Chapter 13 : Air Quality

I. INTRODUCTION

This chapter examines the potential for the Proposed Actions to result in significant adverse impacts to air quality due to air pollutant emissions. The public discretionary actions required to implement the Proposed Project have the potential to affect air quality at existing sensitive receptors due to additional traffic, parking facilities, and emissions from boiler stacks. Existing sources of traffic, heating ventilation and air conditioning (HVAC), or industrial activities could also affect the Project Site. In addition, the individual components of the Proposed Project could generate impacts other planned buildings on the Project Site, which are termed "project-on-project" impacts. The air quality analyses followed the procedures outlined in the 2014 *City Environmental Quality Review (CEQR) Technical Manual* and guidance from the New York City (NYC) Department of City Planning and NYC Department of Environmental Protection (DEP). The results were used to determine the potential for the Proposed Actions to cause exceedances of ambient air quality standards, *de minimis* values, or health-related guideline values.

As described in Chapter 1, "Project Description," the Applicant is seeking a set of Proposed Actions in the form of discretionary approvals to include zoning map and text amendments, a large-scale general development (LSGD) special permit, a City Map Amendment to re-establish a portion of Beach 52nd Street south of Rockaway Beach Boulevard to reconnect with Rockaway Freeway, and public funding and/or financing from various City and New York State agencies and/or programs related to affordable housing development on the Project Site. The Project Site is situated in Queens Community District 14 (CD 14). The Proposed Actions would facilitate the Proposed Project to consist of an approximately 2,371,000 gross square feet (gsf) development on the Project Site, comprised of 11 buildings ranging in height between approximately 90 to 200 feet. The Proposed Project would introduce approximately 2,200 income-restricted dwelling units (DUs), of which 1,927 DUs would be income-restricted up to 80% of the Area Median Income (AMI), to include approximately 201 DUs set aside for Affordable Independent Residences for Seniors (AIRS) senior housing, with the remaining 273 DUs restricted to income levels not exceeding 130% of AMI. In addition to the residential DUs, the Proposed Project would include approximately 72,000 gsf of retail space, including a fitness center and a supermarket, approximately 77,000 gsf of community facility space, approximately 24,000 square feet (sf) of publicly-accessible open space, and approximately 973 accessory parking spaces.

The Proposed Project also includes 973 accessory parking spaces, comprised of 754 spaces for residential use, 144 spaces for retail use, and 75 spaces for community facility medical office use. Parking would be distributed across all six sub-sections of the Project Site. Parking would include surface and covered parking facilities on sub-section A; surface, covered and uncovered parking facilities on sub-section B; and covered parking facilities throughout the remaining sub-sections C through F.

The Air Quality analysis is based on a 2034 analysis year, the year at which the Proposed Project would be completed and in full operation.

II. PRINCIPAL CONCLUSIONS

Air quality analyses addressed mobile sources, parking facilities, stationary HVAC systems, and air toxics. The Proposed Project would result in a significant adverse impact on air quality related to mobile sources.

A screening assessment was completed to determine the potential impact of carbon monoxide (CO) and particulate matter (PM) from the additional motor vehicles that would be generated by the Proposed Project. Multiple intersections failed the screen, such that three intersections were selected as worst cases to warrant a detailed analysis of CO, $PM_{2.5}$, and PM_{10}. The maximum predicted $PM_{2.5}$ concentrations at the Rockaway Beach Boulevard/Beach 54th Street/ Beach 53rd Street would exceed National Ambient Air Quality Standards (NAAQS) and result in a significant adverse air quality impact.

A detailed analysis was conducted for CO and $PM_{2.5}$ emissions from the largest parking facility on the Project Site, Building E2. The analysis determined that emissions from that parking facility would not result in a significant adverse air quality impact. As the other parking facilities would result in lesser impacts than the largest parking facility, none of the parking facilities would have a significant adverse air quality impact.

An (E) Designation (E-532) will be mapped on the Project Site to require the use of natural gas and electric package terminal air conditioning (PTAC) units for the residential units. With these measures in place, the emissions from residential heating and cooling would not cause significant adverse air quality impacts to other buildings on the Project Site or any existing sensitive land uses in the area. A screening assessment was completed to determine the potential impact of on-site HVAC systems for the common areas of the buildings. The results of this assessment indicated that emissions from the HVAC systems would not have any potential significant adverse air quality impacts to other buildings on the Project Site or existing sensitive land uses.

DEP and New York State Department of Environmental Conservation (NYSDEC) databases were reviewed to identify permitted industrial facilities within 400-feet of the Project Site, supplemented by field reconnaissance. No active operational permits for industrial operations were identified; consequently, there would be no potential for industrial sources to adversely impact the Proposed Project.

III. METHODOLOGY

Standards and Guidelines

National Ambient Air Quality Standards

National Ambient Air Quality Standards (NAAQS) have been promulgated by The U.S. Environmental Protection Agency (EPA) for six major pollutants, deemed criteria pollutants, because threshold criteria can be established for determining adverse effects on human health. They consist of primary ambient air quality standards, established to protect public health, and secondary ambient air quality standards, established to protect plants and animals and to prevent economic damage. These six pollutants are:

- Carbon Monoxide (CO), which is a colorless, odorless gas produced from the incomplete combustion of gasoline and other fossil fuels.
- Lead (Pb) is a heavy metal principally associated with industrial sources.
- Nitrogen dioxide (NO_2), which 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 formed through a series of chemical reactions between hydrocarbons and nitrogen oxides in the presence of sunlight.
- Inhalable Particulates (PM_{10}/$PM_{2.5}$) are primarily generated by diesel fuel combustion, brake and tire wear on motor vehicles, and the disturbance of dust on roadways. The PM_{10} standard covers those particulates with diameters of 10 micrometers or less. The $PM_{2.5}$ standard covers particulates with diameters of 2.5 micrometers or less.
- Sulfur dioxides (SO_2) are heavy gases primarily associated with the combustion of sulfur-containing fuels such as coal and oil.

Table 13-1 National and New York State Ambient Air Quality Standards shows the New York and NAAQS, as well as monitored concentrations at stations closest to the Project Site.

Table 13-1: National and New York State Ambient Air Quality Standards

Pollutant	Averaging Period	Standard	2017 Concentrations	Monitoring Station
Sulfur Dioxide	1-hour average[e]	197 µg/m^3 (75 ppb)	6.93 ppb	Queens College 2
	3-hour average	1300 µg/m^3 (0.50 ppm)	Not available	Queens College 2
Inhalable Particulates (PM_{10})	24-hour average[a]	150 µg/m^3	35 µg/m^3	Queens College 2
Inhalable Particulates ($PM_{2.5}$)	3-yr average annual mean	12 µg/m^3	7.3 µg/m^3	Queens College 2
	3-yr average of 24-hr[c]	35 µg/m^3	18.9 µg/m^3	Queens College 2
Ozone	8-hr average[b]	0.070 ppm	0.074 ppm	Queens College 2
Carbon Monoxide	8-hour average[a]	9 ppm	0.9 ppm	Queens College 2
	1-hour average[a]	35 ppm	1.8 ppm	Queens College 2
Nitrogen Dioxide	12-month arithmetic mean	100 µg/m^3 (53 ppb)	17.3 ppb	Queens College 2
	1-hr average[d]	188 µg/m^3 (100 ppb)	59.7 ppb	Queens College 2
Lead	Quarterly mean	0.15 µg/m^3	0.0041 µg/m^3	IS 52

Notes: ppm = parts per million; μ /m^3 = micrograms per cubic meter.

a. Not to be exceeded more than once a year.

b. Three-year average of the annual fourth highest daily maximum 8-hour average concentration effective May 27, 2008.

c. Not to be exceeded by the 98th percentile of 24-hour $PM_{2.5}$ concentrations (averaged over 3 years).

d. Three-year average of the 98th percentile of the daily maximum 1-hour average, effective January 22, 2010.

e. Three-year average of the 99th percentile of the daily maximum 1-hour average, final rule signed June 2, 2010.

Sources: NYSDEC; New York State Ambient Air Quality Development Report, 2017

NYC De Minimis Criteria and Interim Guidelines

NYC *de minimis* criteria are used to determine the significance of the incremental increases in CO concentrations that would result from a proposed action. These set the minimum change in an 8-hour average CO concentration that would constitute a significant environmental impact. These criteria indicate that a significant CO impact would occur with:

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

NYC has also established *de minimis* criteria for $PM_{2.5}$. These *de minimis* criteria indicate that a significant $PM_{2.5}$ impact would occur with:

- Predicted increase of more than half the difference between the background concentration and the 24-hour standard;
- Predicted annual average $PM_{2.5}$ concentration increments greater than 0.1 ug/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 locating neighborhood scale monitoring stations); or
- Predicted annual average $PM_{2.5}$ concentration increments greater than 0.3 µg/m^3 at a discrete or ground-level receptor location.

Based on the NYSDEC's annual air quality report (2017), which lists a 24-hour background value of 18.9 ug/m^3 for $PM_{2.5}$ for the Queens College 2 monitor, the *de minimis* criterion for the 24-hour concentration of $PM_{2.5}$ would be 8.1 ug/m^3. An incremental change in the 24-hour concentration of $PM_{2.5}$ p greater than 8.1 ug/m^3 due to the Proposed Project would be considered a significant air quality impact.

