A. INTRODUCTION

This chapter identifies the potential for significant air quality impacts associated with the proposed mixed-use development involving residential uses, retail uses, and school relocation on the block east of Eleventh Avenue between West 44th Street and West 45th Street in the Clinton neighborhood of Manhattan, as described in Chapter 1, "Project Description." Air quality impacts can be either direct or indirect. Direct impacts could stem from emissions generated by stationary sources at a development site, such as emissions from the development parcels' garage ventilation systems or heating, ventilation, and air conditioning (HVAC) systems. Indirect impacts include emissions from motor vehicles ("mobile sources") traveling to and from a project or from nearby existing emission sources. An analysis was also conducted to evaluate potential impacts due to the Proposed Actions' parking garage. Supporting materials for the air quality analysis are provided in **Appendix C, "Air Quality."**

PRINCIPAL CONCLUSIONS

As discussed below, this analysis finds that the maximum predicted pollutant concentrations and concentration increments from mobile sources with the Proposed Actions and from the accessory parking garage would be below the applicable criteria for determining the significance of potential impacts. There would be no significant adverse air quality impacts from industrial facilities on the development parcels. To preclude the potential for significant adverse air quality impacts from the heating, ventilation, and air conditioning (HVAC) system of the proposed school, the New York City School Construction Authority (SCA) would incorporate specifications on fuel use and stack placement as part of the Proposed Project and per its environmental review requirements under the State Environmental Quality Review Act:

- **Relocated and Expanded P.S. 51.** Any new development on this property must ensure that the heating, ventilating and air conditioning stack(s) utilize either No. 2 fuel oil or natural gas. If development on this property utilizes No. 2 fuel oil for the heating, ventilating and air conditioning, boiler exhaust stacks on this property must be located at least 60 feet from the building lines of Buildings B and C; if the development utilizes natural gas, boiler exhaust stacks on the property must be located at least 47 feet from the building lines of Buildings B and C to avoid any potential significant air quality impacts.

To avoid potential significant adverse impacts from the HVAC systems associated with the proposed residential buildings, the Land Disposition Agreement (LDA) between the New York City Department of Housing Preservation and Development (HPD) and 44th Street Development LLC would include the following requirements for the Proposed Project:

- **Building A.** Any new development on this property must ensure that exhaust stack(s) for the building's heating, ventilating and air conditioning system be located on the roof of the tallest portion of the building to avoid any potential significant air quality impacts.

- **Existing School/Future Residential Building.** Any new development on this property must ensure that the heating, ventilating and air conditioning stack(s) utilize either No. 2 fuel oil or natural gas, and boiler exhaust stacks on this property must be located at least 30 feet from adjacent buildings, Buildings B and C, to avoid any potential significant air quality impacts.

The LDA between HPD and 44th Street Development LLC would also require the developer to ventilate diesel locomotive emissions through vents located on the roofs (or through a combined HVAC venting system on the roofs) of Buildings CN and/or CS. With these measures incorporated as part of the Proposed Project, the proposed actions would not result in significant adverse impacts on air quality.

B. POLLUTANTS FOR ANALYSIS

Ambient air quality is affected by air pollutants produced by both motor vehicles and stationary sources. Emissions from motor vehicles are referred to as mobile source emissions, while emissions from fixed facilities are referred to as stationary source emissions. Ambient concentrations of carbon monoxide (CO) are predominantly influenced by mobile source emissions. Particulate matter (PM), volatile organic compounds (VOCs), and nitrogen oxides (NO and NO_2, collectively referred to as NO_x) are emitted from both mobile and stationary sources. Fine PM is also formed when emissions of NO_x, sulfur oxides (SO_x), ammonia, organic compounds, and other gases react or condense in the atmosphere. Emissions of sulfur dioxide (SO_2) are associated mainly with stationary sources, and sources utilizing non-road diesel such as diesel trains, marine engines, and non-road vehicles (e.g., construction engines). On-road diesel vehicles currently contribute very little to SO_2 emissions since the sulfur content of on-road diesel fuel, which is federally regulated, is extremely low. Ozone is formed in the atmosphere by complex photochemical processes that include NO_x and VOCs.

CARBON MONOXIDE

CO, a colorless and odorless gas, is produced in the urban environment primarily by the incomplete combustion of gasoline and other fossil fuels. In urban areas, approximately 80 to 90 percent of CO emissions are from motor vehicles. Since CO is a reactive gas which does not persist in the atmosphere, CO concentrations can vary greatly over relatively short distances; elevated concentrations are usually limited to locations near crowded intersections, heavily traveled and congested roadways, parking lots, and garages. Consequently, CO concentrations must be predicted on a local, or microscale, basis.

The Proposed Actions would result in changes in traffic patterns and an increase in traffic volume in the study area. Therefore, a mobile source analysis was conducted at the critical intersection in the study area to evaluate future CO concentrations with and without the Proposed Actions. A parking analysis was also conducted to evaluate future CO concentrations with the operation of the proposed parking garage.

NITROGEN OXIDES, VOCS, AND OZONE

NO_x are of principal concern because of their role, together with VOCs, as precursors in the formation of ozone. Ozone is formed through a series of reactions that take place in the atmosphere in the presence of sunlight. Because the reactions are slow, and occur as the pollutants are advected downwind, elevated ozone levels are often found many miles from sources of the precursor pollutants. The effects of NO_x and VOC emissions from all sources are therefore generally examined on a regional basis. The contribution of any action or project to regional emissions of these pollutants would include any added stationary or mobile source emissions; the change in regional mobile source emissions of these pollutants would be related to the total vehicle miles traveled added or subtracted on various roadway types throughout the New York metropolitan area, which is designated as a moderate non-attainment area for ozone by the U.S. Environmental Protection Agency (EPA).

The Proposed Actions would not have a significant effect on the overall volume of vehicular travel in the metropolitan area; therefore, no measurable impact on regional NO_x emissions or on ozone levels is predicted. An analysis of project-related emissions of these pollutants from mobile sources was therefore not warranted.

In addition to being a precursor to the formation of ozone, NO_2 (one component of NO_x) is also a regulated pollutant. Since NO_2 is mostly formed from the transformation of NO in the atmosphere, it is mostly of concern further downwind from large stationary point sources, and is not a local concern from mobile sources. Potential impacts on local NO_2 concentrations from the fuel combustion for the Proposed Actions' heat and hot water boiler systems were evaluated.

