A. INTRODUCTION

The construction air quality analysis presented in this chapter considers whether the Phase II construction of the Project under the Extended Build-Out Scenario would result in any significant adverse construction air quality impacts not previously disclosed. The analyses presented in this chapter include a quantitative analysis of on-site and on-road sources of construction-related air emissions, including fugitive dust emissions, and the overall combined impact of both sources, where applicable.

PRINCIPAL CONCLUSIONS

Consistent with the conclusions of the 2006 FEIS, no significant adverse impacts on air quality are predicted during Phase II construction. Measures would be taken to reduce pollutant emissions during construction in accordance with all applicable laws, regulations, and building codes. These include dust suppression measures and the idling restriction for on-road vehicles. In addition to the required laws and regulations, the project sponsors have committed to a robust emissions reduction program, including early electrification, the use of ultra-low sulfur diesel (ULSD) fuel, best available tailpipe reduction technologies, and utilization of newer equipment. With the implementation of these emission reduction measures, the analysis of construction-related air emissions determined that particulate matter (PM) $PM_{2.5,}$ $PM_{10,}$ annual-average nitrogen dioxide (NO_2), and carbon monoxide (CO) concentrations would be below their corresponding *de minimis* thresholds or National Ambient Air Quality Standards (NAAQS), respectively. Therefore, the construction of Phase II of the Project under the Extended Build-Out Scenario would not result in significant adverse air quality impacts due to construction sources.

B. SUMMARY OF FINDINGS OF PREVIOUS ENVIRONMENTAL REVIEWS

The 2006 FEIS analysis predicted emission profiles for various pollutants to identify concentrations during various stages of peak construction. To ensure that the construction of the Project would result in the lowest practicable diesel particulate matter (DPM) emissions, extensive measures were incorporated into the Project construction program, including early electrification, the use of ULSD fuel, best available tailpipe reduction technologies, dust controls, and idling restrictions. The 2006 FEIS analysis results showed that concentrations of CO, NO_2, and particles with an aerodynamic PM_{10} were not predicted to increase to levels resulting in significant impacts by the construction of the Project in any phase of construction. Although concentrations of $PM_{2.5}$ were found to increase to levels exceeding the City's interim 24-hour and annual average guidance thresholds in areas immediately adjacent to both the Phase I and Phase II construction activity, the $PM_{2.5}$ threshold exceedances were predicted to be limited in extent, duration, and severity. The 2006 FEIS concluded that no significant adverse impacts on air quality would occur during the construction of the Project.

C. METHODOLOGY

In general, much of the heavy equipment used in construction is powered by diesel engines that have the potential to produce relatively high levels of nitrogen oxides (NO_x) and particulate matter (PM). Fugitive dust generated by construction activities is also a source of PM. Gasoline engines produce relatively high levels of CO. Since ULSD fuel is required for all diesel engines used in the construction of the Project, sulfur oxides (SO_x) emitted from those construction activities would be negligible. Therefore, the pollutants analyzed for the construction period are NO_2, particles with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}), particles with an aerodynamic diameter of less than or equal to 2.5 micrometers ($PM_{2.5}$), and CO. Chapter 4E, “Operational Air Quality,” contains a review of these pollutants; applicable regulations, standards, and benchmarks; and general methodology for stationary and mobile source air quality analyses. The general methodology for stationary source modeling (regarding model selection, receptor placement, and meteorological data) presented in Chapter 4E, “Operational Air Quality” was followed for modeling dispersion of pollutants from on-site sources during the construction period. Additional details relevant only to the construction air quality analysis methodology are presented in the following section. For more details on air pollutants, see Chapter 4E, “Operational Air Quality.”

EMISSION REDUCTION MEASURES

Construction activity in general, and large-scale construction in particular, has the potential to adversely affect air quality as a result of diesel emissions. The main component of diesel exhaust that has been identified as having an adverse effect on human health is fine PM. The 2006 FEIS and Amended Memorandum of Environmental Commitments (MEC) require the project sponsors to implement a comprehensive program to reduce DPM emissions from construction activities. The following measures will continue to be employed during Phase II construction, and are assumed for purposes of this analysis:

- Diesel Equipment Reduction. Construction will minimize the use of diesel engines and utilize electric engines to the extent practicable. To that end, the project sponsors will meet with Con Edison to arrange for the provision of grid power to each building site for use during construction to ensure the availability of grid power and reduce the need for on-site generators. Equipment that would use grid power in lieu of diesel engines includes, but may not be limited to, welders, rebar benders, scissor lifts, and hydraulic articulating boom lifts.
- Clean Fuel. ULSD will be used exclusively for all diesel engines throughout the construction sites.
- Best Available Tailpipe Reduction Technologies. Non-road diesel engines with a power rating of 50 horsepower (hp) or greater and controlled truck fleets (i.e., truck fleets under long-term contract with the Project) including but not limited to concrete mixing and pumping trucks, will utilize the best available tailpipe (BAT) technology for reducing DPM emissions. Diesel particle filters (DPFs) are identified as being the tailpipe technology currently proven to have the highest reduction capability. Construction contracts will specify that all diesel non-road engines rated at 50 hp or greater must utilize DPFs, either installed on the engine by the original equipment manufacturer or a retrofit DPF verified by the

USEPA or the California Air Resources Board, and may include active DPFs,[1] if necessary; or other technology proven to achieve equivalent emissions reduction. Waivers may be granted only in cases where the non-compliant equipment is: 1) determined on very short notice to be necessary to complete a critical path item; 2) to remain on site for a very brief period of time; or 3) not practicable to retrofit with a DPF.

- Dust Control. Fugitive dust control plans will be required under the construction contract specifications. For example, chutes would be used for material drops during demolition. An on-site vehicular speed limit of 5 mph will be imposed and truck routes within the site would be watered as needed to avoid the re-suspension of dust. All trucks hauling loose material will be equipped with tight-fitting tailgates and their loads securely covered prior to leaving the construction site. Water sprays will be used to ensure that materials are dampened as necessary to avoid the suspension of dust into the air. In addition, all necessary measures will be implemented to ensure that the New York City Air Pollution Control Code regulating construction-related dust emissions is followed.
- Idling Restriction. In addition to adhering to the local law restricting unnecessary idling on roadways, on-site vehicle idle time will also be restricted to three minutes for all equipment and vehicles that are not using their engines to operate a loading, unloading, or processing device (e.g., concrete mixing trucks) or otherwise required for the proper operation of the engine.

Since the 2006 FEIS, additional air emission reduction technologies have become available. USEPA's Tier 1 through 4 standards for non-road engines regulate the emission of criteria pollutants from new engines, including PM, CO, NO_x, and hydrocarbons (HC). The modeling analysis for this supplemental environmental impact statement (SEIS) assumes that all non-road construction equipment with a power rating of 50 hp or greater would meet at least the Tier 3 emissions standard. Tier 3 NO_x emissions are 40 to 60 percent lower than Tier 1 emissions and considerably lower than uncontrolled engines. All non-road engines rated less than 50 hp would meet at least the Tier 2 emissions standard.

While not assumed for purposes of the modeling analysis, all Phase II construction non-road diesel-powered engines would comply with the Tier 4 emissions standard beginning in 2022**.**

Overall, this emissions reduction program (and the foregoing commitments with respect to the use of Tier 3 equipment and the phase-in of Tier 4 equipment, which would be required for Phase II construction through amendments to the MEC) is expected to substantially reduce DPM emissions and would exceed the reduction levels that would be achieved by applying the currently defined best available control technologies under New York City Local Law 77 (which are required only for publically funded City projects but was adopted for the Project as per the 2006 FEIS). In addition to adopting the measures delineated in New York City Local Law 77, the program institutes the use of electric engines in lieu of diesel engines where practicable, and introduces the use of non-road engines meeting the Tier 3 and Tier 4 emission standards.

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[1] There are two types of DPFs currently in use: passive and active. Most DPFs currently in use are the "passive" type, which means that the heat from the exhaust is used to regenerate (burn off) the PM to eliminate the buildup of PM in the filter. Some engines do not maintain temperatures high enough for passive regeneration. In such cases, "active" DPFs can be used (i.e., DPFs that are heated either by an electrical connection from the engine, by plugging in during periods of inactivity, or by removal of the filter for external regeneration).

As discussed in the “Environmental Compliance and Oversight” section in Chapter 3A, “Construction Overview,” the emission reduction program was included in construction contracts, reemphasized during the bid process, and enforced by the OEM during construction operation. The records maintained for Phase I construction indicate that 98.5 percent of the construction equipment used during peak Arena construction met the requirements specified in the emission reduction program. The emission reduction program specified in the MEC would continue to be implemented during Phase II construction, with certain adjustments to improve contractor compliance. In addition, the Tier 3 and Tier 4 requirements discussed above would be added to the MEC for Phase II construction to further reduce air quality emissions from non-road diesel-powered engines.

