APPENDIX G
NOISE TECHNICAL MEMORANDUM

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September 2020

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Subject: Casa De Oro Branch Library – Noise Technical Memorandum

INTRODUCTION

The purpose of this technical memorandum is to assess the project's potential noise impacts within the project area. The memorandum will compare project-generated noise and vibration to the County of San Diego for construction and operations.

PROJECT DESCRIPTION

The Casa de Oro Branch Library Project (proposed project) would result in replacement of the existing County of San Diego (County) Casa de Oro branch library facility in the community of Spring Valley with a new branch library facility at a different location. The proposed project consists of an approximately 13,000 square-foot (SF) library facility that aims to achieve "zero net energy," with access off Campo Road, 52 parking spaces, landscaping, and fencing. The existing library is currently located at 9805 Campo Road within an existing retail commercial shopping center, just to the southeast of the proposed project site. The proposed project is intended to enhance the County's regional library system and provide expanded services to its patrons within the Spring Valley community and surrounding areas. The proposed project would be processed through the County's Department of General Services (DGS).

PROJECT LOCATION

The proposed project site is located in the community of Spring Valley in southeastern unincorporated San Diego County, California. The site is within the Valle de Oro Community Plan Area. The affected County Assessor Parcel Numbers (APNs) include portions of APNs 500-170-10, -11, and -41.

Regional access to the project vicinity is provided via State Route (SR) 94 located approximately 480 feet to the south/southwest of the site at its closest point; refer to Figure 1. Direct access to the project site would be provided from Campo Road, between Conrad Drive and Rodgers Road.

PROJECT SETTING AND EXISTING CONDITIONS

The proposed project site is located in a highly urbanized area, adjacent to the commercial corridor of Campo Road. The area surrounding the project site is highly developed with a variety of land uses including commercial, general office, and multi-family and (limited) single-family residential uses.

The land where the library would be constructed is currently disturbed and/or developed. The majority of the property is surfaced with asphaltic pavement. Limited vegetation is present on-site and consists of turf grass associated with the sports fields and slope along the western boundary, as well as along the existing drainage in the southwestern portion of the property.

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The site is relatively flat, gently sloping from north to south. On-site elevations range from approximately 422 feet above mean sea level (amsl) in the southern portion of the site near Campo Road to approximately 443 feet amsl in the northwestern portion of the site.

Location: N:\2020\2020-137.01 Casa de Oro Library\MAPS\location_vicinity\CDO_Location.mxd (TR)-trotellini 9/16/2020

Map Date: 9/16/2020

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ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 1. Project Location and Vicinity

2020-137.01 Casa de Oro Library

PROJECT CHARACTERISTICS

The library building would total approximately 13,000 SF in size and would house a number of rooms in order to accommodate internal library operations, as well as to provide a variety of services to the public. The proposed library would consist of the components identified in Table 1.

Table 1. Project Components

Proposed Use	
Entry plaza	Entry lobby
Restroom facilities (including staff-only)	Circulation desk
Public multi-media room (computers/copy machines)	Manager's office/work room/ sorter/storage/break room/staff restroom
Adult (study rooms/seating/book stacks)	Great room (reading area and magazine stacks)
Children (story-time area/discovery zone/book stacks/reading room/study area/crafts and children's restrooms)	Teens (study rooms/seating/book stacks)
Community room	Conference room
Audio/visual storage	Marketplace (popular books/ holds and self-checkouts)
Homework center	Friends of Library bookstore
Outdoor patio	

Project implementation would require acquisition of Real Property from an adjoining private party to the south. The County would lease the affected property from the La Mesa Spring Valley School District; no lands would be purchased from the school.

Access

Direct access to the project site would be from Campo Drive. It is anticipated that a minimum 24-foot wide access drive would be constructed from the street up to the surface parking area proposed with the project. Construction of this access drive would require a new curb cut within the right-of-way on Campo Road and installation of a commercial driveway.

PROJECT CONSTRUCTION

Schedule

It is anticipated that project construction would occur over a period of approximately 12 to 14 months from the onset of demolition through final construction.

Demolition

An existing modular building located on the La Mesa Spring Valley School District property would be removed to accommodate the parking lot for the library. Additionally, an existing restaurant fronting onto Campo Road would be demolished to allow for site access. The existing asphaltic surface in the southern portion of the site would also be broken up and removed. Removal of a portion of the existing sports fields abutting the site to the north would also occur with project grading.

Grading and Site Preparation

The site would anticipate minor grading, 4,000 cubic yards (import), to accommodate the proposed library pad, surface parking area, and driveway. This includes preparation of and/or back filling of the site's retaining walls and driveway ramping (American Disability Act compliant), plus removal and recompaction (12-inch) for the foundation and parking areas. Existing on-site vegetation (i.e., on the sports fields) would be removed. Grading would be accomplished with scrapers, motor graders, water trucks, dozers, and compaction equipment.

PROJECT OPERATIONS

Hours of Operation and Staffing

It is anticipated that the library would be staffed by a maximum of 6 to 8 part- and/or full-time employees on a daily basis. Consistent with current operating hours for other libraries within the County's system, it is anticipated that the Casa de Oro library would operate during the following hours:

Monday and Wednesday: 9:30 a.m. to 6:00 p.m.
Tuesday and Thursday: 9:30 a.m. to 8:00 p.m.
Friday and Saturday: 9:30 a.m. to 5:00 p.m.
Sunday: Closed

NOISE ANALYSIS

Fundamentals of Sound and Environmental Noise

Addition of Decibels

The decibel (dB) scale is logarithmic, not linear; therefore, sound levels cannot be added or subtracted through ordinary arithmetic. Two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted (dBA), an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound and twice as loud as a 60-dBA sound. When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions (Federal Transit Administration [FTA] 2018). For example, a 65-dB source of sound, such as a truck, when joined by another 65-dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). Under the dB scale, three sources of equal loudness together would produce an increase of 5 dB.

Sound Propagation and Attenuation

Noise can be generated by a number of sources, including mobile sources such as automobiles, trucks and airplanes, and stationary sources such as construction sites, machinery, and industrial operations. Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately 6 dB (dBA) for each doubling of distance from a stationary or point source. Sound from a line source, such as a highway, propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately 3 dBA for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics (Federal Highway Administration [FHWA] 2011). No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dBA per doubling of distance is normally assumed.

Noise levels may also be reduced by intervening structures; generally, a single row of detached buildings between the receptor and the noise source reduces the noise level by about 5 dBA (FHWA 2008), while a solid wall or berm generally reduces noise levels by 10 to 20 dBA (FHWA 2011). However, noise barriers or enclosures specifically designed to reduce site-specific construction noise can provide a sound reduction of 35 dBA or greater (Western Electro-Acoustic Laboratory, Inc. 2000). To achieve the most potent noise-reducing effect, a noise enclosure/barrier must physically fit in the available space, must completely break the "line of sight" between the noise source and the receptors, must be free of degrading holes or gaps, and must not be flanked by nearby reflective surfaces. Noise barriers must be sizable enough to cover the entire noise source and extend length-wise and vertically as far as feasibly possible to be most effective. The limiting factor for a noise barrier is not the component of noise transmitted through the material, but rather the amount of noise flanking around and over the barrier. In general, barriers contribute to decreasing noise levels only when the structure breaks the line of sight between the source and the receiver.

The manner in which older structures in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows (California Department of Transportation [Caltrans] 2002). The exterior-to-interior reduction of newer structures is generally 30 dBA or more (Harris Miller, Miller & Hanson Inc. [HMMH] 2006).

Noise Descriptors

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The L_{eq} is a measure of ambient noise, while the L_{dn} and CNEL (Community Noise Equivalent Level) are measures of community noise. Each is applicable to this analysis and defined as follows:

- **Equivalent Noise Level (L_{eq})** is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
- **Day-Night Average (L_{dn})** is a 24-hour average L_{eq} with a 10-dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn}.

- **Community Noise Equivalent Level (CNEL)** is a 24-hour average L_{eq} with a 5-dBA weighting during the hours of 7:00 p.m. to 10:00 p.m. and a 10-dBA weighting added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively.

Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day or night or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60- to 70-dBA range, and high above 70 dBA. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet, suburban, residential streets with noise levels around 40 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate-level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60 to 75 dBA), or dense urban or industrial areas (65 to 80 dBA). Regarding increases in dBA noise levels, the following relationships should be noted in understanding this analysis:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived by humans.
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference.
- A change in level of at least 5 dBA is required before any noticeable change in community response would be expected.
- A 10-dBA change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

Noise-Sensitive Land Uses

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, historic sites, cemeteries, and recreation areas are considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses. The project site is surrounded by numerous noise-sensitive land uses including a middle school to the north, the Crown Inn and Lugar De Encuentro Church to the south and across Campo Road, and multi-family residential uses to the west. The nearest noise-sensitive land use to the project site is the multi-family residences located adjacent to the southwestern project site boundary.

