JERSEY INDUSTRIAL COMPLEX
RANCHO CUCAMONGA, CALIFORNIA

NOISE STUDY

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JERSEY INDUSTRIAL COMPLEX PROJECT RANCHO CUCAMONGA, CALIFORNIA NOISE STUDY

This report is an analysis of the potential noise impacts associated with the proposed construction and operation of the Jersey Industrial Complex Project in the City of Rancho Cucamonga, California. This report has been prepared by Birdseye Planning Group (BPG) under contract to the project applicant to support preparation of the environmental documentation pursuant to the California Environmental Quality Act (CEQA). This study analyzes the potential for temporary impacts associated with construction activity and long-term impacts associated with operation of the proposed project.

PROJECT DESCRIPTION

The project would construct and operate a new warehouse/storage building with offices and related improvements on a vacant site located at 11298 Jersey Boulevard in the City of Rancho Cucamonga. The site is located at the northwest corner of Milliken Avenue and Jersey Boulevard (APN 229-111-60). The site is 7.39 acres in size and zoned Medium Impact/Heavy Industrial. Thus, the project is subject to standards and policies within the City of Rancho Cucamonga Municipal Code for that zoning designation. The project site has not been developed. However, debris piles are located on the site. The site has been fully remediated to remove slag fill that was identified on the site as part of a Phase I Environmental Site Assessment performed in December 2002.

The project would provide a new warehouse building with 143,014 square feet of storage in four separate units, 8,127 square feet of mezzanine storage, 8,127 square feet of office space (i.e., divided into four separate spaces, one for each storage unit) and a 312-square foot electrical room. The total building area would be 159,580 square feet. These would be the architectural parapets on the building frontage. A total of 110 parking spaces would be provided. The building would be oriented east/west with vehicle access to office space fronting the building from Jersey Boulevard. Truck access to the loading docks located at the rear of the building would be provided from Milliken Avenue. The truck access driveway would be gated with security cameras and monitored to ensure no unauthorized entrance to the loading area. The project would provide four warehouse storage units, each with four truck loading docks (i.e., 16 total docks). Water/sewer and other utilities would be provided via existing infrastructure located on-site or within the adjacent roadway corridor. Any cut and fill required during grading would be balanced on-site. No off-site import or export of soil material would be needed. The warehouse is expected to receive and ship non-perishable products from early morning to evening hours seven days a week. No cold storage would be provided. The office personnel would work during typical daytime office hours. Construction of the proposed project would begin in early 2021 and be completed in early 2022. The project site is shown in Figure 1. The proposed site plan is shown in Figure 2.

