A. INTRODUCTION

This chapter examines the potential for air quality impacts from the proposed project. The air quality analysis has two components: the effects of air emission sources created by the proposed project and the effects of existing nearby industrial sources on the proposed project. The proposed project is not expected to significantly alter traffic conditions. Since the project does not meet the New York City Environmental Quality Review (CEQR) criteria for a mobile source intersection analysis, no quantitative assessment of mobile source air quality conditions from project generated traffic is warranted.

The analysis that follows provides an assessment of the potential impacts from the heating, ventilation and air conditioning (HVAC) system exhaust of the proposed project on surrounding residential buildings. The pollutants of concern are by-products of fossil fuel combustion[1].

The chapter also presents an assessment of the potential impacts of nearby industrial sources on the proposed development. Because the development will be located in a mixed-use neighborhood, the affects of air toxic contaminants emitted by existing nearby industrial sources was examined. Air toxic contaminants can be any compound emitted to the atmosphere that is known or suspected to be hazardous to human health at specified ambient concentrations.

A stationary source analysis of the proposed mechanically ventilated, parking garages is provided to assess potential increases in carbon monoxide (CO) concentrations in the immediate vicinity of the garages.

This chapter also addresses the potential for odors from the Gowanus Canal to affect future residents of proposed project. The Gowanus Canal has been identified as a potential source of odors due to the potential for combined sewer overflow (CSO) to enter the canal.

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[1] The City is currently examining how best to address climate change issues in its CEQR process, taking into account current City policies, including PlaNYC. Subsequent to issuance of the DEIS, DEC issued for comment a preliminary draft technical guidance regarding analysis of greenhouse gas (GHG) emissions as part of the environmental review process. That draft proposed that the guidance would apply to large-scale projects such as those involving major stationary sources of air pollutants requiring a DEC permit (such as electric generating facilities) and solid waste facilities. The draft further stated that the guidance could be useful with respect to other large greenhouse gas emitting facilities that generate millions of vehicle miles traveled or use significant amounts of electricity, such as very large scale resort or residential and commercial projects. The draft DEC guidance considers the preparation of GHG analysis in connection with the environmental review of large scale residential and commercial development projects of several million square feet. The proposed action has a maximum development potential of approximately 602,000 gross square feet, and thus is not a project to which the draft guidance is currently applicable. The City is exploring what parameters are appropriate for determining when a GHG analysis warranted.

PRINCIPAL CONCLUSIONS

Air quality analyses for an environmental impact statement (EIS) typically consider four potential sources of pollutants and areas of air quality impacts: 1) the potential for pollutants from mobile sources (such as cars and trucks) to impact the ambient environment; 2) the potential for pollutants from the proposed heating systems to impact the surrounding environment and nearby residential buildings; 3) the potential for future residents of a residential building to be impacted by emissions from nearby industrial or commercial uses; and 4) the potential for pollutants from garages to impact ambient air quality. With respect to mobile source analyses, the proposed project would not generate enough vehicular traffic to result in an air quality impact from mobile sources. To ensure that the development would not result in any significant air quality impacts from HVAC emissions, an (E) designation would be provided as part of the proposed zoning. The text of the (E) designation would be as follows:

> Tax Block 452, Tax Lots 1, 15: Any new development must use natural gas as the type of fuel for HVAC systems. Boiler exhaust stack(s) for all development shall be located on the highest tier of each building.
>
> Tax Block 458, Lot 1: Any new development must use natural gas as the type of fuel for HVAC systems. Boiler exhaust stack(s) for all development shall be located on the highest tier of each building.

With these restrictions in place, no significant adverse air quality impacts would result from the proposed project's HVAC systems.

With respect to local industrial sources, it was determined based on air permits for nearby industrial operations (e.g., concrete batching plants) and air quality modeling of these facilities that future project residents would not experience significant adverse air quality impacts from nearby industrial sources. The garage analysis found that neither future project residents nor the surrounding neighborhood would be impacted by the proposed on-site parking garages.

