13

Air Quality

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"; by fixed facilities, usually referred to as "stationary sources"; or by a combination of both. The air quality assessment presented in this chapter determines the proposed project's effects on ambient air quality as well as the effects of ambient air quality on the project.

Introduction

This chapter examines the potential for air quality impacts from the Proposed Actions, following procedures from the *2021 City Environmental Quality Review (CEQR) Technical Manual.* The following areas of potential concern are considered:

- Potential impacts from mobile sources introduced by the Proposed Actions.
- Potential impacts on the Proposed Development from nearby existing sources, such as manufacturing/processing facilities.
- Potential impacts from the heating, ventilation, and air conditioning (HVAC) systems of the NYCTA Relocation Site to result in stationary source pollutants that would significantly impact existing land uses.

As detailed in **Chapter 1, Project Description**, the Proposed Actions would facilitate on the Development Site (Brooklyn Block 2590, Lots 1 and 25)[1] a mixed-use development that would comprise three buildings totaling approximately 1,215,000 gross square feet (gsf) (the Proposed Development). The Proposed Development would include the construction of two buildings on Lot 1 totaling approximately 1,106,500 gsf of residential space for up to approximately 1,150 total dwelling

[1] On December 17, 2024, the southern half of former Quay Street was incorporated into Lot 25. The northern half of former Quay Street is not controlled by the Applicants.

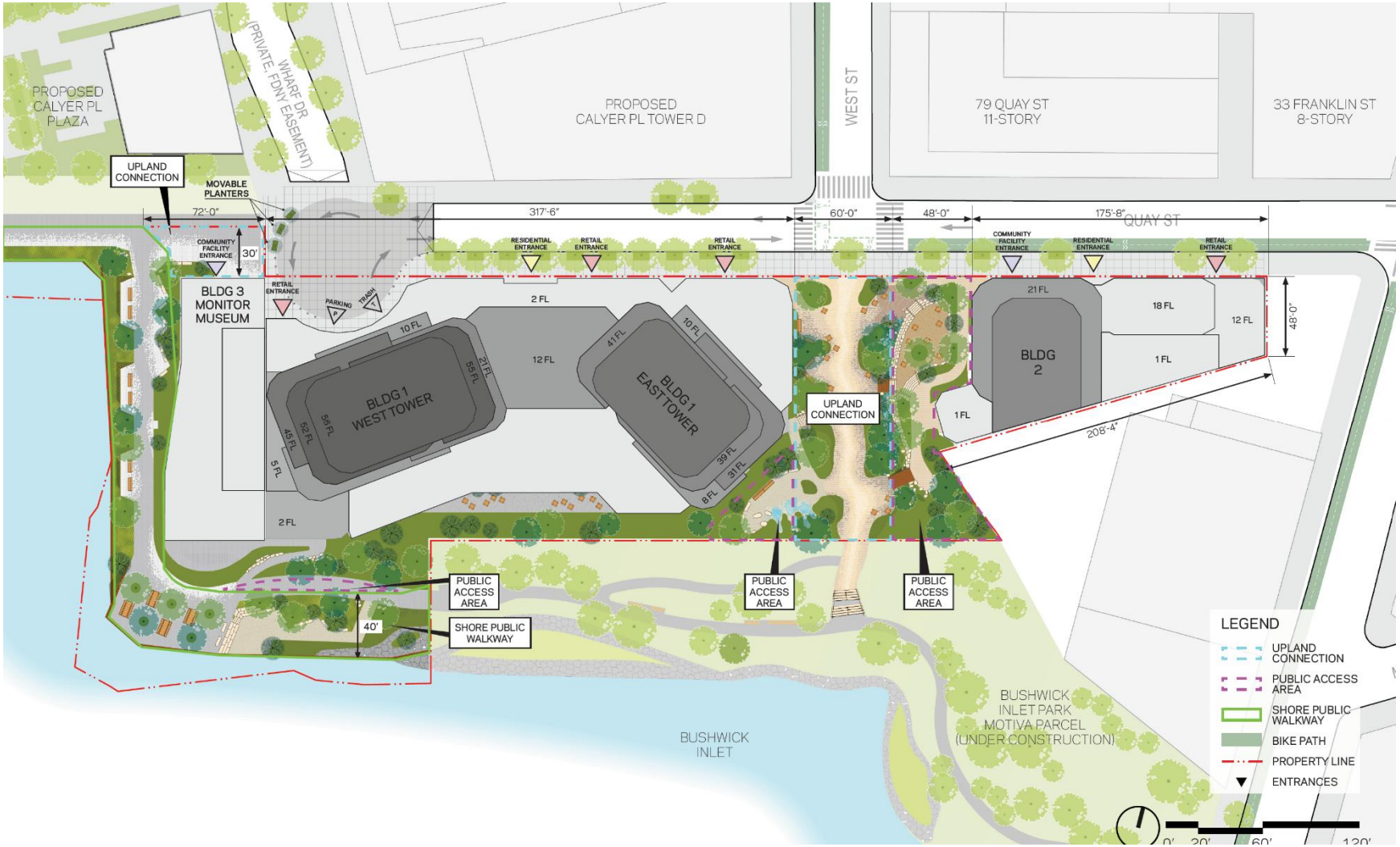
units (DUs). Additionally, the Proposed Development would include the construction on Lot 25 of approximately 35,000 gsf of community facility space earmarked as a permanent home for the Greenpoint Monitor Museum, which is owned by the Monitor Museum.

The Proposed Development would also include substantial open space improvements. The development would include the creation of over an acre of waterfront open space (approximately 50,000 sf or 1.15 acres). This new open space would include a 34,000-sf Waterfront Public Access Area (WPAA), which would provide a pedestrian connection between the future Bushwick Inlet Park and the existing Shore Public Walkway to the north of the site and an upland connection between the future Bushwick Inlet Park and West Street, plus approximately 9,000 sf of Public Access Area (PAA).

In order to allow for the redevelopment of the Development Site, the Proposed Actions also involve the relocation and consolidation of two existing critical NYCTA facilities to a new 143,000-gsf turnkey facility (the NYCTA Replacement Facility) at the NYCTA Relocation Site. The NYCTA Relocation Site would accommodate the NYCTA Mobile Wash Unit and Materials Storage currently located on a portion of the Development Site (Block 2590, Lot 1) (the NYCTA Facility) and the NYCTA Emergency Response Unit (ERU) facility currently located on 65 Commercial Street (Block 2472, Lot 415) (the ERU Site).