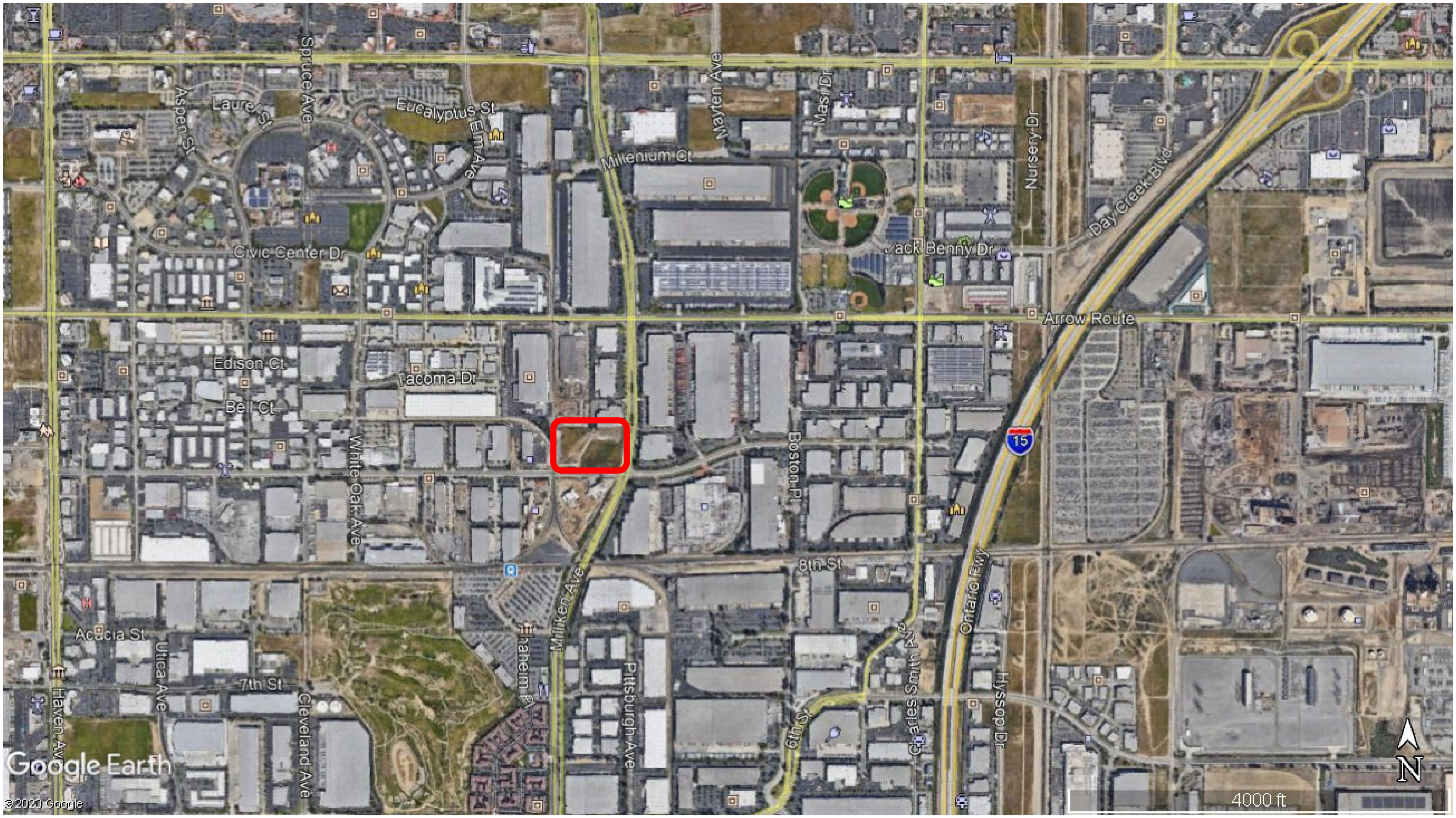

FIGURE 1—Vicinity Map

- Project Site

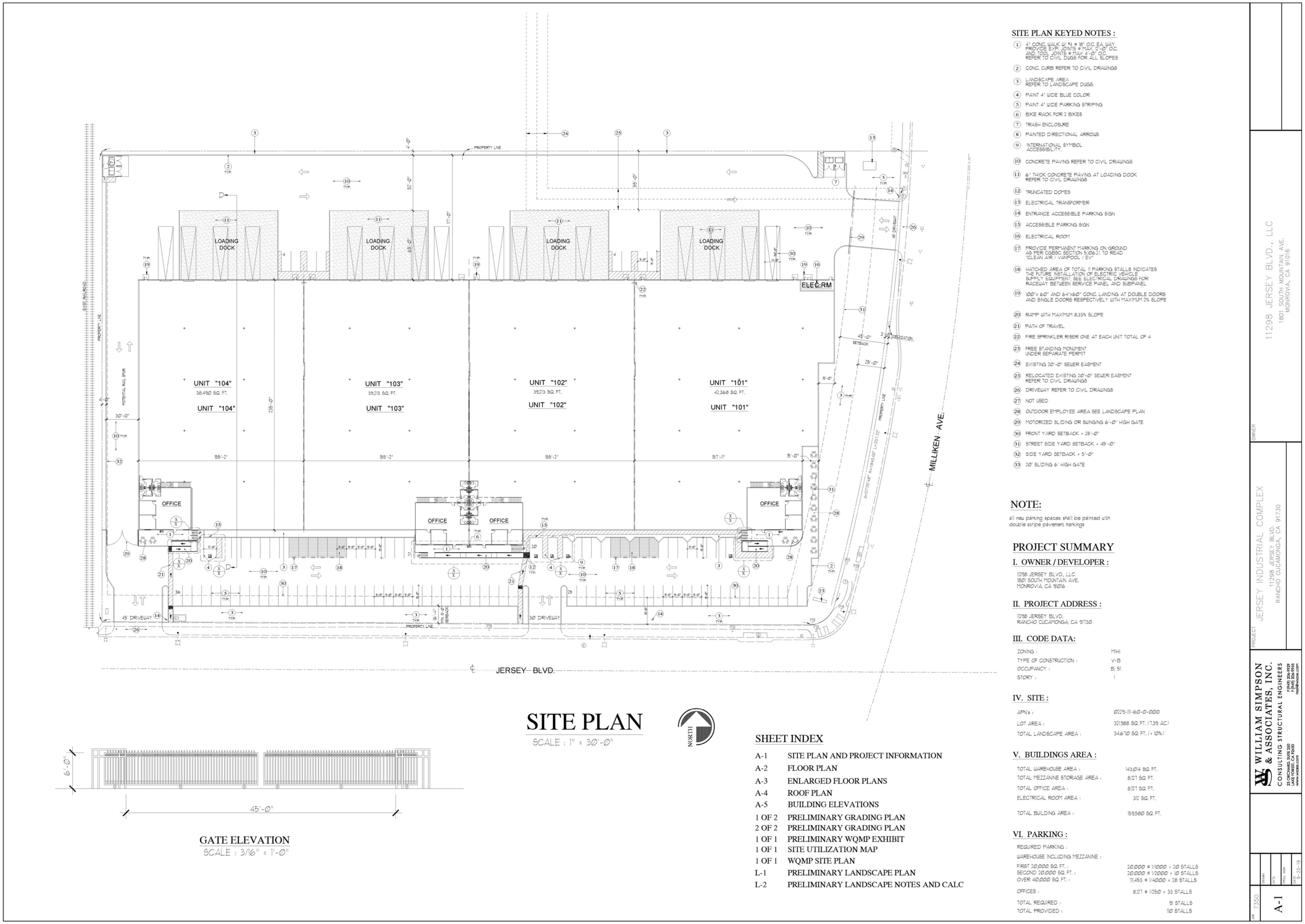

Figure 2— Site Plan

SETTING

Overview of Sound Measurement

Noise level (or volume) is generally measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound pressure levels to be consistent with that of human hearing response, which is most sensitive to frequencies around 4,000 Hertz (about the highest note on a piano) and less sensitive to low frequencies (below 100 Hertz). Sound pressure level is measured on a logarithmic scale with the 0 dB level based on the lowest detectable sound pressure level that people can perceive (an audible sound that is not zero sound pressure level). Based on the logarithmic scale, a doubling of sound energy is equivalent to an increase of 3 dBA, and a sound that is 10 dBA less than the ambient sound level has no effect on ambient noise. Because of the nature of the human ear, a sound must be about 10 dBA greater than the reference sound to be judged as twice as loud. In general, a 3 dBA change in community noise levels is noticeable, while 1-2 dB changes generally are not perceived. Quiet suburban areas typically have noise levels in the range of 40-50 dBA, while arterial streets are in the 50-60+ dBA range. Normal conversational levels are in the 60-65 dBA range, and ambient noise levels greater than 65 dBA can interrupt conversations. Noise levels typically attenuate (or drop off) at a rate of 6 dBA per doubling of distance from point sources (i.e., industrial machinery). Noise from lightly traveled roads typically attenuates at a rate of about 4.5 dBA per doubling of distance. Noise from heavily traveled roads typically attenuates at about 3 dBA per doubling of distance. Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA. The manner in which older homes in California were constructed (approximately 30 years old or older) generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows. The exterior-to-interior reduction of newer residential units and office buildings construction to California Energy Code standards is generally 30 dBA or more (Harris, Miller, Miller and Hanson, 2006).

In addition to the actual instantaneous measurement of sound levels, the duration of sound is important since sounds that occur over a long period of time are more likely to be an annoyance or cause direct physical damage or environmental stress. One of the most frequently used noise metrics that considers both duration and sound power level is the equivalent noise level (Leq). The Leq is defined as the single steady A-weighted level that is equivalent to the same amount of energy as that contained in the actual fluctuating levels over a period of time (essentially, the average noise level). Typically, Leq is summed over a one-hour period. Lmax is the highest RMS (root mean squared) sound pressure level within the measuring period, and Lmin is the lowest RMS sound pressure level within the measuring period.

