NOISE ASSESSMENT

VISTA VALLEY COUNTY CLUB POOL CENTER
APN 170-271-24 and portions of 170-271-23 and 170-191-07
Environmental Log No. PDS 2014-ER-08008
MUP-2014-021
Vac-14-002

Prepared For:

County of San Diego
Planning and Development Services
5510 Overland Avenue #110
San Diego, CA 92123

Prepared By:

Jeremy Louden
Ldn Consulting
446 Crestcourt Lane
Fallbrook, California 92028
760-473-1253

Project Proponent:

All Development, Inc.
29354 Vista Valley Drive
Vista, CA 92084

July 23, 2014

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

Sound Pressure Level (SPL): a ratio of one sound pressure to a reference pressure (L_{ref}) of 20 µPa. Because of the dynamic range of the human ear, the ratio is calculated logarithmically by 20 log (L/L_{ref}).

A-weighted Sound Pressure Level (dBA): Some frequencies of noise are more noticeable than others. To compensate for this fact, different sound frequencies are weighted more.

Minimum Sound Level (L_{min}): Minimum SPL or the lowest SPL measured over the time interval using the A-weighted network and slow time weighting.

Maximum Sound Level (L_{max}): Maximum SPL or the highest SPL measured over the time interval the A-weighted network and slow time weighting.

Equivalent sound level (L_{eq}): the true equivalent sound level measured over the run time. Leq is the A-weighted steady sound level that contains the same total acoustical energy as the actual fluctuating sound level.

Day Night Sound Level (LDN): Representing the Day/Night sound level, this measurement is a 24 –hour average sound level where 10 dB is added to all the readings that occur between 10 pm and 7 am. This is primarily used in community noise regulations where there is a 10 dB "Penalty" for night time noise. Typically LDN's are measured using A weighting.

Community Noise Exposure Level (CNEL): The accumulated exposure to sound measured in a 24-hour sampling interval and artificially boosted during certain hours. For CNEL, samples taken between 7 pm and 10 pm are boosted by 5 dB; samples taken between 10 pm and 7 am are boosted by 10 dB.

Octave Band: An octave band is defined as a frequency band whose upper band-edge frequency is twice the lower band frequency.

Third-Octave Band: A third-octave band is defined as a frequency band whose upper band-edge frequency is 1.26 times the lower band frequency.

Response Time (F,S,I): The response time is a standardized exponential time weighting of the input signal according to fast (F), slow (S) or impulse (I) time response relationships. Time response can be described with a time constant. The time constants for fast, slow and impulse responses are 1.0 seconds, 0.125 seconds and 0.35 milliseconds, respectively.

EXECUTIVE SUMMARY

This noise study has been completed to determine the noise impacts associated with the proposed on-site pool operations and construction activities. The project known as "Vista Valley Pool Center" proposes the construction and operation of a private pool center for the Vista Valley Country Club members and their guests. The project is located at 29455 Hoxie Ranch Road, Vista, CA. The project is north of Vista Valley Drive and south of Gopher Canyon Road in the Bonsall Community Planning Area of the County of San Diego, California.

Based on noise measurements collected at similar existing facilities and the distances to the property lines the proposed operations are anticipated to be below the County's Property Lines standards. No impacts are anticipated and no mitigation is required.

The construction activities would result in an anticipated worst case eight-hour average combined noise level of less than 75 dBA at the property line. Given this and the spatial separation of the equipment over the site, the noise levels from the grading are anticipated to comply with the County of San Diego's 75 dBA standard per Section 36.409 of the Noise Ordinance at all Project property lines.

No blasting or rock crushing is anticipated during the grading operations. Therefore, no impulsive noise sources are expected and the Project will comply with Section 36.410 of the County Noise Ordinance.

1.0 INTRODUCTION

This noise study was completed to determine the noise impacts associated with the proposed Vista Valley Pool Center for the proposed construction and on-site operations. The project is located at 33°14' 49" N and 117°11' 37" W, north of Vista Valley Drive and south of Gopher Canyon Road in the Bonsall Community Planning Area of the County of San Diego, California. The general location of the project is shown on the Vicinity Map, Figure 1-A.

