A. INTRODUCTION

This chapter examines the potential for air quality impacts from the Proposed Action. Ambient air quality is affected by numerous sources and activities that introduce air pollutants into the atmosphere. Air quality impacts from a Proposed Action can be either direct or indirect. Direct impacts stem from emissions generated by stationary sources associated with the Proposed Action, such as emissions from fuel burned on site for heating, ventilation, and air conditioning (HVAC) systems. Indirect effects include emissions from motor vehicles ("mobile sources") generated by the Proposed Action and effects of existing stationary sources on the Proposed Action. The analyses described in the sections that follow were performed utilizing the procedures recommended in the *City Environmental Quality Review (CEQR) Technical Manual*.

The Proposed Action would facilitate the construction of the Public Safety Answering Center II (PSAC II) on an approximately 8.75-acre, unimproved site located to the southwest of the interchange of the Pelham and the Hutchinson River Parkways, and to the east of the New York, New Haven, and Hartford railroad right-of-way for Amtrak. The proposed development site comprises the northernmost portion of the Hutchinson Metro Center (HMC) in Bronx Community District 11 (refer to Figure 1-1 in Chapter 1, "Project Description"). As the proposed development site is relatively isolated, bounded by the associated public open spaces of the Pelham and the Hutchinson River Parkways on its northern and eastern edges, and partially by an Amtrak right-of-way along its western edge, the Proposed Action also involves the mapping of an existing two-way private access roadway, Industrial Street, as a public street ("Marconi Street"). The proposed street would extend north of Waters Place to the southern boundary of the proposed development site.

The proposed PSAC II development would have two staffing level conditions, including (1) a typical day, and (2) an event when there are temporary increases of staffing levels from combined facilities (the staffs of both PSAC I and PSAC II) at the proposed development site. On a typical day, the proposed development would have a staff size of approximately 850 employees that would work over a 24-hour period in overlapping shifts with a maximum of up to approximately 315 employees per shift ("Typical Operations"). During an event when the operations of PSAC I and PSAC II would temporarily consolidate at the proposed development up to 1,700 employees would work over a 24-hour period in overlapping shifts at PSAC II ("Consolidated Operations"). A maximum of 630 employees per shift are expected to work at the proposed development when PSAC I and PSAC II operations are combined at the site. A number of non-emergency situations, such as maintenance and emergency drills, would require the transfer of PSAC I personnel to the proposed development site.

The following air quality analysis includes an assessment of existing conditions based on monitored air quality, a mobile source analysis, a CO analysis for a mechanically ventilated accessory parking garage, an HVAC analysis, and a manufacturing survey for air toxics. For conservative CEQR analysis purposes, the analysis focuses on the temporary Consolidated Operation of the proposed

development when the staffs of both PSAC I and PSAC II are combined at the proposed development site.

B. AIR QUALITY STANDARDS AND CRITERIA

National Ambient Air Quality Standards

Ambient air is defined by the United States Environmental Protection Agency (USEPA) as that portion of the atmosphere, external from buildings, to which the general public has access. National Ambient Air Quality Standards (NAAQS) were promulgated by the USEPA for the protection of public health and welfare, allowing for an adequate margin of safety. The USEPA has set NAAQS for six criteria pollutants. They consist of primary standards, established to protect public health with an adequate safety margin, and secondary standards, established to protect "plants and animals and to prevent economic damage." The six major pollutants are deemed criteria pollutants, since threshold criteria can be established for determining adverse effects on human health. These pollutants are described below:

- Carbon Monoxide (CO). CO is a colorless, odorless gas produced from the incomplete combustion of gasoline and other fossil fuels. The primary source of CO in urban areas is from motor vehicles. Because this gas disperses quickly, CO concentrations can very greatly over relatively short distances.

- Inhalable Particulates also known as Respirable Particulates. Particulate matter (PM) is a generic term for a broad range of discrete liquid droplets or solid particles of various sizes. They are primarily generated by fuel oil combustion and by vehicular traffic that contributes to airborne particulates from brake and tire wear and the disturbance of dust on roadways. The PM_{10} standard covers particulates with diameters of 10 micrometers or less, which are the ones most likely to be inhaled into the lungs. The $PM_{2.5}$ standard covers particulates with diameters of 2.5 micrometers or less.

- Lead (Pb). Lead is a heavy metal. Emissions are principally associated with industrial sources and motor vehicles that use gasoline containing lead additives. Most U.S. vehicles produced since 1975, and all produced after 1980, are designed to use unleaded fuel. As a result, ambient concentrations of lead have declined significantly.

- Nitrogen dioxide (NO_2). Nitrogen dioxide is a highly oxidizing, extremely corrosive toxic gas. It is formed by chemical conversion from nitric oxide (NO), which is emitted primarily by industrial furnaces, power plants, and motor vehicles.

- Ozone (O_3). Ozone, a principal component of smog, is not emitted directly into the air but is formed through a series of chemical reactions between hydrocarbons and nitrogen oxides in the presence of sunlight.

