A. INTRODUCTION

This chapter examines the potential for air quality impacts from the proposed actions. Ambient air quality is affected by numerous sources and activities that introduce air pollutants into the atmosphere. A comprehensive assessment of potential air quality impacts from the proposed actions was performed.

Air quality impacts can be either direct or indirect. Direct impacts stem from emissions generated by stationary sources associated with the proposed actions, such as emissions from fuel burned on site for heating, ventilation, and air conditioning (HVAC) systems. Indirect effects include emissions from motor vehicles ("mobile sources") generated by the proposed actions and effects of existing sources stationary sources on the proposed actions.

The analyses conclude that 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 secondary study area.

The proposed actions are not expected to significantly alter traffic conditions. The maximum hourly incremental traffic from the proposed actions would not exceed the *City Environmental Quality Review (CEQR) Technical Manual* (October 2001) air quality screening threshold of 100 peak hour trips at nearby intersections in the secondary study area. Therefore, a quantified assessment of on-street mobile source emissions is not warranted.

The stationary source analyses determined that there would be no potential significant adverse air quality impacts from HVAC systems at the projected and potential development sites. At certain sites, an E-designation would be mapped as part of the proposed zoning to ensure the developments would not result in any significant air quality impacts from HVAC emissions due to individual or groups of development sites.

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. Typically, ambient concentrations of 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. The formation of such secondary PM takes hours or days to occur and thus has no measurable effect on air quality in the immediate vicinity of the source. Emissions of SO_2 are associated mainly with stationary sources and sources using non-road diesel fuel, such as diesel trains, marine engines, and non-road vehicles such as construction engines; diesel-powered vehicles, primarily heavy-duty trucks and buses, also

contribute somewhat to these emissions. However, diesel fuel regulations that recently took effect will reduce SO_2 emissions from mobile sources to extremely low levels. Ozone is formed in the atmosphere by complex photochemical processes that include NO_x and VOCs, emitted mainly from industrial processes and mobile sources.

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 that 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 are not expected to significantly alter traffic conditions (see Chapter 16, "Traffic and Parking"). Since the proposed actions would result in fewer new peak hour vehicle trips than the *CEQR Technical Manual* screening threshold of 100 trips at nearby intersections in the secondary study area, a quantified assessment of on-street CO emissions is not warranted.

NITROGEN OXIDES, VOC, 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 dispersed 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 would result. An analysis of project-related emissions of these pollutants from mobile sources as it relates to the proposed actions is therefore not warranted.

There is a standard for average annual NO_2 concentrations, which is normally examined only for fossil fuel energy sources. An analysis of the potential NO_2 impacts from the proposed actions' stationary sources of emissions was performed.

LEAD

Airborne lead emissions are principally associated with industrial sources and motor vehicles that use gasoline containing lead additives. Most U.S. vehicles produced since 1975, and all produced after 1980, are designed to use unleaded fuel. As these newer vehicles have replaced the older ones, motor vehicle-related lead emissions have decreased. As a result, ambient concentrations of lead have declined significantly. Nationally, the average measured atmospheric lead level in 1985 was only about one-quarter the level in 1975.

In 1985, EPA announced new rules that drastically reduced the amount of lead permitted in leaded gasoline. The maximum allowable lead level in leaded gasoline was reduced from the previous limit of 1.1 to 0.5 grams per gallon effective July 1, 1985, and to 0.1 grams per gallon effective January 1, 1986. Monitoring results indicate that this action has been effective in significantly reducing atmospheric lead concentrations. 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 the 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 national standard of 1.5 micrograms per cubic meter (three-month average).

No significant sources of lead are associated with the proposed actions, and, therefore, an analysis of this pollutant from stationary or mobile sources is 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 VOCs; 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, i.e., human activities, include the combustion of fossil fuels (e.g., vehicular exhaust, power generation, boilers, engines, and home heating), chemical and manufacturing processes, construction and 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, or $PM_{2.5}$, and particles with an aerodynamic diameter of less than or equal to 10 micrometers, or PM_{10}, which includes the smaller $PM_{2.5}$. $PM_{2.5}$ has the ability to reach the lower regions of the respiratory tract, delivering with it other compounds adsorbed to the surfaces of the particles, and is also extremely persistent in the atmosphere. $PM_{2.5}$ is directly emitted from combustion material that has volatilized and then condensed to form primary PM (often soon after the release from an exhaust) or from precursor gases reacting in the atmosphere to form secondary PM.