The subject property is 9.5 +/- in land area (APN 170-271-24) and portions of 170-271-23 and 170-191-07 contains an existing single family home with ornamental landscaping, a detached garage and several outbuildings. The single family home will remain and be used as the Caretaker's residence. The outbuildings will be demolished.

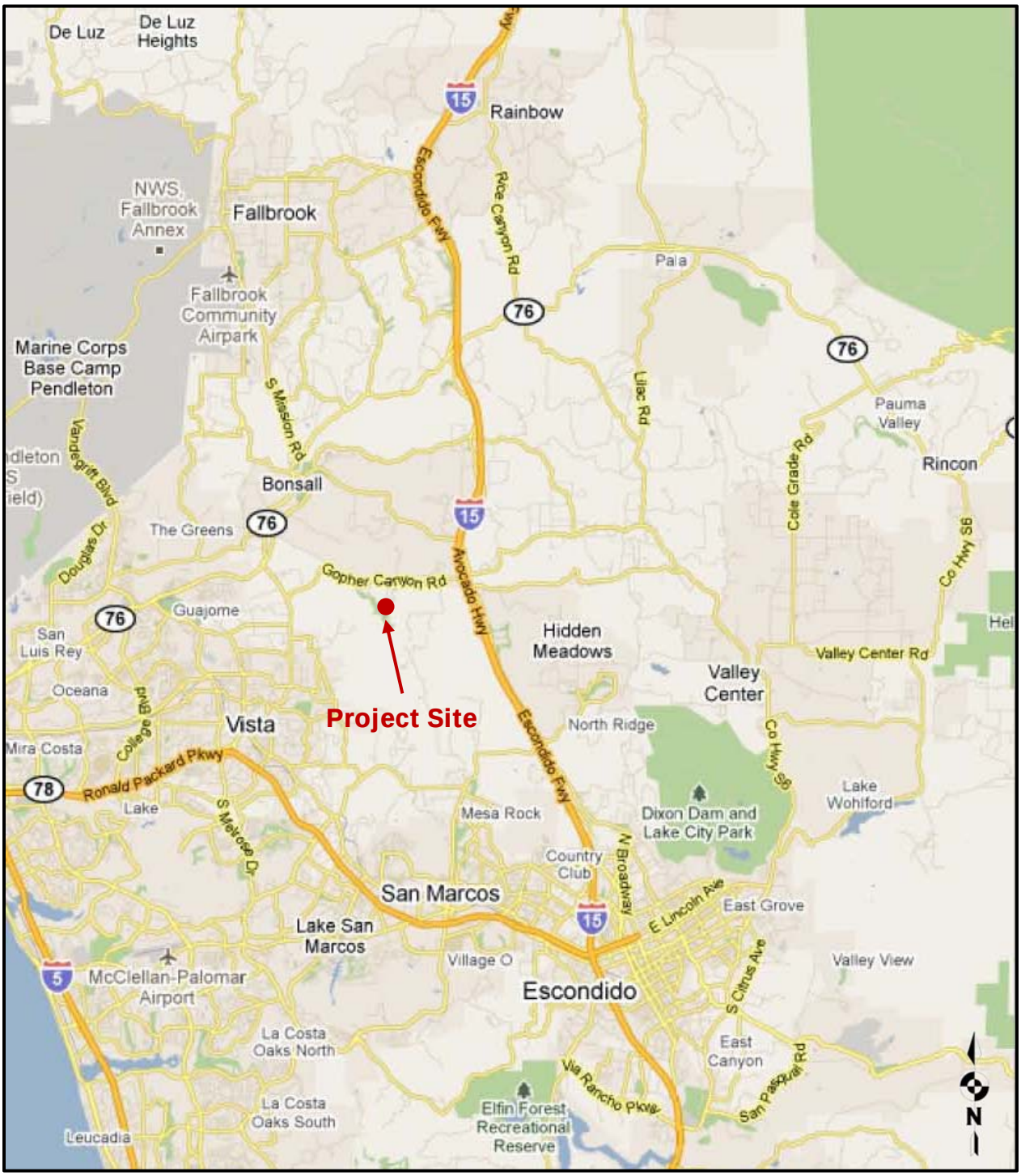
The parking lot and pool center are approximately 40 feet higher than the adjacent residence to the west and are topographically separated from single family residences in the immediate area. The perimeter landscaping and site design features will enhance the visual aesthetics of the project. This project is designed to complement the existing Vista Valley Country Club Golf Course and Clubhouse facilities. The project proposes the operation of a pool and pool maintenance building located in an ancillary building outside of the main building. The overall site plan is provided in Figure 1-B and the proposed pool center is shown on Figure 1-C.

