ENVIRONMENTAL NOISE ASSESSMENT

COLD CANYON LANDFILL EXPANSION
SAN LUIS OBISPO COUNTY, CALIFORNIA

PREPARED FOR

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1. INTRODUCTION

Project Description:

The project is a proposed expansion of the existing Cold Canyon Landfill in San Luis Obispo County. The applicant is proposing to expand the landfill footprint, increase permitted tonnage limits, increase landfill capacity, expand and relocate the resource recovery park, compost operation and materials recovery facility, change hours of operation and construct a new entrance.

Location:

The project site is located at 2268 Carpenter Canyon Road (State Route 227) within San Luis Obispo County. The project site is located in a hilly area bordered by State Route 227 (SR227) on the west and Patchett Road on the south. There are scattered residences and agricultural uses surrounding the project site. The site is located approximately 3½ miles south of the San Luis Obispo County Airport.

Environmental Noise Assessment:

This environmental noise assessment has been prepared to determine if significant noise impacts will be produced by the project and to describe mitigation measures for noise if significant impacts are determined.

Appendix A provides definitions of the acoustical terminology used in this report. Unless otherwise stated, all sound levels reported in this analysis are A-weighted sound pressure levels in decibels (dB). A-weighting de-emphasizes the very low and very high frequencies of sound in a manner similar to the human ear. Most community noise standards utilize A-weighted sound levels, as they correlate well with public reaction to noise.

2. THRESHOLDS OF SIGNIFICANCE

Appendix G (Environmental Checklist Form) of the CEQA Guidelines indicates that significant noise impacts occur when the project exposes people to noise levels in excess of standards established in local noise ordinances or general plan noise elements, or causes a substantial permanent or temporary increase in noise levels above levels existing without the project.

a. Noise Level Standards

The noise level may be considered significant if the project exceeds applicable noise standards. The standards for noise levels that apply to this project are those specified in the San Luis Obispo County General Plan Noise Element.

Section 3.3 of the County's Noise Element[1] establishes land use compatibility criteria for proposed noise sources or existing noise sources that will undergo modifications as they may affect nearby noise-sensitive land uses. Noise-sensitive uses include residences, schools, hospitals and churches. For transportation noise sources, the County's standard is 60 dB DNL at the exterior of noise-sensitive uses. Transportation noise sources include vehicles operated on public roadways, railroad operations and aircraft operations. With regard to the proposed landfill expansion project, the County's 60 dB DNL standard applies to project-related traffic (including trucks) on public roadways near or adjacent to the project site.

Acceptable noise levels from non-transportation noise sources (also referred to as stationary noise sources) are determined by the hourly L_{eq} (energy average) and L_{max} (maximum) noise levels produced by the project. During the daytime hours (defined as 7:00 a.m. to 10:00 p.m.), the L_{eq} standard is 50 dBA and the L_{max} standard is 70 dBA. During the nighttime hours (defined as 10:00 p.m. to 7:00 a.m.), the L_{eq} standard is 45 dBA and the L_{max} standard is 65 dBA. Stationary noise sources include all project-related activities that will occur within the project site.

The San Luis Obispo County noise level standards applicable to the project are summarized in Table I. There are no state or federal noise standards that would apply to the project.

TABLE I

NOISE LEVEL STANDARDS
SAN LUIS OBISPO COUNTY
NOISE-SENSITIVE USES

		Non-Transportation Sources			
	Transportation Sources	**Hourly L_{eq}, dBA**		**Hourly L_{max}, dBA**	
	DNL, dB	**7a-10p**	**10p-7a**	**7a-10p**	**10p-7a**
Exterior Exposure	60	50	45	70	65
Interior Exposure	45	--	--	--	--

Source: San Luis Obispo County Noise Element, adopted 1992.

b. Substantial Noise Increases

CEQA does not define what constitutes a substantial increase in noise levels. Some guidance is provided by the 1992 findings of the Federal Interagency Committee on Noise (FICON)[2], which assessed changes in ambient noise levels resulting from aircraft operations. The FICON recommendations are based upon studies that relate aircraft and traffic noise levels to the percentage of persons highly annoyed by the noise. The rationale for the FICON recommendations is that it is possible to consistently describe the annoyance of people exposed to transportation noise in terms of the DNL (or CNEL). Annoyance is a summary measure of the general adverse reaction of people to noise that results in speech interference, sleep disturbance, or interference with other daily activities.

Although the FICON recommendations were specifically developed to address aircraft noise impacts, they are used in this analysis for transportation noise sources that are described in terms of cumulative noise exposure metrics such as the DNL. Table II summarizes the FICON recommendations.

TABLE II

MEASURES OF SUBSTANTIAL NOISE INCREASE FOR TRANSPORTATION SOURCES

Ambient Noise Level Without Project (DNL/CNEL)	Significant Impact Assumed to Occur if the Project Increases Ambient Noise Levels By:
<60 dB	+ 5 dB or more
60-65 dB	+3 dB or more
>65 dB	+1.5 dB or more

Source: FICON, 1992, as applied by Brown-Buntin Associates, Inc.

For non-transportation noise sources, it is common to assume that a 3-5 dB increase in noise levels represents a substantial increase in ambient noise levels. This is based on laboratory tests that indicate that a 3 dB increase is the minimum change "perceptible" to most people, and a 5 dB increase is perceived as a "definitely noticeable change."

b. Construction Noise and Vibration

Noise due to construction activities is generally considered to be less than significant if the construction activity is temporary, use of heavy equipment and noisy activities is limited to daytime hours, no pile driving or surface blasting is proposed, and all industry-standard noise abatement measures are implemented for noise-producing equipment. These general parameters acknowledge that people are not as likely to be annoyed by activities that are perceived as being necessary for normal commerce, so long as the inconveniences due to noise are of relatively short duration and all practical measures are being implemented to reduce the impacts of noise-producing activities.

