2.N AIR QUALITY

INTRODUCTION

Ambient air quality, or the quality of the surrounding air, may be affected by air pollutants produced by motor vehicles, referred to as "mobile sources;" or by fixed facilities, usually referenced as "stationary sources" or by a combination of both. Under CEQR, an air quality assessment determines both a proposed project's effects on ambient air quality as well as the effects of ambient air quality on the project.

The Proposed Action would replace low-rise, mostly one- and two-story buildings, containing generally low intensity light industrial and automotive uses and vacant formerly industrial space, with seven- to fifteen-story residential buildings, some of which would have ground floor commercial or community facility space and accessory group parking garages. Under the reasonable worst-case development scenario (RWCDS) described in Chapter 1, Project Description, the anticipated development would add 2,635 housing units, 93,000 square feet of commercial space, a child care center, and an outdoor children's playground. It would do so in an area of 11 blocks, parts of which would be in close proximity to the Cross Bronx Expressway, which is slightly elevated in the vicinity of the proposed rezoning area.

This chapter assesses the potential for the Proposed Action to result in significant mobile source air quality impacts by increasing traffic on nearby streets, by adding new parking facilities, or by introducing new residential development near an elevated portion of the Cross Bronx Expressway. It assesses the action's potential to result in significant adverse stationary source air quality impacts because of exhaust vented from the new buildings' heating, ventilation, and air conditioning (HVAC) systems or because the new residential buildings would be subject to existing HVAC emissions, air toxics from remaining industrial uses, or odors.

PRINCIPAL CONCLUSIONS

Mobile Sources and Parking Facilities

The additional traffic volumes anticipated as a result of the Proposed Action would not cause carbon monoxide (CO) or fine particulates ($PM_{2.5}$ and PM_{10}) concentrations to exceed either National Ambient Air Quality Standards (NAAQS) or New York City de minimis criteria at any intersection. Carbon monoxide emissions from the new garages would also not exceed those standards. No new building would be exposed to $PM_{2.5}$ or PM_{10} concentrations in excess of NAAQS as a result of the exhaust from vehicles traveling on the Cross Bronx Expressway. In summary, the Proposed Action would not result in any significant adverse mobile source air quality impact.

Stationary Sources

Searches were performed for federal, state, or city permits for boiler, garage, or air toxics emissions in or near the proposed rezoning area. The searches and subsequent screening and computer modeling showed that no stationary emissions sources are close enough or large enough to have a significant adverse air quality impact on any project or potential development site.

HVAC system boiler emissions from new buildings that might be built on projected or potential development sites would not cause significant air pollutant concentrations at any existing residential building, school, or other sensitive receptor.

Assessment using the federal Environmental Protection Agency's (EPA's) AERMOD dispersion model indicated that, in the absence of restrictions on fuel sources or emissions stack locations, developments on many of the projected and potential development sites could potentially cause significant adverse air

quality impacts on projected or potential new buildings on nearby sites, causing pollutant concentrations that would exceed NAAQS limits, if their boilers are fueled by oil rather than natural gas and if their exhaust stacks are located at rooftop locations sufficiently close to the potentially affected buildings. The Proposed Action would therefore including the mapping of (E) designations on non-applicant-controlled Sites and the recording of restrictive declarations against applicant-controlled Sites that would require the use of natural gas rather than oil, require exhaust stacks to be set back from certain property lines by specified minimum distances, or both. In addition, the applicant proposes to construct exhaust stacks for the boilers that are on the mechanical penthouses and extend seven feet above the penthouses rather than follow the standard, less stringent practice of building stacks three feet higher than the surrounding roof. The more rigorous stack height requirement would be part of restrictive declarations recorded against the applicant-controlled Sites. The mapping of these (E) designations and the recording of these restrictive declarations would avoid the potential significant adverse air quality impacts and ensure that residents of the buildings on proposed and potential development sites would not be subjected to unhealthful levels of air pollution caused by other development resulting from the Proposed Action.

Air Toxics

Four facilities located either within the proposed rezoning area or within 400 feet of its boundaries have permits for the release of air toxics. Analysis indicates that none would have a significant adverse impact on any building that would occupy a projected or potential development site.

Odors

The only establishment likely to generate significant odors that could affect projected or potential development sites is the meat packaging plant at 1560 Boone Avenue (Block 3014, Lot 15). This property exists on Projected Development Site 2N, which is controlled by the applicant, and it would be redeveloped under the Proposed Action. Although construction activity on that site would not commence until years 4 to 6 in construction Phase 3, the firm intends to vacate the premises and relocate its operation well before residential construction on nearby sites has been completed. Therefore, it would not be an odor source affecting the redeveloped lots.

METHODOLOGY

The methodology is based on the *CEQR Technical Manual*. Screening analyses were used to identify pollutant sources which would require a more refined analysis. The modeled concentrations from the more refined analyses were added to background pollutant concentrations and compared with NYC de minimis criteria and interim guidelines, New York State Department of Environmental Conservation (NYSDEC) Short-Term and Annual Guideline concentrations, and NAAQS.

Standards and Evaluation Criteria

National Ambient Air Quality Standards

Ambient air is defined by the United States Environmental Protection Agency (EPA) as that portion of the atmosphere, external from buildings, to which the general public has access. National Ambient Air Quality Standards (NAAQS) were promulgated by EPA for the protection of public health and welfare, allowing for an adequate margin of safety. The EPA has set NAAQS for six criteria pollutants. They consist of primary standards, established to protect public health with an adequate safety margin, and secondary standards, established to protect "plants and animals and to prevent economic damage." Six major pollutants are deemed criteria pollutants because threshold criteria can be established for determining adverse effects on human health. They are described below:

- Carbon Monoxide (CO) is a colorless, odorless gas produced from the incomplete combustion of gasoline and other fossil fuels. The primary source of CO in urban areas is from motor vehicles. Because this gas disperses quickly, CO concentrations can vary greatly over relatively short distances.
- Inhalable Particulates, also known as Respirable Particulates. Particulate matter is a generic term for a broad range of discrete liquid droplets or solid particles of various sizes. They are primarily generated by fuel oil combustion and by vehicular traffic that contributes to airborne particulates from brake and tire wear and the disturbance of dust on roadways. The PM_{10} standard covers particulates with diameters of 10 micrometers or less, which are the ones most likely to be inhaled into the lungs. The $PM_{2.5}$ standard covers particulates with diameters of 2.5 micrometers or less.
- Lead (Pb) is a heavy metal. Emissions are principally associated with industrial sources and motor vehicles that use gasoline containing lead additives. Most U.S. vehicles manufactured since 1975, and all manufactured after 1980, are designed to use unleaded fuel. As a result, ambient concentrations of lead have declined significantly.
- Nitrogen dioxide (NO_2) is a highly oxidizing, extremely corrosive toxic gas. It is formed by chemical conversion from nitric oxide (NO), which is emitted primarily by industrial furnaces, power plants, and motor vehicles.
- Ozone (O_3), a principal component of smog, is not emitted directly into the air but is formed through a series of chemical reactions between hydrocarbons and nitrogen oxides in the presence of sunlight.
- Sulfur dioxide (SO_2) is a heavy gas primarily associated with the combustion of sulfur-containing fuels such as coal and oil. No significant quantities are emitted from mobile sources.

New York State Ambient Air Quality Standards further regulate concentrations of the criteria pollutants discussed above. The Air Resources Division of NYSDEC is responsible for air quality monitoring in the state. Monitoring is performed for each of the criteria pollutants to assess compliance. Table N-1 shows the National and New York State Ambient Air Quality Standards.

New York State Annual and Short-Term Guideline Concentrations

NYSDEC has established Short-Term Guideline Concentrations (SGCs) and Annual Guideline Concentrations (AGCs) for certain toxic or carcinogenic non-criteria pollutants for which the EPA has no established standards. They are maximum allowable 1-hour and annual guideline concentrations, respectively, that are considered acceptable concentrations below which there should be no adverse effects on the health of the general public. SGCs are intended to protect the public from acute, short-term effects of pollutant exposures, and AGCs are intended to protect the public from chronic, long-term effects of the exposures. Pollutants with no known acute effects have no SGC criteria, but do have AGC criteria.

The New York City Department of Environmental Protection (NYCDEP) considers that, for pollutants for which the DEC-established AGC is based on a health risk criterion (i.e., a one in a million cancer risk), impacts of less than ten times the AGC are not considered significant. This is because NYSDEC developed the AGCs for these pollutants by reducing the health risk criteria by a factor of ten as an added safety measure if the source has best available control technology (BACT) installed. In determining potential impacts, therefore, NYCDEP considers concentrations within ten times the AGC to be acceptable.

Table N-1: National and New York State Ambient Air Quality Standards and Monitored Values

Pollutant	Averaging Period	Standard	2009 Value	Monitor
Sulfur Dioxide	12-month arithmetic mean	80 µg/m^3	24 µg/m^3	Botanical Gardens (Bronx)
	24-hour average	365 µg/m^3	110 µg/m^3	
	3-hour average	1,300 µg/m^3	176 µg/m^3	
	1-hour average[f]	75 ppb	NA	
Inhalable Particulates (PM_{10})	24-hour average	150 µg/m^3	64 µg/m^3	I.S. 52 (Bronx)
Inhalable Particulates ($PM_{2.5}$)	3-yr average annual mean	15 µg/m^3	11.8 µg/m^3	I.S. 52 (Bronx)
	Maximum 24-hr. 3-yr. avg.[d]	35 µg/m^3	40.6 µg/m^3	
Carbon Monoxide	8-hour average[a]	9 ppm	2.5 µg/m^3	Botanical Gardens (Bronx)
	1-hour average[a]	35 ppm	3.4 ppm	
Ozone	Maximum daily 1-hr avg.[b]	NA	0.092 ppm	Botanical Gardens (Bronx)
	Maximum daily 8-hr avg.[c]	0.075 ppm	0.065 ppm	
Nitrogen Dioxide	12-month arithmetic mean	100 µg/m^3	51 µg/m^3	Botanical Gardens (Bronx)
	1-hour average[e]	100 ppb (188 ug/m^3)	NA	
Lead	Quarterly mean	1.5 µg/m^3	0.019 µg/m^3	J.H.S. 126 (Brooklyn)

Notes: ppm = parts per million; µg/m^3 = micrograms per cubic meter; NA = not available
a Not to be exceeded more than once a year.
b Applies only to areas designated non-attainment. The NYC metropolitan area is no longer subject to the 1-hour ozone requirement.
c. Three-year average of the annual fourth highest maximum 8-hour average concentration effective May 27, 2008.
d Not to be exceeded by the 98th percentile of 24-hour $PM_{2.5}$ concentrations in a year (averaged over 3 years).
e Three-year average of the 98th percentile of the daily maximum 1-hour average, effective January 22, 2010.
f Three-year average of the 99th percentile of the daily maximum 1-hour average, final rule signed June 2, 2010.
Sources: New York State Department of Environmental Conservation; New York State Ambient Air Quality Development Report, 2009; New York City Department of Environmental Protection, 2010.

Odor Regulations

NYSDEC enforces regulations under 6 NYCRR 211.2 that generally state that no facility should emit measurable amounts of airborne pollutants that result in the detection of bad odors by the general public. These regulations prohibit "emissions of air contaminants to the outdoor atmosphere of such quantity, characteristic, or duration 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." NYSDEC also has a 1-hour ambient air quality standard of 10 ppb for hydrogen sulfide, and NYCDEP considers a 1 ppb increase in hydrogen sulfide to constitute an impact on sensitive receptors.

A significant odor impact would occur if a project results in maximum predicted 1-hour average malodorous pollutant levels above the applicable odor threshold at places of public access, or if it results in the development of a structure that would be subject to such malodorous pollutant levels from nearby sources of these pollutants. While odors may still be detected for time periods from a few seconds to several minutes, it would be unrealistic to define this as a significant impact unless the odor persisted, on average, for at least an hour.

New York City De Minimis and Interim Guidance Criteria

For mobile sources, New York City's *de minimis* criteria are used to determine the significance of the incremental increases in CO concentrations that would result from a proposed action. According to these criteria, a significant impact is defined as follows:

- An increase of 0.5 ppm or more in the maximum 8-hour average carbon monoxide concentration at a location where the predicted No Action 8-hour concentration is equal to or above 8 ppm; or
- An increase of more than half the difference between baseline (i.e., No Action) concentrations and the 8-hour standard (9 ppm) where No Action concentrations are below 8 ppm.

For $PM_{2.5}$ analyses at the microscale level, the City's interim guidance criteria for determining significance are:

- 24-hour average $PM_{2.5}$ concentration increments that are predicted to be greater than 5 $\mu g/m^3$ at a discrete receptor location would be considered a significant adverse impact on air quality under operational conditions (i.e., a permanent condition predicted to exist for many years regardless of the frequency of occurrence);
- 24-hour average PM2.5 concentration increments that are predicted to be greater than 2 $\mu g/m^3$ but no greater than 5 $\mu g/m^3$ would be considered a significant adverse impact on air quality depending on the magnitude, frequency, duration, location, and size of the area of the predicted concentrations. The lead agency must consult with DEP to determine the significance of results between 2 $\mu g/m^3$ and 5 $\mu g/m^3$;
- Predicted annual average $_{PM2.5}$ concentration increments greater than 0.1 $\mu g/m^3$ at ground level on a neighborhood scale (i.e., the annual increase in concentration representing the average over an area of approximately 1 square kilometer, centered on the location where the maximum ground-level impact is predicted for stationary sources; or at a distance from a roadway corridor similar to the minimum distance defined for location neighborhood scale monitoring stations); or
- Predicted annual average $PM_{2.5}$ concentration increments greater than 0.3 $\mu g/m^3$ at a discrete or ground-level receptor location.

State Implementation Plan (SIP)

The Clean Air Act requires states to submit to the EPA a SIP for attainment of the NAAQS. The site is within an area classified as nonattainment for ozone and $PM_{2.5}$ because concentrations historically have exceeded the standards. For ozone, Bronx County is classified as nonattainment (moderate) for the 8-hour ozone standard. In August 2007, the state submitted the final proposed revision of the SIP for ozone, documenting how the area will attain the 8-hour ozone standard by 2013. On June 16, 2011, NYSDEC petitioned the EPA to make a binding determination that the NY-N. NJ-Long Island, NY-NJ-CT metropolitan statistical area (NYMA) has attained both the 1990 1-hour ozone standard of 0.12 ppm and the 1997 ozone standard of 0.08 ppm.

On May 5, 2011, NYSDEC petitioned the EPA to make a binding determination that the New York State portion of the New York-N. New Jersey-Long Island, NY-NJ-CT nonattainment area has attained the 2006 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$. Based on updated air quality monitoring data

from the New York, New Jersey and Connecticut portions of the New York-N. New Jersey-Long Island, NY-NJ-CT nonattainment area, the 2006 24-hour $PM_{2.5}$ NAAQS is now being met.

As stated previously, the site also falls within a CO maintenance area. The 1-hour values shown for nitrogen dioxide in Table N-1 represent maximum annual averages, as the records are not presently sufficient to calculate annual averages over a 3-year period.

Background Pollutant Concentrations

Background concentrations are added to modeled concentrations to determine total concentrations for comparison with NAAQS. For SO_2, nitrogen dioxide (NO_2), and PM_{10}, the background values at I.S. 52 in the Bronx, as provided by NYCDEP's May 21, 2010 memo and shown below, would be used:

- 228 $\mu g/m^3$ for the 3-hour SO_2 average,
- 123 $\mu g/m^3$ for the 24-hour SO_2 average,
- 29 $\mu g/m^3$ for the annual SO_2 average,
- 55 $\mu g/m^3$ for the annual NO_2 average, and
- 64 $\mu g/m^3$ for the 24-hour PM_{10} average.

As a conservative approach for CO, the highest value from the past 5 years of monitored values was used as the background value. Although the I.S. 52 station is the closest to the rezoning area, it does not have 1-hour and 8-hour CO values. Therefore, the CO concentrations from the Botanical Gardens Pfizer Lab station were used. Based on the past 5 years of data at this station, the CO background would be 3.9 ppm for the 1-hour average and 2.5 ppm for the 8-hour average, as shown in Table N-2.

Table N-2: Monitored CO Values (ppm)

Monitor	Year	1-Hour Value	8-Hour Value
Botanical Gardens, Pfizer Lab, Bronx	2005	**3.9**	**2.5**
	2006	2.6	1.9
	2007	3.1	2.0
	2008	2.3	1.8
	2009	3.4	2.5

Note: Numbers in bold type are the highest in their category.
Source: New York State Department of Environmental Conservation

Mobile Sources

Emissions from vehicular traffic roadways are termed mobile sources. In general, mobile source analyses consider projects that add new vehicles to the roads, change traffic patterns by diverting vehicles, include parking lots or garages, or add new uses near sources of pollutants, as when a residential building is proposed adjacent to a highway. For the Proposed Action, the evaluation of mobile sources included the addition of new (action-generated) vehicles to roads, new parking facilities, and the proximity of new residential uses near elevated highways.

Conditions for Further Analysis

According to the *CEQR Technical Manual*, conditions that may require further analysis include:

- Projects that would result in placement of operable windows (i.e., windows that may be opened and closed by the tenant, balconies, air intakes, or intake vents generally within 200 feet of an atypical (e.g., not at-grade) source of vehicular pollutants, such as a highway or bridge with a total of more than two lanes;
- Projects that would generate peak hour auto traffic or divert existing peak hour traffic, resulting in 170 auto trips;
- Projects that would generate peak hour auto heavy-duty diesel traffic or its equivalent in vehicular emissions resulting in the following:
    - 12 or more HDDV for paved roads with fewer than 5,000 vehicles per day;
    - 19 or more HDDV for collector-type roads;
    - 23 or more HDDV for principal and minor arterial roads; and
    - 23 or more HDDV for expressways and limited-access roads;
- Projects that would result in a sizable number of other mobile sources of pollution, such as a heliport, new railroad terminal, or trucking; and
- Projects that would substantially increase the vehicle miles traveled in a large area (a borough, the City, or larger) may require a mesoscale analysis.