This project will consist of the following:

- One swimming pool and children's wading pool
- Building A approximately 2,500square foot building that will accommodate restrooms, showers, lockers, laundry facilities, utility storage room, an office and a snack bar
- Building B approximately 3,400 square foot Multipurpose Building containing offices, children's game rooms, a large activity room, restrooms and an a 900 square foot covered patio joining buildings B.
- An open terraced patio with a covered patio located between Building A and B
- A 37 car parking lot with 5 golf cart spaces is proposed terraced below the swimming pool and building activity area

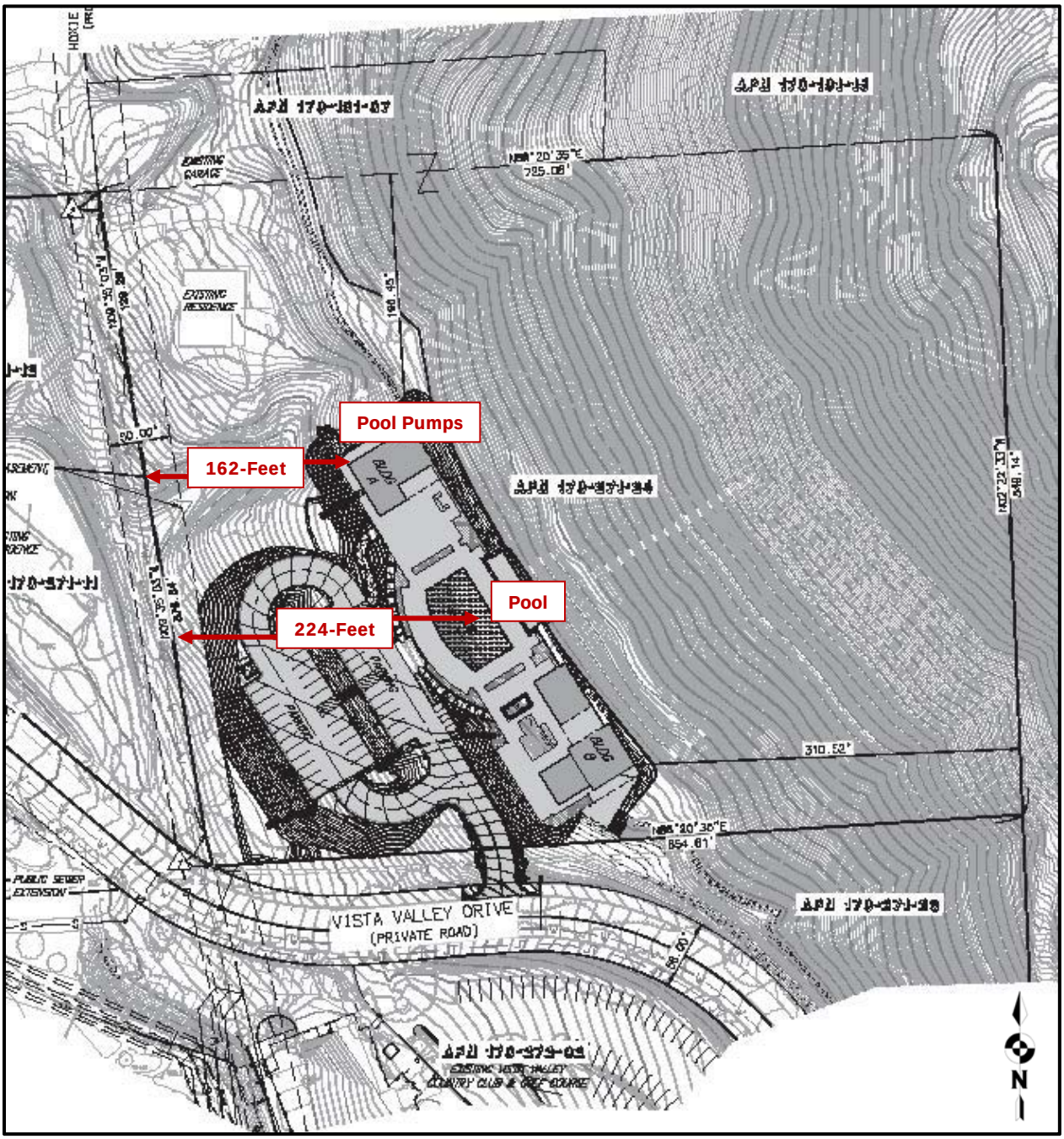
The proposed Vista Valley Pool Center will be a private facility for the use of the members of the Vista Valley Country Club and their guests. The facility will be operated to the same high, quality standards as the Vista Valley Country Club and Cal-A-Vie Spa.