The San Luis Obispo County Noise Element does not specifically limit hours during which construction may occur. However, it is a common practice to limit hours of construction activity to minimize construction noise impacts at nearby residential receptors during the early morning and late evening hours, and on weekends and holidays. Although not specifically stated in the Noise Element, it is also a standard requirement for many jurisdictions that all construction equipment be properly maintained and muffled to minimize noise generation at the source.

San Luis Obispo County does not have regulations that define acceptable levels of vibration. One of the most recent references suggesting vibration standards is the Federal Transit

Administration (FTA) publication concerning noise and vibration impact assessment from transit activities[3]. Although the FTA guidelines are to be applied to transit activities, they may be reasonably applied to the assessment of the potential for annoyance or structural damage resulting from other activities. To prevent vibration annoyance in residences, a vibration velocity level of 80 VdB or less is suggested when there are fewer than 70 vibration events per day. A level of 100 VdB or less is suggested by the FTA guidelines to prevent damage to fragile buildings.

3. SETTING

The existing landfill and the proposed expansion area are located in hilly terrain. Scattered rural residences are located around the landfill. The surrounding land is primarily used for grazing with some planted crops. The important existing sources of man-made noise in the project vicinity are activities at the landfill and traffic on roads, which includes refuse trucks approaching and leaving the landfill. There are also occasional aircraft over-flights as aircraft are preparing to land or after they have taken off from the San Luis Obispo County Airport.

a. Ambient Noise Level Measurements

Measurements of existing ambient noise levels in the project vicinity were conducted over a 24-hour period near the southern project expansion boundary on March 27, 2008. Noise monitoring equipment consisted of a Larson-Davis Laboratories Model LDL 820 sound level analyzer equipped with a Bruel & Kjaer (B&K) Type 4176 ½˝ microphone. The microphone was mounted on a tripod at approximately five (5) feet above the ground and was equipped with a random incidence corrector so that noise from sources in all directions could be accurately measured. The monitor was calibrated with a B&K Type 4230 acoustical calibrator to ensure the accuracy of the measurements. The equipment complies with applicable specifications of the American National Standards Institute (ANSI) for Type 1 sound measurement systems.

Figure 1 shows the location of the ambient noise measurement site (Site 1) with reference to the project site. Figure 2 summarizes measured hourly noise levels in terms of the energy average (L_{eq}), maximum (L_{max}), and L_{90} noise level descriptors. The L_{eq} and L_{max} describe average and maximum noise levels measured during each hour of the noise monitoring period, and the L_{90} describes the noise level exceeded 90 percent of the time during each hour. The L_{90} is generally considered to represent the residual (or background) noise level in the absence of identifiable single noise events from traffic, aircraft and other local noise sources.

The measured DNL for existing conditions at the 24-hour site, including noise from all sources, was 48.0 dB. This is below the County's 60 dB DNL standard for transportation-related noise sources at noise-sensitive locations. The measured hourly L_{eq} values for existing conditions at the 24-hour ambient noise measurement site ranged from 37 to 51 dBA during the daytime hours and from 31 to 45 dBA during the nighttime hours. Measured hourly maximum noise levels ranged from 55 to 70 dBA during the daytime hours and from 44 to 68 dBA during the nighttime hours. Based upon field observations at the 24-hour noise monitoring site, hourly maximum noise levels were most likely caused by aircraft over-flights.