The time period in which noise occurs is also important since noise that occurs at night tends to be more disturbing than that which occurs during the day. Community noise is usually measured using Day-Night Average Level (Ldn), which is the 24-hour average noise level with a 10-dBA penalty for noise occurring during nighttime (10 p.m. to 7 a.m.) hours, or Community Noise Equivalent Level (CNEL), which is the 24-hour average noise level with a 5 dBA penalty for noise occurring from 7 p.m. to 10 p.m. and a 10 dBA penalty for noise occurring from 10 p.m. to 7 a.m. Noise levels described by Ldn and CNEL usually do not differ by more than 1 dB. Daytime Leq levels are louder than Ldn or CNEL levels; thus, if the Leq meets noise standards, the Ldn and CNEL are also met. Table 1 shows sounds levels of typical noise sources in Leq.

Table 1
Sound Levels of Typical Noise Sources and Noise Environments

Noise Source (at Given Distance)	**Noise Environment**	**A-Weighted Sound Level (Decibels)**	**Human Judgment of Noise Loudness (Relative to Reference Loudness of 70 Decibels*)**
Military Jet Takeoff with Afterburner (50 ft)	Carrier Flight Deck	140	128 times as loud
Civil Defense Siren (100 ft)		130	64 times as loud
Commercial Jet Take-off (200 ft)		120	32 times as loud **Threshold of Pain**
Pile Driver (50 ft)	Rock Music Concert Inside Subway Station (New York)	110	16 times as loud
Ambulance Siren (100 ft) Newspaper Press (5 ft) Gas Lawn Mower (3 ft)		100	8 times as loud **Very Loud**
Food Blender (3 ft) Propeller Plane Flyover (1,000 ft) Diesel Truck (150 ft)	Boiler Room Printing Press Plant	90	4 times as loud
Garbage Disposal (3 ft)	Noisy Urban Daytime	80	2 times as loud
Passenger Car, 65 mph (25 ft) Living Room Stereo (15 ft) Vacuum Cleaner (10 ft)	Commercial Areas	70	Reference Loudness **Moderately Loud**
Normal Speech (5 ft) Air Conditioning Unit (100 ft)	Data Processing Center Department Store	60	1/2 as loud
Light Traffic (100 ft)	Large Business Office Quiet Urban Daytime	50	1/4 as loud
Bird Calls (distant)	Quiet Urban Nighttime	40	1/8 as loud **Quiet**

Soft Whisper (5 ft)	Library and Bedroom at Night Quiet Rural Nighttime	30	1/16 as loud
	Broadcast and Recording Studio	20	1/32 as loud **Just Audible**
		0	1/64 as loud **Threshold of Hearing**

Source: Compiled by dBF Associates, Inc., 2016

Sensitive Receptors

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with each of these uses. Urban areas contain a variety of land use and development types that are noise sensitive including residences, schools, churches, hospitals and convalescent care facilities. Nearby sensitive receptors are multifamily residences located on the west side of Milliken Avenue approximately 0.5 miles south of the site.

Project Site Setting

The project area is located in an industrial area of the City of Rancho Cucamonga. Industrial and manufacturing uses surround the site. The dominant source of noise in the project site vicinity are motor vehicles (e.g., automobiles, light trucks and semi-trucks) on Milliken Avenue and Jersey Boulevard. Traffic noise is of concern because where a high number of individual events occur, it can create a sustained noise level.

To gather data on the general noise environment at the project site, two weekday morning 15-minute noise measurement were taken on May 14, 2020. Site 1 is located at the Solamonte Apartments located at 9200 Milliken Avenue approximately 0.5 miles south of the project site. Site 2 is located at 8610 Milliken Avenue approximately 350 feet north of the site (Figure 3). Soil remediation work was occurring on the site and ambient conditions adjacent to the site were not conducive to gathering representative noise data. Thus, Site 2 was selected because it represents ambient conditions in the general project area. The measurement was taken using an ANSI Type II integrating sound level meter. The predominant noise source was traffic on Milliken Avenue. Based on site observations, traffic on Jersey Boulevard contributes negligibly to ambient conditions at the site and has no effect on noise levels at the nearest sensitive receivers. The temperature during monitoring was 65 degrees Fahrenheit with no perceptible wind. The Leq during monitoring was 67.8 dBA at Site 1 and 68.7 at Site 2.

During monitoring at Site 1, the only audible noise was from traffic operation on Milliken Avenue. A total of 195 cars/light trucks, 14 medium (two-axles and six wheels) and 15 heavy (18-wheel) trucks passed the site. A total of 176 cars/light trucks, 11 medium (two-axles and six wheels) and 11 heavy (18-wheel) trucks passed Site 2. Table 2 identifies the noise measurement locations and measured noise levels. The monitoring data sheet is provided as Appendix A. Measured noise levels reflect the fact that traffic on Milliken Avenue dominates the noise environment at the site.

