ACOUSTICAL SITE ASSESSMENT
TPM 21056 RESIDENTIAL SUBDIVISION
LOT 211 MAP 643, APN280-082-11
RAMONA, CA

Submitted to:

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The County of San Diego

ISE Project #07-037

October 4, 2007 (Revised)

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EXECUTIVE SUMMARY

This acoustical site assessment analyzes the 4.29-acre project site located in the Community of Ramona, within the County of San Diego. The project seeks to subdivide the parcel into two single-family residential parcels. Our findings indicate that there would not be any acoustical impacts on the proposed Parcel 1. Additionally, ISE determined that the unmitigated 60 dBA CNEL noise contour would be between 83-Feet and 164-Feet for first floor areas.

INTRODUCTION AND DEFINITIONS

Existing Site Characterization

The project site consists of approximately 4.29 acres located in the City of Ramona, within the County of San Diego, California. The project is located west of Pine Street/State Route 78 (SR-78). Cedar Street provides regional access to the project area from Pine Street to the south as can be seen in Figure 1 below.

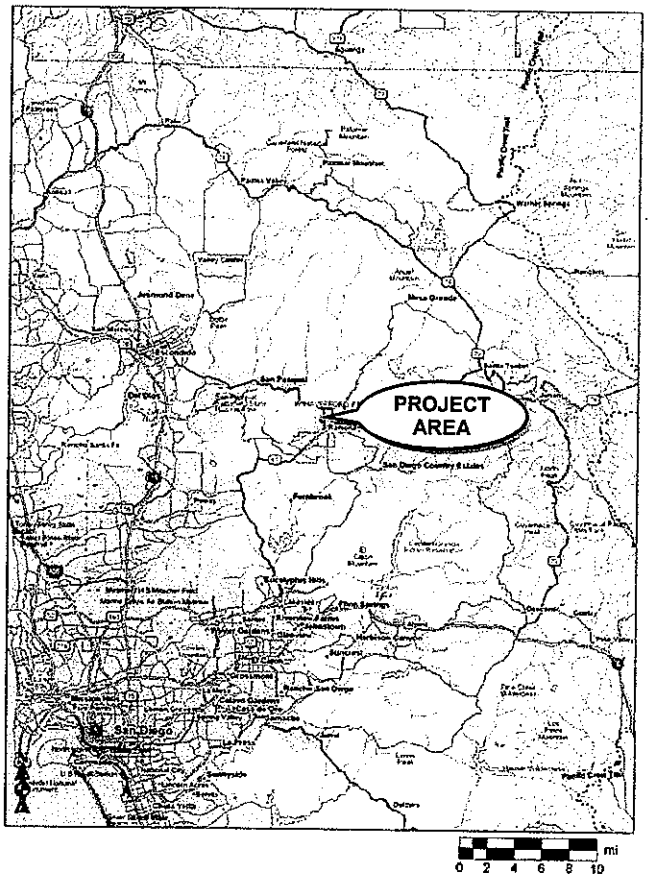

FIGURE 1: Project Vicinity Map (ISE 7/07)

The proposed project site and all surrounding land uses are currently designated as 19 Intensive Agriculture. Elevations on the entire property range from approximately 1,506 to 1,564 feet above mean sea level (MSL) as shown in Figure 2 below.