New York State Short-Term and Annual Guideline Concentrations

NYSDEC has established Short-Term (one-hour) Guideline Concentrations (SGCs) and Annual Guideline Concentrations (AGCs) for certain toxic or carcinogenic non-criteria pollutants. They are maximum allowable 1-hour and annual concentrations, respectively, that are considered acceptable and below which there should be no adverse effects on the health of the general public. The Occupational Safety and Health Administration (OSHGA) and the National Institute for Occupational Safety and Health (NIOSH) have established standards for these pollutants.

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. However, DEP considers that, for pollutants for which the NYSDEC-established AGC is based on a health risk criteria (i.e., a one-in-a-million cancer risk), impacts less than 10 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 10 as an added safety measure. In determining potential impacts, therefore, DEP considers concentrations within ten times the AGC to be acceptable. Pollutants with no known acute effects have no SGC criteria, but do have AGC criteria. NYSDEC DAR-1 (August 10, 2016) contains the most recent compilation of the SGC and AGC guideline concentrations.

No NAAQs, SGCs, or AGCs exist for emissions of air toxic pollutants that are grouped together such as total solid particulates, total hydrocarbons, or total organic solvents. Therefore, total particulates are not

analyzed, and as recommended by NYCDEP, all solid particulates are assumed to be $PM_{2.5}$. For total organic solvents or total hydrocarbons, the SGCs and AGCs for specific compounds should be obtained and used in an analysis.

State Implementation Plan (SIP)

EPA has currently designated all five NYC counties as moderate non-attainment area for the 2008 eight-hour average ozone standard. On July 19, 2017 NYSDEC announced that the New York Metropolitan Area (NYMA) is not projected to meet the July 20, 2018 attainment deadline and NYSDEC is therefore requesting that EPA reclassify the NYMA to "serious" non-attainment, which would impose a new attainment deadline of July 20, 2021 (based on 2018-2020 monitored data). On April 30, 2018, EPA also designated the NYMA as a moderate non-attainment area for the ozone NAAQS revised in 2015.

Background Concentrations

Background concentrations for SO_2, NO_2, CO, and PM_{10} and $PM_{2.5}$ were derived from the NYSDEC annual report for 2017 and are summarized in **Table 13-2 Background Concentrations**. They are identical to the ambient concentrations shown in Table 13-2 except that the value for PM_{10} is the second highest recorded value whereas the value for PM_{10} in Table 13-2 is the maximum recorded value. The background values for CO are based on the second highest values recorded during the past five years.

Table 13-2: Background Concentrations

Pollutant	Averaging Period	Background Concentrations (ug/m^3)	Monitoring Station
SO_2	1-Hour	18.1	Queens College 2
NO_2	Annual	28.7	Queens College 2
NO_2	1-Hour	112.2	Queens College 2
PM_{10}	24-Hour[b]	31	Queens College 2
$PM_{2.5}$	24-Hour	18.9	Queens College 2
$PM_{2.5}$	Annual	7.3	Queens College 2
CO	1-Hour[a]	2,166	Queens College 2
CO	8-Hour[a]	1,596	Queens College 2

Notes:

a. Based on second highest value from past five years (2013-2017).
b. Second highest during past year

Mobile Source Modeling

A screening analysis was performed to identify intersections that may need more detailed analysis. As detailed in Section IV Preliminary Assessment, the mobile source screening analysis is based on the number of peak-hour auto trips and the number of peak-hour heavy-duty diesel vehicles (HDDV) that would be generated by a proposed project. Modeling with MOVES14b for emission factors and CAL3QHCR for dispersion concentrations conformed to the methods outlined in the *CEQR Technical Manual*. Speeds, volumes, and vehicular classifications were obtained from the traffic study. The pollutants of interest were CO and $PM_{2.5}$.

For those intersections selected for further analysis, the EPA CAL3QHCR model was used to determine future (2034) CO, PM_{10} and $PM_{2.5}$ concentrations from vehicular traffic. CAL3QHCR is a Gaussian dispersion model that determines pollutant concentrations at specified receptor points. It accounts for pollutant emissions from both free-flowing vehicles and vehicles idling at signalized intersections. In conformance to EPA guidance, the queuing algorithm cannot be used for modeling PM. Therefore, the estimation of PM concentrations was based on average speeds that incorporated intersection delay.

Inputs to the model include coordinates for receptors and free-flow approach and departure links, and peak-hour traffic volumes, speeds, and vehicular emission factors for each link.

MOVES2014b was used to obtain pollutant emission factors for free-flow links in grams/vehicle-mile. The vehicular mix and speeds used in MOVES2014b were based on the Project traffic studies summarized in Chapter 12, "Transportation". Inputs pertaining to inspection/maintenance, anti-tampering programs, age distribution, meteorology, etc., were obtained from NYSDEC. The pollutant processes included running exhaust and crankcase running exhaust for CO, PM_{10}, and $PM_{2.5}$, as well as brake and tire wear for PM_{10} and $PM_{2.5}$. A surface roughness of 108 centimeters (cm) was used in the modeling.

MOVES2014b was run for January 1st for the 2034 analysis year for the weekday AM and PM peak periods. Post-processing was carried out to obtain emission factors for use in a Tier I analysis with CAL3QHCR. A Tier I analysis assumes that the worst-case peak-hour traffic is the same for every hour of the day. A more refined Tier II analysis would use traffic volumes, speeds, vehicular mix, and emission factors specific to each hour of the day. The use of the same traffic conditions for all hours of the day is very conservative since traffic volumes would be less and vehicle speeds greater during off-peak hours.

Fugitive dust from re-entrainment of dust was calculated using the formulas given in Section 13.2.1-3 of the EPA Compilation of Emissions Factors document "AP-42". The formulas were based on an average fleet weight that varied according to the vehicular mix for a given roadway and a silt loading factor of 0.4 g/m^2 for paved roads with fewer than 5,000 average daily traffic volumes (ADT) and 0.10 g/m^2 for arterials, as recommended by the *CEQR Technical Manual*. The resulting fugitive dust emissions for PM_{10} and $PM_{2.5}$ were added to the emission factors calculated by MOVES2014b.

As noted above, all links were set up as free-flowing traffic links in CAL3QHCR. Free-flow links were modeled for a distance of 1,000-feet from the modeled intersection in each direction. The mixing zone for free-flow links was equal to the width of the travel way plus an additional ten feet (three meters) on each side of the travel lanes. Idle times were incorporated into the calculated average speeds, which included vehicle delay.

As indicated in the *CEQR Technical Manual*, "sensitive" receptors include 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 were modeled at each intersection to identify the points of maximum potential pollutant concentrations. Receptor points were modeled on the corners of the intersections, and at additional points at twenty-meter intervals along both sides of each intersection leg. Receptors for the short-term averaging periods of CO, PM_{10} and $PM_{2.5}$ were placed at mid-sidewalk and outside the air quality mixing zone. In conformance to standard modeling protocol, receptors for $PM_{2.5}$ for the annual period were placed outside the air quality mixing zone and at least 15 meters from the roadway.

The modeled results were added to background concentrations and compared with the NAAQS. For PM_{10}, the highest modeled value over the five-year meteorological period was added to background concentrations and compared with the NAAQS. For $PM_{2.5}$, the modeled maximum 24-hour concentrations were averaged for the five-year meteorological period to approximate the three-year average of the 98th percentile. The highest annual concentrations also were averaged for the five-year meteorological period. Maximum one- and eight-hour averages were used in the estimation of CO concentrations. The results were added to background concentrations and compared with the NAAQS. The results were compared with the NAAQS, and the differences between the modeled No-Action and With-Action concentrations were compared with the NYC *de minimis* criteria.

Parking Facility Analysis

Parking facilities were analyzed according to procedures specified in the *CEQR Technical Manual* Air Quality Appendices. The information utilized for the analysis includes the dimensions of the parking facilities, idle emission factors, emission factors for 5 mph, and hourly vehicular volumes to and from the parking facilities. The analysis was based on highest hourly total volume of incoming and outgoing vehicles. Surface lots were treated as area sources, and garage vents as point sources.

Emission factors were obtained from MOVES2014b. For vehicles within the garage, no brake wear, tire wear, or calculations of fugitive dust were added to the emission factors. A line source contribution to the parking emissions was completed for the roadway in front of the garage entrance/exit using MOVES2014b emission factors and CAL3QHC/R to determine concentrations as described in the mobile sources section above.

The Metropolitan Transportation Authority (MTA) operates the Far Rockaway Bus Depot near the Project Site as shown in **Figure 13-4: MTA Far Rockaway Bus Depot**. The Far Rockaway Bus Depot maintains two sites located southeast of the Project Site with access off of Rockaway Beach Boulevard; the nearest site is a surface parking lot located on the north side of Rockaway Beach Boulevard, between Beach 49th Street and Beach 50th Street, and the second site improved with the depot facility is located on the south side of Rockaway Beach Boulevard, between Beach 47th and Beach 49th Street. This depot serves local routes Q11, Q21, Q22, and Q35, and express routes QM15, QM16, QM17, and QM18. Of these, the Q22 and QM17 routes run along Beach Channel Drive and pass the Project Site. Scheduling information for the Q22 route is published by the MTA and was used to calculate hourly volumes for use in the parking lot analysis. Information from the MTA on the current types of buses and their fuel types at the Far Rockaway and JFK depots was used to obtain emission factors from MOVES14b. The analysis focused on short-term (1-hour, 8-hour, or 24-hour) emissions of CO, and $PM_{2.5}$ for the calculations of concentrations.