Vibration Fundamentals

Ground vibration can be measured several ways to quantify the amplitude of vibration produced. This can be through peak particle velocity or root mean square velocity. These velocity measurements measure maximum particle at one point or the average of the squared amplitude of the signal, respectively. Vibration impacts on people can be described as the level of annoyance and can vary depending on an individual's sensitivity. Generally, low-level vibrations may cause window rattling but do not pose any threats to the integrity of buildings or structures.

Existing Noise Environment

Spring Valley is impacted by various noise sources. It is subject to typical urban noise such as noise generated by traffic, heavy machinery, and day-to-day outdoor activities as well as noise generated from the various land uses (i.e., residential, commercial, institutional, and recreational and parks activities) throughout the community that generate stationary source noise. Mobile sources of noise, especially cars and trucks, are the most common source of noise. The major noise sources in the vicinity of the project site includes roadway noise traffic from Campo Road and State Route 94 to the south, as well as typical noise sources associated with the various land uses that surround the project site such as parking lot noise, mechanical equipment (e.g., HVAC), school bells, and crowd noise.

Existing Noise Measurements

As previously mentioned, the land where the library would be constructed is flat and has previously been disturbed. The majority of the property is surfaced with asphalt pavement. It is predominantly surrounded by a mix of residential and commercial land uses. In order to quantify existing ambient noise levels in the project area, ECORP Consulting, Inc. conducted five short-term noise measurements on August 26, 2020. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the project site (see Attachment A for a visual depiction of the Noise Measurement Locations). The 15-minute measurements were taken between 9:17 a.m. and 11:45 a.m. Short-term (L_{eq}) measurements are considered representative of the noise levels throughout the day. The average noise levels and sources of noise measured at each location are listed in Table 2.

Table 2. Existing (Baseline) Noise Measurements					
Location Number	Location	L_{eq} dBA	L_{min} dBA	L_{max} dBA	Time
1	956 Campo Road	62.7	52.2	74.6	10:57 a.m.-11:13 a.m.
2	Edge of asphalt/baseball field north of the project site	51.6	46.6	55.9	10:12 a.m.-10:27 a.m.
3	Behind the Casa De Oro Senior Apartments	50.6	42.7	59.8	11:30 a.m.-11:45 a.m.
4	Grocery Outlet parking lot off Campo Road	55.2	47.6	62.1	9:17 a.m.-9:32 a.m.
5	Behind Grocery Outlet	53.2	48.4	60.4	9:43 a.m.-9:58 a.m.

Source: Measurements were taken by ECORP with an Ex Tech SDL 600 precision sound level meter, which satisfies the American National Standards Institute for general environmental noise measurement instrumentation. See Attachment A for noise measurement outputs.

As shown in Table 2, the ambient recorded noise levels range from 50.6 to 62.7 dBA near the project site. The most common noise in the project vicinity is produced by automotive vehicles (e.g., cars, trucks, buses, motorcycles). Traffic moving along a roadway produces a sound level that remains relatively constant and is part of the project area's minimum ambient noise level. Vehicular noise varies with the volume, speed and type of traffic. Slower traffic produces less noise than fast-moving traffic. Trucks typically generate more noise than cars. Infrequent or intermittent noise also is associated with vehicles, including sirens, vehicle alarms, slamming of doors, trains, garbage and construction vehicle activity and honking of horns. These noises add to urban noise and are regulated by a variety of agencies.

Existing Roadway Noise Levels

Existing roadway noise levels were calculated for the roadway segments in the project vicinity. This task was accomplished using the FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77-108) (see Attachment B) and traffic volumes from the Transportation Impact Study prepared for the project (Michael Baker 2020). The model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site environmental conditions. The average vehicle noise rates (energy rates) used in the FHWA model have been modified to reflect average vehicle noise rates identified for California by Caltrans. The Caltrans data shows that California automobile noise is 0.8 to 1.0 dBA higher than national levels and that medium and heavy truck noise is 0.3 to 3.0 dBA lower than national levels. The average daily noise levels along these roadway segments are presented in Table 3.

Table 3. Existing (Baseline) Traffic Noise Levels		
Roadway Segment	**Surround Uses**	**CNEL at 100 feet from Centerline of Roadway**
Campo Road		
West of the project driveway	Residential and Lodging	54.8
Between the project driveway and Kenwood Drive	Church and Commercial	52.9
Kenwood Drive		
South of Campo Road	Church and Commercial	56.1
Conrad Drive		
North of Campo Road	Residential and Commercial	51.0

Source: Traffic noise levels were calculated by ECORP using the FHWA roadway noise prediction model in conjunction with the trip generation rate identified by Michael Baker International (2020). Refer to Attachment B for traffic noise modeling assumptions and results.

Note: A total of 3 intersections were analyzed in the Transportation Impact Study; however, only roadway segments that impact sensitive receptors were included for the purposes of this analysis.

As shown, the existing traffic-generated noise level on project-vicinity roadways currently ranges from 51.0 to 56.1 dBA CNEL. As previously described, CNEL is 24-hour average noise level with a 5 dBA "weighting" during the hours of 7:00 p.m. to 10:00 p.m. and a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. It should be noted that the modeled noise levels depicted in Table 3 may differ from measured levels in Table 2 because the measurements represent noise levels at different locations around the project site and are also reported in different noise metrics (e.g., noise measurements are the L_{eq} values and traffic noise levels are reported in CNEL).

Regulatory Setting

San Diego County Code

San Diego County's regulations with respect to noise are included in Chapter 4, *Noise Abatement and Control*, of the County Code. Section 36.404, *General Sound Level Limits*, limits stationary-source noise at any location on a residential property at a maximum 50 dBA L_{eq} from 7:00 a.m. to 10:00 p.m. and 45 dBA L_{eq} from 10:00 p.m. to 7:00 a.m. Additionally, Section 36.409, *Sound Level Limitations on Construction Equipment*, states that noise sources associated with construction are limited to an average sound level of 75 dBA for an eight-hour period, between 7:00 a.m. and 7:00 p.m., when measured at any occupied property where the noise is being received. Construction is prohibited between the nighttime hours of 7:00 p.m. and 7:00 a.m. as well as on Sundays and all major holidays.

Noise Impacts

Methodology

This analysis of the existing and future noise environments is based on noise prediction modeling and empirical observations. Predicted construction noise levels were calculated utilizing the FHWA's Roadway

Construction Model (2006). Transportation-source noise levels in the Project vicinity were calculated using the FHWA Highway Noise Prediction Model (FHWA-RD-77-108) for exiting and existing plus project traffic volumes. Operational noise levels are addressed qualitatively. Groundborne vibration levels associated with construction-related activities for the project were evaluated utilizing typical groundborne vibration levels associated with construction equipment, obtained from Caltrans. Potential groundborne vibration impacts related to structural damage and human annoyance were evaluated, taking into account the distance from construction activities to nearby land uses.

IMPACT DISCUSSION

The impact analysis provided below is based on the following California Environmental Quality Act (CEQA) Guidelines Appendix G thresholds of significance. The significance criteria promulgated by the County Code may be relied upon to make impact determinations.

Would the Project Result in the Generation of a Substantial Temporary or Permanent Increase in Ambient Noise Levels in the Vicinity of the Project in Excess of Standards Established in the Local General Plan or Noise Ordinance, or Applicable Standards of other Agencies?

Construction Noise Impacts

Construction noise associated with the proposed project would be temporary and would vary depending on the nature of the activities being performed. Noise generated would primarily be associated with the operation of off-road equipment for onsite construction activities as well as construction vehicle traffic on area roadways. Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., grading, excavation, trenching, paving). Noise generated by construction equipment, including excavators, material handlers, and portable generators, can reach high levels. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). During construction, exterior noise levels could negatively affect sensitive land uses in the vicinity of the construction site. The nearest noise sensitive land uses to the project site are residences located adjacent to the southwestern project site boundary.

Section 36.409, *Sound Level Limitations on Construction Equipment*, of the County Code states that noise sources associated with construction are limited to an average sound level of 75 dBA for an eight-hour period, between 7:00 a.m. and 7:00 p.m., when measured at any occupied property where the noise is being received. Construction is prohibited between the nighttime hours of 7:00 p.m. and 7:00 a.m. as well as on Sundays and all major holidays.

The anticipated short-term construction noise levels generated for the necessary equipment is presented in Table 4**.** Consistent with FTA recommendations for calculating construction noise, construction noise was measured from the center of the project site (FTA 2018).