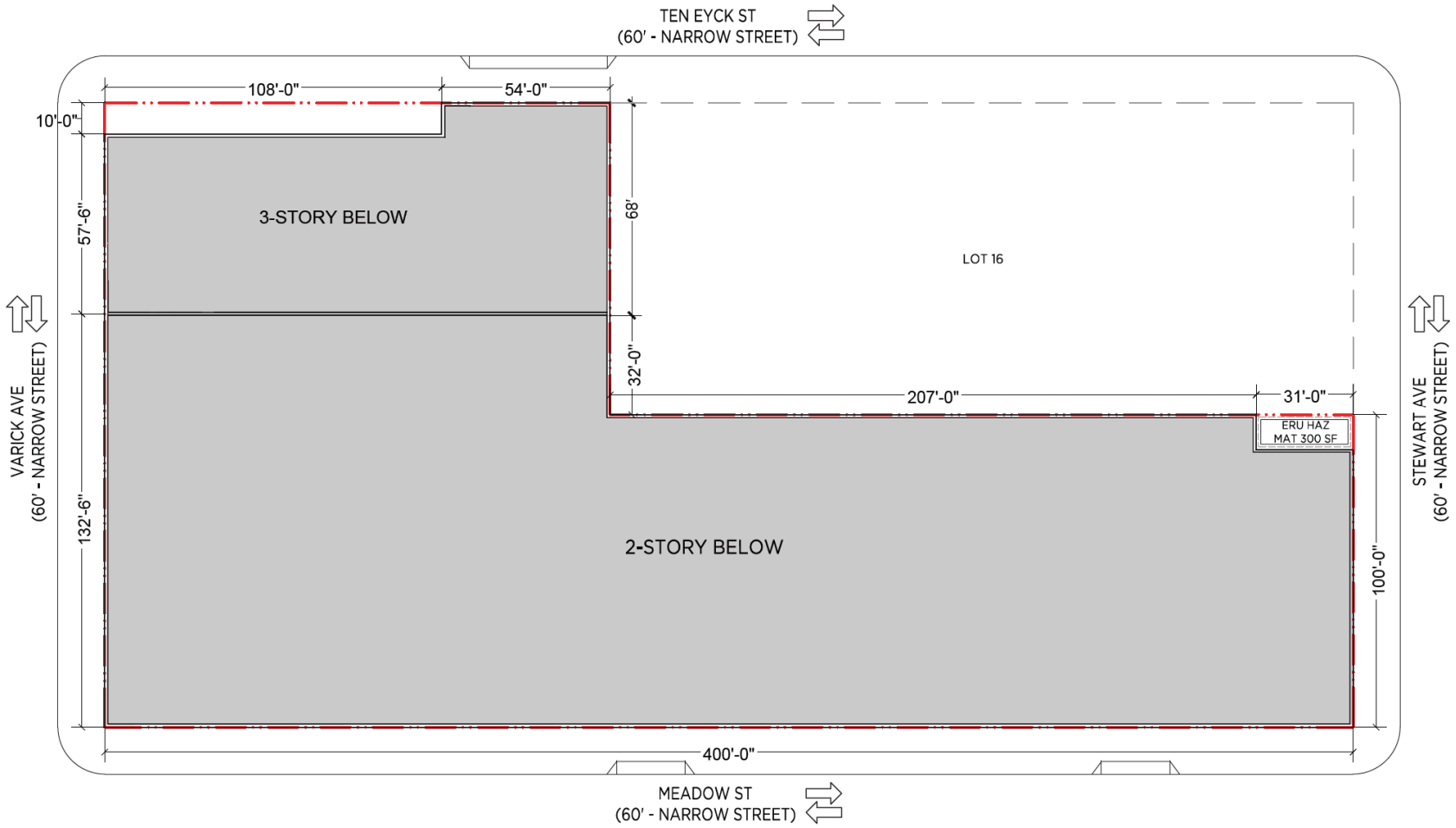
The proposed site plan for the Development Site is shown on **Figure 13-1**, and the NYCTA Relocation Site is shown on Figure 13-2**Figure 13-2**.

Figure 13-1 Proposed Development Site Plan



Source: FX Collaborative
Note:
Site plan is conceptual and provided for illustrative purposes only.

Figure 13-2 NYCTA Relocation Facility Site Plan



Source: FX Collaborative

Note: Site plan is conceptual and provided for illustrative purposes only.

Principal Conclusions

The Proposed Actions would not result in significant adverse air quality impacts on the surrounding sensitive receptors, nor would nearby emission sources significantly impact the Proposed Development.

The mobile source analyses determined that project-generated traffic resulting in concentrations of carbon monoxide (CO) and fine particulate matter ($PM_{2.5}$) at the analyzed intersections would not result in any violations of National Ambient Air Quality Standards (NAAQS). Further, the 8-hour CO incremental concentrations, and the 24-hour and annual incremental $PM_{2.5}$ concentrations, were predicted to be below the City's *de minimis* criteria.

The proposed garage at the Development Site was selected as the worst-case condition for an air quality parking analysis. This analysis determined that the maximum predicted $PM_{2.5}$ increments at this facility would be well below the respective $PM_{2.5}$ *de minimis* criteria of 7.6 $\mu g/m^3$ for the 24-hour average concentration and 0.3 $\mu g/m^3$ for the annual concentration. As such, the parking garage analyzed would not result in any significant adverse air quality impacts.

Because the Applicant would commit to using electric HVAC and hot water systems for the Proposed Development, a stationary source analysis is not warranted, and no significant adverse impacts would occur. A Restrictive Declaration (RD) would be recorded against the Development Site to ensure this commitment. Regarding the NYCTA Relocation Site, a screening analysis, using the nomograph provided in the *CEQR Technical Manual*, determined that there would be no potential significant adverse air quality impacts from fossil fuel-fired heat and hot water systems at the NYCTA Relocation Site if the stack height is located at the highest tier and at least 55 feet above grade. An (E)-Designation (E-870) would be placed on the NYCTA Relocation Site to ensure that the assumptions used in the analysis to preclude the potential for significant adverse impacts are met. Regarding the NYCTA Relocation Site, there are no sensitive stationary source receptors in the area, as adjacent properties contain manufacturing or industrial uses. As the NYCTA Relocation Site would not introduce a sensitive use, an analysis of the potential for existing sources to impact this facility is not warranted.

The analysis of existing industrial/manufacturing uses in the surrounding study area determined that emissions of air toxic compounds would not result in any potential significant adverse air quality impacts. An analysis of the cumulative health risk impacts of existing industrial sources on the Proposed Development was also performed. Maximum concentration levels were found to be below the applicable health risk criteria.

National Ambient Air Quality Standards

In accordance with the requirements of the Clean Air Act, as amended in 1990, the U.S. Environmental Protection Agency (EPA) has promulgated NAAQS (40 CFR part 50) for pollutants considered harmful to public health and the environment. The NAAQS are presented in **Table 13-1**.

The Clean Air Act establishes two types of national air quality standards. Primary standards are designed to set limits to protect public health, including the health of sensitive populations such as sick, children, and elderly populations. Secondary standards set limits to protect public welfare, including protection against decreased visibility and protections against damage to animals, crops, vegetation, and buildings.