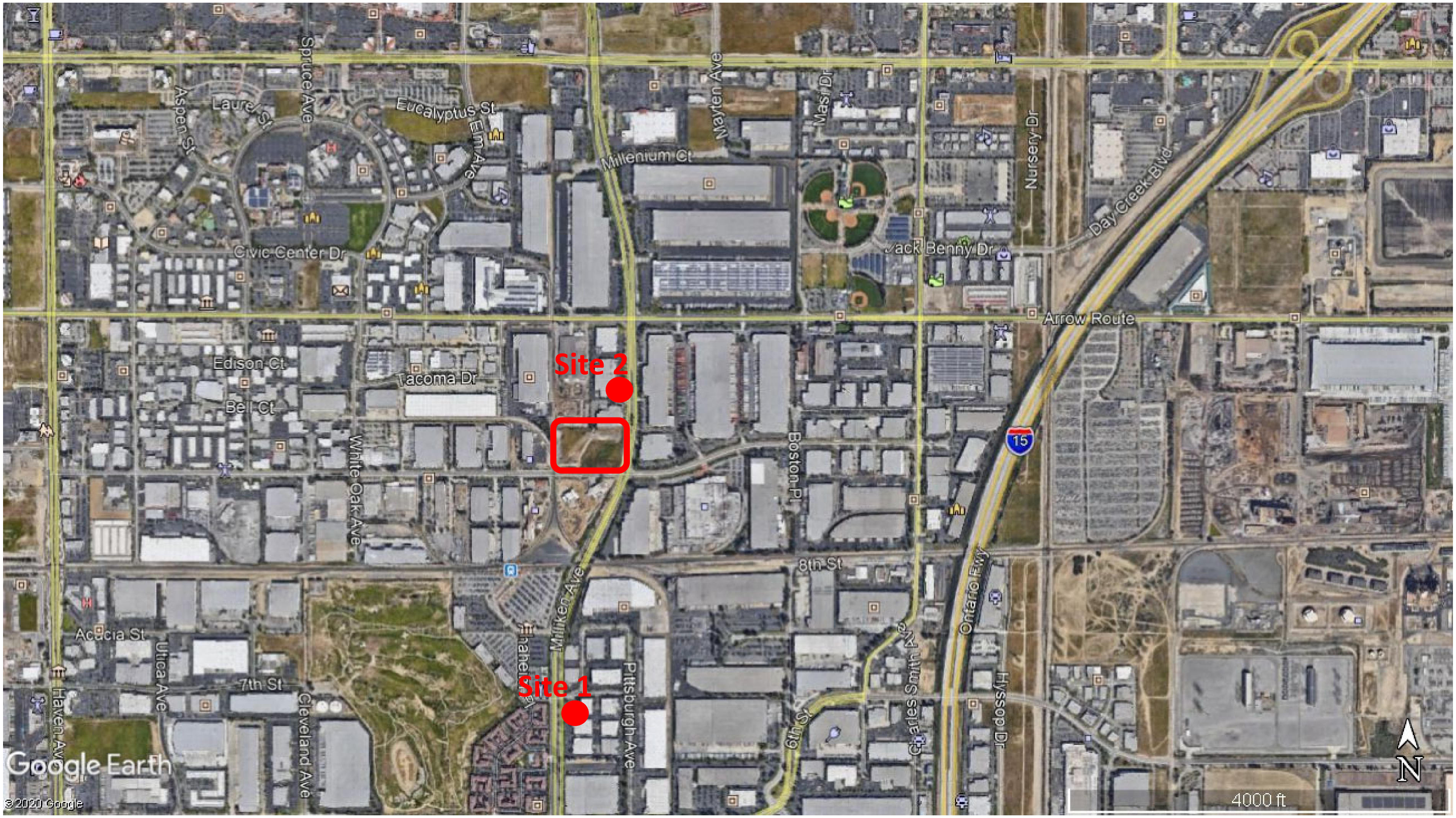

FIGURE 3—Noise Monitoring Locations

- Project Site

Table 2
Noise Monitoring Results

Measurement Location	Primary Noise Source	Sample Time	Leq (dBA)
1. Solamonte Apartment Homes – 9200 Milliken Avenue	Traffic	Weekday morning	67.8
2. 8610 Milliken Avenue	Traffic	Weekday morning	68.7

Source: Field visit using ANSI Type II Integrating sound level meter.

Regulatory Setting

The Federal Noise Control Act (1972) addressed the issue of noise as a threat to human health and welfare. To implement the Federal Noise Control Act, the U.S. Environmental Protection Agency (EPA) undertook a number of studies related to community noise in the 1970s. The EPA found that 24-hour averaged noise levels less than 70 dBA would avoid measurable hearing loss, levels of less than 55 dBA outdoors and 45 dBA indoors would prevent activity interference and annoyance (EPA 1972).

The U.S. Department of Housing and Urban Development (HUD) published a Noise Guidebook for use in implementing the Department's noise policy. In general, HUD's goal is exterior noise levels that are less than or equal to 55 dBA Ldn. The goal for interior noise levels is 45 dBA Ldn. HUD suggests that attenuation be employed to achieve this level, where feasible, with a special focus on sensitive areas of homes, such as bedrooms (HUD 2009).

Title 24 of the California Code of Regulations (CCR) establishes standards governing interior noise levels that apply to all new single-family and multi-family residential units in California. These standards require that acoustical studies be performed before construction at building locations where the existing Ldn exceeds 60 dBA. Such acoustical studies are required to establish mitigation measures that will limit maximum Ldn levels to 45 dBA in any habitable room. Although there are no generally applicable interior noise standards pertinent to all uses, many communities in California have adopted an Ldn of 45 dBA as an upper limit on interior noise in all residential units.

In addition, the State of California General Plan Guidelines (OPR 2017), provides guidance for noise compatibility. The guidelines also present adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

Airport Land Use Compatibility Plans (Public Utilities Code, §21670, et seq.)
The Airport Land Use Compatibility Plans (ALUCPs) promote compatibility between public-use and military airports and the land uses that surround them to the extent that

these areas are not already devoted to incompatible land uses. The City is required to modify its land use plans and ordinances to be consistent with the ALUCPs or to take steps to overrule the Airport Land Use Commission.

California Environmental Quality Act (CEQA)
CEQA considers exposure to excessive noise an environmental impact. Implementation of CEQA ensures that during the decision-making stage of development, City officials and the public will be informed of any potentially excessive noise levels and available mitigation measures to reduce noise to acceptable levels.

California Noise Insulation Standards (California Code of Regulations, Title 24)
Title 24 establishes an Interior Noise Standard of 45 dBA CNEL for multiple-unit and hotel/motel structures. Acoustical studies must be prepared for proposed multiple unit residential and hotel/motel structures within the CNEL noise contours of 60 dBA or greater. The studies must demonstrate that the design of the building will reduce interior noise in habitable rooms to 45 dBA CNEL or lower.

California Airport Noise Standards (California Code of Regulations, Title 21)
Division 2.5, Chapter 6, Section 5012 of Title 21 establishes that 65 dBA CNEL is the acceptable level of aircraft noise for persons living near an airport.

Caltrans Project Development Procedures Manual (Section 2 of Chapter 30: Highway Traffic Noise Abatement) and 23 CFR 772
These documents specify the Noise Abatement Criteria (NAC) for noise-sensitive land uses. These criteria are presented in Table NS-2 of the General Plan Noise Element. The NAC are applicable to new highways and changes to the horizontal or vertical alignment of existing highways and are required for Caltrans and local agency projects that receive Federal funding or require Federal Highway Administration (FHWA) approval action.

