FIRSTCARBON SOLUTIONS™

Noise Impact Analysis
Project Bruin at The Sakioka Farms Business Park
City of Oxnard, Ventura County, California

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Table of Contents

List of Tables

List of Exhibits

ACRONYMS AND ABBREVIATIONS

ADT	average daily traffic
BRA	Biological Resources Assessment
CNEL	Community Noise Equivalent Level
dB	decibel
dBA	A-weighted decibel
FCS	FirstCarbon Solutions
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
L_{dn}	Day-Night Average Sound Level
L_{eq}	Equivalent Sound Level
PPV	peak particle velocity
rms	root mean square
VdB	velocity in decibels

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SECTION 1: INTRODUCTION

1.1 - Purpose of Analysis and Study Objectives

This Noise Impact Analysis has been prepared by FirstCarbon Solutions (FCS) to determine the off-site and on-site noise impacts associated with construction and operation of the proposed Project Bruin at The Sakioka Farms Business Park (Facility). The following is provided in this report:

- A description of the study area, project site, and proposed project
- Information regarding the fundamentals of noise and vibration
- A description of the local noise guidelines and standards
- A description of the existing noise environment
- An analysis of the potential short-term, construction-related noise and vibration impacts from the Facility
- An analysis of long-term, operations-related noise and vibration impacts from the Facility

1.2 - Project Summary

1.2.1 - Site Location

The approximately 64.65-acre project site is predominately farmland located within the 430-acre Sakioka Farms Business Park Specific Plan Area in the City of Oxnard, in Ventura County, California. The 430-acre business park is adjacent to and south of U.S. Route 101 (U.S. 101), at the Rice Avenue off-ramp (Exhibit 1). The project site is specifically located south of U.S. 101, north of State Route 34, east of Rice Avenue, and adjacent to and west of Del Norte Boulevard (Exhibit 2).

1.2.2 - Project Description

The Facility would be used as an e-commerce fulfillment center for general consumer products. The Facility would be constructed as a two-story, non-combustible Type II-B structure that would utilize a complex proprietary inventory management system that would store products on a portion of the ground floor, ground floor mezzanine, a portion of the second floor, and second floor mezzanine. A proprietary material handling system installed in the process areas on the ground floor and second floor would allow employees to organize, package, and ship customer orders quickly and efficiently. The facility has a ground floor footprint of 857,173 gross square feet, which would facilitate a portion of storage and material handling equipment. The ground floor mezzanine, second floor, (known as the Robotic Storage Platform [RSP]), and second floor mezzanine would house a large automated storage and retrieval system with shelf-like storage units (pods) that would be moved by low-profile robots. The remaining portion of the second floor would be used for material handling equipment (process level). Total building space for the project is 2,315,252 gross square feet with 1,814 parking spaces, 230 trailer spaces, and approximately 62 dock doors.

The site plan is shown in Exhibit 3.

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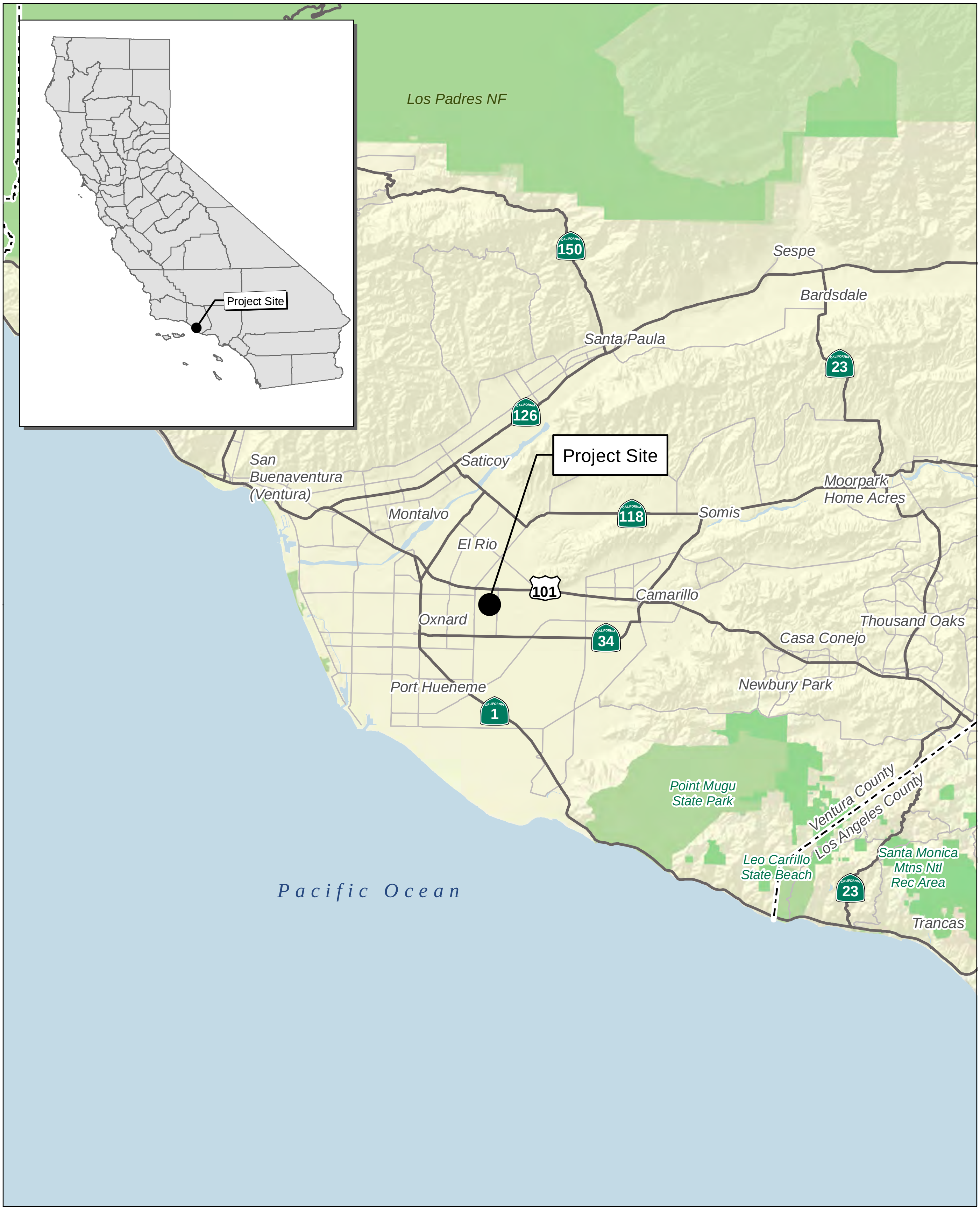

Source: Census 2000 Data, The CaSIL

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5 2.5 0 5 Miles

Exhibit 1
Regional Location Map

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SEEFRIED INDUSTRIAL PROPERTIES, INC.
PROJECT BRUIN AT THE SAKIOKA FARMS BUSINESS PARK
NOISE IMPACT ANALYSIS

