# A. INTRODUCTION

This chapter examines the potential for air quality impacts from the proposed action. Air quality impacts can be either direct or indirect. Direct impacts stem from air contaminant emissions generated by stationary sources at a proposed development site, such as emissions from fuel combustion equipment that provide building heat. The proposed buildings are expected to be heated using natural gas as fuel and therefore, the pollutant of concern is nitrogen dioxide ($NO_2$). In addition, two new parking garages will also be part of the proposed development. Automobile emissions vented from these parking facilities will also be considered in the analysis. The pollutant of concern for vehicle emissions is carbon monoxide (CO).

Indirect impacts are caused by potential emissions from mobile sources (i.e., vehicle trips generated by the project). A micro-scale analysis of affected roadway intersections would be required if the level of project generated traffic were to exceed regulatory thresholds. However, the number of project generated vehicles will be under thresholds for environmental analysis (i.e., 75 peak hour trips for Midtown Manhattan) established in the *New York City Environmental Quality Review (CEQR) Technical Manual*. Therefore, indirect impacts from mobile sources will not be part of the analysis.

This chapter also provides a summary of procedures used for determination of air quality impacts from data provided by the technical analyses. Some of this discussion is relevant to the operational aspects of the proposed project while other parts are intended to address significant impacts levels during site construction activities (e.g., $PM_{2.5}$ interim guidance criteria) analyzed in Chapter 19, "Construction."

# B. AIR QUALITY STANDARDS

### NATIONAL AND STATE AIR QUALITY STANDARDS

As required by the Clean Air Act, 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 CO, $NO_2$, and $SO_2$ standards have also been adopted as the ambient air quality standards for New York State. New York State also has standards for total suspended particulate matter (TSP) and ozone which correspond to federal standards which 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** | | | | |
| 3-Month Average | NA | 1.5 | NA | 1.5 |
| **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 reduced these standards down from 65 µg/m³, effective December 18, 2006.
**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/m³ to 35 µg/m³ and retaining the level of the annual standard at 15 µg/m³. 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.

## NAAQS ATTAINMENT STATUS AND STATE IMPLEMENTATION PLANS (SIP)

The Clean Air Act as amended in 1990 (CAA), 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.

EPA has 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 counties of New York City, and 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 is required to develop a SIP by early 2008, which will be designed to meet the annual average standard by 2010. As described above, EPA has revised the 24-hour average $PM_{2.5}$ standard. Attainment designations for the revised 24-hour $PM_{2.5}$ standard should be effective by April 2010, and state and local governments in areas that are designated as non-attainment are required by April 2013 to develop SIPs that are designed to attain the revised 24-hour $PM_{2.5}$ standards by April 2015, although this may be extended in some cases up to April 2020 (these milestones may occur at earlier dates).

Nassau, Rockland, Suffolk, and Westchester Counties, the 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 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 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 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 would 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 *CEQR Technical* Manual state that the significance of a likely consequence (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. 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.

### *DE MINIMIS CRITERIA REGARDING CO IMPACTS*

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 No Action concentrations and the 8–hour standard, when No Action concentrations are below 8.0 ppm.

### *INTERIM GUIDANCE CRITERIA REGARDING $PM_{2.5}$ IMPACTS*

The New York City Department of Environmental Protection (DEP) is currently employing interim guidance criteria for evaluating the potential $PM_{2.5}$ impacts from DEP projects subject to CEQR. The updated interim guidance criteria currently employed by DEP for determination of potential significant adverse $PM_{2.5}$ impacts under CEQR are as follows:

- 24-hour average $PM_{2.5}$ concentration increments which are predicted to be greater than 5 $\mu g/m^3$ at a discrete location where 24-hour long exposure can be reasonably expected (e.g., residencies) or other sensitive locations (e.g., schools, nursing homes), and which are predicted to occur—
    a. Under operational conditions (i.e., permanent condition predicted to exist for many years) regardless of the frequency of occurrence; or
    b. Temporarily (e.g., construction impacts) but with a high frequency and high probability of occurrence;

  would be considered a significant adverse impact on air quality.
- 24-hour average $PM_{2.5}$ concentration increments which are predicted to be greater than 2 $\mu g/m^3$ but no greater than 5 $\mu g/m^3$ at multiple sensitive locations where day-long exposure can be reasonably expected, and which are predicted to occur with a high frequency and high probability of occurrence, would be considered a significant adverse impact on air quality.