Stationary Source Screen

An assessment was completed of emissions from on-site HVAC stationary sources part of the Proposed Project. In conformance with guidance in the *CEQR Technical Manual*, the assessment of impacts from stationary sources was completed through a multi-step air quality impact assessment procedure. The first step in the analysis was a screening analysis based on the nomographs in in the *CEQR Technical Manual Appendices*. The nomographs represent different fuel types and building uses. For each one, the size of the proposed building is plotted against the distance to the nearest building of similar or greater height (receptor building). If the plotted point is below the applicable curve, the site passes the screen, and no further analysis is necessary. If the plotted point is on or above the applicable curve, the potential for a significant air quality impact exists, and further analysis is required using AERSCREEN or AERMOD modeling. If the distance between the lots is less than 30 feet, a more detailed analysis must be carried out without application of the nomograph.

Stationary Source Modeling

AERMOD is a steady-state Gaussian plume model with three separate components: AERMOD (a dispersion model), AERMAP (a terrain preprocessor), and AERMET (a meteorological preprocessor). AERMOD can model emissions from point, line, area, and volume sources. The model is run with five years of meteorological data that include surface mixing height, wind speed, temperature, and wind direction.

Model Parameters

- The model was run with flat terrain. All buildings and receptors were placed at an elevation of zero (0).
- The one-hour and annual NO_x emissions were run with the Plume Volume Molar Ratio Method (PVMRM) method and ozone files.
- The nearest major airport (JFK) and the Project Site are in urban locations. Therefore, AERMOD's URBAN option was selected. The population used for the urban area was 8,000,000.
- The Building Profile Input Program was run in conjunction with AERMOD.
- The model was run with concatenated meteorological data from JFK Airport for years 2013 through 2017. The upper air station used is Brookhaven, NY. Hourly ozone concentrations for use in modeling NO_2 were obtained from the Queens College 2 monitor.

Stack Parameters

The EPA defines 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 model was run both with and without building downwash to determine which condition would provide worst-case results.
- The stack parameters were based on the DEP CA Permit database and the heat input (with units of 10^6 Btu) of the boilers. The stacks were assigned an exhaust temperature of 307.8° F and inside stack diameters of 1.0 feet. The average exhaust velocity was 7.8 m/s.
- Stacks were assumed to be three feet higher than the roof. They were placed as close as feasible to the receptor building, but at least ten feet from the edge of the roof.
- For NO_2, the PVMRM option was used with an equilibrium ratio of 0.9, and an in-stack ratio of 0.2.

Pollutant Emissions

The applicant has committed to the use of natural gas in the HVAC system. Consequently, emission estimates for NO_2 (one-hour, annual) and $PM_{2.5}$ (24-hour, annual) were based on emission rates for natural gas fired boilers.

Non-residential uses would use natural gas primarily for space heating and hot water. Fuel consumption for these uses were based on an annual consumption rate of 44 cubic feet of natural gas per square foot, which is the consumption rate of all buildings in the northeast, per the Commercial Buildings Energy Consumption Survey *Table C25, Natural gas and conditional energy intensity by Census region, 2012. .* Annual natural gas consumption in cubic feet was used to calculation NOx emissions by emission factor of 100 lb per 1 million cubic feet of natural gas for uncontrolled boilers and 50 lb per 1 million cubic feet of natural gas for low NOx boilers.

Residential uses would use electric package terminal air conditioning (PTAC) units for heating and air conditioning, which do not require the use of natural gas. Therefore, residential demand for natural gas would be limited to cooking and hot water. To estimate the amount of natural gas for these purposes, the commercial/medical square footage was subtracted from the total square footage for each building to

obtain total square footage associated with residential uses, including garage space, laundry facilities, etc.

The fraction of energy consumption used for hot water and cooking was calculated from 2015 Residential Energy Consumption Survey (RECS) data published by the U.S. Energy Information Association. (U.S. EIA). 2015 RECS *Table CE3.2 Annual Household site end-use consumption in the Northeast – totals and averages,* provides energy consumption by housing unit type and end-use. Table CE3.2 indicates that rented apartments use 14.9 million British Thermal Units (Btus) per household for water heating and 20.9 million Btus for space heating. Based on these estimates, energy consumption for water heating represents 42% of total consumption for heating and hot water. This fraction was applied to the residential square footage to obtain the equivalent square footage when natural gas is used for cooking and hot water only.

The residential consumption rate for natural gas was estimated using an energy expenditure of 49.1 thousand Btu per square foot for apartments in buildings with 5 or more units from U.S. EIA, 2015 Residential Energy Consumption Survey, *Table CE1.2 Summary annual household site consumption and expenditures in the Northeast*. The value of 49.1 thousand Btu per square foot was converted to cubic feet of natural gas per square foot by dividing by the heating value of 1,020 Btu per square foot. The resulting value of 48.1 cubic feet of natural gas per square foot was used to estimate an annual consumption rate for the residential square footage.

The annual natural gas usages for the residential and commercial/medical square footage were added together to obtain total annual natural gas usage.

The $PM_{2.5}$ emission factor from natural gas fired boilers is 7.6 lbs/million cubic feet of natural gas as recommended in EPA;s AP-42 document, *Chapter 1.4 Natural Gas Combustion*. The resulting annual emissions were converted to hourly emission rates in grams per second based on a worst case of 2,400 hours per year for short-term averaging periods for non-residential uses and 8,760 hours per year for short-term averaging periods for non-residential uses and all annual averaging periods.

For $PM_{2.5}$, the AERMOD model was run with an emission rate of 1 g/s for the 24-hour and annual periods. The results were then multiplied by the actual emission rates for those periods to obtain $PM_{2.5}$ concentrations. For NO_2, the actual emission rates for one-hour and annual periods were used in the AERMOD runs. AERMOD runs involving multiple sources, such as clusters of source buildings, used the actual emission rates for one-hour and annual periods.

Receptors

Receptors were placed across the façades facing the source buildings at window height.

IV. PRELIMINARY ASSESSMENT

Preliminary assessments were carried out for potential impacts from mobile sources, parking facilities, HVAC, and air toxics.

Mobile Source Air Quality

Localized increases in CO and PM levels may result from increased vehicular traffic volumes and changed traffic patterns in the study area due to the Proposed Actions. The mobile source analysis outlined in the *CEQR Technical Manual* considers actions that add new vehicles to roadways or change traffic patterns, either of which may have significant adverse air quality impacts. Accordingly, a screening level assessment was completed for CO and $PM_{2.5}$ to determine whether traffic generated by the Proposed Project would have the potential to cause a significant air quality impact.

- The screening threshold for CO in this area of Queens is 170 auto trips through an intersection during a peak hour period.
- The screen for $PM_{2.5}$ calculates the number of heavy duty diesel vehicles (HDDVs) that would generate emissions equivalent to the project-generated vehicular increments. The equivalent number of HDDVs varies by type of roadway. A more detailed analysis is required if a proposed action would meet or exceed the following thresholds:

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

Since the screen for $PM_{2.5}$ considers roadway type, the first step was to identify the roadway classifications for roadways within the traffic study area. The New York State Department of Transportation (NYSDOT) functional classifications for the affected roadways, all of which are urban roads, is shown in **Table 13-3: NYSDOT Functional Classifications for Roadways in the Study Area**. For screening purposes, local roads are treated as paved roads with ADT of fewer than 5,000 vehicles.

Table 13-3: NYSDOT Functional Classifications for Roadways in the Study Area

Roadway	From	To	NYS Urban Code	Urban Classification
Beach Channel Dr.	Rockaway Freeway	Beach 73rd St.	14	Principal Arterial
Beach Channel Dr.	Beach 73rd St.	Mott Avenue	16	Minor Arterial
Rockaway Beach Blvd.	Beach 73rd St.	Beach 56th St.	16	Minor Arterial
Rockaway Beach Blvd.	Beach 54th St.	Beach 37th St.	19	Local
Arverne Blvd.	Beach 62nd St.	Beach 54th St.	19	Local Street
Edgemere Avenue	Beach 56th St.	Sea Girt Blvd.	16	Minor Arterial
Rockaway Freeway	Beach Channel Dr.	Beach 84th St.	16	Minor Arterial
Peninsula Way	Beach Channel Dr.	Rockaway Beach Blvd.	NA	Local Street
Beach 32nd St.	Dead End	Cul de sac	19	Local Street
Beach 35th St.	Dead End	Norton Ave.	19	Local Street
Beach 47th St.	Edgemere Ave.	Norton Ave.	19	Local Street
Beach 50th St.	Rockaway Beach Blvd.	Beach Channel Dr.	19	Local Street
Beach 52nd St.	Dead End	Rockaway Beach Blvd.	19	Local Street
Beach 53rd St.	Rockaway Beach Blvd.	Beach Channel Dr.	19	Local Street
Beach 54th St.	Rockaway Beach Blvd	Alameda Ave.	19	Local Street
Beach 59th St.	Dead End	Beach Channel Dr.	19	Local Street
Beach 62nd St.	Beach Front Rd.	Thursby Ave.	19	Local Street
Beach 73rd St.	Rockaway Freeway	Beach Channel Dr.	19	Local Street
Beach 116th St.	Ocean Promenade	Beach Channel Dr.	17	Major Collector

Source: *New York State Functional Class Maps.*

Table 13-4: 2034 Traffic Volume Increments > 170 shows the projected traffic volumes for roadways in the study area for 2034 that exceed an increment of 170 vehicles, the screening threshold for CO. These volumes would also exceed the screening thresholds for $PM_{2.5}$ for collectors and local roads.