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

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		Primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		Primary and Secondary	Rolling 3-month average	0.15 µg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)		Primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Primary and Secondary	1 year	53 ppb (2)	Annual Mean
Ozone (O_3)		Primary and Secondary	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	$PM_{2.5}$	Primary	1 year	9.0 µg/m^3	annual mean, averaged over 3 years
		Secondary	1 year	15.0 µg/m^3	annual mean, averaged over 3 years
		Primary and Secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	Primary and Secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		Primary	1 hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

Source: EPA NAAQS Table, https://www.epa.gov/criteria-air-pollutants/naaqs-table, last updated December 16, 2024.
(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m^3 as a calendar quarter average) also remain in effect.
(2) The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.
(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O_3 standards.
(4) The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

The EPA Office of Air Quality Planning and Standards has established NAAQS for six principal pollutants, which are called "criteria" pollutants. These six pollutants are ozone (O_3), carbon

monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter less than 10 microns in aerodynamic diameter (PM_{10}) and less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$), and lead (Pb). Units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb) by volume, and micrograms per cubic meter of air ($\mu g/m^3$).

These standards are reviewed periodically and may be revised. The State of New York has adopted similar standards as those set by the EPA, with the exception of sulfur dioxide, particulates, fluorides, and hydrogen sulfide.

Pollutants of Concern

Air pollution is of concern because of its demonstrated effects on human health. Of special concern are the cardiovascular and respiratory effects of air pollutants and their potential toxic effects, as described below.

Carbon monoxide (CO) is a colorless and odorless gas that is a product of incomplete combustion. Carbon monoxide is absorbed by the lungs and reacts with hemoglobin to reduce the oxygen carrying capacity of the blood. At low concentrations, CO has been shown to aggravate the symptoms of cardiovascular disease. It can cause headaches, nausea, and at sustained high concentration levels, can lead to coma and death.

Particulate matter is made up of small solid particles and liquid droplets. PM10 refers to particulate matter with a nominal aerodynamic diameter of 10 micrometers or less, and $PM_{2.5}$ refers to particulate matter with an aerodynamic diameter of 2.5 micrometers or less. Particulates can enter the body through the respiratory system. Particulates over 10 micrometers in size are generally captured in the nose and throat and are readily expelled from the body. Particulates smaller than 10 micrometers, and especially particles smaller than 2.5 micrometers, can reach the air ducts (bronchi) and the air sacs (alveoli) in the lungs. Particulates are associated with increased incidence of respiratory diseases, cardiopulmonary disease, and cancer.

Nitrogen oxides (NO_X), the most significant of which are nitric oxide (NO) and nitrogen dioxide (NO2), can occur when fossil fuel combustion temperatures are extremely high (such as in engines), and atmosphere nitrogen gas combines with oxygen gas. NO is relatively harmless to humans but quickly converts to NO_2. Nitrogen dioxide has been found to be a lung irritant and can lead to respiratory illnesses. Nitrogen oxides, along with VOCs, are also precursors to ozone formation.

Sulfur Dioxide (SO_2) emissions are the main components of the "oxides of sulfur," a group of highly reactive gases from fossil fuel combustion at power plants, other industrial facilities, industrial processes, and burning of high sulfur containing fuels by locomotives, large ships, and non-road equipment. High concentrations of SO_2 lead to formation of other sulfur oxides. By reducing the SO_2 emissions, other forms of sulfur oxides are also expected to decrease. When oxides of sulfur react with other compounds in the atmosphere, small particles that can affect the lungs can be formed. This can lead to respiratory disease and aggravate existing heart disease.

Ozone (O_3) and its precursors, including NOx, can cause damage to tissues in the respiratory tract. Ozone forms when oxygen reacts with ozone precursors, including hydrocarbons and nitrogen oxides, in the presence of sunlight (ultraviolet radiation). Ozone is associated with increased risk of respiratory infections and susceptibility to pulmonary inflammation, as well as lung diseases, such as asthma and chronic obstructive pulmonary disease (COPD).

Lead emissions are principally associated with industrial sources and motor vehicles that use gasoline containing lead additives. Lead emissions from automobiles have been declining in recent years because of the use of unleaded gasoline. Lead is not produced in large quantities by mobile sources.

Non-criteria pollutants may be of concern in addition to the criteria pollutants discussed above. Non-criteria pollutants are emitted by a wide range of man-made and naturally occurring sources. These pollutants are sometimes referred to as hazardous air pollutants (HAP) and when emitted from mobile sources, as Mobile Source Air Toxics (MSATs). Emissions of non-criteria pollutants from industrial sources are regulated by the U.S. EPA.

Federal ambient air quality standards do not exist for non-criteria pollutants; however, the New York State Department of Environmental Conservation (NYSDEC) has issued standards for certain non-criteria compounds, including beryllium, gaseous fluorides, and hydrogen sulfide. NYSDEC Division of Air Resources (DAR) has also developed a guidance document, *DAR-1* (February 2021), which contains a compilation of annual and short term (1-hour) guideline concentration thresholds for these compounds. NYSDEC's *DAR-1* guidance thresholds represent ambient levels that are considered safe for public exposure. EPA has also developed guidelines for assessing exposure to non-criteria pollutants. These exposure guidelines are used in health risk assessments to evaluate the potential effects to the public.

Regulatory Context

In accordance with the 1990 Clean Air Act (CAA), EPA designates areas (states, counties, and/or regions) based on their attainment of the NAAQS. The classifications include attainment, unclassified, maintenance, or non-attainment. Attainment areas are regions where ambient concentrations of a pollutant are below the respective NAAQS; non-attainment areas are those where concentrations exceed the NAAQS. Maintenance areas are former non-attainment areas that achieved attainment. An unclassified area is a region where not enough information is available to the EPA to make a determination. Unclassified areas are generally considered as attainment areas for administrative purposes. A single area can be in attainment of the standards for some pollutants while being in non-attainment for others.

Kings County is designated as a severe non-attainment area for the 2008 8-hour ozone standard and serious non-attainment area for the 2015 8-hour ozone standard, both as part of a larger New York-Northern New Jersey-Long Island, NY-NJ-CT non-attainment area.

Kings County has been designated as a maintenance area for the CO standard as of 2002 and for the 2006 $PM_{2.5}$ standard as of 2014. EPA strengthened the annual average primary standard to 9 $\mu g/m^3$ effective May 6, 2024. EPA has not yet designated areas as being in attainment or non-attainment with this new standard. Kings County is in attainment for all other criteria pollutants (PM_{10}, Pb, NO_2, and SO_2).

Impact Criteria

The predicted concentrations of pollutants of concern associated with a proposed project are typically compared with either the NAAQS for criteria air pollutants or ambient guideline concentrations for non-criteria pollutants. In general, if a project would cause the standards for any pollutant to be exceeded, it would likely result in a significant adverse air quality impact. In addition,

the City's *de minimis* criteria are also used to evaluate the significance of predicted impacts for CO and $PM_{2.5}$.

