Viejas Casino & Resort – Phase 3 Project Draft TEIR

Appendix E

Noise Study

Prepared by Birdseye Planning Group

August 2016

VIEJAS CASINO AND RESORT PHASE 3 PROJECT

NOISE STUDY

Prepared for:

BRG Consultants, Inc.

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August 2016

NOISE IMPACT STUDY

VIEJAS CASINO AND RESORT - PHASE 3 PROJECT

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Viejas Casino and Resort Phase 3 Project
San Diego County, California
Noise Study

Table of Contents

Page

List of Figures

List of Tables

Appendices

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Viejas Casino and Resort - Phase 3 Project
San Diego County, California
NOISE STUDY

This report is an analysis of the potential noise impacts associated with the Viejas Casino and Resort - Phase 3 Project proposed for construction on the Viejas Reservation in unincorporated San Diego County. The report has been prepared by Birdseye Planning Group under contract to BRG Consulting, Inc., to support preparation of the Tribal Environmental Impact Report (TEIR). The TEIR will be prepared consistent with Tribal Gaming Compact Section 10.8 which defines the scope of activities required to evaluate off-Reservation impacts associated with activities occurring on the reservation. This study analyzes the potential for temporary impacts associated with construction activity and long-term impacts associated with operation of the proposed project. The analysis herein is based partially on traffic volumes provided by Linscott, Law and Greenspan Traffic Engineers, (June, 2016).

PROJECT DESCRIPTION

The proposed Viejas Casino and Resort - Phase 3 Project (project) would construct and operate a third hotel, demolish and reconstruct a portion of the existing Casino and make interior renovations to the existing Casino. There is no net change in gaming space as a result of construction, reconstruction or renovations.

The proposed five-story hotel will accommodate up to 170 all-suite rooms plus one basement level for back of house functions including service kitchens and offices. Amenities include a full service spa with private pool located at the main level of the hotel and an outside hotel pool with bar service.

A portion of the existing Casino will be demolished and reconstructed in place and a portion will be renovated. Casino amenities include three restaurant/bar venues.

A new bus terminal and bus drop off area will be constructed near the existing Casino's northwest entry and a new casino walk will provide access to the proposed hotel. The valet will be relocated to the new hotel porte cochère.

The total project building area is approximately 215,000 square feet (sq. ft.) consisting of: 165,000 sq. ft. of hotel including a 9,000 sq. ft. spa; 20,000 sq. ft. of demolished and replaced in kind Casino; 20,000 sq. ft. of existing Casino renovation; 9,750 sq. ft. of restaurants/kitchen; and, a 1,900 sq. ft. bus depot. The total project landscaped area is approximately 200,000 sq. ft.

All new construction work, renovation and landscaping will occur on existing developed land (existing parking lot and existing Casino) within an approximately 280,000 sq. ft. project footprint area. The project site is depicted in Figure 1.

Construction would generally occur between the hours of 7:00 a.m. and 7:00 p.m. Monday through Saturday in accordance with San Diego County Code Section 36.408.

