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23 July 2015

Linda Fisher
**HDR Engineering**
2635 Iron Point Road, Suite 300
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Email: linda.fisher@hdrinc.com

Subject: **Jess Ranch Composting Facility Environmental Noise Assessment —**
CSA Project: 15-0320

Dear Ms. Fisher:

In 2009, we worked with HDR to study potential noise impact from a future composting facility to be constructed at the subject site. Last year, the project was restarted so Mike Harding asked us to review the revised project plus comment on changes to the potential environmental noise impacts (if any). This letter summarizes our analysis of the revised project.

## SETTING

The site of the proposed Jess Ranch Composting Facility is in Alameda County near the Altamont Pass, approximately one mile west of the junction between U.S. 205 and U.S. 580 (see area map). The closest noise-sensitive receptor is a residential building (a double-wide mobile home) located adjacent approximately 3000 feet north of the composting area. The second closest noise-sensitive receptor is a residence approximately 4500 feet to the north of the proposed facility. The third closest noise-sensitive receptor is a residence located about 6000 feet northeast of the proposed facility.

## CRITERIA

The County of Alameda has prepared a Noise Element as part of its General Plan. The County also has an *East County Area Plan* that with a policy that states:

*Policy 289 The County shall limit or appropriately mitigate new noise sensitive development in areas exposed to projected noise levels exceeding 60 dB based on the California Office of Noise Control Land Use Compatibility guidelines (See table IV.F.3).*

*Policy 290: The County shall require noise studies as part of development review for projects located in areas exposed to high noise levels and in areas adjacent to existing residential or other noise sensitive uses. Where noise studies show that noise levels in areas of existing housing will exceed "normally acceptable" standards (as defined by the California Office of Noise Control Land Use Compatibility Guidelines), major development projects shall contribute their prorated share to the cost of noise mitigation measures such as those described in Program 104.*

The "normally acceptable" standard for *Single Family Residential* is expressed as a day-night average sound level (DNL or $L_{dn}$) of 60 decibels or less.[1] Aside from these land use policies, the County has no specific noise standards with which to assess the potential noise impact from the adjacencies discussed in this study. For this reason, it was considered prudent to mitigate noise from the project so, at the closest noise-sensitive receptor, project-generated noise should not exceed the existing 24-hour noise environment (i.e., within a three-decibel tolerance).

## NOISE MEASUREMENTS

On 24-25 February 2009, 24-hour noise levels were measured at two offsite receptors in the vicinity of the proposed facility. One was at the residence on Altamont Pass Road, about 1100 feet north of U.S. 580 and 4500 feet north of the proposed facility (see area map). The measured DNL at this location was 64 decibels and was controlled solely by traffic on U.S. 580.

The other offsite measurement location was at a residence on Midway Road near the entrance to Altamont Raceway Park (aka Altamont Speedway), about 1600 feet south of the junction of U.S. 205 and U.S. 580 and 6000 feet northeast of the proposed facility. The resulting DNL was 61 decibels, also controlled by traffic from U.S. 580 plus U.S. 205.[2]

---

[1] **Day-Night Average Sound Level (DNL) —** A descriptor established by the U.S. Environmental Protection Agency to describe the average 24-hour A-weighted noise level with a penalty applied to noise occurring during the nighttime hours (10 pm - 7 am). [see below for a definition of A-weighted sound/noise level]. The penalty is intended to account for the increased sensitivity of people during sleeping hours. DNL is the descriptor currently used for Noise Elements that are included in the General Plan required for all California communities. The former 24-hour average noise descriptor used in California was called the community noise equivalent level (CNEL). Numerical values of CNEL and DNL are virtually identical so the two descriptors are usually considered interchangeable. [Note: in some environmental documents, the mathematical quantity symbol ($L_{dn}$) is sometimes used a substitution for the quantity abbreviation (DNL)].