FIGURE 1: NOISE MEASUREMENT SITES

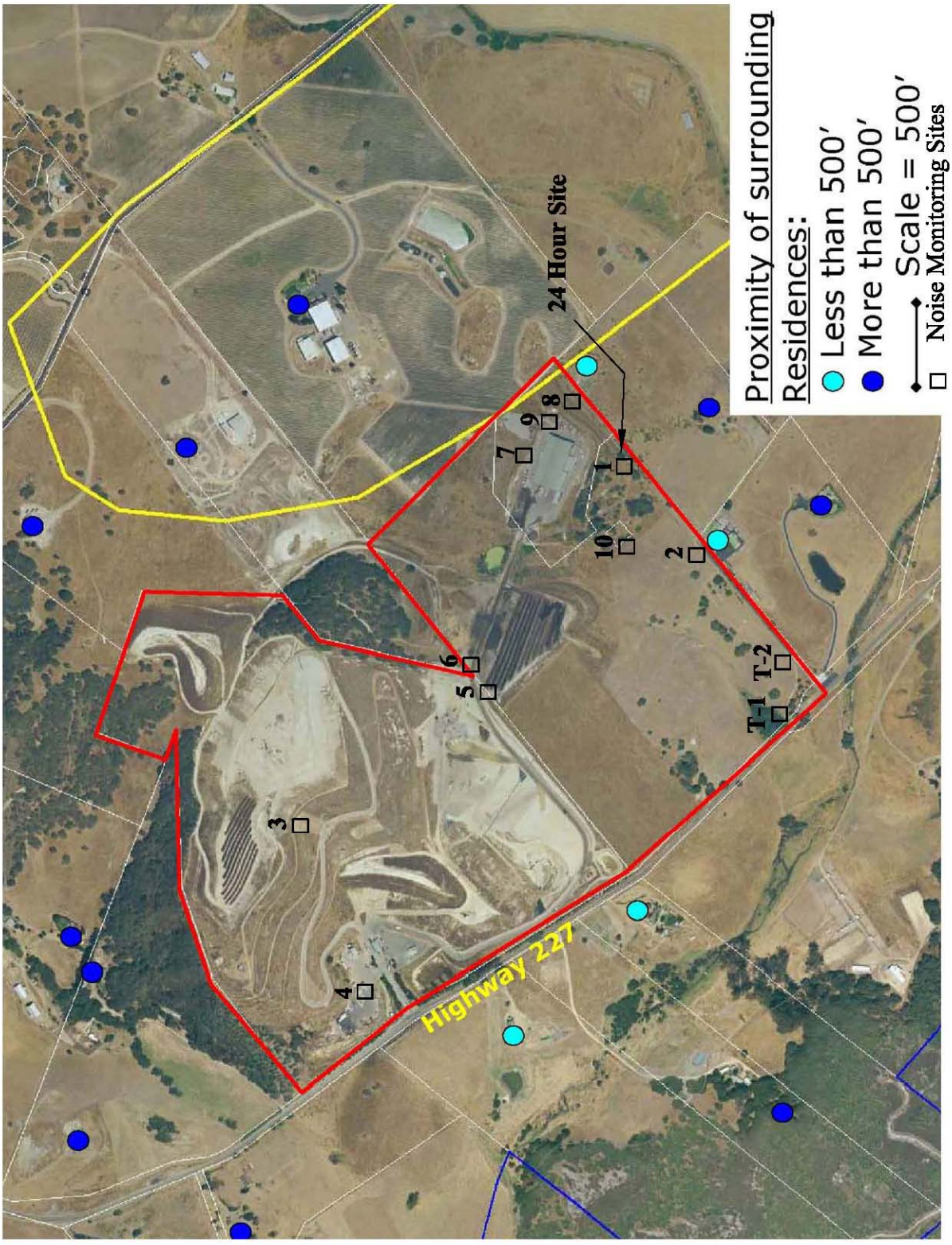
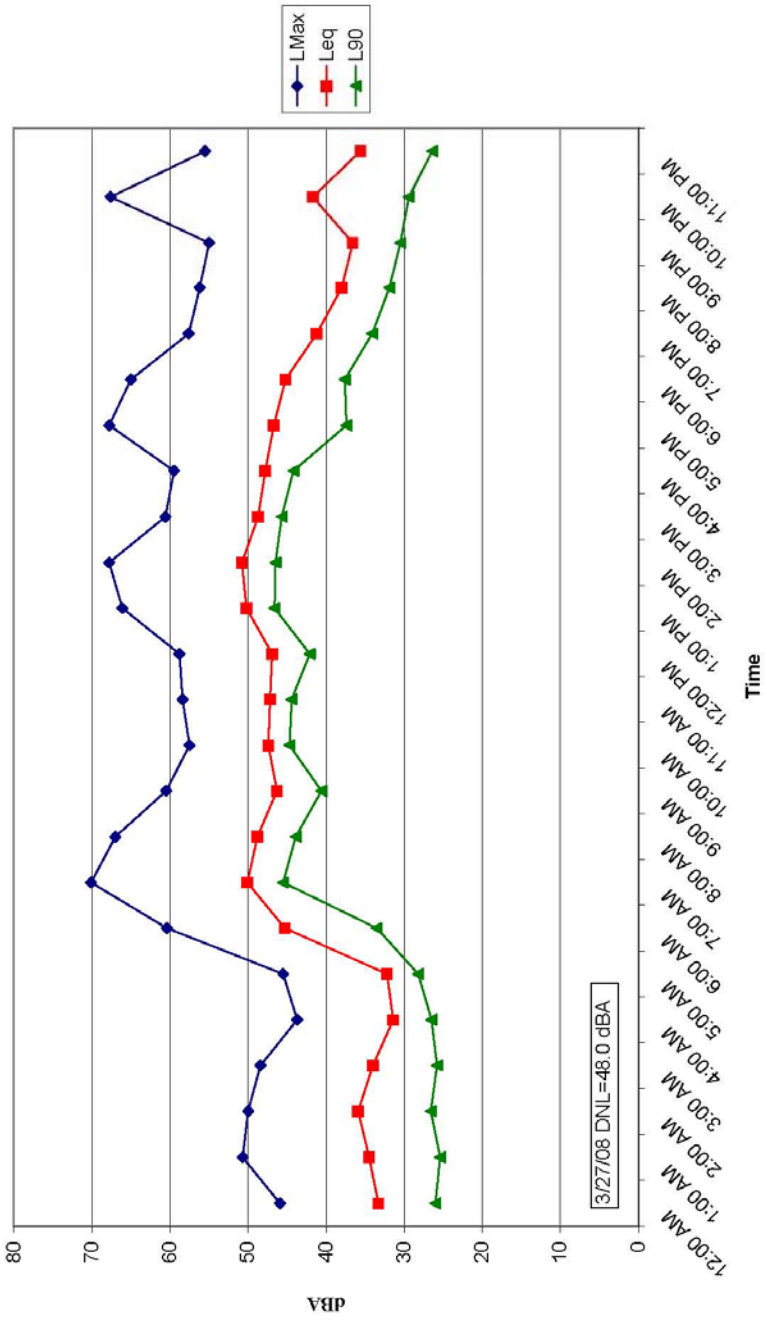


FIGURE 2: MEASURED HOURLY NOISE LEVELS
SITE #1 – March 27, 2008



b. Existing Landfill Activities

Existing operations at the Cold Canyon Landfill include an 88-acre landfill, a resource recovery park (RRP), a compost operation and a materials recovery facility (MRF). Noise producing activities associated with the landfill operation include the movement of trucks between the landfill entrance and active disposal site and heavy equipment used to spread, compact and cover the waste material. Heavy equipment used in the landfill operation includes a Caterpillar D7R bulldozer, Aljon 525 compactor and Caterpillar 627F earthmover. Landfill activities move around within the permitted landfill area over the life of the landfill site, but are focused in a single area at any given time. Landfill operations currently occur between the hours of 7:00 a.m. and 4:30 p.m.