City of Rancho Cucamonga Municipal Code
Noise within the City of Rancho Cucamonga is regulated per Municipal Code Section 17.66.050. The proposed project site is a Zone II noise receptor which are defined as commercial properties. The definition includes industrial properties. The project is a warehouse facility; and thus, is considered a Zone II property. Regulations applying to Zone II properties apply to the proposed project. As referenced, the site is zoned MI/HI; and thus, is subject to Class C performance standards specified in Table 17.66.110-1 of the Municipal Code. Noise related standards are summarized as follows:

- Noise levels are limited to 85 dB at the lot line and 65 dB at a residential property line;
- Where a use occupies a lot abutting or separated by a street from a lot within the designated Class A (Industrial Park) or Class B (General Industrial) performance standard or residential property, the performance standard of the abutting property shall apply at the common or facing lot line;

- All uses shall be operated so as not to generate vibration discernible without instruments by the average person beyond 600 feet from where the source is located. Vibration caused by motor vehicles, trains, and temporary construction and demolition is exempted from this standard.

Section 17.66.050(D)(4) of the Municipal Code exempts sources of noise associated with, or vibration created by, construction, repair, remodeling, or grading of any real property or during authorized seismic surveys, provided when adjacent to a residential land use, school, church or similar type of use, the noise generating activity does not take place between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or at any time on Sunday or a national holiday, and provided noise levels created do not exceed the noise standard of 65 dBA when measured at the adjacent property line.
Section 17.66.050 (F)(1) of the Rancho Cucamonga Municipal Code Table 17.66.050-1, establishes standards concerning acceptable noise levels for residential areas. For residential uses, code allows an interior noise level of 45 dBA from 10:00 p.m. to 7:00 a.m. and 50 dBA from 7:00 a.m. to 10:00 p.m. Exterior noise levels are 60 dBA from 10:00 p.m. to 7:00 a.m. and 65 dBA from 7:00 a.m. to 10:00 p.m. For the purpose of this evaluation, a threshold of 45 dBA Leq is used to determine impact significance for interior noise levels at the nearest residential receivers.

Chapter 17.66 (E) addresses noise at schools, churches, libraries, health care institutions and states that it is unlawful for any person to create any noise which causes the noise level at any school, hospital or similar health care institution, church, or library while the same is in use, to exceed the noise standards specified in this section and prescribed for the assigned noise zone in which the school, hospital, church, or library is located. In this case, the proposed site is in Noise Zone II and no sensitive receivers are located adjacent to or in proximity to the site. However, noise levels for residential areas referenced above would apply to nearby sensitive receivers.

For CEQA review purposes, it is necessary to determine whether the project would create a substantial permanent noise increase. A noise increase greater than 3 dBA is readily perceptible to the average human ear. Thus, 3 dBA is the level that is considered a substantial noise increase. Properties surrounding the site are zoned MI/HI; and thus, have the same operational standards as the project site. The facility is a warehouse which is not expected to generate noise levels in exceed of the 85 dB standard at the lot line referenced above. Thus, operational noise associated with the proposed project would be primarily associated with traffic. Traffic noise associated with the project would have a significant impact if it increases traffic noise levels by 3 dBA or more at nearby Zone I (residential) properties. As referenced, the nearest residences are multifamily apartments located on the west side of Milliken Avenue approximately 0.5 miles south of the site. Existing noise levels at the Solamonte Apartment units fronting Milliken Avenue currently exceed 65 dBA; thus, impact significance is determined based on whether noise levels would noticeably change (i.e., +/- 3 dBA) from baseline conditions with operation of the proposed project.

Vibration Standards

Vibration is a unique form of noise as the energy is transmitted through buildings, structures and the ground whereas audible noise energy is transmitted through the air. Thus, vibration is generally felt rather than heard. The ground motion caused by vibration is measured as particle velocity in inches per second and is referenced as vibration decibels (VdB). The vibration velocity level threshold of perception for humans is approximately 65 VdB. A vibration velocity of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels.

The City of Rancho Cucamonga General Plan and municipal code do not provide vibration standards. As referenced above, activities on Zone II, Class C properties that generate vibration, including motor vehicles and trains operation and temporary construction and demolition is exempted from the Class C performance standard referenced above. The Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment* (September 2018) uses a threshold of 65 VdB for buildings where low ambient vibration is essential for interior operations. These buildings include hospitals and recording studios. A threshold of 72 VdB is used for residences and buildings where people normally sleep (i.e., hotels and rest homes). A threshold of 75 VdB is used for institutional land uses where activities occur primarily during the daytime (i.e., churches and schools). The threshold used for the proposed project is 72 VdB.

With respect to potential ground-borne vibration impacts on structures, the FTA states that ground-borne vibration levels in excess of PPV 0.2 inches/second (100 VdB) could damage fragile buildings and levels in excess of PPV 0.12 inches/second (95 VdB) could damage extremely fragile historic buildings. No historic buildings occur on the site or are known to occur near the site. The closest structures are industrial buildings located to the north and west of the site. The nearest residences are the Solamonte Apartments located approximately 0.5 miles south of the site. These are modern residences constructed consistent with applicable California Building Code and seismic standards and are sufficient distance from the site that no vibration would be perceptible during construction. However, to conservatively estimate potential vibration impacts on neighboring buildings, a PPV of 0.2 inches per second (100 VdB) is used herein.

Construction activities such as blasting, pile driving, demolition, excavation or drilling have the potential to generate ground vibrations near structures. With respect to ground-borne vibration impacts on structures, the FTA states that ground-borne vibration levels in excess of 100 VdB would damage fragile buildings and levels in excess of 95 VdB would damage extremely fragile historic buildings. No historic buildings are located within the project area; thus, 100 VdB is used to quantify potential vibration impacts to neighboring structures. Construction activities referenced above that would generate significant vibration levels are not proposed. However, to provide information for use in completing the CEQA evaluation, construction-related vibration impacts are evaluated using the above referenced criteria.

IMPACT ANALYSIS

Methodology and Significance Thresholds

Construction noise estimates are based upon noise levels reported by the FTA, Office of Planning and Environment, and the distance to nearby sensitive receptors. Reference noise levels from that document were used to estimate noise levels at nearby sensitive receptors based on a standard noise attenuation rate of 6 dB per doubling of distance (line-of-sight method of sound attenuation).