- Annual average $PM_{2.5}$ concentration increments predicted to be—
  a. Greater than 0.1 $\mu g/m^3$ at ground-level on a neighborhood scale (i.e., the annual increase in concentration representing the average over an area of approximately 1 square kilometer, centered on the location where the maximum impact is predicted for stationary sources; or at a distance from a roadway corridor similar to the minimum distance defined for locating background monitoring stations); or
  b. Greater than 0.3 $\mu g/m^3$ at a discrete location where year-long exposure can be reasonably expected (e.g., residential windows) or other sensitive locations (e.g., schools, school yards, medical facilities), and which are predicted to occur with a high frequency and high probability of occurrence;

  —would be considered a significant adverse impact on air quality.

In addition, NYSDEC has published a policy to provide interim direction for evaluating $PM_{2.5}$ impacts. This draft policy would apply only to facilities applying for permits or major permit modification under SEQRA that emit 15 tons of $PM_{10}$ or more annually. The interim guidance policy states that such a project will be deemed to have a potentially significant adverse impact if the project's maximum impacts are predicted to increase $PM_{2.5}$ concentrations by more than 0.3 $\mu g/m^3$ averaged annually or more than 5 $\mu g/m^3$ on a 24-hour basis.

Actions under CEQR that would increase $PM_{2.5}$ concentrations more than the DEP or NYSDEC interim guidance criteria above will be considered to have potential significant adverse impacts, depending upon the probability of occurrence, the projected duration of such impacts, the magnitude of the area and the potential number of people affected. DEP recommends that actions subject to CEQR that fail the interim guidance criteria prepare an Environmental Impact Statement (EIS) and examine potential measures to reduce or eliminate such potential significant adverse impacts.

The above draft interim guidance criteria have been used to evaluate the significance of predicted impacts of the proposed project on $PM_{2.5}$ concentrations and determine the need to minimize particulate matter emissions from the proposed project.

## C. METHODOLOGY FOR PREDICTING POLLUTANT CONCENTRATIONS

Two stationary source analyses were performed to determine air quality impacts during the operational phase of the project. The first analysis considered the heating boilers associated with the heating, ventilation, and air conditioning (HVAC) systems of each project building and that of existing HVAC sources in the project area. The second analysis considered the impacts from automobile emissions mechanically vented from the parking facilities associated with the project.

### HVAC SOURCE ANALYSES

#### *CUMULATIVE SOURCE ANALYSES*

A refined dispersion modeling analysis was performed to assess the cumulative air quality impacts on offsite receptors associated with the HVAC systems of the proposed campus buildings using the EPA's AERMOD dispersion model. Another AERMOD analysis was also performed using HVAC sources associated with both the onsite project buildings and existing offsite developments.

The purpose of this analysis was to determine the cumulative air impacts for onsite receptors associated with the proposed project buildings (including project-on-project impacts). Both analyses considered the Option 1 and Option 2 alternatives proposed for the Site 3 location.

AERMOD is a steady-state plume model that incorporates handling of terrain interactions and current concepts about flow and dispersion in complex terrain, including updated treatments of the boundary layer theory, understanding of turbulence and dispersion. The AERMOD model was designed as a replacement to the EPA Industrial Source Complex (ISC3) model and is applicable to rural and urban areas, flat and complex terrain, surface and elevated releases, and multiple sources (including point, area, and volume sources). Pollutants discharged through multiple heating system exhaust stacks were each modeled as a point source located in the center of each building's rooftop which included each project development site and 15 existing sources within 1,000 feet of the project boundary with boilers rated at 20 MMBtu/hr or greater. These two options include different physical/structural designs for Site 3 but both options contain the same maximum development size. In addition, the analyses includes that concentrations for the law school building that will be present after Phase I is complete but will be gone after Phase II.

The *CEQR Technical Manual* states that the refined model should be run with and without building downwash (the downwash option accounts for the effects on plume dispersion created by the structure the stack is located on, as well as other nearby structures). In general, modeling without building downwash produces higher estimates of pollutant concentrations when assessing the impact of elevated sources on elevated receptor locations. Therefore, the analysis was performed using the AERMOD model with the no downwash option only.