In addition, to these four analyses, an analysis was performed to determine if local odor conditions near the project site could impact the proposed project. Based on real-time sampling of odors at the project site, it was determined that during periods with weather conditions conducive to high concentrations of hydrogen sulfide (H_2S)—an indicator of potential odors—near the Gowanus Canal, the hourly average concentration of H_2S could exceed the nuisance-based standard for this pollutant, resulting in a significant adverse odor impact.

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 18–1. 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 18-1
National Ambient Air Quality Standards (NAAQS)

Pollutant	Primary		Secondary	
	ppm	µg/m^3	ppm	µg/m^3
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/m^3 – micrograms per cubic meter
NA – not applicable
All annual periods refer to calendar year.
PM concentrations (including lead) are in µg/m^3 since ppm is a measure for gas concentrations.
Concentrations of all gaseous pollutants are defined in ppm and approximately equivalent concentrations in µg/m^3 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 60 days after publishing in the federal register.
(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/m^3, 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 PM2.5 standard from 65 µg/m^3 to 35 µg/m^3 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 boroughs of New York City, Nassau, Suffolk, Rockland, Westchester, and Orange Counties as $PM_{2.5}$ nonattainment areas under the CAA. State and local governments are required to develop SIPs by early 2008, which will be designed to meet the standards by 2010. As described above, EPA recently 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, 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 new 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. The 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.

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.

ODOR REGULATIONS

In New York City, odors are regulated by the Industrial Performance Standards of New York City's Zoning Resolution, the Air Pollution Control Code (APCC), and state regulations. Odors

are regulated based on their nuisance factor, and what constitutes a nuisance is usually defined qualitatively, rather than being defined as a quantitative concentration. An exception is the New York State standard for hydrogen sulfide (H_2S).

The Industrial Performance Standards regulate odorous emissions from stationary sources in manufacturing districts. Only use groups 11A, 16, 17 and 18 located in manufacturing districts are regulated.

The APCC provides a provision to regulate odorous air contaminants within the City. Subchapter 6, Section 24-141 of the APCC states that: "No person shall cause or permit the emission of air contaminant, including odorous air contaminant, or water vapor, if the air contaminant or water vapor causes or may cause detriment to the health, safety, welfare or comfort of any person, or injury to plant or animal life, or causes or may cause damage to property or business . . ."

Subchapter 9 of the APCC contains the enforcement provisions. Currently, New York City Department of Environmental Protection (DEP) inspectors issue notices of violation to businesses where the inspector directly observes a noticeable odor caused by the business at or beyond the property boundary of the business. DEP can also require controls be placed on odor emitting facilities.

The New York State Ambient Air Quality Standard (NYSAAQS) for H_2S is 10 ppb. The primary objective of this standard is to prevent disagreeable odors.

State regulations, as presented in 6 NYCRR 211.2, state that: "No person shall cause or allow emissions of air contaminants to the outdoor atmosphere of such quantity, characteristic, or duration which are injurious to human, plant, or animal life or to property, or which unreasonably interfere with the comfortable enjoyment of life or property. Notwithstanding the existence of specific air quality standards or emission limits, this prohibition applies, but is not limited to any particulate, fume, gas, mist, odor, smoke, vapor, pollen, toxic or deleterious emission, either alone or in combination with others."

There are no federal NAAQS for H_2S. However, the Occupational Safety and Health Administration (OSHA), which is a federal agency, has a health based standard of 10 parts per million or 10,000 ppb for worker (i.e., not the general public) safety and protection.

DETERMINING THE SIGNIFICANCE 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, 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 threshold levels would be deemed to have a potential significant adverse impact, even in cases where violations of the NAAQS are not predicted.

Determining the significance for air quality impact with sources of odor is more complex. This is due to the subjective nature and highly variable degree of odor perception by individuals, and the potential for multiple sources of odors with their synergistic effects. As described above, odors are regulated based on their nuisance factor, and what constitutes a nuisance is sometimes defined qualitatively, but is identified quantitatively by the New York State standard for H_2S as 10ppb. However, it is recognized that this standard is for H_2S as an indicator compound for

odors and not health based. As described above, the OSHA standard for worker safety and protection, which is health based, is a significantly greater at 10,000 ppb.

