

15 Air Quality

Introduction

This chapter examines the potential effects on air quality conditions from the Proposed Actions. 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, such as stack emissions from on-site fuel burned boilers for heating, ventilation, and air conditioning (HVAC) systems, usually referred to as stationary sources; or by a combination of both. An air quality assessment determines both a proposed action's effects on ambient air quality as well as the effects of ambient air quality on a proposed project.

An air quality screening assessment was performed following the 2014 *CEQR Technical Manual* guidelines to determine the potential for adverse impacts with respect to mobile and stationary sources of air emissions. The assessment is based on a comparison of the development of the four prototypical analysis sites under the No Action scenario with the With Action scenario, as described in **Chapter 1, Project Description**.

Principal Conclusions

The Proposed Actions, as analyzed through four representative prototypical analysis sites, are not anticipated to result in significant, adverse impacts related to air quality. The air quality analyses for the Proposed Actions considered the potential for both mobile and stationary source impacts.

Mobile Sources

The Proposed Actions would not result in significant, adverse air quality impacts from mobile sources. Potential mobile source impacts are those that could result from an increase in traffic in the area, resulting in greater congestion and higher levels of carbon monoxide (CO) and particulate matter. The qualitative mobile sources screening assessment indicated that the number of incremental vehicular trips generated by each prototypical analysis site would be lower than the 2014 *CEQR Technical Manual* CO-based screening threshold of 170 peak hour auto trips at an intersection, as well as the minimum screening threshold of

12 heavy-duty diesel vehicles peak hour trips at an intersection for fine particulate matter (PM_{2.5}). Because the Proposed Actions would not generate significant emissions from mobile sources, a detailed analysis is not needed to rule out the potential for significant, adverse air quality impacts from mobile sources.

Stationary Sources

The Proposed Actions would not result in significant, adverse air quality impacts as a result of stationary sources. Potential stationary source impacts are those that could occur from stationary sources of air pollution, such as major industrial processes, or heat and hot water boilers of major buildings in proximity to the Proposed Actions. The HVAC systems screening analysis demonstrated that a detailed analysis was not warranted for the prototypical analysis sites. Thus, no potential significant, adverse air quality impacts would occur from fossil fuel-fired heat and hot water systems associated with the prototypical analysis sites. Based on the large and major emission sources screening assessment, a detailed analysis was warranted for one of the sources that was identified. The analysis results indicated that the large source would not have a significant, adverse air quality impact on as-of-right development expected under the With Action scenario. Additionally, the qualitative industrial source screening assessment indicated that the Proposed Actions do not warrant detailed analyses for industrial sources.

Methodology

Analyses were conducted to assess the potential effects of the Proposed Actions on air quality conditions, as related to emissions from mobile sources and stationary sources. The air quality screening and detailed analyses were generally performed following the methodology outlined in the 2014 *CEQR Technical Manual*, as discussed below.

Mobile Sources Screening Methodology

The U.S. Environmental Protection Agency has identified six common air pollutants, which are known as criteria pollutants (ozone, particulate matter, CO, lead, sulfur dioxide [SO₂], and nitrogen dioxide [NO₂]), as being of concern nationwide. The criteria pollutants associated with mobile source emissions (vehicular-related) are CO and particulate matter (PM_{2.5} and PM₁₀). PM_{2.5} refers to particulate matter with an aerodynamic diameter size of 2.5 micrometers or less, and PM₁₀ refers to particulate matter with an aerodynamic diameter of 10 micrometers or less.

Increased traffic volumes could be generated at some of the prototypical analysis sites under the With Action scenario, which could result in localized increases in CO and PM levels. Therefore, a qualitative mobile source screening analysis was conducted for each of the four prototypical analysis sites to determine the potential for CO and PM impacts, following 2014 *CEQR Technical Manual* guidelines. The CO screening used the applicable screening threshold of 170 auto trips per hour at an intersection. For the qualitative PM_{2.5} screening, the minimum or most conservative threshold of 12 heavy-duty diesel vehicles for fine particulate matter (PM_{2.5}) was used.

Stationary Sources Screening Methodology

HVAC Screening

In accordance with 2014 *CEQR Technical Manual* guidance, an HVAC screening analysis was completed for the prototypical analysis sites to assess the potential for emissions from the HVAC system of the proposed building to affect nearby existing land uses. Impacts from boiler emissions are a function of fuel type, stack height, minimum distance from source to the nearest building of similar or greater height, and the square footage size of the proposed building.