LEAD

Airborne lead emissions are currently associated principally with industrial sources. Effective January 1, 1996, the Clean Air Act (CAA) banned the sale of the small amount of leaded fuel that was still available in some parts of the country for use in on-road vehicles, concluding a 25-year effort to phase out lead in gasoline. Even at locations in the New York City area where traffic volumes are very high, atmospheric lead concentrations are far below the 3-month average national standard of 0.15 micrograms per cubic meter ($\mu g/m^3$).

No significant sources of lead are associated with the Proposed Actions and, therefore, analysis was not warranted.

RESPIRABLE PARTICULATE MATTER—PM_{10} AND $PM_{2.5}$

PM is a broad class of air pollutants that includes discrete particles of a wide range of sizes and chemical compositions, as either liquid droplets (aerosols) or solids suspended in the atmosphere. The constituents of PM are both numerous and varied, and they are emitted from a wide variety of sources (both natural and anthropogenic). Natural sources include the condensed and reacted forms of naturally occurring VOC; salt particles resulting from the evaporation of sea spray; wind-borne pollen, fungi, molds, algae, yeasts, rusts, bacteria, and material from live and decaying plant and animal life; particles eroded from beaches, soil, and rock; and particles emitted from volcanic and geothermal eruptions and from forest fires. Naturally occurring PM is generally greater than 2.5 micrometers in diameter. Major anthropogenic sources include the combustion of fossil fuels (e.g., vehicular exhaust, power generation, boilers, engines, and home heating), chemical and manufacturing processes, all types of construction, agricultural activities, as well as wood-burning stoves and fireplaces. PM also acts as a substrate for the adsorption (accumulation of gases, liquids, or solutes on the surface of a solid or liquid) of other pollutants, often toxic and some likely carcinogenic compounds.

As described below, PM is regulated in two size categories: particles with an aerodynamic diameter of less than or equal to 2.5 micrometers ($PM_{2.5}$) and particles with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}, which includes $PM_{2.5}$). $PM_{2.5}$ has the ability to reach the lower regions of the respiratory tract, delivering with it other compounds that adsorb to the surfaces of the particles, and is also extremely persistent in the atmosphere. $PM_{2.5}$ is mainly derived from combustion material that has volatilized and then condensed to form primary PM (often soon after the release from a source exhaust) or from precursor gases reacting in the atmosphere to form secondary PM.

Diesel-powered vehicles, especially heavy duty trucks and buses, are a significant source of respirable PM, most of which is $PM_{2.5}$; PM concentrations may, consequently, be locally elevated near roadways with high volumes of heavy diesel powered vehicles. The Proposed Actions would not result in any significant increases in heavy-duty diesel traffic near the project site or in the region. The maximum number of projected automobile trips at an intersection is equivalent to approximately 15 additional truck trips based on MOBILE6.2 engine emission factors for the Proposed Actions' 2013 Build year. This is below the New York City Department of Environmental Protection's (NYCDEP) current threshold (19 trucks, based on the average daily traffic volume and type of roadway) for conducting a $PM_{2.5}$ microscale mobile source analysis. Therefore, an analysis of potential impacts from respirable particulate matter was not warranted.

SULFUR DIOXIDE

SO_2 emissions are primarily associated with the combustion of sulfur-containing fuels (oil and coal). Monitored SO_2 concentrations in New York City are lower than the national standards. Due to the federal restrictions on the sulfur content in diesel fuel for on-road vehicles, no significant quantities are emitted from vehicular sources. Vehicular sources of SO_2 are not significant and therefore, an analysis of SO_2 from mobile sources was not warranted.

As part of the Proposed Actions, both No. 2 fuel and natural gas could be burned in the heat and hot water systems. Therefore, potential future levels of SO_2 from boilers were examined.

AIR TOXICS

In addition to the criteria pollutants discussed above, air toxics are of concern. Air toxics are emitted by a wide range of man-made and naturally occurring sources. Emissions of air toxics from industries are regulated by EPA. Federal ambient air quality standards do not exist for non criteria air toxics; however, the New York State Department of Environmental Conservation (NYSDEC) has issued standards for certain non-criteria compounds, including beryllium, gaseous fluorides, and hydrogen sulfide. NYSDEC has also developed guideline concentrations for numerous air toxic compounds. The NYSDEC guidance document DAR-1 (September 2007) contains a compilation of annual and short term (1-hour) guideline concentrations for these compounds. The NYSDEC guidance thresholds represent ambient levels that are considered safe for public exposure.

The potential impact from adjacent industrial sources on air toxics concentrations within the Proposed Actions' study area was examined.

C. AIR QUALITY REGULATIONS, STANDARDS, AND BENCHMARKS

NATIONAL AND STATE AIR QUALITY STANDARDS

As required by the CAA, primary and secondary National Ambient Air Quality Standards (NAAQS) have been established for six major air pollutants: CO, NO_2, ozone, respirable PM (both $PM_{2.5}$ and PM_{10}), SO_2, and lead. The primary standards represent levels that are requisite to protect the public health, allowing an adequate margin of safety. The secondary standards are intended to protect the nation's welfare, and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the environment. The primary and secondary standards are the same for NO_2, ozone, lead, and PM, and there is no secondary standard for CO. The NAAQS are presented in **Table 17-1**. The NAAQS for CO, NO_2, and SO_2 have also been adopted as the ambient air quality standards for New York State, but are defined on a running 12-month basis rather than for calendar years only. New York State also has standards for total suspended particulate matter (TSP), settleable particles, non-methane hydrocarbons (NMHC), and ozone which correspond to federal standards that have since been revoked or replaced, and for beryllium, fluoride, and hydrogen sulfide (H_2S).

Table 17-1
National Ambient Air Quality Standards (NAAQS)

Pollutant	Primary		Secondary	
	ppm	µg/m³	ppm	µg/m³
Carbon Monoxide (CO)				
8-Hour Average (1)	9	10,000	None	
1-Hour Average (1)	35	40,000		
Lead				
Rolling 3-Month Average (5)	NA	0.15	NA	0.15
Nitrogen Dioxide (NO_2)				
Annual Average	0.053	100	0.053	100
Ozone (O_3)				
8-Hour Average (2)	0.075	150	0.075	150
Respirable Particulate Matter (PM_{10})				
24-Hour Average (1)	NA	150	NA	150
Fine Respirable Particulate Matter ($PM_{2.5}$)				
Average of 3 Annual Means	NA	15	NA	15
24-Hour Average (3,4)	NA	35	NA	35
Sulfur Dioxide (SO_2)				
Annual Arithmetic Mean	0.03	80	NA	NA
Maximum 24-Hour Average (1)	0.14	365	NA	NA
Maximum 3-Hour Average (1)	NA	NA	0.50	1,300

Notes: ppm – parts per million
µg/m³ – micrograms per cubic meter
NA – not applicable
All annual periods refer to calendar year.
PM concentrations (including lead) are in µg/m³ since ppm is a measure for gas concentrations.
Concentrations of all gaseous pollutants are defined in ppm and approximately equivalent concentrations in µg/m³ are presented.
(1) Not to be exceeded more than once a year.
(2) 3-year average of the annual fourth highest daily maximum 8-hr average concentration. EPA has reduced these standards down from 0.08 ppm, effective May 27, 2008.
(3) Not to be exceeded by the annual 98th percentile when averaged over 3 years.
(4) EPA has lowered the NAAQS down from 65 µg/m³, effective December 18, 2006.
(5) EPA has lowered the NAAQS down from 1.5 µg/m³, effective January 12, 2009.
Source: 40 CFR Part 50: National Primary and Secondary Ambient Air Quality Standards.

