Date: February 5, 2021
To: Mr. Alvaro Gonzalez, Meta Housing Corporation
From: M. S. Hatch Consulting, LLC
**Subject: Air Quality Study – Palmdale Terrace Apartments, Palmdale, CA**

M. S. Hatch Consulting, LLC (MSHC) appreciates the opportunity to prepare the air quality study for the proposed construction and operation of the Palmdale Terrace Apartments for Meta Housing Corporation. This project consists of a 151-unit three-story apartment complex, resident and guest parking, and landscaped amenity areas on approximately 8.40 acres of land, in the City of Palmdale. This air quality study includes the estimated criteria pollutant and greenhouse gas emissions from the construction and operation of the proposed project.

## Executive Summary

Table 1 and Table 2 compare the estimated annual and daily emissions summaries from the construction and operation of the proposed apartment complex to the significant emission thresholds described in the Antelope Valley Air Quality Management District (AVAQMD) California Environmental Quality Act (CEQA) and Federal Conformity Guidelines, dated August 2016, included in Attachment A. The estimated emissions of criteria pollutants and greenhouse gases for each year of construction and the total operational emissions **are well below the applicable thresholds**. Greenhouse gas emissions are presented in units of carbon dioxide equivalent ($CO_2e$). The proposed project is not considered one of the project types that the AVAQMD CEQA Guidelines require to be evaluated for potentially exposing sensitive receptors to substantial pollutant concentrations.[1] As such, hazardous air pollutants (HAP) emissions were not calculated, and the project was not evaluated for potential health risks to sensitive receptors.

**Table 1. Annual Emissions Summary and Significance Thresholds**

| Emissions Source | Total Emissions (tons per year) | | | | | | |
|---|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2e$ |
| Year 1 Construction Emissions (2021) | 0.06 | 0.71 | 0.50 | <0.01 | 0.09 | 0.05 | 140 |
| Year 2 Construction Emissions (2022) | 0.33 | 2.76 | 3.08 | 0.01 | 0.36 | 0.17 | 667 |
| Year 3 Construction Emissions (2023) | 0.98 | 2.18 | 2.68 | 0.01 | 0.30 | 0.14 | 576 |
| Total Operational Emissions | 1.22 | 1.57 | 4.91 | 0.01 | 1.08 | 0.31 | 1,629 |
| **Significant Emissions Threshold** | **25** | **25** | **100** | **25** | **15** | **12** | **100,000** |

[1] Residences, schools, daycare centers, playgrounds and medical facilities are considered sensitive receptor land uses. The following project types proposed for sites within the specified distance to an existing or planned (zoned) sensitive receptor land use must be evaluated using significance threshold criteria number 4 (refer to the significance threshold discussion): any industrial project within 1000 feet; a distribution center (40 or more trucks per day) within 1000 feet; a major transportation project (50,000 or more vehicles per day) within 1000 feet; a dry cleaner using perchloroethylene within 500 feet; or a gasoline dispensing facility within 300 feet.

**Table 2. Daily Emissions Summary and Significance Thresholds**

| Emissions Source | Total Emissions (pounds per day) | | | | | | |
|---|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2e$ |
| Year 1 Construction Emissions (2021) | 3.97 | 40.55 | 25.49 | 0.08 | 9.24 | 5.79 | 8,549 |
| Year 2 Construction Emissions (2022) | 2.67 | 21.12 | 24.61 | 0.06 | 2.78 | 1.30 | 5,832 |
| Year 3 Construction Emissions (2023) | 71.03 | 18.84 | 23.83 | 0.06 | 2.66 | 1.20 | 5,731 |
| Total Operational Emissions | 7.34 | 8.62 | 36.15 | 0.08 | 6.23 | 1.78 | 8,603 |
| **Significant Emissions Threshold** | **137** | **137** | **548** | **137** | **82** | **65** | **548,000** |