All prototypical analysis sites were subjected to an assessment to determine whether an air quality analysis is warranted. If the prototypical analysis site involves no change in floor area, density, or height between the No Action and the With Action scenarios, there would be no stationary source air quality impacts, and no further analysis is warranted. HVAC screening analyses were performed for prototypes with floor area, density, or height changes.

The screening methodology determined the threshold distance between the HVAC stack and the nearest sensitive receptor of similar or greater height beyond which the Proposed Actions would not have a significant, adverse impact. The screening procedures considered the different type of fuel to be used, the maximum development size, type of development, and the heat and hot water systems exhaust stack height to evaluate whether a significant, adverse impact may occur. The screening distance was assumed to be 400 feet for a prototypical analysis site if there were no buildings of similar or taller height than the With Action scenario prototypical analysis site building (also referred to as “proposed building”), indicating that the Proposed Actions could facilitate the development of the tallest building in the neighborhood.¹⁵ For any

¹⁵ The following process was followed to determine whether the prototypical analysis site would result in the development of the tallest building in the neighborhood. Height information from the building footprints GIS data base (maintained by New York City Department of Information Technology & Telecommunications) was used to calculate the average (mean) building height for the prototypical

prototypical analysis sites that do not pass the screening, a detailed analysis may be necessary.

As **Table 15-1** shows, two of the prototypical analysis sites would result in an incremental change in the size and/or height of the proposed development (sites 3 and 4).

Table 15-1. Prototypical Analysis Sites: Incremental Development

Proto- typical Analysis Site	No Action Floor Area (Square Feet)	No Action Number of floors/ Approximate Building Height ^a (Feet)	With Action Floor Area (Square Feet)	With Action Number of floors/ Approximate Building Height ^a (Feet)	Incremental Change Floor Area (Square Feet)	Incremental Change Building Height ^a (Feet)
1	3,000	2 / 24 ft	3,000	2 / 24 ft	0	0
2	2,250	2 / 24 ft	2,250	2 / 24 ft	0	0
3	0	0	6,000	2 / 24 ft	+6,000	+24 ft
4	4,000	2 / 24 ft	3,600	3 / 36 ft	-400	+12 ft

Notes: Cell shading indicates that HVAC screening is warranted for the proposed development.

^a Assumes floor height of 12 feet.

*** This table has been modified for the FEIS.**

Based on aforementioned parameters, if the distance between an HVAC stack and its nearest receptor of similar or greater height is less than the threshold distance according to the *2014 CEQR Technical Manual* figures, the potential for significant, adverse air quality impacts is identified, and a detailed analysis involving a refined dispersion model is typically necessary. Otherwise, if the distance is greater, then the site passes the screening analysis, and no further analysis is required.

Industrial Sources Screening

Actions that would result in the development of new, significant industrial sources or new uses that may be adversely affected by airborne emissions from existing or planned industrial sources require an assessment of both criteria and non-criteria pollutant emissions. A qualitative screening assessment was performed to determine the need for an industrial source screening assessment taking into consideration the location of industrial land uses relative to the rezoning area.

analysis site's existing zoning and special district (i.e., site 3 is zoned R1-1 in NA-2, where the average existing building height is approximately 26.7 feet).

Large and Major Emission Sources Screening

Large and major emissions sources, such as power generating stations, may affect surrounding uses or be affected by new structures nearby.¹⁶ A screening assessment was undertaken to determine whether the Proposed Actions warrant a detailed analysis of large and major emission sources. NYSDEC permit records were reviewed to identify large/major sources within 1,000 feet of the rezoning area.

Large and Major Source Detailed Analysis Methodology

As explained in the screening analysis section below, a detailed analysis was required for the Hebrew Home for the Aged, a large emission source. The AERMOD analysis was based on the modeling files prepared for an expansion project approved in 2018 (CEQR No.18DCP134X). The sources analyzed included boilers and a new cogeneration facility. All stack parameters and emission rates were consistent with those used in the prior Hebrew Home environmental review. Receptors were placed at multiple elevations along the property line of Block 5955, Lot 613, which has been identified as the nearest property where residential development is expected under the With Action scenario.¹⁷

Screening Analysis

Mobile Sources Screening Analysis

Based on the preliminary traffic screening analysis provided in **Chapter 14, Transportation**, none of the prototypical analysis sites required a quantified Level 1 preliminary traffic screening assessment because no sites are expected to generate 50 or more peak hour vehicular trips. Therefore, because the number of incremental vehicular trips generated by each prototypical analysis site would be lower than the 2014 *CEQR Technical Manual* CO-based screening threshold of 170 auto trips per hour at an intersection, all the prototypical analysis sites pass the CO-based mobile source screening analysis.