EPA has revised the NAAQS for PM, effective December 18, 2006. The revision included lowering the level of the 24-hour $PM_{2.5}$ standard from 65 µg/m^3 to 35 µg/m^3 and retaining the level of the annual standard at 15 µg/m^3. The PM_{10} 24-hour average standard was retained and the annual average PM_{10} standard was revoked. EPA has also revised the 8-hour ozone standard, lowering it from 0.08 to 0.075 parts per million (ppm), effective in May 2008.

EPA lowered the primary and secondary standards for lead to 0.15 µg/m^3, effective January 12, 2009. EPA revised the averaging time to a rolling 3-month average and the form of the standard to not-to-exceed across a 3-year span. The current lead NAAQS will remain in place for one year following the effective date of attainment designations for any new or revised NAAQS before being revoked, except in current non-attainment areas, where the existing NAAQS will not be revoked until the affected area submits, and EPA approves, an attainment demonstration for the revised lead NAAQS.

NAAQS ATTAINMENT STATUS AND STATE IMPLEMENTATION PLANS

The CAA, as amended in 1990, defines non-attainment areas (NAA) as geographic regions that have been designated as not meeting one or more of the NAAQS. When an area is designated as non-attainment by EPA, the state is required to develop and implement a State Implementation Plan (SIP), which delineates how a state plans to achieve air quality that meets the NAAQS under the deadlines established by the CAA.

In 2002, EPA re-designated New York City as in attainment for CO. The CAA 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 the city to reduce CO levels, should unanticipated localized growth result in elevated CO levels during the maintenance period.

Manhattan has been designated as a moderate NAA for PM_{10}. On December 17, 2004, EPA took final action designating the five New York City counties, Nassau, Suffolk, Rockland, Westchester, and Orange counties as a $PM_{2.5}$ non-attainment area under the CAA due to exceedance of the annual average standard. New York State has submitted a draft SIP to EPA, dated April 2008, designed to meet the annual average standard by April 8, 2010, which will be finalized after public review.

As described above, EPA has revised the 24-hour average $PM_{2.5}$ standard. In December 2008 EPA designated the New York City Metropolitan Area as nonattainment with the 2006 24-hour $PM_{2.5}$ NAAQS, effective in April 2009. The nonattainment area includes the same 10-county area EPA designated as nonattainment with the 1997 annual $PM_{2.5}$ NAAQS. By April 2012 New York will be required to submit a SIP demonstrating attainment with the 2006 24-hour standard by 2014 (EPA may grant attainment date extensions for up to five additional years).

Nassau, Rockland, Suffolk, Westchester, Lower Orange County Metropolitan Area (LOCMA), and the five New York City counties had been designated as a severe non-attainment area for ozone (1-hour average standard). In November 1998, New York State submitted its *Phase II Alternative Attainment Demonstration for Ozone*, which was finalized and approved by EPA effective March 6, 2002, addressing attainment of the 1-hour ozone NAAQS by 2007. These SIP revisions included additional emission reductions that EPA requested to demonstrate attainment of the standard, and an update of the SIP estimates using the latest versions of the mobile source emissions model, MOBILE6.2, and the nonroad emissions model, NONROAD—which have been updated to reflect current knowledge of engine emissions and the latest mobile and nonroad engine emissions regulations.

On April 15, 2004, EPA designated these same counties as moderate non-attainment for the 8-hour average ozone standard which became effective as of June 15, 2004 (LOCMA was moved to the Poughkeepsie moderate non-attainment area for 8-hour ozone). EPA revoked the 1-hour standard on June 15, 2005; however, the specific control measures for the 1-hour standard included in the SIP are required to stay in place until the 8-hour standard is attained. The discretionary emissions reductions in the SIP would also remain but could be revised or dropped based on modeling. On February 8, 2008, NYSDEC submitted final revisions to a new SIP for the ozone to EPA. NYSDEC has determined that achieving attainment for ozone before 2012 is unlikely, and has therefore made a request for a voluntary reclassification of the New York nonattainment area as “serious”.

In March 2008 EPA strengthened the 8–hour ozone standards. EPA expects designations to take effect no later than March 2010 unless there is insufficient information to make these designation decisions. In that case, EPA will issue designations no later than March 2011. SIPs will be due three years after the final designations are made.

DETERMINING THE SIGNIFICANCE OF AIR QUALITY IMPACTS

The State Environmental Quality Review Act (SEQRA) regulations and the *City Environmental Quality Review (CEQR) Technical Manual* state that the significance of a predicted consequence of a project (i.e., whether it is material, substantial, large or important) should be assessed in connection with its setting (e.g., urban or rural), its probability of occurrence, its duration, its irreversibility, its geographic scope, its magnitude, and the number of people affected.[1] In terms of the magnitude of air quality impacts, any action predicted to increase the concentration of a criteria air pollutant to a level that would exceed the concentrations defined by the NAAQS (see **Table 17-1**) would be deemed to have a potential significant adverse impact. In addition, in order to maintain concentrations lower than the NAAQS in attainment areas, or to ensure that concentrations will not be significantly increased in non-attainment areas, threshold levels have been defined for certain pollutants; any action predicted to increase the concentrations of these pollutants above the thresholds would be deemed to have a potential significant adverse impact, even in cases where violations of the NAAQS are not predicted.

