

March 14, 2008

Ms C. M. Florence  
Oasis Landscape Architecture and Planning  
3427 Miguelito Ct.  
San Luis Obispo, CA 93401

Dear Ms. Florence:

We have completed an acoustic study for Huasna Valley Well Sites east of Arroyo Grande. The study reports on the noise environment for both the construction drilling and future operation of three oil wells. The drilling sites are older well locations. The plan is to drill in the same locations and evaluate the feasibility of renewed extraction. The drilling activity is estimated to involve seven days of work at each of the well sites. Figure 1 shows the project locations superimposed on an aerial photo.

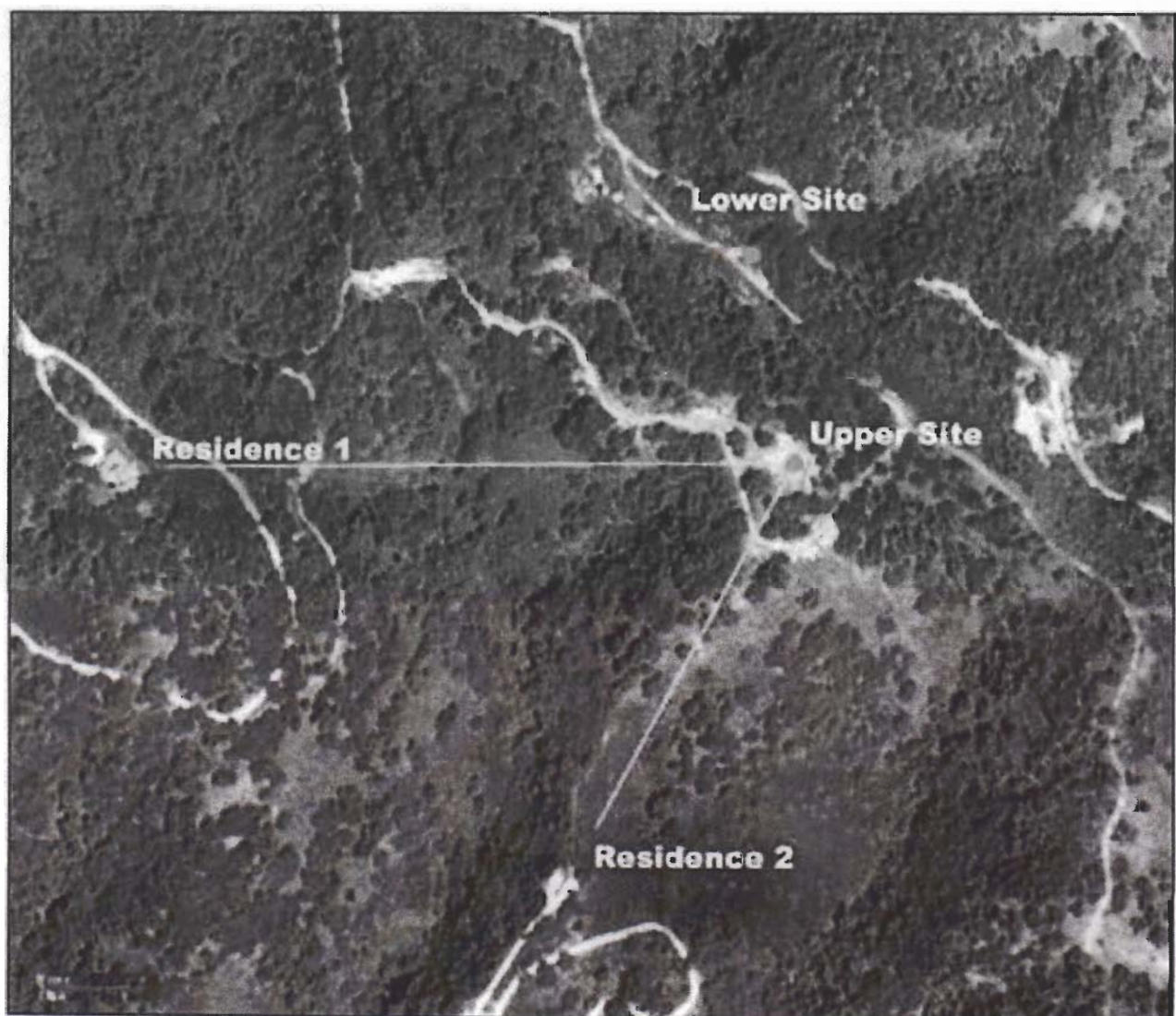


Figure 1: Project Location

## The Noise Environment

Currently, noise levels are low in this remote setting. In a hilly area like this, with no nearby transportation sources, background levels are estimated to be around 40 dB.

