NOISE REPORT

Lime Avenue Project – County of San Bernardino

1. Introduction

This report evaluates noise impacts that could result from the construction and operations of the 8631 Lime Avenue Project (Project). Supporting documents – such as calculation worksheets, modeling outputs, and maps – are included in **Appendix A** to this report.

2. Project Description

The Project proposes to construct and operate a truck dispatching business at APN 0232-061-22-0000 in the City of Fontana. A 12,500 square foot warehouse constructed for the Project would include 9,024 square feet of dry goods storage (no refrigeration) and 3,476 square feet of office space. Two truck loading wells would be attached to the eastern portion of the proposed warehouse. Employee parking would be provided by a 25-space asphalt surface parking area. The asphalt area would also be striped for an additional 18 truck and trailer parking spaces. Another portion of the site would be covered with decomposed granite in order to provide parking for low-boy trucks with heavy loads. Operations of the proposed business would be 24 hours a day, seven days a week. The Project Site, generally located at 8631 Lime Avenue, is bounded by Lime Avenue to the west, Pacific Electric Trail and a storage facility to the north, and an industrial warehouse use to the south. The Project Site is accessed by Lime Avenue, which is currently an un-finished two-lane roadway. As part of the Project, Lime Avenue would be paved and completed by a cul-de-sac that would be located immediately north of the Project Site.

3. Environmental Setting

3.1 Fundamentals of Sound and Environmental Noise

Sound can be described in terms of its loudness (amplitude) and frequency (pitch). The standard unit of measurement for sound is the decibel, abbreviated dB. Because the human ear is not equally sensitive to sound at all frequencies, the A-weighted scale (dBA) is used to reflect the normal hearing sensitivity range of the human ear. **Table 1** provides examples of A-weighted noise levels from common sources. Although the terms “sound” and “noise” are often used synonymously, noise is commonly defined as sound that is either loud, unpleasant, unexpected, or undesired.[1] Because decibels are logarithmic units, they cannot be simply added or subtracted. For example, two cars each producing 60 dBA of noise would not produce a combined 120 dBA.

[1] California Department of Transportation (Caltrans), Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013.

Table 1
A-Weighted Decibel Scale

Common Noise Sources	Sound Level, dBA
Near Jet Engine	130
Rock and Roll Band	110
Jet Flyover at 1,000 feet	100
Power Motor	90
Food Blender	80
Living Room Music	70
Human Voice at 3 feet	60
Residential Air Conditioner at 50 feet	50
Bird Calls	40
Quiet Living Room	30
Average Whisper	20
Rustling Leaves	10
These noise levels are approximations intended for general reference and informational use. They do not meet the standard required for detailed noise analysis but are provided for the reader to gain a rudimentary concept of various noise levels. Source: Cowan, James P., Handbook of Environmental Acoustics, 1993	

3.1.1 Noise Definitions

This noise analysis discusses sound levels in terms of equivalent noise level (L_{eq}), maximum noise level (L_{max}), minimum noise level (L_{mix}), and Community Noise Equivalent Level (CNEL). Statistical descriptors (L_x) are also discussed.

Equivalent Noise Level (L_{eq})

L_{eq} represents the equivalent steady-state noise level for a stated period of time that would contain the same acoustic energy as the fluctuating, time-varying noise level of that same period. For example, the L_{eq} for one hour is the energy average noise level for that hour. L_{eq} can be thought of as a continuous noise level for a certain period that is equivalent in acoustic energy content to a fluctuating noise level of that same period. In this report L_{eq} is expressed in units of dBA.

Maximum Noise Level (L_{max})

L_{max} represents the highest instantaneous noise level of a specified time period.

Minimum Noise Level (L_{mix})

L_{min} represents the lowest instantaneous noise level of a specified time period.

Community Noise Equivalent Level (CNEL)

CNEL is a weighted noise measurement scale of average sound level during a 24-hour period. Due to increased noise sensitivities during evening and night hours, human reaction to sound between 7:00 P.M. and 10:00 P.M. is as if it were actually 5 dBA higher than had it occurred between 7:00 A.M. and 7:00 P.M. From 10:00 P.M. to 7:00 A.M., humans perceive sound as if it

were 10 dBA higher. To account for these sensitivities, CNEL penalizes evening noise levels between 7:00 P.M. and 10:00 P.M. by an additional 5 dBA and nighttime noise levels between 10:00 P.M. and 7:00 A.M. by an additional 10 dBA. Because of this, 24-hour CNEL figures are always higher than their corresponding 24-hour L_{eq}.

Statistical Descriptor (L_x)

L_x is used to represent the noise level exceeded *X*% of a specified time period. For example, L_{90} represents the noise level that is exceeded 90% of a specified time period. L_{90} is commonly used to represent ambient or background steady-state noise levels.[2]

3.1.2 Effects of Environmental Noise

The degree to which noise can impact an environment ranges from levels that interfere with speech and sleep to levels that can cause adverse health effects. Most human response to noise is subjective. Factors that influence individual responses may include the intensity, frequency, and pattern of noise; the amount of background or existing noise present; and the nature of work or human activity that is exposed to intruding noise.

According to the National Institute of Health (NIH), extended or repeated exposure to sounds at or above 85 dB can cause hearing loss. Sounds of 75 dBA or less, even after continuous and repeated exposure, are unlikely to cause hearing loss.[3] The World Health Organization (WHO) reports that adults should not be exposed to sudden "impulse" noise events of 140 dB or greater. For children, this limit is 120 dB.[4]

Exposure to elevated nighttime noise levels can disrupt sleep, leading to increased levels of fatigue and decreased work or school performance. For the preservation of healthy sleeping environments, the WHO recommends that continuous interior noise levels should not exceed 30 dBA L_{eq} and that individual noise events of 45 dBA or higher be limited.[5]

Some epidemiological studies have shown a weak association between long-term exposure to noise levels of 65 to 70 dBA L_{eq} or greater and cardiovascular effects, including ischaemic heart disease and hypertension. However, at this time, the relationship is largely inconclusive.