Table 4. Onsite Construction Average (dBA) Noise Levels by Receptor Distance and Construction Equipment			
Equipment	**Estimated Exterior Construction Noise Level @ Closest Residence**	**Construction Noise Standard (dBA L_{eq})**	**Exceeds Standards?**
Demolition			
Concrete/Industrial Saws (1)	74.8	*75*	**No**
Rubber Tired Dozers (1)	69.9	*75*	**No**
Tractors/Loaders/Backhoes (1)	72.3	*75*	**No**
Combined Demolition Equipment	**79.6**	*75*	**Yes**
Site Preparation			
Water Truck (1)	77.4	*75*	**Yes**
Graders (1)	73.3	*75*	**No**
Tractors/Loaders/Backhoes (1)	72.3	*75*	**No**
Rubber Tired Dozers (1)	69.9	*75*	**No**
Combined Site Preparation Equipment	**80.1**	*75*	**Yes**
Grading			
Water Truck (1)	77.4	*75*	**Yes**
Rubber Tired Dozers (2)	69.9 (each)	*75*	**No**
Tractors/Loaders/Backhoes (1)	72.3	*75*	**No**
Graders (2)	73.3 (each)	*75*	**No**
Scrapers (2)	71.9 (each)	*75*	**No**
Plate Compactors (1)	68.5	*75*	**No**
Rollers (1)	65.3	*75*	**No**
Combined Grading Equipment	**82.4**	*75*	**Yes**
Building Construction			
Generator Sets (1)	69.9	*75*	**No**
Cranes (1)	64.8	*75*	**No**
Forklifts (1)	71.7	*75*	**No**
Tractors/Loaders/Backhoes (1)	72.3	*75*	**No**

Table 4. Onsite Construction Average (dBA) Noise Levels by Receptor Distance and Construction Equipment			
Equipment	**Estimated Exterior Construction Noise Level @ Closest Residence**	**Construction Noise Standard (dBA L_{eq})**	**Exceeds Standards?**
Welders (3)	62.3	*75*	**No**
Combined Building Construction Equipment	**76.9**	*75*	**Yes**
Paving			
Cement and Mortar Mixers (1)	67.1	*75*	**No**
Pavers (1)	66.5	*75*	**No**
Rollers (1)	65.3	*75*	**No**
Tractors/Loaders/Backhoes (1)	72.3	*75*	**No**
Paving Equipment (1)	74.8	*75*	**No**
Combined Paving Equipment	**77.8**	*75*	**Yes**
Architectural Coating			
Air Compressors (1)	65.9	*75*	**No**
Combined Architectural Coating Equipment	**65.9**	*75*	**No**

Source: Construction noise levels were calculated by ECORP Consulting using the FHWA Roadway Noise Construction Model (FHWA 2006). Refer to Attachment C for Model Data Outputs.

Notes: Construction equipment used during construction derived from CalEEMod 2016.3.2. Distance to the nearest residence is approximately 122 feet measured from the center of the project site.

L_{eq} = The equivalent energy noise level, is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.

As shown in Table 4, a majority of the cumulative construction equipment and multiple individual pieces of construction equipment would exceed the County's 75 dBA construction noise standard at the nearest sensitive receptor. Mitigation is required to reduce construction noise to levels below this threshold. Noise barriers or enclosures can provide a sound reduction of 35 dBA or greater (WEAL 2000). To be effective, a noise enclosure/barrier must physically fit in the available space, must completely break the line of sight between the noise source and the receptors, must be free of degrading holes or gaps, and must not be flanked by nearby reflective surfaces. Noise barriers must be sizable enough to cover the entire noise source and extend lengthwise and vertically as far as feasibly possible to be most effective. The limiting factor for a noise barrier is not the component of noise transmitted through the material, but rather the amount of noise flanking around and over the barrier. In the case of project construction, an enclosure/barrier would only be necessary at the area of the construction site where noise producing activities are being performed. It is noted that a wall currently exists between the nearest residence and the project site that could offer some noise reduction. However, an inspection of this wall was not conducted to assess its physical condition.

As such, the following mitigation is recommended.

NOI-1: In order to reduce construction noise during the demolition, site preparation, grading, building construction and paving phases, a temporary noise barrier or enclosure shall be positioned between the construction site and the neighboring residences to the southwest of the site in a manner that breaks the line of sight between the construction equipment and these residences. The temporary noise barrier shall have a sound transmission class (STC) of 10 or greater in accordance with American Society for Testing and Materials Test Method E90, or at least 2 pounds per square foot to ensure adequate transmission loss characteristics. The temporary noise barrier can consist of a solid plywood fence at least 7/16-inch in thickness and/or flexible sound curtains, such as an 18-ounce tarp or a 2-inch-thick fiberglass blanket, attached to chain link fencing. The length, height, and location of the temporary noise barrier shall be adequate to assure proper acoustical performance. Specifically, the barrier must completely break the line of sight between the construction site and the residences to the southwest, must be free of degrading holes or gaps, and must not be flanked by nearby reflective surfaces. The temporary noise barrier must span the entire length of the western boundary of the Project site. All noise control barrier walls shall be designed to preclude structural failure due to such factors as winds, shear, shallow soil failure, earthquakes, and erosion.

OR

In the case that a retaining wall (or walls) is constructed along the southern and western property boundaries, is constructed to a height that breaks the line of sight between the construction site and neighboring residences to the southwest, and is constructed prior to any other construction taking place, no temporary construction noise barrier shall be required along these site perimeters. Otherwise, provision of temporary noise barriers as described above in NOI-1 shall be required, prior to commencement of any project construction activities.

NOI-2: The project improvement and building plans will include the following requirements for construction activities:

- Construction contracts must specify that all construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers and other state-required noise attenuation devices.
- A sign, legible at a distance of 50 feet, shall be posted at the project construction site providing a contact name and a telephone number where residents can inquire about the construction process and register complaints. This sign shall indicate the dates and duration of construction activities. In conjunction with this required posting, a noise disturbance coordinator will be identified to address construction noise concerns received. The coordinator shall be responsible for responding to any local complaints about construction noise. When a complaint is received, the disturbance coordinator shall notify the County within 24 hours of the complaint and determine the cause of the noise complaint (starting too early, malfunctioning muffler, etc.) and shall implement reasonable measures to resolve the complaint, as deemed acceptable by the County. All signs posted at the construction site shall include the contact name and the telephone number for the noise disturbance coordinator.

- Identification of construction noise reduction methods. These reduction methods may include shutting off idling equipment (5 minutes), installing temporary acoustic barriers around stationary construction noise sources, maximizing the distance between construction equipment staging areas and occupied residential areas, and using electric air compressors and similar power tools.
- During construction, stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receivers.
- Per Section 36.409 of the County code, construction shall be prohibited between the hours of 7:00 p.m. to 7:00 a.m. as well as on Sundays and all major holidays.

Implementation of mitigation measures **NOI-1** and **NOI-2** would substantially reduce construction-generated noise levels. As previously described, noise barriers or enclosures such as that recommended in mitigation measure **NOI-1** can provide a sound reduction 35 dBA or greater (WEAL 2000), which would be a reduction robust enough to maintain construction noise levels less than 75 dBA. Temporary noise barriers can consist of a solid plywood fence and/or flexible sound curtains, such as an 18-ounce tarp or a 2-inch-thick fiberglass blanket attached to chain link fencing. Therefore, project construction activities would not expose persons to and generate noise levels in excess of County standards with implementation of **NOI-1** and **NOI-2**.

Operational Noise Impacts

As previously described, noise-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would each be considered noise sensitive and may warrant unique measures for protection from intruding noise. The nearest noise-sensitive land uses to the project site are residences adjacent to the site to the southwest. Additionally, a middle school campus lies just north of the project site. Operational noise sources associated with the proposed project include mobile and stationary (i.e., mechanical equipment, onsite activity) sources.

Operational Traffic Noise

Future traffic noise levels throughout the project vicinity (i.e., vicinity roadway segments that traverse noise sensitive land uses) were modeled based on the traffic volumes identified by Michael Baker International (2020) to determine the noise levels along project vicinity roadways. Table 5 shows the calculated offsite roadway noise levels under existing traffic levels compared to future buildout of the project. The calculated noise levels as a result of the project at affected sensitive land uses are compared to an increase of 3 dB over existing conditions. As previously stated, outside of the laboratory, a 3-dBA change is considered a just-perceivable difference.

Table 5. Existing Plus Project Conditions- Predicted Traffic Noise Levels					
Roadway Segment	Surround Uses	CNEL at 100 feet from Centerline of Roadway		Noise Standard (dBA CNEL)	Exceed Standard/ Significant Impact?
		Existing Conditions	Existing Plus Project Conditions		
Campo Road					
West of the project driveway	Residential and Lodging	54.8	54.9	>3	**No**
Between the project driveway and Kenwood Drive	Church and Commercial	52.9	53.4	>3	**No**
Kenwood Drive					
South of Campo Road	Church and Commercial	56.1	56.5	>3	**No**
Conrad Drive					
North of Campo Road	Residential and Commercial	51.0	51.1	>3	**No**

Source: Traffic noise levels were calculated by ECORP using the FHWA roadway noise prediction model in conjunction with the trip generation rate identified by Michael Baker International (2020). Refer to Attachment B for traffic noise modeling assumptions and results.

Note: A total of 3 intersections were analyzed in the Transportation Impact Study; however, only roadway segments that impact sensitive receptors were included for the purposes of this analysis.

As shown in Table 5, the predicted increase in traffic noise levels associated with the project would be less than 3 dBA. The noise increase, as a result of increased traffic from the proposed project, would not be perceivable.