There is also a New York standard for total suspended particulate matter (TSP), which represents both coarse and fine particles. However, the New York State Department of Environmental Conservation (NYSDEC) no longer conducts monitoring for this pollutant.

The proposed actions would not result in any significant increases in truck traffic near the project site or in the region, and therefore, an analysis of potential PM impacts from mobile sources of air emissions is not warranted.

SULFUR DIOXIDE

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

As part of the proposed actions, it is assumed that fuel oil (in addition to natural gas) would be burned in the proposed HVAC systems. Therefore, an analysis was performed to estimate the future levels of SO_2 with the proposed actions.

AIR TOXICS

In addition to the criteria pollutants discussed above, non-criteria air pollutants, also called air toxics, are also regulated. Air toxics are those pollutants that are known or suspected to cause serious health effects in small doses. 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 compounds. However, the NYSDEC has issued standards for certain non-criteria compounds, including beryllium, gaseous fluorides, and hydrogen sulfide. NYSDEC has also developed ambient guideline concentrations for numerous air toxic non-criteria compounds. The NYSDEC guidance document DAR-1 AGCC/SGC Tables (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.

EPA has developed guidelines for assessing exposure to air toxics. These exposure guidelines are used in health risk assessments to determine the potential effects to the public.

Portions of the primary study area are within 400 feet of existing manufacturing-zoned areas. The proposed actions would result in increased development density but would not result in new residential and commercial development sites as compared to the No Build condition. Therefore, although manufacturing uses would remain under the proposed actions, potential impacts from industrial sources of air emissions would be expected to be similar to the No Build condition. Therefore, no additional analysis was warranted.

C. AIR QUALITY REGULATIONS, STANDARDS, AND BENCHMARKS

NATIONAL AND STATE AIR QUALITY STANDARDS (NAAQS)

As required by the CAA, primary and secondary 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 intended 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. For NO_2, ozone, lead, and PM, the primary and secondary standards are the same; there is no secondary standard for CO. EPA promulgated additional NAAQS that became effective September 16, 1997: a new 8-hour standard for ozone, which replaced the 1-hour standard, and new 24-hour and annual standards for $PM_{2.5}$. The standards for these pollutants are presented in Table 18-1. These standards have also been adopted as the ambient air quality standards for New York State. In addition, New York State has established ambient air quality

standards for total suspended particulate, non-methane hydrocarbons, beryllium, gaseous fluorides, and hydrogen sulfide.

Table 18–1
National Ambient Air Quality Standards

Pollutant	Primary		Secondary	
	ppm	µg/m^3	ppm	µg/m^3
Carbon Monoxide (CO)				
Maximum 8-Hour Concentration[1]	9	10,000	None	
Maximum 1-Hour Concentration[1]	35	40,000		
Lead				
Maximum Arithmetic Mean Averaged Over 3 Consecutive Months	N/A	1.5	N/A	1.5
Nitrogen Dioxide (NO_2)				
Annual Arithmetic Average	0.053	100	0.053	100
Ozone (O_3)				
8-Hour Average[2]	0.075	147	0.075	147
Respirable Particulate Matter (PM_{10}) [5]				
24-Hour Concentration[1]	N/A	150	N/A	150
Fine Respirable Particulate Matter ($PM_{2.5}$)				
Average of Three Annual Arithmetic Means	N/A	15	N/A	15
24-Hour Concentration[3,4]	N/A	35	N/A	35
Sulfur Dioxide (SO_2)				
Annual Arithmetic Mean	0.03	80	N/A	N/A
Maximum 24-Hour Concentration[1]	0.14	365	N/A	N/A
Maximum 3-Hour Concentration[1]	N/A	N/A	0.50	1,300

Notes:
ppm – parts per million
µg/m^3 – micrograms per cubic meter
N/A – not applicable
Concentrations of all gaseous pollutants are defined in ppm — approximately equivalent concentrations in µg/m^3 are presented.
[1] Not to be exceeded more than once a year.
[2] Three-year average of the annual fourth highest daily maximum 8-hr average concentration. EPA has reduced these standards from 0.080 ppm, effective May 27, 2008.
[3] Not to be exceeded by the 98th percentile averaged over 3 years.
[4] EPA has reduced these standards down from 65 µg/m^3, effective December 18, 2006.
[5] EPA has revoked the annual PM_{10} standard, effective December 18, 2006.
Sources: 40 CFR Part 50: National Primary and Secondary Ambient Air Quality Standards.