New York City has developed *de minimis* criteria to assess the significance of the increase in CO concentrations that would result from proposed projects or actions, as set forth in the CEQR Technical Manual. These criteria set the minimum change in CO concentration that defines a significant environmental impact. Significant increases of CO concentrations in New York City are defined as: (1) an increase of 0.5 ppm or more in the maximum 8-hour average CO concentration at a location where the predicted No Action 8-hour concentration is equal to or between 8 and 9 ppm; or (2) an increase of more than half the difference between baseline (i.e., No Action) concentrations and the 8-hour standard, when No Action concentrations are below 8.0 ppm.

[1] *CEQR Technical Manual*, section 222, 2001; and State Environmental Quality Review Regulations, 6 NYCRR § 617.7

D. METHODOLOGY FOR PREDICTING POLLUTANT CONCENTRATIONS

The methods used for predicting air quality in the Future Conditions with the Proposed Actions (Build) and the impact of the Proposed Actions on air quality as compared to the No Build are presented in this section.

MOBILE SOURCES

The prediction of vehicle-generated CO emissions, and their dispersion in an urban environment, incorporates meteorological phenomena, traffic conditions, and physical configurations. 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, particularly under adverse meteorological conditions.

The mobile-source analyses for the Proposed Actions employ a model approved by EPA that has 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 ensue from the Proposed Actions.

DISPERSION MODEL FOR MICROSCALE ANALYSES

Maximum CO concentrations adjacent to the intersection selected for analysis, resulting from vehicle emissions, were predicted using the CAL3QHC model Version 2.0.[1] The CAL3QHC model employs a Gaussian (normal distribution) dispersion assumption and includes an algorithm for estimating vehicular queue lengths at signalized intersections. CAL3QHC predicts emissions and dispersion of CO from idling and moving vehicles. The queuing algorithm includes site-specific traffic parameters, such as signal timing and delay calculations (from the 2000 *Highway Capacity Manual* traffic forecasting model), saturation flow rate, vehicle arrival type, and signal actuation (i.e., pre-timed or actuated signal) characteristics to accurately predict the number of idling vehicles. The CAL3QHC model has been updated with an extended module, CAL3QHCR, which allows for the incorporation of hourly meteorological data into the modeling, instead of worst-case assumptions regarding meteorological parameters. This refined version of the model, CAL3QHCR, is employed if maximum predicted future CO concentrations are greater than the applicable ambient air quality standards or when *de minimis* thresholds are exceeded using the first level of CAL3QHC modeling.

[1] *User's Guide to CAL3QHC, A Modeling Methodology for Predicted Pollutant Concentrations Near Roadway Intersections*, Office of Air Quality, Planning Standards, EPA, Research Triangle Park, North Carolina, Publication EPA-454/R-92-006.

METEOROLOGY

In general, the transport and concentration of pollutants from vehicular sources are influenced by three principal meteorological factors: wind direction, wind speed, and atmospheric stability. Wind direction influences the direction in which pollutants are dispersed, and atmospheric stability accounts for the effects of vertical mixing in the atmosphere. These factors, therefore, influence the concentration at a particular location.

CO calculations were performed using the CAL3QHC model. In applying the CAL3QHC model, the wind angle was varied to determine the wind direction resulting in the maximum concentrations at each precise location at which concentrations are predicted (receptor).

Following the EPA guidelines,[1] CO computations were performed using a wind speed of 1 meter per second, and the neutral stability class D. The 8-hour average CO concentrations were estimated by multiplying the predicted 1-hour average CO concentrations by a factor of 0.77 for Midtown Manhattan to account for persistence of meteorological conditions and fluctuations in traffic volumes. A surface roughness of 3.21 meters and a mixing height of 1,000 meters were chosen. At each receptor location, concentrations were calculated for all wind directions, and the highest predicted concentration was reported, regardless of frequency of occurrence. These assumptions ensured that worst-case meteorology was used to estimate impacts.

ANALYSIS YEAR

The microscale analyses were performed for existing conditions and 2013, the year by which the Proposed Actions are likely to be completed. The future analysis was performed both without the Proposed Actions (the No Build condition) and with the Proposed Actions (the Build condition).

VEHICLE EMISSIONS DATA

Vehicular CO engine emission factors were computed using the EPA mobile-source emissions model, MOBILE6.2.[2] This emissions model is capable of calculating engine emission factors for various vehicle types, based on the fuel type (gasoline, diesel, or natural gas), meteorological conditions, vehicle speeds, vehicle age, roadway types, number of starts per day, engine soak time, and various other factors that influence emissions, such as inspection maintenance programs. The inputs and use of MOBILE6.2 incorporate the most current guidance available from NYSDEC and NYCDEP.

Vehicle classification data were based on field studies. Appropriate credits were used to accurately reflect the inspection and maintenance program. The inspection and maintenance programs require inspections of automobiles and light trucks to determine if pollutant emissions from each vehicle's exhaust system are below emission standards. Vehicles failing the emissions test must undergo maintenance and pass a repeat test to be registered in New York State.

---

[1] *Guidelines for Modeling Carbon Monoxide from Roadway Intersections*, EPA Office of Air Quality Planning and Standards, Publication EPA-454/R-92-005.

[2] EPA, User's Guide to MOBILE6.1 and MOBILE6.2: Mobile Source Emission Factor Model, EPA420-R-03-010, August 2003.

All taxis were assumed to be in hot stabilized mode (i.e., excluding any start emissions). The general categories of vehicle types for specific roadways were further categorized into subcategories based on their relative breakdown within the fleet.[1]

An ambient temperature of 50 dgrees Fahrenheit was used, as recommended in the *CEQR Technical Manual* and consistent with current NYCDEP guidance.

TRAFFIC DATA

Traffic data for the air quality analysis were derived from existing traffic counts, projected future growth in traffic, and other information developed as part of the traffic analysis for the Proposed Actions (see Chapter 15, "Traffic and Parking"). Traffic data for the future without and with the Proposed Actions were employed in the respective air quality modeling scenarios. The weekday morning (8AM to 9AM) peak period was analyzed. This time period was selected for the mobile-source analysis because it would produce the maximum anticipated project-generated traffic and therefore have the greatest potential for significant air quality impacts.

BACKGROUND CONCENTRATIONS

Background concentrations are those pollutant concentrations originating from distant sources not directly included in the modeling analysis, which directly accounts for vehicular emissions on the streets within 1,000 feet and in the line of sight of the analysis site. Background concentrations must be added to modeling results to obtain total pollutant concentrations at an analysis site. The highest background concentrations monitored at the nearest NYSDEC background monitoring station in the most recent three-year period were used. It was conservatively assumed that the maximum background concentrations occur on all days.