The RRP is presently located near the public entrance to the site near SR227. Noise producing activities include the movement of vehicles within the RRP as materials are being delivered to the site and heavy equipment used to sort, transfer and store materials within the site. Heavy equipment used within the RRP includes front loaders (Caterpillar IT18B and IT14G) and a Caterpillar 312C excavator. Recovered paper, cardboard and plastic is transported to the MRF located near the southeast corner of the landfill site for processing and baling. The RRP is currently open between 7:30 a.m. and 4:30 p.m.

The compost operation is located near the center of the landfill site. Noise producing activities include the transport of raw materials to the site and processed materials from the site, truck loading activities, compost processing activities and water truck movements for dust control. Heavy equipment used in the compost operation includes a tub grinder powered by a Caterpillar 3412 engine, 18-foot Scarab compost row turner, Trommel screen, front loaders (Caterpillar IT28) and diesel-powered water truck. Noise-producing activities within the compost processing area presently occur between the hours of 7:30 a.m. and 4:30 p.m.

The MRF is located within a large building near the southeast corner of the project site. The facility processes recyclable materials from curbside residential pickup and commercial/industrial sources. It also processes materials from the on-site RRP as noted above. Noise producing activities associated with the MRF include truck movements to and from the facility, glass cleaning equipment located outside the east side of the building, forklift movements and other activities within the building, and ventilation fans on the south end of the building. Current hours of operation for the MRF are 7:30 a.m. to 4:30 p.m.

Noise levels from the above-described activities and associated equipment were documented by conducting reference noise level measurements at various locations within or near the project site on March 27 and 28, 2008. Since the tub grinder used at the Cold Canyon Landfill compost operation was not on-site at that time, noise measurements were conducted on April 16, 2008 at another compost operation in Visalia, California where similar equipment is used. Noise monitoring equipment was the same as described above for conducting ambient noise level measurements at Site 1. The reference noise measurement locations at the Cold Canyon Landfill are noted in Figure 1.

Table III summarizes the results of reference noise level measurements. Described by Table III are the measurement site, source(s) measured, reference distance from the source(s) and measured noise levels. Measured noise levels are reported in terms of the L_{eq} and range (minimum-maximum) during the sample period.

TABLE III

SUMMARY OF REFERENCE NOISE LEVEL MEASUREMENTS
COLD CANYON LANDFILL

Site	Source Description	Distance, Ft.	Noise Level, dBA L_{eq} (Range)
1	MRF (glass cleaner, fans)	300	46.1 (44.0-48.6)
2	Compost Operation (trucks, loaders)	1100	44.5 (44.0-45.0)
3	Landfill (dozer, compactor, earthmover, trucks)	200-300	70.1 (62.3-77.2)
	Landfill (compactor)	200-300	67.5 (64.6-70.1)
	Landfill (earthmover)	200	72.1 (67.7-80.1)
4	RRP (loaders, alarms, dumping materials)	100-200	68.7 (59.6-75.1)
5/6	Compost Operation (18' Scarab row turner)	100	84.2 (83.4-85.1)
7	MRF (glass cleaner – unobstructed view)	50	77.3 (75.1-79.9)
8	MRF (fans – top of berm)	150	63.4 (62.5-63.9)
9	MRF (fans plus glass cleaner)	100	66.3 (65.4-67.4)
10	Compost Operation (loaders, trucks, alarms)	900	48.7 (39.2-59.5)
	Landfill (dozer, compactor, alarms)	2500	----- (42-48)
*	Diamond Z 1260 Grinder (CAT 3412)	100	81.0 (80.2-82.4)

*Measurements conducted 4/16/08 at Wood Industries Company in Visalia, California.

Source: Brown-Buntin Associates, Inc.

b. Existing Traffic Noise Levels

An analysis of existing traffic noise levels on SR227 and the existing site entrance road was prepared using the FHWA Highway Traffic Noise Prediction Model[4] with traffic data obtained from Caltrans and the project description prepared by the project applicant[6]. SR227 is the only access to the landfill. Homes are located north and south of the SR227 entrance to the landfill.

The FHWA Model is an analytical method used by state and local agencies, including Caltrans, for highway traffic noise prediction. The model is based upon reference energy emission levels for automobiles, medium trucks (2 axles) and heavy trucks (3 or more axles), with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA Model was developed to predict hourly L_{eq} values for free-flowing traffic conditions, and is generally considered to be accurate within +/- 1.5 dB. The model assumes a clear view of traffic with no shielding at the receiver location. To

predict DNL values, it is necessary to determine the hourly distribution of traffic for a typical day and adjust the traffic volume input data to yield an equivalent hourly traffic volume.

Traffic noise level measurements and concurrent traffic counts were performed at two sites along SR227 for the purpose of evaluating the accuracy of the FHWA Model in describing traffic noise exposure in the project area. The traffic noise monitoring sites are noted in Figure 1 as Sites T-1 and T-2. Site T-1 was located 50 feet from the center of the roadway at about the same elevation as the pavement. Site T-2 was located on a low hill overlooking SR227 at about 250 feet from the center of the roadway and 30 feet above the pavement.