Project-related trips were obtained from the Trip Generation Study prepared by Mizuta Traffic Consulting, Inc., (March 2020). Based on the square footage proposed, the proposed project would generate 278 daily weekday trips. Peak hour weekday trips would be approximately 28 in the morning and 31 in the evening. Traffic noise related impacts are addressed herein based on the difference in volumes between existing conditions and when volumes associated with the proposed project are added to the baseline. Because the existing Leq at the project site is less than the 65-dBA exterior standard for residential zones, potential impacts are determined based, in part, on whether project traffic would cause the current Leq at neighboring properties to increase by 3 dBA or more.

Temporary Construction Noise

The main sources of noise during construction activities would include heavy machinery used during clearing the site, as well as equipment used for construction. Initial construction activities would be associated with clearing and grading the site. Table 3 shows the typical noise levels associated with heavy construction equipment. As shown, average noise levels associated with the use of heavy equipment commonly used at construction sites can range from about 80 to 88 dBA at 50 feet from the source, depending upon the types of equipment in operation at any given time and phase of construction.

As referenced above, Section 17.66.050(D)(4) of the Rancho Cucamonga Municipal Code exempts noise or vibration created by construction, repair, remodeling, or grading of any real property or during authorized seismic surveys, provided that when adjacent to a residential land use, school, church or similar type of use, the noise generating activity does not take place between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or at any time on Sunday or a national holiday and provided noise levels created do not exceed the noise standard of 65 dBA when measured at the adjacent property line. In this case, the site is not located adjacent to a residential area nor would construction noise be audible at the Solamonte Apartments, 0.5 miles south of the site. However, for the purpose of addressing impacts, noise levels at adjacent properties during construction are estimated.

Construction of the proposed improvements may utilize, dozers, tractors, loaders, trucks and a variety of other types of equipment as individual phases of the construction process progress.

Table 3
Typical Construction Equipment Noise Levels

Type of Equipment	Range of Maximum Sound Levels Measured (dBA at 50 feet)	Maximum Sound Levels for Analysis (dBA at 50 feet)
Pile Driver 12,000 to 18,000 ft-lb/blow	81–96	93
Rock Drills	83–99	96
Jack Hammers	75–85	82
Pneumatic Tools	78–88	85
Pumps	74–84	80
Scrapers	83–91	87
Haul Trucks	83–94	88
Cranes	79-86	82
Portable Generators	71-87	80
Rollers	75-82	80
Dozers	77–90	85
Tractors	77–82	80
Front-End Loaders	77–90	86
Hydraulic Backhoe	81-90	86
Hydraulic Excavators	81–90	86
Graders	79–89	86
Air Compressors	76–89	86
Trucks	81–87	86
Trencher	73-80	80

Source: Bolt, Beranek & Newman, Noise Control for Buildings and Manufacturing Plants, 1987.
dBA = A-weighted decibels, ft-lb/blow = foot-pounds per blow

A doubling of sound energy yields an increase of three decibels, so multiple pieces of equipment operating together may cause relatively small but noticeable increases in noise levels above that associated with one piece of equipment. For reference purposes, noise levels are shown at varying distances are shown in Table 4. As shown, noise levels at 25 feet from an active construction area would be approximately 88 dBA and would attenuate to 72 dBA or less at 100 feet or more. Thus, noise levels are likely to exceed 65-dBA at the property line. However, adjacent uses are Zone II industrial and manufacturing businesses and construction noise at the site would not be audible at the Solamonte Apartments, the nearest sensitive receiver. Further, temporary construction noise is exempt from the Rancho Cucamonga noise standards per Section 17.66.050(D)(4) of the Municipal Code. Because the adjacent uses are not residential areas or other sensitive receivers (i.e., schools, daycare facilities, care facilities/hospitals), the nighttime construction do apply for the purposes of noise control Temporary noise levels in excess of 65-dBA would be less than significant for the purpose of CEQA review.

Table 4
Typical Maximum Construction Noise Levels at Various Distances from Project Construction

Distance from Construction	Maximum Noise Level at Receptor (dBA)
25 feet	88
50 feet	85
100 feet	72
250 feet	66
500 feet	60
1,000 feet	54

Temporary Construction-Related Vibration

Activities associated with warehousing projects would not generate vibration. Thus, this discussion focuses on temporary vibration caused by construction. The closest residences are located approximately 0.5 miles south of the site. Table 5 shows construction equipment vibration would attenuate to 75 VdB at 100 feet from the source assuming a large bulldozer is the heaviest piece of equipment used during grading.

As referenced, 72 VdB is the threshold for human perception; thus, while construction activities would be temporary, vibration may be perceptible at adjacent receivers depending on the location and type of equipment in operation. Construction activities such as blasting, pile driving, demolition, excavation or drilling have the potential to generate ground vibrations near structures. With respect to ground-borne vibration impacts on structures, the FTA states that ground-borne vibration levels in excess of 100 VdB would damage fragile buildings and levels in excess of 95 VdB would damage extremely fragile historic buildings. No historic buildings are located within the project area nor are construction activities that would generate significant vibration levels required for the proposed project. Construction would occur during daytime

Table 5
Vibration Source Levels for Construction Equipment

Equipment	Approximate VdB				
	25 Feet	50 Feet	60 Feet	75 Feet	100 Feet
Large Bulldozer	87	81	79	77	75
Loaded Trucks	86	80	78	76	74
Jackhammer	79	73	71	69	67
Small Bulldozer	58	52	50	48	46

Source: Federal Railroad Administration, 1998

hours which would minimize disturbances to adjacent buildings. No residences or other sensitive properties are located close enough to the site to be affected by construction vibration. Temporary vibration impacts would be less than significant.

Long-Term Operational Noise Exposure

Long-term operation of the proposed project was evaluated for potential exterior traffic related impacts caused by increased traffic volumes associated with the project as well as interior noise levels caused by existing traffic on Milliken Avenue and Jersey Boulevard. In addition, a discussion regarding potential noise levels associated with roof top Heating, Ventilation and Air Conditioning (HVAC) is provided.

Exterior Traffic Noise. Traffic is the primary noise source that would be generated by the proposed project. Existing measured noise levels exceed the daytime exterior residential standard (65 dBA) at the Solamonte Apartments, the nearest residences to the project site (Figure 4). Thus, whether a traffic-related noise impact would occur is based on whether project traffic, when added to the existing traffic, would cause a noticeable (i.e., +3 dBA) increase in the Leq.