ON-SITE CONSTRUCTION ACTIVITY ASSESSMENT

To determine which construction periods constitute the worst-case periods for the pollutants of concern (PM, CO, NO_2), construction-related emissions were calculated throughout the duration of construction on an annual and peak day basis for $PM_{2.5}$ for each of the three illustrative construction phasing plans. $PM_{2.5}$ was selected for determining the worst-case periods for all pollutants as analyzed, because the ratio of predicted $PM_{2.5}$ incremental concentrations to impact criteria is higher than for other pollutants. Therefore, initial estimates of $PM_{2.5}$ emissions throughout the construction years were used for determining the worst-case periods for analysis of all pollutants. Generally, emission patterns of PM_{10} and NO_2 would follow $PM_{2.5}$ emissions, since they are related to diesel engines by horsepower. CO emissions may have a somewhat different pattern but generally would also be highest during periods when the most activity would occur. Based on the resulting multi-year profiles of annual average and peak day average emissions of $PM_{2.5}$, and the proximity of the construction activities to residences and publicly accessible open spaces, worst-case short-term and annual periods for construction were identified for dispersion modeling of annual and short-term (i.e., 24-hour, 8-hour, and 1-hour) averaging periods. Dispersion of the relevant air pollutants from the construction sites during these periods was then analyzed, and the highest resulting concentrations are presented in the following sections. Broader conclusions regarding potential concentrations during other periods, which were not modeled, are presented as well, based on the multi-year emissions profiles and the reasonable worst-case period results.

ENGINE EMISSIONS

The sizes, types, and number of units of construction equipment were estimated based on the construction activity schedule. Emission factors for NO_x, CO, PM_{10}, and $PM_{2.5}$ from on-site construction engines were developed using the USEPA’s NONROAD2008 emission model (NONROAD). Since emission factors for concrete pumps are not available from either the USEPA Motor Vehicle Emission Simulator (MOVES) emissions model or NONROAD, emission factors specifically developed for this type of application were used.[1] With respect to trucks, emission rates for $NO_{X,}$ CO, PM_{10}, and $PM_{2.5}$ for truck engines were developed using the USEPA MOVES emission model.

[1] Concrete pumps are truck mounted and use the truck engine to power the pumps at high load. This application of truck engines is not addressed by the MOVES model, and since it is not a non-road engine, it is not included in the NONROAD model. Emission factors were obtained from a study which developed factors specifically for this type of activity. *FEIS for the Proposed Manhattanville in West Harlem Rezoning and Academic Mixed-Use Development*, CPC–NYCDCP, November 16, 2007.

As described above in "Emission Reduction Measures," the project sponsors would continue to be obligated to comply with a number of measures to reduce air pollutant emissions during Phase II construction, with special attention given to DPM. These measures include the exclusive use of ULSD for all construction engines, the use of Tier 3 or newer equipment with DPFs during construction on all nonroad construction engines with an engine output rating of 50 hp or greater, and the use of Tier 4 equipment beginning in 2022. In addition, controlled truck fleets (i.e., truck fleets under long-term contract, such as concrete trucks) would use trucks equipped with DPFs.

Based on the commitments discussed above, emission factors for Phase II construction under the Extended Build-Out Scenario were calculated assuming the exclusive use of ULSD and the application of DPFs on all nonroad diesel engines 50 hp or greater and on concrete delivery and pumping trucks; other trucks were assumed to have emissions consistent with the general truck fleet (all on-road diesel vehicles currently use ULSD, as mandated by federal regulations). All diesel engines with a power output of 50 hp or greater were conservatively modeled as meeting the Tier 3 emission standard instead of the Tier 4 emission standard for the applicable Project phase-in schedule since the illustrative phasing plans are not intended to serve as a prediction of the exact schedule and sequence of the Phase II construction, but rather have been developed to illustrate how the timing of the construction of certain project components may vary and to provide for a reasonably conservative analysis of the range of environmental effects associated with a delayed build-out of Phase II. Since the 2006 FEIS was published, additional information regarding emissions controls had become available, indicating that the DPFs—the central component of the emissions reduction program being applied for the construction of the Project—reduce emissions significantly more than was assumed in the analysis. In the 2006 FEIS, DPFs were assumed to reduce diesel particulate matter (DPM) by 85 percent. The latest information indicates that almost all DPFs reduce DPM emissions by at least 92 percent, and most are in the range of 95 to 98 percent. Multiple large construction projects analyzed more recently under the *City Environmental Quality Review (CEQR) Technical Manual* have applied an assumption of 90 percent reduction. Therefore, a 90 percent DPM reduction assumption was used for this analysis, and the $PM_{2.5}$ emission factors for engines retrofitted with a DPF (i.e., all nonroad engines with a power output of 50 hp or greater and all concrete delivery trucks) were calculated as 10 percent of the NONROAD emission factors for uncontrolled equipment. All personnel/material hoists and small hand tools would be electric and would therefore have no associated emissions.

FUGITIVE DUST

In addition to engine emissions, fugitive dust emissions from operations (e.g., excavation, grading, and transferring of excavated materials into dump trucks) were calculated based on U. S. Environmental Protection Agency (USEPA) procedures delineated in AP-42 Table 13.2.3-1. Consistent with the assumptions used in the 2006 FEIS, it was estimated that the planned control of fugitive emissions would reduce PM emissions from such processes by 50 percent. Vehicle speeds on-site would be limited to five miles per hour in order to avoid the resuspension of dust.

ANALYSIS PERIODS

The resulting emission factors were used for the emissions and dispersion analyses. Average annual (running 12-month averages) and peak-day $PM_{2.5}$ engine emissions profiles for each of the construction phasing plans were prepared by multiplying the emission rates by the number of engines, the work hours per day, and fraction of the day each engine would be expected to work during each month of construction. The resulting overall peak day and annual average emission profiles are presented in **Figures 3I-1 through 3I-5**.

Based on the $PM_{2.5}$ construction emissions profiles, August 2031 and the 12-month period from April 2031 to March 2032 under the start and stop sequential phasing of Construction Phasing Plan 3 (see **Figures 3I-1 and 3I-4**) were identified as the first (i.e., worst-case) short-term and annual periods (S1 and A1), respectively, since the highest project-wide emissions were predicted in these periods and construction activities would occur simultaneously at Building 5 and Platforms 6 and 7 on Block 1120 and Buildings 9 and 10 on Block 1121, under the assumed schedule and sequence for Construction Phasing Plan 3. In addition, the construction activities during these peak periods would take place in close proximity to completed Phase II residential and open space locations (Buildings 11 through 14 on Block 1129 and Building 15 on Block 1128), existing residential locations on Block 1128, and residential locations along the north side of Atlantic Avenue across from the construction sites.

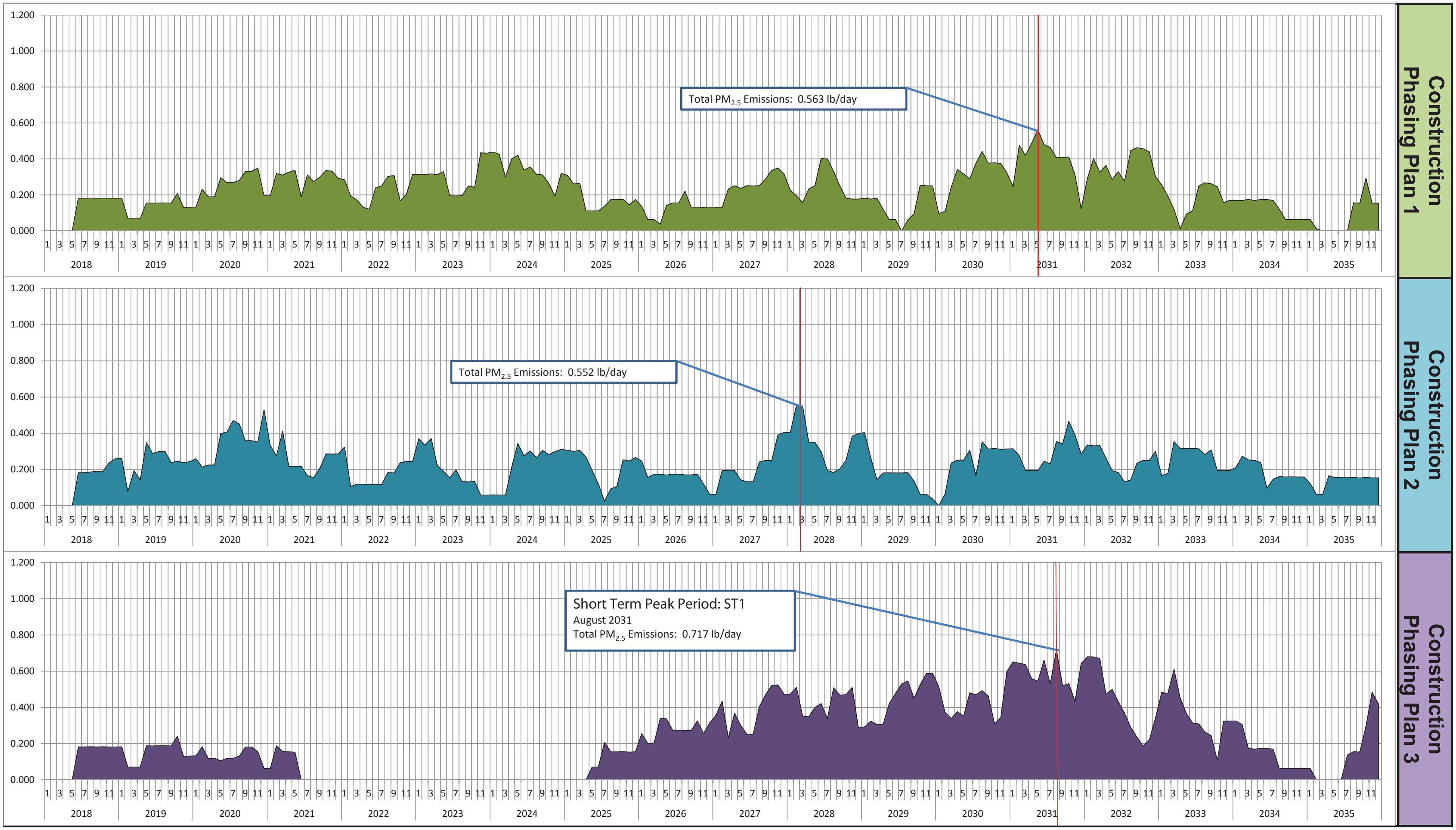
October 2027 under Construction Phasing Plan 3 (see **Figure 3I-2**) was selected as a second short-term peak period (S2) to capture the effects of peak construction activities on Block 1129. During this short-term peak period, construction activities would occur simultaneously at Buildings 11, 12, and 13 on Block 1129 and the activities would take place in close proximity to the residential locations along Dean Street and Vanderbilt Avenue near the construction sites, under the assumed schedule and sequence for Construction Phasing Plan 3.