AERMOD calculates pollutant concentrations based on hourly meteorological data. Five years of meteorological data (2002-2006) with surface data from LaGuardia Airport and concurrent upper air data from Brookhaven, NY, were used for the modeling study. Concentrations of nitrogen dioxide were determined and the predicted values were compared with the national and state ambient air quality standard.

*Receptor Locations*

Discrete receptor locations (coded into the model) were placed on nearby sensitive land uses both inside and outside the Fordham campus boundaries at elevated locations. Outside the campus boundaries, these receptors included residential housing, hospitals and places of worship. Within the project boundaries, receptors were placed on Fordham campus dormitories and academic buildings (both existing and proposed).

*Emissions Estimates*

Project Related Sources: The Fordham project buildings would be heated using natural gas for the HVAC system. For natural gas, nitrogen dioxide ($NO_2$) is the pollutant of concern. Fuel usage rates per unit of floor area obtained from DEP Report 12 were used to determine total natural gas usage by site, based on the size (in square feet) of the development site. The calculated natural gas usage rate (in cubic feet per year) was then multiplied by EPA AP-42 emission factors (in pounds per cubic feet) for natural gas fired boilers to estimate nitrogen dioxide emissions for each building's heating system stack. The stack height for each development site was set equal to the building height (at the highest tier, if applicable) plus three feet and the exhaust was located in the center of the roof based on the expectation that the stack would run up the building mechanical shaft in the middle of the building (these stack locations and the fuel type in the proposed buildings will be controlled by the Restrictive Declaration).

Existing Sources: To assess the combined impacts of criteria air pollutants on the proposed project receptors, a cumulative impact analysis was performed using air emissions projections from the project buildings and other nearby existing HVAC sources that may contribute to ambient air quality concentrations. Existing sources in this analysis included combustion sources within 1,000 feet of the project boundary that have a total capacity equal to or greater than 20 MMBtu/hr (considered a significant source of air emissions). The cumulative emissions inventory was developed based on a survey of permitted facilities in the area. The survey included existing or proposed facilities subject to federal Title V operating permit provisions, NYSDEC State facility operating permits, DEP permits and facilities listed on the EPA's Envirofacts database (exisiting Fordham campus buildings are heated by steam). Depending on the fuel, the pollutants of concern included $NO_2$, particulate matter ($PM_{10}$), and sulfur dioxide ($SO_2$). Emission rates were developed for existing sources by using either those emissions explicitly reported in the air permit, or if permitted emission limitations were not expressed, by using AP-42 emission factors with boiler ratings provided in the air permit.

*Background Concentrations*

To estimate the maximum expected pollutant concentration at a given receptor, the calculated impact must be added to a background value that accounts for existing pollutant concentrations from other sources (see Table 17-2). Background levels for $NO_2$, $PM_{10}$ and $SO_2$ were based on concentrations monitored by the nearest NYSDEC ambient air monitoring station. Measured background concentrations by NYSDEC were added to the predicted contributions from the modeled sources to determine the maximum predicted total pollutant concentrations.

**Table 17-2**
**Background Pollutant Concentrations**

| Pollutant | Monitoring Station | Averaging Period | Background Concentration (μg/m$^3$) | Ambient Standard (μg/m$^3$) |
|---|---|---|---|---|
| $NO_2$ | PS 59 | Annual | 71.5 | 100 |
| $PM_{10}$ | PS59/JHS126 | 24 Hour | 60.0 | 150 |
| $SO_2$ | PS 59 | Annual | 36.6 | 80 |
| | | 24 Hour | 123.0 | 365 |
| | | 3 Hour | 201.6 | 1,300 |
| **Source:** NYSDEC Annual New York State Air Quality Report, July 2007. | | | | |

The annual values in Table 17-2 represent the highest "high" monitored concentration. For short-term periods, the monitored background concentrations represent the highest "second high" (as stated in Table 17-1, the NAAQS may "not be exceeded more than once per year"). The one exception is for $SO_2$, for which the 123 μg/m$^3$ value is both the highest high and second high monitored value.

