to be of a low-flow design (Local Law No. 29, 1989). The City has also implemented a metering program, installing water meters at thousands of properties where water fees had previously been based on property frontage rather than usage, thereby providing a new financial incentive for consumers to conserve. Water rates were increased significantly, increasing incentives to conserve for both those with new meters and old. The City has also implemented leak detection programs to identify and repair leaks in the water distribution system. In addition, once the construction of City Tunnel No. 3 is complete, NYCDEP would be able to conduct its first inspections and repairs of Tunnel Nos. 1 and 2 since they were activated. Other technologies such as gray water systems—where water is recycled within a building for non-potable uses—were explored but never instituted by the City.

The programs instituted have, on the whole, been successful, in that they have somewhat reduced water demand and the load on the City's treatment plants. Often this reduction has been on the order of several million gallons per day. NYCDEP projects that, over the next decade, the savings from these conservation measures would exceed any increase in water demand from consumers.

C. THE FUTURE WITHOUT THE PROPOSED ACTION (NO-ACTION)

In the future without the proposed action, the identified projected development sites are assumed to remain unchanged from existing conditions or become occupied by uses that are as-of-right under existing zoning or made allowable through variances granted by the Board of Standards and Appeals (BSA). Developments granted by BSA variances would generally allow uses that reflect current development trends if sites are vacant, occupied by vacant buildings, or occupied by uses that fail to maximize the potential of a site.

As discussed in Chapter 2, "Land Use, Zoning and Public Policy," DCP has identified 30 of the 76 projected development sites in the Reasonable Worst Case Development Scenario (RWCDs) as sites on which development is projected to occur compliant to as-of-right zoning or through BSA variances in the future without the proposed action (on five additional sites, existing residential use is projected to continue). These No-Action developments would result in additional commercial space and dwelling units. The No-Action RWCDs also includes two development scenarios, Scenarios A and B.

Scenario A would contain 1,294,281 sf of industrial/manufacturing space, 642,686 sf of vehicle/open storage, 32,309 sf of automotive uses, 866 dwelling units (which amounts to 1,062,176 sf of residential

uses), and 83,462 sf of commercial use. As shown in Table 13-3, the 76 projected development sites under Scenario A would consume an estimated 1,065,935 gpd for domestic water use and 529,536 gpd for air conditioning use, yielding a total water consumption of 1,595,470 gpd (approximately 1.60 mgd). Sanitary sewage generated by these sites would be 1,065,935 gpd.

TABLE 13-3

Water Usage/Sewage Generation of Projected Development Sites Under No-Action Conditions (for Scenarios A and B), Compared to Existing Conditions

Use	Rate ^(1,2)	EXISTING			NO-ACTION		
		Area (sf)	Water/Sewage Generation (gpd) ^(1,2)	Air Conditioning (gpd) ^(1,2)	Area (sf)	Water/Sewage Generation (gpd) ^(1,2)	Air Conditioning (gpd) ^(1,2)
SCENARIO A							
Industrial/ Manufacturing	domestic: 10,000 gpd/acre* air conditioning: 0.17 gpd/sf	1,455,168	593,654	247,378	1,294,281	538,418	220,028
Vehicle/ Open Storage	domestic: 10,000 gpd/acre* air conditioning: 0.17 gpd/sf	694,866	300,604	118,127	642,686	284,607	109,257
Automotive	domestic: 10,000 gpd/acre* air conditioning: 0.17 gpd/sf	43,609	13,378	7,414	32,309	8,550	5,493
Residential	domestic: 112 gpd/person ** air conditioning: 0.17 gpd/sf	206,989 [122 DUs]	39,752	35,188	1,062,176 [866 DUs]	220,172	180,570
Commercial	domestic: 0.17 gpd/acre *** air conditioning: 0.17 gpd/acre ***	14,962	2,544	2,554	83,462	14,189	14,189
Subtotals		--	949,892	410,651	--	1,065,935	529,536
TOTAL		1,360,543 (1.36 mgd) ⁽¹⁾			1,595,470 (1.60 mgd) ⁽¹⁾		
SCENARIO B							
Industrial/ Manufacturing	domestic: 10,000 gpd/acre* air conditioning: 0.17 gpd/sf	1,455,168	593,654	247,378	1,422,001	597,059	241,740
Vehicle/ Open Storage	domestic: 10,000 gpd/acre* air conditioning: 0.17 gpd/sf	694,866	300,604	118,127	642,686	284,607	109,257
Automotive	domestic: 10,000 gpd/acre* air conditioning: 0.17 gpd/sf	43,609	13,378	7,414	32,309	8,550	5,493
Residential	domestic: 112 gpd/person ** air conditioning: 0.17 gpd/sf	206,989 [122 DUs]	39,752	35,188	1,062,176 [866 DUs]	220,172	180,570
Commercial	domestic: 0.17 gpd/acre *** air conditioning: 0.17 gpd/acre ***	14,962	2,544	2,554	83,462	14,189	14,189
Subtotals		--	949,892	410,651	--	1,124,576	551,248
TOTAL		1,360,543 (1.36 mgd) ⁽¹⁾			1,675,824 (1.68 mgd) ⁽¹⁾		