The segment of Milliken Avenue between Azusa Court and 6th Street was modeled using the Federal Highway Administration Traffic Noise Model (TNM) version 2.5 software. The model calculates traffic noise at receiver locations based on traffic volumes, travel speed, mix of vehicle types operating on the roadways (i.e., cars/trucks, medium trucks and heavy trucks) and related factors. Traffic volumes for project calculations were obtained from the Trip Generation Study (March 2020). Traffic counts obtained during monitoring were used to represent baseline conditions. to determine whether the Leq at Receiver 1 would increase by 3 dBA or more with the addition of project traffic.

Modeled noise levels are shown in Table 6. As shown, the 65 dBA Leq standard is exceeded (68.2 dBA) under baseline conditions. Project traffic was conservatively assumed to be comprised of heavy trucks. A total of 15 trucks were added to each north and southbound

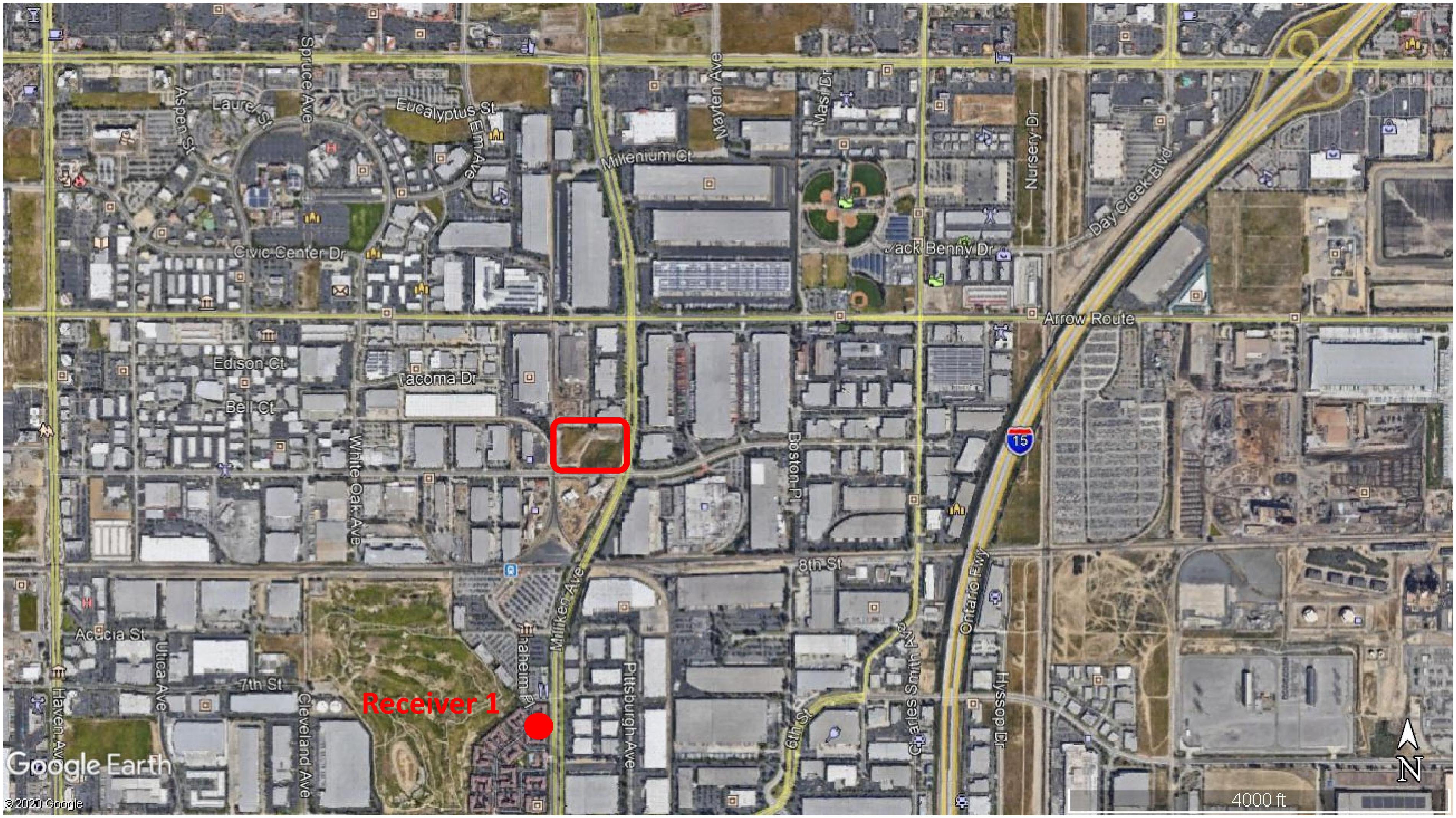

FIGURE 4—Receiver Locations

- Project Site

segment of Milliken Avenue modeled to simulate 30 peak hour truck trips on the segments north and south of Receiver 1. Peak hour noise levels at Receiver 1 would increase by 0.7 dBA. The proposed project would have no perceptible impact on sound levels the nearest receiver to the project site.

Table 6
Modeled Noise Levels

Receptor	Existing Leq	Exceed Standard?	With Project Leq	dBA Change	Significant Impact
Site 1 – 9200 Milliken Avenue	68,2	Yes	68.9	+0.7	No

To calculate project-related noise effects, peak traffic volumes generated by the project were added to baseline traffic conditions. As discussed, peak hour weekday trips would be approximately 28 during a weekday morning and 31 during a weekday evening. For the purpose of estimating noise levels, a peak-hour volume of 31 vehicles were added to baseline conditions and distributed evenly between Jersey Boulevard and Milliken Avenue north and south of Jersey Boulevard.

Exterior Use Noise (HVAC). The HVAC system proposed for use on the site has not been specified and noise levels vary depending on the size of the system. However, multiple HVAC systems will be installed on the roof-tops of the office area. HVAC noise levels can be expected to range from 60 to 70 dBA at 5 feet from the roof top equipment and ventilation openings (Illingsworth & Rodkin, 2011). For the purpose of this evaluation, it was assumed that HVAC units would be installed at the center of the roof top, or approximately 200 feet from the property lines. Per the inverse square law, stationary noise attenuates by approximately 6 dBA per doubling of distance from the source. Using a 70-dBA reference noise level, HVAC noise would attenuate to approximately 46 dBA at 80 feet from the source. Noise levels from HVAC equipment would not be audible at the property line and less than the 60 dBA criteria.