- Sulfur dioxides (SO_2). Sulfur dioxides are heavy gases primarily associated with the combustion of sulfur-containing fuels such as coal and oil. No significant quantities are emitted from mobile sources.

New York State Ambient Air Quality Standards further regulate concentrations of the criteria pollutants discussed above. The New York State Department of Environmental Conservation (NYSDEC), Air Resources Division, is responsible for air quality monitoring in the state. Monitoring is performed for each of the criteria pollutants to assess compliance. Table 14-1 shows the National and New York State Ambient Air Quality Standards.

TABLE 14-1
National and New York State Ambient Air Quality Standards

Pollutant	Averaging Period	Standard	2006 Value	Monitor
Sulfur Dioxide	12-month arithmetic mean 24-hour average 3-hour average	0.03 ppm 0.14 ppm 0.5 ppm	0.007 ppm 0.032 ppm 0.067 ppm	Botanical Gardens (Bronx)
Inhalable Particulates (PM_{10})	24-hour average	150 ug/m^3	18 ug/m^3 (2004)	IS 52 (Bronx)
Inhalable Particulates ($PM_{2.5}$)	3-yr average annual mean Maximum 24-hr. 3-yr. avg.[d]	15 ug/m^3 35 ug/m^3	13.1 ug/m^3 34 ug/m^3	Botanical Gardens (Bronx)
Carbon Monoxide	8-hour avg.[a] 1-hour avg.[a]	9 ppm 35 ppm	1.9 ppm 2.6 ppm	Botanical Gardens (Bronx)
Ozone	Maximum daily 1-hr avg.[b] Maximum daily 8-hr avg.[c] Maximum daily 8-hr avg.[e]	N.A. 0.08 ppm 0.075 ppm	N.A. 0.074 ppm N.A.	Botanical Gardens (Bronx)
Nitrogen Dioxide	12-month arithmetic mean	0.05 ppm	0.025 ppm	Botanical Gardens (Bronx)
Lead	Quarterly mean	1.5 ug/m^3	0.02 ug/m^3	JHS 126 (Brooklyn)

Notes: ppm = parts per million; ug/m^3 = micrograms per cubic meter
[a] Not to be exceeded more than once a year.
[b] Applies only to areas designated non-attainment. The NYC metropolitan area is no longer subject to the 1-hour ozone requirement.
[c] Three-year average of the annual fourth highest maximum 8-hour average concentration.
[d] Not to be exceeded by the 98th percentile of 24-hour $PM_{2.5}$ concentrations in a year (averaged over 3 years).
[e] Three-year average of the annual fourth highest maximum 8-hour average concentration effective May 27, 2008.
Sources: New York State Ambient Air Quality Development Report, 2006

State Implementation Plan (SIP)

The New York State Implementation Plan (SIP) outlines New York State's strategies for attaining the required federal air quality standards pursuant to the Clean Air Act. The Clean Air Act requires each state to submit to the USEPA a SIP for attainment of the NAAQS. The 1977 and 1990 amendments require comprehensive plan revisions for areas where one or more of the standards have yet to be attained (i.e., non-attainment areas).

The USEPA has designated New York City as in attainment for the NO_2, SO_2, and lead. The USEPA also has re-designated New York City as in attainment for CO. The Clean Air Act requires that a maintenance plan ensure continued compliance with the CO NAAQS for former non-attainment areas. New York City is also committed to implementing site-specific control measures throughout New York City to reduce CO levels, should unanticipated localized growth result in elevated CO levels during the maintenance period.

The five boroughs of New York City, as well as Nassau, Suffolk, Rockland, Westchester, and Orange counties, are designated non-attainment areas for PM_{10} and $PM_{2.5}$ under the Clean Air Act. State and local governments are required to develop implementation plans by early 2008, which will be designed to meet the standards by 2010. The state is under mandate to develop SIPs to address ozone, carbon monoxide, and PM_{10}. It is also working with the USEPA to formulate standard practices for regional haze and $PM_{2.5}$.

NYC De Minimis Criteria

In addition to the National Ambient Air Quality Standards (NAAQS), the City of New York (the "City") applies *de minimis* impact criteria to determine the significance of the incremental increases in CO concentrations from mobile sources that would result from a Proposed Action (i.e., net change between the future without and with the Proposed Action). These set the minimum change in 8-hour average carbon monoxide concentrations that constitute a significant environmental impact. According to these criteria, significant impacts are defined as follows:

- An increase of 0.5 parts per million (ppm) or more in the maximum 8-hour average carbon monoxide concentration at a location where the predicted No-Build (i.e., future without the Proposed Action) 8-hour concentration is equal to or above 8 ppm; or

- An increase of more than half the difference between baseline (i.e., No-Build) concentrations and the 8-hour standard, when No-Build concentrations are below 8 ppm.

For $PM_{2.5}$ analyses at the microscale level, the City's *de minimis* criteria for determining significance are:

- 2.0 ug/m^3 for the 24-hour period; and
- 0.3 ug/m^3 for the annual period.