It is generally accepted that people with normal hearing sensitivity can barely perceive a 3 dBA change in noise levels, though if changes occur to the character of a sound (i.e., changes to the frequency content), then changes less than 3 dBA may be more noticeable.[6] Changes of 5 dBA may be readily perceptible, and changes of 10 dBA are perceived as a doubling in loudness.[7] However, few people are highly annoyed by daytime noise levels below 55 dBA.[8]

2 Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013.
3 National Institute of Health, National Institute on Deafness and Other Communication. www.nidcd.nih.gov/health/noise-induced-hearing-loss.
4 World Health Organization, Guidelines for Community Noise, 1999.
5 World Health Organization, Guidelines for Community Noise, 1999.
6 Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013.
7 Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013.
8 World Health Organization, Guidelines for Community Noise, 1999.

Loud noises, such as those from construction activities, can interfere with peoples' abilities to effectively communicate via speech, as well as other activities, resulting in annoyance or inconvenience. The EPA has determined that a home interior noise level of 45 dBA L_{eq} generally protects speech and communication by providing 100% intelligibility of speech sounds.[9] Other common daily activities that may be disrupted by elevated interior noise levels include watching television, listening to music, or activities requiring concentration (such as reading). The EPA has surmised that, given the preservation of an indoor noise level associated with 100% speech intelligibility, the average community reaction is not evident and "7 dBA below levels associated with significant complaints and threats of legal action." Any complaints and annoyance are dependent on "attitude and other non-level related factors."

3.1.3 Noise Attenuation

Generally speaking, noise levels decrease, or "attenuate," as distances from noise sources to receivers increases. For each doubling of distance, noise from stationary or small, localized sources, commonly referred to as "point sources," may attenuate at the rate of 6 dBA for each doubling of distance. This attenuation is referred to as the inverse square law. For example, if a point source emits a noise level of 80 dBA at a reference distance of 50 feet its noise level would be approximately 74 dBA at a distance of 100 feet, 68 dBA at a distance of 200 feet, etc. Noise emitted by "line" sources, such as highways, attenuates at the rate of 3 dBA for each doubling of distance.[10]

Factors such as ground absorption and atmospheric effects may also affect the propagation of noise. In particular, ground attenuation by non-reflective surfaces such as soft dirt or grass may contribute to increased attenuation rates of up to an additional 8-10 dBA per doubling of distance.[11]

Noise is most audible when traveling by direct line of sight, an unobstructed visual path between a noise source and a receiver. Barriers that break the line of sight between noise sources and receivers, such as walls and buildings, can greatly reduce source noise levels by allowing noise to reach receivers by diffraction only. Barriers can reduce source noise levels by up to 20 dBA, though it is generally infeasible for temporary barriers to reduce source noise levels by more than 15 dBA.[12] In cases where the noise path from source to receiver is direct but grazes the top of a barrier, noise attenuation of up to 5 dBA may still occur.[13]

3.2 Fundamentals of Vibration

Vibration is an oscillatory motion that can be described in terms of displacement, velocity, and acceleration.[14] Unlike noise, vibration is not a common environmental issue, as it is unusual for

9 EPA, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, 1974.

10 Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013.

11 Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013.

12 Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013.

13 Caltrans, Technical Noise Supplement to the Traffic Noise Analysis Protocol, September 2013.

14 Federal Transit Administration, Transit Noise and Vibration Impact Assessment, September 2018.

vibration from vehicle sources to be perceptible. Common sources of vibration may include trains, construction activities, and certain industrial operations.

3.2.1 Vibration Definitions

This analysis discusses vibration in terms of Peak Particle Velocity (PPV).

Peak Particle Velocity (PPV)
PPV is commonly used to describe and quantify vibration impacts to buildings and other structures. PPV levels represent the maximum instantaneous peak of a vibration signal and are generally measured in inches per second (in/sec).[15]

3.2.2 Effects of Vibration

High levels of vibration may cause damage to buildings or even physical personal injury. However, vibration levels rarely affect human health outside the personal operation of certain construction equipment or industrial tools. Instead, most people consider environmental vibration to be an annoyance that may affect concentration or disturb sleep. Background vibration in residential areas is usually not perceptible, and perceptible indoor vibrations are generally caused by sources within buildings themselves, such as slamming doors or heavy footsteps. Vibration from traffic on smooth roadways is rarely perceptible, even from larger vehicles such as buses or trucks.[16] Reported thresholds of human perception of vibration generally range between approximately 0.01 and 0.04 in/sec PPV, depending on the nature of the vibration and the receiver.[17]

3.3 Regulatory Framework

3.3.1 Federal

Currently, no federal noise standards regulate environmental noise associated with temporary construction activities or the long-term operations of development projects. As such, both temporary and long-term noise impacts resultant from the Project would be largely regulated or otherwise evaluated by State and City of Fontana standards designed to protect public well-being and health.

3.3.2 State

3.3.2.1 2017 General Plan Guidelines

The State of California's 2017 General Plan Guidelines propose county and city standards for acceptable exterior noise levels based on land use. These standards are incorporated into land use planning processes to prevent or reduce noise and land use incompatibilities. The State's suggested compatibility considerations between various land uses and exterior noise levels are not regulatory in nature, but recommendations intended to aid communities in determining their own noise-acceptability standards.

[15] Federal Transit Administration, Transit Noise and Vibration Impact Assessment, September 2018.
[16] Caltrans, Transportation and Construction Vibration Guidance Manual, September 2013.
[17] Caltrans, Transportation and Construction Vibration Guidance Manual, September 2013.