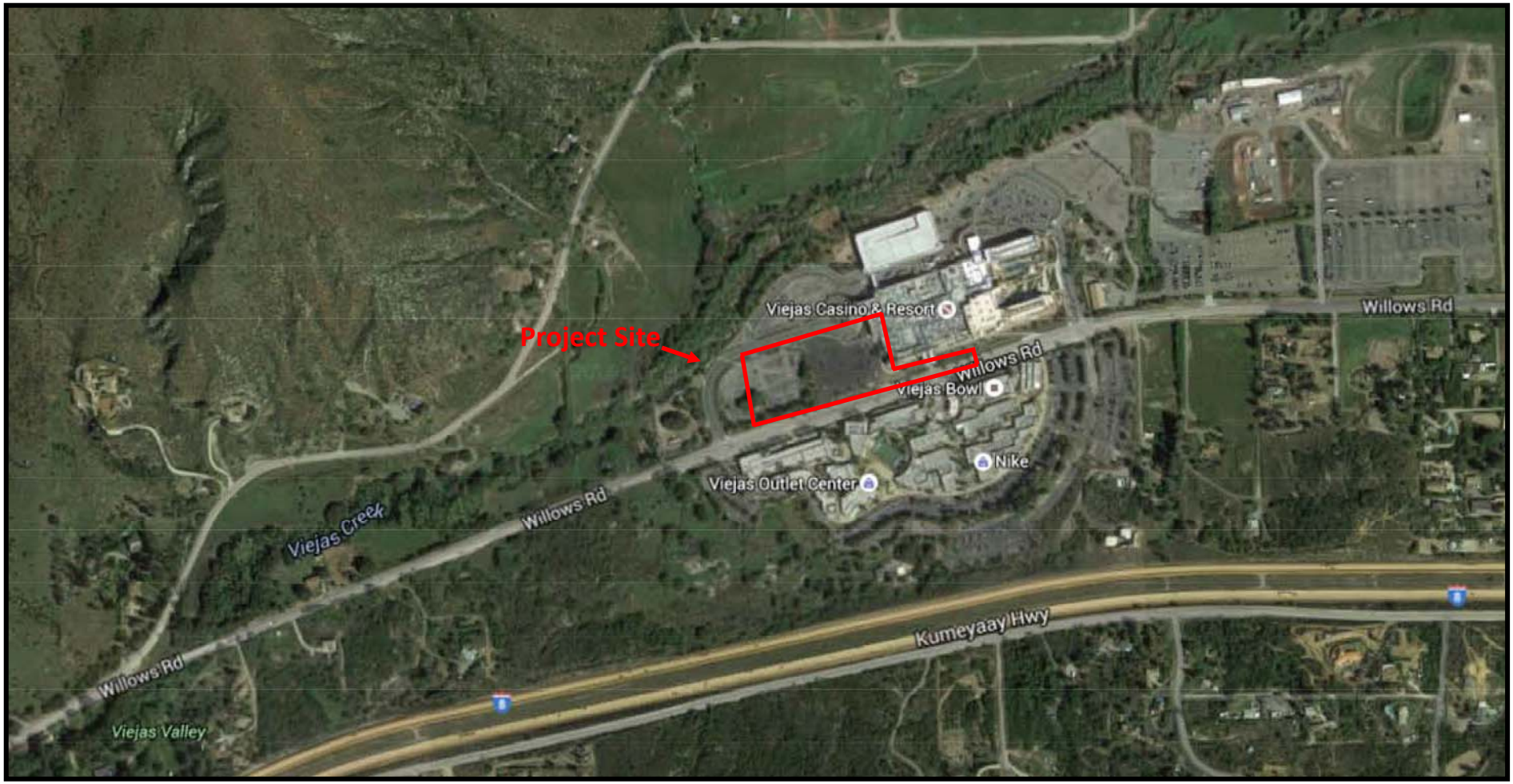

FIGURE 1

Vicinity Map/Project Site

The Phase 3 project described herein would be constructed in proximity to the Viejas Hotel South Tower project which underwent environmental review in 2014. The South Tower project constructed an approximately 128-room, 6-story hotel, additional gaming space, a basement kitchen, ballroom, pre-function terrace, meeting rooms, bar, retail, and pool area adjacent to the existing Viejas Casino.

REGULATORY 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 (such as industrial machinery and commercial HVAC units). 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 is generally 30 dBA or more (HMMH, 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 noise that 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.

Regulatory Setting

In 1976, the California Department of Health, State Office of Noise Control published a recommended noise/land use compatibility matrix which many jurisdictions have adopted as a standard in their general plan noise elements. This matrix indicates that residential land uses and other noise sensitive receptors generally should locate in areas where outdoor ambient noise levels do not exceed 65 to 70 dBA (CNEL or Ldn).

County of San Diego Code

The County of San Diego Code has the following noise restrictions.

Section 36.408: Hours of Operation of Construction Equipment

Except for emergency work, it shall be unlawful for any person to operate or cause to be operated, construction equipment:

a. Between 7 p.m. and 7 a.m.

b. On a Sunday or a holiday. For purposes of this section, a holiday means January 1st, the last Monday in May, July 4th, the first Monday in September, December 25th and any day appointed by the President as a special national holiday or the Governor of the State as a special State holiday. A person may; however, operate construction equipment on a Sunday or holiday between the hours of 10 a.m. and 5 p.m. at the person's residence or for the purpose of constructing a residence for himself or herself, provided that the operation of construction equipment is not carried out for financial consideration or other consideration of any kind and does not violate the limitations in sections 36.409 and 36.410.

Section 36.409: Sound Level Limitations on Construction Equipment

Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceeds an average sound level of 75 decibels for an eight-hour period, between 7 a.m. and 7 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

Operational Noise

Section 36.404: General Sound Level Limits

Section 36.404 of the County of San Diego noise ordinance provides performance standards and noise control guidelines for determining and mitigating non-transportation, or stationary noise source impacts. The County Noise Ordinance prohibits any person to cause or allow the creation of any noise to the extent that the one-hour average sound level, at any point on or beyond the boundaries of the property exceeds the applicable limits. Section 36.404 of the County of San Diego Code sets a most restrictive operational exterior noise limit for residential noise sensitive land uses of 50 dBA Leq for daytime hours of 7 a.m. to 10 p.m. and 45 dBA Leq during the noise sensitive nighttime hours of 10 p.m. to 7 a.m.

Section 36.410: Impulse Noise

Section 36.410 of the San Diego County Code states that in addition to general limitations on sound levels in section 36.404 and limitations on construction equipment in Section 36.409, except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive (short-term, one second or less such as a gunshot, explosion or noise from construction equipment) sound level that exceeds 82 dBA within residential, village zoning or civic use areas when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c). The maximum sound level depends on the use being made of the occupied property.