C. METHODOLOGY FOR PREDICTING POLLUTANT CONCENTRATIONS

HVAC SCREENING ANALYSIS

To assess air quality impacts associated with emissions from the project's HVAC systems, a screening analysis was performed using the methodology described in the *CEQR Technical Manual*. This methodology determines the threshold of development size below which the action would not have a significant impact. The screening procedures utilize information regarding the type of fuel to be burned, the maximum development size and the HVAC exhaust stack height (building height plus three feet), to evaluate whether or not a significant impact is possible. Based on the distance from the development to the nearest building of similar or greater height, if the maximum development size is greater than the threshold size in the *CEQR Technical Manual*, then 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 study is required.

INDUSTRIAL SOURCE SCREENING ANALYSIS

To assess air quality impacts on the proposed development associated with emissions from nearby industrial sources, a screening analysis was performed using the methodology described in the *CEQR Technical Manual*. The first step in this analysis was to perform a field survey in order to identify any processing or manufacturing facilities located within 400 feet of the proposed development. Once identified, information regarding the release of air contaminants from these facilities was obtained from the DEP. This information is based on the most current air permit data available.

The potential ambient concentrations of each air toxic contaminant from a manufacturing facility were determined using a screening database from the EPA Industrial Source Complex dispersion model. Estimates of worst-case short-term (1 hour) and annual averages are predicted and then compared to the short-term (SGC) and annual (AGC) guideline concentrations. The guideline concentrations are established by the New York State Department of Environmental Conservation (DEC) and represent levels that are considered safe for inhalation exposure by the public. A significant impact occurs if the predicted concentration exceeds an SGC or AGC.

In addition, a comprehensive search was performed to identify large stationary sources of air emissions (such as DEC Title V permits or permits listed in the EPA Envirofacts database) out to a distance of 1,000 feet from the project boundary. The search identified two concrete batching plants located 435 Hoyt Street and 160 3rd Street in Brooklyn, NY. Therefore, the air quality analysis included refined dispersion modeling to estimate the combined potential for ambient air quality impacts on the proposed project from both facilities using the EPA AERMOD dispersion model. The pollutant for analysis was PM_{10}. Since PM_{10} is a criteria pollutant, PM_{10} concentrations were compared to the NAAQS with background values added to the total modeled concentration. A background value of 50 $\mu g/m^3$ for PM_{10} was used for the analysis (in accordance with DEP guidance).

PARKING ANALYSIS

As described in Chapter 1, "Project Description," the proposed project would result in the operation of two enclosed parking garages (one on each project block) with a combined total of 268 accessory parking spaces. The parking analysis conservatively assumed that each garage could experience vehicle emissions associated with up to 60 percent of the total project generated "ins and outs" (vehicles entering and exiting the garages). An analysis of the emissions from the outlet vents and dispersion in the environment was performed using the methodology set forth in the *CEQR Technical Manual*.

Emissions from vehicles entering, parking, and exiting the garage were estimated using the EPA MOBILE6.2 mobile source emission model and an ambient temperature of 43 degrees Fahrenheit. 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 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.)

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

The CO concentrations were determined for the time periods when overall garage usage would be the greatest, considering the hours when the greatest number of vehicles would exit the facility. Departing vehicles were assumed to be operating in a "cold-start" mode, emitting higher levels of CO than arriving vehicles. Traffic data for the parking garage analysis were derived from the trip generation analysis described in Chapter 16, "Traffic and Parking."

Since the design of the proposed parking garage ventilation systems have not yet been finalized, the parking analysis conservatively assumed a range of possible exhaust locations, including along the street-facing and courtyard-facing façades of the proposed buildings, and within the courtyard itself. CO concentrations were determined at sensitive receptors (representing operable windows or locations of public access such as sidewalks). A persistence factor of 0.7, supplied by DEP, was used to calculate the 8-hour averages, accounting for meteorological variability over the average 8-hour period.