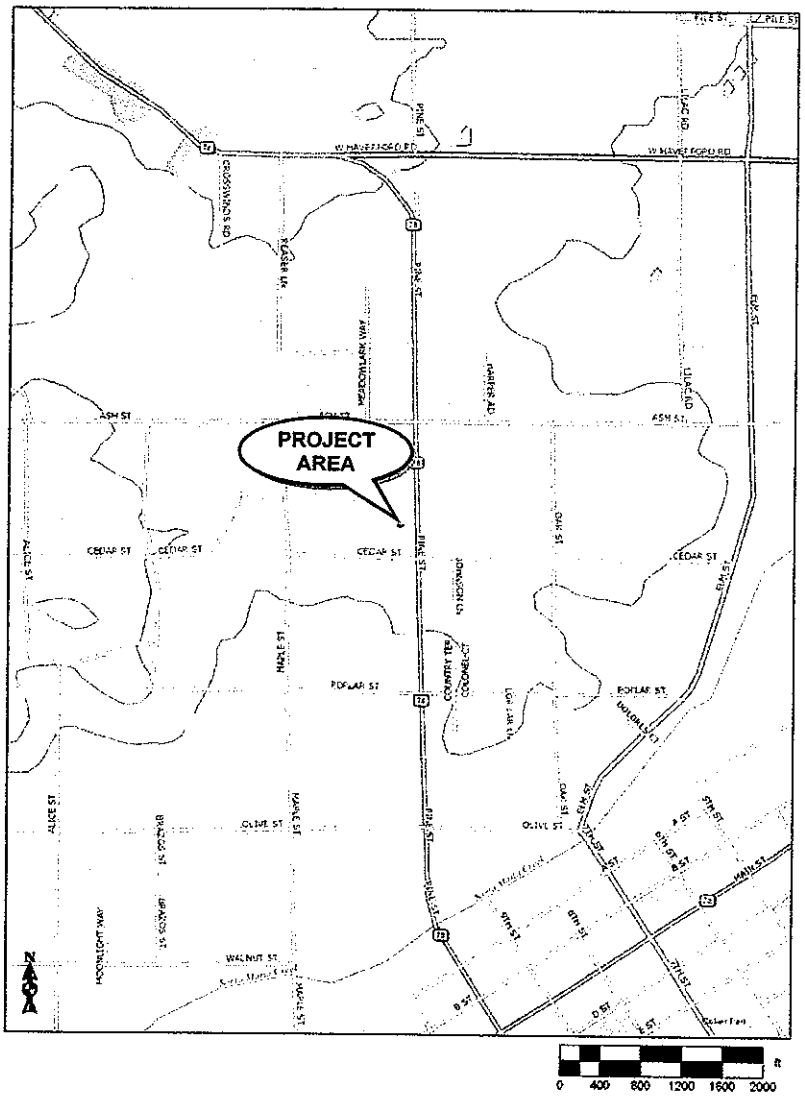

FIGURE 2: Project Site Location Map w/ Topography (ISE 6/07)

Project Description

The proposed TPM 21056 is a Tentative Parcel Map to subdivide 4.29 gross acres into two residential parcels of 2.01 to 2.06 future net acres, with a proposed 5 feet offer to dedicated a right of way on Pine Street as can be seen in Figure 3 below. The dedication will be for the redesigned Pine Street. The site currently contains a newer single-family home and does not seek any structural modifications. The development plan for the new lot would be a single story structure similar to the existing structure on Parcel 1.

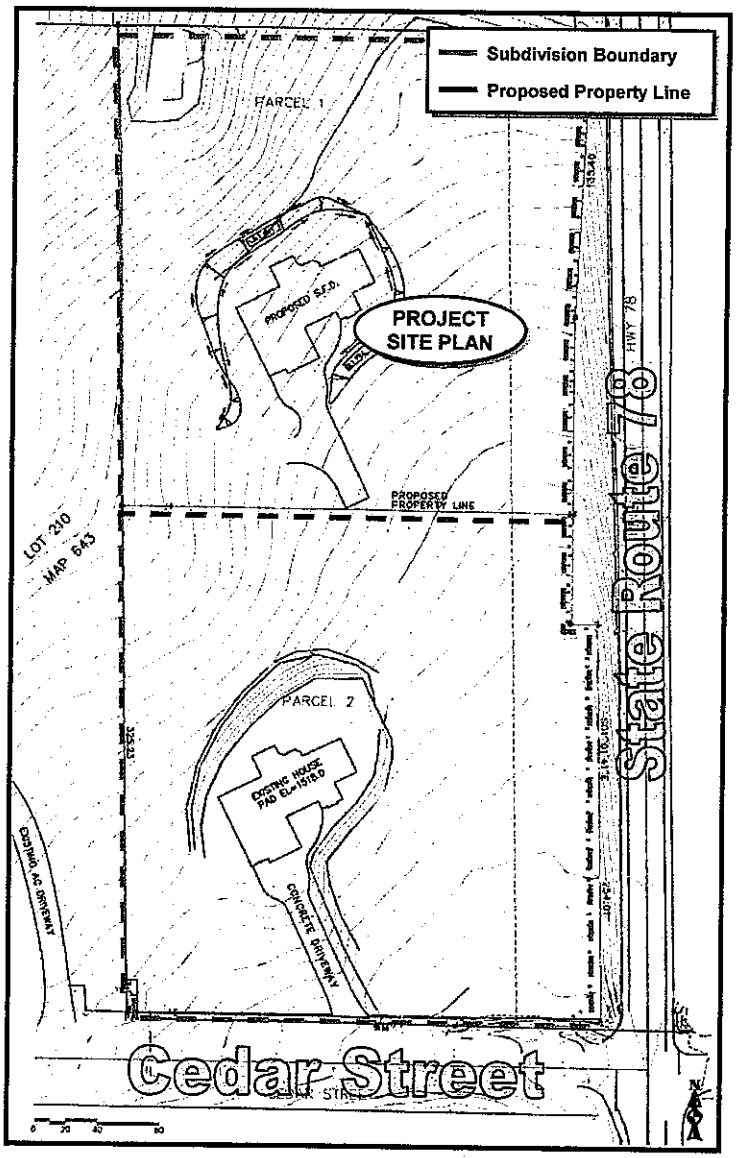

FIGURE 3: Proposed Site Plan –TPM 21056 (Dimensions Land Surveying & Mapping, 6/07)

Acoustical Definitions

Sound waves are linear mechanical waves. They can be propagated in solids, liquids, and gases. The material transmitting such a wave oscillates in the direction of propagation of the wave itself. Sound waves originate from some sort of vibrating surface. Whether this surface is the vibrating string of a violin or a person's vocal cords, a vibrating column of air from an organ or clarinet, or a vibrating panel from a loudspeaker, drum, or aircraft, the sound waves generated are all similar. All of these vibrating elements alternatively compress the surrounding air on a forward movement and expand it on a backward movement.

There is a large range of frequencies within which linear waves can be generated, sound waves being confined to the frequency range that can stimulate the auditory organs to the sensation of hearing. For humans this range is from about 20 Hertz (Hz or cycles per second) to about 20,000 Hz. The air transmits these frequency disturbances outward from the source of the wave. Sound waves, if unimpeded, will spread out in all directions from a source. Upon entering the auditory organs, these waves produce the sensation of sound. Waveforms that are approximately periodic or consist of a small number of periodic components can give rise to a pleasant sensation (assuming the intensity is not too high), for example, as in a musical composition.