On September 21, 2006, EPA 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 micrograms per cubic meter (µg/m^3) to 35 µg/m^3, and retaining the level of the annual fine standard at 15 µg/m^3. The PM_{10} 24-hour average standard was retained and the annual average PM_{10} standard was revoked.

NAAQS ATTAINMENT STATUS AND STATE IMPLEMENTATION PLANS (SIP)

The CAA, as amended in 1990, defines non-attainment areas (NAAs) 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 designated New York City as in attainment for the NO_2, SO_2, and lead. 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 New York 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 boroughs of New York City as well as Nassau, Suffolk, Rockland, Westchester, and Orange counties as $PM_{2.5}$ non-attainment areas under the CAA. State and local governments are required to develop implementation plans by early 2008, which will be designed to meet the standards by 2010. As described above, EPA has revised the PM standards. $PM_{2.5}$ attainment designations would be effective by April 2010, $PM_{2.5}$ SIPs would be due by April 2013, and would be designed to meet the $PM_{2.5}$ standards by April 2015, although this may be extended in some cases up to April 2020.

Nassau, Rockland, Suffolk, Westchester, and the five counties of New York City had been designated as severe non-attainment for the ozone 1-hour standard. In November 1998, New York State submitted its *Phase 2 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. New York State has recently submitted revisions to the SIP. 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. EPA revoked the 1-hour ozone standard on June 15, 2005; however, the specific control measures for the 1-hour standard included in the SIP will be required to stay in place until the 8-hour standard is attained. The discretionary emissions reductions in the SIP will also remain but could be revised or dropped based on modeling. New York State is currently formulating a new SIP for ozone, which is expected to be adopted in the near future. The SIP will have a target attainment deadline of June 15, 2010.

On March 12, 2008, EPA lowered the primary and secondary 8-hour ozone standard from 0.08 ppm to 0.075 ppm. EPA expects designations based on 2008-2009 air quality data to take effect in 2010, and SIPs would be due in 2013.

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 18-1) would be deemed to have a potential significant adverse impact. In addition, 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.

As stated earlier, the proposed actions would not result in new residential and commercial development sites as compared to the No Build condition and, although manufacturing uses would remain under the proposed actions, potential impacts from industrial sources of air emissions would be expected to be similar to the No Build condition. Therefore, it is not necessary to define the criteria for determining a significant impact due to non-criteria, or toxic, air pollutants from industrial source for this air quality analysis.

DE MINIMIS CRITERIA REGARDING CO IMPACTS

New York City has developed *de minimis* criteria to assess the significance of the incremental 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 parts per million (ppm) or more in the maximum 8-hour average CO concentration at a location where the predicted No Build 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 Build) concentrations and the 8-hour standard, when No Build concentrations are below 8.0 ppm.

D. METHODOLOGY FOR PREDICTING POLLUTANT CONCENTRATIONS

A stationary source analysis was conducted to evaluate potential impacts from the proposed actions' HVAC systems.

INDIVIDUAL HVAC SOURCES

SCREENING ANALYSIS

A screening analysis was performed to assess air quality impacts associated with emissions from the HVAC system of projected and potential development sites. The methodology described in the *CEQR Technical Manual* was used for the analysis and considered impacts on sensitive uses (both existing residential developments as well as other residential developments under construction). The CEQR screening analysis methodology determines the threshold of development size below which the actions would not have a significant adverse impact. The screening procedures utilize information regarding the type of fuel to be used, the maximum development size, and the HVAC exhaust stack height to evaluate whether a significant adverse

impact is likely. Based on the distance from the proposed 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 information on the HVAC systems' design is not available, each analyzed projected and potential development site was evaluated with the nearest existing or proposed residential development of a similar or greater height analyzed as a potential receptor. The maximum development floor areas of the proposed sites from the reasonable worst-case development scenario (RWCDS) were used as input for the screening analysis.

It was assumed that either natural gas or No. 4 fuel oil would be used in the HVAC systems, and that the stacks would be installed three feet above roof height (as per the *CEQR Technical Manual*). For buildings with different tier configurations (provided in the conceptual design), the analysis assumed that the HVAC stack would be installed on the highest tier. If a source did not pass any of the screening analyses (oil or gas) using the *CEQR Technical Manual* procedures, a refined modeling analysis was performed, as described below.