At the neighborhood scale of analysis, for mobile and stationary sources combined, the average $PM_{2.5}$ concentration within a 1 km-square grid centered on the worst-case receptor has a *de minimis* value of:

- 0.1 ug/m^3 for the annual period.

No *de minimis* values have been assigned to PM_{10}.

Air Toxics Pollutants

In addition to the criteria pollutants discussed above, non-criteria air pollutants, also called air toxics, are also regulated. Air toxics are those pollutants that are known or suspected to cause serious health effects in small doses. A wide range of man-made and naturally occurring sources emits air toxics. The USEPA regulates *emissions* of air toxics from industries. Although, federal ambient air quality standards do not exist for *concentrations* of these non-criteria compounds, the USEPA has developed guidelines for assessing exposure to air toxics. These exposure guidelines are used in health risk assessments to determine the potential effects to the public. Based on this information and other sources, the NYSDEC has developed ambient guideline concentrations for numerous non-criteria compounds of air toxics. The NYSDEC guidance document DAR-1 (September 2007) contains a compilation of annual and short-term (1-hour) guideline concentrations for these compounds.

The proposed development site is located within a high performance manufacturing-zoned area, which would remain with the Proposed Action. Therefore, an analysis to examine the potential for impacts to the Proposed Action from existing industrial emissions was also performed.

C. EXISTING CONDITIONS

As shown in Table 14-1, air quality for the Bronx is within the NAAQS for all pollutants. However, previous ozone concentrations have exceeded the standards, and 3-year averages for $PM_{2.5}$ have exceeded the former standard. Therefore, the proposed development site is within an area classified as nonattainment for both ozone and $PM_{2.5}$. As stated previously, the proposed development site also falls within a CO maintenance area.

D. PRELIMINARY SCREENING FOR POTENTIAL IMPACTS

Mobile Source Screening

The prediction of vehicle-generated CO and PM emissions and their dispersion in an urban environment incorporates meteorological conditions, traffic data, and roadway geometry. Air pollutant dispersion models mathematically simulate how traffic, meteorology, and geometry combine to affect pollutant concentrations. The mathematical expressions and formulations contained in the various models attempt to describe an extremely complex physical phenomenon as closely as possible. However, because all models contain simplifications and approximations of actual conditions and interactions and it is necessary to predict the reasonable worst-case condition, most of these dispersion models predict conservatively high concentrations of pollutants.

The mobile source analysis for the Proposed Action employs models approved by the USEPA that have been widely used for evaluating air quality impacts of projects in New York City, other parts of New York State, and throughout the country. The modeling approach includes a series of conservative assumptions relating to meteorology, traffic, and background concentration levels resulting in a conservatively high estimate of expected pollutant concentrations that could result from the Proposed Action. To assess the potential for vehicular traffic to cause an air quality impact, a preliminary screening of project-generated traffic volumes was carried out for carbon monoxide (CO) and particulates ($PM_{10}/PM_{2.5}$).

CO. Based on the *CEQR Technical Manual* and subsequent revisions to its procedures, the following screening criteria are applicable to the Proposed Action for identifying intersections that may warrant further analysis for CO:

- Actions resulting in 100 or more trips through an intersection.

Table 14-2, which is based on the traffic diagrams provided in Chapter 12, "Traffic and Parking," shows projected traffic volumes at affected intersections in the future No-Build condition and under both staffing level conditions of the proposed PSAC II development (i.e., Typical and temporary Consolidated Operations) in the future Build condition for the AM (6:30 AM to 7:30 AM) and midday (2:30 PM to 3:30 PM) peak hours.[1] Only intersections that would experience a project-generated increase in traffic are shown in the table. As also shown in Table 14-2, project-generated increments range from increases of 9 to 372 vehicles through an intersection under the Typical Operations of the proposed PSAC II development, as compared to increases of 12 to 746 vehicles under the temporary Consolidated Operations. Multiple intersections and traffic periods would result

[1] Table 14-2 has been updated to reflect revisions to Chapter 12, "Traffic and Parking."

in project-generated volumes that would exceed the CO threshold volume of 100 vehicles under both staffing level conditions of PSAC II in the future Build condition. The Midday peak period generally has the highest project-generated increments under either staffing level condition. The highest increase in traffic (746 vehicles) would occur with the temporary Consolidated Operation of the proposed development at the intersection of Waters Place and Industrial Street during the midday peak hour. Therefore, CO modeling is recommended for the midday peak for the intersection of:

- Waters Place and Industrial Street.

If CO modeling shows no exceedances of the NAAQS or the NYC *de minimis* values at this intersection when the proposed development is accommodating the staffs of both PSAC I and PSAC II under it temporary Consolidated Operations condition, then no exceedances would be expected at the remaining intersections under either staffing level condition at the proposed development.