Table 13-4: 2034 Traffic Volume Increments ≥ 170

ID	Intersection	Increment (Auto Trips/Peak Hour)			
		AM	Midday	PM	Saturday
1	Beach Channel Dr & Beach 116th St	**223**	150	**247**	**215**
4	Beach Channel Dr & Rockaway Fwy	**218**	152	**233**	**204**
13A	Beach Channel Dr & Beach 73rd St	**263**	**193**	**283**	**247**
13B	Beach Channel Dr & Beach 73rd St	91	97	**177**	124
15W	Beach Channel Dr & Beach 62nd St (W)	**287**	**220**	**309**	**269**
15E	Beach Channel Dr & Beach 62nd St (E)	**287**	**220**	**309**	**269**
16	Rockaway Beach Blvd & Beach 62nd St	**213**	**174**	**239**	**207**
19	Arverne Blvd & Beach 59th St	**187**	130	**190**	**174**
21	Rockaway Beach Blvd & Beach 59th St	**213**	**174**	**239**	**207**
23	Arverne Blvd & Beach 54th St	**315**	**244**	**367**	**313**
24	Rockaway Fwy & Beach 54th St	**197**	**178**	**234**	**196**
25	Edgemere Ave & Beach 54th St	160	146	**205**	167
26	Beach Channel Dr & Beach 53rd St	**212**	162	**218**	**194**
27	Rockaway Beach Blvd & Beach 53rd St	**332**	**259**	**395**	**340**
28	Rockaway Beach Blvd & Beach 52nd St	**256**	**228**	**270**	**228**
30	Beach Channel Dr & Beach 50th St	**251**	**219**	**259**	**229**
36	Beach Channel Dr & Beach 47th St	**236**	**210**	**250**	**217**
40	Beach Channel Dr & Beach 35th St	**217**	**186**	**229**	**199**
32	Beach Channel Dr & Beach 52nd St	133	119	155	150
33	Peninsula Way & Beach 53rd St	**217**	158	**255**	**233**
34	Peninsula Way & Beach 52nd St	**271**	**261**	**286**	**239**
35	Peninsula Way & Beach 50th St	**299**	**263**	**253**	**204**

Note: Numbers in bold type exceed 170 vehicles.

To identify the worst-case intersections for assessment of $PM_{2.5}$, the increments shown in the table were subjected to a more detailed screening that considered roadway type and the addition of trucks associated with the proposed supermarket use. Based on the preliminary traffic data, a detailed analysis of CO and $PM_{2.5}$ from mobile sources was warranted, and three worst-case intersections were selected for the detailed analysis. The EPA MOVES14b model was used to estimate mobile source air pollutant emissions, and CAL3QHCR was used for air pollutant dispersion modeling to determine the potential for exceeding the City's *de minimis criteria* and NAAQS. The following three intersections were selected for detailed analysis because they are projected to have the greatest changes in emissions due to traffic volume:

- Rockaway Beach Boulevard/Beach 53rd Street,
- Arverne Boulevard/Beach 54th Street, and
- Beach Channel Drive/Beach 50th Street.

Modeling of CO, PM_{10}, and $PM_{2.5}$ was completed for the three intersections using MOVES 2014b and CAL3QHCR in a Tier I analysis as detailed below in Section V, "Detailed Assessment". No modeling of

the Rockaway Freeway was warranted because it has low existing volumes and would experience very little additional traffic due to the Proposed Project. Therefore, intersections with this roadway would not constitute a worst-case for traffic increments.

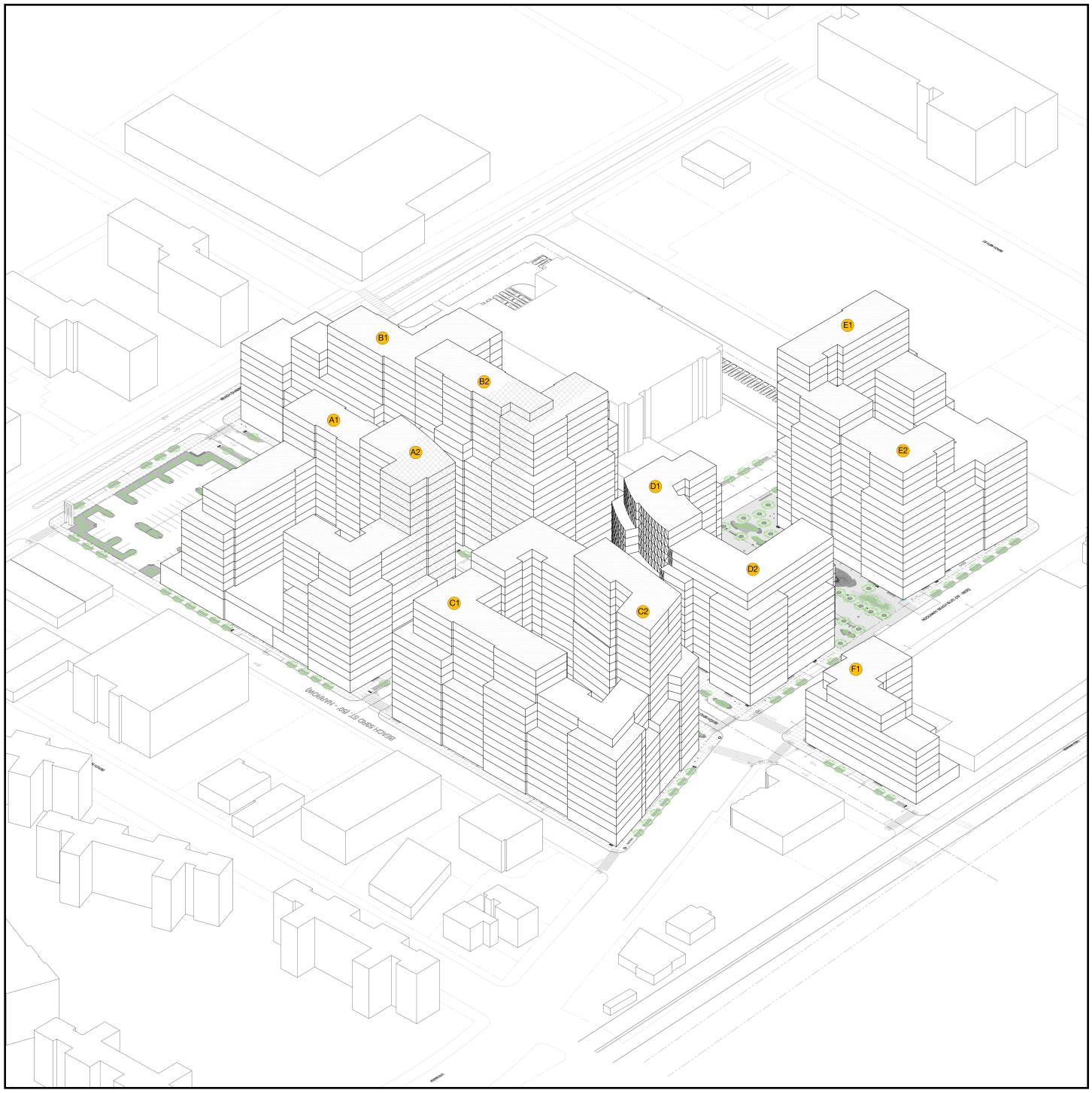
Parking Facilities

The net increase in parking spaces for the Proposed Project (406) would exceed the CEQR assessment threshold warranting a parking facility analysis (85). Therefore, a parking analysis was carried out for CO and $PM_{2.5}$. MTA Far Rockaway Depot on Beach 50th Street and Rockaway Beach Boulevard was also analyzed due to its size and proximity to the Proposed Action. These analyses are described in Section V, “Detailed Assessment.”

Heating Ventilation and Air Conditioning (HVAC)

Actions can result in stationary source air quality impacts when they create new stationary sources of pollutants that can affect surrounding uses (such as exhaust from boiler stack(s) used for heating/hot water, ventilation, or air conditioning systems); when they locate new sensitive uses (schools, hospitals, residences) near such stationary sources; and when new emission sources are located within a short distance of each other. **Figure 13-1: Axonometric View of Proposed Project** shows how the buildings would appear under the Proposed Action.

Since the applicant has committed to the use of natural gas as the fuel for boilers, the pertinent nomographs from the *CEQR Technical Manual Appendices* are Figure 17-7 (NO_2 boiler screen for residential natural gas). As discussed in Section III, Methodology, the square footage used for the nomographs was based on U.S. EIA energy consumption estimates for heating and hot water use to obtain the equivalent square footage.



Source: Aufgang Architects
Note: For illustrative purposes only

EDGEMERE, QUEENS

AXONOMETRIC VIEW OF PROPOSED PROJECT

Figure 13-1

Peninsula Hospital Site Redevelopment

Impact of the Proposed Actions on Existing Buildings

As depicted in **Figure 13-1: Axonometric View of Proposed Project**, the buildings developed as part of the Proposed Project would be higher than existing buildings on adjacent lots. Therefore, the worst potential impacts of the proposed HVAC system would be project-on-project impacts.

Project-on-Project Impacts

The Proposed Project would be comprised of 11 buildings of varying heights within close proximity to each other. Each building would have its own HVAC system. PTAC units will be used to heat residential units. Electric heating will be used to heat lobbies, recreation rooms, and laundry rooms. The mechanical space and enclosed parking will be unheated.

Since PTAC units are planned for use in the residential units, the residents would use natural gas only for cooking and hot water. Non-residential space planned for retail, supermarket, and medical uses would use natural gas only for space heating and hot water. **Table 13-5: HVAC Screen for Project-on-Project Impacts, Natural Gas** shows equivalent square footages for residential natural gas consumption when factors are included that account for the limited use of natural gas in residential units. Stacks were conservatively assumed to be three feet higher than the highest roof (GEP) for a given building. The distances between emissions sources and buildings were conservatively assumed to be the distance between buildings.