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

ODORS

To assess the potential for significant adverse impacts from odors on the residential population that would be introduced into the area with the proposed project, any nearby sources of odors were identified based on a literature review and field investigation, and their location in relationship to the site of the proposed project was noted. Based on the location of the odorous

sources and any available data regarding the nature of these sources, a detailed evaluation of the potential for odor impacts on the proposed project was conducted. As part of this effort, an odor monitoring program was conducted at the project site using H_2S as an indicator of potential odors. The program was performed in accordance with a protocol approved by DEP.

D. EXISTING CONDITIONS

EXISTING MONITORED AIR QUALITY CONDITIONS (2006)

Monitored ambient air concentrations of CO, SO_2, particulate matter, NO_2, lead, and ozone for the project area are shown in Table 18-2 for the year 2006. These values are the most recent monitored data that have been made available by DEC for nearby monitoring stations. There were no monitored violations of the NAAQS for the pollutants at these sites in 2006.

Table 18-2
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).

DEP has undertaken a Gowanus Canal Waterbody/Watershed Facility Plan (dated September 2007) that identified an odor source at the head of the Gowanus Canal which is attributed to the exposure of combined sewer outfall (CSO) sediment at low tide in the areas between the Gowanus Pump Station and approximately Sackett Street. Field visits to the area also identified several outfall pipes including six large pipes at the bottom of DeGraw Street just above the sediment piles. Muddy sediments are also exposed along the edges of the canal during low tides and the water in the canal itself could potentially be a source of odors.

E. THE FUTURE WITHOUT THE PROPOSED PROJECT

Without the proposed project, no major changes to land use would be expected to occur on the project site by 2011. Land uses on the site would remain as one- and two-story light-industrial buildings and vacant land serving primarily as space for vehicle storage. HVAC and industrial source emissions in the No Build condition would likely be similar to existing conditions.

In the future without the proposed project in 2011, any odors due to the exposure of CSO sediment at the north end of the canal at low tide would continue.

In addition, as described in Chapter 10, "Natural Resources," DEPs Gowanus Canal Waterbody/Watershed Facility Plan includes the following measures to be completed in 2013:

- *Rehabilitation of the Gowanus Canal Flushing Tunnel*—This rehabilitation will increase the tunnel's average capacity from 154 mgd to 215 mgd, enhancing circulation from the Upper Harbor of New York Bay to the head of the Gowanus Canal.
- *Reconstruction of the Gowanus Pump Station*—This reconstruction would result in the expansion of the capacity of the Gowanus Pump Station through the installation of four new pumps. An element of this measure would also include the replacement of the force main that currently runs along the inside of the Flushing Tunnel. Because the current force main is not operational, flow is being diverted to the Bond-Lorraine Sewer. The new force main would pump flow directly to the Columbia Street Interceptor, and eventually to the Red Hook WPCP (flow would no longer be re-routed to the Bond-Lorraine Sewer, thereby relieving some of the capacity of the sewer and reducing the potential for CSO discharges into the canal). The reconstruction of the Pump Station and replacement of the force main is projected to reduce the annual volume of CSO discharges to the canal by 34 percent.
- *Floatables Controls*—This measure would involve the implementation of floatables controls at two CSO locations. Period skimming would also be implemented.
- *Dredging*—Dredging the upper 750 feet of the Gowanus Canal will eliminate exposed sediment mounds.

The implementation of these measures (which is proposed to be completed in 2013) would result in the elimination of CSO sediment mounds, the improvement of dissolved oxygen levels, and the reduction of CSO discharges. These improvements would all contribute to the reduction of odors.

F. PROBABLE IMPACTS OF THE PROPOSED ACTION

INTRODUCTION

As stated above the project was evaluated for the potential for impacts due to emissions from HVAC equipment, industrial sources, parking garages and odors. The results of those analyses are presented below proposed.