Noise, on the other hand, can be represented as a superposition of periodic waves with a large number of components and is generally defined as unwanted or annoying sound that is typically associated with human activity and which interferes with or disrupts normal activities. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise and its appropriateness in the setting, the time of day, and the sensitivity of the individual hearing the sound.

Airborne sound is a rapid fluctuation of air pressure above and below atmospheric levels. The loudest sounds that the human ear can hear comfortably are approximately one trillion (or $1x10^{12}$) times the acoustic energy that the ear can barely detect. Because of this vast range, any attempt to represent the acoustic intensity of a particular sound on a linear scale becomes unwieldy. As a result, a logarithmic ratio originally conceived for radio work known as the decibel (dB) is commonly employed[1].

A sound level of zero "0" dB is scaled such that it is defined as the threshold of human hearing and would be barely audible to a human of normal hearing under extremely quiet listening conditions. Such conditions can only be generated in anechoic or "dead rooms". Typically, the quietest environmental conditions (extreme rural areas with extensive shielding) yield sound levels of approximately 20 decibels. Normal speech

[1] A unit used to express the intensity of a sound wave. This level is defined as being equal to 20 times the common logarithm of the ratio of the pressure produced by a sound wave of interest to a 'reference' pressure wave (which is defined as 1 micro Pascal measured at a distance of 1 meter).

has a sound level of approximately 60 dB. Sound levels above 120 dB roughly correspond to the threshold of pain.

The minimum change in sound level that the human ear can detect is approximately 3.0 dBA[2]. A change in sound level of 10 dB is usually perceived by the average person as a doubling (or halving) of the sounds loudness[3]. A change in sound level of 10 dB actually represents an approximate 90 percent change in the sound intensity, but only about a 50 percent change in the perceived loudness. This is due to the nonlinear response of the human ear to sound.

As mentioned above, most of the sounds we hear in the environment do not consist of a single frequency, but rather a broad band of frequencies differing in sound level. The intensities of each frequency add to generate the sound we hear. The method commonly used to quantify environmental sounds consists of determining all of the frequencies of a sound according to a weighting system that reflects the nonlinear response characteristics of the human ear. This is called "A" weighting, and the decibel level measured is called the A-weighted sound level (or dBA). In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

Although the A-weighted sound level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of sounds from distant sources that create a relatively steady background noise in which no particular source is identifiable. For this type of noise, a single descriptor called the Leq (or equivalent sound level) is used. Leq is the energy-mean A-weighted sound level during a measured time interval. It is the 'equivalent' constant sound level that would have to be produced by a given source to equal the average of the fluctuating level measured. For most acoustical studies, the monitoring interval is generally taken as one-hour and is abbreviated *Leq-h*.

To describe the time-varying character of environmental noise, the statistical noise descriptors L10, L50, and L90 are commonly used. They are the noise levels equaled or exceeded during 10 percent, 50 percent, and 90 percent of a stated time. Sound levels associated with the L10 typically describe transient or short-term events, while levels associated with the L90 describe the steady state (or most prevalent) noise conditions. In addition, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the maximum and minimum measured sound level (Lmax and Lmin) indicators. The Lmin value obtained for a particular monitoring location is often called the *acoustic floor* for that location.

Finally, another sound measure employed by the State of California and the County of San Diego is known as the Community Noise Equivalence Level (CNEL) is defined as the "A" weighted average sound level for a 24-hour day. It is calculated by adding a 5-decibel penalty to sound levels in the evening (7:00 p.m. to 10:00 p.m.), and

[2] Every 3 dB equates to a 50% of drop (or increase) in wave strength, therefore a 6 dB drop/increase = a loss/increase of 75% of total signal strength and so on.

[3] This is a subjective reference based upon the nonlinear nature of the human ear.

a 10-decibel penalty to sound levels in the night (10:00 p.m. to 7:00 a.m.) to compensate for the increased sensitivity to noise during the quieter evening and nighttime hours.

APPLICABLE SIGNIFICANCE CRITERIA

Ramona Community Plan Noise Guidelines

The Ramona Community Plan allocates residential land use designations in a range of densities from 24 dwelling units per acre down to one unit per acre and one unit per two acres. Properties on one acre or Single-family residential development will not be permitted in areas that have close proximity to airports or major roads, where projected noise levels are greater than 55 dBA {CNEL}, without adequate mitigation measures.

Vehicular/Transportation Noise Impact Thresholds

Transportation noise levels, such as those produced by vehicles traveling to and from the project site, are governed under Policy 4b of the *County of San Diego's Noise Element of the County's General Plan (as revised 7/06)*. The relevant sections of the Noise Element are cited below:

> Because exterior community noise equivalent levels (CNEL) above 60 decibels and/or interior CNEL above 45 decibels may have an adverse effect on public health and welfare, it is the policy of the County of San Diego that:
>
> 1. Whenever it appears that new *development* may result in any (existing or future) *noise sensitive land use* being subject to noise levels of CNEL equal to 60 *decibels (A)* or greater, an acoustical analysis shall be required.
> 2. If the acoustical analysis shows that noise levels at any *noise sensitive land use* will exceed CNEL equal to 60 decibels, modifications shall be made to the *development* which reduce the *exterior noise* level to less than CNEL of 60 *decibels (A)* and the *interior noise* level to less than CNEL of 45 *decibels (A)*[4].
> 3. If modifications are not made to the *development* in accordance with paragraph 2 above, the *development* shall not be approved unless a finding is made that there are specifically identified overriding social or economic considerations which warrant approval of the development without such modification; provided, however, if the acoustical study shows that sound levels for any noise sensitive land use will exceed a CNEL equal to 75

[4] **Action Program 4b1:** Recommend programs to soundproof buildings or redevelop areas where it is impossible to reduce existing source noise to acceptable levels.