Subsection (c) states that the minimum measurement period for any measurements conducted under this section shall be one hour. During the measurement period a measurement shall be conducted every minute from a fixed location on an occupied property. The measurements shall measure the maximum sound level during each minute of the measurement period. If the sound level caused by construction equipment or the producer of the impulsive noise, exceeds the maximum sound level for any portion of any minute it will deemed that the maximum sound level was exceeded during that minute.

Impulse noise is typically related to construction where pile driving and use of explosives is required. These construction techniques are not required for the proposed project; thus, impulse noise is not expected to occur during construction or operation of the project.

Vibration Standards

County of San Diego Guidelines provide construction-related vibration thresholds based on those established in the Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment* (May 2006). The FTA thresholds are used as guidelines rather than standards; and thus, are discussed below.

ENVIRONMENTAL SETTING

SENSITIVE RECEPTORS

The County of San Diego City Guidelines for Determining Significance - Noise (January, 2009) includes a variety of land use and development types that are noise sensitive. Noise sensitive receptors include residences, schools, churches, and hospitals and convalescent care facilities. The sensitive receptors in proximity to the project site are all single-family residences and are shown on Figure 2. The nearest receptor is located approximately 1,400 feet northwest of the site along Viejas Grade Road (R2). The second is a residential property located approximately 1,750 feet southeast of the project site on the south side of Willows Road east of the Viejas Outlet Center (R1). The third is a residential area located along Willows Road adjacent to the western reservation boundary and approximately one mile from the project site (R3).

IMPACT ANALYSIS

METHODOLOGY AND SIGNIFICANCE THRESHOLDS

This section describes the methodology used to establish baseline (ambient) noise conditions at the nearest sensitive off-Reservation receptors and identifies the approach used to identify potential construction and operational impacts associated with the project. Whether changes in noise levels would be significant are determined by comparing the project-related changes to significance thresholds also identified herein.

Baseline Measured Noise Levels. The most common and primary sources of noise in the project site vicinity are motor vehicles (e.g., automobiles, buses, trucks, and motorcycles) along Willows Road. Interstate 8 is located south of the site but is not audible over the traffic noise on Willows Road. Motor vehicle noise is of concern because it is characterized by a high number of individual events, which often create a sustained noise level, and because of its proximity to noise sensitive uses. Activities associated with the existing hotel, including the outdoor physical plant area located at the east end of the existing complex are audible from outside the hotel. No other noise sources are near the project site.