PM. The New York City Department of Environmental Protection (NYCDEP) has developed a screening analysis for potential $PM_{2.5}$ impacts based on exhaust emissions from heavy duty diesel-powered vehicles for 2008. A more detailed analysis is required if the Proposed Action would add emissions from trucks or mixed traffic that would be equivalent to the 2008 emissions from the volumes of heavy duty diesel vehicles (HDDV) listed below:

- 12 HDDV for paved roads with less than 5,000 vehicles/day;
- 19 HDDV for collector-type roads;
- 23 HDDV for principal and minor arterial roads; and
- 23 HDDV for expressways and limited-access roads.

Waters Place would be an arterial, but Industrial Street would be a collector road.

The MOBILE6.2 emissions model, a USEPA-approved mobile source emissions model, was run for $PM_{2.5}$ to determine the project-generated vehicular emissions for 2012. This emissions model calculates engine emission factors for 28 vehicle types, based on the fuel type (gasoline, diesel, or natural gas), ambient temperature, vehicle speeds, the mixture of vehicular types and ages, average number of starts per day, engine soak time, and various other factors that influence emissions, such as fuel and tailpipe emission standards, and inspection maintenance programs. The inputs used with MOBILE6.2 incorporate the most current guidance available from the NYSDEC and NYCDEP. A composite emission factor was calculated for a mix of 80% autos and 20% SUVs. As mentioned previously, the highest project-generated traffic volume through any intersection is 746 vehicles, at the intersection of Waters Place and Industrial Street, during the midday (2:30 PM to 3:30 PM) peak hour under the temporary Consolidated Operations of the proposed PSAC II development. All of these vehicles would travel on the proposed public street ("Marconi Street"). The composite emission factor for one auto/SUV, 0.0041 g/mi., would generate emissions of 3.0586 g/mi. for 746 vehicles. For 2008, the exhaust emission factor for $PM_{2.5}$ for heavy duty diesel vehicles (HDDV) would be 0.2129 g/mi. Therefore, 19 heavy duty diesel vehicles in 2008 would generate 4.0451 g/mi. This is more than the emissions of 3.0586 g/mi. calculated for 746 project-generated vehicles. Therefore, no $PM_{2.5}$ modeling is required as the emissions from the project-generated vehicles in 2012 would not equal or exceed the emissions from 19 HDDV vehicles using the MOBILE6.2 emission factors for 2008.

TABLE 14-2
Traffic Volume Carbon Monoxide Screening Analysis

INTERSECTION	NO-BUILD CONDITIONS	BUILD CONDITIONS			
		Typical Operations (PSAC II employees only)		Consolidated Operations (PSAC I and PSAC II employees)	
	Traffic Volume	Traffic Volume	Project Increment	Traffic Volume	Project Increment
AM Peak (6:30 – 7:30 AM)					
Waters Pl. / Eastchester Rd.	1,708	1,894	**186**	1,946	**238**
Waters Pl. / Industrial St.	1,340	1,706	**366**	2,052	**712**
Waters Pl. / Fink Ave.	1,723	1,903	**180**	2,197	**474**
Waters Pl. / Bronx Psych. Center	1,387	1,567	**180**	1,861	**474**
Waters Pl. / Westchester Ave.	1,646	1,801	**155**	2,088	**442**
Little League Pl. / Westchester Ave.	847	936	89	1,076	**229**
Little League Pl. / East Tremont Ave.	887	967	80	1,104	**217**
East Tremont Ave. / Ericson Pl.	1,237	1,317	80	1,454	**217**
East Tremont Ave. / Silver St.	1,182	1,237	55	1,246	64
East Tremont Ave. / Castle Hill Ave.	1,855	1,910	55	1,919	64
Pelham Parkway N / Eastchester Rd.	948	976	28	981	33
Pelham Parkway W / Eastchester Rd.	1,913	1,979	66	2,001	88
Pelham Parkway E / Eastchester Rd.	1,736	1,802	66	1,824	88
Westchester Ave. / East Tremont Ave.	1,343	1,352	9	1,355	12
Westchester Ave. / Blondell Ave.	970	979	9	982	12
Eastchester Rd. / Bassett Rd.	1,199	1,330	**131**	1,373	**174**
Eastchester Rd. / Ives St.	1,063	1,194	**131**	1,237	**174**
Eastchester Rd. / Morris Park Ave.	1,568	1,699	**131**	1,742	**174**
Eastchester Rd. / Stillwell Ave.	1,238	1,369	**131**	1,412	**174**
Eastchester Rd. / Rhinelander Ave.	1,054	1,166	**112**	1,197	**143**
Midday Peak (2:30 – 3:30 PM)					
Waters Pl. / Eastchester Rd.	2,566	2,762	**196**	2,816	**250**
Waters Pl. / Industrial St.	2,002	2,374	**372**	2,748	**746**
Waters Pl. / Fink Ave.	2,089	2,265	**176**	2,585	**496**
Waters Pl. / Bronx Psych. Center	1,764	1,940	**176**	2,260	**496**
Waters Pl. / Westchester Ave.	2,358	2,513	**155**	2,820	**462**
Little League Pl. / Westchester Ave.	1,255	1,331	76	1,501	**246**
Little League Pl. / East Tremont Ave.	1,652	1,718	66	1,886	**234**
East Tremont Ave. / Ericson Pl.	1,891	1,957	66	2,125	**234**
East Tremont Ave. / Silver St.	1,348	1,406	58	1,416	68
East Tremont Ave. / Castle Hill Ave.	2,187	2,245	58	2,255	68
Pelham Parkway N / Eastchester Rd.	1,628	1,656	28	1,662	34
Pelham Parkway W / Eastchester Rd.	2,919	2,992	73	3,008	89
Pelham Parkway E / Eastchester Rd.	2,745	2,818	73	2,834	89
Westchester Ave. / East Tremont Ave.	2,340	2,350	10	2,352	12
Westchester Ave. / Blondell Ave.	1,462	1,472	10	1,474	12
Eastchester Rd. / Bassett Rd.	1,966	2,104	**138**	2,148	**182**
Eastchester Rd. / Ives St.	1,824	1,962	**138**	2,006	**182**
Eastchester Rd. / Morris Park Ave.	2,503	2,641	**138**	2,685	**182**
Eastchester Rd. / Stillwell Ave.	1,876	2,014	**138**	2,058	**182**
Eastchester Rd. / Rhinelander Ave.	1,662	1,774	**112**	1,812	**150**

