4.5 NOISE

4.5 NOISE

Noise is commonly defined as unwanted sound, sound that annoys or disturbs people and potentially causes an adverse psychological or physiological effect on human health. Because noise is an environmental pollutant that can interfere with human activities, consideration of noise exposure has become an integral part of land use planning and environmental assessments. This section evaluates the noise impacts associated with implementation of the proposed project. The existing and future noise exposures of a potential dairy site are described; the compatibility of new and expanded dairies with the existing on-site and off-site noise environment is evaluated.

SETTING

Sound is measured in decibels (dB). Zero dB approximates the threshold of hearing. Although decibels can describe the purely physical intensity of sound, they cannot accurately describe sound as perceived by the human ear. The pitch or frequency of a sound must be taken into account when measuring human response to sound since most sounds consist of a broad band of frequencies, with each frequency differing in sound level. For this reason, a frequency-dependent weighting system must be employed whenever sound is measured. These measurements are generally reported in A-weighted decibels (dBA). Decibels and other technical terms are defined in Table 4.5-1; typical A-weighted noise levels measured in the environment and in industry are shown in Table 4.5-2 for different noise types.

The effects of noise on people can be grouped into three general categories: 1) subjective effects of annoyance, nuisance, and dissatisfaction; 2) interference with activities such as speech and sleeping; and 3) physiological effects such as hearing loss. An important method for determining a person's subjective reaction to a new noise is by comparing it to ambient (existing) conditions. The following statements describe the general relationship of noise effects on people:

- An increase or change of one dB cannot typically be perceived, except in carefully controlled laboratory experiments;
- A three-dB change is considered a just-perceivable difference;
- A minimum of a five-dB increase is required before any noticeable change in community response is expected;
- A ten-dB increase is subjectively heard as approximately a doubling in loudness, and would be expected to cause an adverse change in community response.

- Noise levels are reduced by six dB for every doubling of distance from the source, although a greater decrease in noise level could result from the presence of intervening structures or other physical barriers.

TABLE 4.5-1: **Definitions of Acoustical Terms**

Term	Definitions
Decibel, dB	A unit 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).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	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 frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 PM to 10:00 PM and after addition of 10 decibels to sound levels in the night between 10:00 PM and 7:00 AM.
Day/Night Noise Level, L_{dn}	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 PM and 7:00 AM.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

TABLE 4.5-2: **Typical Sound Levels Measured in the Environment and Industry**

At a Given Distance from Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Impression
	140		
Civil defense siren (100')	130		
Jet takeoff (200')	120		Pain Threshold
	110	Rock music concert	
Pile driver (50')	100		Very loud
Ambulance siren (100')			
	90	Boiler room	
Freight cars (50')		Printing press plant	
Pneumatic drill (50')	80	In kitchen with garbage disposal running	
Freeway (100')			
	70		Moderately loud
Vacuum cleaner (10')	60	Data Processing center	
		Department store	
Light traffic (100')	50	Private business office	
Large transformer (200')			
	40		Quiet
Soft whisper (5')	30	Quiet bedroom	
	20	Recording studio	
	10		Threshold of hearing
	0		

Source: Kern County, 1999.

REGULATORY ENVIRONMENT

The Kings County General Plan Noise Element includes noise and land use compatibility standards for various land uses (Table 4.5-3). Proposed land uses exposed to "acceptable" noise levels indicate that a proposed land use would be acceptable. Proposed land uses exposed to "conditionally acceptable" noise levels typically indicate that the proposed land use should be undertaken only after a detailed analysis of noise reduction requirements is made and noise insulation features are included in the design of the structures

corresponding to the specified land use. Proposed land uses exposed to "unacceptable" noise levels typically indicate that the proposed land use should be discouraged or should not be undertaken.

TABLE 4.5-3: **Noise and Land Use Compatibility Standards**

Land Use Category	Community Noise Exposure, L_{dn} or CNEL dB		
	Acceptable	Conditionally Acceptable	Unacceptable
Residential (single family and rural)	<60/<45	60 to 70	>70/>45
Residential (multi-family)	<65/<45	65 to 70	>70/>45
Transient Lodging	<65/<45	65 to 70	>70/>45
Institutional - Noise Sensitive (Schools, Libraries, Hospitals, Churches, and Nursing Homes)	<65/<45	65 to 70	>70/>45
Institutional - Non-Noise Sensitive (Auditoriums, Theaters)	No levels identified	<70	>70
Sports Arena and Outdoor Spectator Sports Activities	No levels identified	No levels identified	<70
Outdoor Activities/Recreation (Playgrounds, Neighborhood Parks, Golf Courses, Riding Stables, Water Recreation, Cemeteries)	<70	No levels identified	>70
Outdoor Spectator Sports Activities, Sports Arenas/Stadiums	No levels identified	No levels identified	>70
Industrial, Commercial, and Agriculture	<70	70 to 75	>75

Source: Kings County, 1993, as amended.