Operational Stationary Noise

By their very nature, libraries are considered relatively quiet places. They do not attract large, noise-intensive gatherings, use amplified sound or accommodate heavy-duty vehicles. The main stationary noise associated with library operations would be parking lot activity (i.e. car doors opening and closing, people talking, stereo music) and internal vehicle circulation in the parking lot located on the northern end of the project site. Previous noise measurements taken by ECORP Consulting, Inc., using a Larson Davis SoundExpert LxT precision sound level meter, at the edge of a parking lot of a large shopping center recorded a noise level of 61.1 dBA at approximately 5 feet distant. (The proposed library would not be expected to generate noise levels at the same intensity as a large grocery store and therefore this reference noise applied to the project is conservative.) The nearest sensitive noise receptor, the residence adjacent to the southwestern property line, is located approximately 55 feet distance from potential parking lot activity and internal circulation. As previously mentioned, sound spreads uniformly outward in a spherical pattern, and the sound level attenuates at a rate of approximately 6 dBA for each doubling of distance from a stationary or point source (FHWA 2011). This would result in a noise level of approximately 40.8 dBA at the nearby residences. The County Code Section 36.404 limits stationary-source noise at any location on a residential property at a maximum 50 dBA L_{eq} from 7:00 a.m. to 10:00 p.m. and 45 dBA L_{eq} from 10:00 p.m. to 7:00 a.m. Thus, the parking lot activity as a result of the proposed project would not exceed the daytime (7:00 a.m. to 10:00 p.m.) or nighttime (10:00 p.m. to 7:00 a.m.) County noise standards.

Additionally, as previously mentioned, the project may result in the construction of on-site retaining walls in support of the proposed development or to expand the existing building pad. Depending on the height of any retaining walls, they may offer an additional reduction in noise levels. Depending on the height of this retaining wall, it could offer an additional reduction in noise. It is further noted that, as shown in Table 2, the area located directly west of the nearest residence (Location 3 in Table 2) experiences an ambient recorded noise level of 50.6 dBA. Thus, the noise levels in the area surrounding the nearest noise-sensitive residential receptors currently experience noise at levels greater than what would be produced by the project.

Would the Project Result the Generation of Excessive Groundborne Vibration or Groundborne Noise Levels?

Construction Vibration Impacts

Excessive groundborne vibration impacts result from continuously occurring vibration levels. Increases in groundborne vibration levels attributable to the proposed project would be primarily associated with short-term construction-related activities. Construction on the project site would have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved. Ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance.

Construction-related ground vibration is normally associated with impact equipment such as pile drivers, jackhammers, and the operation of some heavy-duty construction equipment, such as dozers and trucks. It is not anticipated that pile drivers would be necessary during project construction. Vibration decreases rapidly with distance and it is acknowledged that construction activities would occur throughout the project site and would not be concentrated at the point closest to sensitive receptors. Groundborne vibration levels associated with construction equipment are summarized in Table 6.

Table 6. Typical Construction Equipment Vibration Levels	
Equipment Type	**Peak Particle Velocity at 25 Feet (inches per second)**
Impact Pile Driver	0.644
Sonic Pile Driver	0.17
Vibratory Roller	0.21
Hoe Ram	0.089
Large Bulldozer	0.089
Caisson Drilling	0.089
Loaded Trucks	0.076
Jackhammer	0.035
Small Bulldozer/Tractor	0.003

Source: FTA 2018

San Diego County's regulation pertaining to vibration is included in Policy N-3.1 of the General Plan Noise Element. Policy N-3.1 recommends the use of the FTA guidelines, where appropriate, to limit the extent of exposure that sensitive uses may have to groundborne vibration from construction equipment. As such, this analysis will use a conservative threshold of 0.2 inches per second peak particle velocity (PPV), which is the vibration level that is considered by the FTA to be acceptable for "non-engineered timber and masonry buildings" (FTA 2018). It is acknowledged that construction activities would occur throughout the project site and would not be concentrated at the point closest to the nearest structure. Consistent with FTA recommendations for calculating construction vibration, construction vibration was measured from the center of the project site (FTA 2018). The nearest structures of concern to the construction site is located approximately 122 feet from the center of the project site.

Based on the representative vibration levels presented for various construction equipment types in Table 6 and the construction vibration assessment methodology published by the FTA (2018), it is possible to estimate the potential project construction vibration levels. The FTA provides the following equation: [$PPVequip = PPVref \times (25/D)^{1.5}$]. Table 7 presents the expected project related vibration levels at a distance of 122 feet.

Table 7. Specific Plan Construction Vibration Levels at 122 Feet							
Receiver PPV Levels (in/sec)[1]					**Peak Vibration**	**Threshold**	**Exceed Threshold**
Small Bulldozer	**Jackhammer**	**Loaded Trucks**	**Large Bulldozer**	**Vibratory Roller**			
0.002	0.003	0.007	0.008	0.019	**0.019**	*0.2*	**No**

[1]Based on the Vibration Source Levels of Construction Equipment included on Table 6 (FTA 2018).

As shown in Table 7, vibration as a result of construction activities exceed would not exceed 0.2 PPV at the nearest structure. Thus, would not exceed the recommended threshold.

Operational Vibration Impacts

Project operations would not include the use of any stationary equipment that would result in excessive groundborne vibration levels. Therefore, the project would result in no groundborne vibration impacts during operations.

Would the Project Expose People Residing or Working in the Project Area to Excessive Airport Noise Levels?

The project site is located approximately 5.5 miles north of the Gillespie Field Airport. The proposed project is not located within an airport land use plan or within two miles of a public airport or public use airport. Implementation of the proposed project would not affect airport operations nor result in increased exposure of people working at or visiting the project site to aircraft noise.

Would the Project Result in a Cumulative Noise Impact?

Cumulative Construction Noise

Construction activities associated with the proposed project and other construction projects in the area may overlap, resulting in construction noise in the area. However, construction noise impacts primarily affect the areas immediately adjacent to the construction site. Construction noise for the proposed project would be less than significant following compliance with mitigation measures **NOI-1** and **NOI-2**. Cumulative development in the vicinity of the project site could result in elevated construction noise levels at sensitive receptors in the project area. However, each project would be required to comply with the applicable limitations on construction. Therefore, the project would not contribute to cumulative impacts during construction.

Cumulative Operational Noise

Cumulative long-term noise sources associated with development at the project, combined with other cumulative projects, could cause local noise level increases. Noise levels associated with the proposed project and related cumulative projects together could result in higher noise levels than considered separately. The project is proposing the construction of a 13,000 SF library facility in a highly developed area in the County. The contribution to mobile and stationary noise sources would be minimal and would not result in any substantial changes in the noise environment. Noise increase as a result of the project would not exceed County standards. Therefore, the project would not contribute to cumulative impacts during operations.

REFERENCES

Caltrans (California Department of Transportation). 2002. California Airport Land Use Planning Handbook.

____. 2020. Transportation- and Construction-Induced Vibration Guidance Manual.

FHWA (Federal Highway Administration). 2006. Roadway Construction Noise Model.

FTA (Federal Transit Administration). 2018. Transit Noise and Vibration Impact Assessment.

HMMH. 2006. Transit Noise and Vibration Impact Assessment, Final Report.

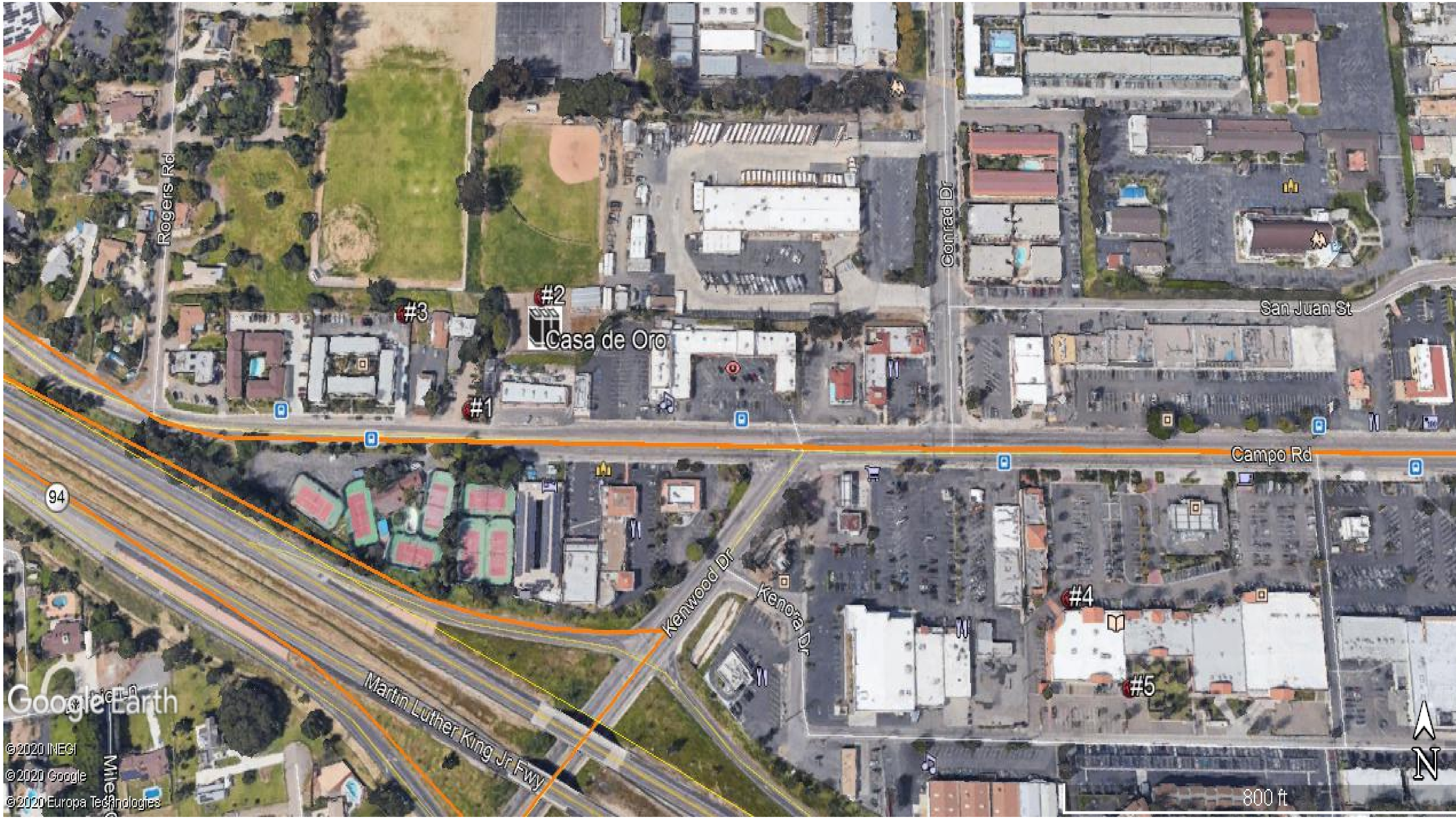
San Diego, County of. 2009. San Diego County Code, Chapter 4, Noise Abatement and Control, Section 36.404, General Sound Level Limits