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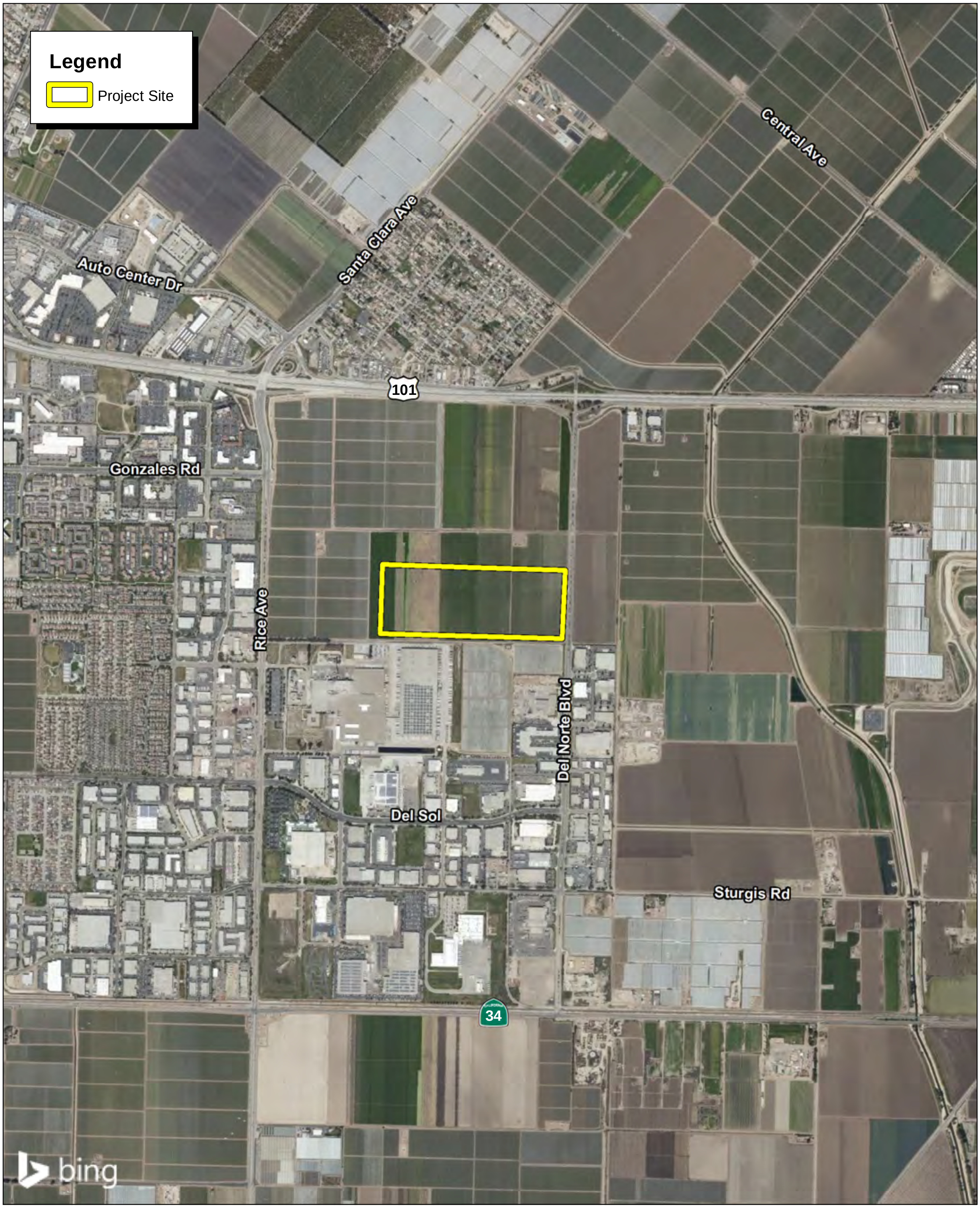

Source: Bing Aerial Imagery.

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2,000 1,000 0 2,000 Feet

Exhibit 2
Local Vicinity Map
Aerial Base

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PROJECT BRUIN AT THE SAKIOKA FARMS BUSINESS PARK
NOISE IMPACT ANALYSIS

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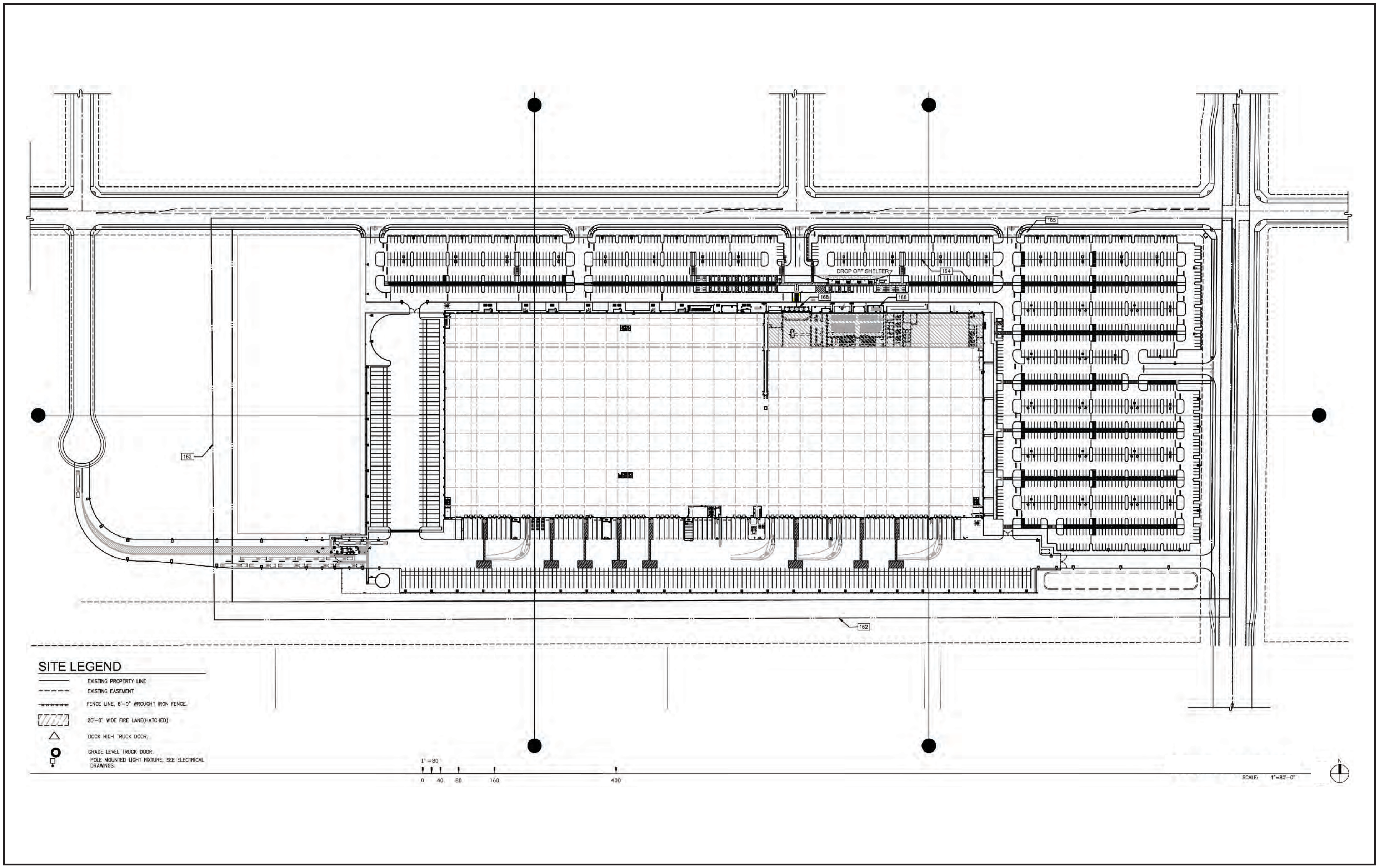

Source: Ware Malcomb, March 2020.

