

Aliso Canyon Project

Acoustical Site Assessment Report

June 20, 2014

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P DS2013-M PA-13-076

18531 Aliso Canyon Road
Assessor's Parcel No. 265-270-84
Rancho Santa Fe, CA

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GLOSSARY OF TERMS AND ACRONYMS

A-Weighted Sound Levels	Decibels (referenced to 20 micro-Pascals) as measured with an A-weighting network of standard sound level meter, abbreviated dB(A)
ADT	Average Daily Trips (roadway traffic)
ANSI	American National Standards Institute
APN	assessor's parcel number
CAGN	coastal California gnatcatcher (<i>Polioptila californica californica</i> ;
County	County of San Diego
CNEL	Community Noise Equivalent Level: A 24-hour average, where sound levels during the evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dB weighting, and sound levels during the nighttime hours of 10:00 p.m. to 7 a.m. have an added 10 dB weighting
dB	Decibel
dBA	A-weighted decibels
Daytime	The period from 7:00 a.m. to 10:00 p.m.
Evening	The period from 7:00 p.m. to 10:00 p.m.
FHWA	Federal Highway Administration
HVAC	Heating, ventilating, and air conditioning
Hz	Hertz
kHz	kilohertz

GLOSSARY OF TERMS AND ACRONYMS (cont.)

L _{EQ}	The equivalent sound level, or the continuous sound level, that represents the same sound energy as the varying sound levels, over a specified monitoring period
L _{DN}	Day-Night level: A 24-hour average, where sound levels during the nighttime hours of 10:00 p.m. to 7 a.m. have an added 10 dB weighting
mPa	micro-Pascals
mph	miles per hour
ms	millisecond
Nighttime	Periods other than daytime or evening (as defined above), including legal holidays
Noise	Any audible sound that has the potential to annoy or disturb humans, or to cause an adverse psychological or physiological effect in humans
Noise Level Measurements	Unless otherwise indicated, measurements that include the use of A-weighting and "slow" response of instrument that complies with at least Type 2 requirements of latest revision of American National Standard Institute (ANSI) S1.4. Specification for Sound Level Meters
Noise-sensitive land uses (NSLU)	A location where particular sensitivities to noise exist, such as residential areas, institutions, hospitals, parks, or other environmentally sensitive areas
OSMRE	Office of Surface Mining Reclamation and Enforcement
PDS	Planning and Development Services (County of San Diego)
PPV	peak particle velocity
Project	Aliso Canyon Project
RCHM	Roadway Construction Noise Model
rms	root mean square
RR	rural residential zoning

GLOSSARY OF TERMS AND ACRONYMS (cont.)

SA	Select Arterial
SF	square feet (foot)
Sound pressure level (SPL)	The observable effect of acoustic energy radiation, quantifying sound level as perceivable by the receiver. When Sound Pressure is used to describe a noise source, the distance between source and receiver must be known in order to yield useful information about the power rating of the source
Sound power level (S_{WL})	A specialized analytical metric that is used to fully quantify the acoustic energy emitted by a source and is complete without accompanying information on the position of measurement relative to the source. It may be used to calculate the sound pressure level at any desired distance
SR	semi-rural residential zoning
TNCC	Transportation Noise Control Center
TNM	Traffic Noise Model
U.S. DOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service

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EXECUTIVE SUMMARY

The proposed Aliso Canyon Project (Project) includes the development of seven new residential lots (the subdivision of an existing parcel into eight individual lots) on an approximately 31-acre site in the community of Rancho Santa Fe in the unincorporated County of San Diego (County). The Project site is located at 18531 Aliso Canyon Road (Assessor Parcel Number [APN] 265-270-84). The existing County General Plan land use designation for the property is SR-2 (Semi-Rural Residential, 2-acre lot size), and the existing zoning is RR-5 (Rural Residential).

Aliso Canyon Road borders the property along the northern and eastern boundary, and existing residential development is located north, south, and west of the site. An existing residence is also located in the eastern portion of the Project site, and will remain. Another existing residence (APN 265-270-83) is located off-site, directly between two of the proposed Project lots).

Project construction would result in short-term increases in noise levels. The loudest piece of equipment involved with the general construction of the Project would be a dozer, which would exceed the County's 8-hour noise level limits if it were to operate closer than 70 feet from an adjacent property for a full day. Based on grading plans, a dozer would not be expected to operate closer than 100 feet from an existing residential outdoor use area. Typically, other types of construction equipment would not be used at the same pad location at the same time, and as they all create lower noise levels than the dozer, construction noise impacts from general construction operations would be less than significant.

Although it is not anticipated that blasting would be required for Project construction, if blasting were to occur within 200 feet of a residence (the closest off-site residence is located 120 feet away), impacts from blasting would be potentially significant. Should blasting be required on the Project site, additional blast planning must be conducted. All blast planning must be done by a San Diego County Sheriff-approved blaster, with the appropriate San Diego County Sheriff blasting permits, in compliance with the San Diego County Consolidated Fire Code SEC. 96.1.3301.2., and all other applicable local, state, and federal permits, licenses, and bonding. The blasting contractor or owner must conduct all notifications, inspections, monitoring, and major or minor blasting requirements planning with seismograph reports, as necessary.

It is also unlikely that breaking will be required; however, if a breaker is necessary and were to operate within 250 feet of the nearest property line of an occupied residence, the breaker noise could exceed the County noise level limit; impacts would be potentially significant. Therefore, a breaker shall not be used within 250 feet of the property line for any occupied residence.

Additionally, if operation of construction equipment occurs within 400 feet of occupied coastal California gnatcatcher habitat during the breeding season (March 1 – August 15), impacts would be potentially significant. Construction noise planning and control would be required to ensure that construction noise would not exceed 60 dBA L_{EQ} . If the existing ambient noise level is already above 60 dBA L_{EQ} , then construction noise must not increase the ambient noise level by more than 3 dBA.