Action Program 4b2: Study the feasibility of extending the application of Section 1092, California Administrative Code dealing with noise insulation standards to single-family dwellings, and incorporating higher standards for reduction of exterior noise intrusion into structures.

Action Program 4b3: Require present and projected noise level data to be included in Environmental Impact Reports. Designs to mitigate adverse noise impacts shall also be used.

decibels (A) even with such modifications, the *development* shall not be approved irrespective of such social or economic considerations.

Definitions, Notes and Exceptions

"Decibels (A)" refers to A-weighted sound levels as noted on page VIII-2 within the Element.

"Development" means any physical development including but not limited to residences, commercial, or industrial facilities, roads, civic buildings, hospitals, schools, airports, or similar facilities.

"*Exterior noise*":

(a) For single family detached dwelling projects, "exterior noise" means noise 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:

(i) Net lot area up to 4,000 sq. ft.:	400 square feet.
(ii) Net lot area 4,000 sq. ft. to 10 ac.:	10% of net lot area.
(iii) Net lot area over 10 ac.:	1 ac.

(b) For all other projects, "exterior noise" means noise measured at all exterior areas, which are provided for group or private usable, *open space* purposes.

(c) For County road construction projects, the exterior noise level due to vehicular traffic impacting a noise sensitive area should not exceed the following values:

(i) Federally funded projects: The Noise standard contained in applicable Federal Highway Administration Standards.

(ii) Other projects: 60 *decibels (A),* except if the existing or projected noise level without the project is 58 decibels (*A*) or greater, a 3 *decibel* (*A*) increase is allowed, up to the maximum permitted by Federal Highway Administration Standards.

"Group or Private Usable Open Space" shall mean: Usable open space intended for common use by occupants of a development, either privately owned and maintained or dedicated to a public agency, normally including swimming pools, recreation courts, patios, open landscaped areas, and greenbelts with pedestrian walkways and equestrian and bicycle trails, but not including off-street parking and loading areas or driveways (Group Usable Open Space); and usable open space intended for use of occupants of one dwelling unit, normally including yards, decks and balconies (Private Usable Open Space).

"Interior noise": The following exception shall apply: For rooms which are usually occupied only a part of the day (schools, libraries, or similar), the interior one-hour average sound level, due to noise outside, should not exceed 50 *decibels (A).*

"Noise sensitive land use" means any residence, hospital, school, hotel, resort, library or any other facility where quiet is an important attribute of the environment.

State of California CCR Title 24 Noise Insulation Standards

The California Code of Regulations (CCR), Title 24, Noise Insulation Standards, states that multi-family dwellings, hotels, and motels located where the CNEL exceeds 60 dBA, must obtain an acoustical analysis showing that the proposed design will limit interior noise to less than 45 dBA CNEL. Interior noise standards are typically applied to sensitive areas within the structure where low noise levels are desirable (such as living rooms, dining rooms, bedrooms, and dens or studies).

Worst-case noise levels, either existing or future, must be used for this determination. Future noise levels must be predicted at least ten years from the time of building permit application. The County of San Diego has adopted the CCR Title 24 standards as part of their Policy 4b implementation.

ANALYSIS METHODOLOGY

Existing Conditions Field Survey

A Quest Model 2900 ANSI Type 2 integrating sound level meter was used as the data collection device. The meter was mounted to a tripod five-feet above ground level in order to simulate the noise exposure of an average-height human being. One short-term sound level measurement was taken on the proposed site as described below. The monitoring location is shown in Figure 4 below.

The monitoring location (denoted as ML 1) was selected in the central portion of the project site, within Parcel 1 (again refer to Figure 4) roughly 170 feet west of Pine Street. Onsite monitoring was performed in this manner in order to obtain an estimate of the worst-case existing onsite noise levels during normal daytime traffic conditions. The monitoring site was spatially logged using a geographic positioning system (GPS) to maintain both horizontal and vertical control.

The measurement was performed on June 22, 2007. All equipment was calibrated before testing at ISE's acoustics and vibration laboratory to verify conformance with ANSI S1-4 1983 Type 2 and IEC 651 Type 2 standards.

FIGURE 4: Ambient Onsite Monitoring Locations –TPM 21056 (ISE 7/07)

Traffic Noise Impact Assessment Approach

The *Traffic Noise Model version 2.5* (TNM 2.5) based on FHWA-PD-96-010 and FHWA/CA/TL-87/03 standards was used to calculate future onsite vehicular traffic noise levels. These components are supported by a scientifically founded and experimentally calibrated acoustic computation methodology. The database is made up of over 6,000 individual pass-by events measured at forty sites across the country. Currently TNM 2.5 is the only noise-modeling program accepted by Caltrans for use within the State of California.