Note: xx/yy = Exterior/interior noise levels
xx = exterior noise levels

EXISTING CONDITIONS

The major sources of noise in Kings County are roadways/highways, airports, railroad operations, industrial operations, auto racing activities at the Kings County Fairgrounds and the Lemoore Jet Bowl, and agricultural activities (season dependent) (Kings County,

1993).[1] Highway traffic noise levels for various roadways throughout the County were contoured for the years 1992 and 2005 and are included in the Kings County General Plan Appendix VIII. The noise level contours identify the distances at which the 60 dB and 65 dB noise level would occur from a given roadway. The major roadways evaluated included Houston Avenue, Hanford/Armona Road, Dairy Avenue, Front Street, Laurel Avenue (Main Street, Stratford), Excelsior Avenue, and Grangeville Boulevard. The contours indicate that noise levels from Houston Avenue at Highway 43 would exhibit the loudest noise levels for both the 1992 and 2005 scenarios; the 60 and 65 dB noise contours at this location would be 147 and 68 feet from the center of the roadway, respectively (Kings County, 1993).

The Lemoore Naval Air Station, Hanford, Corcoran, Salyer, and agricultural airports also contribute to the existing noise within the County. The Lemoore station is a military jet aircraft base located in the northwest portion of the County. Kings County limits development activities within three miles of the Naval Station to control the jet aircraft noise effects on nearby land uses. Hanford and Corcoran airports are public facilities. The Hanford Municipal Airport is located south of State Highway 198 (southeastern part of the city), and the Corcoran airport is located on the western edge of the city of Corcoran. The Kings County General Plan Appendix VIII includes existing 60, 65, and 70 dB Community Noise Equivalent Level (CNEL) noise contours for the Hanford and Corcoran airports; future 2011 noise contours are also included for the Hanford airport. The noise contours indicate that areas within approximately 500 feet from the Hanford airport runway Number 14 could exhibit noise levels at 70 dB CNEL in 2011. Similarly, areas within one-half mile of the Corcoran airport runway could exhibit noise levels exceeding 100 dBA.

The Salyer airport is privately-owned and located east of the Corcoran airport. Agricultural aircraft operate from various private runways throughout the rural areas of the County. According to Table 16 of the Kings County General Plan Appendix VIII, the airport land use noise compatibility criteria for cropland consider noise levels between 50 and 70 as clearly acceptable and noise levels between 70 and 75 normally acceptable.[2] Similarly, the airport land use noise compatibility criteria for livestock breeding considers noise levels between 50 and 55 as clearly acceptable, between 55 and 60 as normally acceptable, between 60 and 70 as marginally acceptable, and between 70 and 75 as normally unacceptable.

Southern Pacific and Santa Fe Railroad operations also contribute to the noise environment in the County. The Southern Pacific railroad lines are situated in an east-west alignment

[1] The Lemoore Jet Bowl has since been relocated to SR 41 and Idaho Avenue, farther from the residential areas of Lemoore and the Lemoore fringe.

[2] The General Plan does not identify unacceptable noise levels for cropland land uses.

and the Santa Fe railroad lines are situated in a north-south alignment. According to Table 17 of the Kings County General Plan Appendix VIII, both the Southern Pacific and Santa Fe railroads exhibit 60 and 65 dB at greater than 100 feet from the centerline of the railroad tracks.

Several industrial operations in the County contribute to the existing noise environment, such as the Kings Industrial Park, the Corcoran Industrial Park, and the Crisp Grain Mill. Figures 26 through 28 of the Kings County General Plan Appendix VIII include the 45 and 50 dB noise level contours from these sources.

Agricultural operations throughout the County also contribute to the existing noise environment. Agricultural sources include the use of farming equipment, such as tractors, harvesting equipment, pump engines, and stationary equipment. Diesel engines typically generate between 75 and 85 dB at about 50 feet from the noise source. Auto racing is also considered a noise source within the County. The noise generated from auto racing varies depending on the season and activity.

EXISTING PLANS AND POLICIES

The Noise Element of the Kings County General Plan includes a goal, objective, and several policies that would be relevant to the proposed project (Kings County, 1993).

Goal 40: Ensure the compatibility of proposed land uses in terms of their appropriate noise levels.

Objective 40.1: Avoid incompatibility of adjacent land uses by requiring appropriate noise-reducing mitigation measures.