____. 2011. San Diego County General Plan.

WEAL. 2000. Sound Transmission Sound Test Laboratory Report No. TL 96-186.

ATTACHMENT A

Baseline (Existing) Noise Measurements – Project Site and Vicinity



Map Date: *8/20-2020*
Photo (or Base) Source: *Google Earth*

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

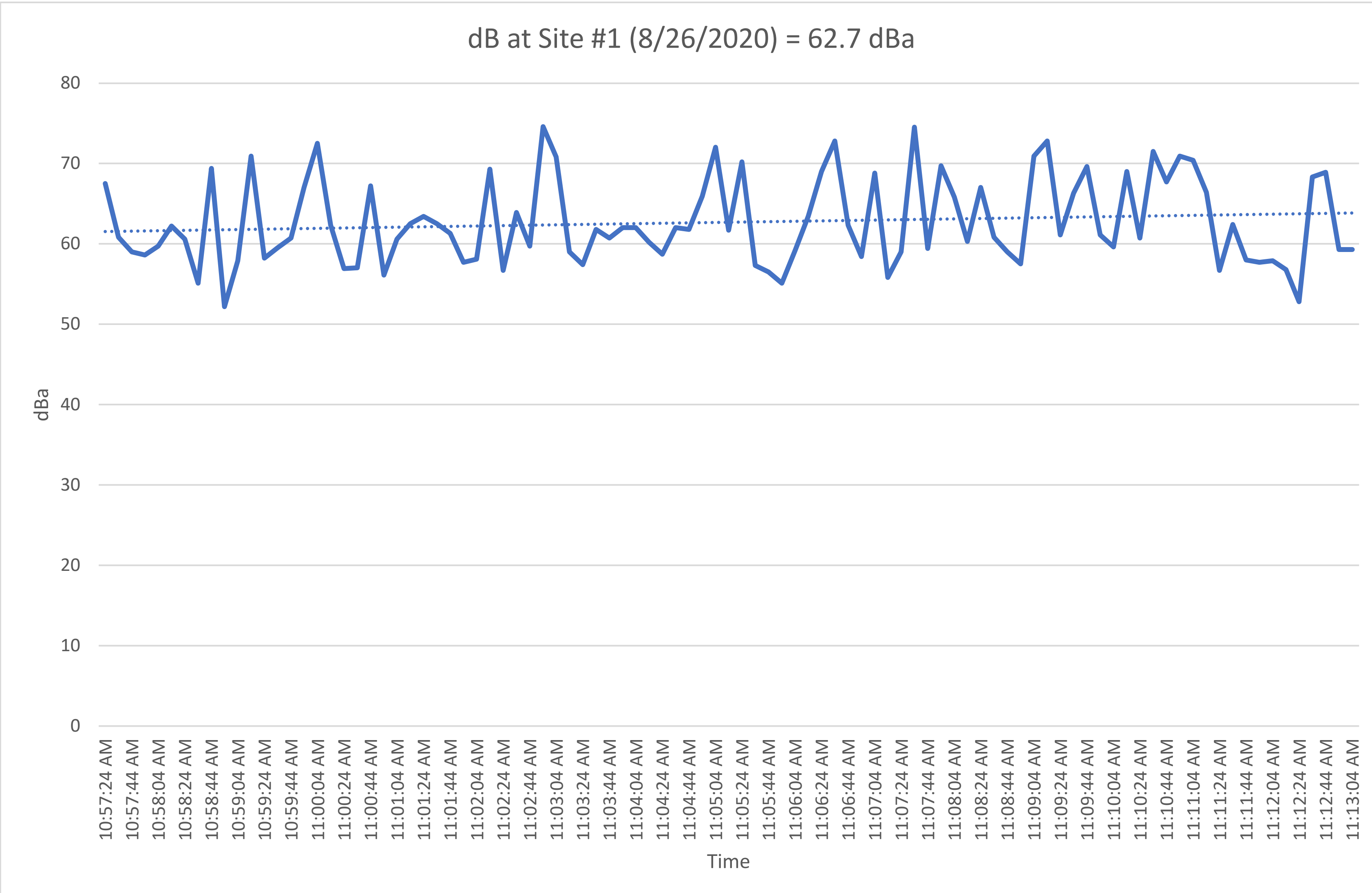
Baseline Noise Measurement Locations

2020-137.01

Site Number: 1			
Recorded By: Jessie Beckman			
Job Number: 2020-137.01			
Date: 8/26/2020			
Time: 10:57 a.m.			
Location: 956 Campo Road			
Source of Peak Noise: Vehicles on adjacent roadways			
Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
62.7	52.2	74.6	

Weather Data			
Est.	**Duration:** 15 minutes		**Sky:** Clear
	Note: dBA Offset = 0.01		**Sensor Height (ft):** 3.5 ft
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	0-3	81	29.97