Figure 1-A: Project Vicinity Map



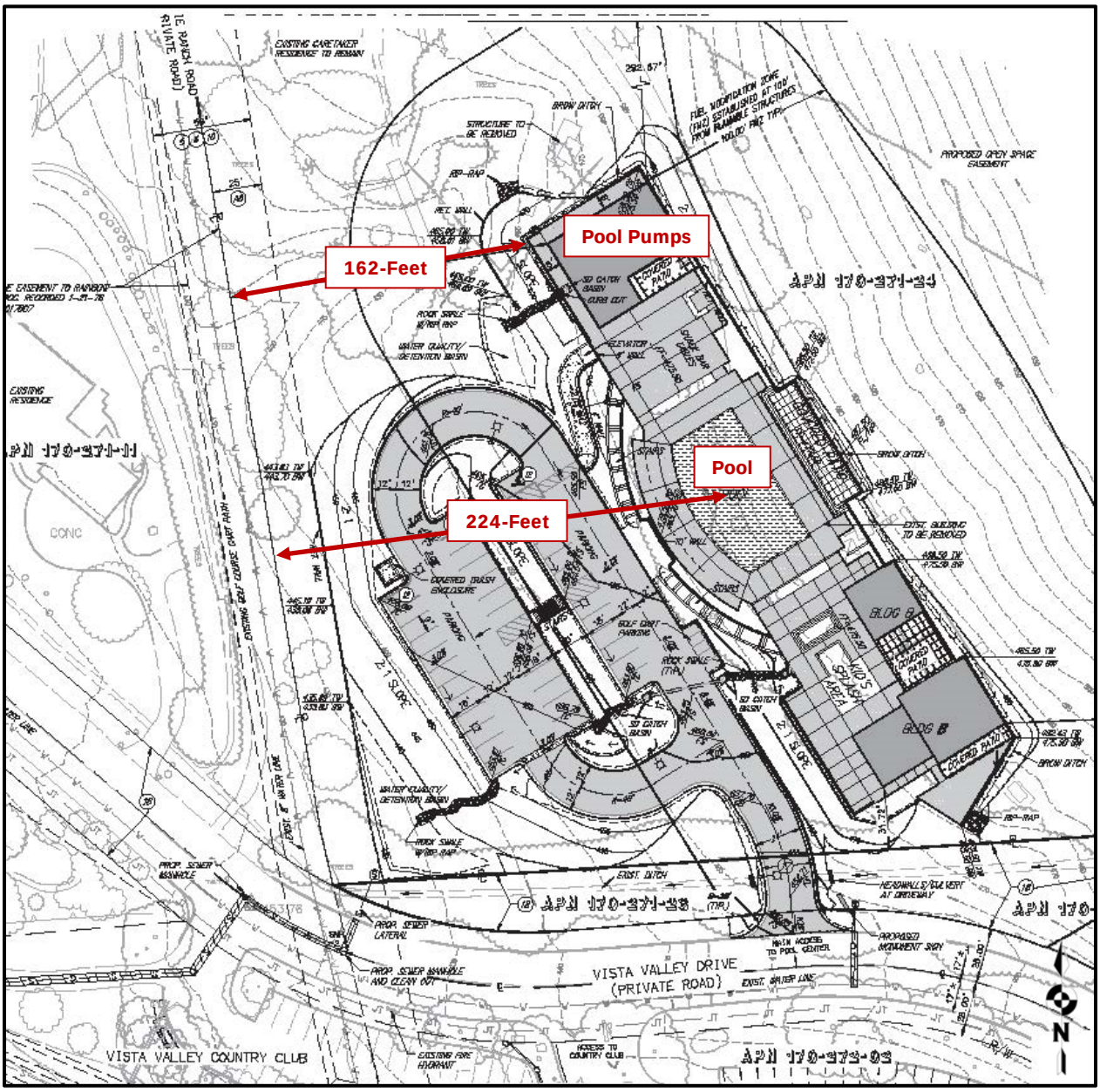
Source: Google Maps, 2014

Figure 1-B: Overall Project Site Plan



Source: Excel Engineering, 2014

Figure 1-C: Proposed Pool Center



Source: Excel Engineering, 2014

1.3 Methodology and Equipment

Equipment Noise Levels

To determine the noise environment and to assess potential noise impacts, noise measurements were taken at an existing pool facility at the Cal-a-Vie Health Spa, located at 29402 Spa Haven Way, Vista, CA 92084. The measurements consisted of two 15 horsepower pool pumps and filtration pumps, similar to the proposed pool center operations. All equipment was fully operational during the measurements. The noise measurements were recorded on March 4, 2014 between approximately 10:30 a.m. and 11:00 a.m.

The noise measurements were taken using a Larson-Davis Model LxT Type 1 precision sound level meter, programmed, in "slow" mode, to record noise levels in "A" weighted form. The sound level meter and microphone was mounted on a tripod, five feet above the ground and equipped with a windscreen during all measurements. The sound level meter was calibrated before and after the monitoring using a Larson-Davis calibrator, Model CAL 150.

The noise measurement locations were determined based on noise impact potential and observed worst case exposure levels (i.e., vent/openings in the building). The short term measurements of the onsite pump operations and equipment are provided in Table 1-1 along with the reference distances. The proposed equipment will all be located within the buildings, similar to sampled site.

Table 1-1: Pool Equipment Noise Levels

Dominate Noise Source	Distance (Feet)	Noise Levels (dBA)		
		Leq	Lmax	Lmin
Filters	15	53.4	56.2	52.0
Pumps	15	55.3	59.0	53.5
Combined	25	57.8	59.0	57.4
Source: Ldn Consulting, March 4, 2014				

Pool Activity Noise Levels

