8A.0 NATURAL ENVIRONMENT: NOISE

8A.1 OVERVIEW

This section discusses the requirements of the Noise Element and describes the existing noise environment in Tehama County. The description of the noise environment includes identification of the most significant noise sources, which include highways and industrial operations. Areas where excessive noise impacts may occur are also identified.

LEGAL BASIS AND REQUIREMENTS

California Government Code Section 65302(f) states that a noise element shall be included as part of all City General Plans. A summary of the required contents of a noise element is presented below:

- A noise element shall identify and appraise noise problems in the community. The noise element shall recognize the guidelines established by the Office of Noise Control in the State Department of Health Services and shall analyze and quantify, to the extent practicable, as determined by the legislative body, current and projected noise levels for all of the following sources:
    1) Highways and freeways.
    2) Primary arterials and major local streets.
    3) Passenger and freight railroad operations and ground rapid transit systems.
    4) Commercial, general aviation, heliport, helistop, and military airport operations, aircraft over-flights, jet engine test stands, and all other ground facilities and maintenance functions related to airport operation.
    5) Local industrial plants, including, but not limited to, railroad classification yards.
    6) Other ground stationary sources identified by local agencies as contributing to the community noise environment.
- Government code requires that noise contours be shown for the above noise sources based on noise monitoring and accepted noise modeling techniques. The noise contours are to be used as a guide for designating land uses within the land use element that minimizes the exposure of community residents to excessive noise.

8A.2 PURPOSE AND METHODOLOGY

The Noise Element of the Tehama County General Plan provides a basis for comprehensive local policies to control and abate environmental noise and to protect the citizens of the county from excessive noise exposure. The fundamental goals of the Noise Element are as follows:

- To provide sufficient information concerning the community noise environment so that noise may be effectively considered in the land use planning process.
- To develop strategies for abating excessive noise exposure through cost-effective mitigation measures in combination with appropriate zoning to avoid incompatible land uses.
- To protect those existing regions of the planning area whose noise environments are deemed acceptable and also those locations throughout the community deemed "noise sensitive."

- To protect existing noise-producing commercial and industrial uses in Mendocino County from encroachment by noise-sensitive land uses.

8A.3 EXISTING SETTING

In the planning area of approximately 5,000 square miles, with a population density of about 19 persons per square mile and with most of its extensive mountain area in substantially unpopulated and undeveloped, noise is a minor problem with respect to the total area of Tehama County.

Because many rural residential areas within the County experience very low noise levels, residents may express concern about the loss of "peace and quiet" due to the introduction of a sound that was not audible previously. In very quiet environments, the introduction of virtually any change in local activities will cause an increase in noise levels. A change in noise level and the loss of "peace and quiet" is the inevitable result of land use or activity changes in such areas. Perception of a new noise source and/or increases in noise levels within recognized acceptable limits are not usually considered to be significant noise impacts, but these concerns should be addressed and considered in the planning and environmental review processes.

General policy is to locate particular present or potential problem sites, identify noise sources, and provide for the reduction and/or reasonable control of noise through this plan element, precise plans based hereon, and appropriate regulatory measures to effectuate the proposals contained herein.

NOISE IN THE AREA

Noise at, or approaching problem magnitudes in the area is concentrated in the urban areas, at certain industrial operations, and along the corridors of transportation routes, air, rail and highway.

Urban and industrial noise problems are generated by people and their local activities, in their use of land and equipment, and in their business and industrial operations. Regulation of noises and their sources is most effectively applied by local City or County ordinances. These include enforcement provisions that specify maximum permissible noise levels in relation to established ambient levels.

MEASUREMENT AND MANAGEMENT OF ENVIRONMENTAL NOISE

Sound travels through the air as waves of tiny air pressure fluctuations, which are caused by various vibrations. In general, sound waves travel away from the noise source as an expanding spherical surface. The energy contained in a sound wave is consequently spread over an increasing area as it travels away from the source. The result is a decrease in volume at greater distances from the noise source.

The human ear is subject to a wide range of sound intensities, and the sounds that people hear are in direct proportion to those intensities. The decibel (dB) scale is a logarithmic scale used to compress this range. On the dB scale, the smallest audible sound (near total silence) is 0 dB. A sound 10 times more powerful is 10 dB. A sound 100 times more powerful than total silence is 20 dB. A sound 1,000 times more powerful than total silence is 30 dB. See **Table 8A-1** for more information. The "A" weighting scale, that which most closely resembles human hearing, is used in this plan and is noted by the symbol (dBA).