The background concentrations for the area of the development parcels are presented in **Table 17-2**. CO backgrounds are based on the latest available three years of monitored data (2005-2007). All other pollutants are based on the latest five years of monitored data (2003–2007). Consistent with the NAAQS for each pollutant, for averaging periods shorter than a year the second-highest value is used. These values were used as the background concentrations for all analyses, including mobile-source analyses.

Table 17-2
Maximum Background Pollutant Concentrations

Pollutant	Average Period	Location	Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
NO_2	Annual	P.S. 59. Manhattan	71.5	100
SO_2	3-hour	P.S. 59, Manhattan	201	1,300
	24-hour		123	365
	Annual		37	80
CO	1-hour	P.S. 59, Manhattan	2.3 ppm	35 ppm
	8-hour		1.7 ppm	9 ppm

Notes:
CO values are the highest of the latest available 3 years; all other pollutants are the highest of the latest 5 years, and for averaging periods shorter than a year the second highest value is used.
Sources: New York State Air Quality Report Ambient Air Monitoring System, NYSDEC, 2003–2007.

[1] The MOBILE6.2 emissions model utilizes 28 vehicle categories by size and fuel. Traffic counts and predictions are based on broader size categories, and then broken down according to the fleet-wide distribution of subcategories and fuel types (diesel, gasoline, or alternative).

ANALYSIS SITES

One analysis site was selected for microscale analysis (see **Table 17-3**). The intersection selected is the location in the study area where the largest levels of project-generated traffic are expected, and, therefore, where the greatest air quality impacts and the maximum change in concentrations would be expected. The intersection was analyzed for CO.

Table 17-3
Mobile-Source Analysis Site

Site	Location
1	West 45th Street at 11th Avenue

RECEPTOR PLACEMENT

Multiple receptors were modeled at the selected site; receptors were placed along the approach and departure links at spaced intervals. Receptors in all analysis models for predicting local concentrations were placed at sidewalk or roadside locations near intersections with continuous public access.

PARKING GARAGE

The Proposed Actions would result in the operation of a 204-space accessory parking for the residential units in a below-grade garage on the Project Site. The outlet air from the garage's ventilation system could contain elevated levels of CO due to emissions from vehicular exhaust emissions in the garage. The ventilation air could potentially affect ambient levels of CO at locations near the outlet vent. An analysis of the emissions from the outlet vent and their dispersion in the environment was performed, calculating pollutant levels in the surrounding area, using the methodology set forth in the CEQR Technical Manual.

Emissions from vehicles entering, parking, and exiting the garage were estimated using the EPA MOBILE6.2 mobile source emission model and an ambient temperature of 50°F, as referenced in the CEQR Technical Manual. All arriving and departing vehicles were conservatively assumed to travel at an average speed of 5 miles per hour within the parking garage. In addition, all departing vehicles were assumed to idle for 1 minute before exiting. The concentration of CO within the garage was calculated assuming a minimum ventilation rate, based on New York City Building Code requirements, of 1 cubic foot per minute of fresh air per gross square foot of garage area. To determine compliance with the NAAQS, CO concentrations were predicted for the maximum 8-hour average period. (No exceedances of the 1-hour standard would occur and the 8-hour values are the most critical for impact assessment.)

To determine pollutant concentrations, the outlet vent was analyzed as a "virtual point source" using the methodology in EPA's *Workbook of Atmospheric Dispersion Estimates, AP-26*. This methodology estimates CO concentrations at various distances from an outlet vent by assuming that the concentration in the garage is equal to the concentration leaving the vent, and determining the appropriate initial horizontal and vertical dispersion coefficients at the vent faces.

The CO concentrations were determined for the time periods when overall garage usage would be the greatest, considering the hours when the greatest number of vehicles would exit the facility. Departing vehicles were assumed to be operating in a "cold-start" mode, emitting higher levels of CO than arriving vehicles. Traffic data for the parking garage analysis were derived from the trip generation analysis described in Chapter 15, "Traffic and Parking."

Since the detailed ventilation plans have not yet been defined, worst-case assumptions were made regarding the design of the garage's mechanical ventilation system. It was conservatively assumed that the air from the garage would be vented through a single outlet at a height of approximately 10 feet. The vent face was modeled to directly discharge toward West 45th Street, and receptors were placed on the sidewalks on both sides of the street (both near the vent and across the street) at a pedestrian height of 6 feet and at distances of 7 feet and 47 feet, respectively, from the vent. A persistence factor of 0.77, supplied by NYCDEP, was used to convert the calculated 1-hour average maximum CO concentrations to 8-hour averages, accounting for meteorological variability over the average 8-hour period.

Background and on-street CO concentrations were added to the modeling results to obtain the total ambient levels. The on-street CO concentration was determined using the methodology in Air Quality Appendix 1 of the CEQR Technical Manual, utilizing traffic volumes from a traffic survey conducted in the study area.

STATIONARY SOURCES

HEATING, VENTILATION, AND COOLING SYSTEMS

A screening analysis was performed to assess potential impacts associated with emissions from the HVAC systems of the residential buildings and the relocated school on the Project Site. The methodology described in the CEQR Technical Manual was used for the analysis. This methodology determines the threshold of development size below which the action would not have a significant adverse impact. The screening procedures utilize information regarding the type of fuel to be burned, the maximum development size, and the HVAC exhaust stack height to evaluate whether a significant adverse impact is likely. Impacts on existing sensitive uses as well as sensitive uses that are under construction were considered. Based on the distance from the development to the nearest building of similar or greater height, if the maximum development size is greater than the threshold size in the CEQR Technical Manual, there is the potential for significant air quality impacts, and a refined dispersion modeling analysis would be required. Otherwise, the source passes the screening analysis, and no further analysis is required.

Since the Proposed Actions would result in buildings of varying heights, including buildings configured with different tiers, the analysis assumed that the boiler stack for each building would be installed on the highest tier, and that the stack would be located 3 feet above roof height (as per the CEQR Technical Manual).

The LDA between the HPD and 44th Street Development LLC would include limitations on the types of fuels and the placement of HVAC exhaust stacks for the existing school which would be converted to residential use to ensure no significant adverse air quality impacts occur. In addition, the New York City School Construction Authority (SCA) is obligated to comply with the specifications on fuel use and stack placement for the proposed school to preclude any significant adverse air quality impacts. More details on the restrictions are discussed in Section G below.

EXISTING HVAC EMISSION SOURCES

Existing commercial, industrial, institutional and large-scale residential sources of combustion (HVAC) emissions were surveyed to determine their potential for air quality impacts on the Proposed Actions. A 400-foot study area around the Proposed Actions' site boundaries was used to identify Buildings with NYSDEC-issued permits. None of the buildings within the study were found to possess either a Title V permit or state facility permit. Therefore, emissions from existing HVAC sources would be considered minor and would not have a significant impact on the Proposed Actions.