Interior Traffic Noise. California Energy Code Title 24 standards specify construction methods and materials that result in energy efficient structures and up to a 30-dBA reduction in exterior noise levels (assuming windows are closed). This includes operation of mechanical ventilation (e.g. heating and air conditioning), in combination with standard building construction that includes dual-glazed windows with a minimum Sound Transmission Class (STC) rating of 26 or higher. When windows are open, the insertion loss drops to about 10 dBA. Assuming windows are closed, interior noise levels at Solamonte Apartment units facing Milliken Avenue would be approximately 39 dBA which would be below the 50-dBA daytime interior standard and 45-dBA nighttime standard.

Airport Land Use Compatibility Plan Compatibility. Ontario International Airport is the closest airport and is located approximately 2.2 miles southwest of the project site. Based on the noise contour maps provided in the Ontario Airport Land Use Compatibility Plan (City of Ontario 2011), the project site is located outside the 60 dBA CNEL contours and is not affected by airport noise. For this reason, the project site is not located in an area that is affected by aircraft noise; and thus, compatibility with an adopted Airport Land Use Compatibility Plan is not required.

CONCLUSION

The proposed project would not have a significant or adverse impact cause by construction noise and vibration. The existing 65 dBA Leq exterior standard is exceeded under existing conditions at the nearest sensitive receiver modeled (i.e., Solamonte Apartments located at 9200 Milliken Avenue). Project-related traffic would increase noise levels at neighboring receivers by 0.7 dBA; and thus, would have a negligible effect on noise levels. Assuming a 30-dBA reduction in noise levels between exterior and interior levels, the interior standard would be met at all residential receivers modeled with operation of the proposed project. Thus, a **less than significant** operational noise impact would occur.

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Appendix A

Monitoring Data Sheet and Modeling Results

FIELD NOISE MEASUREMENT DATA

Project Name: Jersey Industrial complex Page 1 of
Project #: Day / Date My Name.

Sound Level Meter	Calibrator	Weather Meter
Model #: Picollo II	Model #	Model # Serial #
Serial #	Serial #	
Weighting: A / C / Flat	Pre-Test: dBA SPL	Terrain: Hard / Soft / Mixed
Response: Slow / Fast / Impl	Post-Test: dBA SPL	Topo: Flat / Hilly (describe)
Windscreen: Yes / No		Wind: Steady / Gusty

ID	Time Start	Time Stop	Leq	Lmin	Lmax	L10	L50	L90	Wind Spd/ Dir (mph)	Temp (°F)	RH (%)	Bar Psr (in Hg)	Cloud Cover (%)
1	7:25	7:40	67.8	44.4	82.3					65			0%
2	8:05	8:20	68.7	50.5	83.6					65			0%

Location(s) / GPS Reading(s):

Roadway Name	Milliken / 7th	Milliken / [illegible]
Speed (post/obs)	50	50
Number of Lanes	6	6
Width (pave/row)	72	72
1- or 2- way	2	2
Grade	0%	0%
Bus Stops	no	
Stoplights	yes	yes
Street Parking	no	no
Automobiles	195	176
Medium Trucks	14	11
Heavy Trucks	15	11

Other Noise Sources: distant aircraft / roadway traffic / trains / landscaping / rustling leaves / children playing / dogs barking / birds vocalizing

Notes and Sketches on Reverse

Site 1

Start Date	5/14/2020
Start Time	7:23:22 AM
End Time	7:38:22 AM
Duration	00:15:00
Meas Mode	Single
Input Range	Low
Input Type	Mic
SPL Time Weight	Slow
LN% Freq Weight	dBA
Overload	No
UnderRange	No
Sensitivity	18.44mV/Pa

LZeq	78.2
LCeq	77.0
LAeq	67.8
LZSmax	91.3
LCSmax	91.0
LASmax	82.3
LZSmin	62.0
LCSmin	59.6
LASmin	44.4
LZE	107.7
LCE	106.5
LAE	97.3
LZpeak	106.6
LCpeak	106.1
LApeak	100.6
1%	76.8
2%	75.9
5%	74.1
8%	73.0
10%	72.4
25%	68.0
50%	62.7
90%	49.9
95%	48.1
99%	45.8

Site 2

Start Date	5/14/2020
Start Time	8:06:17 AM
End Time	8:21:17 AM
Duration	00:15:00
Meas Mode	Single
Input Range	Low
Input Type	Mic
SPL Time Weight	Slow
LN% Freq Weight	dBA
Overload	No
UnderRange	No
Sensitivity	18.44mV/Pa

LZeq	77.5
LCeq	76.7
LAeq	68.7
LZSmax	92.3
LCSmax	92.0
LASmax	83.6
LZSmin	66.5
LCSmin	64.8
LASmin	50.5
LZE	107.0
LCE	106.2
LAE	98.2
LZpeak	104.0
LCpeak	104.2
LApeak	101.6
1%	79.6
2%	78.4
5%	76.0
8%	74.2
10%	73.2
25%	67.1
50%	61.0
90%	53.4
95%	52.1
99%	51.0

<Organization?> 14 May 2020
<Analysis By?> TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: Jersey Industrial Complex - Existing
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	No Barrier Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	68.2	66	68.2	10	Snd Lvl	68.2	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	1	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

<Organization?>							14 May 2020						
<Analysis By?>							TNM 2.5						
							Calculated with TNM 2.5						
RESULTS: SOUND LEVELS													
PROJECT/CONTRACT:		<Project Name?>											
RUN:		Jersey Industrial Complex w-Project											
BARRIER DESIGN:		INPUT HEIGHTS						Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.					
ATMOSPHERICS:		68 deg F, 50% RH											
Receiver													
Name	**No.**	**#DUs**	**Existing LAeq1h**	**No Barrier LAeq1h Calculated**	**Crit'n**	**Increase over existing Calculated**	**Crit'n Sub'l Inc**	**Type Impact**	**With Barrier Calculated LAeq1h**	**Noise Reduction Calculated**	**Goal**	**Calculated minus Goal**	
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB	
Receiver1	1	1	0.0	68.9	66	68.9	10	Snd Lvl	68.9	0.0	8	-8.0	

Dwelling Units	**# DUs**	**Noise Reduction Min**	**Avg**	**Max**
		dB	dB	dB
All Selected	1	0.0	0.0	0.0
All Impacted	1	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0