Philip Habib & Associates
Engineers and Planners • 102 Madison Avenue • New York, NY 10016 • 212 929 5656 • 212 929 5605 (fax)

TECHNICAL MEMORANDUM

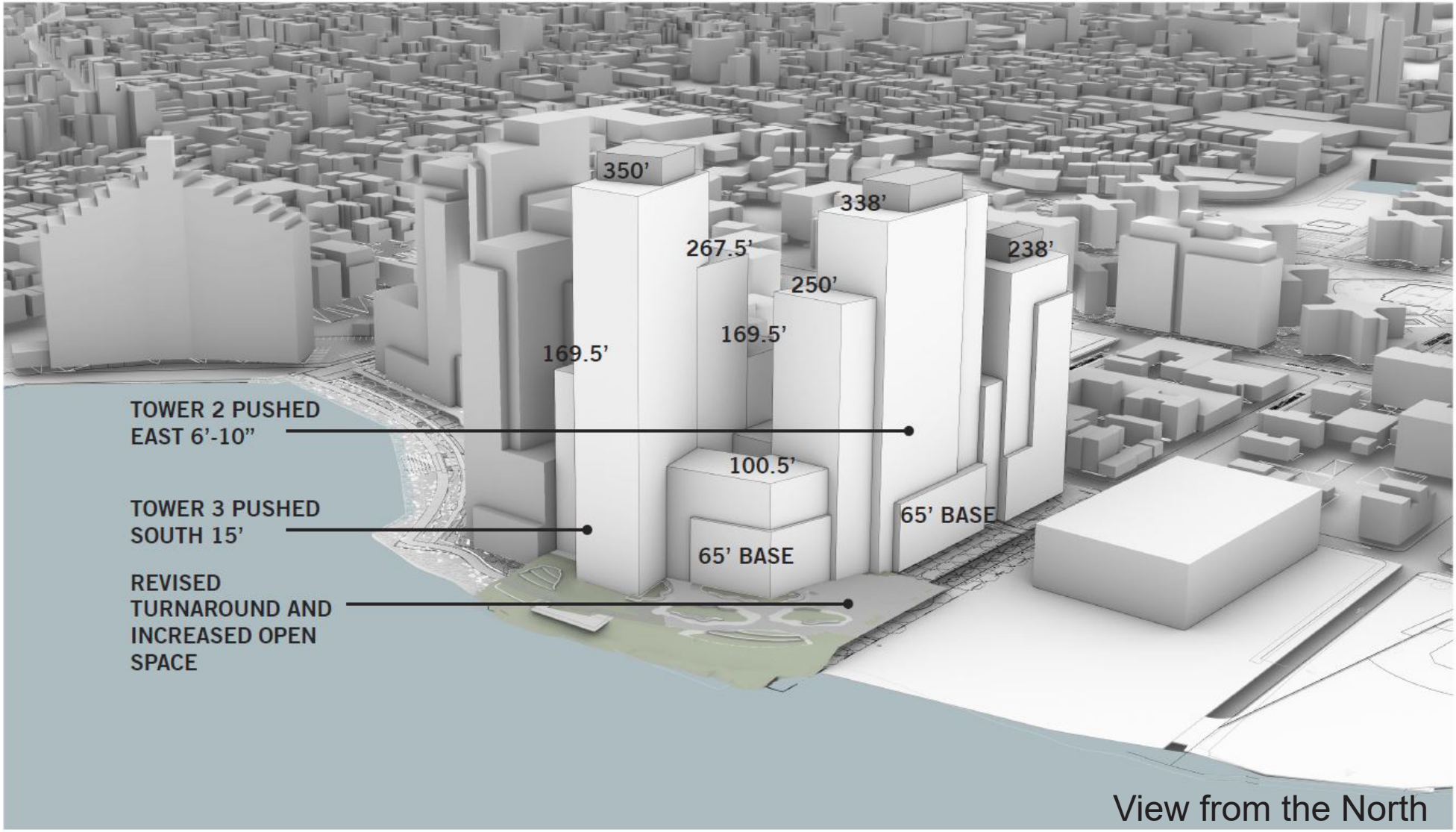
TO: **New York City Planning Commission (CPC)**
FROM: **Philip Habib & Associates**
DATE: **7/20/2022**
PROJECT: **Halletts North (CEQR No. 21DCP138Q)**
RE: **Potential CPC Modification Alternative – Detailed HVAC Analysis**