Noise level measurements of typical daily operations of outdoor pool activities were taken at two San Diego YMCA facilities located in Escondido and Oceanside on September 9th, 2009 and September 13th, 2009, respectively. The measurements were taken using a Quest Sound Pro DL-2 Type 2 precision sound level meter. The noise meter was programmed, in "slow"

mode and set to record noise levels in an "A" weighted form. The sound level meter, preamp and microphone were mounted on a tripod, raised five feet above the ground and equipped with a windscreen during all measurements. The sound level meter was calibrated before and after the monitoring period on site using a Quest calibrator, Model QC-10.

The Escondido YMCA measurements include an instructional swim class with at least 30 children participating and the use of a portable radio. The meter was located 45-feet from the main activities and measurements were taken for more than 15 minutes and were stopped when a helicopter was observed approaching in the background. The Oceanside YMCA measurements consisted of open swimming activities of 25 children in the main pool area. The meter was located 20-feet from the children's activities.

Table 1-2: Pool Activity Noise Levels

Location	Description	Distance (Feet)	Noise Levels (dBA Leq)		
			Leq	Lmin	Lmax
Escondido	Main Pool Swim Class ~ 30 Students	45	61.3	56.1	68.6
Oceanside	Main Pool Open Swimming ~ 25 Children	20	68.8	62.5	78.4
Source: Ldn Consulting, Inc. September 9th and 13th, 2009					

Sound is measured on a logarithmic scale consisting of sound pressure levels known as a decibel. The sounds heard by humans typically do not consist of a single frequency but of a broadband of frequencies having different sound pressure levels. The method for evaluating all the frequencies of the sound is to apply an A-weighting to reflect how the human ear responds to the different sound levels at different frequencies. The A-weighted sound level adequately describes the instantaneous noise whereas the equivalent sound level depicted as Leq represents a steady sound level containing the same total acoustical energy.