The project would result in new residential development within 200 feet of the elevated Cross Bronx Expressway, meet the threshold screening criteria for autos and heavy-duty diesel equivalents at multiple intersections, and create residential uses in close proximity to new parking facilities. Pollutant and sources of interest included:

- Carbon monoxide and fine particulates (PM_{10} and $PM_{2.5}$) from the increase in motor vehicles due to the Proposed Action during the weekday AM, Midday, and PM peak traffic periods,
- Carbon monoxide from parking facilities, and
- PM_{10} and $PM_{2.5}$ from the Cross Bronx Expressway due to the proposed construction of residential units nearby.

Approach

To assess the potential for vehicular traffic to cause an air quality impact, a preliminary evaluation of intersections was carried out for CO and $PM_{2.5}$ based on the project-generated increment of vehicles for the twenty intersections included in the traffic analysis. Multiple intersections failed the CO and $PM_{2.5}$ screens, and one to two worst-case intersections were selected for modeling with CAL3QHC or CAL3QHCR. If modeling of the worst-case intersections shows no potential for air quality impacts, then no impacts are likely for intersections with lower volumes.

CO Screen

Based on the *CEQR Technical Manual*, actions resulting in 170 or more trips through an intersection in the Bronx may require further analysis. Table N-3 shows that multiple intersections would exceed this threshold. To assess the potential for CO impacts, modeling was carried out for the intersection with the greatest traffic increment and for the intersection with the highest overall volume.

As shown in Table N-3, the maximum project increment, 281 vehicles, would occur at the intersection of West Farms Road/Boston Road/East Tremont Avenue, during the weekday AM period. This intersection also has relatively high volumes compared to the other intersections. The intersection of E. 177th Street and the Sheridan Expressway ramp has the highest overall volume, and it has a relatively high project

increment of 259 vehicles for the peak AM period. Therefore, CO modeling was performed for the peak AM period at these two intersections, which are shown in Figure N-1.

Table N-3: Traffic Volume Increments for CO Screening Analysis

Intersections	Auto Trips Added			Truck Trips Added			Total Trips Added		
	AM	MD	PM	AM	MD	PM	AM	MD	PM
East Tremont Ave at East 177th St.	277	107	111	(12)	(9)	(13)	**265**	98	98
West Farms Rd. at Boston Rd, E. Tremont Ave	293	131	161	(12)	(9)	(13)	**281**	122	148
West Farms Rd. at Rodman Place	240	106	124	(13)	(10)	(12)	**227**	96	112
East 177th St. at E. 177th St. (Sheridan Expressway)	271	103	104	(12)	(8)	(13)	**259**	95	91
West Farms Rd. at Cross Bronx Expressway North Service Rd	211	67	83	(13)	(14)	(12)	**198**	53	71
Bronx River Ave at East 174th St.	(23)	44	127	(3)	(6)	(4)	(26)	38	123
Boone Ave at East 174th St.	4	52	156	(9)	(10)	(8)	(5)	42	148
Longfellow Ave at East 174th St.	(19)	19	61	(3)	(4)	(2)	(22)	15	59
West Farms Rd. at East 173rd St.	231	69	131	(14)	(16)	(14)	**217**	53	117
Boone Ave at East 173rd St.	65	36	109	(15)	(17)	(9)	50	19	100
Longfellow Ave at East 173rd St.	(6)	20	61	(3)	(5)	(2)	(9)	15	59
West Farms Rd. at East 172nd St.	113	65	164	(7)	(9)	(10)	106	56	154
Boone Ave at East 172nd St.	15	14	49	(6)	(7)	(6)	9	7	43
West Farms Rd. at Jennings St.	27	39	131	(4)	(5)	(5)	23	34	126
West Farms Rd. at Boone Ave	22	41	131	(5)	(6)	(5)	17	35	126
Boone Ave at Freeman St., Sheridan Expressway Ramp	4	15	56	(2)	(3)	(2)	2	12	54
Westchester Ave at Boone St., Home St.	(3)	29	106	(3)	(6)	(4)	(6)	23	102
West Farms Rd. at Home St., Longfellow Ave	2	39	129	(5)	(6)	(5)	(3)	33	124
West Farms Rd. at Freeman St.	9	39	129	(5)	(6)	(5)	4	33	124
Westchester Ave. at Sheridan Expressway Ramp	6	16	52	(1)	(3)	(2)	5	13	50

Note: Entries in bold type exceed 170-vehicle threshold screen
Source: Stantec Consulting, April 24, 2011

Minor changes to traffic volumes occurred between the DEIS and the FEIS. However, they were not sufficient to change the selection of worst-case intersections or the modeled results.

Figure N-1: Intersections Modeled for CO

Source: Google Earth, Sandstone Environmental Associates, Inc.

CO Modeling

Mobile source CO was modeled at the two worst-case intersections using traffic data from the traffic study, EPA's MOBILE6.2 emissions model for vehicular emission factors, and EPA's CAL3QHC model to obtain modeled CO concentrations.

Traffic data was obtained from the traffic analysis. This included volumes, by approach, for key links and intersections within the study area as well as vehicular speeds, and vehicular mixes. The vehicular mix used for the analysis was based on field classification counts obtained from the traffic study. Vehicular mix represents the proportions of vehicles falling into the 28 MOBILE6.2 categories. Based on NYCDEP guidelines, taxis and sport utility vehicles are treated as special categories of vehicles. Sport utility vehicles (SUVs), which represent about 24% of the passenger vehicles, were included with light duty gasoline trucks in the LDGT1 category. Taxis are counted as a category separate from autos and are usually treated as autos if they are a very small proportion of the traffic. The mixture of vehicular types is used to obtain composite emission factors from MOBILE6.2.

CO emission factors for 2022 were obtained from EPA's MOBILE6.2 model. The ambient temperature used in the model was 43°F, as recommended by the NYCDEP. Inputs pertaining to inspection/maintenance, anti-tampering programs, etc., were obtained from NYCDEP's most recent guidelines (March 2008). The resulting MOBILE6.2 emission factors for each vehicular type were

multiplied by the percentages for each vehicular mix to calculate the composite emission factors, by speed, for use in the CAL3QHC model.

CAL3QHC was used to determine CO concentrations. CAL3QHC is a Gaussian dispersion model that determines pollutant concentrations at specified receptor points. It accounts for CO from both free-flowing vehicles and vehicles idling at signalized intersections. Inputs to the model include Cartesian coordinates for receptors, free-flow approach and departure links, and the approach links for queued vehicles at intersections. Peak hour traffic volumes, signal cycle information, composite vehicular emission factors, and adjusted saturation flow rate are also input into the model.

In CAL3QHC, free-flowing traffic links are set up separately from the intersection queue links. Free-flow links were modeled for a distance for 1,000 feet from the intersection in each direction. The mixing zone for free-flow links was equal to the width of the traveled way plus an additional 10 feet (3 meters) on each side of the roadway. For queue links, the mixing zone was limited to the width of the traveled way. CAL3QHC calculates the length of the queue links.

Sensitive receptors are homes, parks, schools, or other land uses where people congregate and which would be sensitive to air quality impacts. For the purposes of the air quality analysis, any point to which the public has continuous access can be deemed a sensitive receptor site. Numerous receptor points are typically modeled at each intersection to identify the point exposed to the maximum potential CO concentration. To analyze CO levels, receptor points were modeled on the corners of the intersection, and additional points were modeled at 20-foot intervals for a distance of 100 feet along both sides of each intersection leg. Receptors were placed at mid-sidewalk outside the air quality mixing zone.

Typical worst-case meteorological conditions were used with CAL3QHC. These included a mixing layer height of 1,000 meters, a wind speed of 1 meter per second, and an atmospheric stability class of D (neutral stability). Settling and deposition velocities were assumed to be 0 cm/s. Each computer run covered wind angles form 0 to 360 degrees and identified the worst-case wind angle for each receptor point. A surface roughness of 321 cm, representing central business district land uses, was used in the modeling.

To obtain 8-hour concentrations, the modeled CO values were multiplied by a persistence factor of 0.70, and then added to the 8-hour background values to determine total CO concentrations during that period. The same worst-case wind angle would apply to both the 1-hour and 8-hour averaging periods. Only the 8-hour CO concentrations are presented in the report. If no violation of the 8-hour standard occurs, no violation of the 1-hour CO standard is likely.

Mobile source modeling of CO concentrations accounts solely for emissions from vehicles on modeled streets, but not for overall pollutant levels. Therefore, background CO concentrations were added to modeling results to obtain total CO concentrations at a given receptor site.

$PM_{2.5}$ Screen

The screening analysis in the 2010 *CEQR Technical Manual* for potential $PM_{2.5}$ impacts is based on exhaust emissions from heavy duty diesel-powered vehicles. A more detailed analysis is required if a proposed action would add vehicular emissions equivalent to the following volumes of heavy duty diesel vehicles (HDDVs):

- 12 or more HDDV for paved roads with fewer than 5,000 vehicles per day;
- 19 or more HDDV for collector-type roads;
- 23 or more HDDV for principal and minor arterial roads; and
- 23 or more HDDV for expressways and limited-access roads.

The Proposed Action would generate passenger vehicles (autos and SUVs). Additional trucks generated during peak traffic periods would be minimal, and all intersections would experience a net decrease in trucks under Action Conditions because industrial land uses would be redeveloped with residential uses.

A $PM_{2.5}$ screening analysis was conducted using the spreadsheet on page 17-10 of the *CEQR Technical Manual*. The algorithm uses traffic volume according to vehicular class and determines the equivalent number of HDDVs by type of road. Passenger cars were assumed to represent 74% autos and 24% SUVs based on classification counts conducted for the traffic study. No information was available on the types of trucks that would be eliminated with the new development. Therefore, the trucks to be eliminated were assumed to be medium trucks in the HDGV5 category.

Table N-4 shows the results of the $PM_{2.5}$ screen for the highest project-generated increment at each of the 20 intersections. Based on guidance from NYCDEP, the minor leg of an intersection determines its classification as a local road, collector, arterial, or expressway. As shown in Table N-4, 16 of the 20 intersections would fail the $PM_{2.5}$ screen during at least one peak traffic period.

The intersection with the greatest number of HDDV equivalents is West Farms Road at Rodman Place. Because Rodman Place is a local road, the increase of 240 passenger cars coupled with a decrease of 13 medium trucks is equivalent to the $PM_{2.5}$ emissions of an additional 108 heavy duty diesel trucks. However, this is an unsignalized intersection, and unsignalized intersections are not modeled because the traffic volume on the main roadway flows freely and idling vehicles are limited to the much smaller volume on the minor roadway. The signalized intersection with the greatest HDDV equivalent is Boone Avenue at E. 174th Street with 70 HDDV equivalents. This intersection therefore warrants modeling of PM_{10} and $PM_{2.5}$.

As stated previously, minor changes to traffic volumes occurred between the DEIS and the FEIS. However, they were not sufficient to change the selection of worst-case intersections or the modeled results for CAL3QHCR.

PM_{10} and $PM_{2.5}$ Roadway Modeling

For modeling PM_{10} and $PM_{2.5}$, emission factors obtained from MOBILE6.2 were used in conjunction with the CAL3QHC model to determine worst-case pollutant concentrations at sensitive receptor points. In contrast to CO emissions, speed, ambient temperature and the thermal states of vehicular engines do not affect the emissions of fine particulates. Model parameters included a surface roughness of 321, a mixing height of 1,000 feet, and stability class 4. Fugitive dust emissions were included in the $PM_{2.5}$ and PM_{10} emission factors on public roadways in accordance with NYCDEP guidelines and EPA formulas. CAL3QHC modeling was carried out for the No Action and Proposed Action Alternatives. Based on guidance in the CEQR *Technical Manual* and from NYCDEP, the resulting 1-hour concentrations were converted to 24-hour concentrations using a persistence factor of 0.4 and to annual values using a persistence factor of 0.08. Background values were added to PM_{10} to determine total concentrations. For $PM_{2.5}$, the difference between No Action and Proposed Action Alternatives was compared with the City's Interim Guidelines.

Parking Facilities

Parking facilities include fully enclosed garages, partially enclosed decks, and open lots. On-street parking typically is not analyzed.

Table N-4: $PM_{2.5}$ **Screening Analysis**

Intersection	Maximum Trips Added				Road Class*	HDDV Equiva-lent	Result
	Period	Autos	Trucks	Total			
East Tremont Ave at East 177th Street	AM	277	-12	265	C	51	Fail
West Farms Road at Boston Rd, East Tremont Ave	AM	293	-12	281	P	10	Pass
West Farms Road at Rodman Place	AM	240	-13	227	L	108	Fail**
E. 177th Street @ E. 177th Street	AM	271	-12	259	C	49	Fail
West Farms Road at Cross Bronx Expressway North Service Rd	AM	211	-13	198	L	94	Fail**
Bronx River Ave at East 174th Street	PM	127	-4	123	P	5	Pass
Boone Ave at East 174th Street	PM	156	-8	148	L	70	Fail
Longfellow Ave at East 174th Street	PM	61	-2	59	L	28	Fail
West Farms Road at East 173rd Street	AM	231	-14	217	L	103	Fail**
Boone Ave at East 173rd Street	PM	109	-9	100	L	47	Fail
Longfellow Ave at East 173rd Street	PM	61	-2	59	L	28	Fail
West Farms Road at East 172nd Street	PM	164	-10	154	C	29	Fail
Boone Ave at East 172nd Street	PM	49	-6	43	L	20	Fail
West Farms Road at Jennings Street	PM	131	-5	126	L	60	Fail
West Farms Road at Boone Ave	PM	131	-5	126	P	4	Pass
Boone Ave at Freeman Street, Sheridan Expressway Ramp	PM	56	-2	54	L	26	Fail
Westchester Ave at Boone Street, Home Street	PM	106	-4	102	L	49	Fail
West Farms Road at Home Street, Longfellow Ave	PM	104	-4	100	L	48	Fail
West Farms Road at Freeman Street	PM	129	-5	124	L	59	Fail
Westchester Ave. at Sheridan Expressway Ramp	PM	52	-2	50	P	2	Pass

**L= local roads with <5,000 vehicles per day; C=collector roads, P=principal and minor arterials; E=expressways and limited access highways. ** Indicates unsignalized intersection*
Source: Sandstone Environmental Associates, Inc. and Stantec Consulting (April 24,2011)

Conditions for Further Analysis

According to the *CEQR Technical Manual*, conditions that may require further analysis include:

- Projects that would result in new sensitive uses (particularly schools, hospitals, parks, and residences) adjacent to large existing parking facilities or parking garage exhaust vents, and
- Projects that would result in parking facilities or applications to the City Planning Commission requesting the grant of a special permit or authorization for parking facilities should consult the lead agency regarding whether an air quality analysis of parking facilities is necessary.

Approach

The largest garage, the one serving Buildings 1a and 1b on Site 1, was selected for analysis for CO impacts. If this prototypical analysis shows no potential for CO impacts, then no impacts are likely for smaller garages.

Method of Analysis

The garage analysis was based on the guidelines provided in the 2010 *CEQR Technical Manual*. Per guidance from NYCDEP, a persistence factor of 0.70 was used to convert 1-hour CO values to 8-hour CO values. EPA's MOBILE6.2 emissions model was used to obtain emission factors for hot (entering) and cold (exiting) vehicles as well as idling vehicles. Passenger vehicles were divided into 76% autos and 24% SUVs for the purposes of obtaining a composite emission factor. Exiting vehicles were assumed to idle for one minute before departing, and speeds within the facility were 5 mph. As stated previously, the 8-hour background value for 2022 is 2.5 ppm. This background value of 2.5 ppm was added to the concentrations calculated for the parking facilities. For ground-level receptors, the mobile source contribution from the free-flow traffic in front of the garage on East 172nd Street also was added.

Stationary Sources

Sources of pollutants that are fixed in a given location, rather than being mobile, are termed stationary sources. Stationary sources that may cause air quality impacts for a proposed action include:

- Exhaust from boiler stack(s) used for heating, ventilation and air conditioning (HVAC) systems of a large existing commercial or residential complex;
- The emissions of air toxics from a manufacturing or industrial operation;
- The stack emissions from a major industrial source such as a nearby power generating station; and
- The emissions from incinerators or medical or chemical laboratory vents.

A proposed action may cause significant air quality impacts if it creates new HVAC sources that affect the air quality in the surrounding community. Proposed buildings also may cause stationary source impacts by changing the building geometry or topography of an area so that existing fixed facilities begin to adversely affect other existing structures in the area. Stationary source impacts may also result when a proposed action introduces new uses that would be affected by emissions from existing fixed facilities, such as locating a new residential building beside an existing power generating station. In addition, the emissions of the proposed new buildings may cause impacts to each other (project-on-project impacts) if they are in close proximity.

Criteria for Further Analysis

According to the *CEQR Technical Manual*, conditions that may require further analysis include:

- Projects that would use fossil fuels (fuel oil or natural gas) for heating/hot water, ventilation, and air conditioning systems,
- Projects that would create large emission sources, including but not limited to solid waste or medical waste incinerators, cogeneration facilities, asphalt and concrete plants, or power generating plants,
- Projects that would result in new uses (particularly schools, hospitals, parks, and residences) located near a large emission source, and

- Projects that would result in new uses within 400 feet of a stack associated with commercial, institutional, or residential developments, and the height of the new structures would be similar to or greater than the height of the emission stack.

The project would not create a new source of odors. However, a field survey and evaluation were carried out to determine whether it would place new residential or community facility uses in proximity to an existing facility that generates odors.