The following technical memorandum provides the results of the detailed analysis on heating, ventilation, and air conditioning (HVAC) systems of the "Potential CPC Modification Alternative" presented in Chapter 19, "Alternatives," of the *Halletts North FEIS* (2022). As described in the FEIS, the Potential CPC Modification Alternative was developed in response to questions received from the Commissioners during the public review process concerning the Proposed Project's ability to provide adequate light and air at Projected Development Site 1 and its location in relation to the waterfront and project-generated open space. Under this alternative, Tower 3 of the Proposed Project would be shifted approximately 15 feet to the south, Tower 2 would be shifted approximately 6 feet and 10 inches to the east, and the terminus of the turnaround drive extending beyond 3rd Street north of 26th Avenue would shift approximately 35 feet closer to 26th Street as compared to the Proposed Project (see **Figure 1**). While the massing configuration would be slightly different compared to the Proposed Project, the Potential CPC Modification Alternative would include an equivalent amount of floor area that would be generated as a result of the Proposed Actions and incorporated into the waterfront special permit.

As such, the Potential CPC Modification Alternative would not result in any changes to the RWCDS's building program, as the development program under this alternative would be identical to the RWCDS prepared for the Proposed Actions. However, while Tower 1 would remain unchanged under the Potential CPC Modification Alternative, the massing configuration of Tower 2 would be shifted approximately 6 feet 10 inches to the east and Tower 3 would be shifted approximately 15 feet to the south. The Potential CPC Modification Alternative would result in the same land uses as the Proposed Actions, and would require the same zoning actions considered as the Proposed Actions.

In terms of air quality, as with the Proposed Actions, the Potential CPC Modification Alternative would not result in significant adverse air quality impacts. The Potential CPC Modification Alternative would generate the same vehicular trips as the Proposed Actions. As such, the Potential CPC Modification Alternative would result in identical mobile source pollutant concentrations as the Proposed Actions. As such, like the Proposed Actions, no significant adverse mobile source air quality impacts would result. In addition, as the Potential CPC Modification Alternative would include the same number of parking spaces, vehicle emissions within the parking garages would be identical as well.

However, as the configuration of Towers 2 and 3 under the Potential CPC Modification Alternative would be slightly different compared to the Proposed Actions, to ensure that there is no potential for significant adverse impacts of $PM_{2.5}$ or NO_2 from the Potential CPC Modification Alternative's heating and hot water system emissions, a detailed HVAC analysis is warranted. The results of the detailed HVAC analysis under the Potential CPC Modification Alternative are provided below.



Source: Studio V

FOR ILLUSTRATIVE PURPOSES ONLY

Figure 1
Potential CPC Modification Alternative - Massing Diagram

Detailed HVAC Analysis – Potential CPC Modification Alternative

Heating and Hot Water Systems

The Potential CPC Modification Alternative would utilize natural gas-fired combustion equipment to provide heating and hot water services to the proposed buildings.

AERMOD ANALYSIS

The analysis was performed using the AERMOD dispersion model. AERMOD is EPA's preferred regulatory stationary source model. The analysis uses and is consistent with the methodologies described in Chapter 12, "Air Quality," of the *Halletts North FEIS* (2022).

EMISSION RATES AND STACK PARAMETERS

Potential CPC Modification Alternative Buildings

For the Potential CPC Modification Alternative buildings, annual emission rates for heating and hot water systems were calculated based on CEQR-provided energy intensity estimates, and applying emission factors for natural gas-fired boilers.[1] $PM_{2.5}$ emissions include both the filterable and condensable components.