Similarly, because none of the prototypical analysis sites required quantified traffic screening, it is unlikely that any sites would exceed the most conservative PM_{2.5} screening threshold (i.e., an increment of 12 or more peak hour heavy-duty diesel vehicle/ passenger car equivalent trips at one intersection). The Proposed Actions would result in a limited

¹⁶ The 2014 *CEQR Technical Manual* defines major sources as those sources located at Title V facilities that require Prevention of Significant Deterioration permits. Large sources are defined as sources located at facilities that require a state facility permit.

¹⁷ The following process was used to determine the parcel closest to the source that is likely to be developed with an as-of-right residential building in the With Action scenario. DCP's GIS property database (MapPluto) was queried to identify vacant lots within NA-2 that are residentially zoned and located within 1,000 feet of the Hebrew Home source. Of the seven vacant lots identified, Block 5955, Lot 613, is situated closest to the Hebrew Home source, on the eastern side of Palisade Avenue approximately 275 feet from the source. Therefore, this parcel was selected as the worst-case receptor.

amount of incremental development at only one of the four sites, as summarized below:

- Site 3– 1 dwelling unit, 2 parking spaces

Because none of the prototypical analysis sites are expected to exceed the screening threshold, all sites pass the PM_{2.5}-based qualitative screening assessment. Consequently, the Proposed Actions would not result in significant, adverse mobile source air quality impacts, and no further analysis is warranted.

Stationary Sources Screening Analysis

HVAC Screening Analysis

Two prototypical analysis sites required an HVAC screening analysis. In general, buildings with lower height than the emissions stack of a proposed building would not be adversely affected by the proposed building’s HVAC operations. Accordingly, the screening was focused on existing receptors (buildings) of a similar or greater height. If such buildings were closer to the proposed building than the threshold distance, then the proposed building failed the screening and may require a detailed analysis to rule out the potential for significant, adverse impacts.

As **Table 15-2** shows, prototypical analysis site 4 passed the screening due to the height of the emissions stack for each prototypical analysis site building under the With Action scenario. For this site, it is assumed that the prototypical analysis site building under the With Action scenario would be the tallest building in the area (based on average existing building height of the zoning and special district). Thus, a threshold distance of 400 feet was applied to site 4, and it passed the screening.

Table 15-2. HVAC Screening Analysis Results

Proto- typical Analysis Site	With Action Development Size (square feet)	Building Height ^a (feet)	Stack Height ^b (feet)	Existing Zoning	Mean Building Height for Zoning and Special District (feet)	HVAC Screening Results ^c
3	6,000	24	27	R1-1	26.7 ft	Pass
4	3,600	36	39	R1-2	26.2 ft	Pass

^a Assumes floor height of 12 feet.

^b Stack height assumed to be 3 feet taller than building height, per 2014 *CEQR Technical Manual* guidance.

^c Screening figures are provided in Appendix 5.

*** This table has been modified for the FEIS.**

For prototypical analysis site 3, the proposed residential development is not assumed to be the tallest building in the neighborhood because the emission stack height is very close to the average building height

calculated for the zoning and special district. Therefore, the HVAC screening analysis entailed plotting the proposed building size against the appropriate air quality screening figure,¹⁸ yielding a threshold distance of 24 feet.

Prototypical analysis site 3 is assumed to pass the screening based on the side yard requirements of the underlying R1-1 zoning district (which would not be affected by the Proposed Actions). In an R1-1 zoning district, minimum yard requirements are as follows: 20-foot front yard, 30-foot rear yard, and total of 35 feet for two side yards (15-foot per yard). The R1-1 side yard requirements would ensure a minimum of 30 feet separation distance between an adjacent building that may be of equal or greater height. As such, zoning regulations would require that the proposed development be located more than 24 feet from any adjacent receptors.

Industrial Sources Screening Analysis

The Proposed Actions would not encourage the development of industrial sources. Relative to the No Action scenario and based on existing land use patterns, the Proposed Actions are not expected to introduce new sensitive receptors in or close to existing industrial uses or manufacturing-zoned areas.