Each of the projected and potential development sites identified under RWCDS was analyzed. For enlargement sites, only those sites where an increase in floor area of at least 30 percent would occur under the proposed actions were analyzed. Consequently, a total of 7 projected and 121 potential enlargement sites were analyzed.

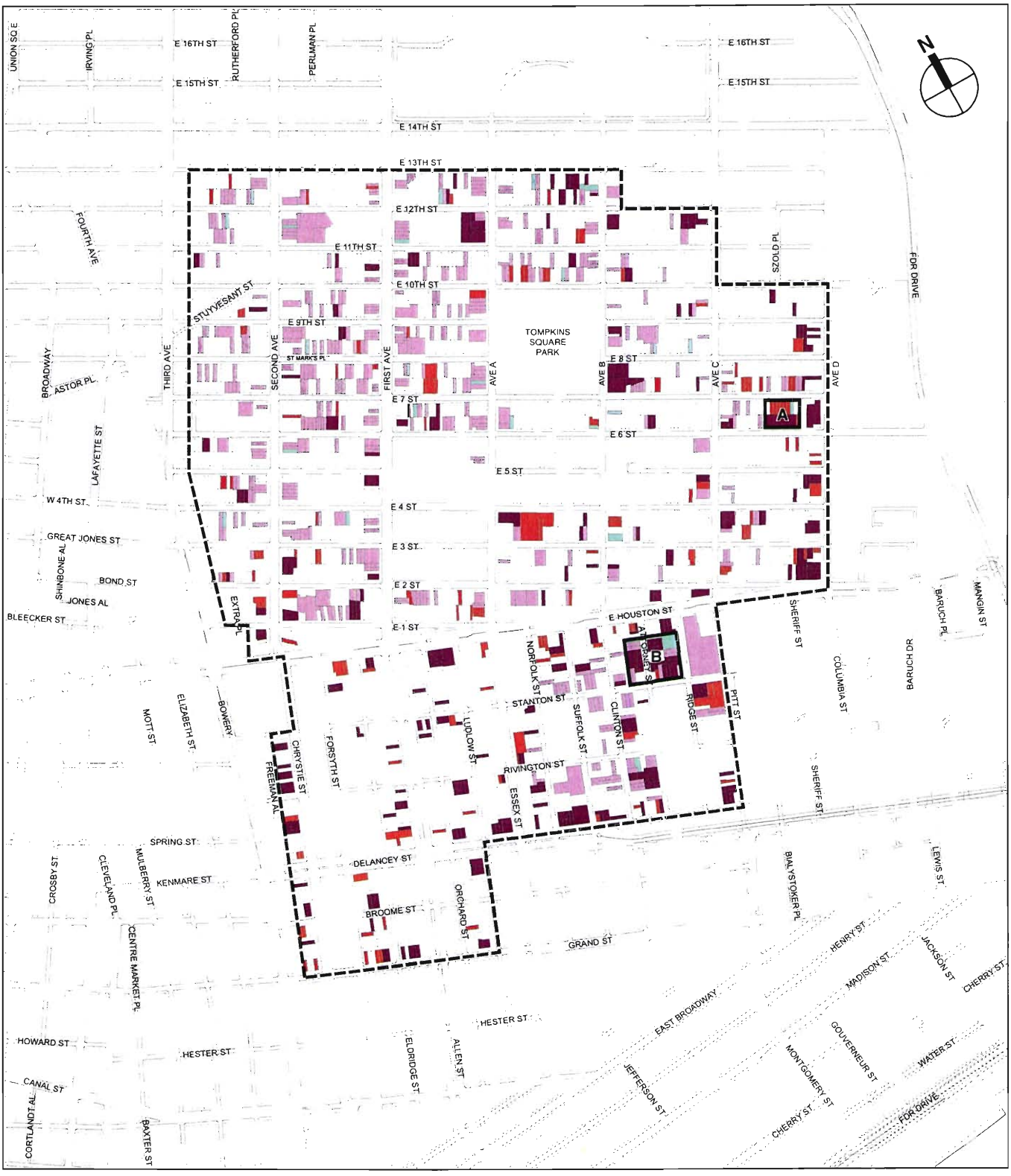
DISPERSION MODELING

Development sites that did not pass HVAC the screening analysis were analyzed using a refined dispersion model, the EPA/AMS AERMOD dispersion model. The AERMOD model was designed as a replacement to the EPA Industrial Source Complex (ISC3) model and is approved for use by EPA. 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 meteorological data set consisted of the five recent years of concurrent meteorological data: surface data collected at LaGuardia Airport (2002-2006) and upper air data collected at Brookhaven, Suffolk County, New York.