The nomograph from the *CEQR Technical Manual* that was used for the screening was Figure 17-7 NO_2 Boiler Screen for Residential Development – Natural Gas. The resulting nomographs are provided as an appendix to this chapter. Most of the buildings screened out where the receiver building was more than 30 feet way. All of the buildings that are 200 feet high screened out. Buildings A1, B1, C1, D2, and E2 have the potential to cause project-on-project impacts to taller buildings and require more detailed analysis. These analyses are described in Section V, “Detailed Assessment.”

The configuration of buildings also has the potential to cause cumulative impacts from two or more stacks, or “clusters”, that could affect a receiver building at the same time. An assessment of these clusters of stacks is provided in Section V, “Detailed Assessment,” and include the following:

- Emissions from A1 and B1 on A2,
- Emissions from A1 and B1 on B2, and
- Emissions from D1 and D2 on C2.

Table 13-5: HVAC Screen for Project-on-Project Impacts, Natural Gas

Source Building	Bldg Height (ft)	Stack Ht. (ft.)	Total Building sf	CEQR Equivalent Residential Use sf	Receiver Building		Source-Receiver Distance (ft)	Comments
					ID	Height (f)		
A1	180	183	239,000	90,320	A2	200	<30'	Use AERMOD
A1	180	183	239,000	90,320	B2	190	85	Screens out
A2	200	203	243,000	84,379	C2	200	200	Screens out
A2	200	203	243,000	84,379	E1	200	380	Screens out
B1	160	163	277,000	99,144	B2	190	<30'	Use AERMOD
B1	160	163	277,000	99,144	A1	180	80	Screens out
B2	190	193	282,000	98,407	A2	200	75	Screens out
C1	150	153	278,000	94,213	C2	200	<30'	Use AERMOD
C1	150	153	278,000	94,213	A2	200	85	Screens out
C2	200	203	308,000	108,434	E1	200	350	Screens out
C2	200	203	308,000	108,434	A2	200	200'	Screens out
D1	150	153	119,000	42,761	C2	200	75	Screens out
D1	150	153	119,000	42,761	B2	190	65	Screens out
D2	130	133	152,000	54,755	D1	150	<30'	Use AERMOD
D2	130	133	152,000	54,755	C2	200	85	Screens out
D2	130	133	152,000	54,755	E2	150	75	Screens out
E1	200	203	269,000	107,379	A2	200	380'	Screens out
E1	200	203	269,000	107,379	C2	200	350'	Screens out
E2	150	153	184,000	77,356	E1	200	<30'	Use AERMOD
F	90	93	72,000	24,401	D2	150	85	Screens out

Large or Major Sources

In conformance to guidance in the *CEQR Technical Manual*, an assessment was completed of the potential impact of major emission sources, including solid waste or medical waste incinerators, cogeneration facilities, asphalt and concrete plants, or power generating plants on the Proposed Project. Existing land uses within 1,000 feet of the Project Site that are likely to have large boilers, such as the school buildings, hospitals, NYCHA buildings, or other facilities or medical buildings, may also have permits and could affect the Proposed Project. Such sources were also considered in the assessment.

No large or major sources were identified within the 1,000-foot study area based on a review of air quality operating permits found in the State Facility and Title V permits on the NYSDEC website. The NYC Housing Authority (NYCHA) Bayside housing development is located approximately 350 feet from the Project Site and was assessed to determine if the development would act as a major emission source to result in potential adverse impacts to the Proposed Project. Covering three blocks, the housing development consists of 31 nine-story buildings comprising over 1.3 million sf. Two DEP permits were found. CA147183 is a work permit for a boiler. It was cancelled in 1983 and therefore not issued. As a work permit, it would not have been a source of air pollutant emissions. CB083602 was a certificate to operate for three boilers using natural gas, each with a heat input of 12.558 million Btu/hr. The permit was rejected in 2002, and therefore no further analysis is required.

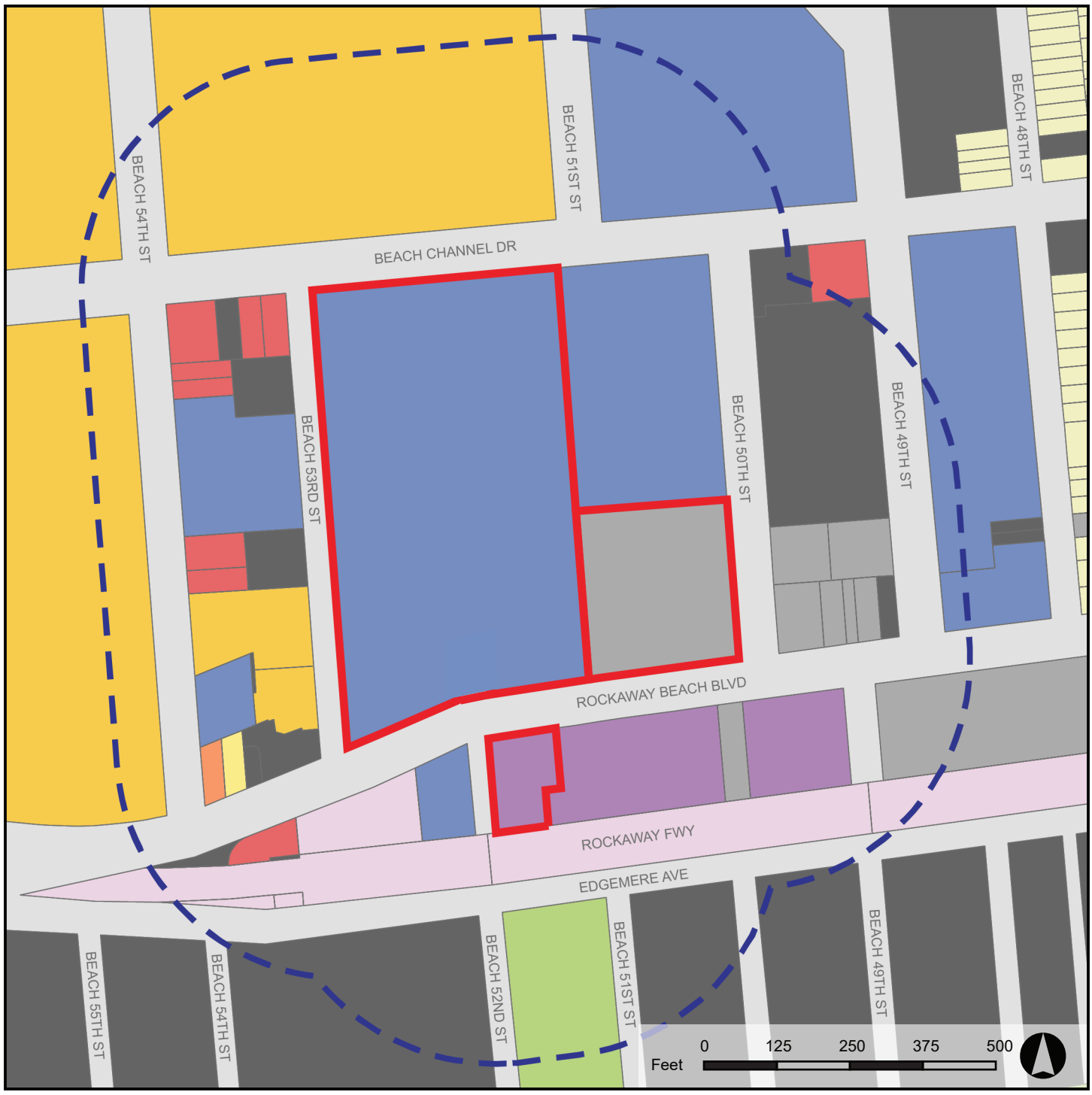
Based on this available information, no further analysis of existing major emissions sources on the Proposed Actions is required.

Air Toxics and Odors

- A manufacturing survey for potential toxic air emissions within 400 feet of the Project Site was completed in conformance to the guidelines in the *CEQR Technical Manual*. Existing facilities with the potential to cause adverse air quality impacts are those that would require permitting under City, state, and federal regulations. The following types of uses are a source of concern for air toxics: A medical, chemical, or research laboratory nearby;
- A manufacturing or processing facility within 400 feet; and
- An odor producing facility within 1,000 feet.

To identify facilities in the categories listed above, online searches were completed of the NYSDEC Air Permit Facilities Registry and the EPA Facility Registry System for permitted facilities, DOB online data, the NYC Open Accessibly Space Information System (OASIS), telephone directory listings, available aerial photos provided by Google and/or Bing, internet websites, and a search of permits from the DEP and the NYC Bureau of Environmental Compliance (BEC), and field reconnaissance.

Figure 13-2: Project Site and Land Uses within 400 Feet of the Project Site shows several industrial sources within the 400-foot radius. The sites are listed in **Table 13-6: Sites of Interest for Air Toxics within 400 feet of the Project Site**.



