Chapter 16 : AIR QUALITY

A. INTRODUCTION

The potential for air quality impacts from the Proposed Action is examined in this chapter. According to the City Environmental Quality Review (CEQR) Technical Manual, air quality impacts can be either direct or indirect. Direct impacts result from emissions generated by stationary sources from a prototype, such as emissions from on-site fuel combustion for heat and hot water systems ("stationary sources"). Indirect impacts are caused by off-site emissions associated with a project, such as emissions from on-road vehicle trips ("mobile sources") generated by the Proposed Action.

B. PRINCIPAL CONCLUSIONS

The Proposed Action would not result in any significant adverse air quality impacts.

Mobile Sources: The Proposed Action would not result in significant adverse air quality impacts due to mobile sources. Based on the traffic screening criteria provided *in CEQR Technical Manual*, the Proposed Action would not exceed the thresholds for requiring a mobile source air quality analysis, and therefore, no further analysis is warranted.

Stationary Sources: The Proposed Action would not result in any significant adverse air quality impacts due to stationary sources. Based on the prototypical analysis, 4 of 27 prototypes require detail analysis and 22 of 27 prototypes require screening analysis. One Prototype does not require any analysis because the action would introduce no change in floor area or bulk between the No-Action and the With-Action scenarios. The prototypical analysis showed that there would be no potential significant adverse air quality impacts from fossil fuel-fired heat and hot water systems associated with any prototype.

C. SCREENING ANALYSIS

The Proposed Action is a "Generic Action," and there are no known potential or projected development sites and, due to its broad applicability, it is difficult to predict the sites where development would be facilitated by the Proposed Action. To produce a reasonable analysis of likely effect of the Proposed Action, 27 representative development prototypes have been identified, as described in Chapter 2, Analytical Framework. The screening analysis was performed to assess air quality impacts associated with emissions from heat and hot water systems for all prototypes. The methodology described in the *2014 CEQR Technical Manual* was used for the analysis.

The screening methodology determines the threshold distance between the HVAC stack and the nearest sensitive receptor of similar or greater height beyond which the action would not have a significant adverse impact. The screening procedures consider the different type of fuel to be used, the maximum development size, type of development and the heat and hot water systems exhaust stack height to evaluate whether a significant adverse impact may occur. The screening distance is assumed to be 400 feet if there are no buildings of similar or taller than the proposed prototype, indicating that the Proposed Action would facilitate the development of the tallest building in the neighborhood.

Based on aforementioned parameters, if the distance between the HVAC stack and the nearest receptor of similar or greater height is less than the threshold distance as per in the *2014 CEQR Technical Manual* figures*,* the potential for significant adverse air quality impacts is identified, and a detail analysis involving a refined dispersion model is needed. Otherwise, if the prototype passes the screening analysis, no further analysis would be required.

Since information on the heat and hot water systems was not available for the citywide action, the distance between the boiler stack and the nearest receptor of similar or greater height is assumed to be the distance between the roof edges of two buildings as a worst-case analysis for screening. The receptors for the screening analysis were placed at either the nearest existing building or at the nearest proposed potential development site with equal or similar height. It was assumed that No. 2 fuel oil would be used in all prototypes heat and hot water systems for conservative analysis. If the screen for oil passes then there is no restriction in the type of fuel. The primary pollutants of concern are SO_2 and PM which are described below. The exhaust stacks were assumed to be located 3 feet above the roof (as per the *2014 CEQR Technical Manual*) and placed on the highest tier for buildings with different tier configurations. For sources that did not pass the screening analyses, a refined modeling analysis was performed.

Mobile Sources Screening

The Proposed Action has the potential to increase traffic volumes on streets within and surrounding rezoning area and could result in localized increases in CO and PM levels (these pollutants are described below). Therefore, a mobile source screening analysis was conducted for each prototype to determine the potential for CO and PM impact in accordance to 2014 *CEQR Technical Manual* guidelines.

Based on the traffic screening analysis provided in Chapter 15, Transportation, the number of incremental trips generated by the Proposed Action associated with each prototype would be lower than the 2014 *CEQR Technical Manual* carbon monoxide (CO)-based screening threshold of 140 auto trips per hour at an intersection as well as the minimum screening threshold of 12 heavy-duty diesel vehicles (HDDV) for fine particulate matter ($PM_{2.5}$), The minimum thresholds throughout the city were chosen for conservative purpose. Consequently, the Proposed Action would not result in significant adverse mobile source air quality impacts, and no further analysis is warranted.