The *CEQR Technical Manual* states that refined dispersion modeling should be run with and without building downwash (the downwash option accounts for the dispersion effects from a stack plume due to the structure the stack is located at, 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 HVAC analysis was performed using the AERMOD model with the no downwash option only.

CUMULATIVE IMPACTS FROM HVAC SOURCES

In addition to the individual HVAC source analysis, groups or "clusters" of HVAC sources with similar stack heights were analyzed, in order to address the cumulative impacts of multiple sources.



Location of HVAC Cluster Sites
Figure 18-1

This analysis was performed using the EPA SCREEN3 Model (version 96043). The SCREEN3 model is a screening version of the ISC3 refined model, and is used for determining maximum concentrations from a single source using predefined meteorological conditions.

The primary study area was analyzed to determine cluster selection and cumulative impacts on nearby buildings of a similar or greater height. The clusters were each modeled as an area source. A total of two clusters were selected for analysis. The location and development sites associated with each cluster are presented in Figure 18-1.

New York City Department of Environmental Protection (DEP) Report 12 was used to determine fuel usage rates per unit of floor area. Emission factors as reported in EPA's Compilation of Air Pollutant Emission Factors Volume 1: Stationary (AP-42) for fuel oil and natural gas fired boilers were used to estimate emissions from each cluster, based on the cluster's total developments size and calculated fuel usage estimate.

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 18-2). Background concentrations were obtained from NYSDEC for the PS 59 monitoring station, located on East 57th Street in Manhattan, which is the closest monitoring location to the rezoning area. Backgrounds are the highest measured concentrations from the latest available five years of monitored data (2002–2006), consistent with current NYCDEP guidance. Consistent with the NAAQS for each pollutant, for averaging periods shorter than a year the second-highest value is used.

Table 18-2
Background Pollutant Concentrations

Pollutants	Averaging Period	Monitoring Station	Background Concentration ($\mu g/m^3$)	Ambient Standard ($\mu g/m^3$)
NO_2	Annual	PS 59	71	100
SO_2	3 hour	PS 59	202	1,300
	24 hour		123	365
	Annual		37	80

Source: 2002–2006 Annual New York State Air Quality Report, Ambient Air Monitoring System, NYSDEC.

E. EXISTING CONDITIONS

EXISTING MONITORED AIR QUALITY CONDITIONS

Monitored background concentrations of SO_2, NO_2, CO, ozone, lead, PM_{10}, and $PM_{2.5}$ for the secondary study area are shown in Table 18-3. These values (2006) are the most recent monitored data that have been made available by NYSDEC. In the case of the 8-hour ozone and 24-hour $PM_{2.5}$, concentrations reflect the most recent three years of data, consistent with the basis for these standards. There were no monitored violations of NAAQS at these monitoring sites with the exception of the annual average $PM_{2.5}$ concentration (the maximum 24-hour $PM_{2.5}$ concentration is above the recently revised NAAQS, however). For modeling purposes the analysis utilized the maximum values over the most recent three-year period (Table 18-2).

Table 18-3
Representative Monitored Ambient Air Quality Data

Pollutants	Location	Units	Period	Concentration	Exceeds Federal Standard?	
					Primary	Secondary
CO	PS 59, Manhattan	ppm	8-hour	1.7	N	N
			1-hour	2.3	N	N
SO_2	PS 59, Manhattan	$\mu g/m^3$	Annual	26	N	-
			24-hour	84	N	-
			3-hour	183	-	N
Respirable particulates (PM_{10})	PS 59, Manhattan	$\mu g/m^3$	Annual	23	N (1)	N (1)
			24-hour	60	N	N
Respirable particulates ($PM_{2.5}$)	PS19, Manhattan	$\mu g/m^3$	Annual	13.8	Y (3)	Y (3)
			24-hour	41	N (4)	N (4)
NO_2	PS 59, Manhattan	$\mu g/m^3$	Annual	64	N	N
Lead	JHS 126, Brooklyn	$\mu g/m^3$	3-month	0.02	N	-
Ozone (O_3)	IS 52, Bronx	ppm	1-hour	0.114 (2)	-	-
		ppm	8-hour	0.072	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.
3 The value does not exceed the NAAQS; however, compliance is determined based on the most recent three-year average, and is greater than the NAAQS.
4 The most recent monitoring data does not exceed the previous standard of 65 $\mu g/m^3$ which was in place at the time the monitoring was performed. However, the concentration does exceed the revised 24-hour $PM_{2.5}$ standard of 35$\mu g/m^3$.
Source: NYSDEC, 2006 New York State Ambient Air Quality Data.