Pollutants and sources of interest included:

- Sulfur dioxide (SO_2), and nitrogen dioxide (NO_2) from fuel combustion at existing major sources;
- Sulfur dioxide (SO_2), and nitrogen dioxide (NO_2) from fuel combustion in boilers in future buildings; and
- Air toxics and odors from existing industrial uses in the area.

Approach

As a first step, the *CEQR Technical Manual* recommends a screening analysis to evaluate the potential for air quality impacts. This analysis uses a nomographic procedure based on the square footage of a building and the distance between the boiler stack and the nearest building of similar or greater height. It is appropriate when the emission stack and the edge of the building are at least 30 feet apart. If the proposed development passes this screen, then no further analysis is required. If the procedure indicates potential for impacts, or if analysis of cumulative impacts from multiple stacks and distances is desired, then the more refined Industrial Source Screen may be used, again providing that a building is at least 30 feet from the emissions stack. If this procedure indicates potential for impacts, then detailed modeling with AERMOD and five years of meteorological data would be required. The potential for odors was addressed in a qualitative manner.

Emission Factors

As a worst case analysis, all square footage except for parking facilities was assumed to be residential. Indoor parking areas, which are not heated, were not included in the HVAC analysis. Emission factors were developed for fuel combustion using both oil and natural gas. Heating use was assumed for 24 hours per day, 100 days per year, equaling 2,400 hours per year. For #2 fuel oil, the SO_2 emission factor used a sulfur content of 0.2%, consumption of 0.38 gallons/sq. ft., and an emission factor of 142 lbs/1,000 gallons. Gallons of fuel consumed were converted to pounds of SO_2 using a conversion rate of 28.4 lbs/1,000 gallons of fuel.

Emission factors for natural gas were based on an annual consumption rate of 52.8 cubic feet of natural gas per square foot for a residential structure, as indicated in the NYC *CEQR Technical Manual.* The annual consumption of natural gas, in cubic feet, was converted to pounds using a multiplier of 100 as recommended in Table 1.4-1 of EPA's AP-42 publication for external combustion sources. The resulting annual emissions for both oil and gas were converted to emission rates in grams/second based on 2,400 hours per year of use for heating.

AERMOD Modeling

The air quality analysis for potential stationary source (project-on-project) impacts due to future HVAC operations was carried out using EPA's AERMOD model. The pollutants included stack emissions (point sources) of SO_2 for fuel oil #2 and NO_x for natural gas. Model parameters were obtained from the NYC *CEQR Technical Manual* and the NYC Department of City Planning.

Pollutants

AERMOD was run for 24-hour concentrations of SO2 and annual concentrations of NOx.

Model Parameters

AERMOD was run using the regulatory default option, stack tip downwash, no building downwash, and a 4-hour half-life for SO2. Initially, the model was run both with and without building downwash for selected receptors to determine which method produced the highest concentrations at elevated receptor points. Using building downwash generally produces higher concentrations for receptors at ground level whereas modeling without building downwash generally produces higher concentrations for receptors at elevated locations close to the stack height. This was verified by the selected modeling runs.

Building Downwash

EPA defines GEP (good engineering practice) stack height as the height necessary to ensure that emissions from a building's stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of atmospheric downwash, eddies, or wakes that may be created by the source itself, nearby structures, or nearby terrain obstacles. The Building Profile Input Program (BPIP) was run prior to running AERMOD where this was applicable.

Urban/Rural

Both the weather station providing meteorological data and the site are in urban locations, and AERMOD's URBAN option was selected. The population used for the urban area is 1,700,000, and the default urban surface roughness length of 1.0 m was used for the site.

Stack Parameters

Based on information from the architects, HVAC stacks on Sites 1, 2S, and 2N were assumed to be 7 feet higher than the mechanical penthouses on the rooftops. Stacks on all other buildings were assumed to be 3 feet higher than the rooftop. Per guidance from the NYC Department of City Planning the stack parameters that were developed using the NYCDEP "CA[1] Permit" database and the heat input (in million BTUs) of the heating systems were used. They included an exhaust temperature of 300^{o} F, inside stack diameters of 0.5 or 1 foot, and exhaust velocities of 3.9 or 5.8 m/s, depending on the boiler capacity.

For projected and potential development sites, stacks were initially placed 10 feet from the edge of the rooftop closest to the nearest building. They were moved back in increments of 10 feet if the initial location resulted in potential impacts. For existing buildings, such as the Department of Sanitation garage, the modeling was based on observed stack locations.

Meteorology Data

AERMOD was run with five years of meteorological data from LaGuardia Airport in Queens. The data that included surface mixing height, wind speed, stability class, temperature, and wind direction for 2005 through 2009. The upper air station used with La Guardia is Brookhaven.

Sensitive Receptors

Sensitive receptor points were modeled at elevated locations similar to the stack heights. Where the receiving building was higher than the source building, the receptors were placed on exterior walls facing the source and at the same elevation as the stack height. Where the source and receptor buildings were the same height, the receptors were placed at the edge of the building's rooftop one foot higher than the stack height. Receptors on the receptor building were placed across the roof or façade at 10-foot intervals.

Modeling Scenarios

AERMOD was run separately for SO_2 and NO_x with stacks placed in worst-case locations. The runs included individual buildings as sources and clusters of buildings as sources. To run a cluster analysis, the

[1] CA refers to Combustion Applicable

square footages of the buildings comprising the cluster were summed to determine the combined emission factor, and a single stack was placed in the middle of the collective building footprint.

Industrial Sources

Stationary industrial sources are those that produce emissions of non-criteria pollutants. Establishments may include auto body paint shops, iron works, furniture repair and finishing, print shops, and a variety of manufacturing establishments.

Criteria for Further Analysis

According to the *CEQR Technical Manual*, conditions that would result in potential significant adverse impacts related to industrial sources include:

- Projects that would include medical, chemical, or research labs,
- Projects that would result in new uses being located near medical, chemical, or research labs,
- Projects that would include operation of manufacturing or processing facilities,
- Projects that would result in new uses (such as residences, schools, hospitals, parks, etc.) within 400 feet of manufacturing or processing facilities,
- Projects that would result in potentially significant odors,
- Projects that would result in new uses near an odor-producing facility,
- Projects that would create non-point sources, such as unpaved surfaces and storage piles that could result in what is knows as fugitive dust, and
- Projects that would result in new uses near non-point sources.

Development under the future alternatives would not be a source of emissions associated with the uses listed above. However, due to the industrial nature of the uses within and around the rezoning area, new residential or school uses could be within 400 feet of manufacturing or processing facilities as well as uses that produce significant odors.

Approach

Personnel field-checked the establishments within the rezoning area and within 400 feet of the rezoning area for industrial uses. In addition, a list of addresses with industrial uses was sent to NYCDEP to determine whether they had operational permits. This included businesses observed in the field (e.g., auto painting establishments) that would be expected to have permits. Establishments located on projected or potential development sites, and therefore expected to be redeveloped, were not included in the analysis of industrial sources. Copies of permits received from NYCDEP were first analyzed using the Industrial Source Screen. If the Industrial Source Screen showed potential for impacts, they were further analyzed using EPA's AERMOD model.

Industrial Source Screen

The *CEQR Technical Manual* provides a table showing pollutant concentrations ($\mu g/m^3$), at various distances, resulting from a source emitting 1 g/s of a generic pollutant. It assumes that all inputs represent worst-case conditions for stack temperature, exhaust velocity, and other variables. Both the receptor height and stack height are assumed to be 20 feet high. Table N-5 shows the generic table from the 2010 *CEQR Technical Manual.* The emission rates in lbs/hour and lbs/year from the permits are converted to grams/second and then multiplied by their corresponding generic concentrations in the table based on the distances between the source and the receptor.

Table N-5: Generic Pollutant Concentrations for Industrial Source Screen

Generic Pollutant Concentrations (1 g/s emission rate)				
Distance from Source (ft)	Averaging Periods ($\mu g/m^3$)			
	1 Hour	8-Hours	24 Hours	Annual
30	137,169	70,848	40,031	6,020
65	29,719	16,528	9,194	1,336
100	12,729	7,561	4,151	583
130	7,689	4,764	2,590	356
165	4,865	3,136	1,688	228
200	3,370	2,252	1,201	159
230	2,622	1,779	942	123
265	2,113	1,402	736	95
300	1,754	1,144	595	76
330	1,520	978	505	64
365	1,308	832	426	54
400	1,144	720	365	46

Source: NYC CEQR Technical Manual (2010).

EXISTING CONDITIONS

Two neighborhoods encompass the study area. Crotona Park East and West Farms are adjacent mixed-use neighborhoods separated from one another by the Cross Bronx Expressway. They are developed with multi-unit apartment houses and townhouses, public housing projects, light-industrial facilities, auto body shops, and garages. Vacant lots are also common. Two highways, the Cross Bronx Expressway (Interstate 95) and the Sheridan Expressway (Interstate 895), occupy significant portions of the nearby area.

The proposed rezoning area contains 70 tax lots. The current development pattern consists of a mix of warehouses, garages, automotive repair facilities, light manufacturing, a meat packing plant, a tow pound, a laundromat, a hotel, schools, a playground, residential buildings, and vacant buildings.

FUTURE CONDITIONS WITHOUT THE PROPOSED ACTION

Projected Development

In the absence of the Proposed Action, the current development scale and mixture of land uses would remain, and no significant new development is anticipated with the exception of Block 3016, Lot 42, at the northern end of the rezoning area. Currently, it is developed with a 15,000 sf hotel and a vacant lot. Anticipated development on Lot 42 without the Proposed Action would include 140 dwelling units and 38,928 sf of commercial space in a seven-story building.

Mobile Sources

Two intersections were modeled for carbon monoxide based on the methodology described previously. Table N-6 shows the results of the CO modeling under 2022 No Action Conditions for the two modeled

intersections for the peak AM period. Only the worst case receptor point is shown in the table. For the West Farms Road / Boston Road / East Tremont Avenue intersection, the receptor location exhibiting the highest CO concentration would be on the westbound lanes 100 feet east of the intersection. The modeled 1-hour concentration of 2.1 ppm is equivalent to an 8-hour concentration of 1.5 ppm when the 0.70 persistence factor is applied. When added to the 8-hour background value of 2.5 ppm, the worst-case 8-hour CO concentration under No Action Conditions is 4.0 ppm. This is within the 8-hour CO NAAQS of 9 ppm.

For the intersection of E. 177th Street and the Sheridan Expressway ramp, the worst-case receptor location was on the southbound lanes, 40 feet north of the intersection. It had a 1-hour modeled concentration of 2.6 ppm, equivalent to an 8-hour concentration of 1.8 ppm. The total concentration of 4.3 ppm is within the NAAQS of 9 ppm.

Table N-6: Eight-Hour Mobile Source CO (ppm), No Action Conditions

2022 No Action Conditions	
Receptor for West Farms/Boston Roads: R27, 80 ft. east of intersection on WB lane	
Wind angle	111°
Modeled CO	1.5
Background CO	2.5
Total CO	4.0
Receptor for E. 177th Street/Sheridan Expy Ramp: R18, 40 ft. north of intersection on SB lanes	
Wind angle	111°
Modeled CO	1.8
Background CO	2.5
Total CO	4.3

Source: Sandstone Environmental Associates, Inc.

The intersection of Boone Avenue and E. 174th Street was intersection was modeled for PM_{10} and $PM_{2.5}$ using CAL3QHC with worst-case meteorological parameters. The resulting on-hour concentrations were converted to 24-hour concentrations using a persistence factor of 0.4 and to an annual concentration using a persistence factor of 0.08. As shown in Table N-7, the total PM_{10} concentration of 74.8 ug/m^3 is within the NAAQS of 150 ug/m^3. The value shown is the highest predicted concentration for all locations analyzed and includes the ambient background concentrations.

Table N-7: No-Action PM_{10}Concentrations at E. 174th St./Boone Avenue (ug/m^3)

Location	24-Hour PM_{10} (µg/m^3)
E. 174th Street / Boone Avenue	74.8
Note: National Ambient Air Quality Standards – 24-hour, 150 µg/m^3.	

Source: Sandstone Environmental Associates, Inc.

CAL3QHC and CAL3QHCR modeling of PM_{10} and $PM_{2.5}$ were also carried out for a segment of the Cross Bronx Expressway using traffic counts from NYCDOT and the traffic mix from NYSDOT for this region and roadway type. The elevated highway is approximately 20 feet above grade, and receptor points

were placed at the equivalent height for the proposed buildings that would be adjacent to it in 2022. Table N-8 shows the results. PM_{10} was modeled with CAL3QHC, and the one-hour result (16 ug/m^3) was multiplied by a persistence factor of 0.4 to obtain the 24-hour value (6.4 ug/m^3). This is a worst-case approach as CAL3QHC is a more conservative model than CAL3QHCR. No violations of the NAAQS are projected for PM_{10}. The value shown is the highest predicted concentration for all locations analyzed and includes the ambient background concentration.

Table N-8: No Action Conditions, PM_{10} at Cross Bronx Expressway (ug/m^3)

Location	24-Hour PM_{10} (ug/m^3)
Cross Bronx Expressway	70.4
Note: National Ambient Air Quality Standards – 24-hour, 150 µg/m^3.	

Source: Sandstone Environmental Associates, Inc.

Parking Facilities

Under the No Action scenario, no major parking facilities would be constructed. Trucks and passenger vehicles would park in small lots, driveways, or on the street as at present.

Stationary HVAC Sources

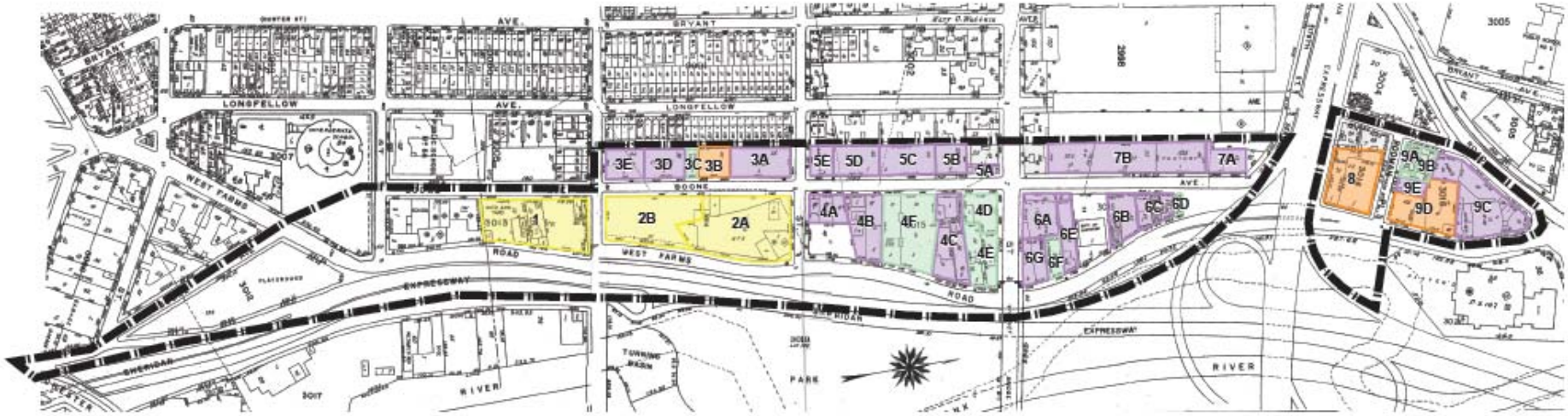
The potential redevelopment of Lot 42 on Block 3016, with 133,912 sq ft. of residential uses and 38,928 sq. ft. of commercial space, would be seven stories high and would be taller than surrounding buildings. No further analysis of this site is required for No Action Conditions because the development would be as-of-right.

FUTURE CONDITIONS WITH THE PROPOSED ACTION

Development Scenario

The Proposed Action would result in a substantial increase in residential, commercial, and community facility space within the rezoning area. The anticipated development would add 2,635 housing units, 93,000 square feet of commercial space, a child care center, and an outdoor children's playground. The projected and potential development sites are shown in Figure N-2.

Figure N-2: Delineation of Projected and Potential Development Sites



CROTONA PARK EAST / WEST FARMS ZONING MAP AMENDMENT

Bronx, New York

Mobile Sources

CO modeling was carried out for 2022 Action Conditions. Table N-9 shows the results for the two intersections that were analyzed. For the intersection of Boston Road / West Farms Road / East Tremont Avenue, the worst case CO concentration is 2.1 ppm for the one-hour period or 1.5 ppm for the 8-hour period. This occurred at on the westbound East Tremont Avenue lanes 80 feet east of the intersection. The total CO concentration of 4.0 ppm is within the NAAQS of 9 ppm for the 8-hour period. No exceedances of the NYC *de minimis* values would occur.

For the intersection of E. 177th Street and the Sheridan Expressway Ramp, the 1-hour modeled CO concentration of 2.7 ppm is equivalent to an 8-hour concentration of 1.9 ppm and a total concentration of 4.4 ppm. This is within the NAAQS and NYC *de minimis* criteria.

Table N-9: Eight-Hour Mobile Source CO Concentrations (ppm), Action Conditions

2022 No Action Conditions		**2022 Action Conditions**		**Difference (Action-No Action)**
Receptor for Boston/West Farms Road: R27, 80 ft. east of intersection on WB lanes		Receptor for Boston/West Farms Road: R27, 80 ft. east of intersection on WB lanes		
Wind angle	111°	Wind angle	118°	
Modeled CO	1.5	Modeled CO	1.5	
Background CO	2.5	Background CO	2.5	
Total CO	4.0	Total CO	4.0	0.0 ppm
Receptor for E.177th St/Sheridan Expressway Ramp: R18, 40 ft. north of intersection on SB lanes		Receptor for E.177th St/Sheridan Expressway Ramp: R18, 100 ft. north of intersection on SB lanes		
Wind angle	111°	Wind angle		
Modeled CO	1.8	Modeled CO	1.9	
Background CO	2.5	Background CO	2.5	
Total CO	4.3	Total CO	4.4	0.1 ppm

Source: Sandstone Environmental Associates, Inc.