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Exhibit 3
Site Plan

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SEEFRIED INDUSTRIAL PROPERTIES, INC.
PROJECT BRUIN AT THE SAKIOKA FARMS BUSINESS PARK
NOISE IMPACT ANALYSIS

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SECTION 2: NOISE AND VIBRATION FUNDAMENTALS

2.1 - Characteristics of Noise

Noise is generally defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, and sleep.

Several noise measurement scales exist, which are used to describe noise in a particular location. A decibel (dB) is a unit of measurement that indicates the relative intensity of a sound. The 0 point on the dB scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Changes of 3.0 dB or less are only perceptible in laboratory environments. Audible increases in noise levels generally refer to a change of 3.0 dB or more, as this level has been found to be barely perceptible to the human ear in outdoor environments. Sound levels in dB are calculated on a logarithmic basis. An increase of 10 dB represents a 10-fold increase in acoustic energy, while 20 dB is 100 times more intense, and 30 dB is 1,000 times more intense. Each 10-dB increase in sound level is perceived as approximately a doubling of loudness. Sound intensity is normally measured through the A-weighted sound level (dBA). This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive.

Noise impacts can be described in three categories: audible impacts, potentially audible, and changes in noise level of less than 1.0 dB. (1) Audible impacts refer to increases in noise levels noticeable to humans. An audible increase in noise levels generally refers to a change of 3.0 dB or greater, since this level has been found to be barely perceptible in exterior environments; (2) potentially audible refers to a change in the noise level between 1.0 and 3.0 dB. This range of noise levels has been found to be noticeable only in laboratory environments; and (3) changes in noise level of less than 1.0 dB are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

As noise spreads from a source, it loses energy so that the farther away the noise receiver is from the noise source, the lower the perceived noise level would be. Geometric spreading causes the sound level to attenuate or be reduced, resulting in a 6 dB reduction in the noise level for each doubling of distance from a single point source of noise, to the noise-sensitive receptor of concern. A long, closely spaced continuous line of vehicles along a roadway becomes a line source and produces a 3 dBA decrease in sound level for each doubling of distance. However, experimental evidence has shown that where sound from a highway propagates close to “soft” ground (e.g., plowed farmland, grass, crops, etc.), the most suitable drop off rate to use is not 3 dBA but rather 4.5 dBA per distance doubling. There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. The predominant rating scales for human communities in the State of California are the L_{eq} and community noise equivalent level (CNEL) or the day-night average level (L_{dn}) based on dBA. Equivalent continuous sound level (L_{eq}) is the total sound energy of time-varying noise over a sample period. CNEL is the time-varying noise over a 24-hour period, with a 5-dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours), and a 10-dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale but without the adjustment for events occurring during the evening hours. CNEL and L_{dn} are within one dBA of each other and are normally exchangeable. The noise adjustments are added to the noise events occurring during the more sensitive hours.

Other noise rating scales of importance when assessing the annoyance factor include the maximum noise level (L_{max}), which is the highest exponential time-averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis are specified in terms of maximum levels denoted by L_{max} for short-term noise impacts. L_{max} reflects peak operating conditions and addresses the annoying aspects of intermittent noise.

Common sources of noise in urban environments include mobile sources, such as traffic, and stationary sources, such as mechanical equipment or construction operations.

Construction is performed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on each construction site and, therefore, would change the noise levels as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table 1 shows typical noise levels of construction equipment as measured at a distance of 50 feet from the operating equipment. Construction-period noise levels are higher than background ambient noise levels, but eventually cease once construction is complete.

Table 1: Typical Construction Equipment Maximum Noise Levels, L_{max}

Category	Specification Maximum Sound Levels for Analysis (dBA at 50 feet)
Pickup Truck	55
Pumps	77
Air Compressors	80
Backhoe	80
Front-End Loaders	80
Portable Generators	82
Dump Truck	84
Tractors	84
Auger Drill Rig	85
Concrete Mixer Truck	85
Cranes	85
Dozers	85
Excavators	85

Table 1 (cont.): Typical Construction Equipment Maximum Noise Levels, L_{max}

Category	Specification Maximum Sound Levels for Analysis (dBA at 50 feet)
Graders	85
Jackhammers	85
Man Lift	85
Paver	85
Pneumatic Tools	85
Rollers	85
Scrapers	85
Concrete/Industrial Saws	90
Impact Pile Driver	95
Vibratory Pile Driver	95
Source: FHWA 2006. Highway Construction Noise Handbook, August.	

2.2 - Characteristics of Groundborne Vibration

Groundborne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. Vibrating objects in contact with the ground radiate vibration waves through various soil and rock strata to the foundations of nearby buildings.

Although groundborne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. When assessing annoyance from groundborne vibration, vibration is typically expressed as root mean square (rms) velocity in units of decibels of 1 micro-inch per second. To distinguish these vibration levels referenced in decibels from noise levels referenced in decibels, the unit is written as “VdB.” In extreme cases, excessive groundborne vibration has the potential to cause structural damage to buildings. Common sources of groundborne vibration include construction activities such as blasting, pile driving, and operating heavy earthmoving equipment. However, construction vibration impacts to building structures are generally assessed in terms of peak particle velocity (PPV). For purposes of this analysis, project related impacts are expressed in terms of PPV. Typical vibration source levels from construction equipment are shown in Table 2.

Table 2: Vibration Levels of Construction Equipment

Construction Equipment	PPV at 25 Feet (inches/second)	RMS Velocity in Decibels (VdB) at 25 Feet
Water Trucks	0.001	57
Scraper	0.002	58
Bulldozer—small	0.003	58
Jackhammer	0.035	79
Concrete Mixer	0.046	81
Concrete Pump	0.046	81
Paver	0.046	81
Pickup Truck	0.046	81
Auger Drill Rig	0.051	82
Backhoe	0.051	82
Crane (Mobile)	0.051	82
Excavator	0.051	82
Grader	0.051	82
Loader	0.051	82
Loaded Trucks	0.076	86
Bulldozer—Large	0.089	87
Caisson drilling	0.089	87
Vibratory Roller (small)	0.101	88
Compactor	0.138	90
Clam shovel drop	0.202	94
Vibratory Roller (large)	0.210	94
Pile Driver (impact-typical)	0.644	104
Pile Driver (impact-upper range)	1.518	112
Source: Compilation of scientific and academic literature, generated by FTA and FHWA.		

Propagation of vibration through soil can be calculated using the vibration reference equation:

PPV= PPV ref * (25/D)^n (in/sec)

Where:

PPV=reference measurement at 25 feet from vibration source
D=distance from equipment to property line
n=vibration attenuation rate through ground

According to Section 7.2 of the Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual, an “n” value of 1.5 is recommended to calculate vibration propagation through typical soil conditions.[1]

[1] Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment Manual. September.