The Project would not result in significant stationary or transportation-related operational noise impacts, and mitigation measures would not be required.

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1.0 INTRODUCTION

The proposed Aliso Canyon Project (Project) includes the development of seven new residential lots on an approximately 31-acre site in the community of Rancho Santa Fe in the unincorporated County of San Diego (County).

1.1 Project Location

The approximately 31-acre Project site is located at 18531 Aliso Canyon Road; the County Assessor Parcel Number is 265-270-84. The existing County General Plan land use designation for the property is SR-2 (Semi-Rural Residential, minimum 2-acre lot size), and the Regional Category is Semi-Rural. Existing zoning for the parcel is RR-5 (Rural Residential). Aliso Canyon Road borders the property along the northern and eastern boundary. Pacifica Ranch Drive, a private road easement, extends from its intersection with Aliso Canyon Drive southward through the western/central portion of the property and provides access to the existing subdivision to the south of the subject property. Refer to Figures 1 and 2 for the regional location and an aerial photograph of the Project site, respectively.

1.2 Project Description

The Project proposes subdivision of the approximately 31-acre parcel into eight individual lots for single-family residential use. Lots will range from approximately 2 acres to 8.3 acres in size; one of the lots will include an on-site existing residence, and new residences will be developed on the seven remaining lots. The Project proposes an on-site looped private road to serve proposed Lots 4-6. In addition, the Project proposes to vacate public roadway right-of-way for Select Arterial (SA) 680, which crosses the northern/northeastern portion of the site. The alignment for SA 680 was formerly removed from the County's Circulation Element in 1995 and is no longer proposed for construction. The Project entails site grading, installation of utilities, and construction of seven single-family residential dwellings. Refer to Figure 3 for the Project tentative map.

1.3 Noise and Sound Level Descriptors and Terminology

1.3.1 Descriptors

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A-weighting (dBA) to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ} , with a specified duration. The Community Noise Equivalent Level (CNEL) is a 24-hour average, where noise levels during the evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dB weighting, and sound levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dB weighting. This is similar to the Day-Night sound level (L_{DN}), which is a 24-hour average with an added 10 dB weighting on the same nighttime hours but no added weighting on the evening hours. Sound levels expressed in CNEL are always based on dBA. These metrics are used to express noise levels for both measurement and municipal regulations, as well as for land use guidelines and enforcement of noise ordinances.

1.3.2 Terminology

Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determine the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

Frequency

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

Sound Pressure Levels and Decibels

The amplitude of pressure waves generated by a sound source determines the loudness of that source. A logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB). The threshold of hearing for the human ear is about 0 dB, which corresponds to 20 mPa.

Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, 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.

1.4 Noise Sensitive Land Uses

Noise-sensitive land uses (NSLU) are land uses that may be subject to stress and/or interference from excessive noise, such as residential areas, institutions, hospitals, parks, or biologically sensitive areas. Noise receptors are individual locations that may be affected by noise. Existing residential development is located north, south, and west of the Project site. An existing residence is located in the eastern portion of the Project site on Lot 8, and will remain. In addition, another existing residence (APN 265-270-83) is located off-site, directly between Lots 7 and 8.



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Regional Location Map

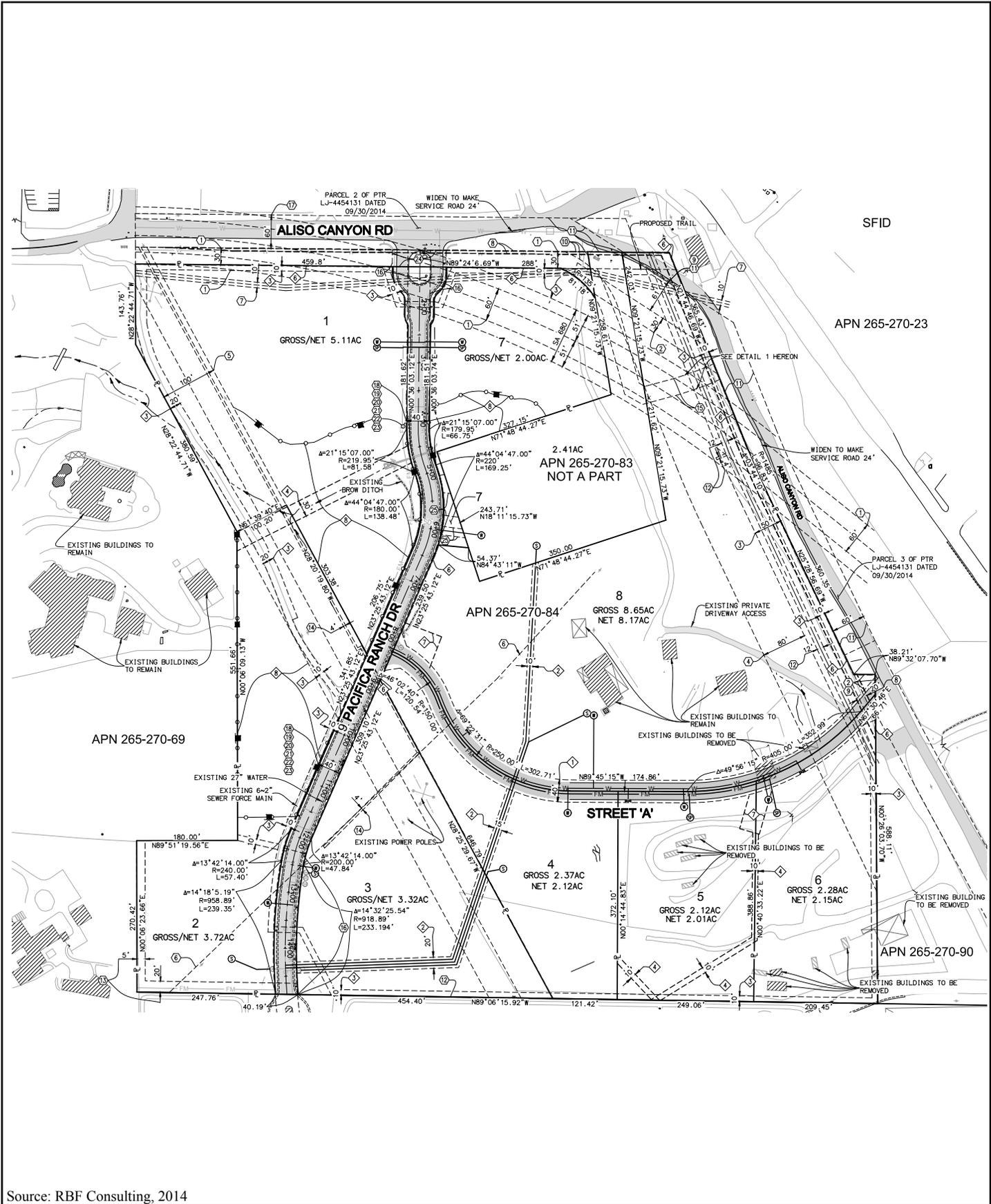
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Project Vicinity Map (Aerial Photograph)