Tables N-10 and N-11 show the results of the PM_{10} and $PM_{2.5}$ modeling with CAL3QHC for the two intersections modeled under Action conditions. The values shown are the highest predicted concentrations for all locations analyzed and include the ambient background concentrations. The PM_{10} values are within the NAAQS of 150 ug/m^3, and the $PM_{2.5}$ concentrations are within the NYCDEP interim guidelines. The guidelines are an increment of 2.0 ug/m^3 for the peak 24-hour period and 0.3 ug/m^3 for the annual period.

Table N-10: Action Conditions, PM10 at E. 174th St./Boone Avenue (ug/m^3)

Location	**24-Hour PM_{10} (µg/m^3)**	
	No Action	**Action**
E. 174th St. /Boone Ave.	74.8	77.2
Note: National Ambient Air Quality Standards – 24-hour, 150 µg/m^3.		

Source: Sandstone Environmental Associates, Inc.

Table N-11: Action Conditions, PM2.5 at E. 174th St./Boone Avenue (ug/m^3)

Location	24-Hour $PM_{2.5}$ (µg/m^3)		
	No Action	Action	Difference
E. 174th St. /Boone Ave.	2.8	3.6	0.8
Note: NYCDEP .Interim Guideline Values – Increment of 2 ug/m^3			
Location	**Annual $PM_{2.5}$ (µg/m^3)**		
	No Action	**Action**	**Difference**
E. 174th St. /Boone Ave.	0.6	0.7	0.1
Note: NYCDEP .Interim Guideline Values – Increment of 0.3 ug/m^3			

Source: Sandstone Environmental Associates, Inc.

CAL3QHC and CAL3QHCR modeling of PM_{10} and $PM_{2.5}$ were also carried out for the Cross Bronx Expressway based on the additional traffic added by the proposed action. Tables N-12 and N-13 show the results. No violations of the NAAQS are projected for PM_{10}, which was modeled with CAL3QHC. The results are the same as for No Action Conditions. For PM 2.5, the highest 24-hour concentration again occurred in 2005, and the increment of 0.01 ug/m^3 would not constitute an impact. The worst-case annual concentration again occurred in 2007. The increment of 0.01 ug/m3 would not exceed the interim guideline of 0.3 ug/m^3.

Table N-12: Action Conditions, PM10 at Cross Bronx Expressway (ug/m^3)

Location	24-Hour PM_{10} (µg/m^3)	
	No Action	Action
Cross Bronx Expressway	70.4	70.4
Note: National Ambient Air Quality Standards – 24-hour, 150 µg/m^3.		

Source: Sandstone Environmental Associates, Inc.

Table N-13: Action Conditions, PM2.5 at Cross Bronx Expressway (ug/m^3)

Location	24-Hour $PM_{2.5}$ (µg/m^3)		
	No Action	Action	Difference
Cross Bronx Expressway	1.78	1.79	0.01
Note: NYCDEP Interim Guideline Value – 2.0 ug/m^3.			
Location	**Annual $PM_{2.5}$ (µg/m^3)**		
	No Action	**Action**	**Difference**
Cross Bronx Expressway	0.58	0.59	0.01
Note: NYCDEP Interim Guideline Value – 0.3 ug/m^3.			

Source: Sandstone Environmental Associates, Inc.

Parking Facilities

No information is available on future parking facilities for the potential or the projected development sites that are not under the applicant's control. Therefore, this section focuses on the applicant's planned development. Four of the applicant's six buildings would have a parking facility as shown in Table N-14. The largest one would be in the combined facility in Buildings 1a and 1b on Block 3013. It would total 49,400 sq. ft. and would have 130 spaces on two below-grade levels. Lower Level 2 would be accessible from E. 172nd Street, while Lower Level 1 would be accessible from West Farms Road. This facility was analyzed for CO as the worst case scenario.

Table N-14: Proposed Parking Facilities

Location		Parking Spaces	Square Feet of Parking			
Block	Bldg #		Ground Level	Lower Level 1	Lower Level 2	Total
3013	1a, 1b	130		24,780	24,620	49,400
3014-S	2	0	0	0	0	0
3014-N	3	81	8,280	12,005	24,620	44,905
3009	4	12	0	0	0	0
3016-S	5	50	17,633	0	0	17,633
3016-N	6	58	15,080	0	0	15,080
Grand Total						**102,238**

Source: Stantec Consulting, March 2010

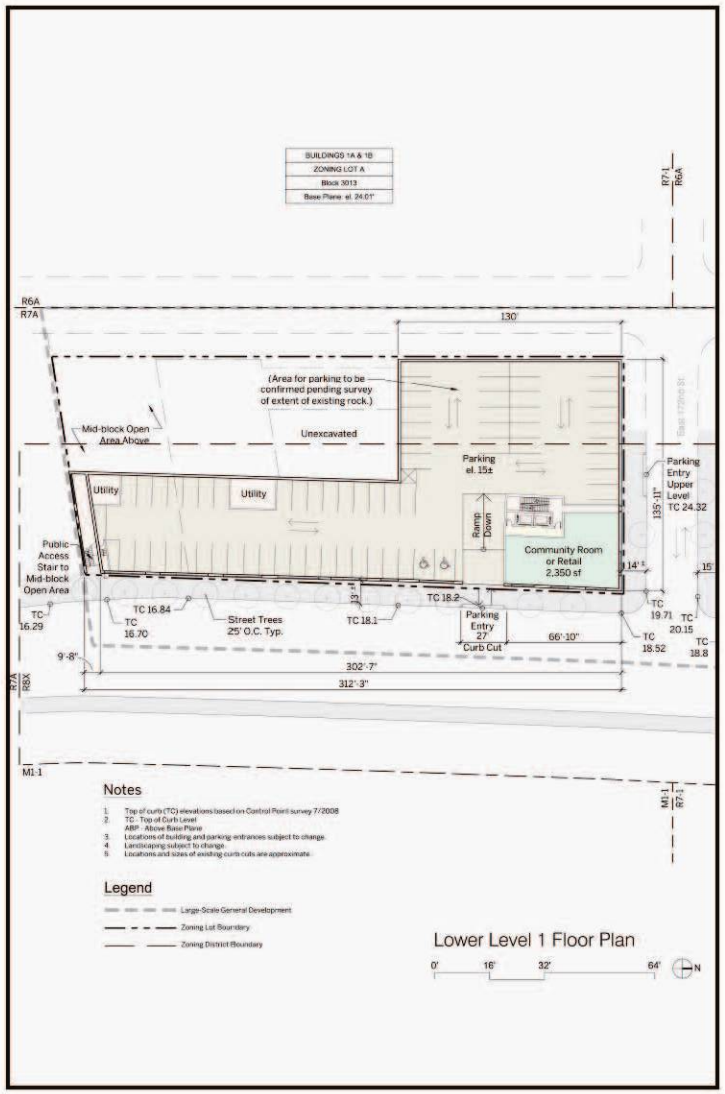
Figure N-3 shows the layout of the parking facility. As a worst case, all vehicles were assumed to enter and exit on E. 172nd Street. The garage has a capacity of 130 vehicles. The worst-case volumes for the garage would be an arrival of 130 vehicles and a departure of 130 vehicles (260 total vehicles) within a one-hour period. All vehicles were assumed to use the same entrance. An average ramp distance of 100 feet was added to the average vehicular travel distance. West Farms Road is 42 feet wide while E. 172nd Street is about 30 feet wide with 14- to 15-foot wide sidewalks. As a conservative analysis, the traffic

from West Farms Road was placed on the narrower roadway, E. 172nd Street, when modeling the line source contribution with CAL3QHC.

Two scenarios were considered. For the first one, receptor points were placed in the middle of the near sidewalk (7 feet from the building), the middle of the far sidewalk (52.5 feet away), the nearest receptor point above the garage exhaust, and a window across the street at the same elevation as exhaust vent (12 feet high, 60 feet away). The total worst case 8-hour concentration is 4.6 ppm for a window above the vent. The calculated concentrations for each receptor were added to the background value of 2.5 ppm and the worst case modeled concentration of 0.1 ppm for the peak traffic volume in front of the garage. Total 8-hour CO concentrations from the garage would range from 0.6 ppm to 1.6 ppm, as shown in Table N-17. The worst-case total concentration, after adding in the background and line source contributions, would be 4.2 ppm, which would occur at a window six feet above the garage vent.

For the second scenario, the garage's vent was located in the courtyard. One sensitive receptor was positioned at a point representing a courtyard bench. The vent would be 7 feet high along the courtyard wall, a bench would be 5 feet away from the wall, and the vent would be placed 3 feet higher than the bench's position. When added to both the background value of 2.5 ppm and the line source value of 0.1 ppm, the total 8-hour CO concentration for this bench location would be 4.4 ppm. This value is below the NAAQS of 9 ppm and the NYCDEP de minimis criteria. Therefore, no impacts from the parking facilities for this alternative scenario are projected.

Table N-15 shows the calculations for the garage air quality. The values at the worst-case receptor points are below the NAAQS of 9 ppm and the NYCDEP de minimis criteria. Therefore, no impacts from other, smaller parking facilities are projected.


BUILDINGS 1A & 1B
ZONING LOT A
Block 3013
Base Plane: el. 24.01'
R7-1
R6A
R6A
R7A
130'
(Area for parking to be confirmed pending survey of extent of existing rock.)
Mid-block Open Area Above
Unexcavated
Parking el. 15±
Utility
Utility
Ramp Down
Parking Entry Upper Level TC 24.32
139'-11"
Community Room or Retail 2,350 sf
14'-5"
15'
Public Access Stair to Mid-block Open Area
TC 16.29
TC 16.84
TC 16.70
Street Trees 25' O.C. Typ.
TC 18.1
TC 18.2
Parking Entry 27' Curb Cut
66'-10"
TC 19.71
TC 18.52
TC 20.15
TC 18.8
9'-8"
302'-7"
312'-3"
R7A
R8X
M1-1
M1-1
R7-1
Notes
1. Top of curb (TC) elevations based on Control Point survey 7/2008
2. TC - Top of Curb Level
ABP - Above Base Plane
3. Locations of building and parking entrances subject to change.
4. Landscaping subject to change.
5. Locations and sizes of existing curb cuts are approximate.
Legend
Large-Scale General Development
Zoning Lot Boundary
Zoning District Boundary
Lower Level 1 Floor Plan
0'
16'
32'
64'
N

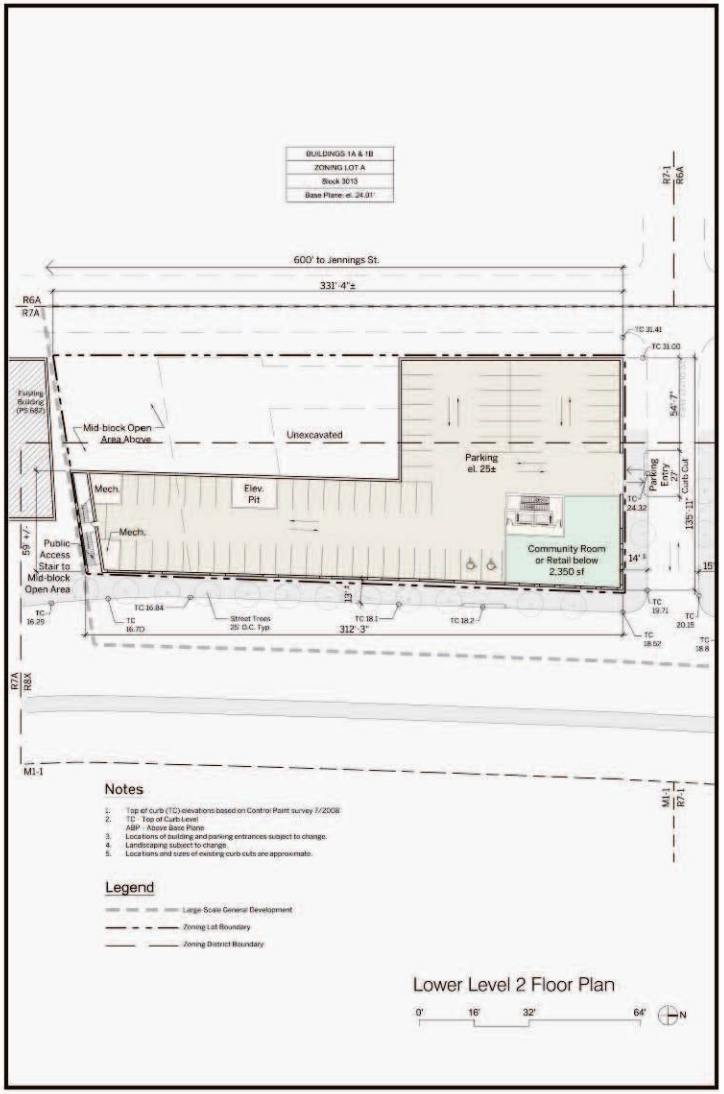

BUILDINGS 1A & 1B
ZONING LOT A
Block 3013
Base Plane: el. 24.01'
R7-1
R6A
600' to Jennings St.
331'-4"±
R6A
R7A
TC 31.41
TC 31.00
Existing Building (PS 682)
Mid-block Open Area Above
Unexcavated
Parking el. 25±
54'-7"
Parking Entry 27'
Curb Cut
135'-11"
Mech.
Elev. Pit
Mech.
TC 24.32
59'-4"
Public Access Stair to Mid-block Open Area
Community Room or Retail below 2,350 sf
14'-5"
15'
TC 16.29
TC 16.84
TC 16.70
Street Trees 25' O.C. Typ.
TC 18.1
TC 18.2
312'-3"
TC 19.71
TC 18.52
TC 20.15
TC 18.8
R7A
R8X
M1-1
M1-1
R7-1
Notes
1. Top of curb (TC) elevations based on Control Point survey 7/2008
2. TC - Top of Curb Level
ABP - Above Base Plane
3. Locations of building and parking entrances subject to change.
4. Landscaping subject to change.
5. Locations and sizes of existing curb cuts are approximate.
Legend
Large-Scale General Development
Zoning Lot Boundary
Zoning District Boundary
Lower Level 2 Floor Plan
0'
16'
32'
64'
N

Table N-15: CO Concentrations from Largest Garage

Building 1 Garage	
2022 Mobile 6.2 Emissions	
Cold idle (g/hr) @ 2.5 × 2.5 mph	47.9
Cold 5 mph	12.4
Hot 5 mph	8.8
Persistence Factor	0.7
Garage Data	
No. of vents	1
Vent elevation (ft)	12
Vent elevation (meters)	3.7
Total sq. ft. (unobstructed)	49,400
Average length (ft)	222
Average width (ft)	222
Average travel @ 2/3 (L + W) (ft)	296
Average total ramp distance (ft)	100
Total Travel Distance (ft)	396
Peak 1-Hour Trips	
In	130
Out	130
Total	260
8-Hour Garage CO Concentrations (ppm)	
Receptor on adjacent sidewalk, 7 feet from vent	1.5
Window 6 feet above vent	1.6
Window on far sidewalk, 52.5 feet from vent	0.6
Window across the street, 60 feet from vent	0.6
Courtyard bench	1.8
Highest Total Hour 8-CO Concentration (ppm)	
Courtyard bench	1.8
8-hour CO background	2.5
Line source contribution	0.1
Total 8-hour CO (ppm)	**4.4**

Source: Sandstone Environmental Associates, Inc.

Stationary HVAC Sources

Only existing boilers with at least 20 million BTU heating input, such as institutional facilities (i.e., schools), large shared commercial facilities (i.e., shopping centers), or large residential complexes would need to be analyzed for potential impacts to the Proposed Action. Stationary HVAC sources of this size would have state and local permits. Lists of draft and issued Title V facilities in the state and federal registries were searched for major sources within 1,000 feet of the rezoning boundaries. No power stations or other major air pollutant emitters with a Title V permit were identified within a 1,000-foot radius of the site. State air facility permits within 400 feet of the rezoning boundaries also were searched. One state facility permit was identified, and it is discussed further below. Figure N-4 shows the 400- and 1,000-foot radii.

Figure N-4: 400- and 1,000- foot Radii from Rezoning Boundaries

Note: Distances shown are approximate. Actual distances were measured on available maps and the industrial uses that fell within them are discussed in the text.

The Air State Facility permit was issued to the NYC Transit Authority for the NYCT West Farms Bus Depot at 1104 E. 177th Street (Block 3904, Lot 40). The facility operates two boilers that use #2 fuel oil, but they also can run on natural gas. Each boiler has the capacity for 12.55 million BTU per hour, resulting in a total heating input of about 25 million BTU. The one-story building is 28 feet high and has 174,731 sf. This building was not analyzed further because it is over 500 feet from the rezoning area boundaries. Figure N-5 shows its location.

Figure N-5: Locations of Boiler Permits with ≥ 20 million BTU

A permit search of NYCDEP files resulted in approximately 40 boiler permits, which are listed in Appendix 2. Of these, 37 were considered to be active or potentially active. Only one permit showed a gross BTU heating input of more than 20 million. It is the West Farms Square Plaza HDFC, a residential apartment complex owned by the New York City Housing Authority (NYCHA) at 990 - 1000 E. 178th Street and 1001-1005 E. Tremont Avenue (Block 3130, Lot 20). Figure N-5 shows the location. The residential complex has three 22-story buildings with a total of 228,404 sq. ft. Each building has its own boiler. The boilers burn #6 fuel oil as the primary fuel, but can also burn natural gas as a secondary fuel.