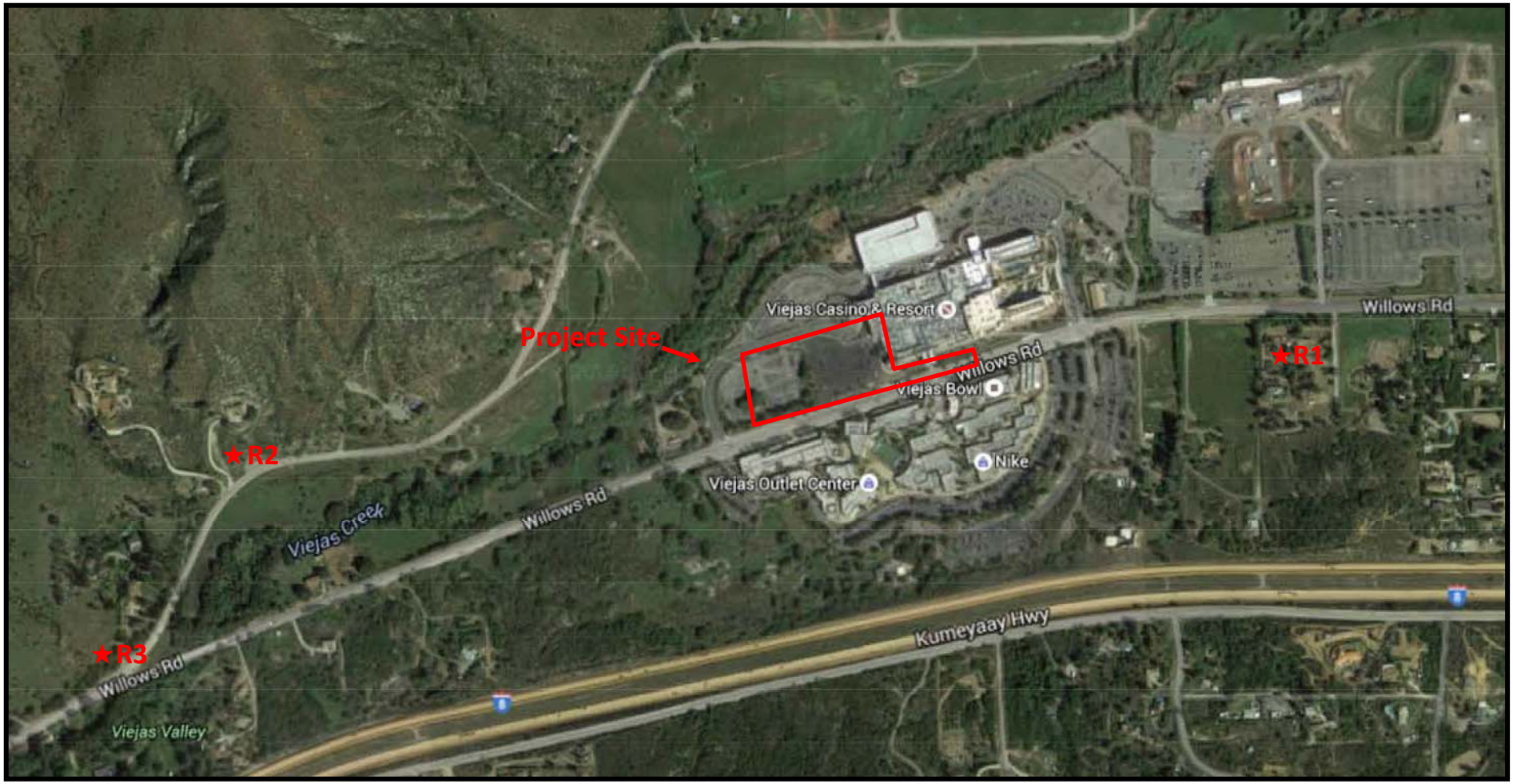

FIGURE 2

Noise Receptors

Three weekday morning 15-minute noise measurements were taken in proximity to the project site on April 4, 2016, using an ANSI Type II integrating sound level meter. These noise measurements provide an estimate of the general noise environment at the nearest sensitive properties located off the Reservation (R1, R2 and R3 described above). The only noise source in the area during monitoring was traffic on Willows Road (Monitoring Sites 1 and 3) and Viejas Grade Road (Monitoring Site 2). Monitoring sites are shown in Figure 3. Table 1 identifies the noise measurement locations and measured noise levels. As shown, existing noise levels ranged from 68.5 dBA to 52.3 dBA Leq during the morning monitoring period. The Leq at the properties along Willows Road closest to the Reservation boundary are 55.5 on the east end of the existing casino resort development and 68.5 on the west end.

Table 1
Noise Monitoring Results

Measurement Location	Primary Noise Source	Sample Time	Leq (dBA)
Monitoring Site 1: South side of parking lot 600' east of existing casino/resort entrance approximately 40 feet from the centerline.	Traffic	Weekday – 11:00 – 11:15 a.m.	55.5
Monitoring Site 2: East side of Viejas Grade adjacent to Reservation boundary adjacent to single family residences	Traffic	Weekday– 11:45 to 12:00 p.m.	52.3
Monitoring Site 3: South side of Willows Road adjacent to western Reservation boundary and single family residences	Traffic	Weekday 12:15 to 12:30 p.m.	68.5

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

The temperature during monitoring was 60 degrees Fahrenheit with no measurable wind. During monitoring, approximately 19 cars/light trucks, 3 medium trucks (i.e., two axles, six tires) and 3 heavy trucks (i.e., 18-wheel tractor/trailer) passed Monitoring Site 1 during the 15 minute period. Approximately 13 cars/light trucks; 0 medium trucks and 1 heavy trucks passed Monitoring Site 2. During the third monitoring period, 103 cars/trucks, 2 medium trucks and 1 heavy truck passed Site 3.

Traffic volumes and mix were similar between Site 1 and 2. The majority of the traffic and highest existing noises levels are along Willows Road west of the Reservation and reflect higher volumes traveling between I-8 and the Viejas Resort area.

Determining Construction Noise Levels. Construction noise estimates are based upon construction equipment reference noise levels reported by the Federal Highway Administration in Table 1 of the Roadway Construction Noise Model (2006) User's Guide (see Table 2 below). Reference noise levels are 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). A construction noise level of 75 dBA, as defined in Section 36.409 of the San Diego County Code, was used to determine whether construction noise could adversely impact off-