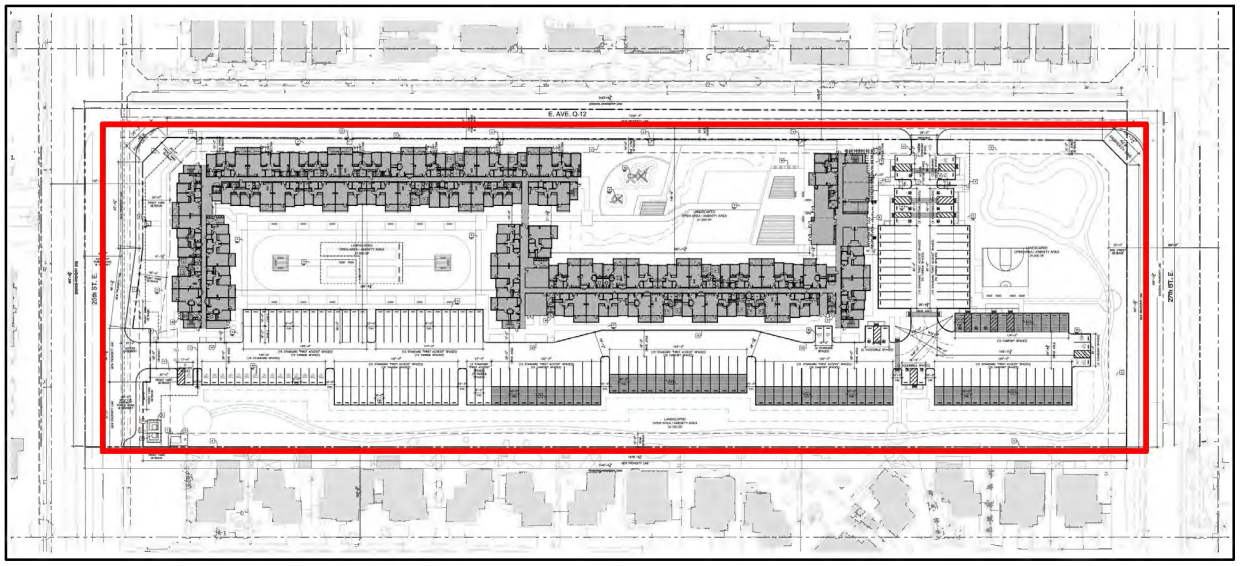
ROG: Reactive Organic Compounds, used interchangeably with Volatile Organic Compounds (VOC); $NO_X$: oxides of nitrogen; CO: Carbon monoxide; $SO_X$: Oxides of sulfur; $PM_{2.5}$: particulate matter less than 2.5 micrometers in diameter; $PM_{10}$: particulate matter less than 10 micrometers in diameter; $CO_2e$: Carbon dioxide equivalent

## Project Description

The proposed project includes the construction of a 151-unit three-story apartment complex, resident and guest parking, and landscaped amenity areas on 8.40 acres of land. The project site is currently a vacant lot located on the southeast corner of 25th street East and East Avenue Q12, in the city of Palmdale, CA. The site location is included in Figure 1 and the proposed site plan is included in Figure 2.

**Figure 1. Regional Vicinity**

**Figure 2. Site Plan – Proposed Apartment Complex - Palmdale, CA**



## Sources of Emissions

The emissions associated with the proposed project consist of construction and operational emissions from the apartment complex. Construction emissions are temporary and include emissions of criteria pollutants and greenhouse gases from construction activities during site preparation, grading, paving, building construction, and the application of architectural coatings. Operational emissions consist of area sources (i.e., re-applying architectural coatings, consumer products, and landscaping equipment), energy use (i.e., electricity and natural gas), mobile sources (e.g., commuting), solid waste disposal, and water and wastewater use (i.e., supplying and treating water and wastewater).

## Emissions Estimates

Table 3 and 4 present the annual and daily emissions summaries from the construction and operation of the proposed project, respectively. Emissions were estimated using CalEEMod Version 2016.3.2. The detailed emissions model outputs are included in Attachment B.

This project is not considered one of the project types that the AVAQMD CEQA Guidelines require to be evaluated for potentially exposing sensitive receptors to substantial pollutant concentrations. As such, HAP emissions were not calculated, and the project was not evaluated for potential health risks to sensitive receptors.

Table 3. Annual Construction and Operational Emissions Summary

| Emissions Source | Total Emissions (tons per year) | | | | | | |
|---|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2e$ |
| ***Construction Emissions*** | | | | | | | |
| Year 1 Construction Emissions (2021) | 0.06 | 0.71 | 0.50 | <0.01 | 0.09 | 0.05 | 140 |
| Year 2 Construction Emissions (2022) | 0.33 | 2.76 | 3.08 | 0.01 | 0.36 | 0.17 | 667 |
| Year 3 Construction Emissions (2023) | 0.98 | 2.18 | 2.68 | 0.01 | 0.30 | 0.14 | 576 |
| ***Operational Emissions*** | | | | | | | |
| Area Sources | 0.91 | 0.01 | 1.12 | <0.01 | 0.01 | 0.01 | 2 |
| Energy | 0.01 | 0.09 | 0.04 | <0.01 | 0.01 | 0.01 | 305 |
| Mobile | 0.30 | 1.46 | 3.75 | 0.01 | 1.07 | 0.29 | 1,191 |
| Waste | N/A | N/A | N/A | N/A | 0.00 | 0.00 | 35 |
| Water | N/A | N/A | N/A | N/A | 0.00 | 0.00 | 96 |
| **Total Operational Emissions** | **1.22** | **1.57** | **4.91** | **0.01** | **1.08** | **0.31** | **1,629** |
| **Significant Emissions Threshold** | **25** | **25** | **100** | **25** | **15** | **12** | **100,000** |