SECTION 3: REGULATORY SETTING

3.1 - Federal Regulations

3.1.1 - United States Environmental Protection Agency

In 1972, Congress enacted the Noise Control Act. This act authorized the EPA to publish descriptive data on the effects of noise and establish levels of sound "requisite to protect the public welfare with an adequate margin of safety." These levels are separated into health (hearing loss levels) and welfare (annoyance levels) categories, as shown in Table 3. The EPA cautions that these identified levels are not standards because they do not take into account the cost or feasibility of the levels.

For protection against hearing loss, 96 percent of the population would be protected if sound levels are less than or equal to an $L_{eq(24)}$ of 70 dBA. The EPA activity and interference guidelines are designed to ensure reliable speech communication at about 5 feet in the outdoor environment. For outdoor and indoor environments, interference with activity and annoyance should not occur if levels are below 55 dBA and 45 dBA, respectively.

Table 3: Summary of EPA Recommended Noise Levels to Protect Public Welfare

Effect	Level	Area
Hearing loss	$L_{eq}(24) \leq 70$ dB	All areas
Outdoor activity interference and annoyance	$L_{dn} \leq 55$ dB	Outdoors in residential areas, farms, and other outdoor areas where people spend widely varying amounts of time, and other places in which quiet is a basis for use.
	$L_{eq}(24) \leq 55$ dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	$L_{eq} \leq 45$ dB	Indoor residential areas.
	$L_{eq}(24) \leq 45$ dB	Other indoor areas with human activities such as schools, etc.

Note:
(24) = L_{eq} duration of 24 hours
Source: EPA, 1974.

3.1.2 - Federal Transit Administration

The Federal Transit Administration (FTA) has established industry accepted standards for vibration impact criteria and impact assessment. These guidelines are published in its Transit Noise and

Vibration Impact Assessment document.[2] The FTA guidelines include thresholds for construction vibration impacts for various structural categories as shown in Table 4.

Table 4: Federal Transit Administration Construction Vibration Impact Criteria

Building Category	PPV (in/sec)	Approximate VdB
I. Reinforced—Concrete, Steel or Timber (no plaster)	0.5	102
II. Engineered Concrete and Masonry (no plaster)	0.3	98
III. Non Engineered Timber and Masonry Buildings	0.2	94
IV. Buildings Extremely Susceptible to Vibration Damage	0.12	90

Note:
VdB = Velocity in decibels
Source: Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment Manual. September.

3.2 - State Regulations

The State of California has established regulations that help prevent adverse impacts to occupants of buildings located near noise sources. Referred to as the "State Noise Insulation Standard," it requires buildings to meet performance standards through design and/or building materials that would offset any noise source in the vicinity of the receptor. State regulations include requirements for the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are found in the California Code of Regulations, Title 24 (known as the Building Standards Administrative Code), Part 2 (known as the California Building Code), Appendix Chapters 12 and 12A. For limiting noise transmitted between adjacent dwelling units, the noise insulation standards specify the extent to which walls, doors, and floor-ceiling assemblies must block or absorb sound. For limiting noise from exterior noise sources, the noise insulation standards set an interior standard of 45 dBA CNEL in any habitable room with all doors and windows closed. In addition, the standards require preparation of an acoustical analysis demonstrating the manner in which dwelling units have been designed to meet this interior standard, where such units are proposed in an area with exterior noise levels greater than 60 dBA CNEL.

The proposed project does not include any type of residential development. Therefore, these standards are not applicable to the proposed project. However, the State has established land use compatibility guidelines for determining acceptable noise levels for specified land uses, including industrial type land uses such as the proposed project, which the City of Oxnard has adopted and modified as described below.

[2] Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment Manual. September.

3.3 - Local Regulations

The project site is located within the City of Oxnard, in Ventura County, California. The City of Oxnard addresses noise in the Safety & Hazards Chapter of its 2030 General Plan[3] and in the Nuisances Chapter of its Code of Ordinances[4].

3.3.1 - City of Oxnard 2030 General Plan

The City of Oxnard adopted its 2030 General Plan in October 2011. The 2030 General Plan's goals, in regard to noise, are to maintain a quiet and safe residential and working environment in terms of exposure to and/or generation of noise; and to consider noise levels and impacts in the land use planning and development process. To assist with meeting its goals, the Safety & Hazards chapter of the 2030 General Plan establishes guidelines for Community Noise Exposure. Policy SH-6.4 requires that proposed development projects not generate more noise than that classified as "satisfactory" based on CEQA thresholds of significance on nearby property. Policy SH-6.9 prohibits the development of new commercial, industrial, or other noise generating land uses adjacent to existing residential uses, and other sensitive noise receptors such as schools, child and daycare facilities, health care facilities, libraries, and churches if noise levels are expected to exceed 70 dBA. Implementation Measure 47.0 of the General Plan required adoption of the State's noise compatibility land use criteria by the year 2013. According to these criteria, environments with ambient noise levels up to 75 dBA CNEL are considered to be "normally acceptable" for new industrial land use development.

3.3.2 - City of Oxnard Code of Ordinances

The Nuisance chapter of the City of Oxnard's Code of Ordinances establishes noise performance standards and permissible hours for construction activities. Noise ordinances applicable to the proposed development project are summarized in Table 5 below.

The City's exterior sound standard limits noise to the following levels at the specified land uses:

Table 5: Exterior Sound Standards

Sound Zone	Type of Land Use	Allowable Exterior Sound Level	
		7:00 a.m. to 10:00 p.m.	10:00 p.m. to 7:00 a.m.
I	Residential	55 dBA	50 dBA
II	Commercial	65 dBA	60 dBA
III	Industrial	70 dBA	70 dBA

[3] City of Oxnard. 2011. The City of Oxnard 2030 General Plan – Goals & Policies. October. Website: https://www.oxnard.org/wp-content/uploads/2017/06/Oxnard-2030-General-Plan-Amend-06.2017-SM.pdf. Accessed February 7, 2020.

[4] City of Oxnard. 2019. City of Oxnard Code of Ordinances. Website: http://library.amlegal.com/nxt/gateway.dll/California/oxnard/oxnardcaliforniacodifiedordinances?f=templates$fn=default.htm$3.0$vid=amlegal:oxnard_ca. Accessed February 7, 2020.

No person at any location within the City shall create, maintain, cause or allow any sound on property that causes the sound level, when measured on any other property, to exceed:

1. The allowable exterior sound level for a cumulative period of more than 30 minutes in any hour; or
2. The allowable exterior sound level plus 5 dBA for a cumulative period of more than 15 minutes in any hour; or
3. The allowable exterior sound level plus 10 dBA for a cumulative period of more than 5 minutes in any hour; or
4. The allowable exterior sound level plus 15 dBA for a cumulative period of more than 1 minute in any hour; or
5. The allowable exterior sound level plus 20 dBA for any period of time.

Furthermore, this ordinance specifies that each of the sound levels specified shall be reduced by 5 dBA for impulse sound and simple tone noise, or for sounds consisting of speech or music, provided, however, that if the ambient sound level exceeds the allowable exterior sound level, the ambient sound level shall be the standard.