CO *De Minimis* Criteria

New York City has developed *de minimis criteria* to assess the significance of the increase in CO concentrations that would result from project-generated mobile sources, as set forth in the *CEQR Technical Manual*. These criteria set the minimum change in CO concentration that defines a significant adverse environmental impact. Significant increases of CO concentrations in New York City are defined as:

- An increase of 0.5 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 between 8.0 and 9.0 ppm; or
- An increase of more than half the difference between baseline (i.e., No-Action) concentrations and the 8-hour standard, when No-Action concentrations are below 8.0 ppm.

$PM_{2.5}$ *De Minimis* Criteria

New York City uses *de minimis* criteria to determine a project's potential to result in a significant adverse $PM_{2.5}$ impact under *CEQR*. The *de minimis* criteria for $PM_{2.5}$ are as follows:

- Predicted increase of more than half the difference between the background concentration and the 24-hour standard;
- Annual average $PM_{2.5}$ concentration increments which are predicted to be 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 locating neighborhood scale monitoring stations); or
- Annual average $PM_{2.5}$ concentration increments which are predicted to be greater than 0.3 $\mu g/m^3$ at a discrete receptor location (elevated or ground level).

Non-Criteria Pollutant Thresholds

Non-criteria, or toxic air pollutants include a multitude of pollutants of variable toxicity. No federal ambient air quality standards have been promulgated for toxic air pollutants. However, NYSDEC has issued guidelines on non-criteria pollutant ambient air concentrations and acceptable risk management range to determine the potential effects to the public.

The NYSDEC *DAR-1* guidance document presents guideline concentrations in micrograms per cubic meter ($\mu g/m^3$) for the one-hour (SGC) and annual average time (AGC) periods for various air toxic compounds[2].

In order to evaluate residual risk of non-carcinogenic toxic air emissions, hazard index is calculated based on annual exposure limits. If the combined ratio of pollutant concentration divided by its annual exposure threshold for each of the toxic pollutants is found to be less than 2.0, according to *DAR-1*, the residual risk is deemed acceptable.

[2] NYSDEC DAR-1 - http://www.dec.ny.gov/docs/air_pdf/dar1.pdf.

In addition, the potential cancer risk associated with each carcinogenic pollutant, as well as the total cancer risk of the releases of all the carcinogenic toxic pollutants combined, can be estimated. If the total incremental cancer risk of all the carcinogenic toxic pollutants combined is less than ten in one million to a hypothetically exposed individual, the residual risk is deemed acceptable.

Background Concentrations

Background concentrations are ambient pollution levels associated with existing stationary, mobile, and other area emission sources. The years 2019 to 2021 of NYSDEC monitoring data from monitoring stations representative of the Development Site were used to develop background concentrations for all pollutants. These concentrations were estimated using the form of the NAAQS (see the "Form" column in **Table 13-1** for more information). **Table 13-2** summarizes the background concentrations for each of the pollutants.

Table 13-2 Background Concentrations

Pollutant	Averaging Time	Monitoring Location	Background Concentration
CO	1-Hour	Queens College	1.95 ppm
	8-Hour		1.7 ppm
NO_2	1-Hour	Queens College	41.23 ppb
	Annual		13.02 ppb
PM_{10}	24-Hour	Queens College	38.0 µg/m^3
$PM_{2.5}$	24-Hour	JHS 126	19.8 µg/m^3
	Annual		7.5 µg/m^3

Source: https://extapps.dec.ny.gov/docs/air_pdf/2021airqualreport.pdf

The CO, NO_2, and PM_{10} background concentrations were developed from monitoring data collected at the Queens College monitoring station at 65-30 Kissena Boulevard. The $PM_{2.5}$ background concentrations were developed from monitoring data collected at the JHS 126 monitoring station at 424 Leonard Street.

Potential $PM_{2.5}$ impacts are also assessed on an incremental basis and compared with the $PM_{2.5}$ *de minimis* criteria. Based on the background concentrations, the 24-hour $PM_{2.5}$ *de minimis* is 7.6 µg/m^3.

Methodology

Mobile Sources

Vehicular traffic may affect air quality levels of CO and PM at nearby sensitive receptor locations. Typically, development projects may have mobile source air quality impacts due to increases or redistribution of traffic located near sensitive receptors.

Mobile Source Screening Analysis

A screening analysis of mobile source emissions of CO and PM on ambient pollutant levels in the study area was conducted pursuant to guidance in the *CEQR Technical Manual*. For the study area, as

described in Chapter 17, Sections 210 and 311 of the *CEQR Technical Manual*, the threshold for conducting an analysis of CO emissions corresponds to 170 project-generated vehicles at a given intersection in the peak hour. The need for conducting an analysis of PM emissions is based on road type and the number of project-generated, peak-hour heavy-duty diesel vehicles, or its equivalency (HDDVs) in vehicular $PM_{2.5}$ emissions, as determined using the worksheet referenced on page 17-12 of the *CEQR Technical Manual*.

Detailed Mobile Source Analysis

The *CEQR Technical Manual* thresholds for undertaking an analysis of the potential for CO impacts were exceeded at two study area intersections, and $PM_{2.5}$ impacts were exceeded at ten study area intersections. The following two intersections were selected because they have the greatest number of project-trip increments and truck-equivalent vehicles, per the screening thresholds in the *CEQR Technical Manual*, that would result in the highest potential incremental concentrations of CO and PM.

A detailed microscale analysis of particulate matter ($PM_{2.5}$) and CO was conducted for the following two intersections:

- Franklin Street at Oak Street; and
- Franklin Street at Quay Street

Vehicle Emissions

Vehicular CO and PM emission factors utilized in the dispersion modeling were computed using the latest version of the EPA's Motor Vehicle Emission Simulator (MOVES4) model. This emissions model is capable of calculating engine emission factors for various vehicle types, based on the fuel type (gasoline, diesel, or compressed natural gas), meteorological conditions, vehicle speeds, vehicle age, roadway types, number of starts per day, engine soak time, and various other factors that influence emissions, such as an inspection maintenance program.

MOVES input files (i.e., fuel data, county-specific hourly temperature and relative humidity data, inspection/maintenance coverage, etc.) for Kings County were obtained from NYSDEC. Source type age distribution data were obtained from NYSDEC and processed using the EPA's *Age Distribution Projection Tool for MOVES4*.[3]

Traffic Data

Traffic data for the intersection analysis were derived from existing traffic counts, projected future growth in traffic, and other information developed as part of the traffic analysis for the Proposed Actions (see **Chapter 12, Transportation**). Traffic data for the future without the Proposed Actions (the No-Action condition) and the future with the Proposed Actions (the With-Action condition) were used in the respective air quality modeling condition. The periods analyzed were weekday morning (7:45 to 8:45 AM), midday (1:00 to 2:00 PM), and evening (5:00 to 6:00 PM) peak periods as well as the Saturday midday peak period (2:15 to 3:15 PM).