ALISO CANYON SUBDIVISION



Tentative Map

ALISO CANYON SUBDIVISION

Figure 3

1.5 Applicable Noise Regulations and Standards

Applicable noise standards for the Project are codified in the following County code and regulations.

Noise impacts would be considered significant if Project implementation would result in the exposure of any on- or off-site, existing or reasonably foreseeable future NSLUs to exterior or interior noise (including noise generated from the Project, together with noise from roads [existing and planned Mobility Element roadways], railroads, airports, heliports, and all other noise sources) in excess of any of the following:

Exterior Locations:

- i. 60 (CNEL) Single-Family; or 65 CNEL Multi-Family or Mixed Use,¹ or
- ii. A significant cumulative impact would occur if the Project would contribute to a cumulative scenario that would result in the exposure of any on- or off-site, existing or reasonably foreseeable NSLU, to: (1) an increase of 10 CNEL over pre-existing noise levels of less than 50 CNEL resulting in a combined exterior noise level of 60 CNEL or greater, (2) an increase of 3 CNEL in existing plus project plus cumulative conditions if that total is above 60 CNEL, or (3) interior noise in excess of 45 CNEL. A “cumulatively considerable” project contribution to an identified significant cumulative noise impact would occur if the project would contribute more than a 1 dB increase.²

In the case of single-family residential detached NSLUs, exterior noise shall be measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum area:

- (1) Net lot area up to 4,000 square feet: 400 square feet
- (2) Net lot area 4,000 sq. ft. to 10 acres: 10 percent of net lot area
- (3) Net lot area over 10 acres: 1 acre

For all other land uses, exterior noise shall be measured at all exterior areas provided for group or private usable open space.

Interior Locations:

45 dB (CNEL) except for the following cases:

- i. Rooms which are usually occupied only a part of the day (schools, libraries, or similar facilities); in such cases, the interior one-hour average sound level due to noise outside should not exceed 50 dBA.

¹ County General Plan 2011

² Report Format and Content Requirements 2009

- ii. Corridors, hallways, stairwells, closets, bathrooms, or any room with a volume less than 490 cubic feet.

It shall be unlawful for 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 will exceed the applicable limits in Table 1-1, *San Diego County Code Section 36.404: Sound Level Limits*.

Table 1-1 SAN DIEGO COUNTY CODE SECTION 36.404: SOUND LEVEL LIMITS		
Zone	Time	One-Hour Average Sound Level Limits (dBA)
(1) R-S, R-D, R-R, R-MH, A-70, A-72, S-80, S-81, S-87, S-90, S-92 and R-V and R-U with a density of less than 11 dwelling units per acre.	7:00 a.m. to 10:00 p.m.	50
	10:00 p.m. to 7:00 a.m.	45
(2) R-RO, R-C, R-M, S-86, V5 and R-V and R-U with a density of 11 or more dwelling units per acre.	7:00 a.m. to 10:00 p.m.	55
	10:00 p.m. to 7:00 a.m.	50
(3) S-94, V4 and all other commercial zones.	7:00 a.m. to 10:00 p.m.	60
	10:00 p.m. to 7:00 a.m.	55
(4) V1, V2	7:00 a.m. to 7:00 p.m.	60
	7:00 p.m. to 10:00 p.m.	55
V1	10:00 p.m. to 7:00 a.m.	55
V2	10:00 p.m. to 7:00 a.m.	50
V3	7:00 a.m. to 10:00 p.m.	70
	10:00 p.m. to 7:00 a.m.	65
(5) M-50, M-52 and M-54	Anytime	70
(6) S-82, M-56 and M-58	Anytime	75
(7) S88 (see subsection (c) below)	-	-

- (a) If the measured ambient level exceeds the applicable limit noted above, the allowable one-hour average sound level shall be the ambient noise level, plus 3 decibels. The ambient noise level shall be measured when the alleged noise violation source is not operating.
- (b) 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; provided however, that the one-hour average sound level limit applicable to extractive industries, including but not limited to borrow pits and mines, shall be 75 decibels at the property line regardless of the zone which the extractive industry is actually located.
- (c) S88 zones are Specific Planning Areas which allow for different uses. The sound level limits in Table 1-1 above that apply in an S88 zone depend on the use being made of the property. The limits in Table 1-1, subsection (1) apply to property with a residential, agricultural, or civic 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) 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.