An additional short-term (May 2024) peak period under Construction Phasing Plan 1 (see **Figure 3I-3**) was selected as the third short-term peak period (S3) to capture the effects of peak construction activities on Block 1128 and the effects of a continuous sequential construction phasing plan. During this short-term peak period, construction activities would occur simultaneously at Building 15 on Block 1128 and Building 11 on Block 1129 and the activities would take place in close proximity to the residential locations along Dean Street and Pacific Street near the construction sites, under the assumed schedule and sequence for Construction Phasing Plan 1.

The 12-month period from December 2027 to November 2028 under Construction Phasing Plan 3 (see **Figure 3I-5**) was selected as a second annual period of peak activity (A2) on Blocks 1128 and 1129. During this annual peak period, construction activities would occur at Building 15 on Block 1128 and Buildings 11 and 12 on Block 1129, under the assumed schedule and sequence for Construction Phasing Plan 3.

The dispersion of pollutants during the worst-case short-term and annual periods was then modeled in detail to predict resulting maximum concentration increments from construction activity and total concentrations (including background concentrations) in the surrounding area. Although the modeled results are based on construction scenarios for specific sample periods, conclusions regarding other periods can be derived based on the fact that lower concentration increments from construction activities would generally be expected during periods with lower construction emissions. As presented in **Figures 3I-1 through 3I-5**, emissions during other periods would be lower—often much lower—than the peak emissions which were modeled. This is particularly the case for annual average analyses. However, since the worst-case short-term results are often indicative of very localized effects, similar maximum local concentrations may occur at any stage at various locations but would not persist in any single location, since emission sources would not be located continuously at any single location throughout construction. Equipment would move throughout the site as construction progresses.