As shown in Table 6, the City limits interior noise levels in residential dwellings to the following levels between the specified hours:

Table 6: Interior Sound Standards

Sound Zone	Type of Land Usage	Allowable Interior Sound Level	
		7:00 a.m. to 10:00 p.m.	10:00 p.m. to 7:00 a.m.
All	Residential	50 dBA	45 dBA

No person at any location within the City shall create, maintain, cause or allow any sound on property that causes the sound level when measured within any dwelling unit in any sound zone to exceed:

1. The allowable interior sound level for a cumulative period of more than 5 minutes in any hour; or
2. The allowable interior sound level plus 5 dBA for a cumulative period of more than 1 minute in any hour; or
3. The allowable interior sound level plus 10 dBA for any period of time.

The City restricts noise associated with or created by construction, repair, remodeling or grading of any real property, or during authorized seismic surveys to between the hours of 7:00 a.m. and 6:00 p.m. on weekdays, including Saturday.

SECTION 4: EXISTING NOISE CONDITIONS

The following section describes the existing ambient noise environment of the project vicinity.

4.1 - Existing Stationary Source Noise Levels

The project site is located in the City of Oxnard, in Ventura County, California, and is specifically located south of U.S. 101, north of State Route 34, east of Rice Avenue, and adjacent to and west of Del Norte Boulevard. Surrounding land uses include agricultural uses to the north and east; industrial uses to the south; and commercial uses to the west. Some of the surrounding land uses generate noise from truck deliveries and typical parking lot activities. Typical medium truck loading and unloading activities in the project vicinity result in maximum noise levels from 70 dBA to 80 dBA L_{max} at 50 feet. Representative parking lot activities, such as people conversing or doors shutting, generate approximately 60 dBA to 70 dBA L_{max} at 50 feet. These activities are potential point sources of noise that contribute to the existing ambient noise environment in the project vicinity.

4.2 - Existing Traffic Noise

Existing traffic noise levels along selected roadway segments in the project vicinity were modeled using the Federal Highway Administration (FHWA) Traffic Noise Prediction Model (FHWA-RD-77-108). Site-specific information is entered, such as roadway traffic volumes, roadway active width, source-to-receiver distances, travel speed, and noise source and receiver heights, as well as the automobiles, medium trucks, and heavy trucks that travel the route throughout the day, amongst other variables. The average daily traffic (ADT) volumes were obtained from the traffic analysis prepared for the project by Linscott, Law & Greenspan.[5] The traffic volumes described here correspond to the existing without project conditions traffic scenario as described in the transportation analysis. The model inputs and outputs—including the 60 dBA, 65 dBA, and 70 dBA CNEL noise contour distances—are provided in Appendix A of this document. A summary of the modeling results is shown in Table 7.

Table 7: Existing Traffic Noise Levels

Roadway Segment	Approximate ADT	Center-line to 70 CNEL (feet)	Center-line to 65 CNEL (feet)	Center-line to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane
Rice Avenue – U.S. 101 to Gonzales Road	45,700	88	173	364	69.7
Rice Avenue - Gonzales Road to Camino Del Sol	36,700	102	213	454	71.8
Gonzales Road - Rose Avenue to Rice Avenue	22,500	69	132	276	68.2

[5] Linscott, Law & Greenspan. 2020. Sakioka Specific Plan Traffic Assessment. March 20.

Table 7 (cont.): Existing Traffic Noise Levels

Roadway Segment	Approximate ADT	Center-line to 70 CNEL (feet)	Center-line to 65 CNEL (feet)	Center-line to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane
Del Norte Boulevard – U.S. 101 to Camino Del Sol	14,500	58	116	245	68.1

Notes:
[1] Modeling results do not take into account mitigating features such as topography, vegetative screening, fencing, building design, or structure screening. Rather, it assumes a worst case of having a direct line of site on flat terrain.
Source: FirstCarbon Solutions 2020.

The projected noise levels for existing traffic near the western boundary of the project site range up to 71.8 dBA CNEL along Rice Avenue between East Gonzales Road and Camino Del Sol as measured at 50 feet from the centerline of the outermost travel lane. Near the project's eastern boundary, projected noise levels range up to 68.1 dBA CNEL along Del Norte Boulevard between U.S. 101 and Camino Del Sol as measured at 50 feet from the centerline of the outermost travel lane.

SECTION 5: THRESHOLDS OF SIGNIFICANCE AND IMPACT ANALYSIS

5.1 - Thresholds of Significance

This report analyzes potential project impacts according to the following criteria of significance. The proposed project would result in a significant impact if the project would result in:

a) Exposure of persons to, or generation of, noise levels in excess of standards established in the Oxnard 2030 General Plan or Noise Ordinance, applicable standards of other agencies;

b) Exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels.

c) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project; or

d) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;

e) Exposure of people residing or working in the project area to excessive noise levels if the project is located within the airport land use plan for Oxnard Airport or within 2 miles of Naval Base Ventura County Point Mugu?

f) Exposure of non-human species in the project area to excessive noise levels?

5.2 - Exceedance of Noise Standards Impacts

A significant impact would occur if implementation of the proposed project would expose persons at the project site or in the project vicinity to noise levels in excess of established standards.

5.2.1 - Mobile Source Operational Noise Impacts

A significant impact would occur if transportation noise levels exceed the State's acceptable noise land use compatibility thresholds for the proposed land use development. According to these standards, environments with ambient noise levels up to 75 dBA CNEL are considered to be "normally acceptable" for new industrial land use development; environments with noise levels between 70 dBA CNEL and 80 dBA CNEL are considered "conditionally acceptable" for new industrial land use development.

The FHWA highway traffic noise prediction model (FHWA RD-77-108) was used to evaluate existing and cumulative traffic noise conditions in the vicinity of the project site.[6] The projected traffic noise levels along roadways adjacent to the project site were analyzed to determine compliance with the State's land use compatibility standards. The daily traffic volumes were obtained from the traffic analysis prepared for the project by Linscott, Law & Greenspan (2020). The resultant noise levels

6 The default Orange County standard traffic distribution for arterial roadways was used in the traffic noise model.

were weighed and summed over a 24-hour period in order to determine the CNEL values. The traffic noise modeling input and output files are included in Appendix A of this document. Table 8 shows a summary of the traffic noise levels for Existing, Existing with Phase 1 Project, Future 2023 without Project, and Future 2023 with Phase 1 Project conditions as measured at 50 feet from the centerline of the outermost travel lane.

Table 8: Traffic Noise Model Results Summary

Roadway Segment	Existing (dBA) CNEL	Existing with Phase 1 Project (dBA) CNEL	Increase over Existing (dBA)	Future 2023 without Project (dBA) CNEL	Future 2023 with Phase 1 Project (dBA) CNEL	Increase over Future 2023 without Project (dBA)
Rice Avenue – U.S. 101 to Gonzales Road	69.7	70.6	0.9	69.9	70.7	0.8
Rice Avenue - Gonzales Road to Camino Del Sol	71.8	73.3	1.5	72.0	73.4	1.4
Gonzales Road - Rose Avenue to Rice Avenue	68.2	69.0	0.8	68.4	69.2	0.8
Del Norte Boulevard – U.S. 101 to Camino Del Sol	68.1	69.6	1.5	68.3	69.7	1.4
Source: FirstCarbon Solutions 2020.						