Section 36.409 states:

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 8-hour period, between 7:00 a.m. and 7:00 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.

Section 36.410 states:

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:

- (e) 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 1-2, San Diego County Code Section 36.410 Maximum Sound Level (Impulsive) Measured at Occupied Property, 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 1-2, *San Diego County Code Section 36.410*, are as described in the County Zoning Ordinance.

Table 1-2 SAN DIEGO COUNTY CODE SECTION 36.410: MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED AT OCCUPIED PROPERTY	
Occupied Property Use	Decibels (dBA)
Residential, village zoning or civic use	82
Agricultural, commercial or industrial use	85

- (f) 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 1-3, San Diego County Code Section 36.410 Maximum Sound Level (Impulsive) Measured at Occupied Property for Public Road Projects, 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 1-3, *San Diego County Code Section 36.410*, are as described in the County Zoning Ordinance.

Table 1-3 SAN DIEGO COUNTY CODE SECTION 36.410: MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED AT OCCUPIED PROPERTY FOR PUBLIC ROAD PROJECTS	
Occupied Property Use	dB(A)
Residential, village zoning or civic use	85
Agricultural, commercial or industrial use	90

- (g) 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.

Impacts associated with ground-borne vibration and noise would be significant if Project implementation would expose the uses listed in Table 1-4, *Guidelines for Determining the Significance of Ground-borne Vibration and Noise Impacts*, and Table 1-5, *Guidelines for Determining the Significance of Ground-borne Vibration and Noise Impacts for Special Buildings*, to ground-borne vibration or noise levels equal to or in excess of the levels shown. Note that the County guidelines for ground-borne vibration impacts state (in the footnote for

Table 1-4 below) that “more specific criteria for structures and potential annoyance were developed by Caltrans (2004) and would be used to evaluate these continuous or transient sources in San Diego County.” Table 1-6, Caltrans Guideline Vibration Annoyance Potential Criteria, presents the more specific Caltrans vibration impact criteria.

Table 1-4 GUIDELINES FOR DETERMINING THE SIGNIFICANCE OF GROUND-BORNE VIBRATION AND NOISE IMPACTS				
Land Use Category	Ground-borne Vibration Impact Levels (inches/sec rms)		Ground-borne Noise Impact Levels (dB re 20 micro Pascals)	
	Frequent Events¹	Infrequent Events²	Frequent Events¹	Infrequent Events²
Category 1: Buildings where low ambient vibration is essential for interior operations (research and manufacturing facilities with special vibration constraints).	0.0018 ³	0.0018 ³	Not applicable ⁵	Not applicable ⁵
Category 2: Residences and buildings where people normally sleep (hotels, hospitals, residences, and other sleeping facilities). ⁶	0.0040	0.010	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use (schools, churches, libraries, other institutions, and quiet offices). ⁶	0.0056	0.014	40 dBA	48 dBA

Source: U.S. Department of Transportation, Federal Transit Administration, “Transit Noise and Vibration Impact Assessment,” May 2006.

Notes:

¹ “Frequent Events” is defined as more than 70 vibration events per day.

² “Infrequent Events” is defined as fewer than 70 vibration events per day.

³ This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research will require detailed evaluation to define acceptable vibration levels.

⁴ Vibration-sensitive equipment is not sensitive to ground-borne noise.

⁵ There are some buildings, such as concert halls, TV and recording studios, and theaters that can be very sensitive to vibration and noise but do not fit into any of the three categories. Table 1-5 gives criteria for acceptable levels of ground-borne vibration and noise for these various types of special uses.

⁶ For Categories 2 and 3 with occupied facilities, isolated events are significant when the peak particle velocity (PPV) exceeds one inch per second. Continuous or frequent intermittent vibration sources such as impact pile drivers are significant when their PPV exceeds 0.1 inch per second.

**Table 1-5
GUIDELINES FOR DETERMINING SIGNIFICANCE OF GROUND-BORNE
VIBRATION AND NOISE IMPACTS FOR SPECIAL BUILDINGS**

Type of Building or Room	Ground-borne Vibration Impact Levels (inches/sec rms)		Ground-borne Noise Impact Levels (dB re 20 micro Pascals)	
	Frequent Events ¹	Infrequent Events ²	Frequent Events ¹	Infrequent Events ²
Concert Halls, TV Studios and Recording Studios	0.0018	0.0018	25 dBA	25 dBA
Auditoriums	0.0040	0.010	30 dBA	38 dBA
Theaters	0.0040	0.010	35 dBA	43 dBA

Source: U.S. Department of Transportation, Federal Transit Administration, "Transit Noise and Vibration Impact Assessment," May 2006.

Notes:

¹ "Frequent Events" is defined as more than 70 vibration events per day.

² "Occasional or Infrequent Events" are defined as fewer than 70 vibration events per day.

**Table 1-6
CALTRANS GUIDELINE VIBRATION
ANNOYANCE POTENTIAL CRITERIA**

Human Response	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.1
Severe	2.0	0.4

Note: Transient sources create a single isolated vibration event, such as blasting. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibrator pile drivers, and vibratory compaction equipment.

Source: Transportation- and Construction-Induced Vibration Guidance Manual, California Department of Transportation Environmental Program Environmental Engineering (2004).

Sensitive Biological Species Noise Guidelines

Some studies, such as that completed by the Bioacoustics Research Team (1997), have concluded that 60 dBA is a single, simple criterion to use as a starting point for passerine impacts until more specific research is done (County 2010). Associated guidelines produced by the U.S. Fish and Wildlife Service (USFWS) require that noise be limited to a level not to exceed an hourly limit of 60 dBA L_{EQ} or the average ambient noise level, whichever is greater, at the edge of habitat during the breeding season.