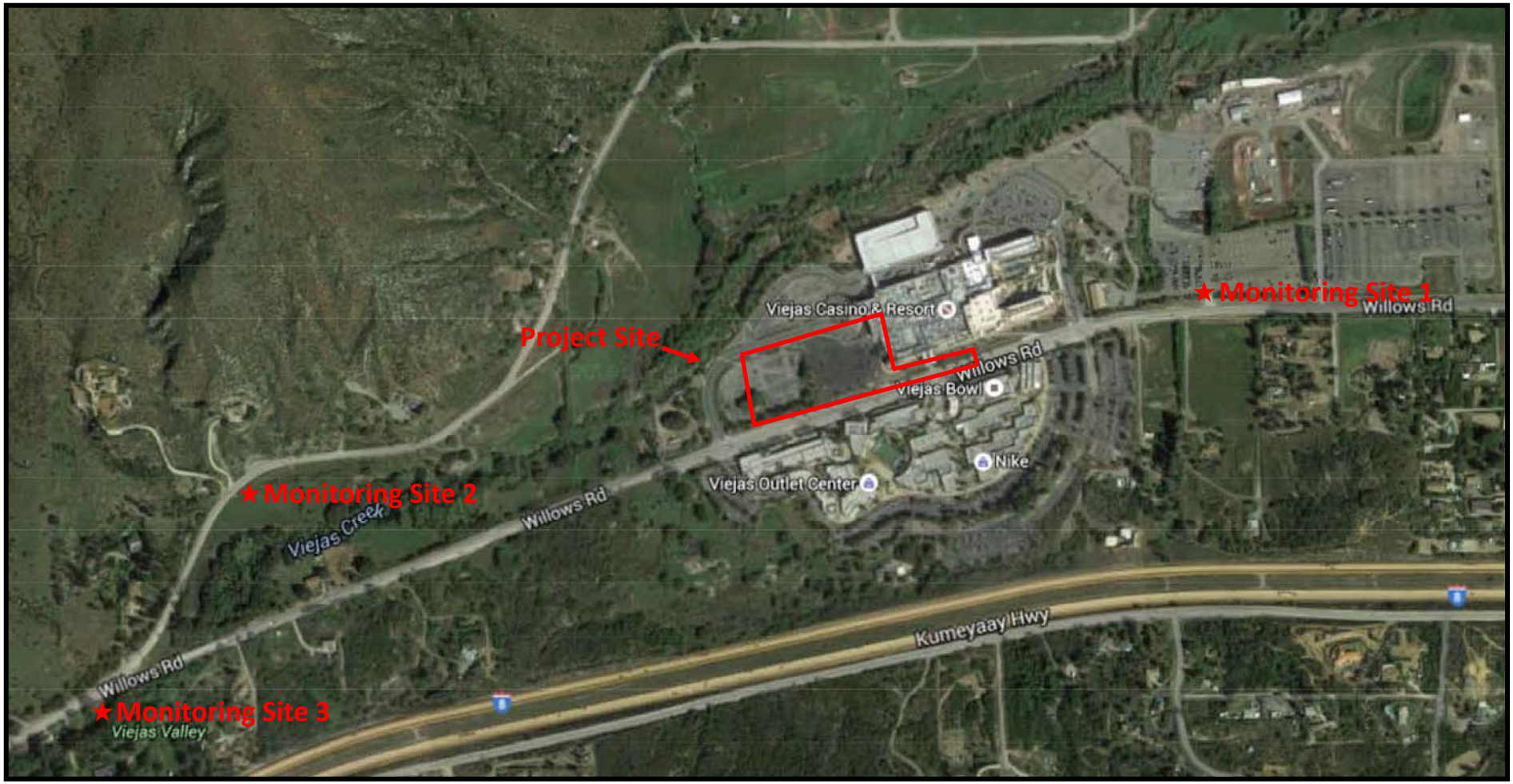

FIGURE 3

Monitoring Locations

Reservation sensitive receptors. The calculations focused on construction noise levels at R2 as that receiver is the closest line of sight receiver to the construction area.

Determining Operational Noise Levels. Noise levels associated with both traffic volumes and operation of the roof-top HVAC units installed as part of the project were calculated to determine whether the project would have operational impacts. Noise levels associated with existing and future traffic along Willows Road was calculated using the Traffic Noise Model Version 2.5 (U.S. Department of Transportation, Federal Highway Administration [FHWA], April 2004) (noise modeling data sheets are provided in Appendix A). The model calculations are based in part on traffic data provided by Linscott, Law and Greenspan, Inc. (June, 2016). Traffic noise levels were calculated for R1 and R3 as both are located off-Reservation adjacent to the east (R1) and west (R3) Reservation boundary. Traffic volumes on Viejas Grade Road were not evaluated in the traffic study. Thus, traffic volumes and related noise levels at R2 are not expected to change as a result of the project.

Operational noise associated with the roof top HVAC units was calculated at R2 based on reference noise levels associated with each unit and distance attenuation between the source and receiving properties. The R2 property is the nearest line of sight off-Reservation property to the project site.

Thresholds of Significance. The Viejas Tribe has not developed or adopted noise standards related to the proposed project nor are federal or local regulations directly applicable to the proposed project. Thresholds of significance used in this analysis for impacts affecting off-Reservation are those in Appendix B of the *Amended and Restated Tribal State Compact Between the State of California and the Viejas Band of Kumeyaay Indians*. Whether project related noise levels would create a significant impact related to those thresholds are based on the County of San Diego noise standards described above. The proposed project would have a significant noise impact if it would result in:

a) *Exposure of off-Reservation persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?*

b) *Exposure of off-Reservation persons to excessive groundborne vibration or groundborne noise levels?*

c) *A substantial permanent increase in ambient noise levels in the off-Reservation vicinity of the project?*

d) *A substantial, temporary or periodic increase in ambient noise levels in the off-Reservation vicinity of the project?*

Construction-related would be a temporary significant impact it would exceed 75 dBA at off-Reservation receivers.