Source: 2018 Pluto, DCP

Project Site

400-Foot Radius

One & Two Family Residence

Multi-Family Residence (Walkup)

Multi-Family Residence (Elevator)

Mixed Residential & Commercial

Commercial Use

Industrial / Manufacturing

Transportation / Utility

Public Facilities & Institutions

Open Space & Recreation

Parking

Vacant Land

PROJECT SITE AND LAND USES WITHIN 400 FEET OF PROJECT SITE

Figure 13-2

Table 13-6: Sites of Interest for Air Toxics within 400 feet of Project Site

ID	Address	Block	Lot	Land Use Code	Notes	Comments
1	49-15 Rockaway Beach Boulevard	15857	42	E1- Warehouse	TKO Total Kitchen Outfitters	No permits found
2	49-15 Rockaway Beach Boulevard	15857	42	E1- Warehouse	A.P.E.C	No permits found
3	49-15 Rockaway Beach Boulevard	15857	42	E1- Warehouse	North American Van Lines Moving/Storage	No permits found
4	50-01 Rockaway Beach Boulevard	15857	7	F9- Factory/Industrial	Singh Hardwoods	No permits found
5	366 Beach 54th Street	15890	55	K1- One-story retail	Dry Cleaners	No permits found; likely vacant based on field observations
6	48-09 Rockaway Beach Boulevard	15855	1	G1- Parking garage	Bus Depot	No permits found

Provided below is an assessment of the potential for each of these sources to result in a potential impact on the Proposed Project:

- TKO Total Kitchen Outfitters, at 49-15 Rockaway Beach Boulevard (Block 15857, Lot 42), is a cabinet maker specializing in cabinets and kitchen remodeling. No online permits were found relating to painting or other activities that could generate particulates on-site.
- Singh Hardwoods, at 50-01 Rockaway Beach Boulevard (Block 15857, Lot 7), mills new and reclaimed wood on-site just 70 feet south of the Project Site and 100 feet east of the southernmost Proposed Project. No online permits were identified. DCP will contact the DEP Bureau of Environmental Compliance regarding the dust collection equipment installed by Singh Hardwoods. If DEP decides that this facility needs an operation permit, and issues one, air toxic impact analysis will be performed between the Draft and Final Environmental Impact Statement.
- The Far Rockaway Depot at 48-09 Rockaway Beach Boulevard (Block 1585, Lot 1) services buses for the MTA former Green Lines routes. No online permits were identified.
- The dry cleaners at 366 Beach 54th Street (Block 15890, Lot 55) did not appear to be in business during field assessment and, consequently, will not be considered in the assessment.

V. DETAILED ASSESSMENT

Existing Conditions

The area in the vicinity of the Project Site contains a mix of land uses in low- to mid-rise buildings. The NYCHA Ocean Front Apartments (Bayside) are to the north and west of the Project Site and range between seven and nine stories in height. Several commercial properties are also located west of the Project Site, including a possible drycleaner on Beach 54th Street. Farther north is the Rockaway Community Park. The JFK Airport is located within two miles north of the Project Site. Across the street to the south of the Project Site are three industrial properties, two of which are listed as factory uses by the NYC Department of Finance and one of which is listed as a warehouse use. Farther south is the Rockaway Beach and Boardwalk and the Rockaway Freeway. Rockaway Freeway has an elevated pathway that carries rail lines and an at grade pathway that carries motor vehicles. To the east of the

Project Site are vacant, commercial, and institutional properties. The Public School 105, Bay School, is approximately 220 feet east of the Project Site.

Future without the Proposed Actions (No-Action Condition)

In the future absent the Proposed Actions (the "No-Action" condition), an as-of-right residential development and supporting retail space would be developed on the Project Site that would be comprised of 12 buildings, including approximately 482,523 gsf of residential space (providing 568 DUs); 21,659 gsf of retail space; 800 gsf of community facility (medical) space; and 557 accessory parking spaces comprised of 483 residential spaces, 72 retail spaces, and two spaces for community facility medical office use. Of the 557 parking spaces, 457 would be provided on surface parking lots and 100 would be in an enclosed parking garage in the center of the northern portion of the Project Site. The No-Action condition would result in approximately 544,982 gsf of development on the Project Site.

Mobile Source Air Quality

Mobile source air quality impacts for PM_{10} and $PM_{2.5}$ were analyzed for the No-Action condition to establish a baseline against which the impacts of the Proposed Actions can be assessed. The EPA MOVES2014b mobile source emissions model was used to obtain emission factors, and CAL3QHCR was used to estimate pollutant concentrations as described in the Methodology section.

Table 13-7: Mobile Source CO (µg/m^3), 2034 No-Action Condition summarizes the results for CO. All concentrations are within the NAAQS.

Table 13-7: Mobile Source CO (ppm), 2034 No-Action Condition

Intersection	1-Hour Modeled Concentration	Background	Total	NAAQS
Rockaway Beach Blvd/ Beach 54th Street/ Beach 53rd Street	0.14	1.90	2.04	35
Beach Channel Drive/ Beach 50th Street	0.04	1.90	1.94	35
Intersection	**8-Hour Modeled Concentration**	**Background**	**Total**	**NAAQS**
Rockaway Beach Blvd/ Beach 54th Street/ Beach 53rd Street	0.10	1.40	1.50	9
Beach Channel Drive/ Beach 50th Street	0.03	1.40	1.43	9

Table 13-8: Mobile Source PM_{10} (µg/m^3), 2034 No-Action Condition summarizes the results for PM_{10}. All concentrations are within the NAAQS.

Table 13-8: Mobile Source PM_{10} ($\mu g/m^3$), 2034 No-Action Condition

Intersection	24-Hour Modeled Value ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
Rockaway Beach Blvd/ Beach 54th Street/ Beach 53rd Street	45.0	31	76.0	150
Beach Channel Drive/ Beach 50th Street	12.0	31	43.0	150

Table 13-9: Mobile Source $PM_{2.5}$ ($\mu g/m^3$), 2034 No-Action Condition shows the modeled results for $PM_{2.5}$. All concentrations are within the NAAQS.

Table 13-9: Mobile Source $PM_{2.5}$ ($\mu g/m^3$), 2034 No-Action Condition

Time Period	Intersection	Modeled Average ($\mu g/m3$)	Background ($\mu g/m^3$)	Total ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
24-Hour	Rockaway Beach Blvd/Beach 54th Street/Beach 53rd Street	10.1	18.9	29.0	35
Annual		0.6	7.3	7.9	12
24-Hour	Beach Channel Drive/Beach 50th Street	3.4	18.9	22.3	35
Annual		0.1	7.3	7.4	12

Future with the Proposed Actions (With-Action Condition)

In the future with the Proposed Actions (the "With-Action" condition), the Applicant plans to construct the Proposed Project to consist of approximately 2,423,000 gsf of mixed-use development, to include mechanical gsf, distributed across 11 buildings on six sub-sections of the Project Site (A, B, C, D, E, and F), with sub-sections A through E on the North Parcels of the Project Site and sub-section F on the South Parcel of the Project Site. The Proposed Project would include of approximately 2,200 residential DUs in approximately 1,858,000 gsf, approximately 72,000 gsf of retail space, approximately 77,000 gsf of community facility programmed for medical office space, approximately 364,000 gsf of parking space, and approximately 24,000 sf of open space. Retail and residential uses would be distributed across sub-sections A through D of the Project Site, while residential and community facility spaces programmed for medical uses are anticipated to be located on sub-section E, and sub-section F would be utilized entirely for residential use. Parking would be distributed across all six sub-sections of the Project Site. Building heights for the Proposed Project would range from approximately 90 to 200 feet.

Approximately 973 accessory parking spaces would be provided, comprised of 754 accessory parking spaces for residential use, 144 accessory parking spaces for retail use, and 75 accessory parking spaces for community facility medical office use. Parking would include surface and covered parking facilities on sub-section A; surface, covered and uncovered parking facilities on sub-section B; and covered parking facilities throughout the remaining sub-sections C through F.

Mobile Source Air Quality

As described in Section III, "Methodology," mobile source air quality modeling was completed using the MOVES2014b mobile source emissions model and CAL3QHCR air quality dispersion model. **Table 13-10: Mobile Source CO (µg/m3), 2034 With-Action Condition** shows the results of the CAL3QHCR modeling for CO. **Table 13-11: Mobile Source PM_{10} (ug/m3), 2034 With-Action Condition** shows the results for PM_{10} and $PM_{2.5}$, respectively. For PM_{10}, the 24-hour modeling results were added to background concentrations and compared to the PM_{10} NAAQS of 150 ug/m^3. The total is below the NAAQS of 150 ug/m^3, and no significant adverse impacts are projected.

Table 13-10: Mobile Source CO (µg/m^3), 2034 With-Action Condition

Intersection	1-Hour Modeled Concentration	Background	Total	NAAQS
Rockaway Beach Blvd/ Beach 54th Street/ Beach 53rd Street	0.15	1.90	2.05	35
Beach Channel Drive/ Beach 50th Street	0.06	1.90	1.96	35
Intersection	**8-Hour Modeled Concentration**	**Background**	**Total**	**NAAQS**
Rockaway Beach Blvd/ Beach 54th Street/ Beach 53rd Street	0.11	1.40	1.51	9
Beach Channel Drive/ Beach 50th Street	0.04	1.40	1.44	9

Table 13-11: Mobile Source PM_{10} (ug/m^3), 2020 With-Action Condition

Intersection	24-Hour Modeled Value (µg/m3)	Background (µg/m3)	Total (µg/m3)	NAAQS (µg/m3)
Rockaway Beach Blvd/ Beach 54th Street/ Beach 53rd Street	53.2	31	84.2	150
Beach Channel Drive/ Beach 50th Street	14.0	31	45.0	150

For $PM_{2.5}$, the incremental changes in $PM_{2.5}$ concentrations were also compared to the NYC *de minimis* criteria of 8.1 µg/m^3 for the 24-hour averaging period and 0.3 for the annual period. The comparison is made between the highest five-year average for the No-Action condition and the highest five-year average for the With-Action condition. The maximum predicted $PM_{2.5}$ concentrations at the Rockaway Beach Boulevard/Beach 54th Street/ Beach 53rd Street would exceed NAAQS and result in a significant adverse air quality impact. Therefore, traffic mitigation measures were examined to avoid the potential significant adverse impact at the Rockaway Beach Boulevard/Beach 53rd Street intersection location. Mitigation measures are discussed in Chapter 20, "Mitigation."