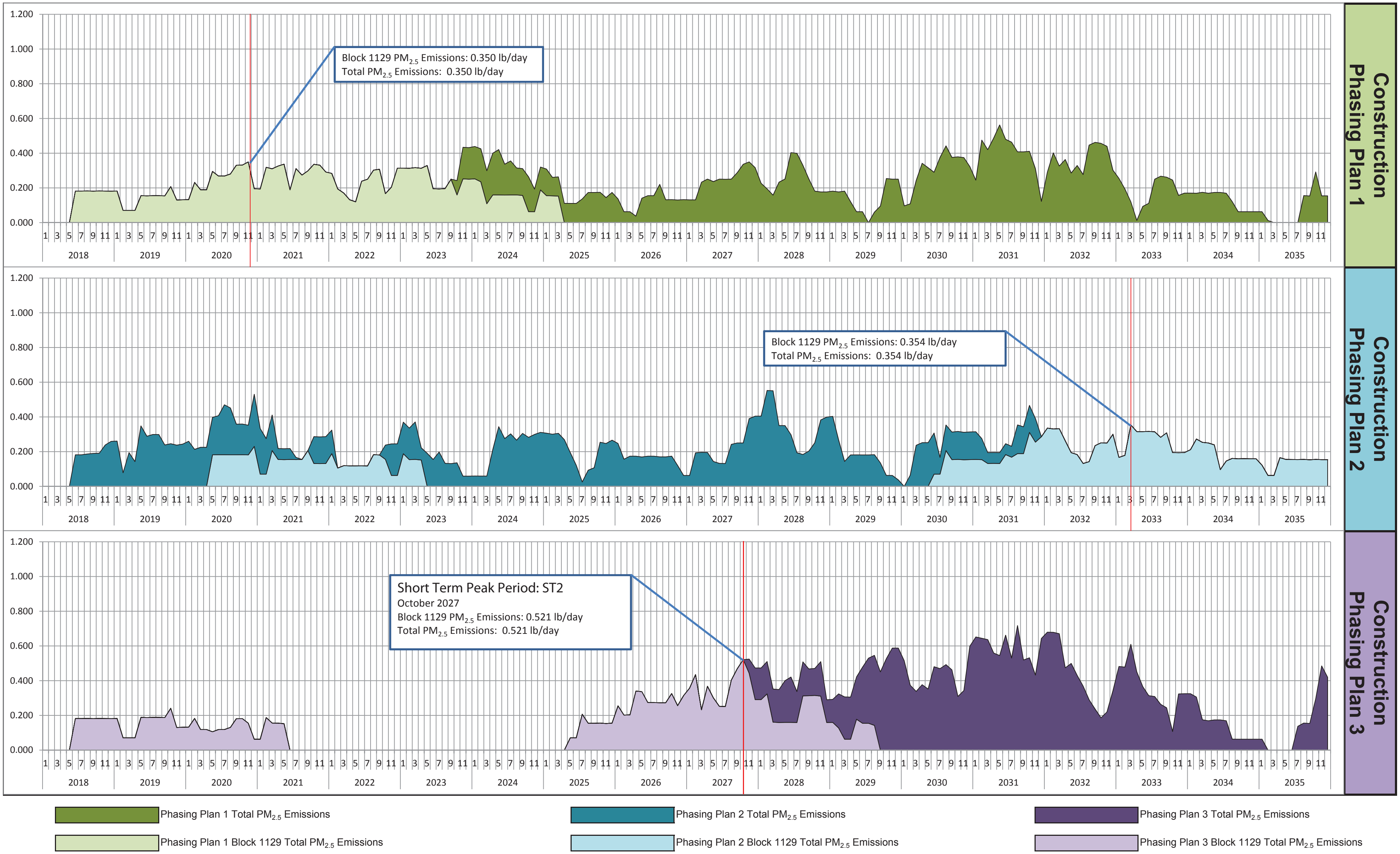
2.26.14



Short-Term (24-Hour Average) $PM_{2.5}$ Construction Emissions Profile

Figure 3I-1

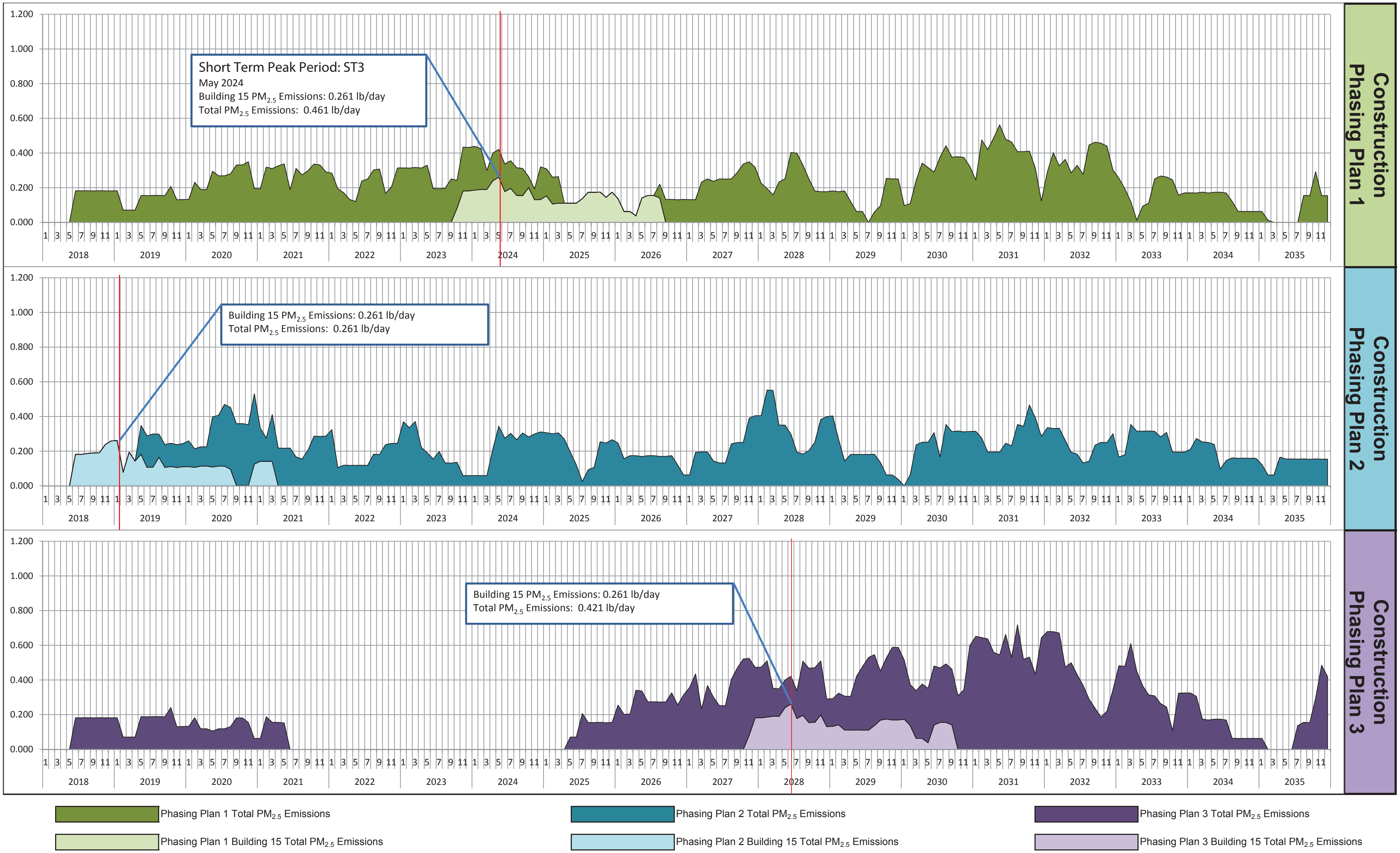
2.26.14



Short-Term (24-Hour Average) $PM_{2.5}$ Construction Emissions Profile - Block 1129

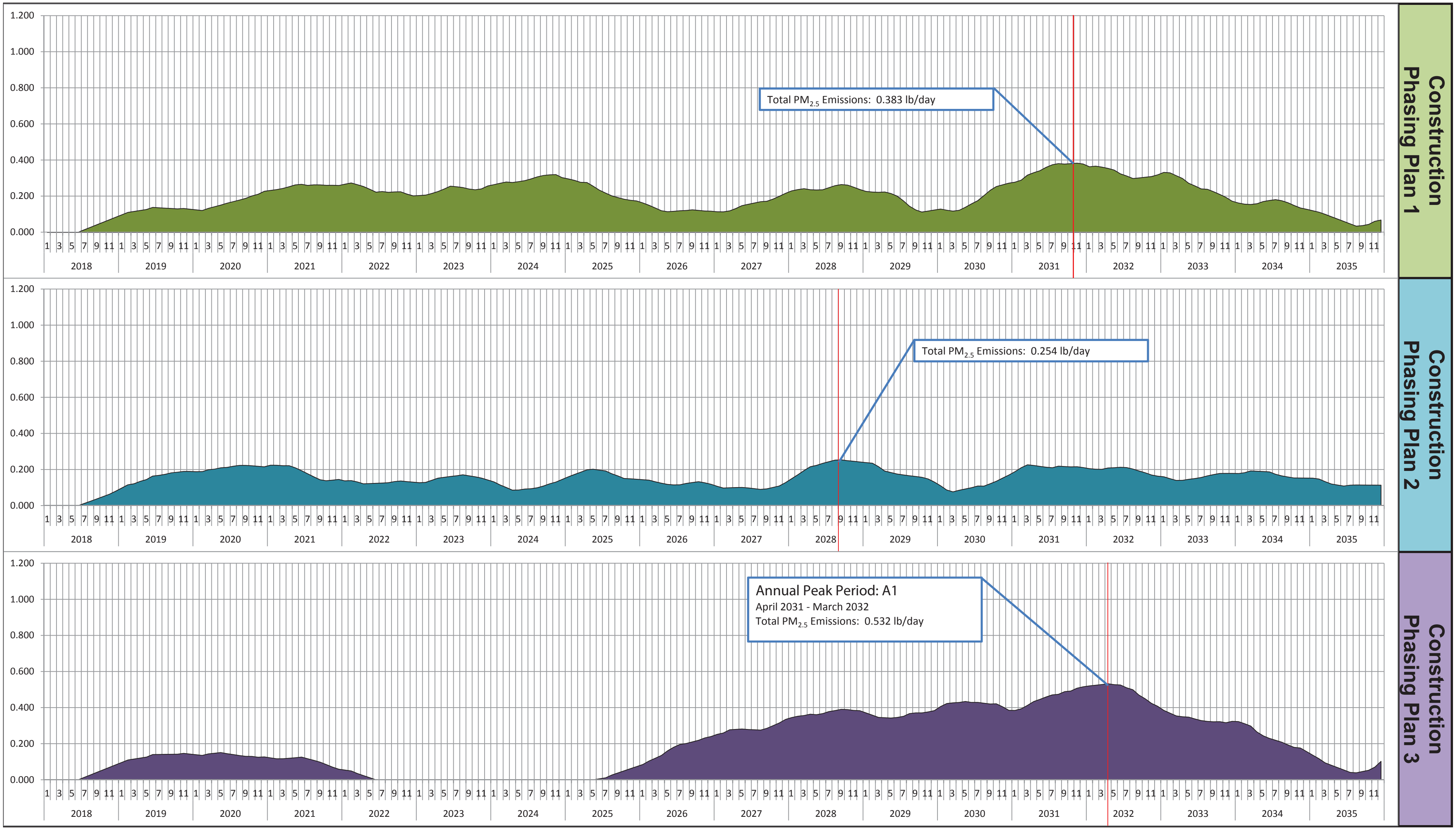
Figure 3I-2

2.26.14



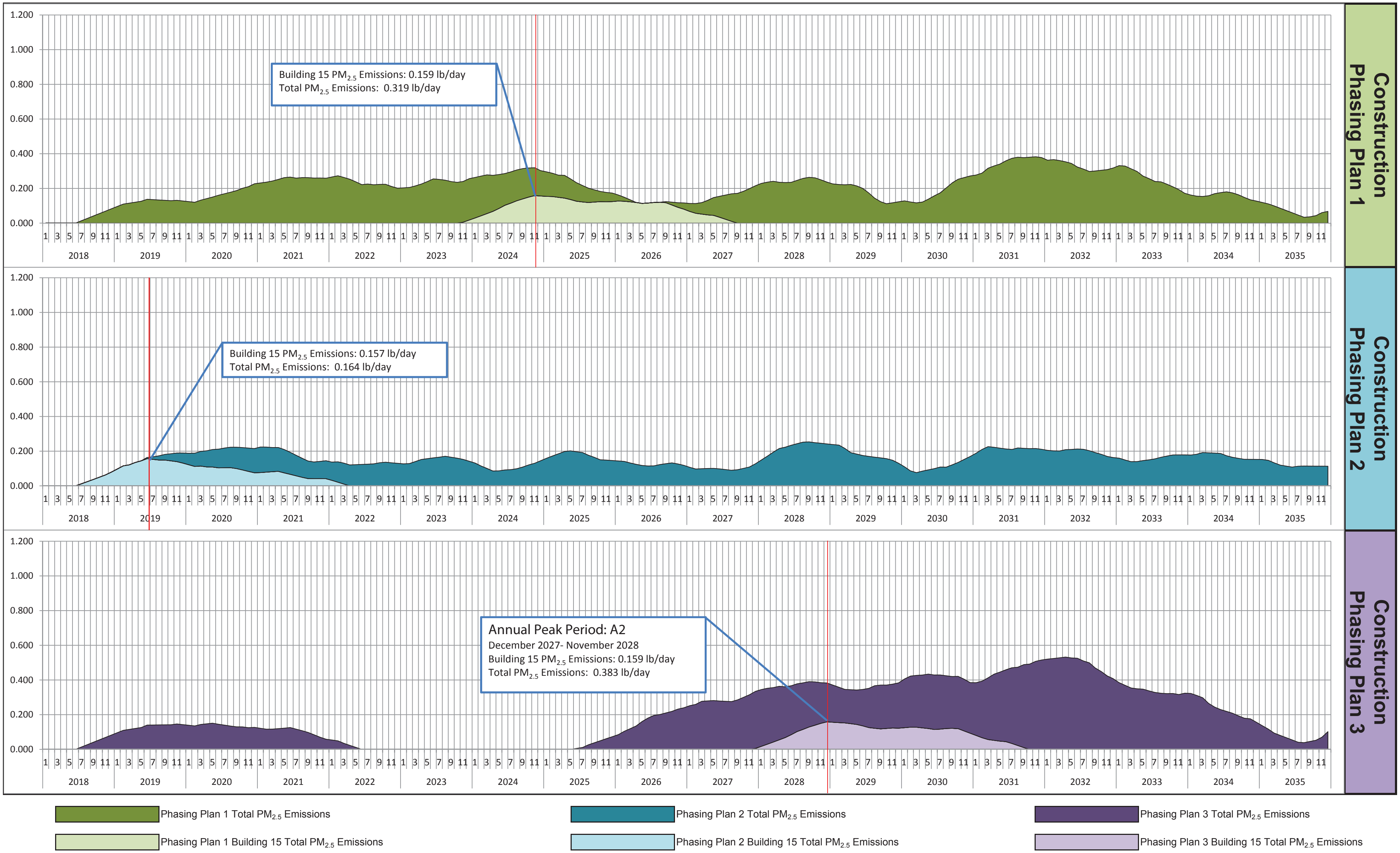
Short-Term (24-Hour Average) $PM_{2.5}$ Construction Emissions Profile - Building 15