INDUSTRIAL SOURCES

Screening Analysis

To assess air quality impacts on the proposed development associated with emissions from nearby industrial sources, a screening analysis was performed using the methodology described in the *CEQR Technical Manual*. The first step in this analysis was to perform a field survey in order to identify any processing or manufacturing facilities located within 400 feet of the proposed development. Once identified, information regarding the release of air contaminants from these facilities was obtained from NYCDEP's Bureau of Environmental Compliance (BEC) and NYSDEC to obtain all the available certificates of operation for these locations and to determine whether manufacturing or industrial emissions occur. In addition, a search of federal and state-permitted facilities within the study area was conducted using the EPA's Envirofacts database.[1]

In the next step, the potential ambient concentrations of each air toxic contaminant were determined using a screening database from the USEPA Industrial Source Complex dispersion model. Estimates of worst-case short-term (1-hour) and annual averages were predicted and then compared to the short-term and annual guideline concentrations (SGCs and AGCs) recommended in *NYSDEC's DAR-1 AGC/SGC Tables*.[2] These guideline concentrations are applied as screening thresholds to determine if the Proposed Actions could be significantly impacted by nearby air pollution sources.

To assess the effects of multiple sources emitting the same pollutants, cumulative source impacts were conservatively estimated. Concentrations of the same pollutant were combined and compared to the NYSDEC AGCs and SGCs.

Dispersion Modeling

Since a potential exceedance was predicted at the project site in the industrial source screening analysis describe above, refined dispersion modeling was required. The refined modeling analysis was performed using the EPA/AMS AERMOD dispersion model. The AERMOD model calculates pollutant concentrations from one or more points (e.g., exhaust stacks) based on emission rates, source parameters and hourly meteorological data, stack tip downwash, urban dispersion and surface roughness length, and elimination of calms. The AERMOD model was run without downwash—a procedure which produces the highest concentrations at elevated locations. The meteorological data set consisted of five years of meteorological data: surface data collected at LaGuardia Airport (2003–2007) and concurrent upper air data collected at Brookhaven, Suffolk County, New York.

---

[1] http://oaspub.epa.gov/enviro/ef_home2.air

[2] NYSDEC Division of Air Resources, September 10, 2007.

Discrete receptors (i.e., locations at which concentrations were calculated) were placed on the project site. The receptor network consisted of receptors located at spaced intervals along the sides of the potentially affected project buildings from the ground floor to the upper level. Emission rates and stack parameters, obtained from the NYCDEP permits and where available, were input into the AERMOD dispersion model.

Predicted worst-case cumulative source impacts were compared with the SGCs and AGCs recommended in *NYSDEC's DAR-1 AGC/SGC Tables*[1] to determine if the Proposed Actions could be significantly impacted by the industrial sources.

E. EXISTING CONDITIONS

Air quality in the existing condition is discussed for informative purposes only, since the baseline condition for air quality in the future condition with the Proposed Actions is the future condition without the Proposed Actions. This is because vehicular emission rates and background traffic conditions would change in the future, regardless of the Proposed Actions.

EXISTING MONITORED AIR QUALITY CONDITIONS

The most recent concentrations of all criteria pollutants at NYSDEC air quality monitoring stations nearest the study area are presented in **Table 17-4**. All data statistical forms and averaging periods are consistent with the definitions of the NAAQS. The only criteria pollutant concentrations which exceeded the NAAQS were the annual and 24-hour average concentrations of $PM_{2.5}$. It should be noted that these values are somewhat different than the background concentrations presented in **Table 17-2**, above. These existing concentrations are the latest (2007) measured, averaged according to the NAAQS (e.g., $PM_{2.5}$ concentrations are averaged over 3 years); the background concentrations are the highest values in past years, and are used as a conservative estimate of the highest background concentrations for future conditions.

Table 17-4
Representative Monitored Ambient Air Quality Data

Pollutants	Location	Units	Period	Concentration	Exceeds Federal Standard? Primary	Exceeds Federal Standard? Secondary
CO	PS 59, Manhattan	ppm	8-hour	1.4	N	N
			1-hour	2.3	N	N
SO_2	PS 59, Manhattan	ppm	Annual	0.010	N	-
			24-hour	0.029	N	-
			3-hour	0.051	-	N
Respirable particulates (PM_{10})	PS 59, Manhattan	μg/m³	Annual	25.0	N[1]	N[1]
			24-hour	53.0	N	N
Respirable particulates ($PM_{2.5}$)	PS 19, Manhattan	μg/m³	Annual	15.6	Y	Y
			24-hour	38.2	Y[2]	Y[2]
NO_2	PS 59, Manhattan	ppm	Annual	0.034	N	N
Lead	JHS 126, Brooklyn	μg/m³	3-month	0.02	N	-
Ozone (O_3)	IS 52, Bronx	ppm	1-hour	0.107[2]	-	-
		ppm	8-hour	0.076	N	N

Notes:
1 The annual PM_{10} standard was revoked, effective December 18, 2006.
2 The 1-hour ozone NAAQS has been replaced with the 8-hour standard; however, the maximum monitored concentration is provided for informational purposes.
Source: NYSDEC, 2007 New York State Ambient Air Quality Data.

EXISTING SIMULATED POLLUTANT CONCENTRATIONS IN THE STUDY AREA

The monitored concentrations (presented above) represent general air quality in the study area. However, the concentrations adjacent to the mobile-source analysis sites in the existing condition may be higher than at the monitoring stations, due to the adjacent vehicular emissions. The highest simulated existing 8-hour average CO concentration at the mobile-source analysis site is presented in **Table 17-5**. (One-hour average value is not shown since the predicted value is much lower than the 1-hour standard of 35 ppm.)

Table 17-5
Maximum Simulated Existing 8-Hour Average Carbon Monoxide Concentration for 2008

Site Number	Location	Time Period	8-Hour Concentration (ppm)
1	West 45th Street at 11th Avenue	AM	3.1
Note: 8-hour standard is 9 ppm.			

F. THE FUTURE WITHOUT THE PROPOSED ACTIONS

In the future condition without the Proposed Actions (No Build), traffic volumes would be higher than in the existing condition, but vehicular emission factors would be lower due to improvements in engine technologies in the general fleet. Since the development parcels would not be developed, there would be no associated parking ventilation or boiler emissions.

The total predicted CO concentration at the analysis intersection for the No Build condition is presented in **Table 17-6**.