Stationary Sources

A stationary source analysis was conducted to evaluate potential impacts from the proposed prototypes heat and hot water systems. All prototypes were subjected to an assessment to determine whether or not an air quality analysis is warranted. If the prototype indicated that no change in floor area, density or height between the No-Action and the With-Action scenarios, it is concluded that there would be no stationary source air quality impacts and no further analysis is warranted. All prototypes with floor area, density or height changes would be subject to HVAC screening analysis. For the prototypes that did not pass screening analysis, a detail analysis is conducted to determine whether or not a potential for air quality impact may occur. The pollutant analyzed includes SO_2, NO_2, PM_{10} and $PM_{2.5}$ as described below.

The screening analysis was performed to evaluate whether potential air quality impacts from the heat and hot water systems associated with each prototype could potentially impact other existing or project sensitive receptors nearby. The analysis was conducted based on the floor area, stack height and the distance to the nearest sensitive receptor as described above.

A total of 22 prototypes (Prototypes 1-9, 11-18, 20, 21, 23-25 and 27) would facilitate the development of the tallest building in the neighborhood, therefore, the distance between to the nearest receptors of similar or greater height is assumed to be 400 feet. These prototypes all passed the screening analysis using No. 2 fuel oil as the fuel type. No further detailed analyses are warranted and no significant impacts would be anticipated for these prototypes. The screens are available in APPENDIX E.

A total of 4 prototypes (Prototypes 10, 19, 22 and 26) failed the screening analysis using No. 2 fuel oil as the fuel type. The distance to the nearest receptors of similar or greater height for these prototypes are presented in Table 4. It needs to be pointed out that in Prototype 26, there would be two stacks located on the Long-term Care Facility and the Affordable Independent Residences for Seniors separately. According to the prototype illustration, the screening distance used for analysis would be the distance between the highest tiers for of the two buildings, which is 30 feet. The screens are available in APPENDIX E. Therefore, each of these prototypes required a refined modeling analysis with No. 2 fuel oil.

Using the stack height and gross square footage associated with each prototype, the minimum distance (screening distance) required between the building's exhaust stack and the nearest building façade of equal or greater height was determined. The screening analysis is summarized below (see Table 3):

Table 16-1: HVAC Screening Results

Prototype No.	Stack Height (ft)	Gross Area (gsf)	Minimum Distance to Nearest Building (ft)	Minimum Screening Distance (ft)	Screening Result
1	88	44,000	400	69	PASS
2	108	50,600	400	73	PASS
3	98	50,600	400	75	PASS
4	88	37,400	400	63	PASS
5	88	74,800	400	92	PASS
6	128	61,600	400	81	PASS
7	148	66,000	400	84	PASS
8	128	110,220	400	111	PASS
9	108	55,110	400	77	PASS
10	88	83,600	70	98	FAIL
11	137	213,624	400	157	PASS
12	218	110,000	400	110	PASS
13	238	132,000	400	122	PASS
14	238	132,000	400	122	PASS
15	238	52,800	400	75	PASS
17	128	79,200	400	93	PASS
18	148	67,320	400	85	PASS
19	138	134,640	50	123	FAIL
20	168	158,400	400	134	PASS
21	158	207,515	400	155	PASS
22	101.5	113,630	40	116	FAIL
23	238	132,000	400	122	PASS
24	48	20,317	400	46	PASS
25	68	30,712	400	57	PASS
26A[1]	68	53,340	30[3]	77	FAIL
26B[2]	68	32,460	30[3]	59	FAIL
27	68	56,760	400	79	PASS

Note:
(1) Prototype 26 Building A refers to the Long-term Care Facility Development in the same parcel as Prototype 26 Building B.
(2) Prototype 26 Building B refers to the Affordable Independent Residences for Seniors in the same parcel as Prototype 26 Building A.
(3) The distance between the highest tiers of Building A and Building B is 30 feet for Prototype 26.
Source: Figure 17-5, 2014 *2014 CEQR Technical Manual* Appendix.