The U.S. Environmental Protection Agency (U.S. EPA) has compiled data regarding the noise generating characteristics of specific types of equipment. Noise levels generated by heavy equipment can be in excess of 100 dBA when measured. However, these noise levels diminish rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling of distance. For example, a noise level of 75 dBA measured at 50 feet from the noise source to the receptor would be reduced to 69 dBA at 100 feet from the source to the receptor, and reduced to 63 dBA at 200 feet from the source.

2.0 OPERATIONAL ACTIVITIES

2.1 Guidelines for the Determination of Significance

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 to adjacent properties. The purpose of the noise ordinance is to protect, create and maintain an environment free from noise and vibration that may jeopardize the health or welfare, or degrade the quality of life. The sound level limits in Table 36.404 of the County's Noise Ordinance are provided below in Table 2-1.

Table 2-1: Sound Level Limits in Decibels (dBA)

Zone	Time	One-Hour Average Sound Level Limits (dBA)
(1) RS, RD, RR, RMH, A70, A72, S80, S81, S87, S90, S92, RV, and RU with a density of less than 11 dwelling units per acre.	**7 a.m. to 10 p.m.**	**50**
	10 p.m. to 7 a.m.	**45**
(2) RRO, RC, RM, S86, V5, RV and RU with a density of 11 or more dwelling units per acre.	7 a.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
(3) S94, V4, and all commercial zones.	7 a.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55
(4) V1, V2	7 a.m. to 7 p.m.	60
V1, V2	7 p.m. to 10 p.m.	55
V1	10 p.m. to 7 a.m.	55
V2	10 p.m. to 7 a.m.	50
V3	7 a.m. to 10 p.m.	70
	10 p.m. to 7 a.m.	65
(5) M50, M52, and M54	Anytime	70
(6) S82, M56, and M58.	Anytime	75
(7) S88 (see subsection (c) below)		

Source: County of San Diego Noise Ordinance Section 36.404

a) Except as provided in section 36.409 of this chapter, it shall be unlawful for any person to cause or allow the creation of any noise, which exceeds the one-hour average sound level limits in Table 36.404, when the one-hour average sound level is measured at the property line of the property on which the noise is produced or at any location on a property that is receiving the noise.

b) Where a noise study has been conducted and the noise mitigation measures recommended by that study have been made conditions of approval of a Major Use Permit, which authorizes the noise-generating use or activity and the decision making body approving the Major Use Permit determined that those mitigation measures reduce potential noise impacts to a level below significance, implementation and compliance with those noise mitigation measures shall constitute compliance with subsection (a) above.

c) S88 zones are Specific Planning Areas which allow different uses. The sound level limits in Table 36.404 above that apply in an S88 zone depend on the use being made of the property. The limits in Table 36.404, subsection (1) apply to property with a residential, agricultural or civic use. The limits in subsection (3) apply to property with a commercial use.

The limits in subsection (5) apply to property with an industrial use that would only be allowed in an M50, M52 or M54 zone. The limits in subsection (6) apply to all property with an extractive use or a use that would only be allowed in an M56 or M58 zone.

d) If the measured ambient noise level exceeds the applicable limit in Table 36.404, the allowable one-hour average sound level shall be the one-hour average ambient noise level, plus three decibels. The ambient noise level shall be measured when the alleged noise violation source is not operating.

e) The sound level limit at a location on a boundary between two zones is the arithmetic mean of the respective limits for the two zones. The one-hour average sound level limit applicable to extractive industries, however, including but not limited to borrow pits and mines, shall be 75 decibels at the property line regardless of the zone in which the extractive industry is located.

f) A fixed-location public utility distribution or transmission facility located on or adjacent to a property line shall be subject to the sound level limits of this section measured at or beyond six feet from the boundary of the easement upon which the facility is located.

According to the stationary source exterior noise standards, no person shall operate any source of sound at any location within the County or allow the creation of any noise on a property which causes the noise levels to exceed the exterior noise limits at the property boundary. Additionally, Section 36.404(e) states that the sound level limits at a location on a boundary between two zones are the arithmetic mean of the respective limits for the two zones. The project site as well as adjacent land uses are zoned A-70 and S-88. According to Section 36.404 of the County of San Diego Noise Ordinance, all areas zoned A-70 and A-72 have a most restrictive property line standard of 50 dBA Leq for the daytime hours of 7 a.m. to 10 p.m. and 45 dBA Leq for the nighttime hours of 10 p.m. to 7 a.m.