Table 2
Appendix D Noise Element Guidelines – Guidelines for Noise-Compatible Land Use

Land Use Category	Day-Night Average Exterior Sound Level (CNEL dB)			
	NA	CA	NU	CU
Residential – Low Density Single Family, Duplex, Mobile Homes	50 – 60	55 – 70	70 – 75	75+
Residential – Multi-Family	50 – 65	60 – 70	70 – 75	75+
Transient Lodging – Motels, Hotels	50 – 65	60 – 70	70 – 80	80+
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 – 70	60 – 70	70 – 80	80+
Auditoriums, Concert Halls, Amphitheaters	-	50 – 70	65 – 80+	-
Sports Arena, Outdoor Spectator Sports	-	50 – 75	70 – 80+	-
Playgrounds, Neighborhood Parks	50 – 70	-	67.5 – 75	72.5 - 80+
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 – 75	-	70 – 80	80+
Office Buildings, Business Commercial and Professional	50 – 70	67.5 - 77.5	75+	-
Industrial, Manufacturing, Utilities, Agriculture	50 – 75	70 – 80	75+	-

NA = Normally Acceptable - Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.

CA = Conditionally Acceptable - New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply system or air conditioning will normally suffice.

NU = Normally Unacceptable - New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

CU = Clearly Unacceptable - New construction or development should generally not be undertaken.

Source: Appendix D to the Noise Element Guidelines, Figure 2.

3.3.3 City of Fontana

3.3.3.1 City of Fontana General Plan 2015-2035 Noise and Safety Element

Adopted in November 2018, the Noise and Safety Element of the Fontana Forward General Plan Update 2015-2035 (Fontana General Plan) contains policies and actions intended to protect sensitive land uses from excessive noise. Those that have relevance to the Project and the determination of its noise impacts are reproduced below for reference.

Goal 8:

The City of Fontana protects sensitive land uses from excessive noise by diligent planning through 2035.

Policies:

- Noise-tolerant land uses shall be guided into areas irrevocably committed to land uses that are noise-producing, such as transportation corridors.
- Noise spillover or encroachment from commercial, industrial and educational land uses shall be minimized into adjoining residential neighborhoods or noise-sensitive uses.

Actions:

A. The following uses shall be considered noise-sensitive and discouraged in areas in excess of 65 dBA CNEL (Community Noise Equivalent Level): Residential Uses; Hospitals; Rest Homes; Long Term Care Facilities; and Mental Care Facilities.

B. The following uses shall be considered noise-sensitive and discouraged in areas in excess of 65 Leq(12) (Equivalent Continuous Sound Level): Schools; Libraries; Places of Worship; and Passive Recreation Uses.

C. The State of California Office of Planning and Research General Plan Guidelines shall be followed with respect to acoustical study requirements.

Goal 9:

The City of Fontana provides a diverse and efficiently operated ground transportation system that generates the minimum feasible noise on its residents

Actions:

A. On-road trucking activities shall continue to be regulated in the City to ensure noise impacts are minimized, including the implementation of truck-routes based on traffic studies.

B. Development that generates increased traffic and subsequent increases in the ambient noise level adjacent to noise-sensitive land uses shall provide appropriate mitigation measures.

C. Noise mitigation practices shall be employed when designing all future streets and highways, and when improvements occur along existing highway segments.

Goal 10:

Fontana's residents are protected from the negative effects of "spillover" noise.

Policy:

- Residential land uses and areas identified as noise-sensitive shall be protected from excessive noise from non-transportation sources including industrial, commercial, and residential activities and equipment.

Actions:

A. Projects located in commercial areas shall not exceed stationary-source noise standards at the property line of proximate residential or commercial uses.

B. Industrial uses shall not exceed commercial or residential stationary source noise standards at the most proximate land uses.

C. Non-transportation noise shall be considered in land use planning decisions.

D. Construction shall be performed as quietly as feasible when performed in proximity to residential or other noise sensitive land uses.

3.3.3.2 City of Fontana Municipal Code

The City of Fontana Municipal Code (FMC) contains a number of regulations that would apply to the Project's temporary construction activities and long-term operations. Those that have relevance to the Project and the determination of its impacts are discussed below.

Article VII, "Industrial Zoning Districts," "establishes general development standards for all industrial development" and is intended to "ensure that industrial operations are compatible with adjacent industrial uses, and non-industrial land uses." The regulations are further intended to "ensure that industrial operations are conducted in a manner that does not threaten the health of City residents and does not harm the environment." The standards set forth in Article VII would apply to the Project as the Project proposes an industrial land use zoned "Regional Industrial" (I-R).

Section 30-525., "Land use compatibility" contains the following subdivisions that instruct how certain features shall be incorporated "to ensure the compatibility of different land uses":

(5) *Physical barriers.* Physical barriers such as masonry block walls and berms shall be provided as specific in these regulations to reduce noise, visual, and light and glare impacts.

(6) *Building orientation.* All buildings shall be cited and oriented to reduce noise, light and glare, visual, and other conflicts. For example, loading areas shall be located in areas where noise from such operations will not adversely impact adjacent uses.

Section 30-543., "Noise and vibration," establishes the following performance standards for land uses in industrial zoning districts, which would regulate the Project's operations:

(a) *Noise levels.* No person shall create or cause to be created any sound which exceeds the noise levels in this section as measured at the property line of any residentially zoned property:

(1) The noise level between 7:00 a.m. and 10:00 p.m. shall not exceed 70 db(A).

(2) The noise level between 10:00 p.m. and 7:00 a.m. shall not exceed 65 dB(A).

(c) *Vibration.* No person shall create or cause to be created any activity which causes a vibration which can be felt beyond the property line with or without the aid of an instrument.