For the Potential CPC Modification Alternative buildings, to calculate exhaust velocity, the fuel consumption was multiplied by EPA's fuel factor for natural gas,[2] providing the exhaust flow rate at standard temperature; the flow rate was then corrected for the exhaust temperature, and exhaust velocity was calculated based on the stack diameter.

The emission rates and exhaust stack parameters used in the modeling analysis for the Potential CPC Modification Alternative buildings are presented in **Table 1**. Tower 3 of the Potential CPC Modification Alternative is not listed in the **Table 1** since this building is taller than surrounding buildings, and therefore a detailed analysis of Tower 3 is not warranted.

[1] EPA. Compilation of Air Pollutant Emission Factors AP-42. 5th Ed., V. I, Ch. 1.4. September, 1998.
[2] EPA. *Standards of Performance for New Stationary Sources.* 40 CFR Chapter I Subchapter C Part 60. Appendix A-7, Table 19-2. 2013.

TABLE 1
Exhaust Stack Parameters and Emission Rates – Potential CPC Modification Alternative and Projected Development Site 2

Building Name	Annual NOx (g/s)	Short Term NOx (g/s)	Annual PM2.5 (g/s)	Short Term PM2.5 (g/s)	Stack diameter (m)	Stack Velocity (m/s)	Stack Height (ft)
Potential CPC Modification Alternative, Tower 1	4.28E-03	1.56E-02	1.76E-03	6.41E-03	0.61	2.72	241
Potential CPC Modification Alternative, Tower 2	6.07E-03	2.22E-02	2.49E-03	9.09E-03	0.61	3.86	321
Projected Development Site 2	3.46E-03	1.26E-02	1.42E-03	5.17E-03	0.61	2.20	153

Notes: The exhaust temperature modeled for all project buildings is 307.8ºF.

BACKGROUND CONCENTRATIONS

To estimate the maximum expected pollutant concentration at a given location (receptor), the predicted impacts must be added to a background value that accounts for existing pollutant concentrations from other sources that are not directly accounted for in the model (see **Table 2**). The annual NO_2 background is based on the maximum annual average value measured over the most recent five years for which data is available (2016-2020), 29.7 µg/m^3.

TABLE 2
Maximum Background Pollutant Concentrations

Pollutant	Average Period	Location	Concentration (µg/m^3)	NAAQS (µg/m^3)
NO_2	1-hour	Queens College, Queens	99.9	188
	Annual	Queens College, Queens	29.7	100
$PM_{2.5}$	24-hour	Queens College, Queens	17.7	35

Source: New York State Air Quality Report Ambient Air Monitoring System, DEC, 2018–2020.

For the AERMOD analysis, total 1-hour NO_2 concentrations were refined following a more detailed approach (EPA "Tier 3"). The methodology used to determine the total 1-hour NO_2 concentrations from the facility was based on adding the monitored background to modeled concentrations, as follows: hourly modeled concentrations from the boilers were first added to the seasonal hourly background monitored concentrations; then the highest combined daily 1-hour NO_2 concentration was determined at each location and the 98th percentile daily 1-hour maximum concentration for each modeled year was calculated within the AERMOD model; finally the 98th percentile concentrations were averaged over the latest five years.

$PM_{2.5}$ impacts are assessed on an incremental basis and compared with the $PM_{2.5}$ *de minimis* criteria. The $PM_{2.5}$ 24-hour average background concentration based on the 98th percentile concentration, averaged over the years 2018-2020 was used to establish the *de minimis* value of 8.7 ug/m^3. $PM_{2.5}$ annual average impacts are assessed on an incremental basis and compared to the $PM_{2.5}$ annual *de minimis* criteria of 0.3 ug/m^3, without considering the annual background. Therefore, the annual $PM_{2.5}$ background is not presented in the Table.