Varying noise levels are often described in terms of the equivalent constant decibel level. Equivalent noise levels (Leq) are used to develop single-value descriptions of average noise exposure over various periods of time. Such average exposure ratings often include additional weighting factors for annoyance potential because of time of day or other considerations.

Ambient noise levels constitute the composite from all sources far and near. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

The Day-Night Average Level (Ldn) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because Ldn represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Noise in the community has often been cited as being a health problem, not in terms of actual physiological damages such as hearing impairment, but in terms of inhibiting general well being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities such as sleep, speech, recreation and tasks demanding concentration or coordination. When community noise interferes with human activities or contributes to stress, public annoyance with the noise source increases, the acceptability of the environment for people decreases. This decrease in acceptability and the threat to public well being are the bases for land use planning policies preventing exposures to excessive community noise levels.

To control noise from fixed sources that have developed from processes other than zoning or land use planning, many jurisdictions have adopted community noise control ordinances. Such ordinances are intended to abate noise nuisances and to control noise from existing sources. They may also be used as performance standards to judge the creation of a potential nuisance, or potential encroachment of sensitive uses upon noise-producing facilities. Community noise control ordinances are generally designed to resolve noise problems on a short-term basis (usually by means of hourly noise level criteria), rather than on the basis of 24-hour or annual cumulative noise exposures.

Parameters used when estimating traffic noise relate to the traffic, the roadway and the receiver. Traffic parameters affecting noise are the number and type of vehicles passing a point during a particular time period and the average speed of the vehicles. Roadway variables include its surface, gradient and geometry.

Highway noise increases as the number and average speed of automobiles on it increases. For example, if the automobile traffic volume doubles, the noise level from those autos increases by about 3 dBA. However, if the speed decreases to half, the noise level from autos decreases by about 6 dBA. The engine exhaust and tire-roadway interaction also contribute prominently to overall automobile noise.

When distance is the only factor considered, sound levels from an isolated noise source will typically decrease by about 6 dB for every doubling of distance from the source. When the noise source is essentially a continuous line (e.g. vehicle traffic on a highway), noise levels decrease by about 3 dB for every doubling of distance.

Receiver parameters are those factors that affect the relationship of the receiver's position to the vehicle-roadway noise source. The distance between the observer and the highway is the

most significant factor. The greater the distance, the lower the noise level. Doubling the distance from the highway (for example going from 100 to 200 feet) reduces the average traffic noise at the receiver's position by about 4 to 6 dBA.

Railroad noises may also be measured and compared using Ldn levels as a basis for evaluation. Railway noise is produced by the combination of diesel engine noise and railway car noise. Other variables include distance to the receiver, numbers of train operations, speed of trains and numbers of cars per train. Engine air horns and grade crossing warnings are treated as single event noises.

Noise from overhead aircraft around general aviation airports is evaluated based on the number of daytime and nighttime operations for jet and non-jet take-offs and landings. Ldn contours are drawn which include consideration of aircraft altitude and other surrounding noise sources.

TABLE 8A-1
TYPICAL A-WEIGHTED SOUND LEVELS OF COMMON NOISE SOURCES

DECIBELS	DESCRIPTION
130	Threshold of pain
120	Jet aircraft take-off at 100 feet
110	Riveting machine at operators position
100	Shotgun at 200 feet
90	Bulldozer at 50 feet
80	Diesel locomotive at 300 feet
70	Commercial jet aircraft interior during flight
60	Normal conversation speech at 5-10 feet
50	Open office background level
40	Background level within a residence
30	Soft whisper at 2 feet
20	Interior of recording studio

EXISTING AND FUTURE NOISE ENVIRONMENTS

The major noise sources in Tehama County consist of highway and local traffic on County roads, as well as commercial and industrial uses, airports and railroad operations. Each of these noise sources is discussed individually below.

Roadways

The use of the automobile is recognized in the 2001 Regional Transportation Plan (RTP) as the dominant mode of transportation in Tehama County. The RTP reported that there were approximately 43,000 licensed motor vehicles (excluding trailers) that travel an average of 2,225,000 vehicle miles daily upon public roads in the county. There are nearly 1,200 centerline miles and 2,400 lane miles of streets and roads in the county.

State Highways provide the primary routes connecting the cities and unincorporated areas in Tehama County. These highways account for nearly 70 percent of vehicle travel in the county.