Notes: S=signalized intersection; U=unsignalized intersection; Numbers in bold type exceed the 100-vehicle screening threshold.

HVAC Screening Analysis

To assess air quality impacts associated with emissions for the proposed development's HVAC systems, a screening analysis was performed using the methodology described in the *CEQR Technical Manual*. This methodology determines the threshold of development size below which the action would not have a significant impact. Based on the type of fuel to be burned, the maximum development size and the type of development, and stack height, this procedure evaluates whether or not a detailed analysis using dispersion modeling is necessary. If based on the distance from the development to the nearest building of similar or greater height, the maximum development size is greater than the threshold size in the *CEQR Technical Manual*, then there is the potential for significant air quality impacts and dispersion modeling is required. The results of the screening analysis are presented in more detail under Section F, *Future with the Proposed Action*.

E. FUTURE WITHOUT THE PROPOSED ACTION (NO-BUILD CONDITIONS)

For conservative CEQR analysis purposes, the proposed development site was projected to remain undeveloped and continue to be occupied partially by at-grade accessory parking and partially by vacant land in the future without the Proposed Action. The area affected by the proposed street would continue to serve as a private two-way roadway providing access to the HMC. The northern portion of the road, which is currently closed due to ongoing construction, would be reopened to vehicular traffic by 2012.

Mobile Source CO Modeling

Vehicular Data

Traffic data were obtained from the traffic analysis provided in Chapter 12, "Traffic and Parking" of the EIS. This includes volumes, vehicular speeds, and signal cycle timing for key links and intersections within the study area. The vehicular mix used for the analysis was based on field classification counts obtained from the traffic study. Vehicular mix represents the proportions of vehicles falling into the 28 MOBILE6.2 categories. Based on NYCDEP guidelines, taxis and sport utility vehicles are treated as special categories of vehicles. Sport utility vehicles (SUVs), which represent about 20% of the passenger vehicles, were included with light duty gasoline trucks in the LDGT1 category. Taxis are counted as a category separate from autos; however, no taxis were observed at the Project Site, and therefore none are included in the vehicular mix. The mixture of vehicular types is used to obtain composite emission factors from MOBILE6.2. For this analysis, review of traffic data indicated that one vehicular mix would be sufficient to characterize the Waters Place and Industrial Street links.

Emission Factors

CO emission factors for 2012 were obtained from USEPA's MOBILE6.2 model. The ambient temperature used in the model was 43^{o} F, as recommended by NYCDEP. Inputs pertaining to inspection/maintenance, anti-tampering programs, etc., were obtained from NYCDEP's most recent guidelines (3/8/08). For each speed, the MOBILE6.2 emission factors for each vehicular type were multiplied by the relative percentages for each vehicular type to calculate the composite emission factors, by speed, for use in the CAL3QHC model.

Modeling

CAL3QHC was used to determine CO concentrations. CAL3QHC is a Gaussian (normal) dispersion model that determines pollutant concentrations at specified receptor points. It accounts for CO from both free-flowing vehicles and vehicles idling at signalized intersections. Inputs to the model include Cartesian coordinates for receptors, free-flow approach and departure links, and the approach links for queued vehicles at intersections. Peak hour traffic volumes, signal cycle information, composite vehicular emission factors, and adjusted saturation flow rate are also input to the model.

Free-flowing traffic links are set up separately from intersection queue links. Free-flow links were modeled for a distance of 1,000 feet from the intersection in each direction unless the roadway terminated at a lesser distance. The mixing zone for free-flow links was equal to the width of the traveled way plus an additional 10 feet (3 meters) on each side of the traveled way. For queue links, the mixing zone was limited to the width of the traveled way. CAL3QHC calculates the length of the queue links.