F. THE FUTURE WITHOUT THE PROPOSED ACTIONS

Minimal growth and development within the primary study area would occur in the future without the proposed actions by 2017. HVAC and industrial source emissions in the No Build condition would likely be similar to existing conditions.

G. PROBABLE IMPACTS OF THE PROPOSED ACTIONS

INDIVIDUAL HVAC SOURCES

SCREENING ANALYSIS

The screening analysis was performed to determine whether impacts from projected and potential development sites could potentially impact other projected and potential development sites, or existing buildings. The analysis was initially performed assuming both natural gas and No. 4 fuel oil as the HVAC systems' fuel type.

A total of 58 projected development sites (52 new construction sites and 6 enlargement sites) and 159 potential development sites (46 new construction and 113 enlargement sites) failed the screening analysis using No. 4 fuel oil as the fuel source. No. 2 oil was then assumed for the sites that failed the initial screening analysis, but 56 of the 58 projected development sites and all of the potential development sites also failed using this fuel. Of the projected and potential

development sites that failed the screening analysis assuming No. 4 or No. 2 oil, none would pass by restricting the fuel type to natural gas only.

DISPERSION MODELING

For each of the projected and potential development sites that failed the HVAC screening analysis, a refined analysis was performed utilizing the AERMOD dispersion model. The results indicated that 45 of the 52 new projected development sites and 5 of the 6 enlargement projected development sites which failed the screening analysis also failed the refined analysis for No. 2 oil. If minimum distances are increased from the most conservative distance (building line to building line) no significant adverse impacts using No. 2 oil are predicted at 42 of the 45 new projected development sites, and 4 of the 5 enlargement projected development sites. A total of 37 new potential development sites (out of a total of 46) which failed the screening analysis also failed the refined analysis for No. 2 oil, while 101 out of 113 enlargement potential development sites failed using No. 2 oil. If minimum distances are increased from the most conservative distance (building line to building line), no significant adverse impacts are predicted at 26 of the 37 new potential development sites, and 59 of the 101 enlargement potential development sites which failed for No. 2 oil. Furthermore, all of the sites analyzed with the AERMOD model would pass the analysis if natural gas is utilized as the fuel type.

CUMULATIVE IMPACTS FROM HVAC SOURCES

Two HVAC site clusters (HVAC sources in close proximity with similar stack heights) were identified and a quantitative analysis was performed to determine their potential impact. The total floor area of the individual sites was summarized and a single representative stack was placed in the approximate geographic center of the cluster (see Figure 18-1). The clusters consisted of the following projected and potential development sites:

A. Projected Development Sites 62 to 69 and 74 to 77; and Potential Development Sites 216 and E-74 – comprising a total floor area of 191,308 square feet with a stack height at 80 feet; and

B. Projected Development Sites 114 and E-4; and Potential Development Sites 242 to 248, – comprising a total floor area of 138,265 square feet with a stack height at 60 feet.

The overall results of the analysis are presented in Table 18-4. For development sites comprising one of the two clusters (B), an E-designation would be written that the fuel type would be restricted to either natural gas.

Table 18-4
HVAC Cluster Analysis

Cluster ID	Projected Sites	Potential Sites	Cluster Development Size (ft^2)	Results (Pass/Fail)		
				No. 4 Oil	No. 2 Oil	Natural Gas
A	62-69, 74-77	216, E-74	191,308	Pass	Pass	Pass
B	114, E-4	242-248	138,265	Fail	Fail	Pass

To preclude the potential for significant adverse air quality impacts on other projected and potential developments from the HVAC emissions, an E-designation would be incorporated into the rezoning proposal for each of the 214 affected sites (comprising 57 projected and 157 potential sites). These designations would specify the type of fuel to be used or the distance that the vent stack on the building roof must be from its edge. The E-designations for these sites are presented in Appendix F. ✷