⁽¹⁾ gpd = gallons per day; mgd = millions of gallons per day.

⁽²⁾ Usage and generation rates for non-industrial/manufacturing uses from the *CEQR Technical Manual*. Usage and generation rates for industrial/manufacturing uses from DEP's *Draft Rules and Regulations Governing the Construction of Private Sewers and Drains*.

* Industrial/Manufacturing, Vehicle and Open Storage & Automotive Uses: for domestic usage - assume 10,000 gpd per acre multiplied by zoning district factors (1.00 for M1-1, 2.00 for M1-2 and M3-1).

** Assumes 2.27 residents per DU.

*** Commercial Use: all assumed as retail (to be conservative).

Under Scenario B, the TransGas Energy facility is assumed to be an approved development in the future without the proposed action and would occupy the Bayside Fuel Site. As shown in Table 13-3, the uses present on the projected development sites in Scenario B are identical to Scenario A in all categories

except for the category of industrial/manufacturing use, which would contain 1,422,001 sf due to the creation of the TransGas Energy facility. As shown in Table 13-3, the 76 projected development sites under Scenario B would consume approximately 1,124,576 gpd for domestic water use and 551,248 gpd for air conditioning use, yielding a total water consumption of 1,675,824 gpd (approximately 1.68 mgd). Sanitary sewage generated by these sites would be 1,124,576 gpd (approximately 1.12 mgd).

Water Supply

Under Scenario A in the future without the proposed action, water usage on the RWCDs projected development sites would be approximately 1.60 mgd (1.07 mgd for water and 0.53 mgd for air conditioning), an increase of 0.24 mgd from existing conditions. Under Scenario B, water usage would be approximately 1.68 mgd (1.13 mgd for water and 0.55 mgd for air conditioning), an increase of 0.32 mgd from existing conditions. This incremental demand is not large enough to significantly impact the ability of the City's water system to deliver water in the future without the proposed action. The existing water mains within the proposed action area would continue to provide adequate water pressure in the future without the proposed action. In addition, as noted above, in conjunction with the reconstruction of Kent Avenue/Franklin Street, water and sewer infrastructure improvements would occur along this corridor.

Sanitary Sewage and Wastewater Management

Sewage flows under Scenario A on the RWCDs projected development sites in the future without the proposed action would be the same as the increase in domestic water demand (approximately 1.07 mgd), an increase of 0.12 mgd from existing conditions, which represents about 0.05% of the average wastewater flows at the Newtown Creek WPCP and 0.04% of its SPDES permitted flows. Sewage flows under Scenario B would be approximately 1.12 mgd, an increase of 0.17 mgd from existing conditions, which represents about 0.07% of the average wastewater flows at the Newtown Creek WPCP and 0.05% of its SPDES permitted flows. Increases in wastewater volumes under both scenarios in the future without the proposed action would allow the Newtown Creek WPCP to continue operation within its current design capacity and SPDES-permitted limits.