The peak weekday morning, midday, and evening as well as Saturday midday period traffic volumes were used as a baseline for determining off-peak volumes. Off-peak traffic volumes were determined

[3] EPA. Age Distribution Projection Tool for MOVES4: https://www.epa.gov/moves/tools-develop-or-convert-moves-inputs

by adjusting the peak period volumes by the 24-hour distributions of actual vehicle counts collected at appropriate locations.

Fugitive Dust

In addition to exhaust, tire, and brake-wear emission factors estimated by MOVES4 for particulate matter, fugitive dust emissions were estimated using EPA's Compilation of Air Emissions Factors (AP-42)[4] guidance for paved roads. Fugitive dust emissions were used in the short-term, 24-hour modeling of $PM_{2.5}$ and PM_{10}. Consistent with the New York City Department of Environmental Protection's (NYCDEP) conclusion that fugitive dust has insignificant contribution on the neighborhood scale, fugitive dust emissions were not used in the annual $PM_{2.5}$ modeling (i.e., neighborhood scale analysis).

Dispersion Model

The CO and PM concentrations due to vehicular emissions adjacent to the analysis sites were predicted using the American Meteorological Society/Environmental Protection Agency Regulated Model (AERMOD) Version 23132.[5] AERMOD is a state-of-the-art dispersion model, applicable to rural and urban areas, flat and complex terrain, surface and elevated releases, and multiple sources (including point, area, and volume sources). AERMOD is a steady-state plume model that incorporates current concepts about flow and dispersion in complex terrain, including updated treatments of the boundary layer theory, understanding of turbulence and dispersion, and handling of terrain interactions. Following USEPA guidelines, the analysis was performed using an area source representation of emission sources in order to simulate traffic-related air pollutant dispersion.[6] Hourly traffic volumes and associated emission factors were used to estimate hourly emission rates from each modeled roadway segment and predict traffic-related air pollutant concentrations at receptor locations.

Receptor Placement

Sensitive receptors near the intersection were placed at the existing sidewalks under No-Action and With-Action conditions at 1.8 meters above grade. For the assessment of short-term impacts, receptors were placed at the sidewalks around the intersection at approximately 6 to 7.5 feet (1.8 to 2.2 meters) from the curb adjacent to the road. For compliance with the annual neighborhood $PM_{2.5}$ criterion, receptors were placed at 15 meters away from the curb.

Meteorological Data

Dispersion analysis used the latest available 5 years (2017 to 2021) of hourly meteorological observations from LaGuardia Airport National Weather Service station (closest to the Development Site) and upper air data obtained from the Brookhaven Station, New York.

[4] EPA. AP-42, chapter 13.2.1 Paved Roads. https://www.epa.gov/sites/production/files/2020-10/documents/13.2.1_paved_roads.pdf

[5] USEPA. User's Guide for the AMS/USEPA Regulatory Model (AERMOD). Office of Air Quality Planning and Standards. USEPA-454/B-19-027. Research Triangle Park, North Carolina. August 2019.

[6] USEPA. Project-Level Conformity and Hot-Spot Analyses, available at: https://www.epa.gov/state-and-local-transportation/project-levelconformity-and-hot-spot-analyses#pmguidance

Parking Facilities Analysis

The Proposed Actions would facilitate the development of parking facilities at the Development Site and NYCTA Relocation Site. Emissions from vehicles at these sites could potentially affect ambient levels of CO and PM in the immediate vicinity in the With-Action condition. The parking garage at the Development Site would include up to approximately 140 spaces. Two separated parking garages would be included at the NYCTA Relocation Site—the Mobile Wash Unit garage would have a capacity of 121 vehicles, which includes the parking spaces for 106 wash trucks, 10 vans, and 5 box trucks, and the ERU garage would have a capacity of 38 vehicles, which includes parking spaces for 3 large trucks and 35 suburban trucks. The garage at the Development Site was selected for the air quality parking facilities analysis as it would have the highest overall capacity (up to 140 spaces, versus 121 and 38) and would generate a higher maximum number of peak-hour vehicle ins/outs, meaning that this facility would have the highest potential incremental concentrations of pollutants.

An analysis of the emissions from the outlet vents and their dispersion in the environment was performed, calculating pollutant levels in the surrounding area, using the methodology set forth in the *CEQR Technical Manual*. Emissions from vehicles entering, parking, and exiting the garage were estimated using the EPA MOVES mobile source emission model, as referenced in the *CEQR Technical Manual*. For all arriving and departing vehicles, an average speed of 5 miles per hour was conservatively assumed for travel within the parking garages. In addition, all departing vehicles were assumed to idle for 1 minute before proceeding to the exit. The concentrations of CO and PM within the garage were calculated assuming a minimum ventilation rate of 1 cubic foot per minute of fresh air per gross square foot of garage area, based on New York City Building Code requirements. To determine compliance with the NAAQS, CO concentrations were determined for the maximum 8-hour average period.

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

The CO concentrations were determined for the time periods when overall garage usage would be the greatest, considering the hours when the greatest number of vehicles would exit the facility (PM concentrations were determined on a 24-hour and annual average basis). Traffic data for the parking garage analysis were derived from the trip generation analysis described in **Chapter 12, Transportation**. Background and on-street concentrations were added to the modeling results to obtain the total ambient levels for CO. The 24-hour average $PM_{2.5}$ background concentration was used to determine the *de minimis* criteria threshold.

Stationary Sources

Individual HVAC Systems Analysis

The Applicant would commit to using electric for HVAC and hot water systems for the Development Site. Therefore, no localized emissions from the HVAC or hot water systems are expected and no air quality analysis of local impacts is required for the Development Site.

The HVAC nomograph screening procedures described in the *CEQR Technical Manual* are used to determine the potential for emissions from the HVAC systems of the NYCTA Relocation Site to result

in stationary source pollutants that could significantly impact existing land uses (project-on-existing impacts). As the NYCTA Replacement Facility would not introduce a sensitive use, an analysis of the potential for existing sources to impact this facility is not warranted.