The County's Noise Element specifies that 10% of the net lot area per parcel must comply with the County's exterior useable area criterion of 60 dBA CNEL (55 for Ramona) for parcels larger than 4,000 sq. ft. but smaller than 10 acres; the proposed project would fall under these standards with Parcel 1 having a minimum designated area of 8,980 sq. ft.

Receptor elevations were considered five feet above the appropriate floor (pad) elevation and were taken near the edge and center of the proposed lot (i.e., within all Noise Sensitive Areas, NSA's) closet to Pine Street. The receptor locations and the designed useable area is shown in Figure 5 on the next page. The TNM model input and output files required for the analysis is provided at the end of this technical report. Input to the acoustical model includes the following:

- A digitized representation of all affected roadways (i.e., *Pine Street/State Route 78*).
- Future Average Daily Trips (ADTs) for nearby major roadways.[5]
- A 94/4/2 (automobiles/medium/heavy) traffic mix in accordance with CALTRANS.
- A peak hour traffic percentage of 10% of the ADT.[6]
- Receptor and topographic elevations as identified in the project site plans.[7]

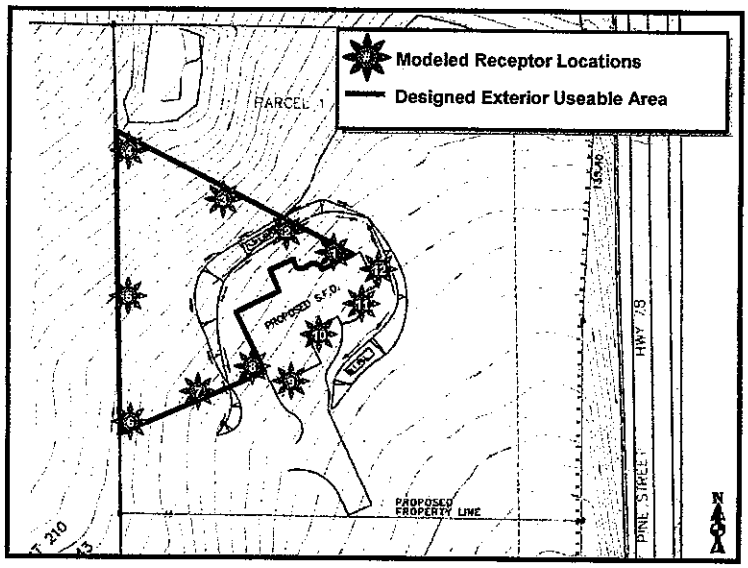

FIGURE 5: Modeled Receptors and NSAs for TPM 21056 Residential Subdivision (ISE 7/07)

FINDINGS / RECOMMENDATIONS

Ambient Sound Measurement Results

Testing conditions during the monitoring period were sunny with an average barometric pressure reading of 30.01 in-Hg, an average westerly wind speed of 0 to 1 miles per hour (MPH) and an approximate mean temperature of 76 degrees Fahrenheit. The results of one-hour sound level monitoring are shown in Table 1 below. The values for the

[5] Source: *SANDAG Series 10 – 2030 Basic Traffic Prediction Model.*

[6] For values between approximately 8 and 12 percent, the energy-mean A-weighted sound level is equivalent to the CNEL. Outside this range, a maximum variance of up to two dBA occurs between Leq-h and CNEL.

[7] Source: Dimensions Land Surveying & Mapping

energy equivalent sound level (Leq), the maximum and minimum measured sound levels (Lmax and Lmin), and the statistical indicators L10, L50, and L90, are given for each monitoring location.

TABLE 1: Measured Ambient Sound Levels –TPM 21056 Residential Subdivision Project Site

		1-Hour Noise Level Descriptors in dBA					
Site	**Start Time**	**Leq**	**Lmax**	**Lmin**	**L10**	**L50**	**L90**
ML 1	8:30 a.m.	53.8	56.0	50.4	55.0	52.3	51.0

Monitoring Location:

- ML 1: Center of Project Site facing Pine Street.
  GPS: 33°03.369'N x 116°52.321'W, EPE 10 ft.

Measurements performed by ISE on June 22, 2007. EPE = Estimated Position Error.

Measurements collected at the monitoring location ML 1 reflect the typical sound levels associated with the community setting with existing adjacent major roadway activities. The hourly average sound levels (or Leq-h) recorded over the monitoring period was 53.8 dBA and was observed to be predominately due to surface street traffic.

As indicated by the monitoring equipment, at least 90 percent of the time (L90) the onsite sound level at ML 1 was approximately 51 dBA. The acoustic floor for the site, as seen by the Lmin indicator was found to be 50.4 dBA. This would be considered the lowest attainable sound levels for the project area near Pine Street.

Future Traffic Noise Impacts

The primary source of future traffic noise near the project site would be from Pine Street which is denoted as a rural collector. Future traffic estimates for this roadway predict volume as high as 13,000 ADT (*Source: SANDAG Series 10 – 2030 Basic Traffic Prediction Model*). The future speed limit along this roadway is projected to be 40 MPH for all vehicles respectively.