Together, the boilers have a heating input of 59.9 million BTU. The nearest boiler stack is about 285 feet from the rezoning area.

A screening analysis was carried out for this residential complex using Figure 17-1 from the air quality appendices in the *CEQR Technical Manual*. Figure 17-1 shows the potential for NO_2 impacts using #6 fuel oil for residential uses. As a worst case, all emissions were presumed to originate from the nearest boiler stack. Based on a square footage of 228,404 and a distance of 285 feet from the rezoning boundary, the site screens out. Therefore, no air quality impacts are projected for this housing complex, and no additional analysis is required.

The NYC Department of Sanitation has two garages within the rezoning area. One, located at 1787 Boone Avenue (Lot 58, Block 3015N), is used for vehicle storage for Bronx Enforcement Agents and some clerical functions. It does not carry out repairs or vehicular maintenance. The building is about 20 feet high and has 32,700 sq. ft. of space. Permits for the garage indicate it has a boiler using #2 fuel oil for 1,480 hours per year. The stack appears to be about nine feet from the southern edge of the lot and about 20 feet higher than the rooftop. AERMOD modeling of SO2 was carried out to determine potential impacts on Building 6E, which would be adjacent to it. The results showed no impacts.

The second garage is at 1661 West Farms Road (Block 3015, Lot 49). This facility is used for storage of mechanical brooms for street cleaning and some clerical functions. The building is one story high (22 feet) and has 15,500 square feet. No information on the boiler is available except that it is oil-fired. Based on the boiler at the DSNY garage on 1787 Boone Avenue, it was assumed to burn #2 fuel oil for 8 hours per day and 185 days per year. The closest future development site is Site 4A, which is about 70 feet west of the stack. Due to its smaller square footage, the emission factor is less than half of the one for 1787 Boone Avenue. Since no SO2 impacts were projected for the garage at 1787 Boone Avenue, none are anticipated for the one at 1661 West Farms Road, which has a lower emission factor and a greater distance from any future residential buildings.

Public School 214 (previously PS 167), located at 1044 E. Tremont Avenue (aka 1970 West Farms Road), is across the street from Block 3016 (and Site 9D in particular). Due to its size (185,888 sq. ft.) and distance of 110 feet from the project site, the school's boiler emissions were modeled with AERMOD. The school is two stories high and has three boilers that burn fuel oil #6 as their primary fuel. Modeling results showed no potential impacts on the future development Sites.

The Fannie Lou Hamer High School, is at 1001 Jennings Street (Block 3008, Lot 1). Its size (120,110 sq. ft.) and location within 225 feet of Site 1 warrant modeling with AERMOD. It has three boilers that burn fuel oil #6. No adverse impacts are from the school's boiler were identified from the modeling.

Impacts to the Surrounding Community

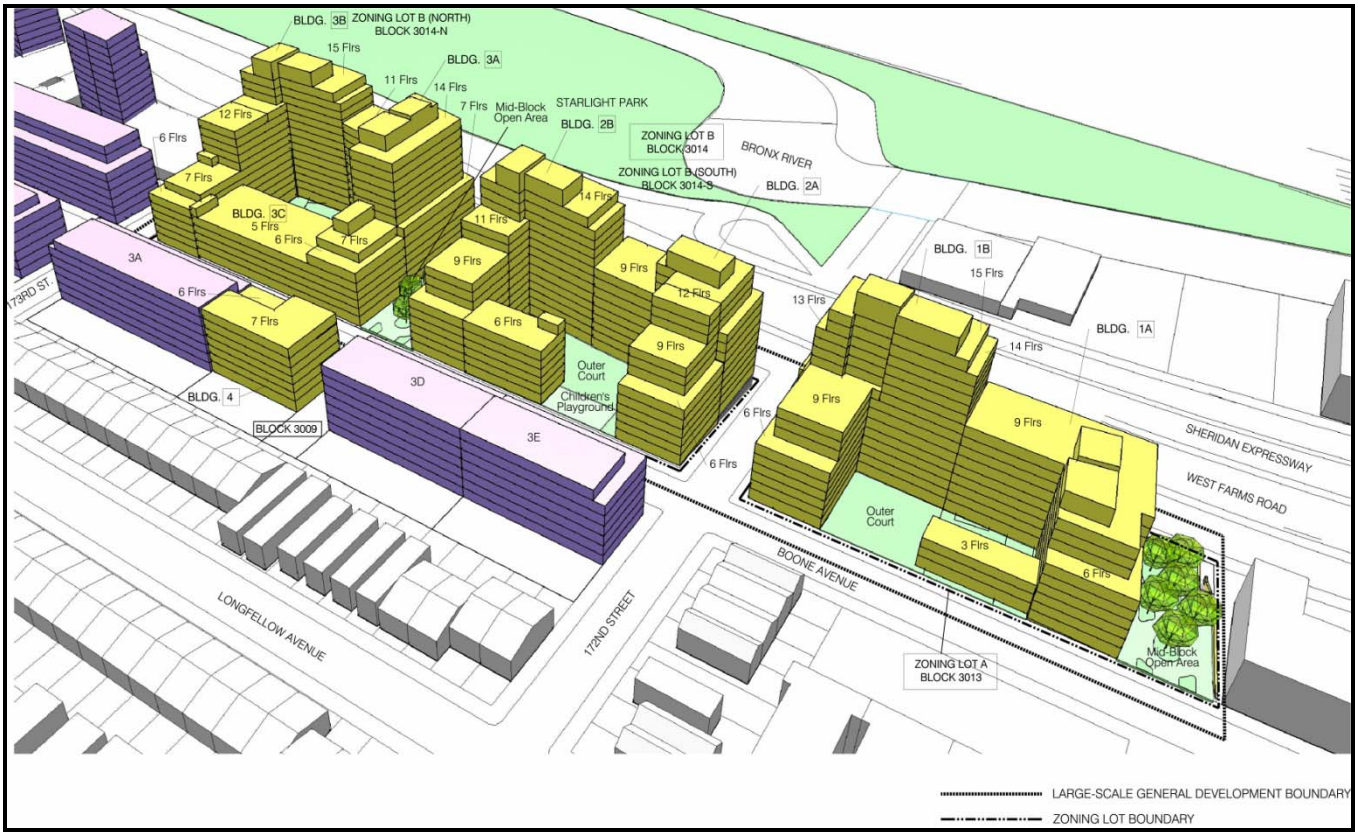
Block 3016 of the proposed development falls within 400 feet of an existing 22-story building located at 999 East Tremont Avenue. A screening analysis was carried out for this residential complex using Figure 17-5 from the air quality appendices in the *CEQR Technical Manual*. Figure 17-5 shows the potential for SO_2 impacts using #2 fuel oil for residential uses. As a worst case, all emissions were presumed to originate from the nearest boiler stack. Based on a square footage of 657,213 ft^2 and a distance of 354 feet from the rezoning boundary, the site screens out. Therefore, no air quality impacts are projected for this housing complex, and no additional analysis is required.

Based on the building heights shown in Figures N-6 through N-11, all of the future new buildings within the rezoning area would be higher than the existing buildings within a radius of 400 feet. Therefore, no stationary source impacts to the surrounding community are projected.

Figure N-6: Blocks 3013, 3014, & 3009

*Source: Dattner Archit*ects. Site 2A=2N; Site 2B=2S

Figure N-7: Blocks 3013, 3014, & 3009

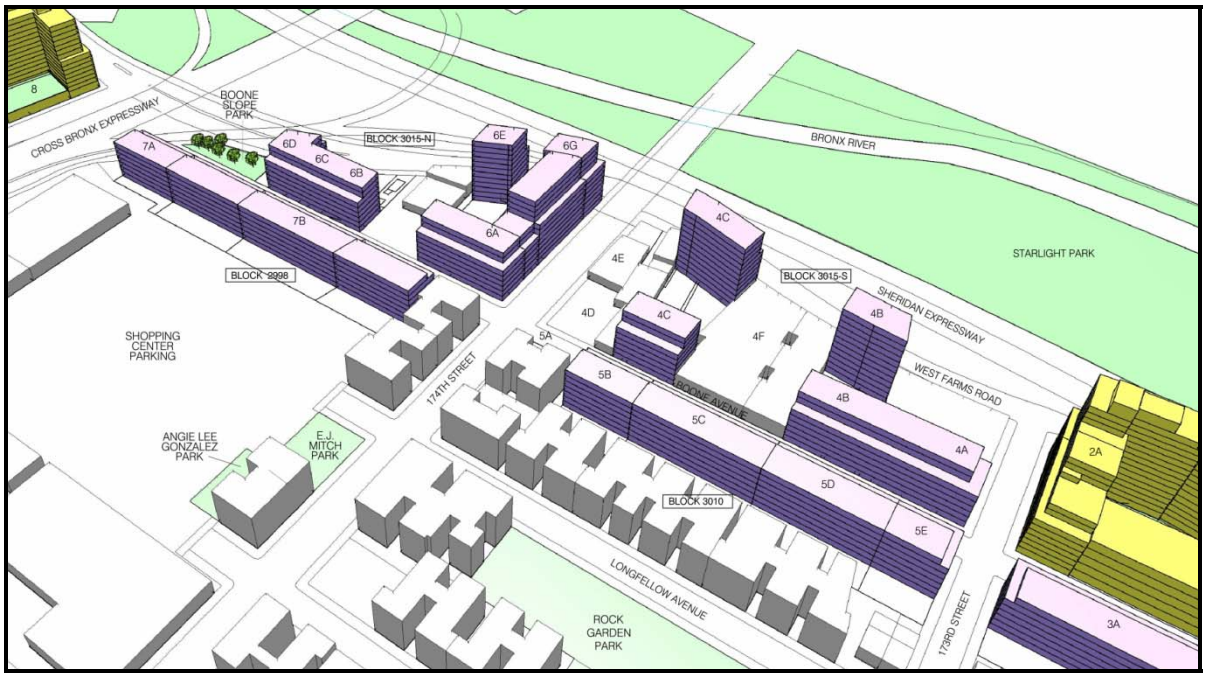


*Source: Dattner Archit*ects. Site 2A=2N; Site 2B=2S

Figure N-8: Blocks 3015, 3010 & 2998

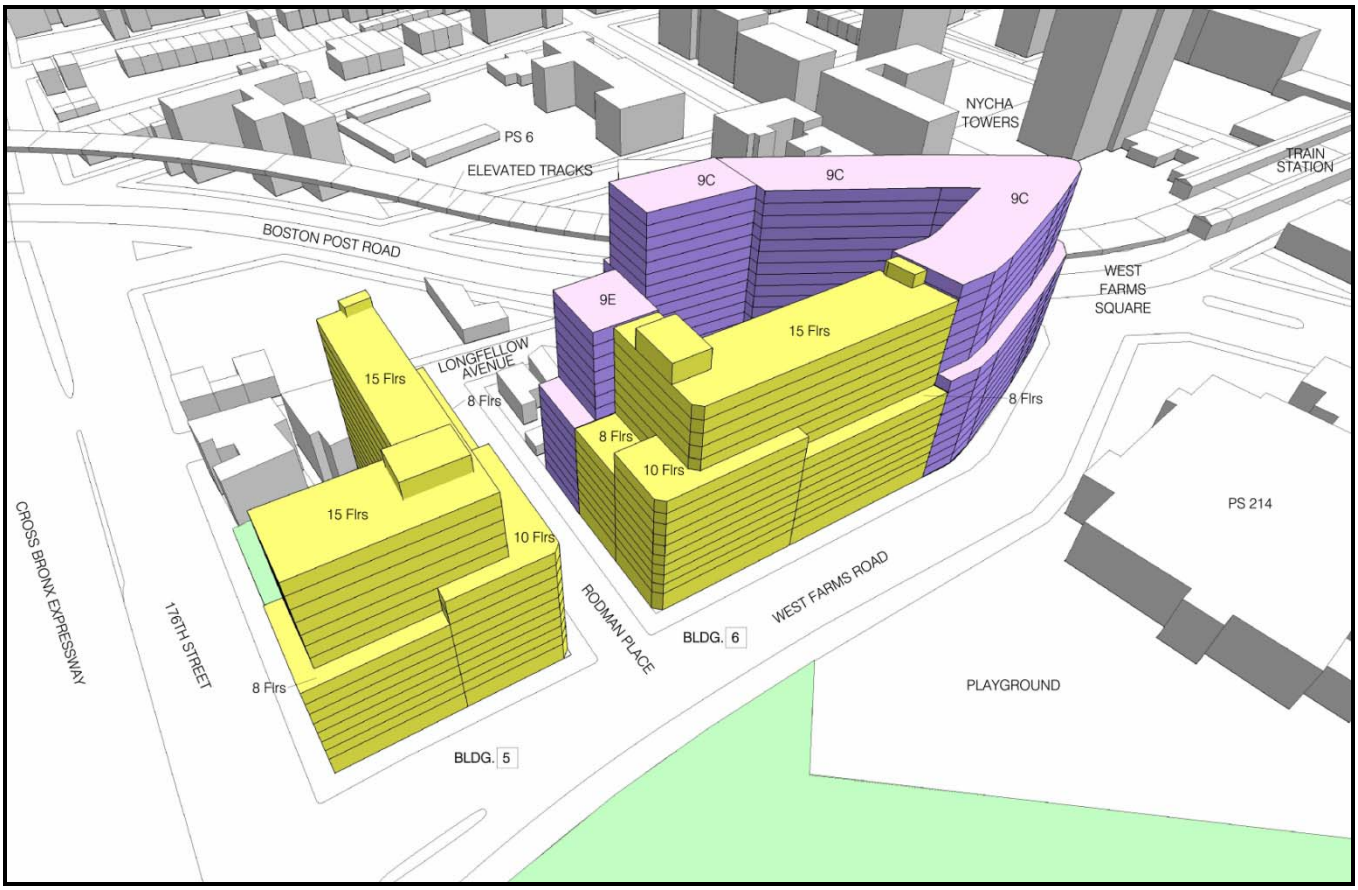
*Source: Dattner Archi*tects.

Figure N-9: Blocks 3015, 3010 & 2998



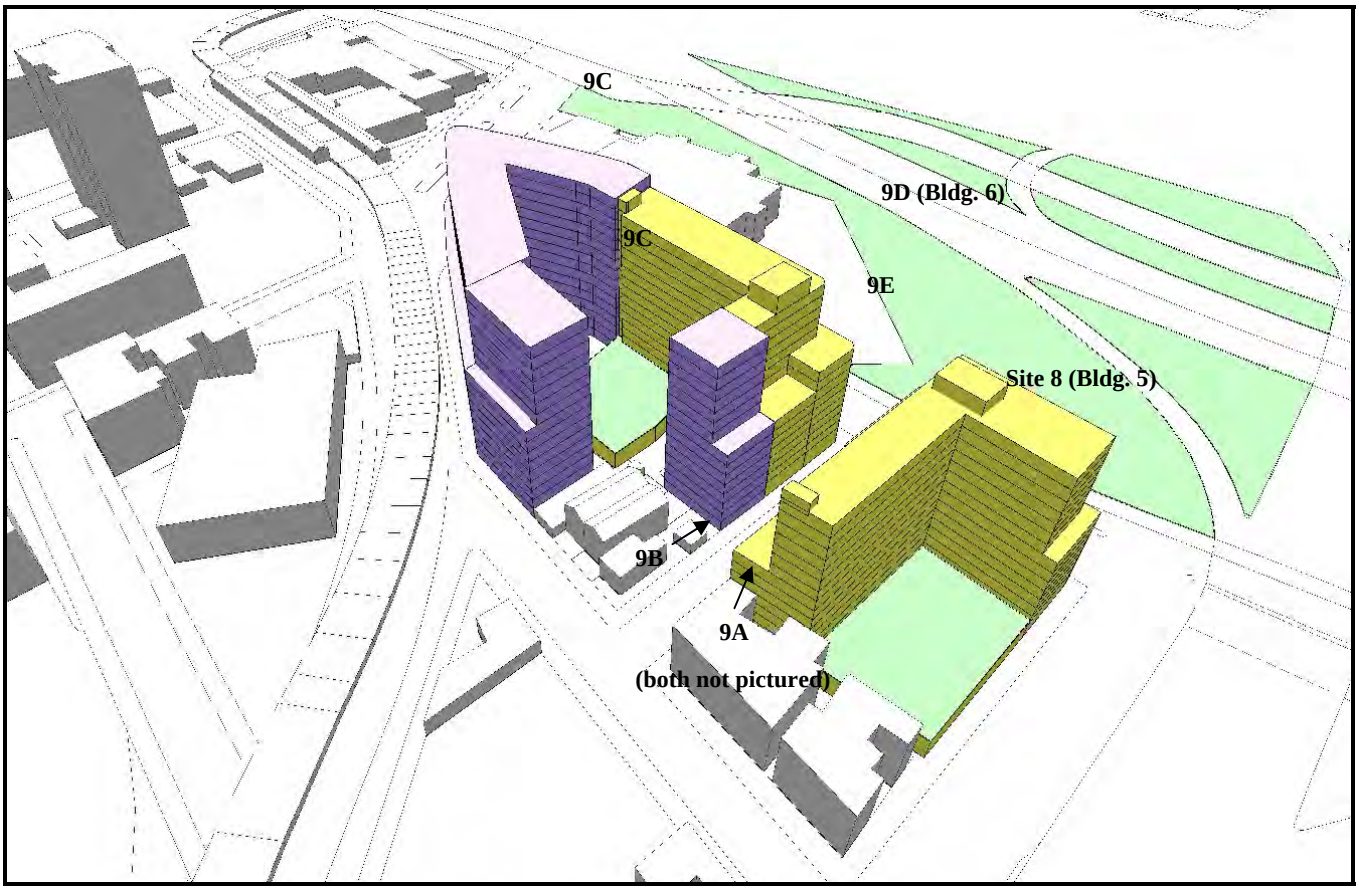
Source: Dattner Architects.