Where existing/ambient noise levels exceed 50 dBA, the County of San Diego Guidelines for Determining Significance - Noise (January, 2009) states an increase of 10 dBA CNEL is considered a significant impact. Because Leq is louder than the CNEL, use of the Leq metric provides a more conservative evaluation of impacts. Because ambient noise levels at the three receptors evaluated exceeds 50 dBA (see Table 1), project-related traffic noise that exceeds measured noise levels by 10 dBA or more, is considered a significant permanent noise impact.

Noise levels associated with the rooftop HVAC system are compared to the 50 dBA day time standard and 45 dBA night time standard for non-transportation or stationary sources referenced in Section 36.404 of the County of San Diego County Code. Noise related to HVAC operation noise that exceeds these standards at off-Reservation receivers would be considered a significant permanent noise impact.

As referenced above, the FTA vibration guidelines are used herein to describe potential impacts associate with vibration. A vibration level of 72 VdB is used for residences and buildings where people normally sleep (i.e., hotels) to determine whether project-related vibration would adversely affect people. The vibration threshold used for the proposed project is 72 VdB as residences are the only off-Reservation receptors that would be affected by the project. Vibration levels that would exceed 72 VdB would cause a potentially significant permanent impact to off-Reservation receivers.

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 known to occur in the immediate vicinity off-Reservation. Thus, 100 VdB is used to conservatively quantify potential vibration impacts to neighboring structures. Vibration levels that would exceed 100 VdB may have a temporary significant vibration impact to structures. Because operation of the proposed project would not create vibration, only construction-related vibration impacts are evaluated.

TEMPORARY CONSTRUCTION NOISE

The primary noise sources during construction activities would include heavy machinery used in demolition, grading and clearing the site, as well as equipment used during building construction and paving. Table 2 provides typical noise levels associated with operation of mobile and stationary construction equipment. As shown, average noise levels associated with the use of heavy equipment can range from 81 to 95 dBA at 25 feet from the source, depending upon the types of equipment in operation at any given time and phase of construction (Hanson, Towers, and Meister, May 2006).

Table 2
Typical Construction Equipment Noise Levels

Equipment Onsite	Typical Level (dBA) 25 Feet from the Source	Typical Level (dBA) 50 Feet from the Source	Typical Level (dBA) 100 Feet from the Source
Air Compressor	84	78	71
Backhoe	84	78	71
Bobcat Tractor	84	78	71
Concrete Mixer	85	79	73
Bulldozer	88	82	76
Jack Hammer	95	89	83
Pavement Roller	86	80	74
Street Sweeper	88	82	76
Man Lift	81	75	69
Dump Truck	82	76	70

Source: Noise levels based on FHWA Roadway Construction Noise Model (2006) Users Guide Table 1.
Noise levels based on actual maximum measured noise levels at 50 feet (Lmax).
Noise levels assume a noise attenuation rate of 6 dBA per doubling of distance.

R2 referenced above is the closest off-Reservation receptor with line of sight views to the construction area. It is located approximately 1,400 feet to the northwest. Tables 2 and 3 show typical maximum construction noise levels at various distances from construction activity, based on a standard noise attenuation rate of 6 dBA per doubling of distance. The noise level used to estimate the maximum sustained noise level that could occur (Table 3) is based on use of a bulldozer as the mobile source reference sound level.

The maximum noise levels during equipment operation would attenuate from 88 dBA at the source to 63 dBA at 500 feet and 57 dBA at 1,000 feet. Therefore, mobile construction equipment noise would not exceed 75 dBA at the property line of R2. Actual construction noise levels will fluctuate throughout the day depending on the type and location of equipment used and whether multiple pieces of equipment are operating simultaneously in the same area.

Therefore, temporary construction noise levels are less than significant and would not expose off-Reservation receiving properties to a significant temporary noise increase (thresholds a and d).

Temporary Construction-Related Vibration

Based on the information presented in Table 4, vibration levels associated with a large bulldozer could range from 87 VdB at 25 feet from the source to 75 VdB, 100 feet from the site.

Table 3
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	82
100 feet	76
250 feet	70
500 feet	63
1,000 feet	57

Table 4
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

The threshold where minor damage can occur in fragile buildings is 100 VdB. Vibration levels are projected to be under this threshold at 100 feet and would further attenuate as the distance between the source and receivers increases. Thus, structural damage is not expected to occur as a result of construction activities associated with the proposed project. The nearest single-family residences are located approximately 1,400 feet northwest of the construction area. Vibration levels would be approximately 75 VdB at 100 feet and attenuate to 69 VdB, approximately 200 feet from the source and further attenuate as the distance from the source increases. Thus, vibration levels at the nearest residence would be below the 72 VdB threshold for residences and/or buildings where people sleep. Temporary construction vibration impacts would not expose off-Reservation receiving properties to a significant temporary vibration increase (threshold b).