Table IV compares measured noise levels to those calculated by the FHWA Model using as model inputs the observed traffic conditions. Table IV shows that the FHWA Model over-predicted traffic noise exposure at Site T-1 by 1.5 dB and calculated the same noise level as was measured at Site T-2. This is considered excellent agreement between measured and predicted results, and indicates that the FHWA Model may be used without adjustments to provide a realistic assessment of annual average traffic noise exposure in the project area.

TABLE IV

COMPARISON OF MEASURED AND PREDICTED (FHWA MODEL) NOISE LEVELS SR227 NEAR COLD CANYON LANDFILL

	Site T-1	Site T-2
Microphone Height, Ft. (above ground)	5	5
Distance, ft. (from center of roadway)	50	300
Observed # Autos/Hr.	224	216
Observed # Medium Trucks/Hr.	4	8
Observed # Heavy Trucks/Hr.	12	16
Estimated Speed (MPH)	55	55
L_{eq}, dBA (Measured)	63.2	54.4
L_{eq}, dBA (Predicted)	64.7	54.4
Difference between Measured and Predicted L_{eq}, dBA	**+1.5**	**0**

Note: FHWA "soft site" assumed for calculations

Source: Brown-Buntin Associates, Inc.

Appendix B provides a summary of the traffic data used to calculate existing annual average traffic noise levels. Annual Average Daily Traffic (AADT) and truck mix data for SR227 were obtained from the Caltrans website. The day/night distribution of traffic on SR227 was estimated by BBA based upon studies conducted along similar roadways since project-specific data were not available from government sources. The data summarized in Appendix B represent the best information known to Brown-Buntin Associates, Inc. (BBA) at the time this analysis was prepared.

The closest residential setbacks from SR227 near the project site are estimated to be in the range of 150 feet from the center of the roadway. The annual average traffic noise exposure calculated by the FHWA Model for a distance of 150 feet from the center of SR227 was 59.2 dB DNL for existing traffic conditions (2006). The calculated distance to the 60 dB DNL contour for existing traffic conditions is 133 feet from the roadway centerline.

4. PROJECT IMPACTS AND MITIGATION MEASURES

The project would expand the area of the landfill operation, expand and relocate the compost operation, expand and relocate the Resource Recovery Park, expand the Materials Recovery Facility, extend hours of operation, relocate the main entrance road and increase traffic on SR227. As described above, noise sources within the landfill site are considered non-transportation (stationary) noise sources for comparison to applicable noise standards. Since extended operating hours would not include the nighttime hours as defined by the County's Noise Element (10:00 p.m.-7:00 a.m.), only the County's daytime noise level standards would apply to the project.

a. Proposed Landfill Activities

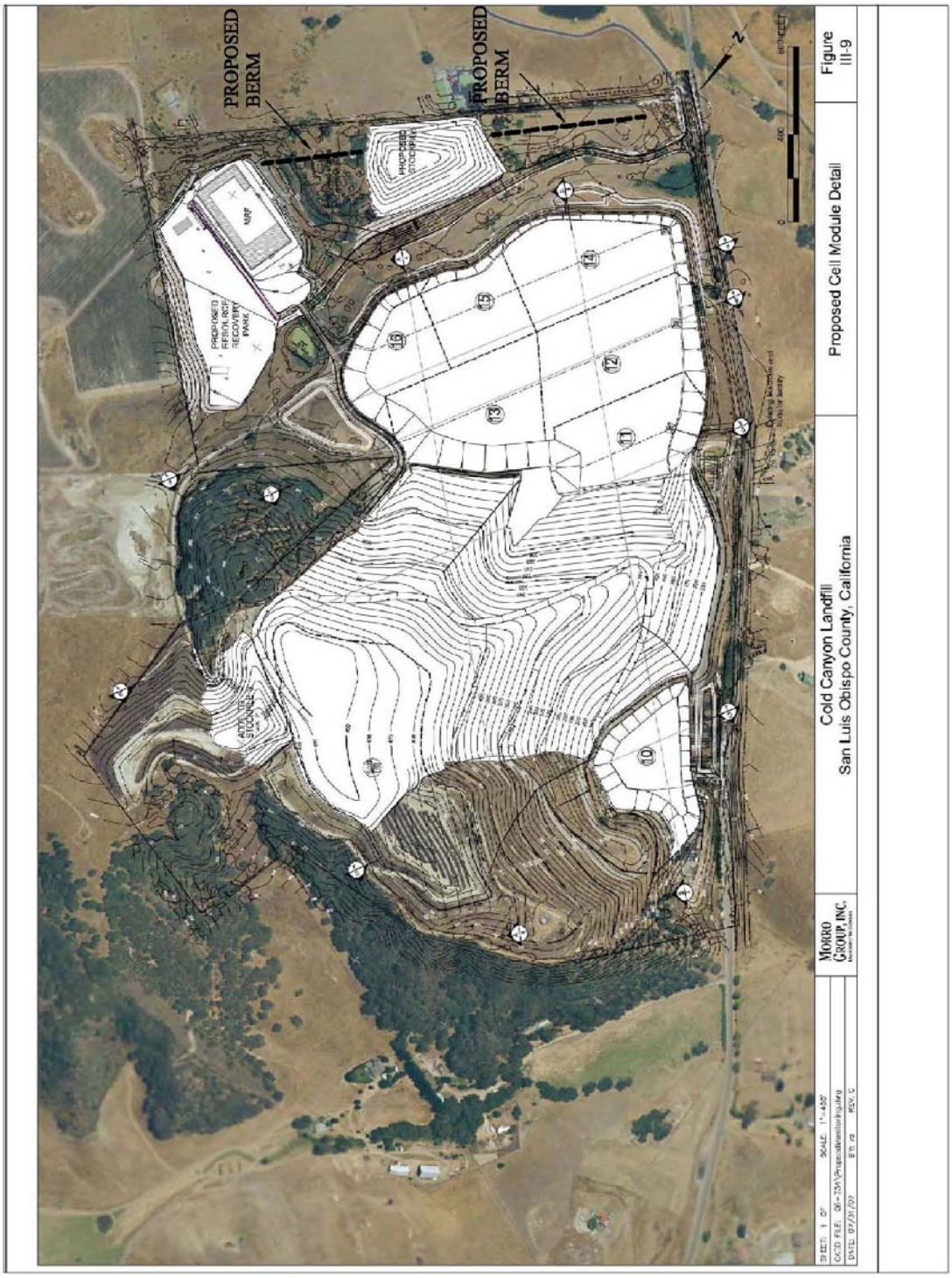
The landfill area would be expanded by 46 acres. The expansion area would potentially move noise producing activities closer to existing homes located to the south of the project site but would not change the nature of noise-producing activities or equipment within the project site. The landfill would be expanded in phases with landfill disposal activities moving around the expansion area over the life of the site. Landfill-related noise levels would not be expected to change significantly with the project at existing homes to the west of the expansion area because such homes are already adjacent to the permitted landfill area.