2.0 ENVIRONMENTAL SETTING

2.1 Surrounding Land Uses

The area surrounding the Project site consists primarily of single-family homes, including the existing on-site residence, and a residence located off site (APN 265-270-83) but directly adjacent to the proposed Lots 7 and 8 (as shown on Figure 3). The Bridges at Rancho Santa Fe Golf Course is located to the northwest. The Santa Fe Irrigation District treatment facility (R.E. Badger Filtration Plant) is located to the northeast of the site across Aliso Canyon Road, and a wholesale nursery is located to the southeast.

2.2 Surrounding Roadways

Aliso Canyon Road is a rural two-lane paved roadway. The eastern terminus of the paved portions of Aliso Canyon Road (adjacent to the site) end at the R.E. Badger Filtration Plant (a Santa Fe Irrigation District treatment facility) east of the site.

2.3 Airport Noise

The Project site is not located near any active airports. The closest airport is the McClellan-Palomar Airport in Carlsbad, California, which is located approximately 8 miles northwest of the site. At this distance, no effects related to airport noise would occur and no further analysis is included in this report.

2.4 Existing Noise Environment

Ambient noise levels are low in this area, with very limited roadway traffic and no audible noise from the R.E. Badger Filtration Plant.

3.0 STUDY METHODS, EQUIPMENT, AND PROCEDURES

This section discusses the methods and procedures used in this Acoustical Report, including the selection of noise measurement and receiver locations, noise measurement procedures, and noise impact evaluation.

3.1 Methodology

A “one-hour” equivalent sound level measurement (L_{EQ} , A-Weighted) was recorded near the Project site. During the noise measurement, start and end times were recorded and vehicle counts were made for cars, medium trucks (double-tires/two axles), and heavy trucks (three or more axles) for the corresponding road segments.

The measurement time was sufficiently long for a representative traffic volume to occur and the noise level (L_{EQ}) to stabilize. A 15-minute measurement was taken. The vehicle counts were then converted to one-hour equivalent volumes by applying an appropriate factor.

3.2 Equipment

The following equipment was used to measure existing noise levels at the Project site:

- Larson Davis System LxT Integrating Sound Level Meter
- Larson Davis Model CA250 Calibrator
- Windscreen and tripod for the sound level meter
- Digital camera

The sound level meter was field-calibrated immediately prior to the noise measurements to ensure accuracy. All sound level measurements conducted and presented in this report were made with a sound level meter that conforms to the American National Standards Institute (ANSI) specifications for sound level meters (ANSI SI.4-1983 R2001). All instruments were maintained with National Bureau of Standards traceable calibration per the manufacturers' standards.

3.3 Noise Modeling Software

Modeling of the outdoor noise environment for this report was accomplished using the Traffic Noise Model (TNM) software version 2.5. The TNM was released in February 2004 by the U.S. Department of Transportation (U.S. DOT), and calculates the daytime average Hourly L_{EQ} from three-dimensional model inputs and traffic data. TNM input variables utilized in this analysis included road alignment, lane configuration, projected traffic volumes, estimated truck composition percentages, and vehicle speeds.

The one-hour L_{EQ} noise level is calculated utilizing peak-hour traffic; peak-hour traffic volumes can be estimated based on the assumption that 8 to 10 percent of the average daily traffic would occur during a peak hour. The model-calculated one-hour L_{EQ} noise output is the equivalent to the CNEL (Caltrans Technical Noise Supplement, November 2009).

Project construction noise was analyzed using the Roadway Construction Noise Model (RCNM; U.S. DOT 2008), which utilizes estimates of sound levels from typical construction equipment.

3.4 Assumptions

3.4.1 Construction Assumptions

Construction of the Project would generate elevated noise levels that may disrupt nearby noise sensitive receptors. The magnitude of the impact would depend on the type of construction activity, equipment, duration of each construction phase, distance between the noise source and receiver, and any intervening structures.

Construction would require heavy equipment during mass grading, utility installations, building construction and paving. Construction equipment utilized on site would include but not be limited to: dozers, excavators, graders, trackers, loaders and backhoes. Construction is expected

to begin in the beginning of 2015 and continue for approximately 15 months. Refer to Table 3-1, *Anticipated Construction Schedule*, for more specific information regarding the schedule of construction activities.

Table 3-1 ANTICIPATED CONSTRUCTION SCHEDULE			
Construction Activity	Construction Period		
	Start	End	Number of Working Days
Site Preparation	01/01/2015	01/14/2015	10
Grading	01/15/2015	02/11/2015	20
Backbone Infrastructure	02/12/2015	03/11/2015	20
Building Construction	03/12/2015	01/27/2016	230
Paving	01/28/2016	02/24/2016	20
Architectural Coating	02/25/2016	03/23/2016	20

Although not expected, construction of the Project may potentially include minimal amounts of blasting. Blasting typically includes three components that can result in impacts: flyrock, vibration, and airblast. Flyrock is debris (smaller and potentially larger chunks of rock) ejected from the blast. Both air and ground vibrations create waves that disturb the material in which they travel. When these waves encounter a structure, they cause it to shake and may cause structural damage. Ground vibrations enter the house through the foundation. Airblast is a pressure wave that creates a push (positive pressure) and pull (negative pressure) effect; it may be audible (noise) or inaudible (concussion). A blast occurring outside of a residence may be heard inside because of the audible noise; however, noise has little impact on the structure. The concussion wave causes the structure to shake and rattle and can break windows at higher pressure levels.