2.2 Potential Operational Noise Impacts

This section examines the potential noise source impacts associated with the operation of the proposed project. Specifically, noise levels from the pool center operations. The measured noise levels from the existing facility were amortized over an hour and propagated to the nearest property lines. To determine potential impacts at the property lines the worst case noise measurements obtained, as shown in Table 1-1 and Table 1-2, were utilized.

The private swim pool center will be open 7 days a week from approximately 7:00 am to 9:00 pm. The pool hours will be limited and dependent upon the time of year. A life guard will be on duty at the pool during pool hours. The pool is anticipated to cycle on and off throughout the day and possibly nighttime hours. Because the pool activities occur during the hours of 7:00 am and 9:00 pm, the property line standard of 50 dBA Leq will be utilized in this analysis. The only noise generating equipment that may operate during the nighttime hours of 10:00 pm and 7:00 am are the proposed pool pumps. Both of these scenarios are provided below.

Fixed or point sources radiate outward uniformly as sound travels away from the source. Their sound levels attenuate or drop off at a rate of 6 dBA for each doubling of distance.

Using a point-source noise prediction model, calculations of the expected operational noise impacts were completed. The nearest property line to the proposed pool center is located to the west 162 feet from the nearest equipment building and 224 feet from the pool. The worst case noise measurements for the facility and the calculated hourly noise levels at the property lines are shown below in Table 2-2 for all the daytime activities. The anticipated nighttime noise levels from the equipment is provided in Table 2-3. Also, included in the Table are the relative property line standards for clarity.

Table 2-2: Daytime Operational Noise Levels

Property Line	Highest Measured Noise Level (dBA)	Reference Distance (Feet)	Distance to Property Line (Feet)	Resultant Noise Level at Property Line (dBA Leq)	Property Line Threshold (dBA Leq)	Complies with the Applicable Threshold
Pool Activities	68.8	20	224	47.8	50	Yes
Pool Equipment	57.8	25	162	41.6	50	Yes
CUMULATIVE PROPERTY LINE NOISE LEVEL				**48.7**	**50**	**Yes**

Table 2-3: Nighttime Operational Noise Levels

Property Line	Highest Measured Noise Level (dBA)	Reference Distance (Feet)	Distance to Property Line (Feet)	Resultant Noise Level at Property Line (dBA Leq)	Property Line Threshold (dBA Leq)	Complies with the Applicable Threshold
Pool Equipment	57.8	25	162	**41.6**	**50**	**Yes**

2.3 Conclusions

Based on noise measurements collected at existing facilities and the distances to the property lines, the proposed operations are anticipated to be below the County's Property Lines standards. No impacts are anticipated and no mitigation is required.

3.0 CONSTRUCTION ACTIVITIES

3.1 Guidelines for the Determination of Significance

Construction Noise: Noise generated by construction activities related to the project will exceed the standards listed in San Diego County Code Sections as follows.

SEC. 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.

SEC. 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.

SEC. 36.410: SOUND LEVEL LIMITATIONS ON IMPULSIVE NOISE

In addition to the general limitations on sound levels in section 36.404 and the limitations on construction equipment in section 36.409, the following additional sound level limitations shall apply:

(a) Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 36.410A (provided below), 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) below. The maximum sound level depends on the use being made of the occupied property. The uses in Table 36.410A are as described in the County Zoning Ordinance.

TABLE 36.410A: MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED AT OCCUPIED PROPERTY IN DECIBELS (dBA)

OCCUPIED PROPERTY USE	DECIBELS (dBA)
Residential, village zoning or civic use	82
Agricultural, commercial or industrial use	85

(b) Except for emergency work, no person working on a public road project shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 36.410B, 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) below. The maximum sound level depends on the use being made of the occupied property. The uses in Table 36.410B are as described in the County Zoning Ordinance.

TABLE 36.410B: MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED AT OCCUPIED PROPERTY IN DECIBELS (dBA) FOR PUBLIC ROAD PROJECTS

OCCUPIED PROPERTY USE	dB(A)
Residential, village zoning or civic use	85
Agricultural, commercial or industrial use	90

(c) 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 be deemed that the maximum sound level was exceeded during that minute.