Stormwater Management

The 76 RWCDs projected development sites in the proposed action area are predominantly covered by rooftops (buildings) and vacant lots with generally impervious surfaces. In the future without the proposed action, under both scenarios, no reduction in the amount of impervious surfaces is anticipated, as development would occur in existing buildings or on vacant parcels of land. Under No Action conditions, approximately 30 upland sites are expected to be developed. As noted previously, NYCDEP requires stormwater detention for existing or for new developments fronting on streets with combined sewers if the developed site's storm flow exceeds the allowable flow.

D. THE FUTURE WITH THE PROPOSED ACTION (WITH-ACTION)

In the future with the proposed action, all of the vehicle/open storage uses and most of the industrial/manufacturing and automotive uses on the projected development sites identified in the RWCDs are expected to be replaced by residential and commercial use. It is anticipated that a total of approximately 8,257 dwelling units and approximately 337,160 square feet of local retail space would be developed on the 76 upland and waterfront projected development sites.

As described in Chapter 1, “Project Description,” under Scenario A, the projected incremental (net) change that would result from the proposed action at the 76 projected development sites is 7,391 DUs, 253,698 sf of local retail, a new park containing approximately 27.8 acres of land area, -1,136,269 sf of industrial/manufacturing space, -642,686 sf of vehicle and open storage uses, -949,997 sf of vacant land and -24,876 sf of automotive uses.

Under Scenario B, the projected incremental change that would result from the proposed action at the 76 projected development sites is 7,391 DUs, 253,698 sf of local retail, a new park with approximately 15.9 acres of land area, -1,076,864 sf of industrial/manufacturing space, -642,686 sf of vehicle and open storage uses, -555,764 sf of vacant land and -24,876 sf of automotive uses.

Water Supply

As shown in Table 13-4, under Scenario A in the future with the proposed action, total water usage on the projected development sites would be 3,757,890 gpd (3.76 mgd), resulting in a net increase of approximately 2.16 mgd over the No-Action Scenario A levels identified earlier in this chapter, and an increase of 0.18% from the City’s current water demand of 1.2 billion gallons daily. Under Scenario B, water usage on the projected development sites would be 3,900,908 (3.9 mgd), resulting in a net increase of approximately 2.22 mgd over the No-Action Scenario B levels identified earlier in this chapter, and an increase of 0.19% from the City’s current daily water demand. This small incremental demand is not large enough to significantly impact the ability of the City’s water system to deliver water. Moreover, as noted above, in conjunction with the reconstruction of Kent Avenue/Franklin Street, which would be completed in the future without the proposed action, water infrastructure improvements would occur along Kent Avenue, which would enhance the system’s ability to handle additional demand. As such, the proposed action would not create significant adverse impacts upon the City’s water supply or local water pressure.

Sanitary Sewage and Wastewater Management

Sanitary sewage flows under Scenario A in the future with the proposed action would be approximately 2.21 mgd, an increase of approximately 1.14 mgd from flows projected for No-Action Scenario A, an increment which represents about 0.5% of the average wastewater flows at the Newtown Creek WPCP and 0.4% of its SPDES permitted flows. Under Scenario B, sewage flows are estimated at 2.31 mgd, an increase of 1.19 mgd from flows projected for No-Action Scenario B, an increment which represents about 0.5% of the average wastewater flows at the Newtown Creek WPCP and 0.4% of its SPDES permitted flows. The increase in sanitary sewage resulting from the proposed action is not anticipated to adversely impact the Newtown Creek WPCP nor cause it to exceed its design capacity or SPDES permit

flow limit. Moreover, as noted above, in conjunction with the reconstruction of Kent Avenue/Franklin Street, which would be completed in the future without the proposed action, sewer infrastructure improvements would occur along Kent Avenue, which would enhance the system's ability to handle additional demand. As such, the proposed action would not create significant adverse impacts upon the City's sanitary sewage and wastewater management system.