As noted, there are two phases to the project. The construction (well-drilling) phase involves heavy equipment that will be operational for about seven days per well site. The equipment is noisy involving diesel generators, pumps, a shaker, and a powered drill. To meet OSHA requirements the noise levels for each piece of equipment is recorded by the drilling company. Reports for a comparable well drilling operation, made by Kenai Drilling are reproduced in the appendix. The noise levels shown in the table are, for the most part, taken directly next to the sources. The table shows the levels for some of the noisier equipment normalized to a 50 foot reference position and extrapolated to the locations of the two residences.

| Source           | Assumed Measurement Distance | Level | @ 50 feet | Residence 1 | Residence 2 |
|------------------|------------------------------|-------|-----------|-------------|-------------|
| Drawworks Engine | 3                            | 105   | 81        | 52.7        | 55.4        |
| Shaker           | 3                            | 96    | 72        | 43.7        | 46.4        |
| Generator House  | 10                           | 93    | 79        | 50.7        | 53.4        |

Residence 1 is 1,300 feet from the upper well site and has a direct line of site across a valley. There is no influence of intervening topography or vegetation. This is not the case for Residence 2 as seen in Figure 4 cross section. "Soft" terrain can reduce exposure levels by 10 dB at the 950 foot distance. It is likely that the construction noise experienced at this location will be less shown in the table and it could be even less than at the more distant residence. Topography blocks both residents from direct exposure to noise from the two lower well sites. The sixty foot hill would lessen noise exposure by at least 10 dB.

Kenai Drilling has measured the noise levels of well pump operations at 50 dB at a 325 foot distance. Extrapolating this to the locations of the residences puts the well operation levels in the 38 to 40 dB range.

## The Regulatory Framework

The County's land use ordinance sets limits on the levels of noise that can be generated by stationary sources<sup>1</sup>. It includes an exemption for construction activities taking place between the hours of 7 AM and 9 PM weekdays and 8 AM to 5 PM weekends<sup>2</sup>. It is understood that drilling operations will be limited to daylight hours so project construction fits the exemption.

|  | Daytime<br>(7 a.m. to 10 p.m.) | Nighttime<br>(10 p.m. to 7 a.m.) |
|--|--------------------------------|----------------------------------|
|--|--------------------------------|----------------------------------|

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|                   |    |    |
|-------------------|----|----|
| Hourly Leq, dB    | 50 | 45 |
| Maximum level, dB | 70 | 65 |

<sup>1</sup> San Luis Obispo County Code -- Title 22, Land Use Ordinance: 22.10.120

<sup>2</sup> Paragraph A-5 of the Title

With construction activities an exception to the County's noise regulation, the governing level for this project is the nighttime hourly 45 Leq. The sound from the continuing pump operation is below this level. It is noted that the ordinance suggests that noise readings are to be taken at the property line of the receivers and this would be closer to the well site than the distances given above. However, in both cases, the property line divisions are lower in elevation than the residences and they are screened by topography. Noise estimates at these points would be similar, and perhaps lower than those described above.

Construction activities are noisy, but at the distances involved do not greatly exceed the source levels that are permitted under the regulations. The exposure at Residence 1 is estimated to be about 53 dB from the noisiest activity and the daytime limit is 50 dB. Simultaneous operation of several noise sources could raise levels by another 3 to 4 dB.

### **Conclusions and Recommendations**

The Huasna well project is not expected to produce noise levels that are in excess of those permitted by County regulations. However, it is recommended that noise management be considered in project construction and operations.

In this remote setting, noise levels that are in full conformance with county requirements will make a difference in the acoustic environment. With 40 dB background levels, the sound of a pumping operation at 40 dB will be noticeable. Ordinary conversation takes place at around a 65 dB level so sounds at such low levels would not be considered disruptive - although it might be bothersome to people accustomed to a very quiet setting,

The 65 dB reference level for conversation also gives perspective to the estimates of construction noise heard at a 53 to 57 dB level. People in the closest residences wouldn't need to raise their voices to be heard above this.

On the other hand, actions can be taken to reduce impacts and potential disruption. The project plans and construction schedule should be made known to the nearby residents. They should be provided with contact information to report problems. The contractor should make sure workers understand noise management issues and have instructions on how to minimize impacts. The permitted hours for construction activities should be respected. Source control is important. Engines should be equipped with mufflers that are in good repair. It is the upper well site that poses the greatest problems but this is an advantage in that the impacted residences are both located in the same direction from this site. Equipment that produces directional noise can be oriented so that noise is directed the opposite way. It may be possible to position equipment trailers to screen noise sources.

Sincerely,



David Dubbink, Ph.D., AICP

## RIG NUMBER 4

## SOUND LEVEL CHECKS

2/15/96

| LOCATION ON RIG    | SOUND LEVEL (dBA)<br>(engines at idle) | SOUND LEVEL (dBA)<br>(engines pulling) |
|--------------------|--|--|
| A<br>(door open)   | 88.5                                   | 88.5                                   |
| A<br>(door closed) | 75                                     | 75                                     |
| B                  | 99.5                                   | 99.5                                   |
| C                  | 104.7                                  | 104.7                                  |
| D                  | 88                                     | 105                                    |
| E                  | 88                                     | 96                                     |
| F                  | 90                                     | 95.5                                   |
| G                  | 90                                     | 95.5                                   |
| H                  | 88                                     | 91                                     |
| I                  | 82                                     | 90                                     |
| J                  | 82                                     | 84                                     |
| K                  | 92.5                                   | 92.5                                   |
| L                  | 91.7                                   | 91.7                                   |
| M                  | 86.5                                   | 86.5                                   |

All of the sound level checks were taken with a sound meter set on the A level, slow response

RIG #4  
SCHEMATIC