Chapter 18 Article II, "Noise," establishes prohibited noises and acts. Section 18-63 Subdivision (b)(6) would apply to the Project's loading and unloading operations. (b)(7) would apply to construction of the Project. The following acts would be in violation of Article II:

> (6) *Loading, unloading or opening boxes*. The creation of a loud, excessive, impulsive or intrusive and excessive noise in connection with loading or unloading of any vehicle or the opening and destruction of bales, boxes, crates and containers.
>
> (7) *Construction or repairing of buildings or structures.* The erection (including excavating), demolition, alternation or repair of any building or structure other than between the hours of 7:00 a.m. and 6:00 p.m. on weekdays and between the hours of 8:00 a.m. and 5:00 p.m. on Saturdays, except in case of urgent necessity in the interest of public health and safety…

3.3.4 Federal Transit Administration (FTA)

For the evaluation of construction-related building damage vibration impacts, Federal Transit Administration (FTA) guidelines and recommendations are used given the absence of applicable federal, County, or City standards specific to temporary construction activities and building damage.

Though not regulatory in nature, the FTA has established vibration impact criteria for buildings and other structures, as building and structural damages are generally the foremost concern when evaluating the impacts of construction-related vibrations. **Table 3** shows the FTA's vibration guidelines for building and structural damage.

Table 3
FTA Construction Vibration Damage Criteria

Building Category	PPV (in/sec)
I. Reinforced concrete, steel or timber (no plaster)	0.5
II. Engineered concrete and masonry (no plaster)	0.3
III. Non-engineered timber and masonry buildings	0.2
IV. Buildings extremely susceptible to vibration damage	0.12
Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, September 2018.	

3.3.5 California Department of Transportation (Caltrans)

For the evaluation of human annoyance-related vibration impacts, Caltrans criteria are used given the absence of applicable quantitative federal, County, or City standards specific to temporary construction activities.

Table 4 shows the Caltrans criteria for vibration annoyance potential.

Table 4
Caltrans Guideline Vibration Annoyance Potential Criteria

Human Response	Maximum PPV (inches per second)	
	Transient Sources	Continuous/ Frequent/ Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4
Source: Caltrans, Transportation and Construction Vibration Guidance Manual, September 2013.		

3.4 Existing Conditions

3.4.1 Project Site

The 4.99-acre Project Site is currently a vacant field with no structures or other improvements. There are no existing anthropogenic noise sources present at the Project Site.

3.4.2 Noise-Sensitive Receptors

The Project would be located in an industrial neighborhood and surrounded by warehouse, manufacturing, and industrial uses. The nearest noise-sensitive receptors to the Project consist of single-family residences located along Almeria Avenue and Sesame Seed Avenue. They are as follows:

- Almeria Avenue Residences: This receptor consists of three single-family homes located along Almeria Avenue (8160-8184 Almeria Avenue), approximately 475 feet east of the Project Site.

- Sesame Seed Avenue Residences: This receptor consists of single-family homes located along Sesame Seed Avenue, across Foothill Boulevard. The closest residence associated with this receptor is located at the address 15635 Sesame Seed Avenue. Though its backyard is approximately 275 feet north of the Project Site, the house itself is approximately 340 feet north of the Project Site.

Other noise-sensitive receptors are located at greater distances from the Project and would experience lesser noise impacts than these receptors. As such, the following analysis focuses on the Almeria Avenue Residences and Sesame Seed Residences receptors in order to assess the significance of the Project's potential noise impacts.

A map showing the location of the Project and nearby sensitive receptors is included in **Appendix A**.

3.4.3 Existing Ambient Noise Conditions

On July 16, 2021, noise measurements were obtained near the aforementioned sensitive receptors to aid in the characterization of their daytime ambient noise conditions. At both locations the primary source of noise levels was vehicular traffic along nearby roadways, though secondary noises from surrounding industrial uses were also audible. The measured noise levels are shown in **Table 5**, below.

Table 5
Existing Noise Levels

Noise Measurement Location	Sound Level (dBA L_{eq})
1. Sesame Seed Avenue Residences – near cul-de-sac at 8000 Lime Avenue.	48.5
2. Almeria Avenue Residences – near intersection of Almeria Avenue and Pacific Electric Trail	62.4
Source: NTEC, 2021.	

4. Project Impacts

4.1 Methodology

The following section discusses the methods used to analyze the Project's noise impacts:

4.1.1 On-Site Construction Activities

The Project's construction noise impact associated with its on-site construction activities was determined by identifying the noise levels of construction equipment with the greatest potential to disrupt nearby sensitive receptors and assessing the noise increases that could result from their operations. Reference equipment noise levels were derived from the Federal Highway Administration's Roadway Construction Noise Model, version 2.0 (FHWA RCNM 2.0).

4.1.2 Off-Site Construction Activities

The Project's off-site construction noise impact from haul trucks was assessed by estimating the Project's number of haul trips and comparing this figure with surrounding traffic levels to determine significance.

4.1.3 On-Site Operational Noise Sources

The Project's potential to result in significant noise impacts from on-site operational noise sources was assessed by identifying likely on-site noise sources and considering the impacts they could produce given the nature of the source (i.e., loudness and/or whether noise would be generated during daytime or more-sensitive nighttime hours), distances to nearby noise-sensitive receptors, surrounding ambient noise levels, the presence of similar noise sources in the vicinity, and maximum allowable noise levels permitted by the FMC.

4.1.4 Off-Site Operational Noise Sources

The Project's off-site operational noise impact was assessed by comparing its estimated trip generation with surrounding traffic levels to determine significance.

4.1.5 Construction Vibration Sources

The Project's potential to generate damaging levels of groundborne vibration was analyzed by identifying construction vibration sources and estimating the maximum vibration levels that they could produce at nearby properties, all based on the principles and guidelines recommended by the FTA in its 2018 Transit Noise and Vibration Impact Assessment manual. Vibration levels were then compared with the manual's suggested damage criteria for various building categories, as well as a threshold of human perception (**Table 3**).