Industrial Source Analysis

As described in Section 220 and Section 322 in Chapter 17 of the *CEQR Technical Manual*, an air quality assessment is required to evaluate the potential impacts of air toxics emissions from ventilation exhaust systems of manufacturing or processing facilities within a 400-foot radius of a project site when a project would result in new sensitive uses (particularly residences, schools, hospitals, or parks). If any sources are identified, a screening analysis is performed using Table 17-3 in Chapter 17 of the *CEQR Technical Manual*. The screening table provides maximum 1-hour, 8-hour, 24-hour and annual average modeled pollutant concentration values at a 20-foot-tall receptor for distances of 30 to 400 feet from a 20-foot-tall stack. These values are based on a generic emission rate of 1 gram per second of a pollutant from the 20-foot-tall point source. Pollutant concentrations predicted from the industrial source of concern based on the screen table are compared with the short-term guideline concentrations (SGCs) and annual guideline concentration (AGCs) recommended in NYSDEC's *DAR-1* AGC/SGC tables. This does not apply to NYCT Relocation Site since this facility is not considered as a new sensitive use.

Additionally, according to the NYSDEC's *DAR-1* guidance, residual risk of carcinogenic emissions is evaluated through the excess cancer risks per one million people associated with the carcinogenic pollutants. If the total cancer risk of all the carcinogenic toxic pollutants combined is less than ten in one million, the residual risk is deemed acceptable, and no significant adverse air quality impacts are predicted to occur due to these pollutant releases. Additionally, the risk of non-carcinogenic toxic air emissions is evaluated through the hazard index, which is based on annual exposure limits. If the sum of all the toxic pollutants' concentrations divided by their annual exposure thresholds is found to be less than 2.0, the residual risk is acceptable and no significant adverse air quality impacts are predicted to occur due to these pollutant releases.

Large and/or Major Source Analysis

As described in Section 220 and Section 322 in Chapter 17 of the *CEQR Technical Manual*, an air quality assessment is required to evaluate the potential impacts of emissions from a large and/or major emission source within a 1,000-foot radius of a project site. Large sources are identified as facilities with a State Facility Permit. Major sources are identified as Title V facilities that require Prevention of Significant Deterioration permits. A detailed analysis is usually performed for such sources, if any are identified, to determine any potential for significant adverse impacts.

Neither the Development Site nor the Relocation Site are within 1,000 feet of any large or major source, and therefore such an analysis is not warranted.

Existing Conditions

Existing conditions in the area are characterized by the monitored concentrations representative of the area surrounding the Development Site. The background concentrations (see **Table 13-2**) are representative of the existing conditions in the area surrounding the Development Site for the presented pollutants.

Assessment

Mobile Sources

Microscale Intersection Analysis

A microscale (detailed) analysis of the impacts of the project-generated trips was conducted for the future No-Action and With-Action conditions at the intersections of Franklin Street at Oak Street, and Franklin Street at Quay Street, using the methodology previously described.

The intersections analysis was conducted using the AERMOD dispersion model and incorporated microscale receptors for the CO impacts and PM 24-hour impacts, as well as neighborhood-scale receptors for the annual $PM_{2.5}$ impacts. The results of this analysis are presented in **Table 13-3** and **Table 13-4**.

Table 13-3 Mobile Source Analysis Results at the Intersection of Franklin Street at Oak Street

Pollutant	Averaging Period	Background	No-Action Total[1]	With-Action Total[1]	Increment	Impact Threshold (*De Minimis*/ NAAQS)
CO	1-hour	1.95 ppm	2.64 ppm	3.17 ppm	N/A	35 ppm (NAAQS)
CO	8-hour	1.7 ppm	1.931 ppm	2.099 ppm	0.168 ppm	3.7/9 ppm (*de minimis*/ NAAQS)
$PM_{2.5}$	24-hour	19.8 µg/m^3	22.67 µg/m^3	23.02 µg/m^3	0.42 µg/m^3	7.6/35 µg/m^3 (*de minimis*/ NAAQS)
$PM_{2.5}$	Annual	7.5 µg/m^3	7.601 µg/m^3	7.688 µg/m^3	0.087 µg/m^3	0.1/9 µg/m^3 (*de minimis*/ NAAQS)

Notes
[1] The No-Action and With-Action concentrations presented here are a sum of the background concentrations and modeled concentrations.

Table 13-4 Mobile Source Analysis Results at the Intersection of Franklin Street at Quay Street

Pollutant	Averaging Period	Background	No-Action Total[1]	With-Action Total[1]	Increment	Impact Threshold (*De Minimis*/ NAAQS)
CO	1-hour	1.95 ppm	2.64 ppm	3.17 ppm	N/A	35 ppm (NAAQS)
CO	8-hour	1.7 ppm	2.059 ppm	2.090 ppm	0.031 ppm	3.7/9 ppm (*de minimis*/ NAAQS)
PM2.5	24-hour	19.8 µg/m^3	23.74 µg/m^3	24.17 µg/m^3	0.43 µg/m^3	7.6/35 µg/m^3 (*de minimis*/ NAAQS)
PM2.5	Annual	7.5 µg/m^3	7.608 µg/m^3	7.685 µg/m^3	0.077 µg/m^3	0.1/9 µg/m^3 (*de minimis*/ NAAQS)

Notes:
[1] The No-Action and With-Action concentrations presented here are a sum of the background concentrations and modeled concentrations.

As **Table 13-3** and **Table 13-4** show, the CO, $PM_{2.5}$ 24-hour and neighborhood-scale annual total and incremental concentrations are below the applicable NAAQS and CEQR *de minimis* criterion thresholds. Therefore, the results demonstrate that mobile source air quality emissions from the Proposed Development would not result in a significant adverse air quality impact.

Parking Analysis

An approximately 140-space parking garage is proposed at the Development Site. At the NYCTA Relocation Site, two parking garages would be provided—an approximately 38 parking-space garage would be provided for the ERU, and an approximately 121 parking- space garage would be provided for the Mobile Wash & Material Control Unit (MWMCU). Both garages at the NYCTA Relocation Site are intended to provide vehicle storage space for fleet vehicles—trucks of varying sizes, SUVs, and vans. As presented in **Chapter 12, Transportation**, a detailed traffic analysis was conducted for only the Development Site, as the level of vehicular traffic expected to be generated at the NYCTA Relocation Site would not meet the levels that warrant detailed analyses. Therefore, the air quality parking analysis was conducted for the proposed garage at the Development Site.

Based on the methodology previously described, the maximum predicted CO and PM concentrations from the proposed parking facility at the Development Site were analyzed assuming a near-side sidewalk receptor on the same side of the street as the parking facility, and a far-side sidewalk receptor on the opposite side of the street from the parking facility. To be conservative, maximum concentrations from the near side receptor of this facility were added to the far side receptor on Quay Street.

The maximum predicted 8-hour average CO concentration for the analyzed parking facility is 1.754 ppm. This value includes a predicted concentration of 0.136 ppm from emissions within the garage, an on-street contribution of 0.018 ppm, and a background level of 1.6 ppm. The maximum predicted concentration is substantially below the applicable standard of 9 ppm and the *de minimis* CO criteria.