The results of the acoustical modeling are shown below in Table 2 for the proposed parcel 1. For each receptor examined in Figure 5 above, the unmitigated ground floor (outdoor pad) noise level are provided. Additionally, an unobstructed (i.e. without structural barriers) noise contour is shown is shown in Figure 6 on the following page.

Based on the model results, no exterior mitigation would be necessary for any noise sensitive areas since the site would not exceed the County's noise abatement thresholds for Ramona. Additionally, all building façade areas would not exceed the CCR Title 24 noise abatement threshold of 60 dBA CNEL.

TABLE 2: Predicted Transportation Noise Levels – TPM 21056 Residential Subdivision

Modeled Receptor No.	Parcel Number and Location.	First Floor Unmitigated Sound Levels
1	Parcel 1, NSA 1	54.2
2	Parcel 1, NSA 2	55.3
3	Parcel 1, NSA 3	55.1
4	Parcel 1, NSA 4	54.2
5	Parcel 1, NSA 5	54.0
6	Parcel 1, NSA 6	55.0
7	Parcel 1, NSA 7	54.6
8	Parcel 1, NSA 8	44.4
9	Parcel 1, Building 1 South Façade	57.8
10	Parcel 1, Building 1 Southeast Façade	58.1
11	Parcel 1, Building 1 Northeast Façade	60.4
12	Parcel 1, Building 1 North Façade	60.4

All levels given in dBA CNEL
NSA = Noise Sensitive Area

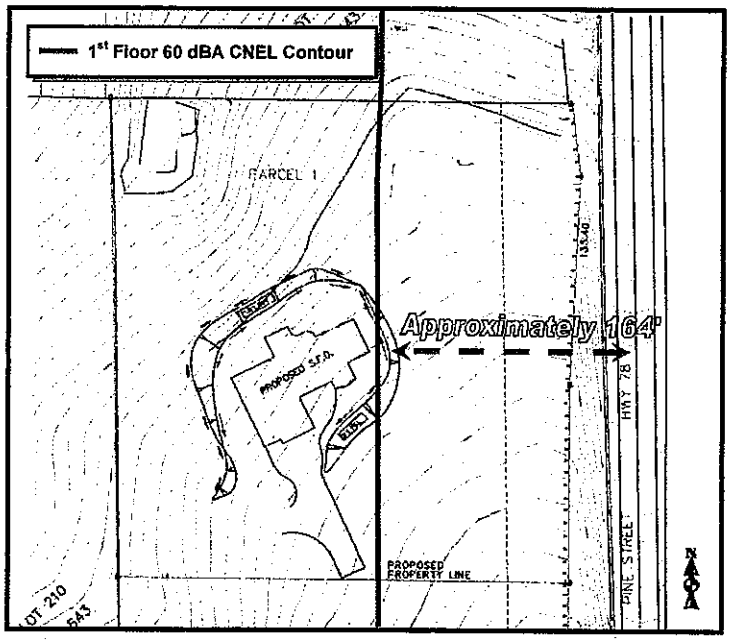

FIGURE 6: Unobstructed 60 Contours for 1st Floor from SR-78 & Cedar St (ISE 7/07)

CERTIFICATION OF ACCURACY AND QUALIFICATIONS

This report was prepared by Investigative Science and Engineering, Inc. (ISE) located at 16486 Bernardo Center Drive, Suite 278, San Diego, CA 92128. The members of its professional staff contributing to the report are listed below:

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ISE affirms to the best of its knowledge and belief that the statements and information contained herein are in all respects true and correct as of the date of this report. Should the reader have any questions regarding the findings and conclusions presented in this report, please do not hesitate to contact ISE at (858) 451-3505.

Content and information contained within this report is intended only for the subject project and is protected under 17 U.S.C. §§ 101 through 810. Original reports contain non-photo blue ISE watermark at the bottom of each page.

Approved as to Form and Content:

Rick Tavares, Ph.D.
Project Principal
Investigative Science and Engineering, Inc.

Attachments to this report: *TNM 2.5 Model Input/Output Decks*

ISE
Andre Estrada

2 October 2007
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 07-037 TPM 21056
RUN: Unmitigated
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
Parcel 1 NSA 1	14	1	0.0	54.2	66	54.2	10	---	54.2	0.0	8	-8.0
Parcel 1 NSA 2	15	1	0.0	55.3	66	55.3	10	---	55.3	0.0	8	-8.0
Parcel 1 NSA 3	16	1	0.0	55.1	66	55.1	10	---	55.1	0.0	8	-8.0
Parcel 1 NSA 4	17	1	0.0	54.2	66	54.2	10	---	54.2	0.0	8	-8.0
Parcel 1 NSA 5	18	1	0.0	54.0	66	54.0	10	---	54.0	0.0	8	-8.0
Parcel 1 NSA 6	20	1	0.0	55.0	66	55.0	10	---	55.0	0.0	8	-8.0
Parcel 1 NSA 7	21	1	0.0	54.6	66	54.6	10	---	54.6	0.0	8	-8.0
Parcel 1 NSA 8	22	1	0.0	44.4	66	44.4	10	---	44.4	0.0	8	-8.0
Building 1 Facade South	24	1	0.0	57.8	66	57.8	10	---	57.8	0.0	8	-8.0
Building 1 Facade Southeast	25	1	0.0	58.1	66	58.1	10	---	58.1	0.0	8	-8.0
Building 1 Facade Northeast	26	1	0.0	60.4	66	60.4	10	---	60.4	0.0	8	-8.0
Building 1 Facade North	29	1	0.0	60.4	66	60.4	10	---	60.4	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	12	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