4.1.6 Operational Vibration Sources

The Project's potential to result in significant impacts from on-site operational vibration sources was assessed by identifying likely on-site groundborne vibration sources and estimating the maximum vibration levels that they could produce at nearby properties, all based on the principles and guidelines recommended by the FTA in its 2018 Transit Noise and Vibration Impact Assessment manual. Vibration levels were then compared with thresholds of human perception established by Caltrans in its 2013 Transportation and Construction Vibration Guidance Manual (**Table 5**).

4.2 Thresholds of Significance

The following thresholds are adopted to aid in the determination of the Project's noise impacts:

4.2.1 State CEQA Guidelines: Appendix G

In accordance with Appendix G of the CEQA Guidelines, the Project would have a significant impact related to noise if the Project would result in:

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

b) Generation of excessive groundborne vibration or groundborne noise levels?

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

4.2.2 On-Site Construction Noise Threshold

Neither the City's Noise and Safety Element nor the FMC contain quantitative noise standards that are specific or directly applicable to construction activities, though Section 13-63 of the FMC restricts construction activities to between the hours of 7:00 A.M. and 6:00 P.M. on weekdays and 8:00 A.M. and 5:00 P.M. on Saturday. Section 30-543 of the FMC establishes that noise from

industrial developments shall not exceed 70 dBA at the property line(s) of residentially zoned property between the hours of 7:00 A.M. and 10:00 P.M. or 65 dBA between the hours of 10:00 P.M. and 7:00 A.M, but this regulation is applicable to industrial land use operations, not to temporary construction activities.

In light of this regulatory framework and other considerations, the Project's construction noise impact would be considered significant if the following would occur:

- Construction activities would take place before 7:00 A.M. or after 6:00 P.M. on weekdays, or before 8:00 A.M. or after 5:00 P.M. on Saturday, pursuant to FMC Section 18-63(b)(7); or

- Construction activities would cause or substantially contribute to ambient exterior noise levels in excess of 70 dBA L_{eq} as measured at the property line of any residentially zoned property, consistent with the daytime performance standard for land uses in industrial zoning districts as set forth by FMC Section 30-543(a); or

- Construction activities would increase existing ambient exterior noise levels at residentially zoned property or other sensitive land uses by 5 dBA or more.

The averaging period shall be equivalent to the duration of a single work day, from start to finish of that day's construction activities. The City's "Local Guidelines For Implementing the California Environmental Quality Act" document (2018) defines "Sensitive Land Uses" to include "schools, hospitals, rest homes, long term care facilities, mental care facilities, residential uses, places of worship, libraries, and passive recreation area." The document notes that sensitive land uses shall not necessarily be limited to these uses.

4.2.3 Operational Noise Thresholds

In consideration of applicable City policies and FMC standards that would regulate or otherwise manage the Project's operational noise impacts, the Project's operational noise impact would be considered significant if the following would occur:

- Project operations would cause noise levels in excess of 70 dBA L_{eq} between 7:00 A.M. and 10:00 P.M. or 65 dBA L_{eq} between 10:00 P.M. and 7:00 A.M. as measured at the property line of any residentially zoned property, pursuant to FMC Section 30-543(a); or

- Project operations would cause ambient noise levels at off-site locations to increase by 3 dBA CNEL or more to or within their "normally unacceptable" or "clearly unacceptable" noise and land use compatibility categories, as defined by the State's "Guidelines for Noise-Compatible Land Use" (see **Table 2**); or

- Project operations would cause any 5 dBA L_{eq} or greater noise increase.[18]

[18] As a 3 dBA increase represents a barely noticeable change in noise level, this threshold considers any increase in ambient noise levels to or within a land use's "normally unacceptable" or "clearly unacceptable" noise/land use compatibility categories to be significant so long as the noise level increase can be

4.2.4 Construction Groundborne Vibration Threshold

As discussed earlier, there are no federal, state, county, or City standards that would regulate the Project's vibration impacts from temporary construction activities, nor are there quantitative thresholds. As a result, the criteria identified by the FTA in its 2018 Transit Noise and Vibration Impact Assessment manual (see **Table 3**) are used where applicable and relevant to assist in analyzing the Project's groundborne vibration impacts as they pertain to Appendix G checklist question (b).

4.2.5 Operations Groundborne Vibration Threshold

The Project's vibration impact from operations would be considered significant if the following were to occur:

- The Project's on-site operations would result in groundborne vibrations in excess of human thresholds for perception beyond the Project's property line. For the purposes of this analysis, this threshold is considered to be 0.01 inches per second for indoor locations and uses where people may be capable of sensing groundborne vibrations that approach human thresholds of perception. For outdoor areas where people are less sensitive to vibration, this threshold is considered to be 0.25 inches per second PPV. This threshold is consistent, in part, with FMC Section 30-543(c), which sets forth vibration performance standards for land uses in industrial zoning districts (see footnote).[19]

These thresholds are consistent with the Caltrans guidance for human annoyance vibration criteria shown in **Table 4**.

considered barely perceptible. For instances when the noise level increase would not necessarily result in "normally unacceptable" or "clearly unacceptable" noise/land use compatibility, a readily noticeable 5 dBA increase would still be considered significant. Increases less than 3 dBA are unlikely to result in noticeably louder ambient noise conditions and would therefore be considered less than significant.