On-Site Parking Facilities

Each of the 11 buildings would have covered parking. Sub-sections D and F would have covered parking on the ground floor only; sub-sections B, C, and E would have covered parking up to the second floor; and sub-section A would have covered parking up to the third floor. In addition, a surface lot with approximately 63 spaces would be located at the corner of Beach Channel Drive and Beach 53rd Street, and a surface lot with approximately 20 spaces would be located at the driveway access to Building B1 off of Beach Channel Drive. Parking entrances would be available throughout the Project Site, as shown on **Figure 13-3: Parking Facility Driveways on the Project Site**. Five of the entrances would be on the roadways bounding the site and two would be on Peninsula Way within the site. **Table 13-12, Parking Lot Volumes, 2034 Action Conditions** shows the volumes in and out of the facilities by peak period.



Source: Aufgang Architects
Note: For illustrative purposes only

EDGEMERE, QUEENS

Parking Facility Driveway

PARKING FACILITY DRIVEWAYS ON PROJECT SITE

Figure 13-3

Peninsula Hospital Site Redevelopment

Table 13-12: Parking Lot Volumes, 2034 With-Action Condition

Parking Lot Location			AM			Midday			PM			Saturday		
Drive-way	Road Access	Building	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
P 1	Beach Channel Dr.	A1 Lot	8	8	16	10	11	21	17	19	36	56	7	63
P 2	Beach 53rd St.	A1/A2 Garage	12	66	78	19	19	38	61	26	87	37	37	74
P 3	Beach 53rd St.	C1/C2 Garage	18	101	119	30	30	60	92	40	132	56	57	113
P 4	Rockaway Beach Blvd.	D1/D2 Garage	10	59	69	18	18	36	53	23	76	33	33	66
P 5	Peninsula Way	B2 Garage	15	81	96	25	25	50	74	32	106	46	46	92
P 6	Beach Channel Dr.	B1 Lot, Garage	9	6	15	23	19	42	21	23	44	29	24	53
P 7	Beach 52nd St.	F1 Garage	2	11	13	4	4	8	11	4	15	7	7	14
P 8	Peninsula Way	E1/E2 Garage	273	124	397	204	196	400	188	165	353	134	131	265

As shown in **Table 13-12**, the peak parking lot volume occurs at the garage serving buildings E1 and E2 during the weekday Midday peak period, during which 204 vehicles arrive at the garage and 196 vehicles depart from the garage. Therefore, it was selected for detailed analysis. Emissions from this garage would be the greatest (worst case) of the proposed garages.

The garage analysis was completed in conformance to guidelines provided in the *CEQR Technical Manual* Appendices. The EPA MOVES2014b mobile source emissions model was used to obtain CO and $PM_{2.5}$ emission factors for idling vehicles, and vehicles entering and exiting the garage. For MOVES14b, idle emissions were treated as a link with a length of 0 feet, and the emission factor was obtained as grams per hour.

Exiting vehicles were assumed to idle for one minute before departing, and speeds within the facility were assumed to be 5 mph. Emissions from vehicles traversing Peninsula Way were modeled as a line source and included in the analysis. The parking garage for building E2 would exhaust emissions from a vent above the garage entrance facing Peninsula Way located 16 feet above ground level. Concentrations at receptor points included:

- The near sidewalk on Peninsula Way in front of the garage;
- The far sidewalk on Peninsula Way in front of the garage; and
- A window above the garage vent.

No calculations were carried out for a window across from the garage since the nearest building on the opposite side of Peninsula Way is at least 100 feet from the roadway. The line source contribution for Peninsula Way was not included for the near sidewalk because wind blowing from the vent towards the near sidewalk would not pass over and pick up pollutant concentrations from the roadway.

Tables 13-13: CO Pollutant Concentrations from E2 Building Garage and **Table 13-14: $PM_{2.5}$ Pollutant Concentrations from E2 Building Garage** summarize the $PM_{2.5}$ calculations for the proposed parking garage for sub-section E.

Table 13-13: CO Pollutant Concentrations from E2 Building Garage (ppm)

Vent above Peninsula Way Entrance						
CO Concentrations	**Near Sidewalk**		**Far Sidewalk**		**Window Above Vent**	
Distance to Vent (ft.)	7.5		70.5		0	
Vent Height (ft.)	16		16		16	
Receptor Height (ft.)	6		6		30	
Averaging Period	1-Hour	8-Hour	1-Hour	8-Hour	1-Hour	8-Hour
Garage CO	0.15	0.10	0.11	0.08	0.06	0.04
Line Source	NA	NA	0.01	0.00	NA	NA
Background Value	1.9	1.4	1.9	1.4	1.9	1.4
Total Concentration	2.05	1.5	2.02	1.48	1.96	1.44
NAAQS	35	9	35	35	9	35
Impact	**No**		**No**		**No**	

Table 13-14: $PM_{2.5}$ Pollutant Concentrations from E2 Building Garage

Stack above Peninsula Way Entrance						
$PM_{2.5}$ Concentrations	**Near Sidewalk**		**Far Sidewalk**		**Window Above Vent**	
Distance to Vent (ft.)	7.5		70.5		0	
Vent Height (ft.)	16		16		16	
Receptor Height (ft.)	6		6		30	
Averaging Period	24-Hour	Annual	24-Hour	Annual	24-Hour	Annual
Garage $PM_{2.5}$ (ug/m3)	1.33	0.27	0.97	0.19	0.71	0.14
Line Source (ug/m^3)	NA	NA	1.8	0.2	NA	NA
Background Value (ug/m^3)	18.9	7.3	18.9	7.3	18.9	7.3
Total Concentration (ug/m^3)	20.23	7.57	21.67	7.69	19.61	7.4
NAAQS	35	12	35	12	35	12
NYC *De Minimis* (ug/m^3)	8.1	$\leq$0.3	8.1	$\leq$0.3	8.1	$\leq$0.3
Impact	**No**		**No**		**No**	

The results of this analysis indicate that no significant adverse air quality impacts would occur due to emissions from the parking facility with the largest projected volume. Therefore, no impacts are anticipated for garages with lower volumes.

MTA Bus Parking Lot

The MTA operates the Far Rockaway Bus Depot in the vicinity of the Project Site as depicted in **Figure 13-4**.



Source: GoogleEarth Pro 2017

Project Site

MTA Bus Depot

MTA FAR ROCKAWAY BUS DEPOT

Figure 13-4

The Far Rockaway Bus Depot is located at 49-19 Rockaway Beach Boulevard between Beach 49th Street and Beach 47th Street on Block 15855, Lot 1. Although the lot area is 90,656 sf, less than half of it is used for bus storage and movement. The lot dimensions were obtained from OASIS, the NYC Digital Tax Maps, and GoogleEarth. Based on this information, the width used by the buses is estimated to be 166.05 feet, and the length is estimated to be 265 feet, resulting in a total lot area of approximately 44,002 sf. It also includes a small maintenance facility on Block 15841, Lots 3, 5, 7, 8, 10, 14, and 70, but this lot is used for storage of buses; no painting or other heavy duty maintenance is carried out.

The Far Rockaway Bus Depot serves local routes Q11, Q21, Q22, and Q35, and express routes QM15, QM16, QM17, and QM18. Of these, the Q22 local bus schedule was used to determine the peak periods of activity. Q22 buses would travel along Rockway Beach Boulevard, Arverne Boulevard, and Beach Channel Drive to access and follow their designated routes. They would not travel on Beach 50th Street, Beach 53rd Street, or Beach 54th Street.

The JFK Bus Depot, located at 165-25 147th Avenue, Jamaica, serves local routes Q6, Q7, Q8, Q9, Q37, Q40, Q41, and Q60 and articulated local routes Q10, Q52, and SBS. The Q52 and SBS routes run along Rockaway Beach Boulevard to Beach 54th Street, and the Q52 schedule was used to determine the peak periods of activity. Buses would travel on Rockaway Beach Boulevard, Arverne Boulevard, and Beach 54th Street to access and follow their designated routes. All 44 of the buses used on the Q52 and SBS routes are articulated buses that use diesel fuel and weigh 39,000 lbs.

As a worst case, the analysis assumed that the Far Rockaway lot would accommodate all buses from the local routes and the express buses at some time during the day. Therefore, it would serve 182 diesel buses and 72 hybrid diesel-electric buses. MOVES14b does not have a category for hybrid buses. However, information on the individual manufacturers indicates that hybrid buses emit 90% fewer particulates than diesel buses. For this reason, the hybrid buses were not included in the analysis.

Table 13-15: MTA Hourly Bus Volumes shows the hourly volumes for the Q22 and Q52 buses based on 2017 Spring and Summer data. As shown in the table, the hours with the highest bus volumes buses are 6-7 am and 12-1 pm. Consequently, the Midday period of 12-1 pm was selected for the purpose of obtaining emission factors from MOVES14b.