Riparian Area Impacts.

The Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-711) is an international treaty that makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50

CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). Sections 3503, 3503.5, and 3800 of the California Department of Fish and Wildlife Code prohibit the take, possession, or destruction of birds, their nests, or eggs. Disturbance that causes nest abandonment and/or loss of reproductive effort (e.g., killing or abandonment of eggs or young) or loss of habitat upon which the birds depend could be considered "take" and constitute a violation of the MBTA.

The San Diego County Guidelines for Determining Significance - Biological Resources significance guideline 4.1.H and supporting material in footnote 18 states that 60 dBA, averaged over a time period such as one hour or 24 hours, is a single, simple criterion to use as a starting point for assessing potential impacts to passerine bird species. This criteria is applied to all bird species for the purpose of this analysis; thus, for the purpose of determining whether temporary construction activities occurring during the breeding season could affect nesting birds, a 60 dBA Leq or ambient noise level is used to assess noise impacts on sensitive wildlife off-Reservation. Construction-related noise levels at 1,000 ft. identified in Table 3 above are estimated to be 57 dBA and 63 dBA at 500 feet. The nearest off-Reservation sensitive habitat area that would support sensitive bird species is location along Viejas Creek approximately 900 feet west of the proposed construction site. Thus, it is unlikely that construction noise levels could reach or exceed 60 dBA Leq and adversely affect off-Reservation bird species. Additionally, 900 feet is more than the standard construction buffer of 500 feet that is typically imposed when construction is conducted during bird breeding season to reduce potential noise impacts to less than significant.

LONG-TERM OPERATIONAL NOISE EXPOSURE

Traffic Noise. Traffic is the primary noise source associated with the proposed project post-construction. The proposed project would contribute to increased traffic volumes on Willows Road both east and west of the casino/resort. The majority of new visitor trips would enter the site from west; however, employee trips from the east are also expected to contribute to an increase in volumes. The increased traffic volumes may cause or contribute to an increase in traffic-related noise on and adjacent to the project site.

Noise levels along Willows Road from just west of Viejas Grade Road to the west and the off-Reservation residences (south of the parking areas located southeast of the casino/resort and east of the Viejas Outlet Center) to the to the east were estimated using the Traffic Noise Model (TNM) Version 2.5 (U.S. Department of Transportation, Federal Highway Administration [FHWA], April 2004) (see Appendix A).

TNM was calibrated to within 2 dBA of the noise measurements taken in the field (see Table 1) using traffic volumes counted during noise monitoring. Roadway noise levels were estimated for a weekday peak hour. Average daily trips were obtained from traffic data provided by Linscott, Law and Greenspan (June, 2016). Of the total ADTs, 10% were assumed to occur during the peak hour for noise modeling purposes. The traffic signal located in the study area

was included in the modeling calculations to account for speeds approaching and departing the intersection.

Table 5 shows the existing and anticipated future (cumulative) traffic noise levels at two off-Reservation receptors (R1 and R3) shown in Figure 2. Existing modeled roadway noise levels are approximately 61.8 at R1 and 69.6 at R3. As referenced, because existing noise levels exceed 50 dBA, a project-related noise impact would occur if the project increased noise levels by 10 dBA or more. As shown in Table 5, project related traffic volumes would not cause a perceptible increase in noise levels within the study area. At most, traffic noise levels would increase by 0.4 dBA at R3, which would experience the largest traffic volumes. The increase is less than the 3 dBA increase needed to cause a perceptible increase and the 10 dBA needed to cause a significant impact. Therefore, the project's impact with respect to traffic noise would be less than significant. Further, the project would not expose off-Reservation persons to a substantial permanent increase in noise (thresholds a and c).

Heating, Ventilation and Cooling Equipment.

This section examines the potential stationary noise source impacts associated with the operation HVAC units installed on the roof top of the proposed buildings. To predict the worst-case future noise environment, continuous reference noise levels were used to provide a representation of potential impacts associated with operation of the compressor and mechanical ventilation systems. While it is understood the units would cycle on and off over a 24-hour day, this approach assumes continuous operation; and thus, represents the worst-case condition. To assess the mechanical equipment noise impacts at the nearest receptors located off-Reservation, the worst-case nighttime standard of 45 dBA was utilized.

Table 5
Existing and Project Related Noise Levels

Roadway	Existing	Existing Plus Project	Project Change	Significant Impact
Receiver 1	61.6	61.7	0.1	No
Receiver 3	69.6	70.0	0.4	No

Estimates of noise generated by traffic from roadway centerline at the property line for each receiver.
Refer to Appendix for full noise model output.
Source: Federal Highway Administration Traffic Noise Model Version 2.5.