The traffic noise model results show that projected traffic noise levels west of the project site along Rice Avenue, between East Gonzales Road and Camino Del Sol, would range up to 73.4 dBA CNEL as measured at 50 feet from the centerline of the outermost travel lane under Future 2023 with Phase 1 Project conditions. The nearest façade of the proposed building would be setback approximately 2,375 feet from the centerline of this roadway segment. At this distance, traffic noise levels from Rice Avenue would range up to approximately 40 dBA CNEL at this building’s nearest façade. These noise levels are well within the State’s normally acceptable range of up to 75 dBA CNEL for new industrial land use developments.

Projected traffic noise levels east of the project site along Del Norte Boulevard, between U.S. 101 and Camino Del Sol, would range up to 69.7 dBA CNEL as measured at 50 feet from the centerline of the outermost travel lane under Future 2023 with Phase 1 Project conditions. The nearest façade of the proposed building would be setback approximately 680 feet from the centerline of this roadway segment. At this distance, traffic noise levels from Del Norte Boulevard would range up to approximately 47 dBA CNEL at this building’s nearest façade. These noise levels are well within the State’s normally acceptable range of up to 75 dBA CNEL for new industrial land use developments. Therefore, traffic noise levels would have a less than significant impact.

5.2.2 - Stationary Source Operational Noise Impacts

A significant impact would occur if operational noise levels generated by stationary noise sources at the proposed project site would exceed the City's allowable exterior or interior noise levels as measured at any noise-sensitive land use in the project vicinity:

The following exterior noise levels shall not be exceeded:

- 55 dBA L_{eq} (30 minutes) at any residential property line between the hours of 7:00 a.m. and 10:00 p.m.; or
- 50 dBA L_{eq} (30 minutes) at any residential property line between the hours of 10:00 p.m. and 7:00 a.m.

Additionally, the following interior noise levels shall not be exceeded:

- 50 dBA L_{eq} (5 minutes) within any residential dwelling between the hours of 7:00 a.m. and 10:00 p.m.; or
- 45 dBA L_{eq} (5 minutes) within any residential dwelling between the hours of 10:00 p.m. and 7:00 a.m.

The proposed project would generate noise from parking lot activities, which includes people conversing, doors shutting, engine startup, and slow-moving vehicles; truck delivery, loading and unloading activities at proposed loading areas; and from new exterior mechanical equipment sources, such as mechanical ventilation equipment.

Customer and employee parking activities include vehicles cruising at slow speeds, doors shutting, or cars starting, and would generate noise levels of approximately 60 dBA to 70 dBA L_{max} at 50 feet. Parking lot activities would be expected to occur sporadically throughout the day, as customers and employees arrive and leave the parking lot areas. The nearest noise-sensitive receptors to the proposed parking areas are the single-family residences located west of the project site on Graves Avenue. The closest home would be located more than 3,300 feet from the proposed parking areas on the project site. At this distance, parking lot activities could result in intermittent noise levels ranging up to approximately 34 dBA L_{max} at the closest residential home. These noise levels would not exceed the City's nighttime exterior noise level threshold of 50 dBA L_{eq} (30 minutes)or the City's nighttime interior noise level threshold of 45 dBA L_{eq} (5 minutes) at any noise-sensitive land use in the project vicinity. Therefore, the resulting noise levels would not exceed any standard established by the City at any noise-sensitive land use in the project vicinity, and the impact of noise produced by project-related parking lot activities to sensitive off-site receptors would be less than significant.

Noise would also be generated by truck delivery, loading and unloading activities at the loading areas of the proposed project site. Typical noise levels from this type of loading and unloading activity can range from 70 dBA to 80 dBA L_{max} as measured at 50 feet. Proposed commercial loading and unloading areas would be located more than 3,900 feet from the nearest off-site noise-sensitive receptors, which are the single-family residences located west of the project site on Graves Avenue. At this distance, activities at loading and unloading areas could result in intermittent noise levels ranging up to approximately 42 dBA L_{max} at the closest residential home. These noise levels would not exceed the City's nighttime exterior noise level threshold of 50 dBA L_{eq} (30 minutes) or nighttime interior noise level threshold of 45 dBA L_{eq} (5 minutes) at any noise-sensitive land use in the project vicinity. Therefore, the impact of noise levels generated by commercial truck loading and unloading activities to sensitive off-site receptors would be less than significant.

At the time of preparation of this analysis, details were not available pertaining to proposed mechanical ventilation systems for the project; therefore, a reference noise level for typical mechanical ventilation systems was used for this analysis. Noise levels from typical mechanical ventilation equipment are anticipated to range up to approximately 60 dBA L_{eq} at a distance of 25 feet. Proposed mechanical ventilation systems at the project site could be located as close as 3,740 feet from the nearest noise-sensitive receptors which are the single-family residences located west of the project site on Graves Avenue. At this distance, this equipment could result in intermittent noise levels ranging up to approximately 17 dBA L_{eq} at the closest residential home. These noise levels would not exceed the City's nighttime exterior noise level threshold of 50 dBA L_{eq} (30 minutes)or the City's nighttime interior noise level threshold of 45 dBA L_{eq} (5 minutes) at any noise-sensitive land use in the project vicinity. Therefore, the resulting noise levels would not exceed any standard established by the City at any noise-sensitive land use in the project vicinity, and the impact of mechanical ventilation equipment operational noise levels to sensitive off-site receptors would be less than significant.

Therefore, operational noise levels generated by stationary noise sources at the proposed project site would have a less than significant impact on noise-sensitive receptors in the project vicinity.

5.3 - Excessive Groundborne Vibration Impacts

The City of Oxnard has not established its own vibration impact criteria. Therefore, for purposes of this analysis, the FTA damage criteria was utilized to evaluate the potential impact of groundborne vibration levels, associated with project-related construction activities, on structures in the project vicinity. A significant impact would occur if structures in the project vicinity would be exposed to groundborne vibration levels in excess of the levels established by the FTA's Construction Vibration Impact Criteria, as shown in Table 4.

Project-related construction and operational groundborne vibration impacts are analyzed separately below. Groundborne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. Vibrating objects in contact with the ground radiate vibration waves through various soil and rock strata to the foundations of nearby buildings.

In extreme cases, excessive groundborne vibration has the potential to cause structural damage to buildings. Common sources of groundborne vibration include construction activities such as blasting, pile driving, and operating heavy earthmoving equipment.

Groundborne noise is an effect of groundborne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves. In general, if groundborne vibration levels are do not exceed levels considered to be perceptible, then groundborne noise levels would not be perceptible in most interior environments. Therefore, this analysis focuses on determining exceedances of groundborne vibration levels.

5.3.1 - Short-term Construction Vibration Impacts

Of the variety of equipment used during construction, the large vibratory rollers that are anticipated to be used in the site preparation phase of construction would produce the greatest groundborne vibration levels. Impact equipment such as pile drivers is not expected to be used during construction of this project. Large vibratory rollers produce groundborne vibration levels ranging up to 0.210 inch per second (in/sec) PPV at 25 feet from the operating equipment.