D. DETAILED ANALYSIS

Methodology

The Proposed Action is a "Generic Action," and there are no known potential or projected development sites and, due to its broad applicability, it is difficult to predict the sites where development would be facilitated by the Proposed Action. To produce a reasonable analysis of likely effect of the Proposed Action, 27 representative development prototypes have been identified, as described in Chapter 2, Analytical Framework.

Ambient air quality is affected by air pollutants produced by both motor vehicles and stationary sources. According to the *CEQR Technical Manual*, mobile source and stationary source analyses are required to determine the potential air quality impacts from the Proposed Action. Emissions from motor vehicles are referred to as mobile source emissions, while emissions from fixed facilities, such as the HVAC system of building, are referred to as stationary source emissions. Pollutants relevant to both mobile source and stationary source are listed below:

Pollutants for Analysis

Ambient concentrations of carbon monoxide (CO) are predominantly influenced by mobile source emissions. Particulate matter (PM), volatile organic compounds (VOCs), and nitrogen oxides (nitric oxide (NO) and nitrogen dioxide (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. 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. Ambient concentrations of CO, PM, NO_2, SO_2, ozone, and lead are regulated by the U.S. Environmental Protection Agency (EPA) under the Clean Air Act, and are referred to as 'criteria pollutants'; emissions of VOCs, NO_x, and other precursors to criteria pollutants are also regulated by EPA.

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. CO concentrations can diminish rapidly 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 analyzed on a local (microscale) basis.

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 chemical reactions that take place in the atmosphere in the presence of sunlight. In addition to being a precursor to the formation of Ozone, NO_2 (one component of NO_x) is also a regulated pollutant.

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.

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 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) or from precursor gases reacting in the atmosphere to form secondary PM.

Gasoline-powered and diesel-powered vehicles, especially heavy duty trucks and buses operating on diesel fuel, are a significant source of respirable PM, most of which is $PM_{2.5}$; PM concentrations may, consequently, be locally at elevated near roadways. The Proposed Action would not result in traffic exceeding the $PM_{2.5}$ vehicle emissions screening analysis thresholds as defined in *2014 CEQR Technical Manual* Chapter 17, Sections 210 and 311.

Sulfur Dioxide

SO_2 emissions are primarily associated with the combustion of sulfur-containing fuels (oil and coal). Due to the federal and State restrictions on the sulfur content in diesel fuel for on-road and non-road vehicles, no significant quantities are emitted from vehicular sources. Vehicular sources of SO_2 are not significant and therefore, analysis of SO_2 from mobile and/or non-road sources was not warranted.

Noncriteria Pollutants

In addition to the criteria pollutants discussed above, noncriteria pollutants may be of concern. Noncriteria pollutants are emitted by a wide range of man-made and naturally occurring sources.

Federal ambient air quality standards do not exist for noncriteria pollutants but the New York State Department of Environmental Conservation (NYSDEC) has issued standards for certain noncriteria pollutant. The NYSDEC guidance thresholds represent ambient levels that are considered safe for public exposure.

The citywide Action would not introduce new sensitive receptors on existing manufacturing-zoned areas, auto related or dry cleaning facilities. Therefore, an analysis to examine the potential for impacts to the Proposed Action from industrial emissions was not warranted.

Emission Estimates and Stack Parameters

Prototypes that did not pass the screening analysis were subsequently analyzed using a refined dispersion model, the EPA AERMOD dispersion model. AERMOD is a state-of-the-art dispersion model, applicable to rural and urban areas, flat and complex terrain, surface and elevated releases, and multiple sources (including point, area, and volume sources). AERMOD is a steady-state plume model that incorporates current concepts about flow and dispersion in complex terrain, including updated treatments of the boundary layer theory, understanding of turbulence and dispersion, and includes handling of terrain interactions.

The AERMOD model calculates pollutant concentrations from one or more points (e.g., exhaust stacks) based on hourly meteorological data for five years (2010-2014), and has the capability to calculate pollutant concentrations at locations where the plume from the exhaust stack is affected by the aerodynamic wakes and eddies (downwash) produced by nearby structures. The analyses of potential impacts from exhaust stacks were made assuming stack tip downwash, urban dispersion and surface roughness length, and elimination of calms. AERMOD can 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, and other nearby structures). Therefore, the analysis was performed using the AERMOD model under with downwash and without downwash scenario respectively.