[19] As noted earlier in this report, FMC Section 30-543 additionally prohibits vibrations that "can be felt beyond the property line with…the aid of an instrument." However, given the sensitivity of modern seismometers and other vibration-sensing instruments, this regulation is likely unenforceable. The latest seismometers can detect ground movements as small as 1/10,000,000 centimeters, a distance nearly as small as atomic spacing (Source: "How Does a Seismometer Work?" Incorporated Research Institutions for Seismology). Modern seismometers and similar instruments would be capable of sensing groundborne vibrations that are many orders of magnitude below human perception, whether from sources such as the Project's HVAC equipment or the footsteps of its future workers. It is without question that such instruments would be capable of sensing vibrations generated by other trucking warehouse uses in the Project's vicinity, to say nothing of the heavy rail line that is a feature of the facility to the Project's west. As a result, this analysis does not consider vibrations that are perceptible by instruments but imperceptible to humans to constitute a significant impact.

5. Analysis of Project Impacts

5.1 Threshold a):

Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

5.1.1 On-Site Construction Activities

Construction of the Project would require approximately six to seven months of site preparation, grading, building construction, and paving activities. During all construction phases, noise-generating activities would be permitted to occur at the Project Site (including Lime Avenue, for paving) between the hours of 7:00 A.M. and 6:00 P.M. on weekdays. Saturday construction is not anticipated to occur, but would be permitted between the hours of 8:00 A.M. and 5:00 P.M.

Construction of the Project would first require clearing and preparation of the site, which could require heavy-equipment such as bulldozers, loaders, and a scraper to remove vegetation and other unwanted material or debris. Grading for the site would similarly require bulldozers and loaders, as well as an excavator and a grader. Bulldozers, loaders, and a grader would assist in establishing the proper base and slope for the Project. An excavator may be utilized to dig and backfill trenches for the installation of the Project's utilities. Construction of the Project's metal warehouse building, office area, and other improvements may require construction forklifts, a welder, skid steer loaders, a diesel-powered generator, and a variety of hand tools. Asphalt paving for the Project's parking area, as well as Lime Avenue, would require dump trucks to feed asphalt mix into a paver, which would then lay the asphalt. After this, compactors would be utilized to compress the asphalt layer.

The following analysis assesses noise impacts that may result from the Project's scraper operations during its site preparation or grading phase. As discussed in greater detail below, the noise level generated by a scraper at 50 feet would be greater than the noise level produced by any other equipment or combination of equipment required for the Project's construction.

5.1.1.1 Site Preparation/Grading

A scraper would be required to remove layers of earth from the Project Site to aid subsequent fine grading activities. For the Project, a scraper would grade the site in a sequence of rows, grading approximately 1-acre of the site per workday. Scrapers can produce peak noise levels of 92.4 dBA L_{max} at 50 feet when operating past a receiver. This is an extreme noise level; no other construction vehicle or combination of construction vehicles would generate as loud a noise level. For example, a paver and dump truck would be estimated to produce a peak noise level of only 81.8 dBA L_{max} at 50 feet when laying asphalt – more than a 90% reduction in relative acoustic energy. A combination of an excavator and various loaders or bulldozers all operating at a

distance of 50 feet from a receptor also would not generate as loud a noise level (and it is an unlikely scenario that such equipment would all be operating at the same distance from a receptor to begin with).

The noise impact from scraper operations has been modeled by estimating the average noise level in L_{eq} that could result from a day's work (1 acre graded) occurring in proximity of a receptor. **Table 6** shows the estimated noise impacts that would result from the Project's scraper usage. As shown, construction-related noise levels would not exceed the 70 dBA L_{eq} threshold of significance at either receptor. However, the Project's construction could result in a noise increase of 14.5 dBA at Sesame Seed Avenue Residences, in excess of the 5 dBA increase threshold of significance. Therefore, without mitigation, this impact would be considered significant.

Table 6
Construction Noise Levels – Scraper (Unmitigated)

Receptor	Construction Noise Level (dBA L_{eq})	Existing Ambient Noise Level (dBA L_{eq})	New Noise Level (dBA L_{eq})	Increase
Equipment: Scraper				
Almeria Avenue Residences	57.8	62.4	63.7	1.3
Sesame Seed Avenue Residences	62.8	48.5	63.0	14.5
Source: NTEC, 2021.				

To ensure that the Project's construction-related noise increases at Sesame Seed Avenue Residences do not exceed 5 dBA, the following mitigation measure is required:

MM-1 Sound barriers rated to achieve a sound attenuation of at least 15 dBA shall be erected along the Project Site's north-facing boundaries that face residences located along Sesame Seed Avenue. The prescribed sound barriers shall be installed for the duration of the Project's construction activities.

Implementation of Mitigation Measure MM-1 would reduce scraper-related construction noise impacts to below the 5 dBA increase threshold of significance at Sesame Seed Avenue Residences. As noise levels due to other construction phases would not exceed noise levels associated with the Project's scraper usage, implementation of Mitigation Measure MM-1 would also ensure that all other construction noise impacts to Sesame Seed Avenue Residences are less than significant. As shown in **Table 7**, after mitigation, the noise impact to Sesame Seed Avenue Residences would be 3.6 dBA, below the 5 dBA increase threshold of significance. Thus, implementation of Mitigation Measure MM-1 would result in a **less than significant impact with mitigation** as it pertains to the Project's construction noise.

Table 7
Construction Noise Levels – Scraper (Mitigated)

Receptor	Construction Noise Level (dBA L_{eq})	Existing Ambient Noise Level (dBA L_{eq})	New Noise Level (dBA L_{eq})	Increase
Equipment: Scraper				
Sesame Seed Avenue Residences	49.5	48.5	52.1	3.6
Source: NTEC, 2021.				

5.1.2 Off-Site Construction Activities

Construction of the Project would generate vehicle trips from workers, vendor deliveries, and haul trips. Activities related to vendor deliveries (e.g., unloading building materials, pouring concrete/asphalt, etc.) and haul trips (i.e., dumping imported fill at the Project Site) would be subject to FMC Section 18-63(b)(7), which sets allowable hours from construction activities. The travel of workers, vendors, and haul trucks to and from the Project Site would not be subject to these allowable hours, but given that associated construction activities would be regulated by FMC Section 18-63(b)(7), it is anticipated that most trips generated by the Project's construction would take place around or during the hours permitted by the FMC. Thus, these trips would take place generally during daytime hours and not nighttime hours when people are more sensitive to noise.