## PARKING GARAGE ANALYSIS

The proposed action would result in the operation of two new accessory parking garages. One would be a 66,704-square-foot garage that would serve Fordham University and the residential development on Site 4 (Parking Garage A). The other parking garage (Parking Garage B) would be 44,847 square feet and would serve the residential development on Site 3. Both garages would be mechanically vented and below-grade. Emissions from vehicles using these parking garages could potentially affect ambient levels of CO in the immediate vicinity of the ventilation outlets. Therefore, an analysis was performed using the methodology set forth in Appendix 1 of the *CEQR Technical Manual*.

Emissions from vehicles entering, parking, and exiting the garages were estimated using the EPA MOBILE6.2 mobile source emission model and an ambient temperature of 50°F. For all arriving and departing vehicles, an average speed of 5 miles per hour was conservatively assumed for travel within the parking garages. In addition, all departing vehicles were assumed to idle for 1 minute before proceeding to the exit. The concentration of CO within the mechanically vented 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 determined 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.)

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. Maximum emissions would result in the highest CO levels and the greatest potential impacts. Traffic data for the parking garage analysis were derived from the parking accumulation tables presented in the traffic section of the EIS and the analysis was performed for the full built scenario in 2032.

## D. EXISTING CONDITIONS

### EXISTING MONITORED AIR QUALITY CONDITIONS (2006)

Monitored background data were utilized to determine the background concentrations. Monitored ambient air concentrations of CO, $SO_2$, particulate matter, $NO_2$, lead, and ozone for the project area are shown in Table 17-3 for the year 2006. These values are the most recent monitored data that have been made available by NYSDEC for nearby monitoring stations. There were no monitored violations of the NAAQS for the pollutants at these sites in 2006.

**Table 17-3**
**Representative Monitored Ambient Air Quality Data**

| Pollutants | Location | Units | Period | Concentrations | | | Number of Times Federal Standard Exceeded | |
|---|---|---|---|---|---|---|---|---|
| | | | | Mean | Highest | Second Highest | Primary | Secondary |
| CO | PS 59 | ppm | 8-hour | - | 1.9 | 1.7 | 0 | - |
| | | | 1-hour | - | 2.3 | 2.3 | 0 | - |
| $SO_2$ | PS 59 | μg/m$^3$ | Annual | 26.2 | - | - | 0 | - |
| | | | 24-hour | - | 102.1 | 83.8 | 0 | - |
| | | | 3-hour | - | 185.8 | 183.2 | - | 0 |
| Respirable Particulates ($PM_{10}$) | PS 59 | μg/m$^3$ | Annual | 23 | - | - | 0 | 0 |
| | | | 24-hour | - | 67 | 60 | 0 | 0 |
| Respirable Particulates ($PM_{2.5}$) | JHS 126 | μg/m$^3$ | Annual | 14.0 | - | - | - | - |
| | | | 24-hour | - | 40.2 | 39.0 | - | - |
| $NO_2$ | PS59 | μg/m$^3$ | Annual | 64.0 | - | - | 0 | 0 |
| Lead | Susan Wagner | μg/m$^3$ | 3-month | - | 0.02 | 0.02 | 0 | - |
| $O_3$ | Botanical Gardens | ppm | 1-hour | - | 0.110 | 0.104 | 0 | 0 |

**Source**: 2007 Annual New York State Air Quality Report, NYSDEC (Draft).

## E. PROBABLE IMPACTS OF THE PROPOSED ACTION

### INTRODUCTION

The proposed action could affect the surrounding community or adjacent campus buildings (i.e., project on project impacts) with air emissions from building heating systems and/or parking facilities. The following section present the results of the studies performed to analyze the potential impacts from the proposed building HVAC heating systems at full buildout (plus existing sources) and two project related parking garages. The HVAC analysis considered both Option 1 and Option 2 design alternatives for Site 3.

### HVAC EQUIPMENT

*CUMULATIVE SOURCE ANALYSIS*

Existing Onsite and Offsite Receptors: The maximum predicted concentration (of either Phase I or Phase II) of any offsite receptor for $NO_2$ is presented in Table 17-4 along with background concentrations obtained from a nearby NYSDEC monitoring station. This maximum off-site concentration of 2.23 $\mu g/m^3$ and was located at a receptor placed on the façade of The Alfred. As indicated in the table, the results of the modeling analysis for the combined impacts of all Fordham project development sites demonstrates compliance with the NAAQS for $NO_2$ at receptors placed outside the Fordham campus boundaries. Based on the results of the analysis, the impacts from the development of the proposed project buildings would not result in any significant adverse air quality impacts in surrounding neighborhoods.