Typical worst-case meteorological conditions were used with CAL3QHC. These included a mixing layer height of 1,000 meters, a wind speed of 1 meter per second, and an atmospheric stability class of D (neutral stability). Settling and deposition velocities were assumed to be 0 cm/s. Each computer run covered wind angles from 0 to 360 degrees and identified the worst-case wind angle for each receptor point. A surface roughness of 175 cm, representing office land uses, was used in the modeling.

CO Receptors

Sensitive receptors are homes, parks, schools, or other land uses where people congregate and which would be sensitive to air quality impacts. For the purposes of the air quality analysis, any point to which the public has continuous access can be deemed a sensitive receptor site. Numerous receptor points are typically modeled at each intersection to identify the points of maximum potential CO concentration. To analyze CO levels, receptor points were modeled on the corners of the intersection, and additional points were modeled at 20-foot intervals for a distance of 100 feet along both sides of each intersection leg. Receptors were placed at mid-sidewalk and outside the air quality mixing zone.

Calculation of Total CO Concentrations

To obtain 8-hour concentrations, the modeled CO values were multiplied by a persistence factor of 0.7 and then added to the 8-hour background values to determine total CO concentrations during that period. The same worst-case wind angle would apply to both the 1-hour and 8-hour averaging periods. Only the 8-hour CO and background values are presented in the report. If no violation of the 8-hour standard occurs, no violation of the 1-hour CO standard is likely.

Mobile source modeling of CO concentrations accounts solely for emissions from vehicles traveling along modeled streets, but not for overall pollutant levels. Therefore, background CO concentrations must be added to modeling results to obtain total CO concentrations at a given receptor site. The NYCDEP recommends a background 8-hour CO level of 2.0 ppm for the Bronx in 2012.

Table 14-3 shows the results of the CO modeling for 2012 No-Build Conditions for the modeled intersection. Only the worst case receptor point is shown in the table. The worse case receptor is located 40 feet north of the northeast corner of the intersection of Waters Place and Industrial Street. The modeled 1-hour concentration of 2.9 ppm is equivalent to an 8-hour concentration of 2.0 ppm when the 0.7 persistence factor is applied. When added to the background value of 2.0 ppm, the worst-case CO concentration under No-Build Conditions is 4.0 ppm. Based on the wind angle, the traffic on

Waters Place is the dominant contributor to the projected CO levels. The total CO concentration of 4.0 ppm is within the NAAQS.

TABLE 14-3
No-Build Conditions Eight-Hour Mobile Source Carbon Monoxide (ppm)

2012 No-Build Conditions	
Receptor Location: NE corner of Waters Place and Industrial Street	
Wind angle	256^{o}
Modeled CO	2.0
Background CO	2.0
Total CO	4.0

Source: Sandstone Environmental Associates, Inc.

F. FUTURE WITH THE PROPOSED ACTION (BUILD CONDITIONS)

When completed in 2012, the proposed PSAC II development would operate continuously 24 hours per day, seven days per week and is expected to have a typical staff size of approximately 850 employees working three eight to ten hour shifts throughout the 24-hour period (maximum of approximately 315 employees per shift) ("Typical Operations"). There are expected to be a number of circumstances when the proposed development would handle emergency communications for the entire City and the staff of PSAC I would be temporarily relocated to the proposed development. During an event when the operations of PSAC I and PSAC II would temporarily consolidate at the proposed development, up to approximately 1,700 employees would work in overlapping shifts at the proposed development site ("Consolidated Operations"). A maximum of 630 employees per shift are expected to work at the proposed development when PSAC I and PSAC II operations are combined. For analysis purposes, the following air quality analysis is conservative and considers the temporary Consolidated Operations of the proposed PSAC II development as a worse case.

Mobile Source CO

Modeling for Build Conditions followed the same procedures that were described under No-Build Conditions. Table 14-4 shows the CO concentrations for 2012 Build Conditions. The worst case CO concentration is 3.5 ppm for the one-hour period or 2.5 ppm for the 8-hour period. The total CO concentration of 4.5 ppm is within the NAAQS of 9 ppm for the 8-hour period. No exceedances of the NYC *de minimis* value for CO would occur and therefore, no impacts are expected under these very conservative analysis conditions. Further, given the concentration of project vehicles and the fact that this intersection yielded a total CO concentration of 4.5 ppm under Build conditions, no significant air quality impacts at other study area intersections are anticipated.

TABLE 14-4
Eight-Hour Mobile Source Carbon Monoxide (CO) Concentrations (ppm), Build Conditions
Temporary Consolidated Operation of PSAC II (staffs of PSAC I and PSAC II)

2012 No-Build Conditions		2012 Build Conditions Consolidated Operations (staffs of PSAC I and PSAC II)		Incremental Change between No-Build and Build Conditions
Receptor Location: NE corner, Waters Pl & Industrial St.		Receptor Location: NE corner, Waters Pl & Industrial St.		
Wind angle	256°	Wind angle	266°	
Modeled CO	2.0	Modeled CO	2.5	0.5
Background CO	2.0	Background CO	2.0	
Total CO	4.0	Total CO	4.5	0.5

Source: Sandstone Environmental Associates, Inc.