The maximum predicted 24-hour and annual average $PM_{2.5}$ increments are 1.15 µg/m^3 and 0.035 µg/m^3, respectively. The maximum predicted $PM_{2.5}$ increments are well below the respective $PM_{2.5}$ *de minimis* criteria of 7.6 µg/m^3 for the 24-hour average concentration and 0.3 µg/m^3 for the annual concentration. Therefore, the parking facility analyzed would not result in any significant adverse air quality impacts.

Stationary Sources

Individual Heat and Hot Water Systems

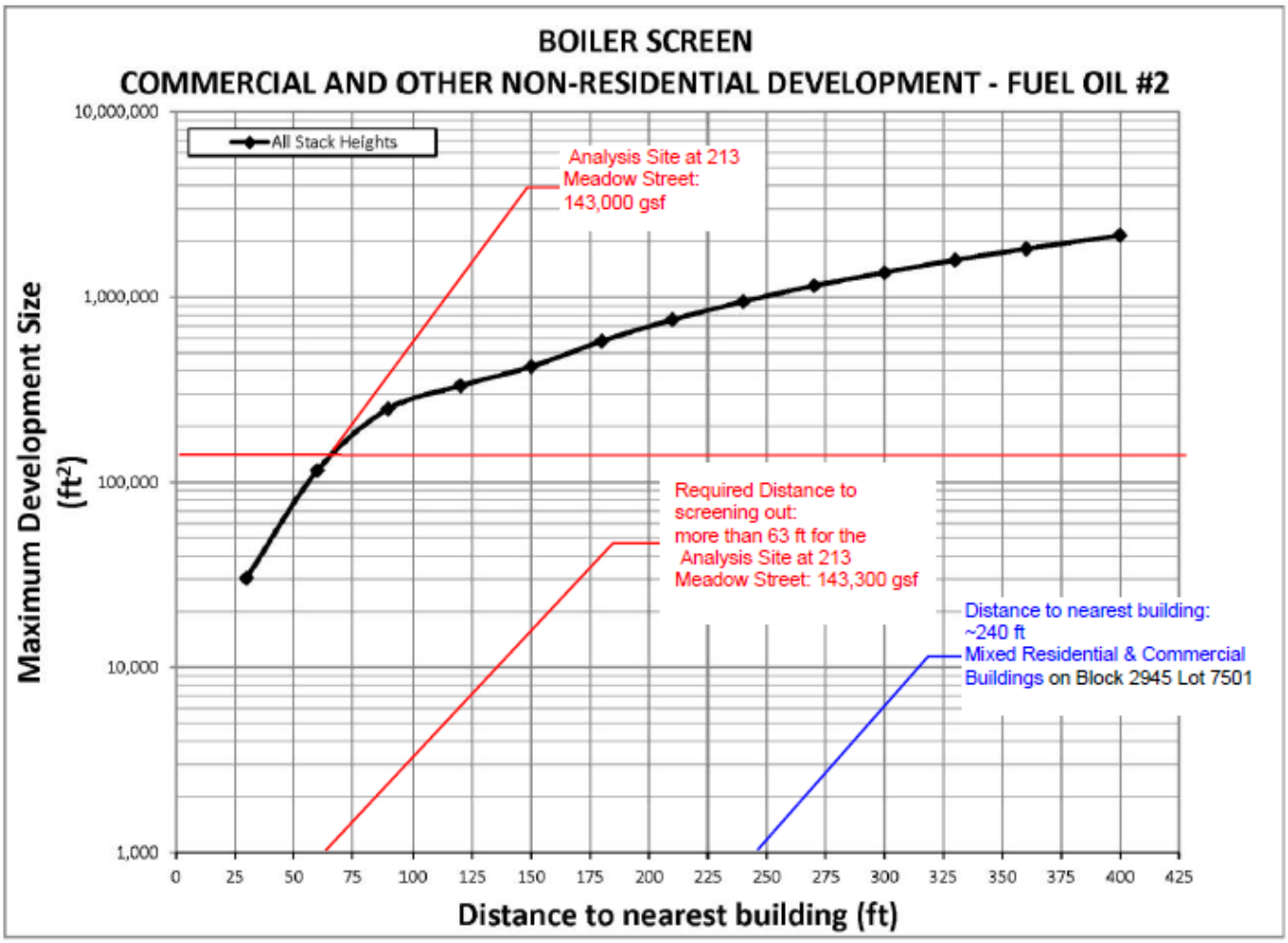
As mentioned above, the Proposed Development at the Development Site would use electric for HVAC and hot water systems and therefore do not warrant a screening analysis. A screening analysis is, however, warranted to evaluate whether potential air quality impacts from the heat and hot water systems associated with the NYCTA Relocation Site could potentially impact other planned developments, or existing buildings.

The potential for the heat and hot water system(s) to have a significant adverse impact on nearby receptors depends on the type of fuel that would be used by the HVAC system, the height of the stack venting the emissions, the distance to the nearest building of similar or greater height, the building's use which effects and the square footage of the development that would be served by the system which effects the amount of fossil fuel consumed. The *CEQR Technical Manual* screening analysis is based on these factors. A detailed analysis is required if the screening analysis fails. The following screening analyses were conducted:

› **Project-on-Existing—NYCTA Relocation Site on existing land uses**: Based on the methodology above, the NYCTA Relocation Site at 213 Meadow Street was analyzed as a 143,000-gsf commercial building. A distance of approximately 240 feet, which is the distance between the NYCTA Relocation Site and the closet residential property at 1196 Metropolitan Avenue (Block 2945, Lot 7501), was used in the screening analysis. The CEQR nomograph, depicted on Figure 17-1 of the *CEQR Technical Manual*, was used for the screening analysis. **Figure 13-3** shows the screening analysis.

As shown in the screening analysis (see **Figure 13-3**), using the nomograph provided in the *CEQR Technical Manual*, the impact of NYCTA Relocation Site on the closest existing building with a similar or taller building height would fall below the curve. As such, the NYCTA Relocation Site passes the HVAC screening analysis on existing land uses, and further analysis is not warranted.

Figure 13-3 NYCTA Relocation Site Screening Analysis on Existing Land Uses



To preclude the potential for significant adverse air quality impacts associated with the Development Site, a Restrictive Declaration (RD) would be recorded against the Development Site to ensure that the above requirements would be implemented. The RD would supersede the existing (E)-Designation (E-138) on the Development Site from the 2005 Greenpoint-Williamsburg Rezoning The requirements specified in the RD would be as follows:

Block 2590, Lots 1 and 25 (Development Site)

Any new residential and/or commercial development on the above-referenced property must ensure the HVAC system and hot water equipment are powered by electricity only with no venting or stacks associated with the HVAC system and hot water equipment, to avoid any potential significant adverse air quality impacts.

To preclude the potential for significant adverse air quality impacts associated with thew NYCTA Relocation Site, an (E)-Designation (E-870) would be placed to ensure the following measures:

Block 2951, Lots 1, 5, and 45 (NYCTA Relocation Site)

Any new commercial development on the above-referenced property must ensure the HVAC system and hot water equipment stack is located at the highest tier and at least 55 feet above grade to avoid any potential significant adverse air quality impacts.