Figure N-10: Block 3016



Source: Dattner Architects.

Figure N-11: Block 3016



Source: Dattner Architects.

Project-on-Project Impacts

Project-on-project impacts are the potential adverse effects of the future buildings on each other. The buildings were analyzed for both #2 fuel oil and natural gas for HVAC. The LSGD buildings may use dual-fired boilers, in which case, they would switch between #2 fuel oil and natural gas depending on the costs. Since residential square footage is dominant in all of the projected and potential developments, and since the pollutant emission factors are highest for residential use, the analysis assumes that the buildings are 100% residential. This constitutes a worst-case analysis. The pollutants of interest are 24-hour SO_2 from #2 fuel oil and annual NO_x from natural gas. If these pollutants and averaging periods show no potential for impacts, then none are likely for other pollutants or averaging periods.

The potential for impacts is determined from building size, which determines the volume of emissions, stack height, and stack location. For Sites 1, 2, and 3, the boiler stacks were located on the mechanical penthouse bulkheads on the roofs of the tallest building segments, and the stacks were assumed to be seven feet high in order to exceed the height of the nearby elevator penthouses by three feet. For all other projected and potential development sites, the stacks were assumed to be three feet higher than the roof . All stacks were initially assumed to be in a worst-case location 10 feet from the edge of the roof or mechanical penthouse.

The first step for each building is to identify buildings of similar or greater height within 400 feet. If the stack on a building is higher than any other buildings within 400 feet, then it screens out because it is unlikely to cause significant adverse impacts. Table N-16 shows that four buildings would pass this screen: Building 1B on Site 1, Buildings 3A and 3B on Site 2N, and Building 2B on Site 2S. The stack heights on these buildings range from 172 to 181 feet above the ground, and they are therefore taller than any of the 15-story buildings proposed for development. No sensitive receptors are at the same height as these stacks within a distance of 400 feet. Therefore, these buildings do not require further analysis.

HVAC stacks within 400 feet of a building of similar or greater height were next evaluated using two nomographs in the *CEQR Technical Manual* Air Quality Appendix. Figure 17-5 was used to screen the residential buildings for impacts if #2 fuel oil was used. Figure 17-7 was used to determine the potential for impacts if natural gas is used. These figures provide a conservative estimate of the minimum distance between buildings of similar or greater height based on their sizes, stack heights and distances from each other. If a user plots a building's size and distance on the graph, and it falls below the curve for its stack height, then no air quality impacts are likely and no further analysis is required. However, the figures are only applicable where the distance between a stack and the closest building of similar or greater height is at least 30 feet. If the distance is less than 30 feet, or if a building fails this screen, the potential for impacts must be determined by modeling with the AERMOD model.

All other buildings shown in Table N-16 require AERMOD modeling. Building 1A on Site 1 almost screens out for natural gas. The stack location on the building's mechanical penthouse is 125 feet high and approximately 85 feet from the taller 14-story tier on Building 1B. Based on Figure 17-7 in the CEQR *Technical Manual Appendices*, Building 1a falls on the curve for its stack height; thus it must be analyzed further with AERMOD. The other buildings required AERMOD modeling because they are less than 30 feet from buildings of similar or greater heights.

Table N-16: Screening Analysis for Project on Project Impacts, Proposed Action

Block	Lot	Address	Source Building*			Receiving Building		Screening Results
			Site	Sq. Ft.	Stack Ht. (ft)	Nearest Residential Tier ≥ Ht	Distance from Stack	
2998	97	1829 Boone Ave.	7A	36,522	73	7B (70)	< 30	Use AERMOD
2998	104 113 124	1817 Boone Ave. 1801 Boone Ave. 1769 Boone Ave.	7B	180,572	73	7A (70)	< 30	Use AERMOD
3009	25	1006 E. 173 St.	3A	72,000	73	3B (70)	< 30	Use AERMOD
3009	33	1559 Boone Ave.	3B (4)	40,000	73	3A, 3C (70)	< 30	Use AERMOD
3009	37	1549 Boone Ave.	3C	13,500	73	3B, 3D (70)	< 30	Use AERMOD
3009	38	1529 Boone Ave.	3D	49,500	73	3C, 3E (70)	< 30	Use AERMOD
3009	44	1015 E. 172 St.	3E	45,000	73	3D (70)	< 30	Use AERMOD
3010	26	1711 Boone Ave.	5A	5,000	73	5B (70)	< 30	Use AERMOD
3010	29	1701 Boone Ave.	5B	36,000	73	5A (70)	< 30	Use AERMOD
3010	33	1695 Boone Ave.	5C	63,090	73	5B,5D (70)	< 30	Use AERMOD
3010	40	1685 Boone Ave.	5D	53,910	73	5C, 5E (70)	< 30	Use AERMOD
3010	46	1661 Boone Ave.	5E	37,000	73	5D (70)	< 30	Use AERMOD
3013	12 46 29	1471 West Farms Rd. 1481 West Farms Rd. 1493 West Farms Rd.	1 (1a)	106,936	125	1 (1b) (148)	85	Use AERMOD
3013	31 35 37	1508 Boone Ave. 1512 Boone Ave. E. 172 St.	1 (1b)	146,750	181	> 400	> 400	Pass
3014N	15 (part)	1560 Boone Ave.	2N (3a)	139,044	174	> 400	> 400	Pass
3014N	15 (part)	1560 Boone Ave.	2N (3b)	190,809	178	> 400	> 400	Pass
3014N	15 (part)	1560 Boone Ave.	2N (3c)	77,270	106	2N (3a) (151)	< 30	Use AERMOD
3014S	9 (part)	1544 Boone Ave.	2S (2a)	129,916	156	2S (2b) (149)	75	Use AERMOD
3014S	9 (part) 45	1544 Boone Ave. 1525 West Farms Rd.	2S (2b)	176,283	172	> 400	> 400	Pass
3015S	1	1015 E. 173 St.	4A	60,168	83	4B (80)	< 30	Use AERMOD
3015S	3 5	1680 Boone Ave. 1717 West Farms Rd.	4B	40,443	83	4A, 4F (80)	< 30	Use AERMOD
3015S	3 5	1680 Boone Ave. 1717 West Farms Rd.	4B	61,664	128	4A, 4F (125)	< 30	Use AERMOD
3015S	17 18	1704 Boone Ave. 1708 Boone Ave.	4C	61651	83	4D, 4F (80)	< 30	Use AERMOD
3015S	29 31	1735 West Farms Rd. 1731 West Farms Rd.	4C	92,477	128	4E, 4F (125)	< 30	Use AERMOD

3015S	19	1720 Boone Ave.	4D	73,970	83	4C (80), 4E (125)	< 30	Use AERMOD
3015S	25 26	1745 West Farms Rd. 1743 West Farms Rd.	4E	92,296	128	4C (125)	< 30	Use AERMOD
3015S	34	1725 West Farms Rd.	4F	78,565	83	4B, 4C (80)	< 30	Use AERMOD
3015S	34	1725 West Farms Rd.	4F	52,510	128	4B, 4C (125)	< 30	Use AERMOD
3015N	50 56 110	1760 Boone Ave. Boone Ave. E. 174 St.	6A	71,573	83	6E, 6F, 6G	< 30	Use AERMOD
3015N	62 87 89	Boone Ave. 1817 West Farms Rd. 1815 West Farms Rd.	6B	56, 773	83	6C (80)	< 30	Use AERMOD
3015N	67 83 84 85	1820 Boone Ave. 1825 West Farms Rd. 1821 West Farms Rd. 1819 West Farms Rd.	6C	51,138	83	6B, 6D (800	< 30	Use AERMOD
3015N	81	1829 West Farms Rd.	6D	10,598	83	6C (80)	< 30	Use AERMOD
3015N	95	1783 West Farms Rd.	6E	56,060	128	6F (125)	< 30	Use AERMOD
3015N	96	1775 West Farms Rd.	6F	44,080	128	6E, 6G (125)	< 30	Use AERMOD
3015N	97	1763 West Farms Rd.	6G	72,082	128	6F (125)	< 30	Use AERMOD
3016	11 13 21	Rodman Place 1905 West Farms Rd. 1899 West Farms Rd.	8	202,319	153	9D (150)	70	Use AERMOD
3016	33 35	1916 Longfellow Ave. 1918 Longfellow Ave.	9A	42,599	153	9B, 9E (150)	< 30	Use AERMOD
3016	36 37	1920 Longfellow Ave. 1924 Longfellow Ave.	9B	46,281	153	9A, 9C (150)	< 30	Use AERMOD
3016	38 42	Longfellow Ave. 1962 Boston Rd.	9C 9C	318,582	153	9B, 9D (150)	< 30	Use AERMOD
3016	60 66	1927 West Farms Rd. 1923 West Farms Rd.	9D	196,308	153	9C, 9E (150)	< 30	Use AERMOD
3016	71	1295 Rodman Place	9E	38,549	153	9B, 9D (150)	< 30	Use AERMOD

Notes: Entries in bold are sites controlled by the applicant
**Does not include below-grade parking areas that would not be heated.*
Source: Sandstone Environmental Associates

Table N-17 shows the AERMOD results for 24-hour concentrations of SO_2. Most buildings would require (E) designations restricting their stack locations if fuel oil #2 is used. Several buildings would require an (E) designation restricting the fuel use to natural gas. This includes Building 3C on Site 2N and Building 2A on Site 2S as well as buildings on Sites 3B, 3C, and 4C on Boone Avenue, Site 4C on West Farms Road, and Sites 6C, 6E, 6F,6G, 9B, and 9E. The rooftops of these buildings are not large enough to accommodate the setbacks necessary to avoid potential impacts if they were to burn #2 fuel oil.

Table N-18 shows the results of the modeling for annual concentrations of NOx. Many of the buildings would require (E) designations restricting the location of the stack. However, the restrictions are not as severe as the ones required for #2 fuel oil. The required setbacks range from 20 to 30 feet.

Tables N-19 and N-20 show the results of AERMOD modeling for the combined emissions from clusters of buildings. The modeling examined the potential for these clusters to have an impact on other nearby buildings. The clusters included:

- Sites 3D and 3E on Sites 2S and 2N;
- Sites 5A through 5E on Sites 4A, 4B 4C, 4F, and 4D along Boone Avenue;
- Sites 6B through 6D on Sites 6E through 6G; and
- Sites 9C and 9D on Site 8 (Bldg. #5).

No potential air quality impacts were identified for the combined concentrations of the clusters, and no additional stack restrictions would be required for the clusters of buildings.

Table N-17: HVAC AERMOD Modeling for 24-Hour SO_2 (µg/m^3), Proposed Action

File Name	Source Building								Receptor Building and Height	SO2 Concentrations (ug/m3)			
	Block	Site	Sq. Ft.	Emission Rate (g/s)	mm BTU/hr	Stack Ht (ft)	Stack Dia-meter	Exit Velocity (m/s)		Back-ground	Maximum Modeled	Total	Restrictions (ft)
7A7B7SP	2998	7A	36,522	0.02070	0.9	73	0.5	3.9	7B (70)	123	215	338	
7B7A7SP	2998	7B	180,572	0.10230	4.5	73	0.5	3.9	7A (70)	123	201	324	80*
3A3B7SP	3009	3A	72,000	0.04080	1.8	73	0.5	3.9	3B (70)	123	225	348	70
3B3A7SP	3009	3B (4)	40,000	0.02270	1.0	73	0.5	3.9	3A(70)	123	214	337	Use natural gas
3B3C7SP	3009	3B (4)	40,000	0.02270	1.0	73	0.5	3.9	3C(70)	123	236	359	Use natural gas
3C3B7SP	3009	3C	13,500	0.00760	0.3	73	0.5	3.9	3B (70)	123	180	303	Use natural gas
3C3D7SP	3009	3C	13,500	0.00760	0.3	73	0.5	3.9	3D (70)	123	195	318	Use natural gas
3D3C7SP	3009	3D	49,500	0.02800	1.2	73	0.5	3.9	3C(70)	123	212	335	60
3D3E7SP	3009	3D	49,500	0.02800	1.2	73	0.5	3.9	3E (70)	123	216	339	60
3E3D7SP	3009	3E	45,000	0.02550	1.1	73	0.5	3.9	3D (70)	123	198	321	60
5A5B7SP	3010	5A	5,000	0.00280	0.1	73	0.5	3.9	5B (70)	123	37	160	
5B5A7SP	3010	5B	36,000	0.02040	0.9	73	0.5	3.9	5A (70)	123	155	278	
5B5C7SP	3010	5B	36,000	0.02040	0.9	73	0.5	3.9	5C (70)	123	196	319	40
5C5B7SP	3010	5C	63,090	0.03570	1.6	73	0.5	3.9	5B (70)	123	196	319	60
5C5D7SP	3010	5C	63,090	0.03570	1.6	73	0.5	3.9	5D (70)	123	210	333	60
5D5C7SP	3010	5D	53,910	0.03050	1.4	73	0.5	3.9	5C (70)	123	181	304	60
5D5E7SP	3010	5D	53,910	0.03050	1.4	73	0.5	3.9	5E (70)	123	179	302	60
5E5D7SP	3010	5E	37,000	0.02100	0.9	73	0.5	3.9	5D (70)	123	163	286	50
1A1B1SP	3013	1 (1a)	106,936	0.06060	2.7	125	0.5	3.9	(1b) (148)	123	240	363	20
B3C3ASP	3014 N	2N (3c)	77,270	0.04380	1.9	123	0.5	3.9	(3a) (151)	123	481		Use natural gas
2A2B1SP	3014 S	2S (2a)	129,916	0.07360	3.3	156	0.5	3.9	(2b) (149)	123	280		Use natural gas
4A4B8SP	3015 S	4A	60,168	0.03410	1.5	83	0.5	3.9	4B (80)	123	193	316	60*
4B4A8SP	3015 S	4B (80)	40,443	0.02290	1.0	83	0.5	3.9	4A(80)	123	191	314	60*

4B4F8SP	3015 S	4B (80)	40,443	0.02290	1.0	83	0.5	3.9	4F (80)	123	176	299	50*
4B4F1SP	3015 S	4B (125)	60,664	0.03440	1.5	128	0.5	3.9	4F (125)	123	203	326	60
4C4D8SP	3015S	4C (80)	61,651	0.03490	1.5	83	0.5	3.9	4D(80)	123			Use natural gas
4C4F8SP	3015S	4C (80)	61,651	0.03490	1.5	83	0.5	3.9	4F (80)	123			Use natural gas
4C4E1SP	3015S	4C (125)	92,477	0.05240	2.3	128	0.5	3.9	4E (125)	123			Use natural gas
4C4F1SP	3015S	4C (125)	92,477	0.05240	2.3	128	0.5	3.9	4F(125)	123			Use natural gas
4D4C8SP	3015S	4D	73,970	0.04190	1.9	83	0.5	3.9	4C(80)	123	209	332	80*
4D4E1SP	3015S	4D	73,970	0.04190	1.9	83	0.5	3.9	4E(125)	123	166	289	80
4E4C1SP	3015S	4E	92,296	0.05230	2.3	128	0.5	3.9	4C (125)	123	127	250	80
4F4B8SP	3015S	4F (80)	78,765	0.04460	2.0	83	0.5	3.9	4B (80)	123	219	342	80
4F4C8SP	3015S	4F (80)	78,765	0.04460	2.0	83	0.5	3.9	4C(80)	123	143	266	80
4F4B1SP	3015S	4F (125)	52,510	0.02980	1.3	128	0.5	3.9	4B(125)	123	98	221	30
4FRC1SP	3015S	4F (125)	52,510	0.02980	1.3	128	0.5	3.9	4C(125)	123	216	339	50
6A6G1SP	3015N	6A	71,573	0.04060	1.8	83	0.5	3.9	6G (125)	123	108	231	70
6B6C8SP	3015N	6B	56,773	0.03220	1.4	83	0.5	3.9	6C (80)	123	173	296	60
6C6B8SP	3015N	6C	51,138	0.02900	1.3	83	0.5	3.9	6B (80)	123			Use natural gas
6D6C8SP	3015N	6D	10,598	0.00600	0.3	83	0.5	3.9	6C (80)	123			Use natural gas
6D6C8SP	3015N	6D	10,598	0.00600	0.3	83	0.5	3.9	6C (80)	123	76	199	30
6E6F1SP	3015N	6E	56,060	0.03180	1.4	128	0.5	3.9	6F (125)	123			Use natural gas
6F6E1SP	3015N	6F	44,080	0.02500	1.1	128	0.5	3.9	6E(125)	123			Use natural gas
6F6G1SP	3015N	6F	44,080	0.02500	1.1	128	0.5	3.9	6G(125)	123			Use natural gas
6G6F1SP	3015N	6G	72,082	0.04080	1.8	128	0.5	3.9	6F (125)	123			Use natural gas
89D1SP	3016	5 (8)	202,319	0.11460	5.1	153	1.0	5.8	9D (150)	123	233	356	20
9A9B1SP	3016	9A	42,599	0.02410	1.1	153	0.5	3.9	9B (150)	123	211	334	50
9A9E1SP	3016	9A	42,599	0.02410	1.1	153	0.5	3.9	9E (150)	123	184	307	60
9B9A1SP	3016	9B	46,281	0.02620	1.2	153	0.5	3.9	9A(150)	123			Use natural gas
9B9C1SP	3016	9B	46,281	0.02620	1.2	153	0.5	3.9	9C(150)	123			Use natural gas

9C9B1SP	3016	9C	318,582	0.18050	8.0	153	1.0	5.8	9B (150)	123	232	355	140
9C9D1SP	3016	9C	318,582	0.18050	8.0	153	1.0	5.8	9D (150)	123	206	329	130
9D9C1SP	3016	6 (9D)	196,308	0.11120	4.9	153	0.5	3.9	9C (150)	123	222	345	110
9D9E1SP	3016	6 (9D)	196,308	0.11120	4.9	153	0.5	3.9	9E (150)	123	236	359	100
939A1SP	3016	9E	42,404	0.02400	1.1	153	0.5	3.9	9A(150)	123	297		Use natural gas
9E9D1SP	3016	9E	42,404	0.02400	1.1	153	0.5	3.9	9D(150)	123	356		Use natural gas

*Notes. * Would exceed NAAQS for cluster analysis.*
NAAQS for 24-hour SO_2 is 365 ug/m^3
Source: Sandstone Environmental Associates, Inc.