**A-Weighted Sound Level (Noise Level) —** The term for the A-weighted sound pressure level. It is obtained by use of a standard sound level meter and is expressed in decibels (dB). Sometimes the unit of sound level is written as dB(A). A-weighting is a standard frequency filter that is commonly employed to measure the loudness or "noisiness" of sounds. A-weighting is required by regulations promulgated by the U.S. EPA, the California Department of Aeronautics, Caltrans, and others. A 10-decibel increase in sound level is perceived by people to be twice as loud.

[2] During the noise measurement period in February 2009, the wind speed varied from calm to 22 mph and the wind direction was mostly from the west/southwest.

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On 16 April 2009, a supplemental short-term measurement was conducted during the morning hours at an existing double-wide mobile home.[3] This short-term measurement was divided into two individual time segments, each of which was 15-to-20 minutes in duration. The average A-weighted noise level during each segment was 58 decibels due to traffic noise on U.S. 580. Assuming the dominant noise source over a 24-hour period is traffic, the estimated DNL at this closest receptor would be 63 decibels.

## FUTURE PROJECT-RELATED CONDITIONS

### *Aerated Static Pile*

The composting process to be used at the proposed facility is a covered *Aerated Static Pile*. The process involves engine-powered equipment, some of which is mobile (see photos in Figure 1, below). The three discrete noise-generating items include a "pre-screener/horizontal shredder", a "trommel screen", and a "compost turner" (the latter being a mobile, self-powered machine).

Figure 1: Photos of noise-generating equipment similar to those proposed for the Jess Ranch composting facility. The machine shown in the right photo is the mobile "compost turner". The left photo shows the stationary equipment consisting of the yellow "trommel screen" on the right feeding material into the "pre-screener/horizontal shredder" beneath the blue tarp on the left. The horizontal shredder is used to grind wood-like material such as palm branches, etc. The ground material then drops into the two debris boxes below. The useful output from the material-handling equipment is discharged back onto the compost pile by means of the conveyor system seen to the extreme left of the left photo.

[3] For the purposes of this noise study, the double-wide mobile home is considered an *onsite* noise-sensitive receptor. The reasoning is that it could feasibly be rented to a party other than the business entity that is leasing part of the Jess Ranch parcel for use as a composting facility.

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Noise generated by these types of engine-powered machines was measured at another composting facility in the Bay Area. At a distance of 50 feet from the combined "trommel screen", "pre-screener/horizontal shredder" and "tumbler" assembly, the A-weighted noise level was 78 decibels (equivalent to 72 decibels at 100 feet). At 100 feet from the "compost turner", the A-weighted noise level was 69 decibels.

The distance between the Jess Ranch composting site and the offsite Altamont Pass Road residence ("No. 2") is approximately 4500 feet. At this distance, the projected A-weighted noise level of the combined "trommel screen", "pre-screener/horizontal shedder", and tumbler" assembly would be [72 minus 33 =] 39 decibels.[4] Similarly, the "compost turner" is projected to generate an A-weighted noise level of 36 decibels.

For the third offsite residence ("No. 3", 6000 feet northeast of the site), the projected noise level from this engine-powered equipment would be about six decibels lower. These projections mean that operation of this engine-powered equipment should have a negligible effect upon the existing noise environment at the two most distant noise-sensitive locations (i.e., the increase in the existing noise level would be a fraction of a decibel, a change in loudness that is barely detectable, even under laboratory conditions).

***Circulation Fans***

In addition to the engine-powered equipment described above, the *Aerated Static Pile* technique involves a series of small-sized fans (<2 HP) to help circulate air through the composting material.[5] It is anticipated that approximately 20 fans will be used at the site, one for each aerated compost pile. These fans would operate 80% of the time.

The A-weighted noise level generated by each fan is estimated to be 75 decibels at five feet. This information was corroborated by independent calculations based on generic fan noise data; thus the fan noise level is calculated to be 40 decibels when projected to a 500-foot distance.

The fans are also estimated to generate a noise level less than 30 decibels at the double-wide mobile home, assuming the closest fan is located at least 2,000 feet away. The projected fan noise level at the offsite Altamont Pass Road residence is also less than 30 decibels, well below the existing background noise level.