Based upon noise measurement data summarized in Table II, landfill activities produce an equivalent energy level (L_{eq}) of approximately 70 dBA and a maximum noise level (L_{max}) of approximately 70 dBA at 200-300 feet from simultaneous activities by disposal trucks, the dozer, compactor and earthmover. The proposed landfill expansion would move landfill operations as close as approximately 700 feet from the closest existing home to the south of the project site. Assuming noise attenuation due to geometric spreading over distance and no topographic shielding, noise levels from landfill activities at the closest home to the south would be expected to exceed the County's daytime hourly L_{eq} standard of 50 dBA by approximately 11 dB. This is a significant noise impact that will require mitigation. Noise levels from landfill activities would not be expected to exceed the County's daytime hourly L_{max} standard of 70 dBA at the closest home to the south of the landfill expansion area.

Landfill Noise Mitigation

The project applicant has proposed that a stockpile of fill earth be created near the center of the southern boundary of the expansion area as shown in Figure 3. The stockpile would acoustically shield the closest home to the south of the expansion area and achieve compliance with applicable County noise level requirements during work within Modules 13, 15 and 16 (Please

FIGURE 3: POTENTIAL NOISE MITIGATION



refer to Figure 3). The stockpile would not provide effective noise mitigation at that home during work on Modules 12 and 14.

Additional mitigation of landfill activities may be accomplished by constructing an earthen berm along the southern boundary of the landfill expansion area that is continuous with the proposed stockpile. Determination of the precise location and height of the berm would require a more detailed analysis. Generally, the berm would need to be tall enough to interrupt line of site between the closest homes and heavy equipment noise sources within the landfill expansion area at the full height of each module. The approximate location of the berm is shown in Figure 3.

b. Proposed Compost Operation Expansion and Relocation

The compost operation would be expanded and relocated near the top of the hill in the northern portion of the project site. This would result in moving associated noise sources farther away from the closest homes south and west of the site but closer to existing homes to the north and east of the site. However, the closest homes to the north and east of the site are already exposed to noise levels from existing landfill operations. Expansion of the compost operation would not be expected to cause an increase in noise levels produced by the facility since the existing equipment would continue in use.

Based upon noise measurement data summarized in Table II, the existing compost operation produces an L_{eq} of approximately 81 dBA at 100 feet from the tub grinder and 84 dBA at 100 feet from the Scarab row turner. Such levels are comparable to those produced by the heavy equipment used at the landfill disposal site as described above. Assuming noise attenuation due to geometric spreading over distance and no topographic shielding, it is estimated that operations by the grinder and/or row turner produce L_{eq} values of approximately 55-60 dBA at the closest existing homes to the south and west (1,000-1,800 feet away). Such levels exceed the County's 50 dBA daytime L_{eq} standard by 5-10 dB. During more typical compost activities, loader operations and truck movements produce L_{eq} values that are less than the County's 50 dBA standard at the closest existing homes.

When the compost operation is relocated, the closest existing homes to the north and east will be located at approximately the same setbacks from compost-related equipment as are existing homes to the south and west of the existing compost operation. This means that the relocated compost operation could result in hourly L_{eq} values of approximately 55-60 dBA at the closest homes to the north and east. Such levels exceed the County's 50 dBA L_{eq} standard. However, as previously noted, heavy equipment associated with the landfill operation produce noise levels that are comparable to those produced by the loudest compost-related equipment (Scarab row turner and tub grinder), and existing homes to the north and east are already potentially affected by such noise levels due to their proximity to the existing landfill area.

Compost Noise Mitigation

When the compost operation is relocated, it is estimated that noise levels from that operation would be reduced at the closest existing homes to the south and west by approximately 10 dB

due to increased distance and ground absorption. This would result in a beneficial impact to those residences. Since the relocated compost operation would not cause noise levels to increase at existing homes to the north and east of the project site, additional noise mitigation is not required.

c. Proposed Expansion and Relocation of Resource Recovery Park (RRP)

The RRP would be expanded from two to four acres and relocated near the southeastern corner of the project site. The site would be recessed into a hillside at that location just east of the existing MRF building. The proposed expansion of the RRP would include a sort line that is elevated approximately 15 feet above the ground. There is an existing earthen berm approximately 25 feet high between the MRF facility and the closest home to the south that would be effective for mitigating noise from the relocated and expanded RRP.