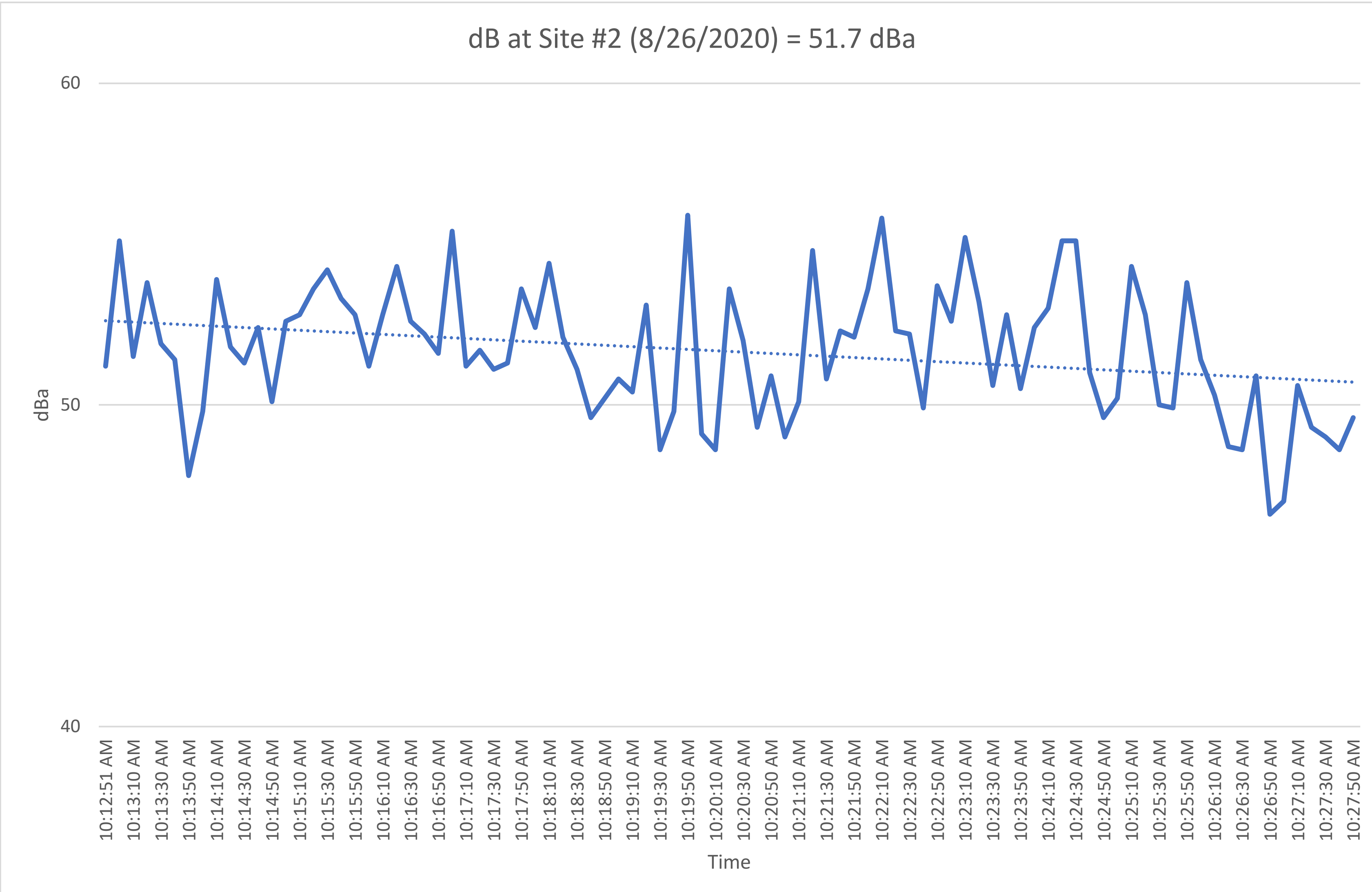
Photo of Measurement Location


dB at Site #1 (8/26/2020) = 62.7 dBa
dBa
80
70
60
50
40
30
20
10
0
Time
10:57:24 AM
10:57:44 AM
10:58:04 AM
10:58:24 AM
10:58:44 AM
10:59:04 AM
10:59:24 AM
10:59:44 AM
11:00:04 AM
11:00:24 AM
11:00:44 AM
11:01:04 AM
11:01:24 AM
11:01:44 AM
11:02:04 AM
11:02:24 AM
11:02:44 AM
11:03:04 AM
11:03:24 AM
11:03:44 AM
11:04:04 AM
11:04:24 AM
11:04:44 AM
11:05:04 AM
11:05:24 AM
11:05:44 AM
11:06:04 AM
11:06:24 AM
11:06:44 AM
11:07:04 AM
11:07:24 AM
11:07:44 AM
11:08:04 AM
11:08:24 AM
11:08:44 AM
11:09:04 AM
11:09:24 AM
11:09:44 AM
11:10:04 AM
11:10:24 AM
11:10:44 AM
11:11:04 AM
11:11:24 AM
11:11:44 AM
11:12:04 AM
11:12:24 AM
11:12:44 AM
11:13:04 AM

Site Number: 2			
Recorded By: Jessie Beckman			
Job Number: 2020-137.01			
Date: 8/26/2020			
Time: 10:12 a.m.			
Location: Edge of asphalt/baseball field north of the project site			
Source of Peak Noise: Vehicles on surrounding roadways			
Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
51.6	46.6	55.9	

Weather Data			
Est.	**Duration:** 15 minutes		**Sky:** Clear
	Note: dBA Offset = 0.01		**Sensor Height (ft):** 3.5 ft
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	0-3	81	29.97

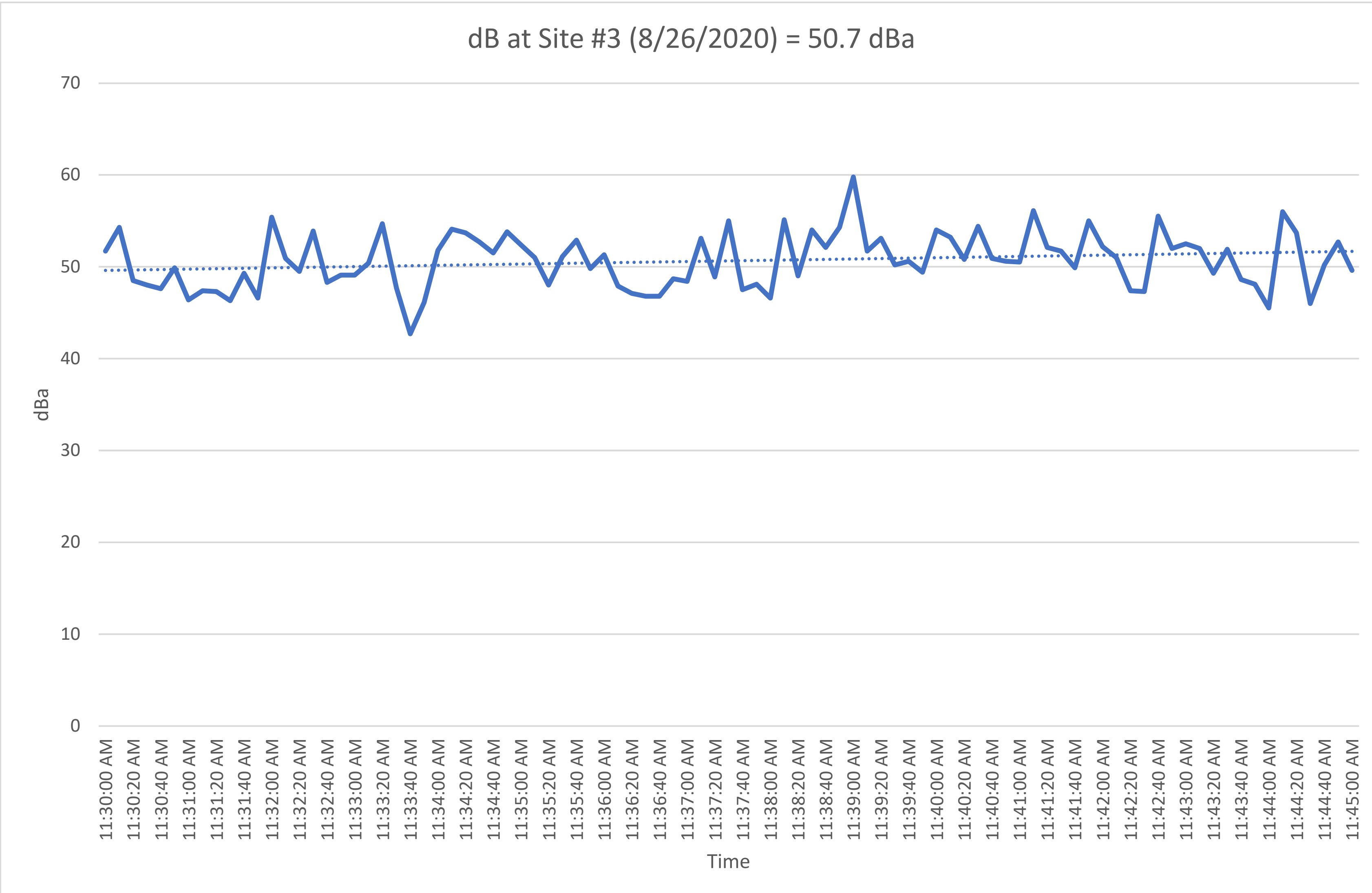
Photo of Measurement Location


dB at Site #2 (8/26/2020) = 51.7 dBa
60
50
40
dBa
10:12:51 AM
10:13:10 AM
10:13:30 AM
10:13:50 AM
10:14:10 AM
10:14:30 AM
10:14:50 AM
10:15:10 AM
10:15:30 AM
10:15:50 AM
10:16:10 AM
10:16:30 AM
10:16:50 AM
10:17:10 AM
10:17:30 AM
10:17:50 AM
10:18:10 AM
10:18:30 AM
10:18:50 AM
10:19:10 AM
10:19:30 AM
10:19:50 AM
10:20:10 AM
10:20:30 AM
10:20:50 AM
10:21:10 AM
10:21:30 AM
10:21:50 AM
10:22:10 AM
10:22:30 AM
10:22:50 AM
10:23:10 AM
10:23:30 AM
10:23:50 AM
10:24:10 AM
10:24:30 AM
10:24:50 AM
10:25:10 AM
10:25:30 AM
10:25:50 AM
10:26:10 AM
10:26:30 AM
10:26:50 AM
10:27:10 AM
10:27:30 AM
10:27:50 AM
Time

Site Number: 3			
Recorded By: Jessie Beckman			
Job Number: 2020-137.01			
Date: 8/26/2020			
Time: 11:30 a.m.			
Location: Behind the Casa De Oro Senior Apartments			
Source of Peak Noise: Vehicles on surrounding roadways			
Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
50.6	42.7	59.8	

Weather Data			
Est.	**Duration:** 15 minutes		**Sky:** Clear
	Note: dBA Offset = 0.01		**Sensor Height (ft):** 3.5 ft
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	0-3	81	29.97