For the refined analysis, the exhaust stacks for the heat and hot water systems were assumed to be located at distance of 10 feet away from the edge of the roof closest to the nearest receptor in consistent with building code §[1501.4] 27-859. The refined dispersion modeling analysis was performed for $PM_{2.5}$, PM_{10}, NO_2 and SO_2. The analysis was then performed using calculated emission rates for fuel oil.

The AERMOD analysis was performed by utilizing a unitary emission rate (1 gram/second) as the input. The estimated emissions based on total floor area were converted into grams/second and multiplied by the modeled unitary concentrations to determine the worst-case impact. The resulted concentrations were added to background concentrations and then compared to the National Ambient Air Quality Standards (NAAQS) and *de minimis* criteria in order to determine any potential for significant adverse impact.

Fuel consumption was estimated based on procedures outlined in the *2014 CEQR Technical Manual* as discussed above. Using worst-case assumptions the type of fuel was Oil No. 2. Emission factors from the fuel oil sections of EPA’s AP-42 were used to calculate emission rates for the proposed prototype’s heat and hot water systems.

Receptor Placement

Discrete receptors (*i.e.*, locations at which concentrations are calculated) were modeled along the existing and proposed building façades to represent potentially sensitive locations such as operable windows and air intake vents. Rows of receptors at spaced intervals on the modeled buildings were analyzed at multiple elevations.

Background Concentrations

To estimate the maximum expected pollutant concentration at a given location (receptor), the predicted impacts must be added to a background value that accounts for existing pollutant concentrations from other sources that are not directly accounted for in the model (see Table 1). To develop background levels, the latest available maximum concentration measured at the most representative NYSDEC ambient monitoring station was used considering the proposed development is city-wide. The concentration measured over the latest available 5-year period (2010-2014) was used for annual average NO_2 and 1-hour NO_2 background concentration, while the latest available 5-year period (2008-2012) was used for 3-hour average SO_2 background concentration and the latest available 3-year period (2012-2014) was used for 1-Hour SO_2 and 24-hour PM_{10} background concentration.

$PM_{2.5}$ impacts are assessed on an incremental basis and compared with the $PM_{2.5}$ *de minimis* criteria, without considering the annual background. Therefore the annual $PM_{2.5}$ background is not presented in the table. The $PM_{2.5}$ 24-hour average background concentration of 25.7 $\mu g/m^3$ based on the 2012 to 2014 average of 98th percentile concentrations measured at the Botanical Garden (Pfizer Lab) monitoring station was used to establish the *de minimis* value for the 24-hour increment, consistent with the guidance provided in the *2014 CEQR Technical Manual.*

Table 16-2: Background Pollutant Concentrations

Pollutant	**Average Period**	**Location**	**Concentration ($\mu g/m^3$)**	**NAAQS ($\mu g/m^3$)**
NO_2	1-hour[1]	Botanical Garden, Bronx	109	188
	Annual[2]	IS 52, Bronx	40.6	100
SO_2	1-hour[3]	Botanical Garden, Bronx	58	197
	3-hour[4]	Botanical Garden, Bronx	162	1,300
PM_{10}	24-Hour[5]	PS 19, Manhattan	45	150
$PM_{2.5}$	24-hour	Botanical Garden, Bronx	25.7	35

Notes:

(1) The 1-Hour NO_2 background concentration is based on the maximum 98th percentile 1-Hour NO_2 concentration averaged over five years of data, from 2010–2014.

(2) Annual average NO_2 background concentration is based on the 5-year highest value from 2010–2014.

(3) The 1-Hour SO_2 background concentration is based on the maximum 99th percentile concentration averaged over three years of data, from 2012–2014.

(4) The 3-hour SO_2 background concentration is based on the 5-year highest second-highest measured value from 2008–2012.

(5) The 24-Hour PM_{10} is based on the 3-year highest second-highest value from 2012–2014.

Source: New York State Air Quality Report Ambient Air Monitoring System, NYSDEC, 2010-2014.

DETERMINING THE SIGNIFICANCE OF AIR QUALITY IMPACTS

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. 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 2) would be deemed to have a potential significant adverse impact. Similarly, for non-criteria pollutants, predicted exceedance of the DAR-1 guideline concentrations would be considered a potential significant adverse impact.