ISE 2 October 2007
Andre Estrada TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: 07-037 TPM 21056
RUN: Unmitigated

Roadway	Points		Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
Name	Name	No.	V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
State Route 78, Northbound	point1	1	611	40	26	40	13	40	0	0	0	0
	point2	2	611	40	26	40	13	40	0	0	0	0
	point3	3	611	40	26	40	13	40	0	0	0	0
	point4	4	611	40	26	40	13	40	0	0	0	0
	point5	5	611	40	26	40	13	40	0	0	0	0
	point6	6	611	40	26	40	13	40	0	0	0	0
	point7	7										
State Route 78, Southbound	point8	8	611	40	26	40	13	40	0	0	0	0
	point9	9	611	40	26	40	13	40	0	0	0	0
	point10	10	611	40	26	40	13	40	0	0	0	0
	point11	11	611	40	26	40	13	40	0	0	0	0
	point12	12	611	40	26	40	13	40	0	0	0	0
	point13	13	611	40	26	40	13	40	0	0	0	0
	point14	14										

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2 October 2007
TNM 2.5

INPUT: TERRAIN LINES
PROJECT/CONTRACT: 07-037 TPM 21056
RUN: Unmitigated

Terrain Line Name	Points No.	Coordinates (ground) X ft	Y ft	Z ft
Proposed Pad	1	119.0	448.0	1,533.00
	2	129.0	451.0	1,533.00
	3	135.0	460.0	1,533.00
	4	133.0	469.0	1,533.00
	5	126.0	480.0	1,533.00
	6	117.0	496.0	1,533.00
	7	109.0	519.0	1,533.00
	8	105.0	537.0	1,533.00
	9	110.0	552.0	1,533.00
	10	132.0	570.0	1,533.00
	11	158.0	585.0	1,533.00
	12	185.0	597.0	1,533.00
	13	213.0	586.0	1,533.00
	14	223.0	564.0	1,533.00
	15	231.0	538.0	1,533.00
	16	225.0	519.0	1,533.00
	17	201.0	497.0	1,533.00
	18	192.0	483.0	1,533.00
	19	191.0	467.0	1,533.00
Terrain Line2	20	353.0	732.0	1,545.00
	21	347.0	704.0	1,541.00
	22	352.0	661.0	1,537.00
	23	353.0	652.0	1,536.00
	24	350.0	590.0	1,530.00

	25	346.0	538.0	1,526.00
	26	346.0	490.0	1,523.00
	27	346.0	445.0	1,520.00
	28	346.0	374.0	1,516.00
	29	345.0	338.0	1,514.00
	30	348.0	288.0	1,512.00
	31	350.0	254.0	1,511.00
	32	350.0	200.0	1,509.00
	33	351.0	164.0	1,508.00
	34	354.0	87.0	1,506.00
	35	341.0	71.0	1,506.00
	36	265.0	73.0	1,506.00
	37	237.0	73.0	1,507.00
	38	220.0	73.0	1,508.00
	39	163.0	73.0	1,509.00
	40	138.0	74.0	1,510.00
	41	88.0	73.0	1,513.00
	42	10.0	68.0	1,516.00

ISE
Andre Estrada

2 October 2007
TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 07-037 TPM 21056
RUN: Unmitigated

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

Roadway		Points					Flow Control			Segment	
Name	Width	Name	No.	Coordinates (pavement) X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
State Route 78, Northbound	12.0	point1	1	403.0	40.0	1,512.00				Average	
		point2	2	402.0	114.0	1,513.00				Average	
		point3	3	401.0	156.0	1,514.00				Average	
		point4	4	400.0	211.0	1,515.00				Average	
		point5	5	400.0	258.0	1,516.00				Average	
		point6	6	397.0	405.0	1,526.00				Average	
		point7	7	390.0	759.0	1,543.00					
State Route 78, Southbound	12.0	point8	8	378.0	759.0	1,543.00				Average	
		point9	9	385.0	405.0	1,526.00				Average	
		point10	10	388.0	258.0	1,516.00				Average	
		point11	11	388.0	211.0	1,515.00				Average	
		point12	12	389.0	156.0	1,514.00				Average	
		point13	13	390.0	114.0	1,513.00				Average	
		point14	14	391.0	40.0	1,512.00					