RECEPTOR PLACEMENT

Discrete receptors were modeled along existing, future proposed Potential CPC Modification Alternative building façades to represent potentially sensitive locations such as operable windows and intake vents. Rows of receptors at spaced intervals on the modeled buildings were analyzed at multiple elevations.

Heat and Hot Water System Analysis

Table 3 presents the maximum predicted concentration from the heating and hot water systems of the Potential CPC Modification Alternative. As shown in the table, all predicted pollutant concentrations are less than the applicable impact criteria. Therefore, there would be no potential for significant adverse air quality impacts from the Potential CPC Modification Alternative developments' heating and hot water systems.

TABLE 3
Maximum Modeled Pollutant Concentrations - Project-on-Project (µg/m^3)

Pollutant	Averaging Period	Maximum Modeled Impact	Background	Total Concentration	Criterion
NO_2	1-hour	(1)	-	187.3	188(2)
	Annual	0.5	29.7	30.2	100
$PM_{2.5}$	24-hour	4.54	-	-	8.7(3)
	Annual	0.19	-	-	0.3

Notes:

(1) The 1-hour NO_2 concentration presented represents the maximum of the total 98th percentile 1-hour NO2 concentration predicted at any receptor using seasonal-hourly background concentrations.

(2) NAAQS

(3) $PM_{2.5}$ 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

To ensure that there is no potential for significant adverse impacts of $PM_{2.5}$ or NO_2 from the Potential CPC Modification Alternative's heating and hot water system emissions, certain restrictions would be required through an Air Quality (E) Designation that would be placed on the Projected Development Sites. As described in Chapter 12, "Air Quality," of the *Halletts North FEIS* (2022), the Projected Development Sites under the Proposed Actions would require certain restrictions through the placement of an (E) Designation (E-671) to avoid the potential for significant adverse air quality impacts from stationary

sources. Similar to the Proposed Actions, the Potential CPC Modification Alternative would require certain restrictions through the placement of an (E) Designation as well in order to avoid the potential for significant adverse air quality impacts. These restrictions were assumed in the analysis results presented in **Table 3** and would avoid the potential for significant air quality impacts from stationary sources based on the conservative assumptions used in the analysis.

The restrictions for the Potential CPC Modification Alternative would be as follows:

BLOCK 911, LOT 1 – PROJECTED DEVELOPMENT SITE 1, TOWER 1

Any new residential and/or commercial development on Projected Development Site 1, Tower 1 (Block 911, Lot 1) under the Potential CPC Modification Alternative must utilize natural gas in any fossil fuel-fired heating equipment and hot water equipment, be fitted with low NO_x (15 ppm) burners. The stacks must be located more than 90 feet from the north wall and more than 75 feet from the east wall of Tower 1, and at least 241 feet above grade, to avoid potential significant air quality impacts.

BLOCK 911, LOT 1 – PROJECTED DEVELOPMENT SITE 1, TOWER 2

Any new residential and/or commercial development on Projected Development Site 1, Tower 2 (Block 911, Lot 1) under the Potential CPC Modification Alternative must utilize natural gas in any fossil fuel-fired heating equipment and hot water equipment, be fitted with low NO_x (15 ppm) burners. The stacks must be located more than 100 feet from the north wall and more than 40 feet from the east wall of Tower 2, and at least 321 feet above grade, to avoid potential significant air quality impacts.

BLOCK 911, LOT 49 – PROJECTED DEVELOPMENT SITE 2

Any new residential and/or commercial on Projected Development Site 2 Building (Block 911, Lot 49) under the Potential CPC Modification Alternative must utilize natural gas in any fossil fuel-fired heating equipment and hot water equipment, be fitted with low NO_x (15 ppm) burners. The stacks must be located more than 150 feet from the north lot line facing the waterfront and more than 110 feet from the western lot line adjacent to Block 911 Lot 1, at least 153 feet above grade, to avoid potential significant air quality impacts.