The closest off-site structure to the proposed construction areas is an industrial building located south of the project site. The facade of this building would be located approximately 480 feet from the proposed construction footprint where heavy equipment would operate. At this distance, groundborne vibration levels would attenuate to less than 0.003 PPV from the operation of a small vibratory roller. These levels are well below the FTA's Construction Vibration Impact Criteria of 0.12 for the most sensitive types of structures. Therefore, construction-related groundborne vibration levels would have a less than significant impact on off-site receptors in the project vicinity.

5.3.2 - Operational Vibration Impacts

Implementation of the project would not include any permanent sources that would expose persons in the project vicinity to groundborne vibration levels that could be perceptible without instruments at any existing sensitive land use in the project vicinity. In addition, there are no existing significant permanent sources of groundborne vibration in the project vicinity to which the proposed project would be exposed. Therefore, project operational groundborne vibration level impacts would be considered less than significant.

5.4 - Substantial Temporary or Periodic Increase Impacts

5.4.1 - Construction Noise Impacts

Two types of short-term noise impacts could occur during the construction of the proposed project. First, construction crew commutes and the transport of construction equipment and materials to the project site would incrementally increase noise levels on access roads leading to the project site. Because project construction workers and construction equipment would use existing routes, noise from passing trucks would be similar to existing vehicle-generated noise on these local roadways. In addition, these trips would not result in a doubling of daily traffic volumes on any of the local roadways in the project vicinity and would thus not result in a perceptible change in existing traffic noise levels. For this reason, intermittent noise from construction trips would be minor when averaged over a longer time-period and would not be expected to result in a perceptible increase in hourly- or daily-average traffic noise levels in the project vicinity. Therefore, construction-related noise impacts associated with the transportation of workers and equipment to the project site would be less than significant.

The second type of short-term noise impact is related to noise generated during construction on the project site. Construction is completed in discrete steps, each of which has its own mix of equipment and noise characteristics. These various sequential phases would change the character of the noise generated on the site and alter the noise levels surrounding the site as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation alter construction related noise ranges within each work phase. Table 1 lists typical construction equipment noise levels, based on a distance of 50 feet between the equipment and a noise receptor.

The site preparation phase, which includes excavation and grading activities, tend to generate the highest noise levels, because the noisiest construction equipment is earthmoving equipment. Earthmoving equipment includes excavating machinery and compacting equipment, such as bulldozers, draglines, backhoes, front loaders, roller compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 or 4 minutes at lower power settings. Operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 or 4 minutes at lower power settings.

Construction of the project is expected to require the use of water trucks, haul trucks, backhoes, front loaders, roller compactors, scrapers, and graders. Based on the information provided in Table 1, the maximum noise level generated by each scraper is assumed to be 85 dBA L_{max} at 50 feet from this equipment. Each bulldozer would also generate 85 dBA L_{max} at 50 feet. The maximum noise level generated by graders is approximately 85 dBA L_{max} at 50 feet. Each doubling of the sound sources with equal strength increases the noise level by 3 dBA. Assuming that each piece of construction equipment operates at some distance from the other equipment, a reasonable worst-case combined noise level during this phase of construction would be 90 dBA L_{max} at a distance of 50 feet from the acoustic center of a construction area. This would result in a reasonable worst-case hourly average of 86 dBA L_{eq}. The acoustic center reference is used, because construction equipment must operate at some distance from one another on a project site, and the combined noise level as measured at a point equidistant from the sources would (acoustic center) be the worst-case maximum noise level. The effect on sensitive receptors is evaluated below.

The nearest noise-sensitive receptors to the project site are the single-family residences located west of the project site on Graves Avenue. The closest residential home would be located more than 3,260 feet from the acoustic center of construction activity where multiple pieces of heavy machinery would operate. Again, the acoustic center refers to a point equidistant from multiple pieces of equipment operating simultaneously which would produce the worst-case maximum noise level. At this distance, worst-case construction noise levels could range up to approximately 54 dBA L_{max}, intermittently, and could have an hourly average of up to 50 dBA L_{eq}, at the façade of the nearest single-family residential home. These noise levels would not exceed existing background daytime noise levels as measured at the nearest off-site sensitive receptor.

The project would comply with the permissible construction hours established by the City's Code of Ordinances, which would ensure that noise produced by construction activities would not occur during nighttime hours, and it would reduce potential impacts that could result in annoyance or sleep disturbances at nearby sensitive receptors. The City's Code of Ordinances limits noise associated with or created by construction repair, remodeling or grading of any real property to between the hours of 7:00 a.m. and 6:00 p.m. on weekdays, including Saturday. In addition, the project will comply with all applicable air quality management district best management practice (BMP) measures during construction. Such measures would include the following techniques and practices which would further reduce construction noise levels to ensure they would not expose persons in the project vicinity to a substantial temporary increase in ambient noise levels.

Best Management Practices

The project applicant should implement the following best management practices to further reduce potential construction period noise impacts:

- The construction contractor shall ensure that all equipment driven by internal combustion engines shall be equipped with mufflers, which are in good condition and appropriate for the equipment.
- The construction contractor shall ensure that unnecessary idling of internal combustion engines (i.e., idling in excess of 5 minutes) is prohibited.
- The construction contractor shall utilize "quiet" models of air compressors and other stationary equipment where such technology exists.
- The construction contractor shall ensure that the construction staging areas shall be located to create the greatest feasible distance between the staging area and sensitive receptors nearest the project site.

5.5 - Substantial Permanent Increase Impacts

A significant impact would occur if implementation of the proposed project would result in a substantial increase in ambient noise levels compared with noise levels existing without the project. As noted in the characteristics of noise discussion, audible increases in noise levels generally refer to a change of 3 dBA or more, as this level has been found to be barely perceptible to the human ear in outdoor environments. A change of 5 dBA is considered the minimum readily perceptible change to the human ear in outdoor environments. Therefore, for purposes of this analysis, an increase of 5 dBA or greater would be considered a substantial permanent increase in ambient noise levels.

The highest traffic noise level increase with implementation of the project would occur along Rice Avenue between Gonzales Road and Camino Del Sol, and along Del Norte Boulevard between U.S. 101 and Camino Del Sol. Along these roadway segments, the project would result in an increase of 1.5 dBA under Existing with Phase 1 Project conditions compared to conditions that would exist without the project. This increase is well below the 5 dBA increase that would be considered substantial. Therefore, the impact would be less than significant.

As is shown in the impact discussion of Section 5.2.2, new stationary noise sources resulting from implementation of the project would not result in noise levels above existing ambient noise levels as measured at off-site sensitive receptors. Existing traffic noise levels along Rice Avenue, adjacent to the nearest off-site sensitive receptors, range up to 71.8 dBA CNEL. The maximum operational noise level generated by project-related stationary noise sources would range up to 42 dBA L_{max}. These highest stationary source operational noise levels are well below the existing traffic noise levels in the vicinity of the nearest noise sensitive receptors. Therefore, project-related stationary sources would not result in a substantial permanent increase compared with noise levels existing without the project, and noise impacts on off-site receptors would be less than significant.