Table N-18: HVAC AERMOD Modeling for Annual NO_x (µg/m^3), Proposed Action

File Name	Source Building								Receptor Building and Height	NOx Concentrations (ug/m3)			
	Block	Site	Sq. Ft.	Emission Rate (g/s)	mm BTU/hr	Stack Ht (ft)	Stack Dia-meter	Exit Velocity (m/s)		Back-ground	Maximum Modeled	Total	Restrictions (ft)
7A7B7NP	2998	7A	36,522	0.002781	0.9	73	0.5	3.9	7B (70)	55	29.3	84.3	
7B7A7NP	2998	7B	180,572	0.013750	4.5	73	0.5	3.9	7A (70)	55	33.5	88.5	30
3A3B7NP	3009	3A	72,000	0.005483	1.8	73	0.5	3.9	3B (70)	55	29.3	84.3	
3B3A7NP	3009	3B (4)	40,000	0.003046	1.0	73	0.5	3.9	3A(70)	55	33.5	88.5	30
3B3C7NP	3009	3B (4)	40,000	0.003046	1.0	73	0.5	3.9	3C(70)	55	18.17	73.2	20
3C3B7NP	3009	3C	13,500	0.001028	0.3	73	0.5	3.9	3B (70)	55	20.63	75.6	
3C3D7NP	3009	3C	13,500	0.001028	0.3	73	0.5	3.9	3D (70)	55	18.46	73.5	
3D3C7NP	3009	3D	49,500	0.003769	1.2	73	0.5	3.9	3C(70)	55	23.07	78.1	20
3D3E7NP	3009	3D	49,500	0.003769	1.2	73	0.5	3.9	3E (70)	55	23.33	78.3	20
3E3D7NP	3009	3E	45,000	0.003427	1.1	73	0.5	3.9	3D (70)	55	20.98	76.0	20
5A5B7NP	3010	5A	5,000	0.000381	0.1	73	0.5	3.9	5B (70)	55	0.53	55.5	
5B5A7NP	3010	5B	36,000	0.002741	0.9	73	0.5	3.9	5A (70)	55	3.16	58.2	
5B5C7NP	3010	5B	36,000	0.002741	0.9	73	0.5	3.9	5C (70)	55	29.2	84.2	
5C5B7NP	3010	5C	63,090	0.001028	1.6	73	0.5	3.9	5B (70)	55	19.6	74.6	
5C5D7NP	3010	5C	63,090	0.001028	1.6	73	0.5	3.9	5D (70)	55	10.8	65.8	
5D5C7NP	3010	5D	53,910	0.004105	1.4	73	0.5	3.9	5C (70)	55	21.4	76.4	20
5D5E7NP	3010	5D	53,910	0.004105	1.4	73	0.5	3.9	5E (70)	55	18.2	73.2	20
5E5D7NP	3010	5E	37,000	0.002817	0.9	73	0.5	3.9	5D (70)	55	13.1	68.1	20
1A1B1NP	3013	1 (1a)	106,936	0.008143	2.7	125	0.5	3.9	(1b) (148)	55	3.99	59.0	
B3C3ANP	3014 N	2N (3c)	77,270	0.005884	1.9	123	0.5	3.9	(3a) (151)	55	36.05	91.1	20
2A2B1NP	3014 S	2S (2a)	129,916	0.009893	3.3	156	0.5	3.9	(2b) (149)	55	7.71	62.7	
4A4B8NP	3015 S	4A	60,168	0.004582	1.5	83	0.5	3.9	4B (80)	55	20.8	75.8	20
4B4A8NP	3015 S	4B (80)	40,443	0.003080	1.0	83	0.5	3.9	4A(80)	55	33.4	88.4	
4B4F8NP	3015 S	4B (80)	40,443	0.003080	1.0	83	0.5	3.9	4F (80)	55	14.1	69.1	20

4B4F1NP	3015 S	4B (125)	60,664	0.004619	1.5	128	0.5	3.9	4F (125)	55	25.7	80.7	20
4C4D8NP	3015S	4C (80)	61,651	0.004694	1.5	83	0.5	3.9	4D(80)	55	22.7	77.7	20
4C4F8NP	3015S	4C (80)	61,651	0.004694	1.5	83	0.5	3.9	4F (80)	55	20.8	75.8	20
4C4E1NP	3015S	4C (125)	92,477	0.004619	2.3	128	0.5	3.9	4E (125)	55	19.4	74.4	20
4C4F1NP	3015S	4C (125)	92,477	0.004619	2.3	128	0.5	3.9	4F(125)	55	42	97.0	
4D4C8NP	3015S	4D	73,970	0.005633	1.9	83	0.5	3.9	4C(80)	55	25	80.0	20
4D4E1NP	3015S	4D	73,970	0.005633	1.9	83	0.5	3.9	4E(125)	55	26.6	81.6	20
4E4C1NP	3015S	4E	92,296	0.007028	2.3	128	0.5	3.9	4C (125)	55	36	91.0	20
4F4B8NP	3015S	4F (80)	78,765	0.005998	2.0	83	0.5	3.9	4B (80)	55	29.9	84.9	20
4F4C8NP	3015S	4F (80)	78,765	0.005998	2.0	83	0.5	3.9	4C(80)	55	29.5	84.5	20
4F4B1NP	3015S	4F (125)	52,510	0.003998	1.3	128	0.5	3.9	4B(125)	55	29.7	84.7	
4FRC1NP	3015S	4F (125)	52,510	0.003998	1.3	128	0.5	3.9	4C(125)	55	19.6	74.6	20
6A6G1NP	3015N	6A	71,573	0.005450	1.8	83	0.5	3.9	6G (125)	55	24	79.0	20
6B6C8NP	3015N	6B	56,773	0.004323	1.4	83	0.5	3.9	6C (80)	55	19.5	74.5	20
6C6B8NP	3015N	6C	51,138	0.003894	1.3	83	0.5	3.9	6B (80)	55	43	98.0	
6C6D8NP	3015N	6C	51,138	0.003894	1.3	83	0.5	3.9	6D (80)	55	20.7	75.7	20
6D6C8NP	3015N	6D	10,598	0.000807	0.3	83	0.5	3.9	6C (80)	55	8.5	63.5	
6E6F1NP	3015N	6E	56,060	0.004269	1.4	128	0.5	3.9	6F (125)	55	33.9	88.9	
6F6E1NP	3015N	6F	44,080	0.003357	1.1	128	0.5	3.9	6E(125)	55	40.7	95.7	
6F6G1NP	3015N	6F	44,080	0.003357	1.1	128	0.5	3.9	6G(125)	55	40.7	95.7	
6G6F1NP	3015N	6G	72,082	0.005489	1.8	128	0.5	3.9	6F (125)	55	25.7	80.7	20
89D1NP	3016	5 (8)	202,319	0.015406	**5.1**	**153**	**1.0**	**5.8**	9D (150)	55	3.52	58.5	
9A9B1NP	3016	9A	42,599	0.003244	1.1	153	0.5	3.9	9B (150)	55	33.29	88.3	
9A9E1NP	3016	9A	42,599	0.003244	1.1	153	0.5	3.9	9E (150)	55	33.95	89.0	
9B9A1NP	3016	9B	46,281	0.003524	1.2	153	0.5	3.9	9A(150)	55	36.35	91.4	
9B9C1NP	3016	9B	46,281	0.003524	1.2	153	0.5	3.9	9C(150)	55	19.47	74.5	20
9C9B1NP	3016	9C	318,582	0.024259	**8.0**	**153**	**1.0**	**5.8**	9B (150)	55	43.93	98.9	30
9C9D1NP	3016	9C	318,582	0.024259	**8.0**	**153**	**1.0**	**5.8**	9D (150)	55	30.48	85.5	40

9D9C1NP	3016	6 (9D)	196,308	0.014948	4.9	153	0.5	3.9	9C (150)	55	37.22	92.2	30
9D9E1NP	3016	6 (9D)	196,308	0.014948	4.9	153	0.5	3.9	9E (150)	55	35.99	91.0	30
939A1NP	3016	9E	42,404	0.003229	1.1	153	0.5	3.9	9A(150)	55	14.14	69.1	20
9E9D1NP	3016	9E	42,404	0.003229	1.1	153	0.5	3.9	9D(150)	55	28.29	83.3	

Note. NAAQS for annual NO2 is 150 ug/m3.
Source: Sandstone Environmental Associates, Inc.

Table N-19: HVAC AERMOD Cluster Modeling for 24-Hour SO_2 (µg/m^3), Proposed Action

Name	Source Building							Receptor Building and Height	Back-ground	Maxi-mum	Total	Restrictions (ft)
	Site	Sq. Ft.	Emission Rate (g/s)	mm BTU/hr	Stack Ht (ft)	Stack Dia-meter	Exit Velocity (m/s)					
C32NSP	3D and 3E	94,500	0.053542	2.4	73	0.5	3.9	2S, 2N (74)	123	104	127	
C5A4ASP	5A-5E	195,000	0.110483	4.9	83	0.5	3.9	4A-D, F (125)	123	77.8	201	
6B6ESP	6B-D (80)	118,510	0.067145	3.0	83	0.5	3.9	6E-G (125)	123	22.5	146	
9A8SP	9C and D	514,890	0.291726	12.9	153	2	10.2	8 (150)	123	54	177	

Notes. NAAQS for 24-hour SO_2 is 365 ug/m^3

Source: Sandstone Environmental Associates, Inc.

Table N-20: HVAC AERMOD Cluster Modeling for Annual NO2 (µg/m^3), Proposed Action

Name	Source Building							Receptor Building and Height	Back-ground	Maxi-mum	Total	Restrictions (ft)
	Site	Sq. Ft.	Emission Rate (g/s)	mm BTU/hr	Stack Ht (ft)	Stack Dia-meter	Exit Velocity (m/s)					
C32NSP	3D and 3E	94,500	0.007196	2.4	73	0.5	3.9	2S, 2N (74)	55	2.0	57.0	
C5A4ASP	5A-5E	195,000	0.014848	4.9	83	0.5	3.9	4A-D, F (125)	55	0.935	55.9	
6B6ESP	6B-D (80)	118,510	0.009024	3.0	83	0.5	3.9	6E-G (125)	55	0.458	55.5	
9A8SP	9C and D	514,890	0.039207	12.9	153	2	10.2	8 (150)	55	0.56	55.6	

Source: Sandstone Environmental Associates, Inc.

Air Toxics and Odors

Field Survey

On March 27, 2009, a field survey was carried out to identify manufacturing uses that have the potential to impact projected development. This includes sources with potential non-criteria emissions that may not have or may require necessary air permits. Criteria for identifying such operations during the field survey included:

- industrial buildings with stacks, vents, or observed emissions;
- establishments with names indicative of operations that could require permitting;
- establishments with the potential to cause unpleasant odors.

No medical, chemical, or research laboratories were identified within 400 feet of the proposed rezoning boundaries. Industrial establishments identified during the field work were cross-referenced with information from other sources to obtain additional information about their activities.

No unpleasant odors were encountered during the field survey. The only establishment likely to generate significant odors is the Ferris, Stahl-Meyer Packing Corp., a meat packaging plant at 1560 Boone Avenue (Block 3014, Lot 15). This property is a projected development site controlled by the applicant, and it would be redeveloped under the Proposed Action. The site would be redeveloped during years 4 to 6 in construction Phase 3. However, the operation would vacate the site before redevelopment starts on nearby sites. Therefore, it would not be an odor source for the redeveloped lots in the future.

NYCDEP Permit Search

Based on field work and information obtained from NYC's Open Accessible Space Information System (OASIS), a list of lots with industrial uses within the rezoning area and within 400 feet of the rezoning area was compiled and sent to NYCDEP in order to identify facilities with permits for emissions from industrial sources.

No permits were found for several auto repair and painting establishments that were observed in the field. The 2010 *CEQR Technical Manual* indicates that a generic analysis is required for these types of existing facilities if they have no permits. However, these unpermitted facilities are located on lots projected for redevelopment. Thus, they do not require further analysis.

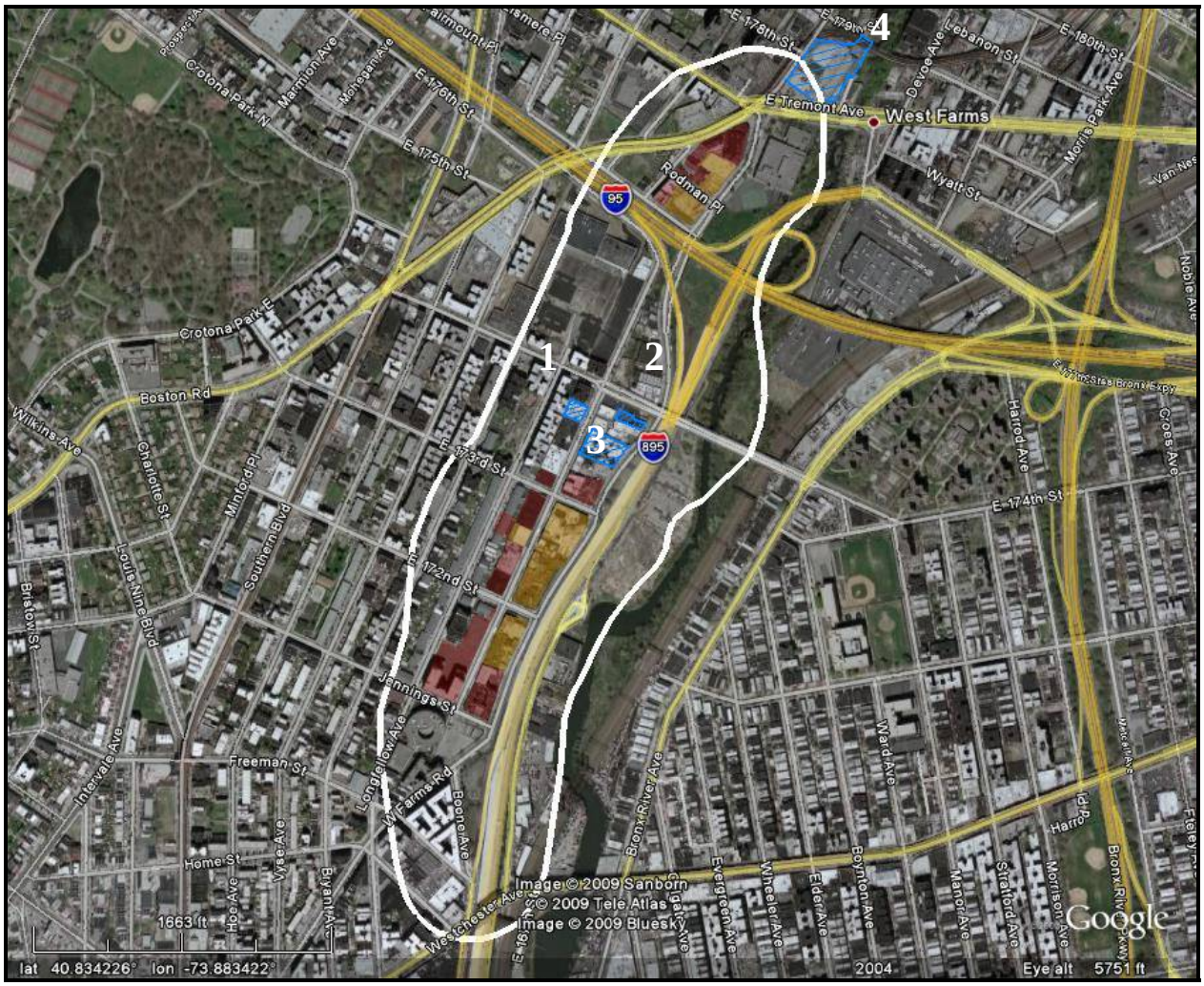
Four operating permits were found in the NYCDEP files. The blocks, lots and addresses of these sites are listed in Table N-21 and shown in Figure N-12. One site is north of the rezoning area. The other three are projected or potential development sites within the rezoning area. The four sites are discussed below.

TableN-21: Industrial Sites with Air Quality Permits

ID	Block	Lot	Address	Financial Code*	Permitted Use	Comments
1	3010	29	1701 Boone Ave.	G2	Woodworking	Projected development site not controlled by applicant
2	3015	26	1743 West Farms Rd.	F9	Paint Mixing and Retail	Potential development site
3	3015	34	1725 West Farms Rd.	E7	Painting with spray booth	Potential development site; permitted use no longer present
4	3139	1	2024 Boston Rd.	K9	Dry cleaning establishment	Outside of rezoning area; closed system does not vent to outside
**Legend: G2 – Garage, F9 – Misc. Factory, E7 – Self-Storage Warehouse, K9 – Misc. Store Building*						

Source: NYC OASIS.

Figure N-12: Sites with Operating Permits for Processes



Source: Google Earth, Sandstone Environmental Associates.

1. Block 3010, Lot 29, at 1701 Boone Avenue This is a projected development site. Therefore, it will be redeveloped in the future and does not require further analysis.