Figure 3I-3



Annual $PM_{2.5}$ Construction Emissions Profile
Figure 3I-4

2.26.14



Annual $PM_{2.5}$ Construction Emissions Profile - Building 15

Figure 3I-5

SOURCE SIMULATION

For the short-term model scenarios (predicting concentration averages for periods of 24 hours or less), all stationary sources, such as compressors, pumps, or concrete trucks, which idle in a single location while unloading, were simulated as point sources. Other engines, which would move around the site on any given day, were simulated as area sources. For periods of 8 hours or less (less than the length of a shift), it was assumed that all engines would be active simultaneously. All sources would move around the site throughout the year and were therefore simulated as area sources in the annual analyses.

RECEPTOR LOCATIONS

Receptors (locations in the model where concentrations are predicted) were placed along the sidewalks surrounding the construction sites on both sides of the street at locations that would be publicly accessible, at residential and other sensitive uses at both ground-level and elevated locations (e.g., residential windows), at publically accessible open spaces, and at completed and occupied Phase I and Phase II buildings and open spaces. In addition, a ground-level receptor grid was placed to enable extrapolation of concentrations throughout the area at locations more distance from Phase II construction.

MOBILE SOURCE ASSESSMENT

The general methodology for operational mobile source intersection modeling presented in Chapter 4E, "Operational Air Quality," was followed for intersection modeling during the construction period. The CAL3QHC model was used to perform mobile source CO computations, while CAL3QHCR, a refined version of the CAL3QHC model, was used to determine motor vehicle generated PM concentrations. The intersection selected for CO, PM_{10} and $PM_{2.5}$ modeling is presented in **Table 3I-1.**

Table 3I-1
Mobile Source Analysis Intersection Location

Analysis Site	Location
1	Atlantic Avenue and Flatbush Avenue
2	Dean Street and Sixth Avenue

As described in Chapter 3H, "Construction Transportation," the first quarter of 2032 under Construction Phasing Plan 3 was identified as the overall construction traffic peak period with the highest level of construction trip generation. Therefore, this period was selected to represent the highest potential for mobile source air quality impacts. This worst-case period was also used to represent the highest predicted mobile source CO and PM increments for all other construction periods to be added to the concurrent on-site emissions from construction equipment and activities; this is a conservative assumption, since concentration increments from mobile sources during construction periods with lower vehicle increments would be lower.

Sites for mobile source analysis were selected based on the construction trip assignments analyzed for the construction peak traffic scenarios. The sites were chosen with the objective of capturing the highest construction-related traffic increment, the highest expected increments at locations where background concentrations were predicted to be high in the No Build condition, and the mobile source increments in areas near the project site at intersections where relatively high increments are predicted from on-site construction activity. Analysis Site 1 (Flatbush Avenue and

Atlantic Avenue) was selected as the location with highest predicted construction volume increments during Phase II construction. Analysis Site 2 (Dean Street and Sixth Avenue) was selected because it is near the location where the highest potential increase in off-site concentrations from on-site emissions was predicted during Phase II construction.

TEMPORARY SURFACE PARKING LOT

As described in the "Construction Staging and Temporary Parking Areas" section in Chapter 3A, "Construction Overview," Block 1129 would continue to be used for temporary parking during part of the Phase II construction, although the area used for temporary parking area would diminish as the buildings and open space on Buildings 11, 12, 13, and 14 are developed. Emissions from vehicles using the temporary surface parking facility on Block 1129 could potentially affect ambient levels of pollutants at adjacent receptors, including completed Phase II buildings and open space. The parking analysis assumed the peak parking activities on Block 1129[1] during construction to capture the reasonable worst-case effects of the temporary surface parking lot operations (assumed to be located at Building sites 11, 12, and 13) on the adjacent completed Project building and open space (Building 14). An analysis was performed using the methodology delineated in the 2014 *CEQR Technical Manual* to calculate pollutant levels of CO, $PM_{2.5}$, and PM_{10}.

Potential impacts from the temporary surface parking facility on Block 1129 were assessed at multiple receptor locations. Concentrations were determined for the time periods when overall usage would be the greatest, considering the hours when the greatest number of vehicles would enter and exit the project site. Emissions from vehicles entering, parking, and exiting the temporary surface parking facility were estimated using the USEPA MOVES mobile source emission model. All arriving and departing vehicles were conservatively assumed to travel at an average speed of 5 miles per hour within the temporary surface parking facility. In addition, all departing vehicles were assumed to idle for 1 minute before exiting.

A "near" and "far" receptor was placed on the sidewalk and on the completed open space area at Building 14 adjacent to the temporary surface parking facility and on the sidewalk directly opposite the parking facility. To determine compliance with the NAAQS, CO concentrations were determined for the maximum 1- and 8-hour average periods. A persistence factor of 0.70 was used to convert the calculated 1-hour average maximum concentrations to 8-hour averages, accounting for meteorological variability over the average 8-hour period. PM concentrations were determined for the maximum 24-hour and annual average periods utilizing USEPA recommended persistence factors of 0.60 and 0.1, respectively.

CUMULATIVE ASSESSMENT

Since there are various emission source types (on-site sources, mobile sources and operational heating, ventilation, and air conditioning [HVAC] systems sources) that may contribute to concentration increments concurrently, a cumulative assessment of all Project sources was undertaken to determine the potential maximum effect of all sources combined. As described in Chapter 3A, "Construction Overview," Building 1 and Site 5 may be constructed anytime during

[1] The hourly volumes for the peak hour and peak eight-hour averages used for the analysis of potential air emissions from parking on Block 1129 were 319 vehicles and 211 vehicles per hour, respectively, which represent a conservative assumption of the utilization of the Block 1129 parking facilities during the peak construction hours.

the overall construction period and could occur during Phase II construction. However, since these buildings are not in close proximity to the Phase II construction sites and there would be minimal overlapping effects between the construction of these buildings and Phase II construction, construction of Building 1 and Site 5 was assumed to be completed and the buildings were assumed to be operational during Phase II construction for the purpose of accounting for stationary sources of emissions. For mobile sources, the traffic analysis assumed that Building 1 and Site 5 would be under construction since the construction period traffic associated with these buildings was determined to be greater than the operational traffic. Overall, both the stationary and mobile sources of emission from Building 1 and Site 5 were conservatively accounted for in the cumulative analysis to determine the maximum incremental pollutant concentrations.

The analyzed Phase II construction periods would take place while all Phase I and some Phase II buildings are operational. Therefore, the combined concentration for the Phase II construction period includes the effects of operational HVAC sources for all Phase I buildings and Phase II buildings that are completed and occupied during the respective analysis periods.

Total cumulative concentration increments were estimated by adding the highest results from the mobile source analysis, the construction analysis, and the Phase I and Phase II operational stationary source analysis by location. Mobile sources included Phase II construction vehicles and Phase I and Phase II (portions of the Phase II buildings that would be completed during the peak construction traffic analysis periods) operational vehicles. The mobile source and stationary source analyses would be performed separately with different dispersion models, as appropriate for the different types of analyses. The combination of the results from different models is a conservatively high estimate of potential impacts, since it is likely that the highest results from different sources would occur under different meteorological conditions (e.g., different wind direction and speed) and would not actually occur simultaneously.