Site specific geotechnical information is not currently available; however, a visual review was conducted during the site visit to assess if the area would require blasting during construction. No rock outcroppings or large-sized boulders were observed at the site and blasting is not anticipated based on the visual review of the area. However, the possibility of blasting occurring still exists, as the underlying soil types cannot be determined with certainty without a geotechnical report. The blasting analysis provided is based on general requirements that would be anticipated for a development of this size in the event that hard subsurface materials are discovered during the pad development. The analysis also includes a discussion of the use of a breaker, in the event that large rocks would be generated from the potential blasting that would require breaking.

Construction Vibration Assumptions

The Project is not expected to utilize any pile driving. The most likely source of vibration during the Project construction (excluding blasting discussed above) would be a vibratory roller, which

may be used to achieve soil compaction as part of the foundation construction (and possibly for on-site driveways at a later time).

3.4.2 Operational Assumptions

Operational noise sources for the proposed Project include stationary noise sources in the form of residential heating, ventilation, and air conditioning (HVAC) systems, and transportation sources from vehicles on surrounding roadways.

Residential Air Conditioners

Specific planning data for the future HVAC systems is not available at this stage of project design; however, analysis using a typical to larger-sized residential condenser mounted on ground level pads provides a reasonable basis for analysis. The unit used in this analysis is a Carrier 38HDR060 split system condenser. The manufacturer’s noise data is provided below in Table 3-2, *Carrier HDR060 Condenser Noise*.

Table 3-2 CARRIER HDR060 CONDENSER NOISE							
Noise Levels in Decibels¹ (dB) Measured at Octave Frequencies							Overall Noise Level in A-weighted Scale (dBA)¹
125 Hz	250 Hz	500 Hz	1 KHz	2 KHz	4 KHz	8 KHz	
63.0	61.5	64.0	66.5	66.0	64.5	55.5	72.0

¹ Sound Power Levels (S_{WL})
KHz = kilohertz

Transportation Sources

The Major Pre-Application Summary Letter prepared by County staff (dated March 19, 2014) for the Project that the proposed development would generate approximately 96 average daily trips (ADT) based on 12 ADT per lot for an 8-lot residential subdivision with lots greater than two acres. Baseline traffic numbers (existing without project) were estimated from traffic counts conducted during the May 2014 site visit. Approximately 10 vehicles (9 cars and 1 medium truck) were noted along Aliso Canyon Road during a 15 minute period. This would equate to approximately 36 cars and 4 medium trucks as a baseline hourly traffic volume for this segment of Aliso Canyon Road.

4.0 EXISTING NOISE ENVIRONMENT

As described in Section 2.4, ambient noise levels are low in this area, with very limited roadway traffic from Aliso Canyon Road and no audible noise from the nearby water treatment plant.

4.1 Ambient Noise Measurement

After a continuous 15-minute sound level measurement, minimal changes in the L_{EQ} were detectable and the results were recorded. The measured noise level and related weather conditions are shown in Table 4-1, *Site Noise Measurement Conditions and Results*. Traffic counts for the timed measurement and the one-hour equivalent volumes are shown in Table 4-2, *Traffic Counts from Site Visit*. Note that traffic volumes were too low to provide usable data to calibrate the noise model.

Table 4-1 SITE NOISE MEASUREMENT CONDITIONS AND RESULTS	
Date	May 14, 2014
Conditions	Sunny, clear skies, 8 miles per hour (mph) breeze from the west, temperature of approximately 66°F, with 68% humidity
Time: Measurement 1	3:50 p.m. – 4:05 p.m.
Location 1	Aliso Canyon Road east of Via De Las Flores
Distance to Centerline of Roadway from Noise Monitor Microphone	~20 feet
Measured Noise Level 1	59.0 dBA L_{EQ}

Table 4-2 TRAFFIC COUNTS FROM SITE VISIT				
Roadway	Traffic	Autos	MT ¹	HT ²
January 21, Southern Measurement				
Aliso Canyon Road	15-minute count	9	1	0
	1-hour equivalent	36	4	0

Note: Traffic volumes were too low to provide usable data to calibrate the noise model.

¹ Medium Trucks (double tires/two axles)

² Heavy Trucks (three or more axles)

5.0 IMPACTS

5.1 Significance Thresholds

Section 1.5 above presents the overall County significance thresholds; this section is a brief summary and explanation of those pertinent to the analysis.

5.1.1 Construction Noise Impacts

Construction noise impacts would be significant if the Project exceeds the following County Code requirement:

- As stated in Section 36.409 of the San Diego County Code: 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 8-hour period, between 7:00 a.m. and 7:00 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.

Construction Vibration

Ground-borne vibration during the construction process and would be considered significant if it exceeds the severe criteria, as specified by Caltrans (2004), for residences of 0.4 inches/sec peak particle velocity (PPV).

Construction Impacts to Sensitive Species

Guidelines produced by the USFWS require that noise be limited to a level not to exceed an hourly limit of 60 dBA L_{EQ} or result in no greater than a 3 dBA increase over the average ambient noise level (if the ambient level exceeds 60 dBA L_{EQ}), at the edge of habitat occupied by federally-listed biological species during the breeding season.

5.1.2 Operational Noise Impacts

Transportation Noise

A significant noise impact would occur if the exterior noise level would exceed 60 CNEL for single family residential uses.³

Stationary Sources

Noise generated by the Project would be significant if it would result in noise levels at a common property line with a single-family residential use that would exceed the following one-hour

³ County General Plan 2011

average exterior noise levels: 50 dBA from 7:00 a.m. to 10:00 p.m.; 45 dBA from 10:00 p.m. to 7:00 a.m.

5.2 Construction Noise Impacts

This section will address potential construction noise impacts to on- and off-site human receptors and biologically sensitive habitats. Additional information on noise impacts to sensitive habitats can be found in the Project Biological Technical Report (HELIX 2014).