Table 4. Daily Construction and Operational Emissions Summary

| Emissions Source | Total Emissions (pounds per day) | | | | | | |
|---|---|---|---|---|---|---|---|
| | ROG | $NO_x$ | CO | $SO_x$ | $PM_{10}$ | $PM_{2.5}$ | $CO_2e$ |
| ***Construction Emissions*** | | | | | | | |
| Year 1 Construction Emissions (2021) | 3.97 | 40.55 | 25.49 | 0.08 | 9.24 | 5.79 | 8,549 |
| Year 2 Construction Emissions (2022) | 2.67 | 21.12 | 24.61 | 0.06 | 2.78 | 1.30 | 5,832 |
| Year 3 Construction Emissions (2023) | 71.03 | 18.84 | 23.83 | 0.06 | 2.66 | 1.20 | 5,731 |
| ***Operational Emissions*** | | | | | | | |
| Area Sources | 5.17 | 0.14 | 12.46 | <0.01 | 0.07 | 0.07 | 23 |
| Energy | 0.06 | 0.51 | 0.22 | <0.01 | 0.04 | 0.04 | 656 |
| Mobile | 2.11 | 7.96 | 23.47 | 0.08 | 6.12 | 1.67 | 7,925 |
| Waste | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Water | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Total Operational Emissions** | **7.34** | **8.62** | **36.15** | **0.08** | **6.23** | **1.78** | **8,603** |
| **Significant Emissions Threshold** | **137** | **137** | **548** | **137** | **82** | **65** | **548,000** |

ROG: Reactive Organic Compounds, used interchangeably with Volatile Organic Compounds (VOC); $NO_X$: oxides of nitrogen; CO: Carbon monoxide; $SO_X$: Oxides of sulfur; $PM_{2.5}$: particulate matter less than 2.5 micrometers in diameter; $PM_{10}$: particulate matter less than 10 micrometers in diameter; $CO_2e$: Carbon dioxide equivalent

## Emissions Calculation Methodology

Construction and operational emissions were based on three CalEEMod land use types: *Apartments Mid Rise, Parking Lot, and City Park*. A discussion on the land use types that were used for the emissions modeling is included below.

*CalEEMod Land Use Type: Apartments Mid Rise*

The *Apartments Mid Rise* land use type was used to model the emissions associated with the 151-unit three-story apartment complex and the parking spots allotted for residents.[2] The total building square footage (205,215 sq. ft.) was provided on the site plan. The combined area of the apartment complex and resident parking spots (3.60 acres) was calculated based on the first-floor area provided on the site plan and the residential parking area provided by Meta Housing Corporation.[3]

*CalEEMod Land Use Type: Parking Lot*

The *Parking Lot* land use type was used to model the emissions associated with the five guest parking spaces and driveway. The guest parking and driveway area (0.09 acres) was provided by Meta Housing Corporation.[4]

*CalEEMod Land Use Type: City Park*

The *City Park* land use type was used to model the emissions associated with the apartment complex's open space (e.g., recreation area, amenity areas). The acreage (4.70 acres) was based on the difference between the total net site area (8.40 acres) provided on the site plan and the areas designated for the other land use types (discussed above).[5]

## *Construction Emissions*

Construction emissions were calculated using CalEEMod defaults and input provided by Meta Housing Corporation. The client reviewed and updated the list of construction equipment and anticipated construction schedule.

Table 5 provides the anticipated construction schedule. Meta Housing Corporation provided the project's proposed start date (11/1/2021), the *Building Construction* phase start date (12/1/2021) and end date (11/1/2023) and indicated that work would be conducted five days per week. The durations of the Grading, Paving, and Architectural Coating phases were based on CalEEMod default values. The duration of the Site Preparation phase was shortened to fit within the project start date and the start date of the Grading Phase.[6]

[2] Based on the CalEEMod User's Guide dated November 2017, a separate parking land use type does not need to be included for residential land uses because parking is already included in the calculation.
[3] Meta Housing Corporation provided the site plan on 1/18/2021. Residential parking acreage was provided via email by Meta Housing Corporation on 1/12/2021.
[4] The number of visitor parking spaces was provided on the site plan, provided on 1/18/2021. Acreage of parking lot and driveway provided by Meta Housing Corporation via email on 1/12/2021.
[5] Based on a call with Meta Housing Corporation on 1/19/2021, the remaining area was modeled as open, landscaped area (under the City Park land use type).
[6] Meta Housing Corporation verified the proposed construction schedule via email on 1/28/2021.

Table 6 provides the anticipated number of equipment that will be used during each construction phase, the hours per day the equipment will be operated, and the horsepower of the equipment. The values were based on CalEEMod default values.