2. Block 3015, Lot 26 at 1743 West Farms Road is occupied by Champion Paint Manufacturing. A Sanborn map for 1950 shows that the Diamond Syrup Company occupied the front of this building, and a garage with a 550-gasoline tank was in the rear of the building. Diamond Syrup apparently vacated the site by 1993. Champion Paint mixes paint in two tanks that are 36 inches in diameter. Emissions are exhausted through a roof-mounted fan, about 20 feet above street level, with 2,500 cfm and a diameter of 16 inches. The exhaust is 70°F, and the exit velocity is 30 feet/second. It operates 200 days per year for 8 hours per day. No control devices are used. This site warrants further analysis.

3. Block 3015, Lot 34 at 1725 West Farms Road is the location of Secure Self-Storage, a mini storage facility for consumers. The permit refers to Wilray Metal Fabricators, which appears to have been located on the same lot as the commercial storage business. Between the 1890s and approximately 1950, the site was used as a two-family home. The home was converted to storage uses by 1950, and additional buildings were constructed at the rear of the lot. The current building covering the entire lot was constructed in 1963 and is shown as a factory on the 1977 through 2007 Sanborn maps. Further review of available property transaction records and recent Certificates of Occupancy indicate the fabricating business is no longer present on this Site. No additional analysis is warranted.

4. Block 3139, Lot 1 at 2024 Boston Road is the location of Boston Cleaners. It is on the ground floor of an existing commercial building. This dry cleaning establishment apparently uses a closed system and does not vent emissions to the outdoors. Therefore, it does not warrant further analysis.

The paint spray booth at 1743 West Farms Road operates 8 hours per day, 200 days per year. The stack exhaust is 20 feet above ground level and it located on the northeastern side of the roof. 1743 West Farms Road is Projected Development Site 4E. Lot 25, which is adjacent to it on the north, is also part of Projected Development Site 4E and is currently improved with a one-story warehouse building. Since both of these lots would be developed together, the spray booth emissions would not have an air quality impact on Lot 25. The next closest future development site is Lot 29 (1735 West Farms Road), an adjacent site on the south. Lot 29 is Projected Development Site 4C, which could be redeveloped with a seven-story residential building. The boundaries of Lot 29 are approximately 35 feet from the exhaust stack at 1743 West Farms Road. Therefore, an industrial source screen analysis was carried out to determine the potential for impacts.

Industrial Source Screen

Table N-22 shows the Industrial Source Screen results for non-criteria pollutants at 1743 West Farms Road, which is the only permitted facility warranting additional analysis. Based on Table N-22, emissions from propylene glycol would exceed the NYSDEC AGC standard. However, the projected concentration of 4.2 $\mu g/m^3$ would be lower than the concentration of 8.1 $\mu g/m^3$ that would be created by multiplying the AGC by 10. Therefore, as stated in the methodology section, it would not be considered an impact by NYCDEP, and no additional analysis is required for this source. Based on the analyses and available information, no impacts to future development sites are projected from air toxics.

Table N-22: Non-Criteria Pollutant Concentrations (µg/m^3) at 1743 West Farms Road Compared with NYSDEC Standards

Pollutant	CAS #	1-Hour Concentration	NYS SGCs	Annual Concentration	NYS AGCs
Propylene Glycol	06423-43-4	519	N/A	4.2	0.81
Texanol	25265-77-4	346	N/A	2.8	N/A

Source: Sandstone Environmental Associates, Inc

E Designations and Restrictive Declarations, Proposed Action

According to the NYC Building Code, rooftop stacks for HVAC should be at least 10 feet from the edge of the roof and/or from a building of similar or grater height. The HVAC air quality analysis in this section indicated that some stacks would have to be placed at a greater distance than 10 feet, and some buildings would be restricted to using natural gas in order to avoid a significant potential impact. The restrictions may not be directly related to building size. In some cases, relatively small buildings would be restricted to using natural gas because the lots are narrow and not of sufficient size to accommodate the necessary setbacks to avoid an impact. In others, the direction of the prevailing winds for a 24-hour or annual period resulted in higher concentrations for a building north of a stack (e.g.) than for a building south of a stack.

To prevent potential exceedances of the NAAQS, the Proposed Action would include the mapping of (E) designations (E-277) on non-applicant-controlled sites and the recording of restrictive declarations against applicant-controlled sites. As shown in Table N-23, restrictive declarations and (E) designations would specify stack setback distances, mandate the use of natural gas, or both.

Table N-23: Restrictive Declarations and (E) Designations for Proposed Action

Site	Block	Lot(s)	Minimum Set-Back or Fuel Use Requirements
7B	2998	104,113,124	Use natural gas with setback of 30 feet
3A	3009	25	70 feet for fuel oil #2 or use natural as
3B (4)	3009	33	Use natural gas with setback of 30 feet
3C	3009	37	Use natural gas
3D	3009	38	60 feet for fuel oil #2 or 20 feet for natural gas
3E	3009	44	60 feet for fuel oil #2 or 20 feet for natural gas
5B	3010	29	40 feet for fuel oil #2 or use natural gas
5C	3010	33	60 feet for fuel oil #2 or 20 feet for natural gas
5D	3010	40	60 feet for fuel oil #2 or 20 feet for natural gas
5E	3010	46	50 feet for fuel oil #2 or 20 feet for natural gas
1(1a)	3013	12, 46, 29	20 feet for fuel oil #2 or use natural gas
2N(3C)	3014N	15 (part)	Use natural gas with setback of 20 feet
2S(2A)	3014S	9 (part)	Use natural gas
4A	3015S	1	Use natural gas with setback of 20 feet

4B (Boone)	3015 S	3 (part), 5 (part)	Use natural gas with setback of 20 feet
4B (WFR)	3015S	3 (part), 5 (part)	Use natural gas with a setback of 20 feet
4C (Boone)	3015S	17, 18	Use natural gas with a setback of 20 feet
4C (WFR)	3015S	29, 31	Use natural gas with a setback of 20 feet
4D (Boone)	3015S	19	Use natural gas with a setback of 20 feet
4E	3015S	25, 26	80 feet for fuel oil #2 or 20 feet for natural gas
4F (Boone)	3015S	34 (part)	80 feet for fuel oil #2 or 20 feet for natural gas
4F (WFR)	3015S	34 (part)	50 feet for fuel oil #2 or 20 feet for natural gas
6A	3015N	50, 56, 110	70 feet for fuel oil #2 or 20 feet for natural gas
6B	3015N	62, 87, 89	60 feet for fuel oil #2 or 20 feet for natural gas
6C	3015N	67, 83, 84, 85	Use natural gas with setback of 20 feet
6D	3015N	81	Use natural gas
6E	3015N	95	Use natural gas
6F	3015N	96	Use natural gas
6G	3015N	97	Use natural gas with setback of 20 feet
5 (8)	3016	11, 13, 21	20 feet for fuel oil #2 or use natural gas
9A	3016	33, 35	Use natural gas
9B	3016	36. 37	Use natural as with setback of 20 feet
9C	3016	38, 42	140 feet for fuel oil #2 or 40 feet for natural gas
9D	3016	60, 66	110 feet for fuel oil #2 or 30 feet for natural gas
9E	3016	71	Use natural gas with setback of 20 feet

Source: Sandstone Environmental Associates, Inc.

The language for the (E) designations is specified below:

Block 2998, Lots 104, 113, and 124 (Parcel 7B): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems and ensure that the HVAC stack(s) are located at least 30 feet from the lot line facing E. 176th Street to avoid any potential significant adverse air quality impacts.

Block 3009, Lot 25 (Parcel 3A): Any new residential and/or commercial development on the above-referenced properties must ensure that the heating, ventilating, and air conditioning stack(s) are located at least 70 feet from the lot line facing E. 172nd Street and 20 feet from the lot line facing Boone Avenue and 20 feet from the lot line fronting E. 173rd Street for fuel oil #2 or use natural gas as the type of fuel for space heating and hot water (HVAC) systems to avoid any potential significant adverse air quality impacts.

Block 3009, Lot 37 (Parcel 3C): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems to avoid any potential significant adverse air quality impacts.

Block 3009, Lot 38 (Parcel 3D): Any new residential and/or commercial development on the above-referenced properties must ensure that the heating, ventilating, and air conditioning stack(s) are located at least 60 feet from the lot line facing E. 172nd Street and 60 feet from the lot line facing E. 173rd Street for fuel oil #2 or at least 20 feet from the lot line facing E. 172nd Street and 20 feet from the lot line adjoining facing E. 173rd Street for natural gas to avoid any potential significant adverse air quality impacts.

Block 3009, Lot 44 (Parcel 3E): Any new residential and/or commercial development on the above-referenced properties must ensure that the heating, ventilating, and air conditioning stack(s) are located at least 60 feet from the lot line facing E. 173rd Street for fuel oil #2 or at least 20 feet from the lot line facing E. 173rd Street for natural gas to avoid any potential significant adverse air quality impacts.

Block 3010, Lot 29 (Parcel 5B): Any new residential and/or commercial development on the above-referenced properties must ensure that the heating, ventilating, and air conditioning stack(s) are located at least 40 feet from the lot line facing E.174th Street and 40 feet from the lot line facing E. 173rd Street for fuel oil #2 or use natural gas to avoid any potential significant adverse air quality impacts.

Block 3010, Lot 33 (Parcel 5C): Any new residential and/or commercial development on the above-referenced properties must ensure that the heating, ventilating, and air conditioning stack(s) are located at least 60 feet from the lot line facing E. 174th Street and 60 feet from the lot line facing E. 173rd Street for fuel oil #2 or 20 feet from the lot line facing E. 174th Street and 20 feet from the lot line facing E. 173rd Street for natural gas to avoid any potential significant adverse air quality impacts.

Block 3010, Lot 40 (Parcel 5D): Any new residential and/or commercial development on the above-referenced properties must ensure that the heating, ventilating, and air conditioning stack(s) are located at least 60 feet from the lot line facing E. 174th Street and 60 feet from the lot line facing E. 173rd Street for fuel oil #2 or 20 feet from the lot line facing E. 174th Street and 20 feet from the lot line facing E. 173rd Street for natural gas to avoid any potential significant adverse air quality impacts.

Block 3010, Lot 46 (Parcel 5E): Any new residential and/or commercial development on the above-referenced properties must ensure that the heating, ventilating, and air conditioning stack(s) are located at least 50 feet from the lot line facing E. 174th Street for fuel oil #2 or 20 feet from the lot line facing E.174th Street for natural gas to avoid any potential significant adverse air quality impacts.

Block 3015S, Lot 1 (Parcel 4A): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems and ensure that the HVAC stack(s) are located at least 20 feet from the lot line facing E. 174th Street to avoid any potential significant adverse air quality impacts.

Block 3015S, Lots 3 (part) and 5 (part) (Parcel 4B fronting Boone Avenue): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems and ensure that the HVAC stack(s) are located at least 20 feet from the lot line facing E. 174th Street and 20 feet from the lot line facing E. 173rd Street to avoid any potential significant adverse air quality impacts.

Block 3015S, Lots 3 (part) and 5 (part) (Parcel 4B fronting West Farms Road): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems and ensure that the HVAC stack(s) are located at least 20 feet from the lot line facing E. 174th Street and 20 feet from the lot line facing E. 173rd Street to avoid any potential significant adverse air quality impacts.

Block 3015S, Lots 17 and 18 (Parcel 4C fronting Boone Avenue): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems and ensure that the HVAC stack(s) are located at least 20 feet from the lot line facing E. 174th Street and 20 feet from the lot line facing E. 173rd Street to avoid any potential significant adverse air quality impacts.

Block 3015S, Lots 29 and 31 (Parcel 4C fronting West Farms Road): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems and ensure that the HVAC stack(s) are located at least 20 feet from the lot line facing E. 174th Street and 20 feet from the lot line facing E. 173rd Street to avoid any potential significant adverse air quality impacts.

Block 3015S, Lot 19 (Parcel 4D): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems and ensure that the HVAC stack(s) are located at least 20 feet from the lot line facing West Farms Road and 20 feet from the lot line facing E. 173rd Street to avoid any potential significant adverse air quality impacts.

Block 3015S, Lots 25 and 26 (Parcel 4E): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems and ensure that the HVAC stack(s) are located at least 20 feet from the lot line facing E. 173rd Street and 20 feet from the lot line facing Boone Avenue to avoid any potential significant adverse air quality impacts.

Block 3015S, Lot 34 (part) (Parcel 4F fronting Boone Avenue): Any new residential and/or commercial development on the above-referenced properties must ensure that the heating, ventilating, and air conditioning stack(s) are located at least 80 feet from the lot line facing E. 173rd Street and 80 feet from the lot line facing E. 174th Street for fuel oil #2 or at least 20 feet from the lot facing E. 173rd Street and 20 feet from the lot line facing E. 174th Street for natural gas to avoid any potential significant adverse air quality impacts.

Block 3015S, Lot 34 (part) (Parcel 4F fronting West Farms Road): Any new residential and/or commercial development on the above-referenced properties must ensure that the heating, ventilating, and air conditioning stack(s) are located at least 80 feet from the lot line facing E. 173rd Street and 80 feet from the lot line facing E. 174th Street for fuel oil #2 or at least 20 feet from the lot line facing E. 173rd Street and 20 feet from the lot line facing E. .174th Street for natural gas to avoid any potential significant adverse air quality impacts.

Block 3015N, Lots 50, 56, and 110 (Parcel 6A): Any new residential and/or commercial development on the above-referenced properties must ensure that the heating, ventilating, and air conditioning stack(s) are located at least 70 feet from the s lot line facing E. 174th Street and 70 feet from the lot line facing E. 176th Street and 20 feet from the lot line facing Boone Avenue for fuel oil #2 or at least 20 feet from the lot line facing E. 174th Street and 20 feet from the lot line facing E. 176th Street for natural gas to avoid any potential significant adverse air quality impacts.

Block 3015N, Lots 62, 87, 89 (Parcel 6B): Any new residential and/or commercial development on the above-referenced properties must ensure that the heating, ventilating, and air conditioning stack(s) are located at least 60 feet from the lot line facing E. 176th Street fuel oil #2 or at least 20 feet from the lot line facing E. 176th Street for natural gas to avoid any potential significant adverse air quality impacts.

Block 3015N, Lots 67, 83, 84, and 85 (Parcel 6C): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems and ensure that the HVAC stack(s) are located at least 20

feet from the lot line facing E. 176th Street and 20 feet from the lot line facing E. 174th Street to avoid any potential significant adverse air quality impacts.

Block 3015N, Lot 81 (Parcel 6D): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems to avoid any potential significant adverse air quality impacts.

Block 3015N, Lot 95 (Parcel 6E): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems to avoid any potential significant adverse air quality impacts.

Block 3015N, Lot 96 (Parcel 6F): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems to avoid any potential significant adverse air quality impacts.

Block 3015N, Lot 97 (Parcel 6G): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems and ensure that the HVAC stack(s) are located at least 20 feet from the lot line facing E. 176th Street and 20 feet from the lot line facing Boone Avenue to avoid any potential significant adverse air quality impacts.

Block 3016, Lots 33 and 35 (Parcel 9A): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems to avoid any potential significant adverse air quality impacts.

Block 3016, Lots 36 and 37 (Parcel 9B): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems and ensure that the HVAC stack(s) are located at least 20 feet from the lot line facing E. 177th Street and 20 feet from the lot line facing Rodman Place to avoid any potential significant adverse air quality impacts.

Block 3016, Lots 38 and 42 (Parcel 9C): Any new residential and/or commercial development on the above-referenced properties must ensure that the heating, ventilating, and air conditioning stack(s) are located at least 140 feet from the lot line facing Rodman Place for fuel oil #2 and 40 feet from the lot line facing Rodman Place for natural gas to avoid any potential significant adverse air quality impacts.

Block 3016, Lot 71 (Parcel 9E): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems and ensure that the HVAC stack(s) are located at least 20 feet from the lot line facing West Farms Road and 20 feet from the lot line facing Longfellow Avenue to avoid any potential significant adverse air quality impacts.

The language for restrictive declarations is specified below:

Block 3009, Lot 33 (Parcel 3B, Building 4): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems and ensure that the HVAC stack(s) are located at least 30 feet from the lot line facing E. 172nd Street and 30 feet from the lot line facing E. 173rd Street to avoid any potential significant adverse air quality impacts.

Block 3013, Lots 12, 46, and 29 (Parcel 1, Building 1a): Any new residential and/or commercial development on the above-referenced properties must ensure that the heating, ventilating, and air conditioning stack(s) are located at least 20 feet from the lot line facing E.

172nd Street for fuel oil #2 or use for natural gas to avoid any potential significant adverse air quality impacts.

Block 3014N Lots 15 (part) (Parcel 2N, Building 3c): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems to avoid any potential significant adverse air quality impacts.

Block 3014S Lots 9 (part) (Parcel 2S, Building 2a): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems to avoid any potential significant adverse air quality impacts.

Block 3016, Lots 11, 13, and 21 (Parcel 5, Building 8): Any new residential and/or commercial development on the above-referenced properties must ensure that the heating, ventilating, and air conditioning stack(s) are located at least 20 feet from the lot line facing Rodman Place for fuel oil #2 or use natural gas as the type of fuel for space heating and hot water (HVAC) systems to avoid any potential significant adverse air quality impacts.

Block 3016, Lots 60 and 66 (Parcel 9D): Any new residential and/or commercial development on the above-referenced properties must use natural gas as the type of fuel for space heating and hot water (HVAC) systems and ensure that the HVAC stack(s) are located at least 30 feet from the lot line facing E. 177th Street and 30 feet from the lot line facing Longfellow Avenue to avoid any potential significant adverse air quality impacts.