Table 17-6
Future (2013) Maximum Predicted 8-Hour Carbon Monoxide No Build Concentrations

Site Number	Location	Time Period	8-Hour Concentration (ppm)
1	West 45th Street at 11th Avenue	AM	2.9
Note: 8-hour standard is 9 ppm.			

G. PROBABLE IMPACTS OF THE PROPOSED ACTIONS

Predicted air quality in the future condition with the Proposed Actions (Build) and the impact of the Proposed Actions on air quality as compared to the No Build are presented in this section.

MOBILE SOURCES

The Proposed Actions would result in changes in traffic patterns and an increase in traffic volume in the study areas and could potentially result in local increases in CO concentrations. Total predicted CO concentrations at the selected mobile-source analysis site for the No Build and Build conditions are presented in **Table 17-7**. The results indicate that the Proposed Actions would not result in any violations of the CO standard or any significant impacts at the receptor location. In addition, the incremental increases in 8-hour average CO concentrations would be very small and, consequently, would not result in a violation of the CEQR *de minimis* CO criteria. (The *de minimis* criteria were previously described in Section C of this chapter.) Therefore, the Proposed Actions would not result in any significant adverse CO air quality impacts.

Table 17-7
Future (2013) Maximum Predicted 8-Hour Average
No Build and Build Carbon Monoxide Concentrations

Site Number	Location	Time Period	Total 8-Hour Concentration (ppm) No Build	Build
1	West 45th Street at 11th Avenue	AM	2.9	2.9

Note: All totals include background concentrations.
8-hour standard is 9 ppm.

PARKING GARAGE

Based on the methodology previously described, the maximum predicted CO concentrations from the proposed parking facility was analyzed. The proposed parking garage was modeled as a worst-case parking facility using two receptor points: a near side receptor on the same side of the street as the parking facility and a far side receptor on the opposite side of the street from the parking facility. The total CO impacts included both background CO levels and the far side receptor included contributions from traffic on adjacent roadways.

The maximum overall predicted future CO concentrations, with ambient background levels, at receptor locations, were predicted to be 3.5 ppm and 2.2 ppm for the 1- and 8-hour periods, respectively. The maximum 1- and 8-hour contribution from the proposed parking facility was predicted to be 1.2 ppm and 0.5 ppm, respectively. The values are the highest predicted concentrations for receptor analyzed.

The CO impacts from the parking garage were substantially below the applicable standard of 9 ppm. Therefore, it can be concluded that the accessory parking associated with the Proposed Actions would not result in any significant adverse air quality impacts.

STATIONARY SOURCES

HEATING, VENTILATION, AND COOLING SYSTEMS

The screening analysis was performed to determine potential impacts from each building's HVAC system on other buildings on the Project Site or existing buildings nearby. The development sizes for each of the proposed buildings in square feet were used to determine potential for impacts. Building A at the western end of the block is approximately 632,935 square feet in size with a stack height of 374 feet; Building B, located midblock, is approximately 272,414 square feet in size with a stack height of 197 feet; the size of the existing five-story school, which is to be converted to residential use once the new school is completed, is approximately 30,000 square feet with a stack height of 110 feet; the size of the new P.S. 51 is 97,850 square feet with a stack height of 110 feet; and Buildings CN and CS, located east of the existing and proposed schools, is approximately 83,093 square feet, each with a stack height of 199 feet.[1] The closest building of similar or greater height found in the study area (including project on project impacts) was used for the analysis.

Based on this information, it was determined that Buildings B, CN, and CS would pass the screening analysis conservatively for both project on project and project on existing impacts

[1] Elevations reflect heights above Manhattan datum and include an additional 3 feet to account for the height of ventilation stacks.

using No. 4 oil as the fuel source, with no restrictions required; however, to preclude the potential for significant adverse air quality impacts from Building A and the residential building to be converted from the existing school, the LDA between HPD and 44th Street Development LLC would include the following requirements as part of the Proposed Project:

- **Building A.** Any new development on this property must ensure that exhaust stack(s) for the building's heating, ventilating and air conditioning system be located on the roof of the tallest portion of the building to avoid any potential significant air quality impacts.
- **Existing School/Future Residential Building.** Any new development on this property must ensure that the heating, ventilating and air conditioning stack(s) utilize either No. 2 fuel oil or natural gas, and boiler exhaust stacks on this property must be located at least 30 feet from adjacent buildings, Buildings B and C, to avoid any potential significant air quality impacts.

In addition, to preclude the potential for significant adverse air quality impacts from the proposed school, SCA would incorporate the following specifications on fuel use and stack placement as part of the Proposed Project and per its environmental review requirements under the State Environmental Quality Review Act:

- **Relocated and Expanded P.S. 51.** Any new development on this property must ensure that the heating, ventilating and air conditioning stack(s) utilize either No. 2 fuel oil or natural gas. If development on this property utilizes No. 2 fuel oil for the heating, ventilating and air conditioning, boiler exhaust stacks on this property must be located at least 60 feet from the building lines of Buildings B and C; if the development utilizes natural gas, boiler exhaust stacks on the property must be located at least 47 feet from the building lines of Buildings B and C to avoid any potential significant air quality impacts.

With these restrictions, emissions from the boiler exhaust stacks would not result in any significant adverse air quality impacts.

INDUSTRIAL SOURCES

Screening Analysis

As discussed above, a study was conducted to identify manufacturing and industrial uses within the 400-foot study area. For the addresses identified, a request for permit information was made to NYCDEP.

The screening procedure used to estimate the pollutant concentrations from these businesses is based on their emission rates described in the certificates to operate obtained from NYCDEP-BEC and the distances between the sources and the project site in the Build condition. This screening analysis identified one business that could potentially have short-term impacts of particulate matter on the Proposed Actions. Therefore, refined dispersion modeling was performed for this pollutant.

Dispersion Modeling

As a result of the industrial source screening analysis, a detailed analysis of short-term particulate matter impacts was undertaken using the AERMOD model. The SGC for particulate matter is an equivalent standard, adjusted from the 24-hour NAAQS to a 1-hour average concentration. In accordance with guidance in NYSDEC DAR-1, if a predicted exceedance of the equivalent standard occurs, the short-term concentrations of particulate matter were compared to the 24-hour NAAQS to determine if the Proposed Actions could be significantly impacted by nearby air pollution sources.

Results

Table 17-8 presents the potential maximum impacts from the industrial screening and detailed modeling at the project site. The table lists the highest calculated SGC and AGC calculated (or standards) for each toxic air pollutant.