ANALYSIS FOR HVAC EQUIPMENT IMPACTS

The primary stationary source of air pollutants associated with the proposed development would be emissions from the combustion of natural gas by the HVAC equipment associated with the project buildings located on Blocks 452 and 458. The primary pollutant of concern when burning natural gas is NO_2. The screening methodology in the *CEQR Technical Manual* was utilized for the analysis, with the size of each proposed development building in square feet and the use of natural gas as fuel. The development program would result in a total of 232,406 gross square feet (gsf) of development on Block 452 and 373,744 gsf of development on Block 458, comprised primarily of residential uses with some community facility and commercial space, and accessory parking. The range of building tier heights would be from 4 to 12 stories (up to approximately 125 feet) comprising low-rise buildings along Bond Street (6 stories), mid block

low-rise townhouses on 1st and 2nd Streets (4 stories in height; 3 floors available for residential occupancy) and low- to mid-rise residential buildings along the waterfront (6 to 12 stories). For HVAC analysis purposes, it was assumed that there would be multiple HVAC systems servicing each project block (i.e., one for the condominiums, one for the inclusionary housing, and individual units for the townhouses). As mentioned above, the townhouses would be small (i.e., approximately 3, 760 square foot) structures. According to the New York City Building Code, the individual stacks for these structures would be required to be at a distance of ten feet or more to the nearest façade. In addition, a cumulative analysis was conducted for each group of townhouses on Blocks 452 and 458. Based on Figure 3Q-9 of the *CEQR Technical Manual*, no significant adverse impacts are predicted because the combined size of the townhouse development on each block is below the maximum permitted size. Therefore, there would be no significant adverse air quality impacts on nearby taller buildings from the townhouse emission sources. It was also assumed that the HVAC system exhaust stack for the inclusionary housing and condominium structures would be located on the highest tier of each of the buildings, which is common design practice. Based on these assumptions, and Figure 3Q-9 of the *CEQR Technical Manual* and the analysis procedures outlined above under "Methodology" the proposed project would not result in any significant stationary source air quality impacts from HVAC sources.

To ensure that the development would not result in any significant air quality impacts from HVAC emissions, an (E) designation would be provided as part of the proposed zoning. The text of the (E) designation would be as follows:

> Tax Block 452, Tax Lots 1, 15: Any new development must use natural gas as the type of fuel for HVAC systems. Boiler exhaust stack(s) for all development shall be located on the highest tier of each building.
>
> Tax Block 458, Lot 1: Any new development must use natural gas as the type of fuel for HVAC systems. Boiler exhaust stack(s) for all development shall be located on the highest tier of each building.

With these restrictions in place, no significant adverse air quality impacts would result from the proposed project's HVAC systems.

ANALYSIS FOR INDUSTRIAL SOURCE IMPACTS

The results of a field survey for manufacturing sites and DEP permit inquiry indicated that only one permitted industrial site (associated with a single business) was located within 400 feet of the proposed development. That facility is permitted to emit certain air contaminants to the atmosphere. The screening methodology in the *CEQR Technical Manual* was utilized for the analysis, with the air contaminant emission rate from the facility and a distance of 218 feet to the proposed development. Table 18-3 shows the air contaminants, calculated concentrations, and the respective, recommended short-term and annual guideline concentrations. The concentrations shown represent predicted impacts on the project site nearest to the industrial source in order to determine worst-case impacts on the proposed project.

The conservative screening procedure used to estimate maximum potential impacts from this business showed that the operations would not result in any predicted violations of the NAAQS or any exceedances of the recommended SGC or AGC. Therefore, based on the data available on the surrounding industrial uses, the proposed project would not experience significant adverse air quality impacts from nearby industrial sources.