MOVES14b emissions were used to calculate hourly and daily emission factors for use with AERMOD. EPA's MOVES14b emissions model was used to obtain emission factors for entering and exiting vehicles as well as idling vehicles. As a worst case, all 182 diesel-powered buses were assumed to enter and exit within an hour. AERMOD used 24-hour and annual emissions of $PM_{2.5}$ to calculate pollutant concentrations at nearby receptor points. **Table 13-16: $PM_{2.5}$ Concentrations from MTA Bus Depot** summarizes the results of this assessment. As shown on Table 13-18, all values are within the applicable NAAQS.

Table 13-15: MTA Hourly Bus Volumes

Time	Q52 Spring 2017			Q22 Summer 2017			Q22 & Q52 Total		
	Out	In	Total	Out	In	Total	Out	In	Total
4:00 AM	0	0	0	1	0	1	1	0	1
5:00 AM	4	0	4	7	0	7	11	0	11
6:00 AM	5	0	5	7	0	7	12	0	12
7:00 AM	3	0	3	0	0	0	3	0	3
8:00 AM	0	0	0	0	0	0	0	0	0
9:00 AM	0	4	4	0	0	0	0	4	4
10:00 AM	2	3	5	1	2	3	3	5	8
11:00 AM	2	2	4	5	1	6	7	3	10
12:00 PM	2	2	4	2	6	8	4	8	12
1:00 PM	3	3	6	1	1	2	4	4	8
2:00 PM	5	1	6	1	0	1	6	1	7
3:00 PM	6	2	8	0	0	0	6	2	8
4:00 PM	3	1	4	0	0	0	3	1	4
5:00 PM	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	2	2	0	2	2
7:00 PM	0	2	2	0	3	3	0	5	5
8:00 PM	0	5	5	0	1	1	0	6	6
9:00 PM	1	3	4	2	0	2	3	3	6
10:00 PM	1	1	2	0	0	0	1	1	2
11:00 PM	0	1	1	0	1	1	0	2	2
12:00 AM	0	2	2	0	2	2	0	4	4
1:00 AM	0	1	1	0	2	2	0	3	3
Total	**37**	**32**	**69**	**26**	**19**	**45**	**63**	**51**	**114**

Table 13-16: MTA $PM_{2.5}$ Parking Lot Concentrations (ug/m^3)

Time Period	Modeled value	Background	Total	NAAQS
24-hour	0.2	18.9	19.1	35
Annual	0.001	7.3	7.30	12

HVAC

Analysis of NO_2 from building emissions from heating and hot water were analyzed using AERMOD. For natural gas, the pollutants of interest are NO_2 and $PM_{2.5}$ associated with NO_2. **Figure 13-5: HVAC Stack Locations** shows the locations of the stacks on buildings within the Proposed Project that require an HVAC analysis. **Table 13-17: NO_2 and $PM_{2.5}$ Concentrations, Proposed Project on Proposed Buildings** summarizes the results of this analysis. As presented in the table, no significant adverse air quality impacts are projected with the use of natural gas.

Table 13-17: NO_2 and $PM_{2.5}$ Concentrations, Proposed Project on Proposed Buildings

Source Building	Receiver Building	NO_2 Concentrations ($\mu g/m^3$)						Comments
		1-Hr Modeled NO_2	Back-ground	1-Hr Total NO_2	Annual Modeled NO_2	Back-ground	Annual Total NO_2	
A1	A2	43.6	112.2	155.8	0.8	28.7	29.5	Pass
B1	B2	39.8	112.2	152.0	0.8	28.7	29.5	Pass
C1	C2	44.2	112.2	156.4	1.3	28.7	30.0	Pass
D2	D1	51.4	112.2	163.6	1.5	28.7	30.2	Pass
E2	E1	50.3	112.2	162.5	1.1	28.7	29.7	Pass
A1 and B1	A2	43.6	112.2	155.8	0.9	28.7	29.6	Pass
A1 and B1	B2	39.8	112.2	152.0	0.8	28.7	29.5	Pass
D1 and D2	C2	18.5	112.2	130.7	0.3	28.7	29.0	Pass
NAAQS (ug/m^3)				**188**			**100**	
Source Building	**Receiver Building**	**$PM_{2.5}$ Concentrations ($\mu g/m^3$)**						**Comments**
		24-Hr $PM_{2.5}$ Modeled	**Back-ground**	**24-Hr $PM_{2.5}$ Total**	**Annual $PM_{2.5}$ Modeled**	**Back-ground**	**Annual $PM_{2.5}$**	
A1	A2	2.7	18.9	21.6	0.1	7.3	7.4	Pass
B1	B2	2.3	18.9	21.2	0.1	7.3	7.4	Pass
C1	C2	1.2	18.9	20.1	0.1	7.3	7.4	Pass
D2	D1	1.4	18.9	20.3	0.1	7.3	7.4	Pass
E2	E1	2.8	18.9	21.7	0.2	7.3	7.5	Pass
A1 and B1	A2	2.7	18.9	21.6	0.2	7.3	7.5	Pass
A1 and B1	B2	2.3	18.9	21.2	0.1	7.3	7.4	Pass
D1 and D2	C2	0.4	18.9	19.3	0.03	7.3	7.3	Pass
NAAQS (ug/m^3)				**35**			**12**	
De Minimis		**8.1**			**0.3**			



Source: Aufgang Architects
Note: For illustrative purposes only

EDGEMERE, QUEENS

Project Site

HVAC Stack

HVAC STACK LOCATIONS

Figure 13-5

Peninsula Hospital Site Redevelopment

Air Quality E-Designations

The analysis determined that buildings A through E on the Project Site would require an (E) Designation mapped on the Project Site to eliminate the potential for a significant adverse air quality impact. For buildings which screened out of the HVAC analysis for air quality, the (E) Designation will specify the type of fuel to be used and the height of the boiler stack. For buildings analyzed for potential air quality impacts related to HVAC systems, the (E) Designation will specify the fuel type, height, and the distance of the stack from the nearest building.

The text of the (E) Designation, E-532, for the Proposed Project buildings is as follows:

> **Building A1: Block 15843, Lot 1: Any new residential and/or commercial development on the above-referenced properties must use PTAC units for residential heating, exclusively use natural gas as the type of fuel, use natural gas with low NOx boilers for HVAC systems, and ensure that the heating, ventilating and air conditioning stack is located at least 183 feet above ground level and at least 65 feet from the nearest building or tier of similar or greater height to avoid any potential significant adverse air quality impacts.**
>
> **Building A2: Block 15843, Lot 1: Any new residential and/or commercial development on the above-referenced properties must use PTAC units for residential heating, exclusively use natural gas for HVAC systems, and ensure that the heating, ventilating and air conditioning stack is at least 203 feet above ground level to avoid any potential significant adverse air quality impacts**
>
> **Building B1: Block 15843, Lot 1: Any new residential and/or commercial development on the above-referenced properties must use PTAC units for residential heating, exclusively use natural gas with low NOx boilers for HVAC systems, and ensure that the heating, ventilating and air conditioning stack is at least 163 feet above ground and is at least 65 feet from the nearest building or tier of similar or greater height to avoid any potential significant adverse air quality impacts.**
>
> **Building B2: Block 15843 Lot 1: Any new residential and/or commercial development on the above-referenced properties must use PTAC units for residential heating, exclusively use natural gas for HVAC systems, and ensure that the heating, ventilating and air conditioning stack is at least 193 feet high to avoid any potential significant adverse air quality impacts.**
>
> **Building C1 Block 15843, Lot 1: Any new residential and/or commercial development on the above-referenced properties must use PTAC units for residential heating, exclusively use natural gas for HVAC systems, and ensure that the heating, ventilating and air conditioning stack is at least 153 feet above ground and at least 70 feet from the nearest building or tier of similar or greater height to avoid any potential significant adverse air quality impacts.**
>
> **Building C2: Block 15843 Lot 1: Any new residential and/or commercial development on the above-referenced properties must use PTAC units for residential heating, exclusively use natural gas for HVAC systems, and ensure that the heating, ventilating and air conditioning stack is at least 203 feet above ground to avoid any potential significant adverse air quality impacts.**
>
> **Building D1: Block 15843 Lot 1: Any new residential and/or commercial development on the above-referenced properties must use PTAC units for residential heating, exclusively use natural gas for HVAC systems, and ensure that the heating, ventilating and air conditioning stack is at least 153 feet above ground and at least 45 feet from the nearest**

building or tier of similar or greater height to avoid any potential significant adverse air quality impacts.

<u>Building D2: Block 15843 Lot 1</u>: Any new residential and/or commercial development on the above-referenced properties must use PTAC units for residential heating, exclusively use natural gas for HVAC systems, and ensure that the heating, ventilating and air conditioning stack is at least 133 feet above ground to avoid any potential significant adverse air quality impacts.

<u>Building E1: Block 15842 Lot 1</u>: Any new residential and/or commercial development on the above-referenced properties must use PTAC units for residential heating, exclusively use natural gas for HVAC systems, and ensure that the heating, ventilating and air conditioning stack is at least 203 feet above ground to avoid any potential significant adverse air quality impacts.

<u>Building E2: Block 15842 Lot 1</u>: Any new residential and/or commercial development on the above-referenced properties must use PTAC units for residential heating, exclusively use natural gas with low NOx boilers for HVAC systems, and ensure that the heating, ventilating and air conditioning stack is at least 153 feet above ground and at least 60 feet from the nearest building or tier of similar or greater height to avoid any potential significant adverse air quality impacts.

With (E) Designation E-532, the potential impacts from the Project Site building's heating systems would not exceed the applicable NAAQS or *de minimis* criteria and would therefore not have potential significant adverse environmental impacts on air quality.