Policy 40a: Use the information shown in Noise and Land Use Compatibility Standards Table 18 of Appendix VIII of the General Plan (Table 4.5-3 of this EIR), as Kings County policy regarding the compatibility of land uses and noise levels produced or received.

Policy 40b: Require developers of projects expected to produce excessive noise to mitigate the effects of the excessive noise on existing land uses.

Policy 40c: Require developers of noise-sensitive projects to mitigate for existing excessive noise sources which may be expected to impact the project.

RELEVANT GOALS, OBJECTIVES, AND POLICIES

The following goals, objectives, and policies of the Kings County Draft Dairy Element (Element) address noise issues:

Dairy Siting Goals, Objectives, and Policies

Goal DE 1 restricts the locations where dairies may be located to those areas of the County where they are most compatible with surrounding uses and activities, and environmental constraints. **Objective DE 1.1** commits to protect agricultural uses from encroachment of incompatible nonagricultural uses.

Policy DE 1.1a acknowledges the Kings County Right to Farm Ordinance and inherent potential inconveniences and discomforts, including noise from equipment and animals, often associated with agriculture uses.

Objective DE 1.2 requires that specific ~~criteria~~ standards be used to avoid potential land use conflicts when approving new dairies and expansion of existing dairies. Such conflicts could include nuisance noise at residences near existing or proposed dairies.

Policy DE 1.2b provides a mechanism for avoiding potential land use conflicts between jet aircraft noise and new dairies. The policy prohibits the placement of actual animal concentration facilities (e.g., corrals, freestall barns, milk barns) within the exclusive agricultural zone district but would allow the placement of manure and dairy process water storage areas in this zone.

Theoretical Herd Capacity Goals, Objectives, and Policies

Goal DE 3 requires the development of a countywide policy for the evaluation and distribution of dairies and dairy stock replacement location and operation. **Objective DE 3.1** requires consideration of mitigation measures developed in this PEIR when reviewing and evaluating proposals for new or expanded dairies.

Policy DE 3.1a requires the consideration of ~~the~~ various criteria, including noise, in the Technical Report for both the general dairy siting criteria and site specific dairy projects~~; including ground and surface water quality; traffic and road conditions; proximity to the nearest residences; and potential health, safety, and/or nuisance problems that may be identified on a case by case basis. Nuisance problems could include noise generation at dairies and by traffic generated by dairy development~~.

Policy DE 3.1i requires that dairy project applications include an assessment, which demonstrates that the project will comply with the Noise Element of the Kings County General Plan.

Element Monitoring and Enforcement Goals, Objectives, and Policies

Goal DE 6 requires the implementation of a monitoring program that both demonstrates the Element's effectiveness in protecting the environment, and the effectiveness of the mitigation measures required for each operating dairy facility in Kings County. **Objective DE ~~6.1~~ 6.2** requires the protection of the environment through monitoring of the dairy industry's operational activities so that adjustments in the operation can be made when necessary. **Policies DE ~~6.1a~~ 6.2a ~~and 6.1b~~** provide a mechanism for: determining the current baseline environmental conditions for comparison with future monitoring results; continuous monitoring of individual dairy operations subject to the Element; and the establishment of the dairy system monitoring program and its elements.

Objective DE ~~6.2~~ 6.3 requires the implementation of a continuous monitoring program for each operating dairy. **Policy DE ~~6.2a~~ 6.3a** requires that each new dairy, or expanded dairy conduct annual inspections to demonstrate that the facility is operating under approved conditions, and if conditions are violated would be subject to modification of the operation.

Goal DE ~~7~~ 6 requires the establishment of a Dairy Monitoring Program in the Dairy Monitoring Office, managed by the Kings County Planning Agency. **Objective DE ~~7.1~~ 6.1** would establish a Dairy Monitoring Program in the Kings County Planning Agency. **Policies DE ~~7.1a~~ 6.1a.A** through **~~7.1c~~ 6.1a.C** establish procedures and requirements for dairy data tracking, problem resolution, and reporting to the Planning Commission. **Objective DE ~~7.2~~ 6.4** establishes a formal complaint response system for complaints made by the public concerning dairy operations, potentially including issues related to noise generation. Corresponding **Policies DE ~~7.2a~~ 6.4a** through **~~7.2c~~ 6.4c** identify the requirements of the complaint system.