1-HOUR NO_2

As discussed in Chapter 4E, “Operational Air Quality,” USEPA established a 1-hour average standard for NO_2 in 2010. USEPA has designated the entire state of New York as “unclassifiable/attainment” for the new 1-hour NO_2 standard effective February 29, 2012. Substantial uncertainty still exists as to 1-hour NO_2 background concentrations at ground level, especially near roadways, since these concentrations have not been adequately measured. In addition, there are no clear methods to predict the rate of transformation of NO to NO_2 at ground-level given the level of existing data and models. Additional roadside NO_2 monitors are required in the New York City area, and are expected to be operational by mid-2014. Therefore, the significance of predicted construction impacts cannot be determined based on comparison with the new 1-hour NO_2 NAAQS since total 98th percentile values (which is the form of the 1-hour NO_2 NAAQS), including local area roadway contributions adjacent to construction sites, cannot be estimated. In addition, methods for accurately predicting 1-hour NO_2 concentrations from construction activities have not been developed. However, exceedances of the 1-hour NO_2 standard resulting from construction activities cannot be ruled out and therefore, as discussed above in “Introduction,” non-road diesel-powered vehicles and construction equipment rated Tier 3 or higher would be used during Phase II construction to reduce NO_x emissions. In addition, all Phase II construction non-road diesel-powered engines would comply with the Tier 4 emissions standard beginning in 2022. The Tier 4 emissions standards for newly manufactured non-road diesel engines have a phase-in period of 2008 to 2015. Over time, irrespective of any Project-specific commitments, there would be an increasing percentage of non-road diesel engines on-site conforming to the Tier 4 emissions standards, resulting in reduced NO_x emissions during construction activities. Further, the electrification and idling restrictions mentioned above in “Introduction” would also reduce NO_X emissions and consequently, NO_2 concentration levels.

If New York City is determined to be nonattainment with the 1-hour NO_2 NAAQS, New York State will be required to develop a SIP that identifies and implements specific measures to reduce ambient NO_2 concentrations to attain and maintain the new 1-hour NO_2 standard, most likely by requiring further reductions of NO_x emissions from various sources. Note that regardless of the 1-hour NO_2 attainment status determination, USEPA and New York State anticipate that NO_x emissions, and the ensuing ambient NO_2 concentrations, will continue to decrease in the future due to current efforts by USEPA and New York State to reduce NO_x emissions for the purpose of attaining the ozone and $PM_{2.5}$ NAAQS. These efforts will have in increasing effect as lower-NO_x vehicles and engines become an increasingly large fraction of in-use mobile and non-road sources and as stationary sources reduce NO_x emissions.

D. FUTURE WITH PHASE II CONSTRUCTION ACTIVITIES

ON-SITE CONSTRUCTION ACTIVITY ASSESSMENT

Maximum predicted concentration increments from construction of Phase II under the Extended Build-Out Scenario, and overall concentrations including background concentrations, are presented in **Table 3I-2** and **Table 3I-3** for the construction phasing plans analyzed. For $PM_{2.5}$, monitored concentrations are not added to modeled concentrations from sources, since impacts are determined by comparing the predicted increment from construction activities as compared to the CEQR *de minimis* criteria. The total maximum combined concentrations, including mobile sources and operational HVAC sources, are presented in the “Cumulative Assessment” section, below.

As described above under “Analysis Periods,” based on the $PM_{2.5}$ construction emissions profiles, the following worst-case periods under the start and stop sequential phasing of Construction Phasing Plan 3 were analyzed: August 2031 (S1) and the 12-month period from April 2031 to March 2032 (A1) to capture the effects of overall peak construction activities which would occur simultaneously on Blocks 1120 and 1121; October 2027 (S2) to capture the effects of peak construction activities on Block 1129; and the 12-month period from December 2027 to November 2028 to capture the effects of construction activities on Blocks 1128 and 1129. In addition, May 2024 (S3) under the continuous sequential phasing of Construction Phasing Plan 1 was analyzed to capture the effects of peak construction activities on Block 1128.

As shown in **Table 3I-2**, the maximum predicted total concentrations of PM_{10}, CO, and annual-average NO_2 for the worst-case periods under Construction Phasing Plan 3 are below the applicable NAAQS.

From the on-site sources related to the construction, the maximum predicted 24-hour average $PM_{2.5}$ incremental concentrations at a sidewalk location and at a residential location would occur on the west sidewalk at Carlton Street south of Atlantic Avenue (1.4 $\mu g/m^3$) and along the northern façade of 700 Pacific Street located across the construction site for Building 6 (0.9 $\mu g/m^3$) respectively. The maximum predicted annual average $PM_{2.5}$ incremental concentrations at a sidewalk location and at a residential location would occur on the north sidewalk at Dean Street

Table 3I-2
Maximum Predicted Pollutant Concentrations from Construction Site Sources
Worst-Case Short-Term (S1 and S2) and Annual (A1 and A2) Periods
Construction Phasing Plan 3 (µg/m³, Except Where Noted)

Pollutant	Averaging Period	No Build	Phase II Construction	Increment	*De Minimis Criteria*	NAAQS
Residence, Community Facility Buildings or Open Space						
$PM_{2.5}$	24-hour[1]	—	—	0.9	5.5[2]	35[3]
	Annual Local[1]	—	—	0.29	0.3	12[4]
PM_{10}	24-hour	48	60	12	—	150[5]
NO_2	Annual	42.4	48.9	6.4	—	100
CO	1-hour	3.4 ppm	10.6 ppm	7.2 ppm	—	35 ppm[5]
	8-hour	1.7 ppm	2.4 ppm	0.7 ppm	—	9 ppm[5]
Sidewalks and Covered Walkways Adjacent to Construction						
$PM_{2.5}$	24-hour[1]	—	—	1.4	5.5[2]	35[3]
	Annual Local[1]	—	—	0.26	0.3	12[4]
PM_{10}	24-hour	48	68	20	—	150[5]
NO_2	Annual	42.4	49.2	6.7	—	100
CO	1-hour	3.4 ppm	10.7 ppm	7.3 ppm	—	35 ppm[5]
	8-hour	1.7 ppm	3.0 ppm	1.3 ppm	—	9 ppm[5]

Notes:
Results for any other time period would be lower.
$PM_{2.5}$ concentration increments were compared with the applicable *de minimis* criteria. Total concentrations were compared with the NAAQS.
1 Monitored concentrations are not added to modeled $PM_{2.5}$ values.
2 $PM_{2.5}$ *de minimis* criteria — 24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 µg/m³.
3 Not to be exceeded by the annual 98th percentile of 24-hour concentrations when averaged over 3 years.
4 3-Year average of annual mean. USEPA has lowered the primary standard from 15 µg/m³, effective March 2013.
5 Not to be exceeded more than once a year.

east of 6th Avenue (0.26 µg/m³) and along the west façade of 497 Dean Street located immediately east of the construction site for Building 15 (0.29 µg/m³), respectively. It should be noted that the maximum increments predicted at sidewalks, covered walkways, and any ground-floor residential or open space receptors adjacent to construction, are overstated since they do not include the effect of the solid fence and sidewalk protection on mixing. The location of the maximum 24-hour average increments would vary based on the location of the sources, which would move throughout the site over time. Nevertheless, as shown in **Table 3I-2**, the maximum predicted $PM_{2.5}$ incremental concentrations would not exceed the applicable CEQR *de minimis* criterion of 5.5 µg/m³ in the 24-hour average period or 0.3 µg/m³ in the annual average period. The maximum predicted neighborhood-scale annual average $PM_{2.5}$ concentration would be 0.01 µg/m³—lower than the *de minimis* criterion of 0.1 µg/m³.

As shown in **Table 3I-3**, the maximum predicted total concentrations of PM_{10}, CO and annual-average NO_2 for Construction Phasing Plan 1 are below the applicable NAAQS.

Table 3I-3
Maximum Predicted Pollutant Concentrations from Construction Site Sources
Worst-Case Short-Term (S3) Period
Construction Phasing Plan 1 (µg/m³, Except Where Noted)

Pollutant	Averaging Period	No Build	Phase II Construction	Increment	*De Minimis Criteria*	NAAQS
Residence, Community Facility Buildings or Open Space						
$PM_{2.5}$	24-hour[1]	—	—	1.9	5.5[2]	35[3]
PM_{10}	24-hour	48	70	22	—	150[5]
CO	1-hour	3.4 ppm	4.7 ppm	1.3 ppm	—	35 ppm[5]
	8-hour	1.7 ppm	1.9 ppm	0.2 ppm	—	9 ppm[5]
Sidewalks and Covered Walkways Adjacent to Construction						
$PM_{2.5}$	24-hour[1]	—	—	2.7	5.5[2]	35[3]
PM_{10}	24-hour	48	79	31	—	150[4]
CO	1-hour	3.4 ppm	5.2 ppm	1.9 ppm	—	35 ppm[4]
	8-hour	1.7 ppm	1.9 ppm	0.2 ppm	—	9 ppm[4]

Notes:

Results for any other time period would be lower.

$PM_{2.5}$ concentration increments were compared with the applicable *de minimis* criteria. Total concentrations were compared with the NAAQS.

1 Monitored concentrations are not added to modeled $PM_{2.5}$ values.

2 $PM_{2.5}$ *de minimis* criteria — 24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 µg/m³.