The Project's peak construction truck trip generation is likely to occur during its grading phase. According to a preliminary grading plan for the Project, it is anticipated that the Project will require 3,100 cubic yards of imported fill. Assuming a standard haul truck capacity of 16 cubic yards, this corresponds with the requirement of 194 haul truck deliveries (or 388 one-way haul trips) to transport imported fill to the Project Site. Over the course of an estimated two-week grading phase, this would result in an average generation of approximately 39 haul trips per workday, or approximately five haul trips per work hour. The addition of five haul trips per work hour to Lime Avenue and other roadways in the vicinity of the Project that are dominated by industrial, manufacturing, and warehouse uses would not be capable of increasing noise levels at roadside land uses by greater than 5 dBA, especially when considering that a doubling of roadway traffic volume generally corresponds with a 3 dBA increase in roadside noise levels. Neither haul trucks nor vendor delivery trucks would access the Project Site via quieter residential streets that are more susceptible to noise from trucks. The Project's generation of haul trips and other construction-related trips would have a nominal effect on roadside ambient noise levels, and the Project's noise impact from off-site construction sources would therefore be **less than significant**.

5.1.3 On-Site Operational Noise

The Project's potential on-site operational noise sources are identified and discussed below:

Mechanical Equipment

The Project's proposed storage warehouse and office building would be located in excess of 350 feet from the nearest residential properties located along Sesame Seed Avenue and in excess of 950 feet from residential properties located along Almeria Avenue. Given these distances, it is unlikely that the Project's HVAC and other mechanical systems would be capable of increasing ambient noise levels at these sensitive receptors by a discernable degree, much less a significant one. It is similarly unlikely the Project's HVAC and other mechanical systems would cause considerable noise increases at surrounding industrial and warehouse land uses, as these land uses surrounding the Project contain their own HVAC and mechanical sources of noise onsite. The Project's HVAC and other mechanical systems would not have a substantial effect on surrounding ambient noise conditions, nor would they introduce a new major source of operational noise to the location.

Parking Lot

The Project would include 25 passenger car parking spaces (and 2 handicapped spaces) and 18 truck and trailer parking spaces. The Project would also include an acre of decomposed granite parking for heavy "low-boy" trucks hauling construction vehicles. Idling diesel trucks can generate sound power levels of 96 dBA, which is not likely to correspond with a sound pressure level in excess of 55 dBA at any nearby residential receptor.[20,21] Considering SCAQMD and CARB rules that prohibit diesel truck idling for more than five minutes, idling-related noise increases at sensitive receptors that are located approximately 500 feet or greater from the Project's truck parking areas are not likely to be considerable as measured over any applicable time-averaging period. On-site parking lot noise associated with the Project's peak passenger car trip generation of five trips per hour would have a nominal impact at surrounding uses and sensitive receptors that are hundreds of feet away from the Project's passenger car parking areas.

Loading Dock/Truck Well

The Project's loading dock/truck well would be located over 500 feet south of Sesame Seed Avenue Residences and over 900 feet west of Almeria Avenue Residences. As noted above, truck idling would generate noise levels less than 55 dBA at Sesame Seed Avenue Residences, and SCAQMD/CARB rules would prevent idling from lasting more than five minutes in duration. As a result, noise associated with truck loading or unloading would not have the potential to cause substantial noise increases at Sesame Seed Avenue Residences, and impacts to the more distant Almeria Avenue Residences would be even less.

Overall, the Project is located in an industrial neighborhood with similar, if not more intensive, existing industrial land uses and accompanying noise sources. Land uses in closest proximity to the Project are all industrial and/or warehousing in nature and would not be exposed to significant noise increases as a result of the Project. The nearest noise sensitive uses are located hundreds of feet from the Project and even farther from portions of the Project Site that would be responsible for most of its operational noises (e.g., the loading dock). The Project's on-site operational noise

[20] Source: Noise impact analysis for the Blooming Truck Terminal Project as prepared by LSA Associates, Inc., June 2013.

[21] As the Project's proposed warehouse storage would not be refrigerated, it is not anticipated that the Project would involve trucks utilizing trailer refrigeration units ("reefer" units).

sources would have no potential to increase noise levels at Sesame Seed Avenue Residences or Almeria Avenue Residences by greater than a minimum 3 dBA CNEL or in excess of 70 dBA L_{eq} overall (65 dBA L_{eq} during nighttime hours). Regarding nearby industrial uses, the Project also would not increase noise levels at these properties by 3 dBA CNEL or greater to or within their "Normally Unacceptable" noise category as per the State guidelines shown in **Table 2**, or by 5 dBA. As a result, the impact of the Project's on-site operational noise sources would be **less than significant**.

5.1.4 Off-Site Operational Noise

The Project is estimated to result in approximately ten new A.M. peak hour trips and twelve new P.M. peak hour trips. The A.M. trips would consist of four passenger car trips and six truck trips, while the P.M. peak hour trips would consist of five passenger car trips and seven truck trips. Trucks would access and exit the Project via Lime Avenue. Whether accessing or departing the Project via Lime Avenue, truck trips are anticipated to be evenly distributed to the west and east along Arrow Boulevard. The addition of seven truck trips per hour to Lime Avenue would have a nominal impact to the industrial and warehousing uses that line this roadway. The addition of three to four truck trips per hour to Arrow Boulevard would similarly have a nominal impact on this roadway's surrounding ambient noise levels. As discussed earlier, a 3 dBA increase in roadway noise levels generally requires a doubling of traffic volume. The Project's maximum seven hourly truck trips on Lime Avenue and four hourly trips on Arrow Boulevard (east or west of Lime Avenue) would not double the truck traffic volumes of these roadways and contribute to roadside noise increases greater than 3 dBA CNEL, which is the minimum significant impact criteria for operational noise impacts. As a result, the Project's off-site operational impact from its related trip generation would be **less than significant.**