Therefore, project-related stationary sources would not result in a substantial permanent increase of 5 dBA or greater compared with noise levels existing without the project, and noise impacts to off-site sensitive receptors would be less than significant.

5.6 - Airport Noise Impacts

5.6.1 - Public Airport Noise Impacts

The project site is not located within the airport land use plan for Oxnard Airport or within 2 miles of Naval Base Ventura County Point Mugu. The nearest public airport to the project site is Camarillo Airport, located approximately 1.2 miles east of the project site. Because of its distance from the airport runways, the project site is located outside of the 60 dBA CNEL airport noise contours.[7] Therefore, implementation of the project would not expose persons visiting or working at the project site to noise levels from airport activity that would be in excess of normally acceptable standards established by the City or in an airport land use plan. Impacts associated with public airport noise would be less than significant.

5.6.2 - Private Airstrips Noise Impacts

The project site is not located within the vicinity of a private airstrip. Therefore, no impacts associated with private airstrip noise would occur.

5.7 - Noise Impacts on Non-Human Species

Based on the Biological Resources Assessment[8] (BRA), construction noise could have a possible impact on nesting birds if construction occurs during nesting season, which is generally from February 1 to August 31. However, the project will implement avoidance and minimization measures including a preconstruction nesting bird survey conducted prior to the start of construction activities, and delineation of buffer zones, that would reduce this impact to less than significant.

Based on the literature search and field survey analyzed in the BRA, the project site and survey area do not contain suitable habitat for special-status wildlife species within the project site. Therefore, the presence of special-status wildlife is not likely to occur on-site or within the survey area, and no further studies are necessary, and no mitigation measures are required.

7 Ventura County Airport Land Use Commission. 2000. Airport Comprehensive Land Use Plan for Ventura County Final Report. July 7. Website: https://www.goventura.org/wp-content/uploads/2018/03/2000-airport-land-use-for-ventura-county.pdf. Accessed May 27, 2020.

8 FirstCarbon Solutions (FCS). 2020. Biological Resources Assessment, Project Bruin at The Sakioka Farms Business Park. March 27.

Additionally, the proposed project site contains open farmland and is immediately surrounded by roads, interstates, and commercial buildings. The project site has a low potential to be utilized by regional wildlife as a movement corridor. Therefore, project operational noise would result in less than significant impacts to non-human species and no mitigation would be required.

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Appendix A:
Traffic Noise Modeling Data

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TABLE Existing-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 03/23/2020
ROADWAY SEGMENT: Rice Avenue - US 101 to Gonzales Road
NOTES: Project Bruin - Existing

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 45700 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 42 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 69.68

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
88.5	173.0	363.9	779.7

TABLE Existing-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 03/23/2020
ROADWAY SEGMENT: Rice Avenue - Gonzales Road to Camino Del Sol
NOTES: Project Bruin - Existing

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 36700   SPEED (MPH): 50   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30   SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.80

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
102.2	212.6	454.3	976.9

TABLE Existing-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 03/23/2020
ROADWAY SEGMENT: Gonzales Road - Rose Avenue to Rice Avenue
NOTES: Project Bruin - Existing

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 22500   SPEED (MPH): 45   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 36   SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.18

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
69.2	132.2	276.4	591.4

TABLE Existing-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 03/23/2020
ROADWAY SEGMENT: Del Norte Boulevard - US 101 to Camino Del Sol
NOTES: Project Bruin - Existing

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 14500   SPEED (MPH): 50   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 24   SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.14

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
57.8	115.9	245.4	526.6

TABLE Existing with Phase 1

Project-01

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 03/23/2020
ROADWAY SEGMENT: Rice Avenue - US 101 to Gonzales Road
NOTES: Project Bruin - Existing with Phase 1 Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 56000   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 42   SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.56

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
98.6	196.7	416.0	892.5

TABLE Existing with Phase 1 Project-02

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 03/23/2020
ROADWAY SEGMENT: Rice Avenue - Gonzales Road to Camino Del Sol
NOTES: Project Bruin - Existing with Phase 1 Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 51700   SPEED (MPH): 50   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30   SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.29

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
126.4	266.2	570.5	1227.4

TABLE Existing with Phase 1 Project-03

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 03/23/2020
ROADWAY SEGMENT: Gonzales Road - Rose Avenue to Rice Avenue
NOTES: Project Bruin - Existing with Phase 1 Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 27100   SPEED (MPH): 45   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 36   SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.99

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
75.9	148.5	312.3	669.2

TABLE Existing with Phase 1

Project-04

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 03/23/2020
ROADWAY SEGMENT: Del Norte Boulevard - US 101 to Camino Del Sol
NOTES: Project Bruin - Existing with Phase 1 Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 20100   SPEED (MPH): 50   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 24   SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 69.56

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
69.7	143.0	304.6	654.5

TABLE Future 2023 without Project-01

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 03/23/2020
ROADWAY SEGMENT: Rice Avenue - US 101 to Gonzales Road
NOTES: Project Bruin - Future 2023 without Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 47800 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 42 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 69.87

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
90.6	177.9	374.8	803.3

TABLE Future 2023 without Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 03/23/2020
ROADWAY SEGMENT: Rice Avenue - Gonzales Road to Camino Del Sol
NOTES: Project Bruin - Future 2023 without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 38400   SPEED (MPH): 50   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30   SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.99

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
105.1	219.0	468.2	1006.8

TABLE Future 2023 without Project-03

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 03/23/2020
ROADWAY SEGMENT: Gonzales Road - Rose Avenue to Rice Avenue
NOTES: Project Bruin - Future 2023 without Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 23500   SPEED (MPH): 45   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 36   SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.37

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
70.7	135.8	284.4	608.8

TABLE Future 2023 without Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 03/23/2020
ROADWAY SEGMENT: Del Norte Boulevard - US 101 to Camino Del Sol
NOTES: Project Bruin - Future 2023 without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 15100 SPEED (MPH): 50 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.32

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
59.2	118.9	252.1	541.0

TABLE Future 2023 with Phase 1 Project-01

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 03/23/2020
ROADWAY SEGMENT: Rice Avenue - US 101 to Gonzales Road
NOTES: Project Bruin - Future 2023 with Phase 1 Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 58100   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 42   SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.72

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
100.6	201.4	426.3	914.7

TABLE Future 2023 with Phase 1 Project-02

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 03/23/2020
ROADWAY SEGMENT: Rice Avenue - Gonzales Road to Camino Del Sol
NOTES: Project Bruin - Future 2023 with Phase 1 Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 53300   SPEED (MPH): 50   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30   SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.42

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
128.8	271.6	582.1	1252.6

TABLE Future 2023 with Phase 1 Project-03

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 03/23/2020
ROADWAY SEGMENT: Gonzales Road - Rose Avenue to Rice Avenue
NOTES: Project Bruin - Future 2023 with Phase 1 Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 28200   SPEED (MPH): 45   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 36   SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 69.16

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
77.5	152.2	320.6	687.2

TABLE Future 2023 with Phase 1 Project-04

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 03/23/2020
ROADWAY SEGMENT: Del Norte Boulevard - US 101 to Camino Del Sol
NOTES: Project Bruin - Future 2023 with Phase 1 Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 20800   SPEED (MPH): 50   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 24   SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 69.71

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
71.1	146.2	311.6	669.5

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