In the case of tetrachloroethylene, the maximum predicted annual concentration from a dry cleaner establishment exceeds the NYSDEC AGC of 1.0 μg/m^3. However, it does not represent a significant public health impact. This is because NYSDEC guidance interprets impacts of less than 10 times higher than the AGC for carcinogenic compounds that have a risk-based threshold (which includes tetrachloroethylene) as allowable, as long as best available control technology (BACT) is in place. The owners and/or operators of any dry cleaning establishment that uses tetrachloroethylene must comply with state air pollution regulations. These rules in 6 NYCRR Part 232, provided on the NYSDEC website, include among other things, the mandatory use of specific air pollution control systems designed to reduce and contain the release of tetrachloroethylene and to minimize the public's exposure to these vapors. As indicated in the associated NYCDEP air permit, this dry cleaning facility has installed NYSDEC certified fourth generation equipment which is in compliance with Part 232 regulations. Since the source is equipped with state-of-the-art controls (as described above) and clearly represents BACT, the maximum annual concentration of tetrachloroethylene on the Proposed Actions is not considered a significant adverse impact.

Table 17-8
Maximum Predicted Impacts from Industrial Sources

Potential Contaminants	Estimated Short-term Impact (ug/m^3)	SGC[a] (ug/m^3)	Estimated Long-term Impact (ug/m^3)	AGC[a] (ug/m^3)
Acetic Acid	0.22	3,700	0.00085	60
Hydrogen Chloride	0.97	2,100	0.0037	20
Isobutyl Acetate	2,951	--	9.79	17,000
Isopropyl Alcohol	1,005	98,000	5.04	7,000
Methyl Ethyl Ketone	5,427	59,000	18.00	1,000
Nitric Acid Mist	0.49	86	0.0019	12
Oxides of Nitrogen	0.73	--	0.0016	74
Particulate Matter	36.63[b]	150[c]	4.86[d]	45
Tetrachloroethylene	462.51	1,000	1.15[e]	1
Toluene	16,755	37,000	55.59	5,000
Triethylene Glycol	0.22	620	0.00085	330

Notes:
[a] NYSDEC DAR-1 (Air Guide-1) AGC/SGC Tables, September, 2007.
AGC-Annual Guideline Concentrations.
SGC-Short-term Guideline Concentrations.
[b] 24-hour impact based on the refined analysis.
[c] NAAQS Standard for PM_{10} .
[d] Annual impact based on screening analysis.
[e] NYSDEC guidance interprets impacts of less than 10 times higher than the AGC for carcinogenic compounds that have a risk-based threshold as allowable, as long as BACT is in place. For tetrachloroethylene, this guidance applies.

Therefore, based on the data available on the surrounding industrial uses, the Proposed Actions would not experience significant air quality impacts from these facilities.

ANALYSIS OF EMISSIONS FROM DIESEL LOCOMOTIVES

An analysis was performed to determine the potential effect of the proposed deck over the rail cut on pollutant concentrations emitted from Amtrak diesel train operations in the vicinity of the project site. To be conservative, the analysis did not include natural ventilation of the rail line and assumed up to two vents would be located on the project site.

The analysis shows that to avoid potential $PM_{2.5}$ concentration increments on the Proposed Project that would exceed impact thresholds, measures would be necessary to require the developer to ventilate diesel locomotive emissions through vents located on the roofs (or through a combined HVAC venting system on the roofs) of Buildings CN and/or CS. With these measures incorporated as part of the Proposed Project, the Proposed Actions would not result in significant adverse impacts on air quality.

CONSISTENCY WITH NEW YORK STATE AIR QUALITY IMPLEMENTATION PLAN

As addressed above, maximum predicted CO concentrations with the Proposed Actions would be less than the applicable ambient air standard. Therefore, the Proposed Actions would be consistent with the New York State Implementation Plan for the control of ozone and CO.

CONCLUSION

Based on the analyses conducted, the Proposed Actions would not result in any significant adverse air quality impacts on sensitive uses in the surrounding community, and the Proposed Actions would not be adversely affected by existing sources of air emissions in the study area, as described below.

The additional traffic that would be generated by the Proposed Project was found to not have the potential for significant adverse impacts on air quality. Maximum CO concentrations in the future with the Proposed Actions would not result in violations of EPA air quality standards. It was also determined that the increase in CO impacts from the additional traffic that is predicted to occur as a result of the Proposed Actions would not exceed the allowable levels stated in the CEQR *de minimis* criteria. In addition, the parking garage analysis determined that the ventilation of air from the parking facilities that would be constructed would not cause any significant adverse air quality impacts.

To preclude the potential for significant adverse air quality impacts from the HVAC system of the proposed school, SCA would incorporate specifications on fuel use and stack placement as part of the Proposed Project and per its environmental review requirements under the State Environmental Quality Review Act:

- **Relocated and Expanded P.S. 51.** Any new development on this property must ensure that the heating, ventilating and air conditioning stack(s) utilize either No. 2 fuel oil or natural gas. If development on this property utilizes No. 2 fuel oil for the heating, ventilating and air conditioning, boiler exhaust stacks on this property must be located at least 60 feet from the building lines of Buildings B and C; if the development utilizes natural gas, boiler exhaust stacks on the property must be located at least 47 feet from the building lines of Buildings B and C to avoid any potential significant air quality impacts.

To avoid potential significant adverse impacts from the HVAC systems associated with the proposed residential buildings on the project site, the LDA between HPD and 44th Street Development LLC would include the following requirements as part of the Proposed Project:

- **Building A.** Any new development on this property must ensure that exhaust stack(s) for the building's heating, ventilating and air conditioning system be located on the roof of the tallest portion of the building to avoid any potential significant air quality impacts.
- **Existing School/Future Residential Building.** Any new development on this property must ensure that the heating, ventilating and air conditioning stack(s) utilize either No. 2 fuel oil or natural gas, and boiler exhaust stacks on this property must be located at least 30 feet from adjacent buildings, Buildings B and C, to avoid any potential significant air quality impacts.

The LDA between HPD and 44th Street Development LLC would also require the developer to ventilate diesel locomotive emissions through vents located on the roofs (or through a combined HVAC venting system on the roofs) of Buildings CN and/or CS. With these measures incorporated as part of the Proposed Project, the Proposed Actions would not result in significant adverse impacts on air quality.

Finally, existing manufacturing and industrial uses within 400 feet of the proposed development site were identified. Based on the industrial source screening and refined analyses, it was concluded that the Proposed Actions would not experience significant air quality impacts from these facilities. ✷