5.2.1 Construction Noise Impacts and Mitigation

This noise impact analysis focuses on the rough grading, which is typically substantially louder than other activities and has the greatest potential to create impacts to on and off-site NSLUs. The Project will not require extensive mass grading; the grading would include approximately 900 feet of driveway to provide access to the southeastern seven residences, short individual residential driveway, and the residential pads. All of the grading would be done with negligible materials import or export, and roadway elevations and pads would be adapted to match the vicinity topographic levels.

Project construction noise was analyzed using the Roadway Construction Noise Model (RCNM; U.S. DOT 2008), which utilizes estimates of sound levels from typical construction equipment. Table 5-1, *Construction Equipment Noise Levels*, provides the 50-foot distance noise level of the equipment used in this analysis. The FHWA database assumes that pieces of construction equipment are only operating for a percentage of a given hour; these percentage assumptions are incorporated into the noise level calculations provided in Table 5-1.

Table 5-1 CONSTRUCTION EQUIPMENT NOISE LEVELS		
Unit	% Operating Time	dBA L_{EQ} @ 50-Ft
Dozer	40	77.7
Excavator	40	76.7
Breaker	10	80.0
Rock Drill	20	74.0

Based on an hourly noise level of 77.7 dBA, a dozer would exceed the County's 8-hour noise level limits if it is operating closer than 70 feet from an adjacent property for a full day. A dozer would be used only within the areas on the site plan that are proposed to be graded. The building pad located closest to an adjacent residential property line (Lot 4 on Figure 3) is located approximately 100 feet away from an existing residential outdoor use area. Typically the other

types of construction equipment would not be used at the same pad location at the same time, and as they all create lower noise levels than the dozer (with the exception of a breaker, as discussed below), construction noise impacts from general construction operations would be less than significant.

Breaking

A hydraulically operated impact hammer attached to a tracked excavator is commonly called a breaker. These units are used in site preparation to reduce large granitic materials to a size where they can either be transported off site, buried on site for fill, or used as rip rap or landscaping materials.

Impacts

Breakers create an impulsive noise, which is regulated by the 75 dBA 8-hour average requirement, and the maximum impulsive noise level requirement of 82 dBA L_{MAX} . If a breaker operates within 250 feet of the nearest property line of an occupied residence, the breaker noise may exceed the County noise level limit, and impacts would be potentially significant. **(Impact Noi-1)**.

Mitigation

M-Noi-1 Breaker Equipment Operation Limit: If a breaker is required on-site, then it shall not be used within 250 feet of the property line for any occupied residence. Material that would be broken would need to be moved further away from the perimeter of the Project site, so it is a minimum distance of 250 feet from the nearest occupied residence.

Blasting

A full blasting analysis cannot be done until after the site is cleared of all surface material, including any rippable material, to expose the specific type of material to be blasted, the extent of the area of blasting, and the required blasting charge type is known. Although no areas of the Project site are specifically anticipated to require blasting, the possibility of blasting cannot be ruled out at this time.

Impacts

The following analysis is based on a general description of potential impacts that may potentially occur if blasting is found to be necessary as part of Project construction. The information is based on guidance provided by the Office of Surface Mining Reclamation and Enforcement including the document, *Controlling the Adverse Effects of Blasting* (OSM website <http://www.osmre.gov/>) for calculating the scaled distance in blasting.

Based on an assumption of 0.5 pounds of explosive material required per ton of material removed and a typical granite weight of 166.5 pounds per cubic foot, or 2.25 tons per cubic yard, a typical shot designed to break up 10 cubic yards of material (typical truck load) would require

about 11.25 pounds of explosive charge. The charge would typically consist of a 0.5-pound or less of detonation charge per hole, and the remainder of the charge would be provided by TOVEX or other similar water gel explosive slurry. Given the probable small size of any blasting at this site, it is assumed that a single blasting shot would occur. This assumes up to 12 holes (approximately 1.5 inches in diameter or less) for minor explosive activities with up to five blasting operations per day.

Based on these assumptions, the minimum distance to a residence from any blast for this site would need to be at least 200 feet away in order to provide for control of ground borne vibration impacts to the closest residence. Note that additional Project-specific blasting analysis would be necessary once more information is known about the location and extent of Project blasting required.

As specific details regarding the potential location or extent of blasting required on site are not yet available, and blasting could potentially occur within 200 feet of a residence (the closest off-site residence is located 120 feet away), impacts from blasting are conservatively assessed as potentially significant. (**Impact Noi-2**).

Mitigation

M-Noi-2 Blasting Management Plan: Should blasting be required on the Project site, additional blast planning must be conducted. All blast planning must be done by a San Diego County Sheriff-approved blaster, with the appropriate San Diego County Sheriff blasting permits, in compliance with the San Diego County Consolidated Fire Code SEC. 96.1.3301.2., and all other applicable local, state, and federal permits, licenses, and bonding. The blasting contractor or owner must conduct all notifications, inspections, monitoring, and major or minor blasting requirements planning with seismograph reports, as necessary.

5.2.2 Construction Vibration Impacts

As noted previously, the Project is not expected to utilize any pile driving. The most likely source of vibration during the Project construction (excluding blasting discussed above) would be a vibratory roller (primarily used to achieve soil compaction as part of the foundation construction). A vibratory roller creates approximately 0.210 inches/sec PPV at 25 feet.

The County provides for the use of the Caltrans standards (2004) for construction vibration impacts in the footnotes of Table 4 of the County of San Diego Guidelines for Determining Significance, Noise (Table 1-4 in this report). Using the Caltrans criterion of 0.4 inches/sec PPV, the approximately 0.210 inches/sec PPV vibration impact would be less than what is considered to be a “severe” impact. In addition, it is expected that, if used, the vibratory roller would be operating at a distance greater than 25 feet from the nearest occupied residence. Therefore, although vibration may be perceptible by nearby residences, temporary impacts associated the vibratory roller (and other potential equipment) would be less than significant.