Industrial Source Analysis

A study was conducted to analyze potential air quality impacts on the Proposed Development from existing industrial sources that emit toxic air contaminants. A review of land use maps, the NYCDEP's Clean Air Tracking System (NYCDEP CATS) website, NYCDEP registration forms, and field surveys were conducted to identify land uses that could have NYCDEP-issued industrial permits and land uses that are unpermitted sources of air toxics within 400 feet of the Development Site. Although permits were identified at several sites, further analysis was required for only one facility, which was Budd Woodwork Inc. at 54 Franklin Street. The remaining permitted sites and potential unpermitted sites were not analyzed for the following reasons:

- **38 Franklin Street (Permits PA114788 and PB016407):** Both permits PA114788 and PB016407 expired in 2022 and were for the purposes of wax processing. The current site at 38 Franklin Street was observed to be an abandoned building during a field survey in February 2025. Therefore, an industrial source analysis was not warranted for this site.
- **22 Franklin Street (Permits PR000977 and PB033501):** Both permits PR000977 and PB033501 are for W.H. Christian & Sons Uniforms at 24 Franklin Street.[7] While both of these permits are active, they are for laundry dryers. Thus, per NYCDEP guidance, they were screened out from further analysis.
- **12 Franklin Street (Permits PA055889, PA057294, and PB419203):** PA055889, PA057294, and PB419203 are all over 10-year-old expired permits. Permit PA055889 is associated with printing presses; permit PA057294 is associated with polyethylene bag manufacturing; and permit PB419203 was unavailable from the NYCDEP permit request. The current site at 12 Franklin Street was observed to be an abandoned building during a field survey in February 2025. Therefore, an industrial source analysis was not warranted for this site.
- **22 North 15 Street (Permit PB029515):** Permit PB029515 at 22 North 15th Street is a current registration for an emergency use generator under the ownership of NYCDEP Brooklyn Water Maintenance. The CEQR guidance does not require an analysis of sources that are used infrequently for emergency purposes. Therefore, an industrial source analysis was not warranted for this site.
- **234 Banker Street (Unpermitted):** The current site at 234 Baker Street is ABC Worldwide Stone. This site could create potential emissions from stone cutting. While the parcel is within 400 feet of the Development Site, any potential emission points on site are more than 400 feet away. Therefore, an industrial source analysis was not warranted for this site.
- **64 Calyer Street (Unpermitted):** The current site at 64 Calyer Street is Smashbox Studios BK Photography Studio. Further investigation of the company provided no evidence of large-scale commercial or industrial photo printing or any other potential emission-creating processes at the site. Therefore, an industrial source analysis was not warranted for this site.

[7] Note that permits PR000977 and PB033501 are listed under 22 Franklin Street. This parcel is the parking lot for W.H. Christian & Sons Uniforms. The facility is on the adjacent parcel at 24 Franklin Street.

There are two active permits for Budd Woodwork Inc. at 54 Franklin Street. This woodshop is approximately 270 feet away from the Development Site. Industrial permit PA025190 indicated that there is a woodworking spray booth at this facility. Permit PB002302 indicated that a wood planer, molder, jointer, ripsaw, and sander were also on-site. Therefore, a *CEQR Technical Manual* industrial screening analysis was performed for the spray booth and various woodworking equipment to assess impacts from paint spraying and wood shaving emissions on the Proposed Development. The list of contaminants and their corresponding hourly and annual emission rates from the permit records were used for the analysis.

The emission rates and results of this analysis are presented in **Table 13-5**. The results indicate that all individual contaminant concentrations are below their respective short and annual guidance levels obtained from the NYSDEC *DAR-1* Guidelines for the Evaluation and Control of Ambient Air Contaminants. They also show that solid particulates 2.5 ($PM_{2.5}$) are below their respective short-term and annual NAAQS.

Table 13-5 Results of Industrial Source Analysis

Chemical Name	CAS	Short-term Emission Rate (g/s)	Total Short-Term Concentration ($\mu g/m^3$)	SGC ($\mu g/m^3$)[4]	Annual Emission Rate (g/s)	Total Annual Concentration ($\mu g/m^3$)	AGC ($\mu g/m^3$)[4]
Permit PA025190 – Spray Booth							
Solids ($PM_{2.5}$)[1]	NY075-02-5	3.72×10^{-4}	0.32	35	6.79×10^{-4}	0.05	9
Methyl Isobutyl Ketone	00108-10-1	0.19	343.56	31,000	1.73×10^{-2}	1.33	3,000
Ethanol	00064-17-5	0.01	13.74	-	6.90×10^{-4}	0.05	45,000
Butyl Alcohol, N-	00071-36-3	0.02	34.36	-	1.73×10^{-3}	0.13	1,500
Xylene, M, O & P MIXT.	01330-20-7	0.07	132.84	22,000	6.67×10^{-3}	0.51	100
Permit PB002302 – Woodworking Equipment							
Solids ($PM_{2.5}$)[2]	NY075-02-5	3.72×10^{-4}	0.32	35	6.79×10^{-5}	0.01	9
$PM_{2.5}$ Totals							
Solids ($PM_{2.5}$)[3]	NY075-02-5	7.43×10^{-4}	20.45	35	7.47×10^{-4}	7.56	9

Notes:
[1] Conservatively assuming all PM to be PM2.5.
[2] Conservatively assuming all PM is PM2.5.
[3] Total PM2.5 concentrations include background concentrations from **Table 13-2**.
[4] Particulates are compared against the NAAQS, as there are no SGCs or AGCs for particulate matter.

Health risk is characterized using excess cancer risks per one million people for carcinogenic compounds and as hazard index for non-carcinogens. None of the chemicals present have been identified as carcinogenic. Therefore, a cancer risk assessment was not warranted. Non-cancer health risk (i.e., hazard index) was estimated using procedures from the NYSDEC DAR-1 based on the annual concentrations and AGC levels. The non-cancer hazard index is presented in **Table 13-6**.

Table 13-6 Hazard Index Assessment

Chemical Name	CAS	DAR-1 classification	Hazard Quotient
Methyl Isobutyl Ketone	00108-10-1	Medium toxicity	4.42×10^{-4}
Ethanol	00064-17-5	Low toxicity	1.18×10^{-6}
Butyl Alcohol, N-	00071-36-3	Low toxicity	8.84×10^{-6}
Xylene,M,O&P MIXT.	01330-20-7	Medium toxicity	5.13×10^{-3}
Hazard Index			**0.0056**

Source: VHB, 2025

Because the hazard quotient is well below 1.0, there is no significant toxicity risk from the modeled toxic pollutants, and a related significant adverse impact would not be expected.