Table 16-3: 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	N/A	
1-Hour Average [1]	35	40,000		
Lead				
Rolling 3-Month Average [2]	N/A	0.15	N/A	0.15
Nitrogen Dioxide (NO_2)				
1-Hour Average [3]	0.100	188	N/A	
Annual Average	0.053	100	0.053	100
Ozone (O_3)				
8-Hour Average [4,5]	0.075	150	0.075	150
Respirable Particulate Matter (PM_{10})				
24-Hour Average [1]	N/A	150	N/A	150
Fine Respirable Particulate Matter ($PM_{2.5}$)				
Annual Mean [6]	N/A	12	N/A	15
24-Hour Average [7]	N/A	35	N/A	35
Sulfur Dioxide (SO_2) [8]				
1-Hour Average[9]	0.075	196	N/A	N/A
Maximum 3-Hour Average [1]	N/A	N/A	0.50	1,300

Notes:

ppm – parts per million (unit of measure for gases only)
µg/m³ – micrograms per cubic meter (unit of measure for gases and particles, including lead)
NA – not applicable

All annual periods refer to calendar year.
Standards are defined in ppm. Approximately equivalent concentrations in µg/m³ are presented.

(1) Not to be exceeded more than once a year.
(2) EPA has lowered the NAAQS down from 1.5 µg/m³, effective January 12, 2009.
(3) 3-year average of the annual 98th percentile daily maximum 1-hr average concentration. Effective April 12, 2010.
(4) 3-year average of the annual fourth highest daily maximum 8-hr average concentration.
(5) EPA has proposed lowering the primary and secondary standards further to within the range 0.065-0.070 ppm. EPA will take final action on the proposed standards by Oct. 1, 2015.
(6) 3-year average of annual mean. EPA has lowered the primary standard from 15 µg/m³, effective March 2013.
(7) Not to be exceeded by the annual 98th percentile when averaged over 3 years.
(8) EPA revoked the 24-hour and annual primary standards, replacing them with a 1-hour average standard. Effective August 23, 2010.
(9) 3-year average of the annual 99th percentile daily maximum 1-hr average concentration.

Source: 40 CFR Part 50: National Primary and Secondary Ambient Air Quality Standards.

In order to maintain concentrations lower than the NAAQS in attainment areas, or to ensure that concentrations would 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.

$PM_{2.5}$ De Minimis Criteria

The *City Environmental Quality Review (CEQR) Technical Manual* state that Predicted 24-hour maximum $PM_{2.5}$ concentration increase of more than half the difference between the 24-hour background concentration and the 24-hour standard; or Predicted annual average $PM_{2.5}$ concentration increments greater than 0.3 µg/m^3 at any receptor location for stationary sources.

The policy states that such a project would 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 µg/m^3 averaged annually or more than 4.65 µg/m^3 on a 24-hour basis.

FUTURE WITHOUT THE PROPOSED ACTION

In the future without the Proposed Action, it is assumed that the current uses, bulk and floor area for each prototype would remain. Some development for each prototype would occur on an as-of-right basis in the future without the Proposed Action. Thus, no stationary source analysis is included for the No-Action condition.

FUTURE WITH THE PROPOSED ACTION

The With Action scenario for associated with all other 26 prototypes (Prototypes 1-15, 17-27) would introduce some changes in floor area and/or bulk regulation between the No-Action and the With-Action scenarios. Therefore, air screening analysis would be provided for these prototypes. Prototypes that did not pass the screening analysis would be subsequently analyzed using a refined dispersion model, the EPA AERMOD dispersion model. Prototype 16 would introduce no change in floor area or bulk between the No-Action and the With-Action scenarios. Therefore, an analysis for this prototype is not warranted in the air quality analysis.

Individual Heat and Hot Water Systems

Refined Dispersion Analysis

The screening analysis results show that a total of 4 prototypes (Prototype 10, 19, 22 and 26) required a refined modeling analysis to determine the potential for air quality impacts. For detail analysis, the exhaust stacks for the heat and hot water systems were assumed to be located at distance of 10 feet away from the edge of the building closest to the nearest receptor consistent with building code §[1501.4] 27-859.