Parking Facilities

The proposed accessory parking garage would accommodate 500 vehicles and would be accessible from the proposed public street through a gated security entrance controlled by the New York Police Department (NYPD) at the southwestern corner of the proposed development site. The main access point to the parking garage would be located on its western façade with a separate opening for exiting vehicles. A secondary access/egress point would be provided on the structure's eastern façade. The garage would contain approximately 163,000 gsf with three levels of parking. No parking is proposed for the roof, which would be used for green space. A 2,000 gsf security control office, to be located on a portion of the second floor of the structure, would house security and screening operations for entering the office building. An enclosed walkway would connect the security screening office in the parking garage to the main entrance of the office building. The parking facility would be enclosed on all sides of the structure, with the north side abutting the blast wall, which would face and protect the proposed PSAC II office building. Emissions from vehicles would be exhausted through four louvers on the rooftop. An analysis of the CO emissions from the garage was carried out using the methodology set forth in the *CEQR Technical Manual Appendices*.

The USEPA's MOBILE6.2 emissions model was used to obtain emission factors for hot (entering) and cold (exiting) vehicles as well as idling vehicles using an ambient temperature of 43°F, as referenced in the *CEQR Technical Manual*. For all arriving and departing vehicles, an average speed of 5 miles per hour was conservatively assumed for travel within the parking facility. In addition, all departing vehicles were assumed to idle for 1 minute before proceeding to the exit. Passenger vehicles were divided into 80% autos and 20% SUVs for the purposes of obtaining a composite emission factor.

Because automobiles leaving a parking facility with engines in cold-start mode would emit higher levels of CO than departing vehicles with engines in hot-stabilized mode, the impact from a parking facility typically is greatest during those periods with the largest number of departing vehicles. Traffic volumes for the analysis were obtained from the trip generation analysis described in Chapter 12, "Traffic and Parking" of this EIS. As shown in Table 14-5, the peak use period for the accessory parking facility is the weekday midday period (2:30 PM to 3:30 PM), when the highest volume of vehicles would enter and exit the proposed facility (up to 688 vehicles under the temporary Consolidated Operations of PSAC II). However, the worst-case period for CO emissions would be during the weekday PM period (10:30 PM to 11:30 PM), when 324 vehicles would arrive and 358 vehicles would exit (682 total vehicles) the proposed garage under the temporary Consolidated Operations of proposed development. Since this period features the largest number of exiting vehicles in cold start mode, coupled with a high overall volume, it would constitute the worse case for CO

emissions. Therefore, CO concentrations from the parking facility were calculated for the peak PM hour, when the greatest number of vehicles would exit the garage.

TABLE 14-5
Projected Volumes for the Accessory Parking Garage in the Peak AM, Midday and PM Periods

2012 Build Conditions Consolidated Operations (both PSAC I and PSAC II employees)			
Peak Period	**Traffic Volume In**	**Traffic Volume Out**	**Total Traffic Volume**
AM (6:30- 7:30 AM)	330	324	654
Midday (2:30- 3:30 PM)	358	330	688
PM (10:30- 11:30 PM)	324	358	682

Source: Philip Habib & Associates, 2008.

An average total ramp distance of 600 feet was added to the average vehicular travel distance. The vent elevation would be 55 feet above the Bronx Highway Datum (approximately 30 feet tall). Although the exhaust would be divided among four louvers, the analysis for each receptor point assumes a worst-case with only one louver. One louver would be on roof near the southern wall of the garage at an elevation of 55 feet. Therefore, a receptor point was placed at ground level (24 feet above the Bronx Highway Datum), 6 feet away from the southern wall of the structure. Another louver would be on the roof near the northern wall of the garage at an elevation of 55 feet above the Bronx Highway Datum. Therefore a receptor point was placed at a window in the proposed office building at the same elevation. The window would be located approximately 100 feet from the louver. These two receptor points are the closest to a garage exhaust. No line source contribution was calculated because the two receptor points are not adjacent to a roadway.

To determine compliance with the NAAQS, CO concentrations were determined for the 8-hour averaging period. The 8-hour values are the most critical for impact assessment because no exceedances of the 1-hour standard would occur if the 8-hour concentrations were in compliance with the NAAQS. Per guidance from NYCDEP, a persistence factor of 0.7 was used to convert 1-hour CO values to 8-hour CO values. As stated previously, the 8-hour background value for 2012 recommended by NYCDEP for the Bronx is 2.0 ppm. This background value of 2.0 ppm was added to the concentrations calculated for the parking garage.

Table 14-6 shows the CO calculations for the parking facility for the weekday PM period. Due to the size of the proposed parking facility and the distance from the upper levels to a receptor point at ground level, the total 8-hour concentration for a receptor point at ground level would be very low. CO concentrations typically are shown in tenths of a part per million. The worst-case receptor point would be in a window in the proposed office building located approximately 100 feet from the vent. The garage's contribution to the 8-hour CO level would be 1.9 ppm. This would result in a total of 3.9 ppm after adding in the background concentration of 2.0 ppm. This value is below the NAAQS of 9 ppm and the NYCDEP *de minimis* criteria. Therefore, the proposed parking facility would not cause an air quality impact.