Table 18-3
Maximum Predicted Impacts on Proposed Project from the Industrial Source

Potential Contaminants	CAS No.	Estimated Short-term Impact (ug/m^3)	SGC (ug/m^3)	Estimated Long-term Impact (ug/m^3)	AGC (ug/m^3)
Acetone	00067-64-1	9.35	180,000	0.013	28,000
Ammonium Chloride	12125-02-9	0.47	380	0.0016	24
Boric Acid	10043-35-3	0.47	N/A	0.0016	4.8
Butyl Acetate	00123-86-4	458.14	95,000	0.629	17,000
Hydrogen Chloride	07647-01-0	0.93	2,100	0.003	20
Isopropyl Alcohol	00067-63-3	448.79	98,000	0.616	7,000
Particulates	NY075-00-0	5.61	380	0.015	N/A
Sodium Hydroxide	01310-73-2	37.4	200	0.128	N/A
Toluene	00108-88-3	925.64	37,000	1.27	5,000

Notes: a) The SGC/AGC for ethylene glycol was substituted for this compound.
Source: Guideline concentrations were obtained from NYSDEC DAR-1 (Air Guide-1) AGC/SGC Tables, Sept. 2007
AGC - Annual Guideline Concentrations; SGC - Short-term Guideline Concentrations

In addition, a refined modeling analysis was performed for two nearby concrete batching plants that are located within 1,000 feet of the project site. Based on the analysis of these facilities, the maximum predicted 24-hour average concentration of PM_{10} from the modeling analysis was determined to be 11 $\mu g/m^3$ at the project site. Including a background concentration of 60 $\mu g/m^3$ (obtained from a nearby NYSDEC monitoring station), the total PM_{10} concentration at the project site is then predicted to be 71 $\mu g/m^3$, which is less than the NAAQS for PM_{10} (i.e., 150 $\mu g/m^3$). As a result of this analysis, it was concluded that the combined emissions from the two concrete batching plants would not result in any significant adverse air quality impacts on the proposed project.

ANALYSIS FOR PARKING GARAGE IMPACTS

Based on the methodology described above, the maximum predicted 8-hour average CO concentration over a range of possible exhaust locations associated with the garage on Block 452 at a sensitive receptor would be 0.49 ppm and the maximum predicted 8-hour average CO concentration associated with the garage on Block 458 at a sensitive receptor would also be 0.47 ppm. Therefore, including a background level of 2.0 ppm, the maximum predicted future (2011) 8-hour average CO levels associated with either garage for the proposed project would be 2.49 ppm for all the exhaust locations that were assumed, which is substantially below the applicable standard of 9 ppm. As the results show, the proposed parking garages would not result in any significant adverse air quality impacts.

ANALYSIS FOR ODOR IMPACTS

The potential for odor impacts at the project site was based on a monitoring protocol referred to above under "Methodology." In accordance with that protocol, real-time sampling was conducted at the northeast corner of the project site near the Gowanus Canal in order to determine ambient concentrations of H_2S at the project site. This sampling was conducted for a period of 6 hours on three different summer days (July 18, 21 and 22, 2008).Weather conditions on these days included light and variable winds interspersed with periods of calm at ground level average highs in the low 90's on July 18 and 21 and in the low 80's on July 22. Wind and temperature conditions were recorded at the site during the course of the sampling. The choice of a receptor location nearest the canal was made based on a field survey where the canal waters,

sediments, and combined outfall structures were found to be the greatest potential sources of odor impacts at the project site. The testing program was also specifically designed to capture the lowest tidal conditions at the site when sediments would be exposed.

The results of the monitoring program indicated that the hourly average concentration of H_2S, during periods with weather conditions conducive to high concentrations near the Gowanus Canal, ranged from 7 to 12 ppb. As stated above, the New York State ambient air standard for H_2S as an indicator compound for odors is 10 parts per billion (ppb). According to the state regulations, this is not a health-based standard, but rather its primary objective is nuisance control to prevent disagreeable odors. New York State applies this standard when issuing permits to new air emissions sources. The only health based standard for H_2S is the OSHA limit of 10,000 ppb discussed above under "Odor Regulations." New York City uses the 10 ppb concentration as a guide for determining odor impacts in its *CEQR Technical Manual*. As a result of the site sampling, under the conditions when the hourly average concentration exceeds 10 ppb, this would be considered a significant adverse odor impact. ✷