5.2.3 Construction Noise Impacts to Sensitive Habitats

Impacts

A dozer may create noise impacts in excess of 60 dBA L_{EQ} out to a distance of approximately 400 feet. This is within the potential impact distance of habitat area if sensitive endangered species are present during the site rough grading and construction activity occurs during the breeding season. According to the Project Biological Report, the Project site includes coastal sage scrub that is likely to include the presence of the federally listed coastal California gnatcatcher. If construction occurs during the breeding season (March 1 – August 15), a significant impact would occur. **(Impact Noi-3).**

Mitigation

M-Noi-3 Construction Noise Impacts to Sensitive Species: If construction occurs within 400 feet of occupied coastal California gnatcatcher (*Polioptila californica californica*; CAGN) habitat during the breeding season (March 1 – August 15), construction noise planning and control would be required to ensure construction noise does not exceed 60 dBA L_{EQ} or, if the existing ambient noise level is above 60 dBA L_{EQ} , increase the ambient noise level by 3 dBA.

5.3 Operational Noise Analysis Assumptions

5.3.1 Stationary Noise Sources (Residential Air Conditioners)

Although specific planning and distance information is not available, a worst-case modeling scenario has been used to provide analysis of the potential impacts. Provided that a residential air conditioning unit condenser is placed beyond a distance of 35 feet from an adjacent residence, noise levels at the adjacent property would be below the 45 dBA L_{EQ} threshold. Based on the site plan and that the proposed lot sizes, it is unlikely that any residential air conditioning unit condensers would be positioned closer than 35 feet from an adjacent lot line. Therefore, potential noise impacts from residential air conditioning equipment would be less than significant.

5.3.2 Transportation Noise Sources

For general planning purposes, TNM software was utilized to calculate the distances to traffic noise levels associated with Aliso Canyon Road. As the eight homes on the Project site (conservatively counting both the seven new homes and the one existing residence) were estimated to generate a total of approximately 96 ADT (based on 12 ADT/Lot), and it is generally accepted that 10 percent of the average daily traffic would occur during a peak hour, the Project would be anticipated to add up to 10 trips per hour to the surrounding roadways.

The baseline hourly traffic volume on Aliso Canyon Road was estimated to be 36 cars and 4 medium trucks per hour based on the field visit. Assuming the cars are conservatively traveling a maximum speed of 35 mph (the surrounding residential streets have posted speed

limits of 25 mph, but no sign was noted on Aliso Canyon Road), the baseline noise level is estimated to be approximately 52.2 CNEL at a distance of 45 feet from the roadway centerline. The proposed Project would add approximately 10 automobile trips to the baseline volumes per hour, for a total (baseline plus project) of 46 cars and 4 medium trucks per hour. The Project-added traffic noise level generated along Aliso Canyon Road would increase by 0.7 dBA, or 52.9 CNEL at the nearest residence (located approximately 45 feet from the centerline of the roadway). As the Project-added traffic noise levels at surrounding residences are expected to be below the 60 CNEL threshold, transportation noise impacts would be less than significant.

5.4 Impact Summary

The following is a summary of Project noise impacts:

- Noi-1 Breaker Noise Impacts:** If a breaker operates within 250 feet of the nearest property line of an occupied residence, the breaker noise may exceed the County noise level limit, and impacts would be potentially significant.
- Noi-2 Blasting Impacts:** As specific details regarding the potential location or extent of blasting required on site are not yet available, and blasting could potentially occur within 200 feet of a residence, impacts from blasting are conservatively assessed as potentially significant.
- Noi-3 Construction Noise Impacts to Sensitive Species.** If operation of construction equipment occurs within 400 feet of occupied coastal California gnatcatcher habitat during the breeding season (March 1 – August 15), impacts would be potentially significant.

6.0 MITIGATION MEASURES

6.1 Mitigation

- M-Noi-1 Breaker Equipment Operation Limit:** If a breaker is required on-site, then it shall not be used within 250 feet of the property line for any occupied residence. Material that would be broken would need to be moved further away from the perimeter of the Project site, so it is a minimum distance of 250 feet from the nearest occupied residence.
- M-Noi-2 Blasting Management Plan:** Should blasting be required on the Project site, additional blast planning must be conducted. All blast planning must be done by a San Diego County Sheriff-approved blaster, with the appropriate San Diego County Sheriff blasting permits, in compliance with the San Diego County Consolidated Fire Code SEC. 96.1.3301.2., and all other applicable local, state, and federal permits, licenses, and bonding. The blasting contractor or owner must conduct all notifications, inspections, monitoring, and major or minor blasting requirements planning with seismograph reports, as necessary.

M-Noi-3 Construction Noise Impacts to Sensitive Species: If construction occurs within 400 feet of occupied coastal California gnatcatcher habitat during the breeding season (March 1 – August 15), construction noise planning and control would be required to ensure construction noise does not exceed 60 dBA L_{EQ} or, if the existing ambient noise level is above 60 dBA L_{EQ} , increase the ambient noise level by 3 dBA.

7.0 CONCLUSION

With implementation of construction noise measures M-Noi-1, M-Noi-2, and M-Noi-3, impacts associated with Project construction would be reduced to less than significant levels.

The Project would not result in significant stationary or transportation-related noise impacts, and mitigation measures would not be required.

8.0 CERTIFICATION

The findings and recommendations of this acoustical analysis report are based on the available information, and are a true and factual analysis of the potential acoustical issues associated with the proposed Aliso Canyon Project located in the unincorporated community of Rancho Santa Fe within the County of San Diego. This report was prepared by Charles Terry.



Charles Terry, Senior Acoustics Specialist

June 20, 2014

Date

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