- Interstate 5: A high-emphasis route of the National Highway System, I-5 passes through approximately 42 miles of Tehama County, through Red Bluff and Corning.
- SR-99: State Route 99 (also known as 99 East) is a 2-lane conventional highway/expressway with a 25-mile segment through Tehama County.
- SR-36: State Route 36 runs 104 miles through Tehama County. The road is an east-west highway with important principal arterial segments near Red Bluff (which connect I-5 and SR 99E).
- SR-89: State Route 89 is a 2-lane conventional highway that spans a total of 243 miles. In Tehama County, SR-89 runs 4.4 miles, leading to Lassen National Volcanic Park.
- SR-172: State Route 172 is a 2-lane conventional highway. It spans 8.91 miles in Tehama County, beginning in Mineral and continuing through Mill Creek.

Railroads

The railroad contributes a significant source of noise locally, within areas of Tehama County adjacent to the tracks, due to warning horns and wheel noise on the tracks. The only active railroad operation within Tehama County is the Union Pacific Railroad, which runs through central Tehama County. Union Pacific's north-south main line, between Seattle and Southern California, runs through Tehama County on its route between Red Bluff and Chico. This route passes through or within 5 miles of the towns of Vina, Los Molinos, Gerber, Las Flores, Proberta and Red Bluff.

According to noise studies conducted by Union Pacific, the average sound exposure levels (SEL) for freight train operations along the UPRC railroad track is approximately 100 dB at a distance of 100 feet from railroad track centerline.

According to John Bromley, Director of Public Affairs for Union Pacific, the route between Red Bluff and Chico currently averages 18 trains per day, including Amtrak passenger trains. Cargo is predominantly southbound lumber and paper products, but cargo also includes a wide variety of other consumer and industrial goods.

Operations are continuous throughout the year, although a reduction of service occurs in the off-season. The trains run 24 hours a day without any particular times favored. The numbers of trains and the times they run vary day to day depending on business levels, traffic on the railroad and weather.

Airports

There are two public airports within Tehama County: Corning Municipal Airport and Red Bluff Municipal Airport. Both airports are owned and operated by the cities of Corning and Red Bluff, respectively.

The noise impacts from these airports were analyzed in the Tehama County Airport Comprehensive Land Use Plan (TCACLUP), adopted by the Airport Land Use Commission. The following data for these airports was also obtained from the TCACLUP.

Noise contours are based on the Community Noise Equivalent Level (CNEL) as defined in Title 21 of the California Code of Regulations. The TCACLUP includes noise contours for the two airports. Specific locations and operational information for each of the airports discussed with the TCACLUP is provided below.

The history of noise complaints around general aviation airports suggests that some land use regulation measures are required under the traffic pattern and within the 55 CNEL contour. Preferred measures are those that restrict residential land use within the traffic pattern. Land use restrictions may include prohibiting residential development underneath that traffic pattern or limiting development to low density uses.

Corning Municipal Airport

The Corning Municipal Airport consists of one runway on 77 acres of land. It is located within the City Limits of Corning at the intersection of Neva Ave. and Marguerite Ave. in the northeast quadrant of the City. According to the TCACLUP, there are currently 21 airplanes and 1 helicopter based at the Corning Municipal Airport.

Runway 16-34 spans 2,700 ft., with single-wheel weight limitations of 12,000 lbs. Aircraft that generally use the airport are single-engine fixed wing general aviation aircraft, but twin-engine aircraft also occasionally utilize the airport. On an annual average basis, there are approximately 24 operations per day.

The Corning Municipal Airport Master Plan includes a planned relocation and extension of Runway 16-34. These actions are proposed to better separate aircraft operations from urban uses to the south. As a result, the threshold for the runway will shift 900 feet to the north. Additionally, a 1,500-foot northerly extension will be completed, resulting in a net lengthening of 600 feet for an overall runway length of 3,300 feet.

Wadell Engineering Corporation developed an identification of noise contours for the Corning Municipal Airport on behalf of the TCACLUP. On the contour maps for both the 2,700-foot and the 3,300-foot versions of the runway, three contours were identified (55 CNEL, 60 CNEL and 65 CNEL) which extend approximately 500 feet to the east and west of the center of the runway and 1,500 feet to the north and south of the respective ends of the runway. Because of the airport's small size and lack of commercial air traffic, the noise levels are not considered significant within the contour lines of the runway.

Red Bluff Municipal Airport

The Red Bluff Municipal Airport has 602 acres of land and a 5,984-foot runway system. It is located entirely within the Red Bluff City Limits and is served by Luther Rd. to Airport Blvd. or South Jackson St. to Airport Blvd. It is bounded on the west by Paskenta Rd. The primary runway, 15-33, is 150 feet wide and 5,984 feet long with single-wheel weight limitations of 30,000 lbs. and double-wheel weight limitations of 65,000 lbs.