TABLE 14-6
Carbon Monoxide Concentrations from the Proposed Accessory Parking Garage

2012 Mobile 6.2 Emissions	
Cold idle (g/hr) @ 2.5 x 2.5 mph	81.6
Cold 5 mph	23.9
Hot 5 mph	12.3
Garage Levels	
Total sq. ft. (unobstructed)	163,000
Average length (ft)	515
Average width (ft)	125
Avg. travel @ 2/3 (L + W) (ft)	429
Avg. total ramp distance (ft.)	600
Total travel distance (ft.)	1,029
Peak 1-Hour Trips	
Ins	324
Outs	358
Total	682
Total Garage Emissions	
Peak 1-hour emission rate (ER)	0.813
Maximum 1-hour CO	9.23
Garage Vents	
No. of vents	1
Vent elevation (ft)	55.0
Vent elevation (meters)	16.8

Receptor Data	
South sidewalk, dist.(ft)	6.0
South sidewalk, dist. (m)	1.8
South sidewalk, height (ft)	24.0
South sidewalk, height (m)	7.3
Window in PSACII Bldg, dist.(ft)	100.0
Window in PSACII Bldg, dist. (m)	30.5
Window in PSACII Bldg, height (ft)	55.0
Window in PSACII Bldg, height (m)	16.8

Worst Case CO Concentrations		
Variable	**PSAC Above**	**South Sidewalk**
H (meters)	-	9.4
Q/vent	0.813	0.813
CO (g/m^3)	0.0106	0.0106
$1/oy^2$	0.0408	0.0408
o_y	4.95	4.95
o_y (dist)	9.83	5.24
o_z (dist)	9.22	5.20
1-Hour CO g/m^3	0.00286	0.00183
1-Hour CO ppm	**2.5**	**1.6**
8-Hour persistence factor	0.77	0.77
8-Hour CO (ppm) from garage	**1.9**	**1.2**
8-Hour background value (ppm)	2.0	2.0
Total 8-hour garage CO and background	**3.9**	**3.2**
CO from passing traffic (ppm)	0.0	0.0
Total 8-hour CO (ppm)	**3.9**	**3.2**

Source: Sandstone Environmental Associates, Inc.

HVAC Screening Analysis

As described previously, to assess air quality impacts associated with emissions for the proposed development's HVAC systems, a screening analysis was performed using the methodology described in the *CEQR Technical Manual and CEQR Technical Manual Appendices.* To evaluate the potential for project on project impacts the appropriate figures in the *CEQR Technical Manual Appendices* are used to plot the minimum distances between the stacks on the proposed buildings and the nearest buildings of similar or greater height. The maximum distance in the figures is 400 feet, as no impacts are anticipated for non-major emission sources at this distance. The boiler stack for the proposed 350-foot tall office building would be located on the roof. No other buildings within 400 feet of the proposed PSAC II development are equal to or taller than 350 feet. Therefore, based on CEQR *Technical Manual* screening procedures, no air quality impacts of the proposed development's HVAC emissions on existing land uses are anticipated, and no additional air quality analyses are required.

Stationary Source Manufacturing Survey

According to the *CEQR Technical Manual*, industrial facilities with the potential to cause adverse impacts are those that would require permitting under city, state and federal regulations. The *CEQR Technical Manual* lists the following types of uses as a source of concern:

- A large emission source (e.g., solid waste or medical waste incinerators, cogeneration facilities, asphalt and concrete plants, or power generating plants) within 1,000 feet;
- A medical, chemical, or research laboratory nearby;
- A manufacturing or processing facility within 400 feet; and
- An odor producing facility within 1,000 feet.

To identify facilities in the categories listed above, the manufacturing survey included on-line searches of NYSDEC's Air Permit Facilities Registry and the USEPA's Facility Registry System for permitted facilities, a field survey to identify non-permitted facilities or facilities that may have NYCDEP permits, an on-line search of data provided by the New York City Department of Buildings (NYCDOB), telephone directory listings, internet websites, and NYSDEC's DAR-1 software. No industrial facilities of concern were identified within either the 400 or 1,000-foot search radius (see Figure 14-1). Therefore, no search of NYCDEP permits was necessary.

Large emission sources would be identified in the listing of draft and issued Title V facilities found in the state and federal registries. No major air pollutant emitters with a Title V permit were identified within a 1,000-foot radius of the proposed development site. The Bronx Psychiatric Center, a Title V facility occupying the same block as the proposed development site, is located more than 1,000 feet from the boundaries of the proposed development site. Furthermore, no state facility permits were identified within a 400-foot radius of the proposed development site boundaries. In conclusion, no air quality impacts to the proposed facility from existing land uses is projected.

G. CONCLUSION

The results of the conservative analyses presented in this chapter demonstrate that the Proposed Action is not expected to cause or experience any significant adverse air quality impacts due to mobile sources, parking facility emissions, HVAC emissions, or air toxics.