Based upon noise measurement data summarized in Table II, the existing RRP operation produces an L_{eq} of about 69 dBA and an L_{max} of approximately 75 dBA at 100-200 feet from loaders engaged in the movement and sorting of materials. These are typical activities at the RRP. Maximum noise levels are generally caused by backup alarms and/or materials being dumped into sorting bins. Noise levels produced by the proposed elevated sort line would be expected to produce a noise level comparable to glass cleaning equipment currently located on the east side of the MRF building, which is an L_{eq} of approximately 77 dBA at 50 feet.

The closest homes to the relocated RRP site are about 500 and 1,000 feet to the south of the site. Accounting for noise attenuation due to geometric spreading over distance , estimated noise levels from the relocated and expanded RRP at the closest homes are L_{eq} and L_{max} values of 58.2 and 64.6 dBA at 500 feet and 52.2 and 58.6 dBA at 1,000 feet, respectively. When acoustic shielding from the existing berm and MRF building are taken into consideration, noise levels from the relocated and expanded RRP would not be expected to exceed applicable County noise standards.

RRP Noise Mitigation

None required.

d. Proposed Expansion and Enhancement of the Materials Recycling Facility (MRF)

The MRF capacity would be increased by adding upgraded equipment and increasing hours of operation. The upgraded equipment would be located inside an expanded building. As previously noted, the extended hours of operation would not occur during the nighttime hours of 10:00 p.m. to 7:00 a.m.

Based upon noise measurement data summarized in Table II, MRF operations produce an L_{eq} of 46.1 dB at approximately 300 feet from the east side of the MRF building. This includes noise from ventilation fans, sorting operations inside the building, and the glass cleaner located outside and on the east (opposite) side of the building. The maximum noise level from the glass cleaner

was 48.6 dBA at that location. There is an existing earthen berm between the MRF and the closest home to the south that is effective for mitigating noise from that facility.

Noise levels from the existing MRF do not exceed applicable County noise standards at the closest homes to the south. It is not anticipated that proposed facilities or equipment associated with the expansion and/or enhancement of the MRF would result in a significant noise impact. This is based upon the assumptions that new ventilation fans will not produce higher noise levels than the existing fans and the new fans would be oriented in the same direction as the existing fans.

MRF Noise Mitigation

Ventilation fans should be oriented to the southeast or northeast of the expanded MRF building.

e. Proposed Relocation of Main Entrance

The main entrance to the Cold Canyon Landfill from SR227 would be relocated about 2,800 feet to the south. This would result in moving on-site traffic closer to existing homes located to the south and southwest of the project site. The closest existing home would be located approximately 350 feet from the main entrance road.

The FHWA Model was used to calculate hourly L_{eq} values for on-site traffic along the main entrance road during a peak hour as defined by Reference 6. The analysis showed that the peak hour L_{eq} at 350 feet would be 52.6 dBA for 2031 traffic conditions. This exceeds the County's 50 dBA daytime L_{eq} standard, and means that noise mitigation will be required.

Entrance Road Noise Mitigation

Mitigation of noise from the relocated main entrance road could be achieved by the same berm proposed for mitigation of expanded landfill operations, as described above and noted in Figure 3. The berm would have to be tall enough to interrupt line of sight between the traffic noise source and the mid-window height of the closest homes.

f. Traffic Noise Impacts

The proposed expansion of the landfill would increase the number of allowed daily trips for the landfill, according to Reference 6. Currently, there is an average of 346 daily trips at the landfill. This is expected to increase to an average of 891 daily trips by 2031. All such vehicles would access the site from SR227. According to the Caltrans website and the statewide annual traffic growth rate over the past few years (2000-2006), the annual average daily traffic volume on SR227 in the vicinity of the project site would be expected to increase from 5,500 in 2006 to 8,590 by 2031. This does not include the effects of the landfill expansion project. Accounting for project-related traffic, the future (2031) AADT on SR227 near the project site would be 9,135. Assuming that 84% of project-related traffic would be trucks, the overall truck percentage on SR227 would increase from 5.2% to 8.2% by 2031 with the project.

The FHWA Model was used to calculate project-related changes in traffic noise exposure at the closest residential setbacks along SR227 near the project site. Noise modeling assumptions are summarized in Appendix B. At a setback of 150 feet from the center of the roadway, future (2031) annual average traffic noise exposure *without* the project would be 61.2 dB DNL. This exceeds the County's 60 dB DNL noise compatibility standard. Including project-related traffic, the future traffic noise exposure would increase by 0.8 dB to 62.0 dB DNL. This is not considered a significant increase in traffic noise exposure. Since the project would not directly result in a traffic noise exposure that exceeds the County's 60 dB DNL standard at the closest residential setbacks or a significant increase in traffic noise exposure, traffic noise mitigation is not required for the project.

Traffic Noise Mitigation

None required.

g. Construction Noise Impacts

Construction noise could occur at various locations within and adjacent to the project site through the build-out period. During the construction of the project, noise from construction activities could potentially impact noise-sensitive land uses in the immediate area. Activities involved in construction would generate noise levels at 50 feet as indicated by Table V. It is anticipated that no single home or group of homes will be continuously subject to construction noise throughout the phasing and build-out of the project, although construction noise could occur on a frequent basis during construction and maintenance of the stockpile near the southern boundary of the landfill expansion area.