Aircraft that generally use the airport are single-engine fixed-wing general aviation aircraft and twin-engine aircraft, but jets and helicopters also occasionally utilize the airport. On an annual average basis, there are approximately 72 operations per day.

The noise contours for the Red Bluff Airport were developed as part of the Red Bluff Airport Master Plan. The contours identified are 55 CNEL, 60 CNEL and 65 CNEL, extending in decreasing order approximately 1,000 feet to the north and 1,000 feet south of the runway. Although the majority of the identified noise contours are located southwest of the City, the northwest extensions of the 55 CNEL and 60 CNEL contour lines stretch between approximately 400-800 feet past Paskenta Road in the southwestern corner of Red Bluff. The southern points of the contours extend into unoccupied land, approximately 500 feet north of Red Bank Creek.

NOISE POLICIES

The following noise policies were adopted by both airports in the TCACLUP:

1) Airport/Land use noise compatibility shall be evaluated in terms of the Community Noise Equivalent Level (CNEL), as defined in Title 21 of the California Administration Code.

2) The maximum noise exposure that shall be considered normally acceptable for residential areas is 60 dBA CNEL.

3) The relative acceptability or unacceptability of particular land uses with respect to the noise levels to which they would be exposed as indicated in the "Airport/Land Use Noise Compatibility Criteria" matrix, Table 2. These criteria shall be the principal determinants of whether a proposed land use is compatible with the noise impact from a nearby airport, but special circumstances, which would affect the specific proposal's noise sensitivity (e.g., the extent or lack of outdoor activity), also shall be taken into account.

4) One of the conditions for approval of a land use which is "marginally acceptable" or "normally unacceptable" for the given noise environment is that the building must provide a satisfactory degree of noise attenuation. If the structure can reduce the noise exposure to the indicated level, the use may be acceptable. It should be noted that the interior noise criteria are measured in terms of maximum noise levels of individual events and not average noise levels as represented by CNEL values. Since maximum exterior individual even noise levels are greater than the CNEL value at a given location, the required noise reduction of the structure thus will be greater than the difference between the interior noise level criterion and the CNEL value.

5) In applying the interior noise level criteria, engine run-up noise shall be considered as a source of commonly occurring exterior noise.

6) When applying the noise compatibility criteria to a given location, the basis for evaluation shall be the maximum Community Noise Equivalent Level to which the location is or is forecast to be exposed.

7) If a noise analyses, including noise monitoring, is conducted for a particular location and the results indicate that the maximum CNEL will be less than shown herein, the lower exposure level may be used for the land use evaluation at the discretion of the Airport Land Use Commission.

8A.4 REGULATORY FRAMEWORK

The control of noise from transportation equipment and facilities, such as motor vehicles, railroad trains and aircraft, and their highways, tracks and airways, are almost entirely within the jurisdiction of Federal and State agencies.

In 1987, the California Department of Health Services published guidelines for the noise element of local general plans. These guidelines include a noise level/land use compatibility chart that categorizes various outdoor LDN ranges into up to four compatibility categories (normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable), depending on land use. For many land sues, the chart shows overlapping LDN ranges for two or more compatibility categories. The noise element guidelines chart identifies the normally acceptable range for low-density residential uses as less than 60 dB, which the conditionally

acceptable range is 55-70 dB. The normally acceptable range for high-density residential uses is identified as LDN values below 65 dB, while the conditionally acceptable range is identifies as 60-70 dB. For educational and medical facilities, LDN values below 70 dB are considered normally acceptable, while LDN values of 60-70 DB are considered conditionally acceptable. For office and commercial land uses, LDN values below 70 dB are considered normally acceptable, while LDN values of 67.5-77.5 are categorized as conditionally acceptable.

These overlapping LDN ranges are intended to indicate that local conditions (existing noise levels and community attitudes toward dominant noise sources) should be considered in evaluating land use compatibility at specific locations.

The California State Aeronautics Noise Standards state that an outdoor sound level of 65 CNEL is acceptable for residences and schools. Standards are not specified for other potentially noise-sensitive land uses.

The California Department of Housing and Community Development has adopted noise insulation performance standards for new hotels, motels, and dwellings other than detached single-family structures. These standards require that "interior CNEL with windows closed, attributable to exterior sources, shall not exceed an annual CNEL of 45 dB in any habitable room."

It is plan policy to recognize and treat both fields of noise problems, each in a manner and to a degree considered reasonable and adequate for the best interests of the area and the comfort and convenience of its people.