[4] When extrapolated from 100 feet to a distance of 4500 feet, the noise level would decrease by a factor of 20 x $\text{Log}_{10}$ (4500/100) or 33 decibels. These projections do not account for excess attenuation due to the intervening terrain that would further reduce project-generated noise. This simple noise prediction model is appropriate for this project, given all the uncertainties of equipment type and terrain features.

[5] Although the Aerated Pile composting process is not available for study in the Bay Area, both the prediction and mitigation of fan noise is well understood. For this reason, it is possible to estimate the potential noise impact from composting process equipment that uses fans.

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## FUTURE NOISE ENVIRONMENT DUE TO VEHICULAR TRAFFIC

### *Double-Wide Mobile Home*

A potentially significant noise source for the double-wide mobile home is haul truck traffic along Jess Ranch road that will enter and depart the composting facility near the existing *WindPower* maintenance facility (see area map). At the point of entry to the facility, the trucks will be within 600 feet of this mobile home. The haul truck volume is estimated to be 10 per hour (based on the ultimate material flow of 1,000 tons per day). Based on information from the U.S. Traffic Noise Model, the average hourly noise level generated by the haul trucks is estimated to be less than 50 decibels at the mobile home (relative to the existing hourly traffic noise level of 58 decibels).

### *Growth of U.S. 580 Traffic*

The current traffic on U.S. 580 is such that the *peak* hour traffic volume is approaching the maximum hourly capacity of the road (i.e., about 7000-to-9600 vehicles per hour in each direction). As the maximum hourly capacity is approached, the speed of traffic tends to slow until the road becomes saturated (i.e., a "stop and go" traffic situation).

The annual average daily traffic (AADT) on U.S. 580 is currently 140,000 vehicles at the Grant Line Road Interchange. Caltrans has estimated that the traffic volume on U.S. 580 will double by the year 2025. In the absence of future road improvements, the *peak* hourly volume and the consequential reduced traffic speed will probably remain as they are today. Any projected increase in daily volume implies that this same *peak* hourly volume (i.e., about 7000-to-9600 vehicles per hour in each direction) would be distributed over several additional hours. In summary, only the AADT will be affected by future traffic increases on U.S. 580.

In acoustical terms, the net result of a nearly saturated road is that the *peak-hour* noise level actually *de*creases since traffic noise levels are primarily affected by vehicular speed and secondarily by the number of vehicles. As the AADT continues to increase, however, there will be more hours in a day having moderate traffic volumes during which free-flowing traffic travels at the speed limit of the road (a moderate volume of free-flowing traffic generates the greatest hourly noise level).

The future 24-hour average noise level (DNL) is influenced mainly by these additional hours of moderate-volume, free-flowing traffic. This influence is significant if more of these free-flowing hourly periods occur before 7 a.m. since, in the calculation of DNL, nighttime hourly noise levels are assigned a 10-dB "penalty" prior to averaging with the daytime hourly noise levels.

In summary, doubling the AADT on a road that has already attained its *peak* hourly capacity could increase the DNL by zero-to-three decibels, depending upon the nature of the distribution of moderate-volume, free-flowing traffic throughout the nighttime hours (10 p.m. to 7 a.m.). For this reason, the most conservative estimate of the future noise environment is a three-decibel increase in DNL for any receptors that are currently controlled by traffic noise on U.S. 580.

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**FINDINGS**

- Operation of the future composting facility should cause little or no noise impact upon the double-wide mobile home adjacent to the composting facility

- Noise generated by the future composting facility should be undetectable at both Altamont Pass Road and the residences along Midway Road near the Speedway entrance

This concludes our discussion of the subject project. If you have any questions, please call me.

**CHARLES M. SALTER ASSOCIATES**

Anthony Nash, PE
Encl: As Noted

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Altamont Pass Rd
Residence #2
580
1500 feet
Jess Ranch Rd
Residence #1
WindPower
205
3015 feet
Residence #3
5830 feet
N Midway Rd
Compost Site
© 2015 Google
Google earth
1993
Imagery Date: 6/9/2014 37°44'09.75" N 121°35'03.99" W elev 384 ft eye alt 9204 ft