Sound from a small stationary source radiates uniformly outward from the source. As discussed, the sound level attenuates or drops-off at a rate of 6 dBA for each doubling of distance. The specific number of units that will be installed is unknown; however, the Viejas Hotel South Tower project assumed the installation of eleven 20 Ton condensers. To evaluate the HVAC impacts associated with the proposed project, the reference noise level (e.g. 84-85 dBA at a reference distance of 6 feet) for each unit was assumed to be consistent with those used in the *Viejas Hotel South Tower Project Noise Assessment* (Ldn Consulting, 2014). Thus, 85

dBA at a distance of 6 feet was assumed for the purpose of estimating worst-case noise levels associated with the project's HVAC system.

The closest off-Reservation (R2) receptor is located to the northwest of the project site at a distance of approximately 1,400 feet. The HVAC units will be spread out over the entire rooftop with units ranging in distance from 1,400 feet to 1,800 feet from the property line. Assuming 11 units are installed, it is reasonable to expect a unit could be installed at 35-foot intervals along the roof-top.

The noise levels associated with the roof-top HVAC units will be partially attenuated by building parapets that will likely vary in height to shield roof top equipment and provide aesthetic benefits to the building exterior. However, because the height and location relative to the HVAC units is unknown, it is assumed for this analysis that no shielding will be provided by the parapets. It is assumed that a total of 11 units will be installed. Assuming each have a reference level of 85 dBA at 6 feet and that all are operating at one time, the total sound level generated by the units at 6 feet will be approximately 95 dBA. In reality, the units will be spread out and the sound level at any one location will not cumulatively reach that level. However, assuming a 6 dBA attenuation per doubling of distance, noise levels from the cumulative operation of the HVAC units will attenuate to the 45 dBA nighttime standard at approximately 800 feet from the source. The nearest off-Reservation residence is approximately 1,400 ft away. Therefore, the project's noise impact associated with stationary operational noise is less than significant, Further, the project would not expose off-Reservation persons to a substantial permanent noise increase (thresholds a and c).

Vibration

As referenced, the operational activities associated with the proposed project would not generate vibration; thus, there would be no vibration impact. The project would not expose off-Reservation persons to excessive groundborne vibration or groundborne noise levels (threshold b).

Cumulative Noise Levels

Traffic noise impacts are measured at R1 and R3 and as discussed, projected noise levels would not significantly increase from existing conditions. Noise associated with operation of the stationary HVAC units would attenuate to 45 dBA approximately 800 feet from the source. Thus, given the distance between the source and receivers, stationary noise would be inaudible over ambient noise at R1, R2 and R3. Cumulative mobile and stationary noise would be the same as that reported for traffic (mobile) noise in Table 5.

REFERENCES

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Federal Highway Administration. *Roadway Construction Noise Model. 2006.* Users Guide Table 1.

Federal Highway Administration, Transportation Noise Model Version 2.5, 2004.

Federal Railroad Administration (FRA) Guidelines, (Report Number 293630-1), December, 1998.

Federal Transit Administration. *Transit Noise and Vibration Impact Assessment*. May 2006.

Hanson, Carl E., Towers, David A., and Meister, Lance D. (2006, May). *Transit Noise and Vibration Impact Assessment.* Federal Transit Administration, Office of Planning and Environment. http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf

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San Diego County Guidelines for Determining Significance - Biological Resources, September, 2010.

Appendix A

Transportation Noise Model Files

FIELD NOISE MEASUREMENT DATA

Project Name: VIEJAS HOTEL/CASINO III — Page 1 of

Project #: — Day / Date — My Name

Sound Level Meter	Calibrator	Weather Meter
Model # LD 820	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	11:00	11:15	55.5	41.6	74.8	58.4	46.9	43.8	5/W	65			0%
2	11:45	12:00	52.3	42.1	69.2	54	45.9	43.9	5/W	65			0%
3	12:15	12:30	68.5	36.9	82.1	73.1	60.8	44.6	5/W	66			0%

Roadway Name / Location(s) / GPS Reading(s):	1. WILLOWS	2. VIEJAS GRADE	3. WILLOWS
Speed (post/obs)			
Number of Lanes	4	2	2
Width (pave/row)	48'	24'	24'
1- or 2- way	2	2	2
Grade	0	2%	0
Bus Stops	NO	NO	NO
Stoplights	YES	NO	YES
Street Parking	NO	NO	NO
Automobiles	19	13	103
Medium Trucks	3	0	2
Heavy Trucks	2	1	1

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

Notes and Sketches on Reverse

<Organization?>
<Analysis By?>

16 June 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: Viejas III Existing Conditions
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 LAeq1h Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	With Barrier Noise Reduction Calculated	With Barrier Noise Reduction Goal	With Barrier Noise Reduction Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	61.6	66	61.6	10	----	61.6	0.0	8	-8.0
Receiver2	2	1	0.0	69.6	66	69.6	10	Snd Lvl	69.6	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	2	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?>
<Analysis By?>

16 June 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: Viejas III w-Project Cumulative
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					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	61.7	66	61.7	10	----	61.7	0.0	8	-8.0
Receiver2	2	1	0.0	70.0	66	70.0	10	Snd Lvl	70.0	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	2	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