3 Not to be exceeded by the annual 98th percentile of 24-hour concentrations when averaged over 3 years.

4 Not to be exceeded more than once a year.

From the on-site sources related to the construction, the maximum predicted 24-hour average $PM_{2.5}$ incremental concentrations at a sidewalk location and at a residential location would occur on the south sidewalk at Pacific Street east of 6th Avenue (2.7 µg/m³) and along the west façade of 497 Dean St located immediately east of the construction site for Building 15 (1.9 µg/m³), respectively. It should be noted that the maximum increments predicted at sidewalks, covered walkways, and any ground floor residential or open space receptors adjacent to construction, are overstated since they do not include the effect of the solid fence and sidewalk protection on mixing. The location of the maximum 24-hour average increments would vary based on the location of the sources, which would move throughout the site over time. Nevertheless, as shown in **Table 3I-3**, the maximum predicted $PM_{2.5}$ incremental concentrations would not exceed the applicable CEQR *de minimis* criterion of 5.5 µg/m³ in the 24-hour average period.

As described above in "Emission Reduction Measures," waivers on the use of the DPFs may be granted where the non-compliant equipment is: 1) determined on very short notice to be necessary to complete a critical path item: 2) to remain on site for a very brief period of time: or 3) not practicable to retrofit with a DPF. However, as discussed in the "Environmental Compliance and Oversight" section in Chapter 3A, "Construction Overview," records maintained for Phase I indicate that 98.5 percent of the construction equipment used during peak Arena construction met the requirements specified in the emission reduction program. In addition, there would be an increasing percentage of in-use newer and cleaner vehicles and engines, resulting in reduced air pollutant emissions during construction activities and fewer instances where compliant equipment is not available. Further, the air quality analysis examined the reasonable worst-case emission levels and used conservative assumptions (e.g., that DPFs only reduce DPM by 90 percent) and, consequently, is conservative in assessing increases in emission levels. Therefore, the few instances in which a waiver may be granted for temporary use of non-compliant construction equipment would not affect the conclusions of the analyses of air quality impacts of Phase II construction.

MOBILE SOURCE ASSESSMENT

A mobile source air quality analysis was conducted for the construction of Phase II of the Project under the Extended Build-Out Scenario for the peak construction traffic years of 2032. Localized pollutant impacts from the vehicles queuing at the selected intersection were analyzed for CO for the 8-hour averaging period. PM_{10} was analyzed for the 24-hour averaging period and $PM_{2.5}$ was analyzed for the 24-hour and annual averaging periods.

CO mobile source concentrations for the future with and without Phase II construction activities were predicted using the methodology previously described. **Table 3I-4** shows the future maximum predicted 8-hour average CO concentration at the intersections studied. (No 1-hour values are shown, since no exceedances of the NAAQS would occur and the *de minimis* criteria are only applicable to 8-hour concentrations; therefore, the 8-hour values are the most critical for impact assessment.) The value shown is the highest predicted concentration. The results indicate that the Phase II construction of the Project would not result in any violations of the 8-hour CO standard. In addition, the incremental increases in 8-hour average CO concentrations are very small, and consequently would not result in a violation of the CEQR *de minimis* CO criteria. Therefore, construction-related mobile source CO emissions during Phase II would not result in a significant adverse impact on air quality.

Table 3I-4
Maximum Predicted
8-Hour Average CO Concentrations from Mobile Sources

Analysis Site	Location	Time Period	8-Hour Concentration (ppm)			
			No Build	Phase II Construction	Increment	*De Minimis*
1	Atlantic Avenue and Flatbush Avenue	PM	2.1	2.2	0.1	3.4
2	Dean Street and 6th Avenue	AM	1.8	1.8	0.1	3.6

Notes:
8-hour standard (NAAQS) is 9 ppm.
Concentration includes a background concentration of 1.7 ppm.

PM_{10} mobile source concentrations for the Phase II construction of the Project were also determined using the methodology previously described. **Table 3I-5** presents the future maximum predicted PM_{10} 24-hour concentrations, including background concentrations, at the analyzed intersections for the peak construction traffic year of 2032. The values shown are the highest predicted concentrations for the receptor locations. The results show that the 24-hour PM_{10} concentrations are predicted to be below the NAAQS. Therefore, construction-related mobile source PM_{10} emissions during Phase II would not result in a significant adverse impact on air quality.

Table 3I-5
Maximum Predicted 24-Hour Average
PM_{10} Build Concentrations from Mobile Sources ($\mu g/m^3$)

Receptor Site	Location	Concentration	
		No Build	With Phase II Construction
1	Atlantic Avenue and Flatbush Avenue	75.6	76.1
2	Dean Street and 6th Avenue	58.3	58.8

Notes:
NAAQS—24-hour average 150 $\mu g/m^3$.
Concentration includes a background concentration of 48 $\mu g/m^3$.

Using the methodology previously described, maximum predicted 24-hour and annual average $PM_{2.5}$ concentration increments were calculated so that they could be compared to the *de minimis* criteria that would determine the potential significance of any impacts from Phase II construction of the Project. Based on this analysis, the maximum predicted localized 24-hour average and neighborhood-scale annual average incremental $PM_{2.5}$ concentrations are presented in **Tables 3I-6 and 3I-7**, respectively. Note that $PM_{2.5}$ concentrations in the No Build condition are not presented, since impacts are assessed on an incremental basis. The results show that the annual and daily (24-hour) $PM_{2.5}$ increments are predicted to be below the *de minimis* criteria. Therefore, construction-related mobile source $PM_{2.5}$ emissions during Phase II would not result in a significant adverse impact on air quality.

Table 3I-6
Maximum Predicted 24-Hour Average
$PM_{2.5}$ Incremental Concentrations from Mobile Sources

Receptor Site	Location	Increment (μg/m^3)	*De Minimis* (μg/m^3)
1	Atlantic Avenue and Flatbush Avenue	0.3	5.5
2	Dean Street and 6th Avenue	0.2	5.5

Note:
$PM_{2.5}$ *de minimis* criteria—24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 μg/m^3.

Table 3I-7
2035 Maximum Predicted Annual Average
$PM_{2.5}$ Incremental Concentrations from Mobile Sources (μg/m^3)

Receptor Site	Location	Increment
1	Atlantic Avenue and Flatbush Avenue	0.05
2	Dean Street and 6th Avenue	0.02

Note: $PM_{2.5}$ *de minimis* criteria—annual (neighborhood scale), 0.1 μg/m^3.

TEMPORARY SURFACE PARKING LOT

Based on the methodology previously described, the maximum predicted 8-hour average CO concentrations from the temporary parking lot on Lot 1129 were analyzed at the following locations: a near side sidewalk receptor on the same side of the street (5 feet) as the parking facility, an open space receptor at Building 14 (5 feet), and a far side sidewalk receptor on the opposite side of the street (80 feet) from the parking facility.

The total CO concentrations include both background CO levels and contributions from traffic on adjacent roadways for the far side receptor only. The maximum predicted 8-hour average CO concentration of all the receptors modeled is 1.73 ppm at the near side sidewalk receptor and the open space receptor. This value includes a predicted concentration of 0.03 ppm from the temporary surface parking lot, and includes a background level of 1.7 ppm. The maximum predicted concentration is substantially below the applicable standard of 9 ppm.

The maximum predicted 24-hour average PM_{10} concentration is 49.1 μg/m^3, on Building 14. This value includes a predicted concentration of 1.1 μg/m^3 from the parking garage vent, and a background concentration of 48 μg/m^3. The maximum predicted concentration is substantially below the applicable standard of 150 μg/m^3.

The maximum predicted 24-hour and annual average $PM_{2.5}$ increments are 0.2 μg/m^3 and 0.03 μg/m^3, respectively, which are both on Building 14. The maximum predicted $PM_{2.5}$ increments are well below the respective $PM_{2.5}$ *de minimis* criteria.

Therefore, the temporary parking lot on Block 1129 would not result in any significant adverse air quality impacts.

CUMULATIVE ASSESSMENT

Maximum predicted combined concentration increments from construction stationary sources and mobile sources, operational HVAC sources and mobile sources as well as background concentrations are presented in **Tables 3I-8 and 3I-9**. The cumulative increments presented in **Tables 3I-8 and 3I-9** are a sum of the maximum combined construction on-site increments (the highest increments from all periods analyzed) and the maximum construction-related mobile-source increments from the mobile source site closest to the location of the maximum on-site increment. The cumulative assessment conservatively adds together the highest predicted effect of on-site and mobile-source emissions. Since the highest short-term increments for each component are predicted under different meteorological conditions, these results are conservatively high. In addition, it should be noted that the maximum increments predicted at sidewalks, covered walkways, and any ground floor residential or open space receptors adjacent to construction, are overstated since they do not include the effect of the solid fence and sidewalk protection on mixing. Nevertheless, as shown in **Tables 3I-8 and 3I-9,** the maximum predicted combined $PM_{2.5,}$ $PM_{10,}$ annual-average NO_2, and CO concentrations would be below their corresponding *de minimis* thresholds or NAAQS respectively during Phase II construction of the Project. Therefore, the construction of Phase II of the Project under the Extended Build-Out Scenario would not result in significant adverse air quality impacts due to construction sources.