TABLE 13-4

Water Usage/Sewage Generation of Projected Development Sites Under With-Action Conditions (for Scenarios A and B), Compared to No-Action Conditions

Use	Rate	NO-ACTION			WITH-ACTION		
		Area (sf)	Water/Sewage Generation (gpd) ^(1,2)	Air Conditioning (gpd) ^(1,2)	Area (sf)	Water/Sewage Generation (gpd) ^(1,2)	Air Conditioning (gpd) ^(1,2)
SCENARIO A							
Industrial/ Manufacturing	domestic: 10,000 gpd/acre* air conditioning: 0.17 gpd/sf	1,294,281	538,418	220,028	158,012	46,984	26,862
Vehicle/ Open Storage	domestic: 10,000 gpd/acre* air conditioning: 0.17 gpd/sf	642,686	284,607	109,257	0	0	0
Automotive	domestic: 10,000 gpd/acre* air conditioning: 0.17 gpd/sf	32,309	8,550	5,493	7,433	2,839	1,264
Residential	domestic: 112 gpd/person ** air conditioning: 0.17 gpd/sf	1,062,176 [866 DUs]	220,172	180,570	8,623,806 [8,257 DUs]	2,099,260	1,466,047
Commercial	domestic: 0.17 gpd/sf *** air conditioning: 0.17 gpd/sf ***	83,462	14,189	14,189	337,160	57,317	57,317
Subtotals		--	1,065,935	529,536	--	2,206,400	1,551,490
TOTAL		1,595,470 (1.60 mgd)			3,757,890 (3.76 mgd)		
SCENARIO B							
Industrial/ Manufacturing	domestic: 10,000 gpd/acre* air conditioning: 0.17 gpd/sf	1,422,001	597,059	241,740	345,137	132,900	58,673
Vehicle/ Open Storage	domestic: 10,000 gpd/acre* air conditioning: 0.17 gpd/sf	642,686	284,607	109,257	0	18,457	6,834
Automotive	domestic: 10,000 gpd/acre* air conditioning: 0.17 gpd/sf	32,309	8,550	5,493	7,433	2,839	1,264
Residential	domestic: 112 gpd/person ** air conditioning: 0.17 gpd/sf	1,062,176 [866 DUs]	220,172	180,570	8,623,806 [8,257 DUs]	2,099,260	1,466,047
Commercial	domestic: 0.17 gpd/sf *** air conditioning: 0.17 gpd/sf ***	83,462	14,189	14,189	337,160	57,317	57,317
Subtotals		--	1,124,576	551,248	--	2,310,773	1,590,135
TOTAL		1,675,824 (1.68 mgd)			3,900,908 (3.90 mgd)		

⁽¹⁾ gpd = gallons per day; mgd = millions of gallons per day.

⁽²⁾ Usage and generation rates for non-industrial/manufacturing uses from the *CEQR Technical Manual*. Usage and generation rates for industrial/manufacturing uses from DEP's *Draft Rules and Regulations Governing the Construction of Private Sewers and Drains*.

* Industrial/Manufacturing, Vehicle and Open Storage & Automotive Uses: for domestic usage - assume 10,000 gpd per acre multiplied by zoning district factors (1.00 for M1-1, 2.00 for M1-2 and M3-1).

** Assumes 2.27 residents per DU.

*** Commercial Use: all assumed as retail (to be conservative).

Stormwater Management

Under the RWCDs, the projected development sites, except for the proposed park and portions of the waterfront public access areas, would be occupied by roofs and other impervious surfaces. As such, no measurable change to stormwater runoff is expected for these sites. For the sites of the proposed 27.8-acre park under Scenario A (15.9 acres under Scenario B) and 5.6 acres of waterfront public access required by the development of the projected sites under the proposed action in Scenario A (4.0 acres under Scenario B), there is expected to be lower stormwater runoff than under No-Action conditions. Moreover, as demonstrated in Appendix K, even if the increase in open space and on-site stormwater detention for new construction are not taken into account, the increases in the frequency and volume of CSOs resulting from the proposed action, and the resulting increases in pollutant mass loadings, would be insignificant.