Based on input from Meta Housing Corporation, the project will require 10,000 cubic yards of material export during the *Grading* phase; as such, the emissions for material haul trips were included in the construction emissions.[7] For fugitive dust emissions, CalEEMod defaults do not include any control of fugitive dust from project construction sites. AVAQMD Rule 403 requires that fugitive dust from any "active operation, open storage pile, or disturbed surface area" be controlled so that the no presence of dust remains visible beyond the property line. To meet this requirement, the standard operation is watering active sites three times per day. Although the addition of watering for dust control is listed as a mitigation measure in CalEEMod, within the AVAQMD this is a requirement, and is therefore included.

For architectural coating operations, VOC emissions were calculated based on the assumption that the coatings would be compliant with the VOC content limits of AVAQMD Rule 1113.[8]

**Table 5. Construction Schedule**

| Construction Phase | Start Date | End Date | Days/week | Total Days |
|---|---|---|---|---|
| Demolition | N/A | N/A | N/A | N/A |
| Site Preparation | 11/1/2021 | 11/2/2021 | 5 | 2 |
| Grading | 11/3/2021 | 11/30/2021 | 5 | 20 |
| Building Construction | 12/1/2021 | 11/1/2023 | 5 | 501 |
| Paving | 11/2/2023 | 11/29/2023 | 5 | 20 |
| Architectural Coating | 11/30/2023 | 12/27/2023 | 5 | 20 |

[7] The material export for the Grading phase was provided via email by Meta Housing Corporation on 1/12/2021. Based on completed data request form provided via email on 12/11/2020, material is not expected to be imported or exported during the *Site Preparation* phase.

[8] For building coatings, assumed to be 90% flat paints (50 g/L) and 10% non-flat paints (100 g/L). For the parking lot coatings, assumed to be compliant with the Traffic Marking Coating category (100 g/L). VOC limits based on AVAQMD Rule 1113.

**Table 6. Construction Equipment**

| Construction Phase | Equipment | Number of Equipment | Hours per day | Horsepower |
|---|---|---|---|---|
| Site Preparation | Rubber Tired Dozers | 3 | 8 | 247 |
| | Tractors/Loaders/Backhoes | 4 | 8 | 97 |
| Grading | Excavators | 1 | 8 | 158 |
| | Graders | 1 | 8 | 187 |
| | Rubber Tired Dozers | 1 | 8 | 247 |
| | Tractors/Loaders/Backhoes | 3 | 8 | 97 |
| Building Construction | Cranes | 1 | 7 | 231 |
| | Forklifts | 3 | 8 | 89 |
| | Generator Sets | 1 | 8 | 84 |
| | Tractors/Loaders/Backhoes | 3 | 7 | 97 |
| | Welders | 1 | 8 | 46 |
| Paving | Pavers | 2 | 8 | 130 |
| | Paving Equipment | 2 | 8 | 132 |
| | Rollers | 2 | 8 | 80 |
| Architectural Coating | Air Compressors | 1 | 6 | 78 |

*Operational Emissions*

Operational emissions consist of area sources (i.e., re-applying architectural coatings, consumer products, fireplaces, and landscaping equipment), energy use (i.e., electricity and natural gas), mobile sources (e.g., commuting), solid waste disposal, and water and wastewater use (i.e., supplying and treating water and wastewater).

For area-source emissions, it was determined that woodstoves and fireplaces would not be installed.[9] For architectural coating operations (i.e., re-applying coatings), VOC emissions were calculated based on the assumption that the coatings would be compliant with the VOC content limits of AVAQMD Rule 1113.[10] For mobile emissions, it was assumed that the amenity areas, modeled under the *City Park* land use type, would be primarily used by apartment residents and there would be no external vehicle trips. All other operational emissions sources were calculated using CalEEMod default factors.

[9] Based on completed data request form provided by Meta Housing Corporation via email on 12/11/2020.
[10] For building coatings, assumed to be 90% flat paints (50 g/L) and 10% non-flat paints (100 g/L). For the parking lot coatings, assumed to be compliant with the Traffic Marking Coating category (100 g/L). VOC limits based on AVAQMD Rule 1113.

## Findings

The estimated emissions of criteria pollutants and greenhouse gases for each year of construction and the total operational emissions **are well below the applicable AVAQMD Significant Emissions Thresholds**; therefore, this project does not have a significant air quality impact on the environment. In addition, this project is not expected to expose sensitive receptors to substantial pollutant concentrations. Since the construction and operational emissions are below the significance thresholds, emissions mitigation measures are not required.

# ATTACHMENT A – Antelope Valley AQMD California Environmental Quality Act (CEQA) and Federal Conformity Guidelines

# ATTACHMENT B – CalEEMod Emissions Model Output