Table 3I-8
Maximum Predicted Cumulative Pollutant Concentrations during Construction
Worst-Case Short-Term (S1 and S2) and Annual (A1 and A2) Periods
Construction Phasing Plan 3 ($\mu g/m^3$, Except Where Noted)

Pollutant	Averaging Period	No Build	Phase II Construction	Increment	*De Minimis Criteria*	NAAQS
Residence, Community Facility Buildings or Open Space						
$PM_{2.5}$	24-hour[1]	—	—	1.2	5.5[2]	35[3]
	Annual Local[1]	—	—	<u>0.293</u>	0.3	12[4]
PM_{10}	24-hour	48	60	12	—	150[5]
NO_2	Annual	42.4	48.8	6.4	—	100
CO	1-hour	3.4 ppm	10.7 ppm	7.3 ppm	—	35 ppm[5]
	8-hour	1.7 ppm	2.5 ppm	0.8 ppm	—	9 ppm[5]
Sidewalks and Covered Walkways Adjacent to Construction						
$PM_{2.5}$	24-hour[1]	—	—	1.7	5.5[2]	35[3]
	Annual Local[1]	—	—	<u>0.281</u>	0.3	12[4]
PM_{10}	24-hour	48	69	21	—	150[5]
NO_2	Annual	42.4	49.1	6.7	—	100
CO	1-hour	3.4 ppm	10.8 ppm	7.4 ppm	—	35 ppm[5]
	8-hour	1.7 ppm	3.1 ppm	1.4 ppm	—	9 ppm[5]

Notes:
Results for any other time period would be lower
$PM_{2.5}$ concentration increments were compared with the applicable *de minimis* criteria. Total concentrations were compared with the NAAQS.
1 Monitored concentrations are not added to modeled $PM_{2.5}$ values.
2 $PM_{2.5}$ *de minimis* criteria — 24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 $\mu g/m^3$.
3 Not to be exceeded by the annual 98th percentile of 24-hour concentrations when averaged over 3 years.
4 3-Year average of annual mean. USEPA has lowered the primary standard from 15 $\mu g/m^3$, effective March 2013.
5 Not to be exceeded more than once a year.

Table 3I-9
Maximum Predicted Cumulative Pollutant Concentrations during Construction
Worst-Case Short-Term (S3) Period
Construction Phasing Plan 1 (μg/m³, Except Where Noted)

Pollutant	Averaging Period	No Build	Phase II Construction	Increment	*De Minimis Criteria*	NAAQS
Residence, Community Facility Buildings or Open Space						
$PM_{2.5}$	24-hour[1]	—	—	2.0	5.5[2]	35[3]
PM_{10}	24-hour	48	71	23	—	150[4]
CO	1-hour	3.4 ppm	4.4 ppm	1.4 ppm	—	35 ppm[4]
	8-hour	1.7 ppm	2.0 ppm	0.3 ppm	—	9 ppm[4]
Sidewalks and Covered Walkways Adjacent to Construction						
$PM_{2.5}$	24-hour[1]	—	—	2.8	5.5[2]	35[3]
PM_{10}	24-hour	48	80	32	—	150[4]
CO	1-hour	3.4 ppm	5.4 ppm	2.0 ppm	—	35 ppm[4]
	8-hour	1.7 ppm	2.0 ppm	0.3 ppm	—	9 ppm[4]

Notes:
Results for any other time period would be lower
$PM_{2.5}$ concentration increments were compared with the applicable *de minimis* criteria. Total concentrations were compared with the NAAQS.
1 Monitored concentrations are not added to modeled $PM_{2.5}$ values.
2 $PM_{2.5}$ *de minimis* criteria — 24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 μg/m³.
3 Not to be exceeded by the annual 98th percentile of 24-hour concentrations when averaged over 3 years.
4 Not to be exceeded more than once a year.

CONCLUSIONS

Construction activity in general has the potential to adversely affect air quality as a result of diesel emissions. Measures would be taken to reduce pollutant emissions during construction in accordance with all applicable laws, regulations, and building codes. These include dust suppression measures and the idling restriction for on-road vehicles. In addition to the required laws and regulations, the project sponsors have committed to a robust emissions reduction program, including early electrification, the use of ULSD fuel, best available tailpipe reduction technologies, and utilization of newer equipment. With the implementation of these emission reduction measures, a detailed analysis of construction-related air emissions determined that $PM_{2.5}$, PM_{10}, annual-average NO_2, and CO concentrations would be below their corresponding *de minimis* thresholds or NAAQS respectively. Therefore, the construction of Phase II of the Project under the Extended Build-Out Scenario would not result in significant adverse air quality impacts due to construction sources.

E. COMPARISON OF SEIS FINDINGS AND PREVIOUS FINDINGS

Phase II $PM_{2.5}$, PM_{10}, NO_2, and CO concentrations due to construction sources predicted in the 2006 FEIS are presented in **Table 3I-10**. The 2006 FEIS identified no significant adverse impacts on air quality during Project construction. Although concentrations $PM_{2.5}$ were predicted to potentially increase by more than the applicable 24-hour and annual average guidance thresholds in areas immediately adjacent to the construction activity, the threshold exceedances were predicted to be limited in extent, duration, and magnitude. This low level of impact can be mostly attributed to the extensive measures incorporated in the Project's construction program aimed at reducing $PM_{2.5}$ emissions.

Table 3I-10
Maximum Predicted Pollutant Concentrations from Construction Site Sources
2006 FEIS Phase II ($\mu g/m^3$, Except Where Noted)

Pollutant	Averaging Period	No Build	Phase II Construction	Increment	*De Minimis Criteria*[2]	NAAQS
Residence, Academic Buildings or Open Space						
$PM_{2.5}$	24-hour[1]	—	—	5.1	5.5	35[3]
	Annual Local[1]	—	—	0.32	0.3	12[4]
PM_{10}	24-hour	50	85.2	35.2	—	150[5]
NO_2	Annual	70.8	79.7	8.9	—	100
CO	8-hour	2.5 ppm	4.7 ppm	0.7 ppm	—	9 ppm[5]
Sidewalks and Covered Walkways Adjacent to Construction						
$PM_{2.5}$	24-hour[1]	—	—	8.0	5.5[2]	35[3]
	Annual Local[1]	—	—	0.49	0.3	12[4]
PM_{10}	24-hour	50	110.6	60.6	—	150[5]
NO_2	Annual	70.8	88.3	17.5	—	100
CO	8-hour	2.5 ppm	4.8 ppm	2.3 ppm	—	9 ppm[5]

Notes:

Results for any other time period would be lower.

$PM_{2.5}$ concentration increments were compared with the applicable *de minimis* criteria. Total concentrations were compared with the NAAQS.

1 Monitored concentrations are not added to modeled $PM_{2.5}$ values.

2 The $PM_{2.5}$ *de minimis* criteria superseded the $PM_{2.5}$ interim guidance criteria on June 5, 2013. The 24-hour average interim guidance criteria for $PM_{2.5}$ were as follows > 2 $\mu g/m^3$ (5 $\mu g/m^3$ not-to-exceed value), based on the magnitude, frequency duration, location, and size of the area of the predicted concentrations.

3 Not to be exceeded by the annual 98th percentile of 24-hour concentrations when averaged over 3 years.

4 3-Year average of annual mean. USEPA has lowered the primary standard from 15 $\mu g/m^3$, effective March 2013.

5 Not to be exceeded more than once a year.

As demonstrated in **Tables 3I-8 and 3I-9,** pollutant concentrations during Phase II under the Extended Build-Out Scenario are predicted to be lower than those presented in the 2006 FEIS. Primarily this is because the Extended Build-Out Scenario would be completed on a prolonged schedule compared to that analyzed in the 2006 FEIS, reducing the intensity of construction activity analyzed under this scenario. In addition, as compared with the 2006 FEIS, night and weekend work is not anticipated to be as frequently required for Phase II construction activities under the Extended Building-Out Scenario, thereby reducing pollutant concentrations due to construction activities. Further, since the publication of the MEC, additional air quality emission reduction technologies had become available. Therefore, to ensure that Phase II construction would result in the lowest practicable DPM emissions, the following measures would be added to the MEC for Phase II construction: the use of Tier 3 or newer equipment with DPFs during construction on all nonroad construction engines with an engine output rating of 50 hp or greater and the use of Tier 4 equipment beginning in 2022. Moreover, additional information regarding emissions controls has become available since the publication of the 2006 FEIS, indicating that the DPFs—the central component of the emissions reduction program being applied for the construction of the Project—reduce emissions significantly more than was assumed in the analysis. In the 2006 FEIS, DPFs were assumed to reduce DPM by 85 percent. The latest information indicates that almost all DPFs reduce DPM emissions by at least 92 percent, and most are in the range of 95 to 98 percent. Multiple large construction projects analyzed more recently under the CEQR *Technical Manual* have applied an assumption of 90 percent reduction. Therefore, a 90 percent reduction assumption was used for the SEIS analysis. The project sponsors would continue to be committed to a number of measures to reduce air pollutant emissions under the Extended Build-Out Scenario, with special attention given to DPM. These measures include early electrification, the use of ULSD fuel, best available tailpipe reduction technologies, dust controls, and idling restrictions. Therefore, as with the conclusion of the 2006 FEIS, construction of Phase II Project would not result in significant adverse air quality impacts due to construction sources. ✷