ISE 2 October 2007
Andre Estrada TNM 2.5

INPUT: RECEIVERS
PROJECT/CONTRACT: 07-037 TPM 21056
RUN: Unmitigated

Receiver Name	No.	#DUs	Coordinates (ground) X	Y	Z	Height above Ground	Input Sound Levels and Criteria: Existing LAeq1h	Impact Criteria LAeq1h	Impact Criteria Sub'l	NR Goal	Active in Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
Parcel 1 NSA 1	14	1	190.0	559.0	1,533.00	4.92	0.00	66	10.0	8.0	Y
Parcel 1 NSA 2	15	1	154.0	573.0	1,533.00	4.92	0.00	66	10.0	8.0	
Parcel 1 NSA 3	16	1	117.0	588.0	1,540.00	4.92	0.00	66	10.0	8.0	
Parcel 1 NSA 4	17	1	57.0	613.0	1,547.00	4.92	0.00	66	10.0	8.0	
Parcel 1 NSA 5	18	1	57.0	535.0	1,541.00	4.92	0.00	66	10.0	8.0	Y
Parcel 1 NSA 6	20	1	58.0	468.0	1,539.00	4.92	0.00	66	10.0	8.0	Y
Parcel 1 NSA 7	21	1	102.0	483.0	1,532.00	4.92	0.00	66	10.0	8.0	Y
Parcel 1 NSA 8	22	1	143.0	496.0	1,533.00	4.92	0.00	66	10.0	8.0	Y
Building 1 Facade South	24	1	161.0	481.0	1,533.00	4.92	0.00	66	10.0	8.0	Y
Building 1 Facade Southeast	25	1	180.0	512.0	1,533.00	4.92	0.00	66	10.0	8.0	Y
Building 1 Facade Northeast	26	1	212.0	533.0	1,533.00	4.92	0.00	66	10.0	8.0	Y
Building 1 Facade North	29	1	215.0	556.0	1,533.00	4.92	0.00	66	10.0	8.0	Y

ISE 2 October 2007
Andre Estrada TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: 07-037 TPM 21056
RUN: Unmitigated

Barrier									Points									
Name	Type	Height		If Wall	If Berm			Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment			
		Min	Max	$ per Unit Area	$ per Unit Vol.	Top Width	Run:Rise	$ per Unit Length			X	Y	Z	at Point	Seg Ht Increment	Perturbs #Up	#Dn	On Struct?	Important Reflections?
		ft	ft	$/sq ft	$/cu yd	ft	ft:ft	$/ft			ft	ft	ft	ft	ft				
Existing House	W	0.00	99.99	0.00				0.00	point1	1	144.0	167.0	1,518.00	10.00	0.00	0	0		
									point2	2	122.0	211.0	1,518.00	10.00	0.00	0	0		
									point3	3	150.0	225.0	1,518.00	10.00	0.00	0	0		
									point4	4	144.0	237.0	1,518.00	10.00	0.00	0	0		
									point5	5	158.0	244.0	1,518.00	10.00	0.00	0	0		
									point6	6	161.0	240.0	1,518.00	10.00	0.00	0	0		
									point7	7	164.0	239.0	1,518.00	10.00	0.00	0	0		
									point8	8	171.0	242.0	1,518.00	10.00	0.00	0	0		
									point9	9	174.0	240.0	1,518.00	10.00	0.00	0	0		
									point10	10	176.0	238.0	1,518.00	10.00	0.00	0	0		
									point11	11	199.0	249.0	1,518.00	10.00	0.00	0	0		
									point12	12	210.0	228.0	1,518.00	10.00	0.00	0	0		
									point13	13	196.0	221.0	1,518.00	10.00	0.00	0	0		
									point14	14	201.0	211.0	1,518.00	10.00	0.00	0	0		
									point15	15	188.0	204.0	1,518.00	10.00	0.00	0	0		
									point16	16	186.0	209.0	1,518.00	10.00	0.00	0	0		
									point17	17	166.0	199.0	1,518.00	10.00	0.00	0	0		
									point18	18	176.0	179.0	1,518.00	10.00	0.00	0	0		
									point19	19	156.0	169.0	1,518.00	10.00	0.00	0	0		
									point20	20	154.0	172.0	1,518.00	10.00	0.00	0	0		
									point21	21	145.0	167.0	1,518.00	10.00					
Proposed House	W	0.00	99.99	0.00				0.00	point22	22	152.0	482.0	1,533.00	10.00	0.00	0	0		
									point23	23	131.0	526.0	1,533.00	10.00	0.00	0	0		
									point24	24	158.0	539.0	1,533.00	10.00	0.00	0	0		
									point25	25	152.0	552.0	1,533.00	10.00	0.00	0	0		
									point26	26	166.0	559.0	1,533.00	10.00	0.00	0	0		
									point27	27	169.0	554.0	1,533.00	10.00	0.00	0	0		
									point28	28	172.0	553.0	1,533.00	10.00	0.00	0	0		
									point29	29	179.0	556.0	1,533.00	10.00	0.00	0	0		
									point30	30	183.0	555.0	1,533.00	10.00	0.00	0	0		
									point31	31	184.0	552.0	1,533.00	10.00	0.00	0	0		
									point32	32	208.0	564.0	1,533.00	10.00	0.00	0	0		
									point33	33	218.0	543.0	1,533.00	10.00	0.00	0	0		
									point34	34	204.0	536.0	1,533.00	10.00	0.00	0	0		
									point35	35	210.0	525.0	1,533.00	10.00	0.00	0	0		

									point36	36	197.0	519.0	1,533.00	10.00	0.00	0	0		
									point37	37	194.0	523.0	1,533.00	10.00	0.00	0	0		
									point38	38	174.0	513.0	1,533.00	10.00	0.00	0	0		
									point39	39	184.0	494.0	1,533.00	10.00	0.00	0	0		
									point40	40	164.0	484.0	1,533.00	10.00	0.00	0	0		
									point41	41	163.0	487.0	1,533.00	10.00	0.00	0	0		
									point42	42	153.0	482.0	1,533.00	10.00					