TABLE V

TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS

Type of Equipment	Maximum Noise Level, dBA @ 50 Ft.
Backhoe	78
Concrete Saw	90
Crane	81
Excavator	81
Front End Loader	79
Jackhammer	89
Paver	77
Pneumatic Tools	85
Dozer	82

Source: FHWA[5]

Construction Noise Mitigation

Construction noise is not usually considered to be a significant impact if construction occurring near noise-sensitive land uses is limited to the daytime hours, extraordinary noise-producing activities (e.g., pile driving) are not anticipated, and construction equipment is adequately maintained and muffled. The effects of noise from the construction and maintenance of a stockpile near the southern boundary of the landfill expansion could be mitigated by requiring that the stockpile be worked from the north side to the greatest practical extent.

h. Vibration Impacts

The important sources of man-made vibration are sonic booms, blasting, pile driving, pavement breaking, demolition, diesel locomotives, and rail-car coupling. None of these sources are anticipated from the project site. The primary vibratory source during the construction and operation of the project would be heavy equipment and loaded trucks. Typical bulldozer or loaded truck activities generate an approximate vibration level of 86-87 VdB at a distance of 25 feet[5]. The closest homes are at least 300 feet from where vibration-producing equipment might operate. Typically, vibration levels must exceed 80 VdB before annoyance occurs or 100 VdB before building damage occurs.

Vibration Mitigation

Construction vibration, if it is detected at all at the closest homes, would be temporary. Vibration due to landfill activities would not be expected to exceed acceptable limits at the closest homes. Additionally, no one residence or group of residences would be subject to vibration throughout the phasing and build-out of the project. Vibration mitigation is therefore not required.

i. Cumulative Noise Impacts

Cumulative noise impacts due to the project would not be expected provided proposed mitigation measures are implemented, including a properly designed berm (noise barrier) along the southern boundary of the landfill expansion area.

REFERENCES

1. San Luis Obispo County, *Noise Element of the General Plan,* adopted by Resolution No. 92-227, May 5,1992.
2. *Federal Agency Review of Selected Airport Noise Analysis Issues,* Federal Interagency Committee on Noise, August, 1992.
3. U.S. Department of Transportation, Federal Transit Administration, *Transit Noise and Vibration Impact Assessment,* April 1995.
4. Federal Highway Administration, *Traffic Noise Model, Version 2.5,* April 14, 2004.
5. Federal Highway Administration, *Roadway Construction Noise Model User's Guide,* January 2006.
6. Waste Connections, Inc., *Project Description-Cold Creek Landfill,* Project 115271, July17, 2007.

APPENDIX A

ACOUSTICAL TERMINOLOGY

AMBIENT NOISE LEVEL: The composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

CNEL: Community Noise Equivalent Level. The average equivalent sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night before 7:00 a.m. and after 10:00 p.m.

DECIBEL, dB: A unit for describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).

DNL/L_{dn}: Day/Night Average Sound Level. The average equivalent sound level during a 24-hour day, obtained after addition of ten decibels to sound levels in the night after 10:00 p.m. and before 7:00 a.m.

L_{eq}: Equivalent Sound Level. The sound level containing the same total energy as a time varying signal over a given sample period. L_{eq} is typically computed over 1, 8 and 24-hour sample periods.

NOTE: The CNEL and DNL represent daily levels of noise exposure averaged on an annual basis, while L_{eq} represents the average noise exposure for a shorter time period, typically one hour.

L_{max}: The maximum noise level recorded during a noise event.

L_n: The sound level exceeded "n" percent of the time during a sample interval (L_{90}, L_{50}, L_{10}, etc.). For example, L_{10} equals the level exceeded 10 percent of the time.

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ACOUSTICAL TERMINOLOGY

NOISE EXPOSURE CONTOURS: Lines drawn about a noise source indicating constant levels of noise exposure. CNEL and DNL contours are frequently utilized to describe community exposure to noise.

NOISE LEVEL REDUCTION (NLR): The noise reduction between indoor and outdoor environments or between two rooms that is the numerical difference, in decibels, of the average sound pressure levels in those areas or rooms. A measurement of "noise level reduction" combines the effect of the transmission loss performance of the structure plus the effect of acoustic absorption present in the receiving room.

SEL or SENEL: Sound Exposure Level or Single Event Noise Exposure Level. The level of noise accumulated during a single noise event, such as an aircraft overflight, with reference to a duration of one second. More specifically, it is the time-integrated A-weighted squared sound pressure for a stated time interval or event, based on a reference pressure of 20 micropascals and a reference duration of one second.

SOUND LEVEL: The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear and gives good correlation with subjective reactions to noise.

SOUND TRANSMISSION CLASS (STC): The single-number rating of sound transmission loss for a construction element (window, door, etc.) over a frequency range where speech intelligibility largely occurs.

APPENDIX B: TRAFFIC MODELING ASSUMPTIONS
FHWA-RD-77-108
Calculation Sheets
April 17, 2008

Project #:	08-007
Description:	Cold Canyon
Ldn/Cnel:	Ldn
Site Type:	Soft

Contour Levels (dB): 55, 60, 65, 70

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	Truck % Med	Truck % Hvy	Speed mph	Dist ft	Offset dB
1	SR227	n/o Price Canyon Road-2006	5500	90		10	3.7	1.5	55	150	
2	SR227	n/o Price Canyon Road-2031-NP	8590	90		10	3.7	1.5	55	150	
3	SR227	n/o Price Canyon Road-2031-P	9135	90		10	5.8	2.4	55	150	
4	Entrance Rd	existing-2006	1752	100			58.9	24.7	25	350	
5	Entrance Rd	with project-2031	4520	100			58.9	24.7	25	350	