3.2 Potential Construction Noise Impacts

Construction noise represents a short-term impact on the ambient noise levels. Noise generated by construction equipment includes haul trucks, water trucks, graders, dozers, loaders and scrapers which can reach relatively high levels. Grading activities typically represent one of the highest potential sources for noise impacts. Site grading will be less than 8,000 cubic yards. The most effective method of controlling construction noise is through local control of construction hours and by limiting the hours of construction to normal weekday

working hours.

The U.S. Environmental Protection Agency (U.S. EPA) has compiled data regarding the noise generating characteristics of specific types of construction equipment. Noise levels generated by heavy construction equipment at a distance of 50 feet can range from 60 dBA for a small tractor to up to 100 dBA for rock breakers. However, these noise levels diminish rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling of distance. For example, a noise level of 87 dBA measured at 50 feet from the noise source would be reduced to 81 dBA at 100 feet from the source and be further reduced to 75 dBA at 200 feet from the source.

Using a point-source noise prediction model, calculations of the expected construction noise impacts were completed. The essential model input data for these performance equations include: the source levels of each type of equipment, relative source to receiver, horizontal and vertical separations, and the amount of time the equipment is operating in a given day, also referred to as the duty-cycle and any transmission loss from topography or barriers. To determine the worst-case noise levels for the grading operations no topographic attenuation, duty-cycle reductions or barrier reductions were utilized.

The grading operation may utilize a total of one loader/backhoe, a dozer, an excavator and one water truck. The noise levels utilized in this analysis based upon the conservative list of equipment is shown in Table 3-1 below. Most of the construction activities will consist of grading the site. The equipment is anticipated to be spread out over the site with some equipment potentially operating at or near the property line while the rest of the equipment may be located up to 300 feet from the same property line. This would result in an acoustical center for the construction operation at approximately 150 feet from the nearest property line.

As can be seen in Table 3-1, if all the equipment were operating in the same location, which is not physically possible, at a distance as close as 100 feet from the nearest property line, the point source noise attenuation from construction activities is reduced 6.0 dBA. This would result in an anticipated worst case eight-hour average combined noise level of 72.9 dBA at the property line. Given this and the spatial separation of the equipment, the noise levels will comply with the County of San Diego's 75 dBA standard at all Project property lines.

Table 3-1: Construction Noise Levels

Construction Equipment	Quantity	Duty Cycle (Hours/Day)	Source Level @ 50-Feet (dBA)	Cumulative Noise Level @ 50-Feet (dBA Leq-8h)
Water Truck	1	8	70	70
Dozer	1	8	75	75
Loader/Tractor	1	8	73	73
Excavator	1	8	72	72
			Cumulative Levels @ 50 Feet (dBA)	78.9
			Distance To Property Line	100
			Noise Reduction Due To Distance	-6.0
			NEAREST PROPERTY LINE NOISE LEVEL	72.9

No blasting or rock crushing is anticipated during the grading operations. Therefore, no impulsive noise sources are expected and the Project is anticipated to comply with Section 36.410 of the County Noise Ordinance and no further analysis is required.

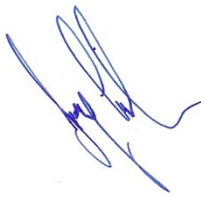
3.3 Construction Conclusions

If all the equipment were working in the same area, at a distance as close as 135 feet, the point source noise attenuation from the construction activities and the nearest property line is -8.6 dBA. This would result in an anticipated worst case eight-hour average combined noise level of less than 75 dBA at the property line. Given this and the spatial separation of the equipment over the site, the noise levels from the grading are anticipated to comply with the County of San Diego's 75 dBA standard per Section 36.409 of the Noise Ordinance at all Project property lines.

No blasting or rock crushing is anticipated during the grading operations. Therefore, no impulsive noise sources are expected and the Project will comply with Section 36.410 of the County Noise Ordinance.

4.0 CERTIFICATIONS

The contents of this report represent an accurate depiction of the future acoustical environment and impacts within and surrounding the Vista Valley Pool Center development. The report was prepared by Jeremy Louden; a County approved CEQA Consultant for Acoustics.



Jeremy Louden, Principal
Ldn Consulting
760-473-1253
jlouden@ldnconsulting.net

Date July 23, 2014