5.2 Threshold b):

Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

5.2.1 Building Damage Vibration Impact

As discussed earlier, construction of the Project would require heavy-duty earthmoving equipment, including bulldozers, loaders, an excavator, a scraper, and other diesel-powered vehicles. Large steel-tracked-mounted grading vehicles can produce vibration levels of 0.089 inches per second PPV at a reference distance of 25 feet. However, parking lot and Lime Avenue paving activities would require the use of vibratory compacting equipment, such as a vibratory roller vehicle. Vibratory rollers can produce vibration levels of 0.210 inches per second PPV at a reference distance of 25 feet and 0.046 inches per second PPV at a distance of 100 feet. This 0.046 inches per second PPV groundborne vibration level at a distance of 100 feet is lower than the FTA's strictest 0.12 inches per second PPV criteria for buildings that may be extremely sensitive to vibration damage. Given there are no buildings that would be located within 100 feet of the Project's construction activities, much less buildings that would be considered extremely

sensitive to vibration damage, groundborne vibration generated by the Project's construction and its potential to result in building damage would be considered **less than significant**.

5.2.2 Operational Vibrations Impact

Loaded trucks, such as the vehicles that would be dispatched from the Project Site, can produce vibration levels of 0.076 inches per second PPV at a reference distance of 25 feet, though this vibration level is associated with vibration events caused by truck drive-bys, not with slow parking lot operations. Nevertheless, utilizing this vibration level, the Project's loaded trucks would not be expected to generate perceptible groundborne vibrations at surrounding uses. Given the layout of the Project's surface parking, areas where trucks may operate would be located approximately 150 feet from the nearest indoor spaces where occupants may be capable of sensing groundborne vibrations at the minimum thresholds of human perception (a warehouse building located at 8250 Almeria Avenue that may contain offices). At this distance, the vibration level would be approximately 0.01 inches per second PPV, which is below the 0.04 inches per second PPV threshold of perception for transient sources. Additionally, areas where Project trucks may operate would also be located approximately 35 feet from the property to its south. At this distance, groundborne vibration from the Project's trucks would be approximately 0.05 inches per second PPV, which would not exceed the 0.25 inches per second PPV threshold for vibration perceptibility in outdoor spaces. The Project's related passenger vehicle travel would not be a significant source of vibration, as passenger vehicles normally generate vibration peaks that are one-fifth to one-tenth of truck vibrations. Given these considerations, the Project's impact from operational sources of groundborne vibration would be considered **less than significant**.

5.3 Threshold c):

For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The Project is not located within two miles of a public or public use airport and would not expose people residing or working in the project area to excessive noise levels from aircraft.

NOISE RECEPTOR & MONITORING LOCATION MAP

8631 Lime Avenue Project

Imagery via Google

Construction Noise Impact Analysis

noah tanski environmental consulting

Sesame Seed Avenue Residences: SCRAPER

Ambient Noise Level:	48.5 dBA Leq
Distance:	n/a feet

Unmitigated

Equipment Noise Levels

Equipment	Daily Work Area - Noise Level at Receptor	Usage %	Adjusted Noise Level
Scraper	66.8	0.4	62.8
-	0	1	0.0
-	0	1	0.0
-	0	1	0.0
-	0	1	0.0
		Combined dBA Leq:	62.8

Unmitigated Construction Noise Impact

Combined Equipment Noise Level	62.8 dBA Leq
Total Shielding (existing building rows/sound barrier)	0 dBA
Ground Factor (n/a per calculations)	0
Distance (n/a per calculations)	50 ft

Unmitigated Construction Noise Level	62.8 dBA Leq
Ambient Noise Level	48.5 dBA
New Noise Level	63.0 dBA Leq
Unmitigated Noise Increase	**14.5 dBA**

Mitigated

Equipment Noise Levels

Equipment	Daily Work Area - Noise Level at Receptor	Usage %	Adjusted Noise Level
Scraper	68.5	0.4	64.5
-	0	1	0.0
-	0	1	0.0
-	0	1	0.0
-	0	1	0.0
		Combined dBA Leq:	64.5

Mitigated Construction Noise Impact

Combined Equipment Noise Level	64.5 dBA Leq
Total Shielding (sound barrier)	15 dBA
Ground Factor (n/a per calculations)	0
Distance (n/a per calculations)	50 ft

Mitigated Construction Noise Level	49.5 dBA Leq
Ambient Noise Level	48.5 dBA
New Noise Level	52.1 dBA Leq
Mitigated Noise Increase	**3.6 dBA**

Construction Noise Impact Analysis

noah tanski environmental consulting

Almeria Avenue Residences: SCRAPER

Ambient Noise Level:	62.4 dBA Leq
Distance:	n/a feet

Unmitigated

Equipment Noise Levels

Equipment	Daily Work Area - Noise Level at Receptor	Usage %	Adjusted Noise Level
Scraper	61.8	0.4	57.8
-	0	1	0.0
-	0	1	0.0
-	0	1	0.0
-	0	1	0.0
		Combined dBA Leq:	57.8

Unmitigated Construction Noise Impact

Combined Equipment Noise Level	57.8 dBA Leq
Total Shielding (existing building rows/sound barrier)	0 dBA
Ground Factor (n/a per calculations)	0
Distance (n/a per calculations)	50 ft

Unmitigated Construction Noise Level	57.8 dBA Leq
Ambient Noise Level	62.4 dBA
New Noise Level	63.7 dBA Leq
Unmitigated Noise Increase	**1.3 dBA**