Photo of Measurement Location

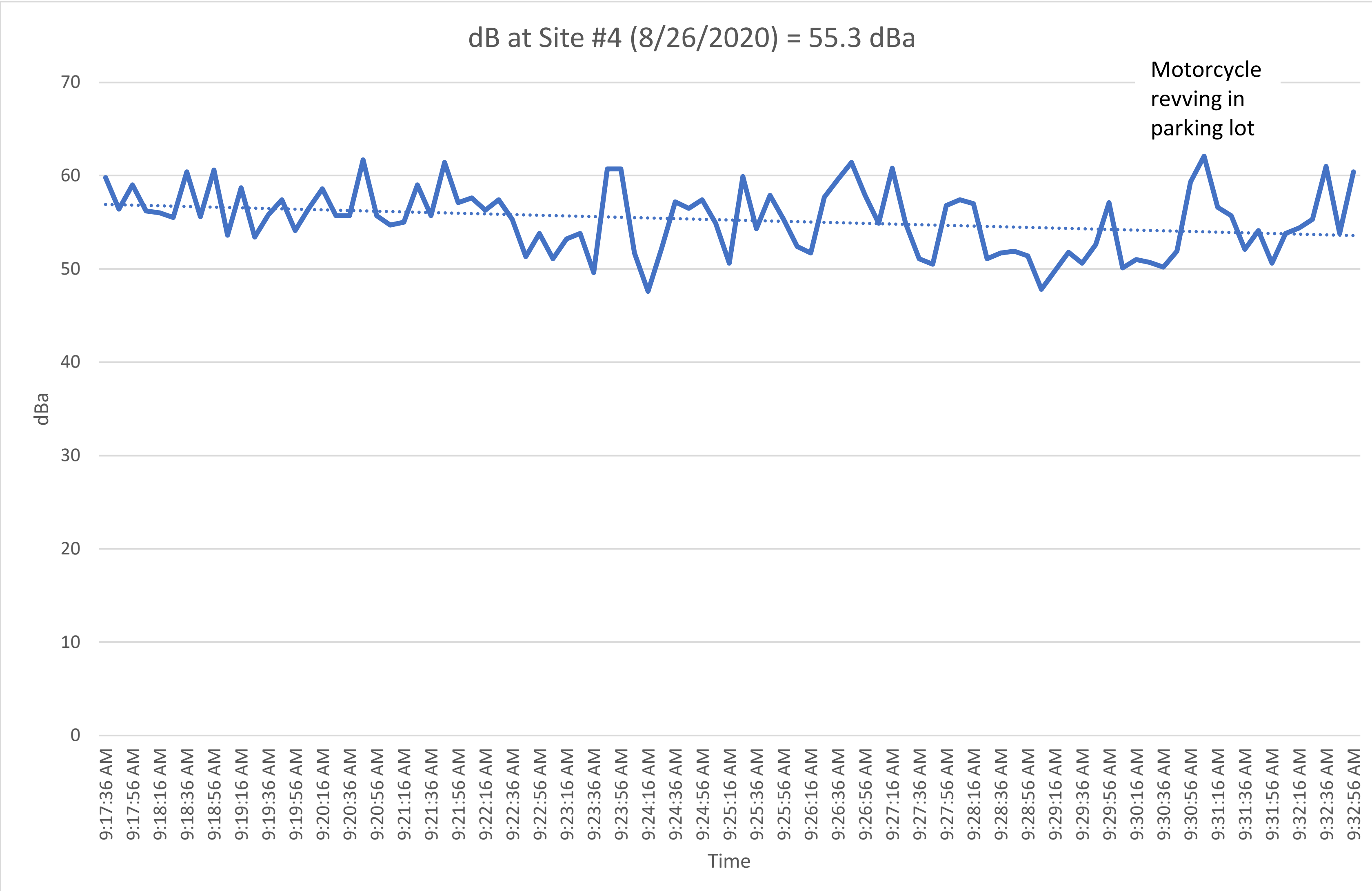


dB at Site #3 (8/26/2020) = 50.7 dBa
dBa
70
60
50
40
30
20
10
0
11:30:00 AM
11:30:20 AM
11:30:40 AM
11:31:00 AM
11:31:20 AM
11:31:40 AM
11:32:00 AM
11:32:20 AM
11:32:40 AM
11:33:00 AM
11:33:20 AM
11:33:40 AM
11:34:00 AM
11:34:20 AM
11:34:40 AM
11:35:00 AM
11:35:20 AM
11:35:40 AM
11:36:00 AM
11:36:20 AM
11:36:40 AM
11:37:00 AM
11:37:20 AM
11:37:40 AM
11:38:00 AM
11:38:20 AM
11:38:40 AM
11:39:00 AM
11:39:20 AM
11:39:40 AM
11:40:00 AM
11:40:20 AM
11:40:40 AM
11:41:00 AM
11:41:20 AM
11:41:40 AM
11:42:00 AM
11:42:20 AM
11:42:40 AM
11:43:00 AM
11:43:20 AM
11:43:40 AM
11:44:00 AM
11:44:20 AM
11:44:40 AM
11:45:00 AM
Time

Site Number: 4			
Recorded By: Jessie Beckman			
Job Number: 2020-137.01			
Date: 8/26/2020			
Time: 9:17 a.m.			
Location: Grocery Outlet parking lot off Campo Road			
Source of Peak Noise: Vehicles on surrounding roadways and cars passing in the parking lot			
Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
55.2	47.6	62.1	

Weather Data			
Est.	**Duration:** 15 minutes		**Sky:** Clear
	Note: dBA Offset = 0.01		**Sensor Height (ft):** 3.5 ft
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	0-3	81	29.97