Existing Dairy Voluntary Conformance Goals, Objectives, and Policies

~~**Goal DE** 8 would bring all existing dairies in Kings County into voluntary conformance with the provisions of the Element by the end of 2006. **Objective DE 8.1** requires the development of a program by which an existing dairy operation can earn a certificate certifying that it is being operated in compliance with the policies of the Element. **Policies DE 8.1a** and **8.1b** require: the implementation of a Dairy Conformance Program for existing dairies and coordination with the Legislature, industry programs, and individual dairy operators to develop programs and funding to assist dairies meet current operating standards.~~ **Policy DE ~~8.1c~~ 3.7a** indicates that nothing in the Element guarantees that a dairy that does not meet the specified standards will be able to ~~come into conformance~~ make the changes necessary for future expansion.

IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Based on the Kings County General Plan Noise Element goal, objective, and policies and the recently amended environmental checklist recommended in the CEQA *Guidelines*, project-generated noise would be considered to result in a significant noise impact on the environment if it would result in any of the following:

- exposure of persons to, or generation of, noise levels in excess of standards established in local general plan or noise ordinance;
- exposure of people to, or generation of, excessive ground borne vibration or noise levels;
- a substantial permanent increase in ambient noise levels in the project vicinity above existing levels without the project; or
- for a project in the vicinity of an airport, exposure of people to excessive noise levels.

Impact 4.5-1

Construction activities associated with new or expanded dairies would result in short-term noise increases. This is a less-than-significant impact.

Construction of new and expanded dairies would typically include soil excavation, soil grading, site preparation, construction of structures (e.g., freestall barns, manure management system, milking center, hospital, entry court), and installation of utilities and paving. Construction noise would depend on the equipment used, the distance from the noise source to a sensitive receptor, phasing of construction equipment use, and presence or absence of noise barriers.

Construction equipment that may be used at new or expanded dairies would likely include scrapers, water trucks, bulldozers, backhoes, and miscellaneous equipment (e.g., pneumatic tools, generator, portable air compressor). Noise levels generated by these types of construction equipment at various distances from the noise source are shown in Table 4.5-4.

Noise levels generated from the individual pieces of equipment would range from 76 to 89 dBA at a distance of 50 feet from the noise sources. Construction noise levels would decrease with increasing distance from the noise source; typically, noise levels are reduced by six dB for every doubling of distance from the source, although the presence of intervening physical barriers would result in a greater decrease in noise levels. Assuming that no intervening structures would be present in the vicinity of a dairy, noise levels generated by the individual construction equipment could range from 70 to 83 dBA at a distance of 100 feet and 36 to 49 dBA at a distance of 1.0 mile from the noise sources.

Noise levels would increase by three dBA for each doubling of sound sources with equal noise levels. Therefore, if two scrapers (emitting 88 dBA individually) were used simultaneously at a similar location, the cumulative noise level generated by the scrapers would be 91 dBA at 50 feet. Under a worst-case scenario, if each piece of equipment (or nine pieces of equipment with similar noise strengths) were used simultaneously at the same location, the cumulative noise level would be 109, 103, and 69 dBA at distances of 50 feet, 100 feet, and 1.0 mile from the noise source, respectively.

TABLE 4.5-4: **Estimated Noise Levels**

Construction Equipment Noise Source	Typical Noise Level (dBA) (distance from source)[1]		
	50 feet	100 feet	1.0 mile
Pneumatic tools	85	79	45
Truck (e.g., dump, water)	88	82	48
Concrete mixer (truck)	85	79	45
Scraper	88	82	48
Bulldozer	87	81	47
Paver	89	83	49
Backhoe	85	79	45
Generator	76	70	36
Portable air compressor	81	75	41
Combined equipment[2]	109	103	69

[1] Noise levels 50 feet from the source were obtained from San Francisco, 1990, and Charles M. Salter Associates, Inc., 1998; noise levels 100 feet and 1.0 mile from the source were calculated by BASELINE.

[2] Assumes that each piece of equipment (up to nine pieces of equipment with similar noise strengths) is used simultaneously at similar locations on site.

Nearby receptors, if present in the vicinity of a future dairy facility, could potentially be affected by construction noise, depending on the distance of the receptor to the noise source and the actual noise levels observed by the receptor. Potential nearby receptors would likely be rural residences throughout the agricultural-zoned areas. Exterior noise levels greater than 70 dB day/night noise level (L_{dn}) and interior noise levels greater than 45 dB L_{dn} would be would be considered unacceptable for rural farm residences, respectively, according to the noise and land use compatibility standards of the General Plan (Table 4.5-3).

Although the Element does not specifically address noise control from dairy construction activities, Policy 40b of the Kings County General Plan requires developers to mitigate excessive noise effects on existing land uses for projects that are expected to produce excessive noise. Policy 40a of the General Plan refers to the Noise and Land Use Compatibility Standards Table 18 (Table 4.5-3 of this EIR) for determining compatible land use noise levels. Compliance with policies 40a and 40b of the General Plan would reduce this potential impact to a less-than-significant level without additional mitigation.