**Table 17-4**
**Combined Impacts of the Fordham Campus Development Sites**
**Maximum Predicted Offsite Pollutant Concentration ($\mu g/m^3$)**

| Pollutant | Averaging Period | Concentration Due to Stack Emissions | Maximum Background Concentration[a] | Total Concentration | Air Quality Standard |
|---|---|---|---|---|---|
| $NO_2$ | Annual | 2.23 | 71.5 | 73.73 | 100 |
| **Note:** a. Background concentrations are from NYSDEC monitoring data. | | | | | |

Development Site Receptors: The maximum predicted concentration of any onsite receptor (i.e., those placed on the facades of the proposed project buildings) for $NO_2$, $PM_{10}$, and $SO_2$ is presented in Table 17-5 along with background concentrations obtained from a nearby NYSDEC monitoring station. This maximum concentration occurred at Site 1 for $NO_2$, Site 3 for $PM_{10}$, and Sites 3 and 1 for $SO_2$ for short-term and annual impacts, respectively. The total predicted concentrations for the annual averaging period represent the maximum predicted values added to the highest monitored value. For short-term averaging periods (i.e., 24 hours or less), the total predicted concentrations represent the maximum predicted values added to the second highest monitored value. The one exception is $SO_2$ for the 24-hour averaging period. There, the total predicted concentration represents the second highest predicted value added to the highest monitored value.

**Table 17-5**
**Cumulative Impacts of the Fordham Campus Development Sites and Offsite Sources**
**Maximum Predicted Onsite Pollutant Concentrations (μg/m$^3$)**

| Pollutant | Averaging Period | Concentration Due to Stack Emissions | Maximum Background Concentration[1] | Total Concentration | Air Quality Standard |
|---|---|---|---|---|---|
| $NO_2$ | Annual | 11.5 | 71.5 | 83.0 | 100 |
| $PM_{10}$ | 24 Hour | 55.9 | 60.0 | 115.9 | 150 |
| $SO_2$ | Annual | 9.0 | 36.6 | 45.6 | 80 |
| | 24 Hour | 170 | 123.0 | 293.0 | 365 |
| | 3 Hour | 1,031.1 | 201.6 | 1,232.7 | 1,300 |

**Note:** 1. Background concentrations are from NYSDEC monitoring data.

As indicated in the table, the results of the modeling analysis for the combined impacts of all proposed development sites plus 15 existing sources nearby demonstrates compliance with the NAAQS for each pollutant. Based on the results of the analysis, the cumulative impacts on the proposed project buildings would not result in any significant adverse air quality impacts.

## PARKING GARAGE ANALYSIS

Based on the methodology previously described, the maximum predicted 8-hour average CO concentrations from the two proposed parking facilities were analyzed 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 contributions from traffic on adjacent roadways.

For Garage A, the highest predicted CO concentrations at the near and far receptors analyzed on Amsterdam Avenue are 0.56 ppm and 0.12 ppm, respectively. Therefore, including a background level of 3.2 ppm and on-street traffic with an estimated CO concentration of 0.73 ppm for the far receptor, the maximum predicted 8-hour average CO concentrations with the proposed project would be 3.8 ppm for the near receptor, and 4.1 ppm for the far receptor.

For Garage B, the highest predicted CO concentrations at the near and far receptors analyzed on Amsterdam are 0.16 ppm and 0.03 ppm, respectively. Therefore, including a background level of 3.2 ppm and on-street traffic with an estimated CO concentration of 0.73 ppm for the far receptor, the maximum predicted 8-hour average CO concentrations with the proposed project would be 3.4 ppm for the near receptor, and 4.0 ppm for the far receptor.

As indicated above, the CO impacts from the three parking facilities are substantially below the applicable standard of 9 ppm. Therefore, it can be concluded that the parking facilities would not result in any significant adverse air quality impacts. ✷