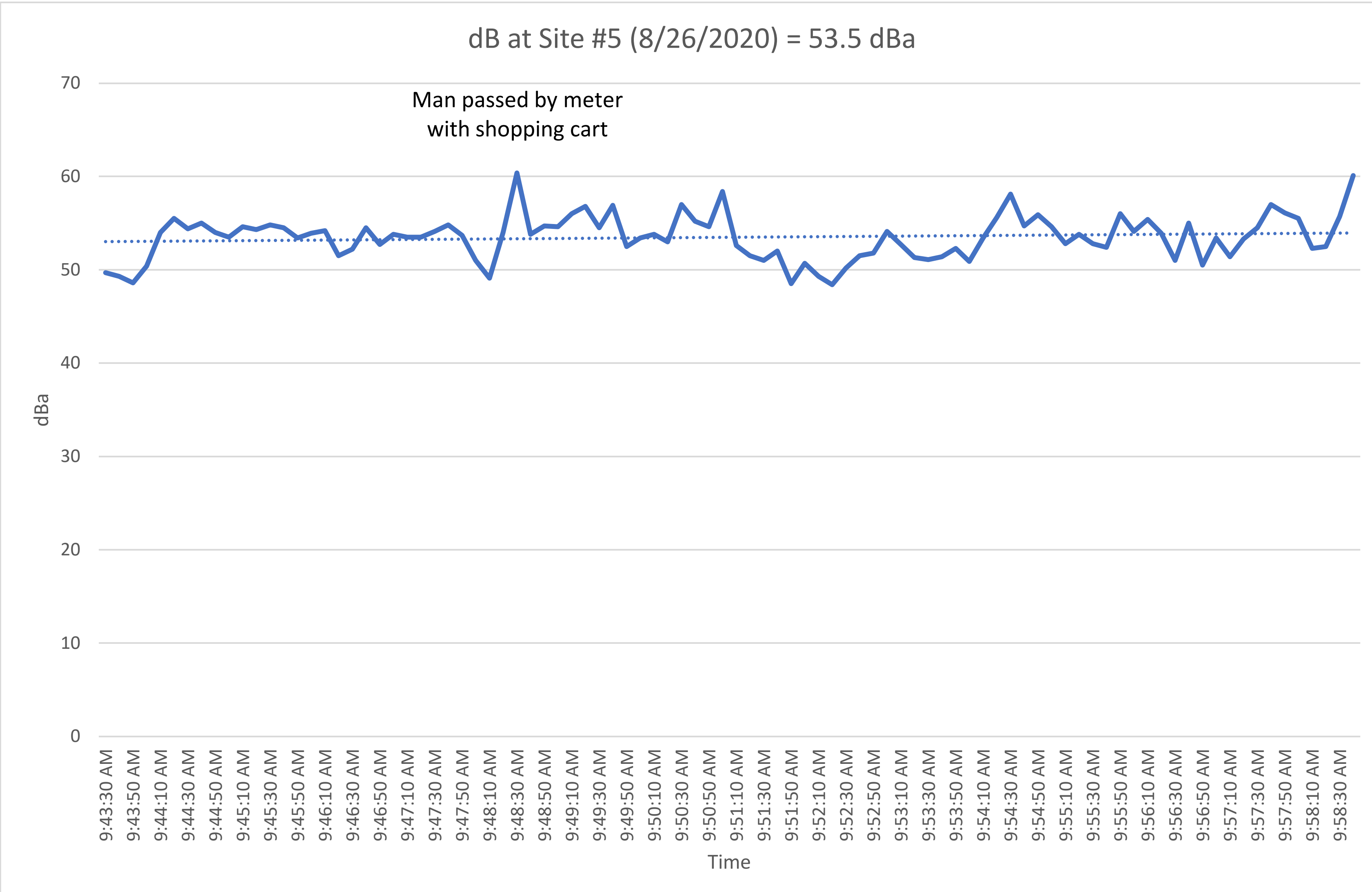
Photo of Measurement Location


dB at Site #4 (8/26/2020) = 55.3 dBa
Motorcycle revving in parking lot
dBa
70
60
50
40
30
20
10
0
9:17:36 AM
9:17:56 AM
9:18:16 AM
9:18:36 AM
9:18:56 AM
9:19:16 AM
9:19:36 AM
9:19:56 AM
9:20:16 AM
9:20:36 AM
9:20:56 AM
9:21:16 AM
9:21:36 AM
9:21:56 AM
9:22:16 AM
9:22:36 AM
9:22:56 AM
9:23:16 AM
9:23:36 AM
9:23:56 AM
9:24:16 AM
9:24:36 AM
9:24:56 AM
9:25:16 AM
9:25:36 AM
9:25:56 AM
9:26:16 AM
9:26:36 AM
9:26:56 AM
9:27:16 AM
9:27:36 AM
9:27:56 AM
9:28:16 AM
9:28:36 AM
9:28:56 AM
9:29:16 AM
9:29:36 AM
9:29:56 AM
9:30:16 AM
9:30:36 AM
9:30:56 AM
9:31:16 AM
9:31:36 AM
9:31:56 AM
9:32:16 AM
9:32:36 AM
9:32:56 AM
Time

Site Number: 5			
Recorded By: Jessie Beckman			
Job Number: 2020-137.01			
Date: 8/26/2020			
Time: 9:43			
Location: Behind Grocery Outlet			
Source of Peak Noise: Vehicles on surrounding roadways and cars passing in the parking lot			
Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
53.4	48.4	60.4	

Weather Data			
Est.	**Duration:** 15 minutes		**Sky:** Clear
	Note: dBA Offset = 0.01		**Sensor Height (ft):** 3.5 ft
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	0-3	81	29.97

Photo of Measurement Location



dB at Site #5 (8/26/2020) = 53.5 dBa
Man passed by meter with shopping cart
dBa
70
60
50
40
30
20
10
0
9:43:30 AM
9:43:50 AM
9:44:10 AM
9:44:30 AM
9:44:50 AM
9:45:10 AM
9:45:30 AM
9:45:50 AM
9:46:10 AM
9:46:30 AM
9:46:50 AM
9:47:10 AM
9:47:30 AM
9:47:50 AM
9:48:10 AM
9:48:30 AM
9:48:50 AM
9:49:10 AM
9:49:30 AM
9:49:50 AM
9:50:10 AM
9:50:30 AM
9:50:50 AM
9:51:10 AM
9:51:30 AM
9:51:50 AM
9:52:10 AM
9:52:30 AM
9:52:50 AM
9:53:10 AM
9:53:30 AM
9:53:50 AM
9:54:10 AM
9:54:30 AM
9:54:50 AM
9:55:10 AM
9:55:30 AM
9:55:50 AM
9:56:10 AM
9:56:30 AM
9:56:50 AM
9:57:10 AM
9:57:30 AM
9:57:50 AM
9:58:10 AM
9:58:30 AM
Time

ATTACHMENT B

Federal Highway Administration Highway Noise Prediction Model (FHWA-RD-77-108) Outputs – Project Traffic Noise

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: 2020-137.01
Project Name: Casa de Oro

Background Information

Model Description:	FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes:	Michael Baker International 2020
Community Noise Descriptor:	L_{dn}: ______ CNEL: x

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Analysis Condition Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	CNEL at 100 Feet	Distance to Contour: 70 CNEL	65 CNEL	60 CNEL	55 CNEL	Calc Dist	Traffic Volumes: Day	Eve	Night
Existing																
Campo Road																
West of the project driveway	2	0	4,113	35	0.5	1.8%	0.7%	**54.8**	-	-	45	97	100	3,196	522	395
Between the project driveway and Kenwood Drive	2	0	2,646	35	0.5	1.8%	0.7%	**52.9**	-	-	34	72	100	2,056	336	254
Kenwood Drive																
South of Campo Road	2	0	5,494	35	0.5	1.8%	0.7%	**56.1**	-	-	55	118	100	4,269	698	527
Conrad Drive																
North of Campo Road	4	0	1,683	35	0.5	1.8%	0.7%	**51.0**	-	-	-	54	100	1,308	214	162

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: 2020-137.01
Project Name: Casa de Oro

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: Michael Baker International
Community Noise Descriptor: L_{dn}: ____ CNEL: x

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Analysis Condition Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	Distance from Centerline of Roadway CNEL at 100 Feet	Distance to Contour 70 CNEL	65 CNEL	60 CNEL	55 CNEL	Calc Dist	Traffic Volumes Day	Eve	Night
Existing + Project																
Campo Road																
West of the project driveway	2	0	4,194	35	0.5	1.8%	0.7%	**54.9**	-	-	46	98	100	3,259	533	403
Between the project driveway and Kenwood Drive	2	0	2,956	35	0.5	1.8%	0.7%	**53.4**	-	-	36	78	100	2,297	375	284
Kenwood Drive																
South of Campo Road	2	0	6,075	35	0.5	1.8%	0.7%	**56.5**	-	-	58	126	100	4,720	772	583
Conrad Drive																
North of Campo Road	4	0	1,728	35	0.5	1.8%	0.7%	**51.1**	-	-	-	55	100	1,343	219	166

ATTACHMENT C

Federal Highway Administration Highway Roadway Construction Noise Model – Project Construction Noise

Report date: 9/17/2020
Case Description: Demolition

Description	**Affected Land Use**
Demolition	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Concrete Saw	No	20		89.6	122
Dozer	No	40		81.7	122
Tractor	No	40	84		122
Tractor	No	40	84		122
Tractor	No	40	84		122

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Concrete Saw		81.8	74.8
Dozer		73.9	69.9
Tractor		76.3	72.3
Tractor		76.3	72.3
Tractor		76.3	72.3
	Total	**81.8**	**79.6**

*Calculated Lmax is the Loudest value.

Report date: 9/17/2020
Case Description: Site Preparation

Description	**Affected Land Use**
Site Preparation	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Water Truck	No	20		92.1	122
Grader	No	40	85		122
Tractor	No	40	84		122
Dozer	No	40		81.7	122

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Water Truck		84.4	77.4
Grader		77.3	73.3
Tractor		76.3	72.3
Dozer		73.9	69.9
	Total	**84.4**	**80.1**

*Calculated Lmax is the Loudest value.

Report date: 9/17/2020
Case Description: Grading

Description	**Affected Land Use**
Grading	Residential

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)
Water Truck	No	20		92.1	122
Dozer	No	40		81.7	122
Dozer	No	40		81.7	122
Tractor	No	40	84		122
Grader	No	40	85		122
Grader	No	40	85		122
Scraper	No	40		83.6	122
Scraper	No	40		83.6	122
Compactor (ground)	No	20		83.2	122
Roller	No	20		80	122

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Water Truck		84.4	77.4
Dozer		73.9	69.9
Dozer		73.9	69.9
Tractor		76.3	72.3
Grader		77.3	73.3
Grader		77.3	73.3
Scraper		75.8	71.9
Scraper		75.8	71.9
Compactor (ground)		75.5	68.5
Roller		72.3	65.3
	Total	**84.4**	**82.4**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/17/2020
Case Description: Paving

Description	**Affected Land Use**
Paving	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Concrete Mixer Truck	**No**	**40**		**78.8**	**122**
Paver	No	50		77.2	122
Roller	No	20		80	122
Tractor	No	40	84		122
Pavement Scarafier	No	20		89.5	122

Calculated (dBA)

Equipment	***Lmax**	**Leq**
Concrete Mixer Truck	71.1	67.1
Paver	69.5	66.5
Roller	72.3	65.3
Tractor	76.3	72.3
Pavement Scarafier	81.8	74.8
Total	**81.8**	**77.8**

*Calculated Lmax is the Loudest value.

Report date: 9/17/2020
Case Description: Building Construction

Description	**Affected Land Use**
Building Construction	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Generator	No	50		80.6	122
Crane	No	16		80.6	122
Gradall	No	40		83.4	122
Tractor	No	40	84		122
Welder / Torch	No	40		74	122
Welder / Torch	No	40		74	122
Welder / Torch	No	40		74	122

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Generator		72.9	69.9
Crane		72.8	64.8
Gradall		75.7	71.7
Tractor		76.3	72.3
Welder / Torch		66.3	62.3
Welder / Torch		66.3	62.3
Welder / Torch		66.3	62.3
	Total	**76.3**	**76.9**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/17/2020
Case Description: Architectural Coating

Description	Affected Land Use
Architectural Coating	Residential

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)
Compressor (air)	No	40		77.7	122

Calculated (dBA)

Equipment		*Lmax	Leq
Compressor (air)		69.9	65.9
	Total	**69.9**	**65.9**

*Calculated Lmax is the Loudest value.