The analysis assumed a unitary emission rate input. The estimated emissions based on total floor area were converted into grams/second and multiplied by the modeled unitary concentrations to determine the worst-case impact. The resulted concentrations were added to background concentrations and then compared to the National Ambient Air Quality Standards (NAAQS). $PM_{2.5}$ impacts are assessed on an incremental basis and compared with the $PM_{2.5}$ *de minimis* criteria, consistent with the guidance provided in the *2014 CEQR Technical Manual.*

As indicated above, for Prototype 26, there would be two stacks located on the Long-term Care Facility and the Affordable Independent Residences for Seniors separately, which would introduce a project-on-project impact analysis.

The detail analysis was performed using the AERMOD model under with and without downwash scenario respectively. The results of both scenarios are summarized in Table 4. Generally, as shown in the table, higher concentrations result from the without downwash scenario. It was determined that these prototypes all passed the refined analysis for No. 2 fuel oil. Therefore, no restrictions are required and no significant adverse impacts are predicted for these prototypes.

Table 16-1: Maximum Modeled Concentration (µg/m3)

Pollutant			NO_2		SO_2		PM_{10}	$PM_{2.5}$	
Averaging Period			1-Hour	Annual	1-Hour	3-Hour	24-Hour	24-Hour	Annual
Maximum Modeled Conc.[1]	Pro 10		**22.9** / 9.4	**0.7** / 0.3	**0.3** / 0.1	**0.2** / 0.1	**1.7** / 0.5	**1.51** / 0.41	**0.07** / 0.03
	Pro 19		**26.8** / 22.6	**0.5** / 0.3	**0.3** / 0.3	**0.3** / 0.2	**1.6** / 0.7	**1.46** / 0.61	**0.05** / 0.03
	Pro 22		**38.1** / 24.8	**0.3** / 0.2	**0.5** / 0.3	**0.5** / 0.2	**3.7** / 0.8	**3.31** / 0.73	**0.03** / 0.02
	Pro 26	BLDG A on BLDG B	**26.3** / 7.8	**0.6** / 0.3	**0.3** / 0.1	**0.3** / 0.1	**1.5** / 0.5	**1.38** / 0.45	**0.06** / 0.03
		BLDG B on BLDG A	**31.3** / 11.9	**0.6** / 0.4	**0.3** / 0.2	**0.3** / 0.1	**1.8** / 0.7	**1.58** / 0.66	**0.06** / 0.05
Background			109	40.6	58	162	45	25.7	N/A
Total Conc.[2]	Pro 10		**131.9** / 118.4	**41.3** / 40.9	**58.3** / 58.1	**162.2** / 162.1	**46.7** / 45.5	N/A	N/A
	Pro 19		**135.8** / 131.6	**41.1** / 40.9	**58.3** / 58.3	**162.3** / 162.2	**46.6** / 45.7	N/A	N/A
	Pro 22		**147.1** / 133.8	**40.9** / 40.8	**58.5** / 58.3	**162.5** / 162.2	**48.7** / 45.8	N/A	N/A
	Pro 26	BLDG A on BLDG B	**135.3** / 116.8	**41.2** / 40.9	**58.3** / 58.1	**162.3** / 162.1	**46.5** / 45.5	N/A	N/A
		BLDG B on BLDG A	**140.3** / 120.9	**41.2** / 41	**58.3** / 58.2	**162.3** / 162.1	**46.8** / 45.7	N/A	N/A
NAAQS / *De Minimis* [3]			188	100	197	1310	150	4.65*	0.3*

Note:

(1) Detail analysis was performed using the AERMOD model under with downwash and without downwash scenarios respectively. The higher concentrations in bold font are modeled from without downwash scenario.

[2] The higher total concentrations in bold font are modeled from without downwash scenario.

[3] The $PM_{2.5}$ *de minimis* criteria is 4.65 µg/m^3 for the 24-Hour period, which is half the difference between the NAAQS of 35

µg/m^3 and the ambient monitored background of 25.7 µg/m^3, and 0.3 µg/m^3 for the annual period.

The Proposed Action would not result in any significant adverse air quality impacts for stationary source. Based on the prototypical analysis, 4 of 27 prototypes require detail analysis, 22 of 27 prototypes require screening analysis. One Prototype (prototype 16) does not require any analysis because the action would introduce no change in floor area or bulk between the No-Action and the With-Action scenarios. The prototypical analyses showed that there would be no potential significant adverse air quality impacts from fossil fuel-fired heat and hot water systems associated with each prototype. Therefore, the Proposed Action would not result in significant adverse air quality impacts due to stationary sources.