As discussed in **Chapter 2, Land Use, Zoning, and Public Policy**, no portion of the existing NA-2 is zoned for, or currently contains, industrial uses.

Therefore, because the Proposed Actions would not facilitate the development of new industrial sources and are not expected to introduce new sensitive receptors within or adjacent to (i.e., within 400 feet of) existing industrial uses and areas, an industrial source screening analysis is not warranted.

Large and Major Emission Sources Screening Analysis

The Proposed Actions would not result in major or large emissions sources, nor would they result in large-scale development that would have the potential to be affected by large or major emissions sources. For example, the tallest buildings introduced by the prototypical analysis sites in the With Action scenario would be three stories or approximately 36 feet in height. Because large and major emission sources typically have substantially higher stack heights, they are not expected to have an adverse effect on the prototypical analysis site developments.

¹⁸ Fuel oil No. 2 was conservatively assumed to be the HVAC fuel source in the screening analysis. The refined screening analysis process provided on page 25 of the 2014 *CEQR Technical Manual Air Quality Appendix* was followed using Appendix Figure 17-5, Residential Development, Fuel Oil #2, SO₂.

A review of NYSDEC-issued Title V Permits and State Facility Permits indicates that one permitted facility is located within the large and major emissions sources study area, which is delineated by a 1,000-foot buffer of NA-2.

The Hebrew Home for the Aged is located at 5901 Palisade Avenue in the Bronx, in the northwestern portion of NA-2 near the Hudson River. NYSDEC State Facility Permit data indicate that the emission points for the emission units range in height from 37 feet to 51 feet. Because the lowest emission point of 37 feet is similar to or above the 36-foot building height assumed for prototypical analysis sites 3 and 4, a detailed analysis was warranted for this large emission source.

Detailed Analyses

Large/Major Source Detailed Analysis

Table 15-3 summarizes the results of the detailed analysis of the Hebrew Home emission sources on a worst-case residential development site in the With Action scenario. The results show that the NAAQS and/or *de minimis* criteria would not be exceeded. Therefore, the Hebrew Home emission sources would not have a significant, adverse air quality impact.

Table 15-3. HVAC Detailed Analysis Results for Hebrew Home

Pollutant	Averaging Period	Units	Maximum Predicted Increment	Background Concentration	Maximum Predicted Total Concentration	De Minimis Criteria ^a	NAAQS
SO ₂	1-hour	µg/m ³	0.49	20.1	20.6	-	196
PM ₁₀	24-hour	µg/m ³	1.09	34.0	35.1	-	150
PM _{2.5}	Annual	µg/m ³	0.05	8.6	-	0.3	12
PM _{2.5}	24-hr	µg/m ³	0.96	21.2	-	7.9	35
NO ₂	Annual	µg/m ³	-	32.3	83.7	-	100
NO ₂	1-hr	µg/m ³	-	108.2	145.1	-	188

Notes: µg/m³ = micrograms per cubic meter; PM_{2.5} concentration increments are compared to the *de minimis* criteria. Increments of all other pollutants are compared with the NAAQS to evaluate the magnitude of the increments. Comparison to the NAAQS is based on total concentrations.

^a PM_{2.5} *de minimis* criteria are defined as: (a) 24-hour average not to exceed more than half the difference between the background concentration and the 24-hour NAAQS; and (b) annual average not to exceed more than 0.3 µg/m³ at discrete receptor locations.

Conclusion

Mobile Sources

The transportation screening analysis results indicate that the Proposed Actions would generate less than 50 vehicular trips and do not require a detailed traffic analysis. As such, the number of incremental vehicular trips generated by each prototypical analysis site would be below the relevant CO and PM screening thresholds provided in the 2014 *CEQR Technical Manual*. Therefore, the Proposed Actions would not result in significant, adverse air quality impacts as a result of mobile sources.

Stationary Sources

The results of the HVAC screening analyses show that the Proposed Actions, as analyzed through the four prototypical analysis sites, would not cause significant, adverse air quality impacts because of stationary sources. Similarly, the results of the detailed analyses demonstrate that major and large emission sources would not result in significant, adverse air quality impacts on development introduced by the Proposed Actions. In addition, per the screening analysis, the Proposed Actions do not warrant detailed analyses for industrial sources. Therefore, the Proposed Actions are not expected to result in significant, adverse air quality impacts as a result of stationary sources.