Mitigation Measure 4.5-1

None required.

Impact 4.5-2

Operation of a new or expanded dairy could increase noise levels generated by additional vehicular traffic. This is a less-than-significant impact.

New or expanded dairies would generate an increase in vehicular trips from milk trucks, supply feed trucks, employee/visitor vehicles, manure haul trucks, and other miscellaneous vehicle use. The increase in vehicular trips associated with dairy operations is considered to be minimal since heavy traffic volumes typically do not result from dairy operations, even for large dairies. Typically, additional vehicular traffic from dairy operations would likely result in an increase in noise level of less than two decibels along the major roadways within the project vicinity; this minimal increase in existing traffic noise levels is not generally detectable and would not be expected to result in a significant noise impact or adverse community response.

Mitigation Measure 4.5-2

None required.

Impact 4.5-3

New or expanded dairies could be exposed to adverse existing noise sources. This is a less-than-significant impact.

New or expanded dairies could be exposed to noise generated from existing noise sources throughout the County, including aircraft noise from existing airports (i.e., Hanford, Corcoran, and Lemoore), roadway noise, railroad operations, industrial operations, auto racing, and agricultural activities. According to the Kings County General Plan, noise levels estimated in 1992 and projected for 2005 for several of these noise sources could reach levels greater than 75 dBA (unacceptable noise threshold), depending on the distance of the receptor to the noise source.

Policy DE 1.2b of the Element prohibits the siting of actual animal concentration facilities within the exclusive agricultural zone district. The policy indicates that it is "designed to protect the Lemoore Naval Air Station from encroachment of uses that are not compatible with the noise generated from the jet aircraft operations at the air station..."

In addition, Goal 40 of the Kings County General Plan requires that the noise levels of proposed land uses are compatible. Policy 40c of the General Plan requires developers of noise-sensitive projects to mitigate for existing excessive noise sources that may be expected to impact the project. Policy 40a refers to the Noise and Land Use Compatibility Standards Table 18 (Table 4.5-3 of this EIR) for determining compatible land use noise levels. Compliance with the policies of the General Plan and Element would be adequate

to reduce this potential impact to a less than significant level without additional mitigation. This is a less-than-significant impact.

Mitigation Measure 4.5-3

None required.

Compliance with Policy 40c of the General Plan and **Policy DE 1.2b** of the Element would reduce construction-related noise impacts to a less-than-significant level.

Impact 4.5-4

Noise levels generated by project operations. This is a less-than-significant impact.

In addition to traffic noise, described in Impact 4.5-2 above, project operations would generate outdoor noise levels from dairy operations and cattle above the existing ambient conditions. However, the area in the site vicinity is agricultural in nature and cattle noise is not generally considered offensive in rural agricultural areas. No noise complaints related to operation of existing dairies have been filed with the Kings County Planning Agency (Zumwalt, 2000).

Potential nearby receptors, such as rural farm residences that could be located near a new or expanded dairy, may be subject to noise from dairy operational activities. According to the Noise and Land Use Compatibility Standards of the Kings County General Plan (Table 4.5-3), rural residences exposed to exterior or interior noise levels or less than 60 and 45 dB L_{dn}, respectively, would be considered "acceptable"; noise levels between 60 and 70 dB L_{dn} would be considered "conditionally acceptable" and interior and exterior noise levels greater than 70 and 45 dB L_{dn} would be considered "unacceptable," respectively.

The Element does not provide specific noise control measures for dairy operations. However, **Objective DE ~~7.2~~ 6.4** establishes a formal complaint response system for any public complaints regarding dairy operations. The objective is supported by **Policies DE ~~7.2a~~ 6.4a** through **~~7.2c~~ 6.4c,** which define the requirements of the complaint response system. In addition, Policy 40b of the General Plan requires developers of noise-sensitive projects to mitigate for existing excessive noise sources that may be expected to impact the project; Policy 40a refers to the Noise and Land Use Compatibility Standards (Table 4.5-3 of this EIR) for determining compatible land use noise levels. Compliance with the policies of the General Plan and Element would be adequate to reduce this potential impact to a less than significant level without additional mitigation.

Mitigation Measure 4.5-4

None required.

Implementation of **Policies ~~7.2a~~ 6.4a** through **~~7.2c~~ 6.4c** of the Element would ensure that conditions leading to complaints related to dairy operations would be investigated and corrected. In addition, compliance with Policies 40a and 40b of the General Plan would reduce noise impacts related to dairy operations to a less-than-significant level.