

11.1 Affected Environment

This section describes the regulatory and physical environmental setting for noise in the Plan Area.

11.1.1 Regulatory Setting

Federal and State

Noise sources within the Plan Area are regulated at the local level. There are no applicable federal or state regulations.

Local

Butte County

Butte County Code of Ordinances

The Butte County Code of Ordinances, Chapter 24, Zoning, Section 24-153 states as follows.

Maximum Sound Emissions. Maximum sound emissions for any use shall not exceed equivalent sound pressure levels in decibels, A-weighted scale, for any one hour as stipulated in Table 24-153-1 (Maximum Allowable Noise Exposure). These maximums are applicable beyond any property lines of the property containing the noise.

Table 24-153-1. Maximum Allowable Noise Exposure [1] [2] [3] [4]

	Daytime 7 a.m. – 7 p.m.		Evening 7 p.m. – 10 p.m.		Night 10 p.m. – 7 a.m.	
Noise Level Description	Urban	Rural	Urban	Rural	Urban	Rural
	Zone Type					
Hourly L_{eq} , dB	55	50	50	45	45	40
Maximum Level, dB	70	60	60	55	55	50

Notes:

[1] "Non-Urban" zones are Agriculture, Timber Mountain, Timber Preserve, Resource Conservation, Foothill Residential and Rural Residential. All other zones are considered "Urban" zones.

[2] Each of the noise levels specified above shall be lowered by 5 dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g. caretaker dwellings).

[3] The County can impose noise level standards which are up to 5 dB less than those specified above based upon determination of existing low ambient noise levels in the vicinity of the project site.

[4] In urban zones, the exterior noise level standard shall be applied to the property line of the receiving property. In rural zones, the exterior noise level standard shall be applied at a point 100 feet away from the residence. The above standards shall be measured only on property containing a noise sensitive land use. This measurement standard may be amended to provide for measurement at the boundary of a recorded noise easement between all affected property owners and approved by the County.

Source: *Butte County Zoning Ordinance*

- B. Exemptions. Local noise standards set forth in this section do not apply to the following situations and sources of noise provided standard, reasonable practices are being followed:
1. Emergency equipment operated on an irregular or unscheduled basis;
 2. Warning devices operated continuously for no more than five minutes;
 3. Bells, chimes or carillons;
 4. Non-electronically amplified sounds at sporting, amusement and entertainment events;
 5. Construction site sounds between 7:00 a.m. and 7:00 p.m.;
 6. Lawn and plant care machinery fitted with correctly functioning sound suppression equipment and operated between 7:00 a.m. and 8:00 p.m.;
 7. Aircraft when subject to federal or state regulations; and
 8. Agricultural equipment when operated on property zoned for agricultural activities.
- C. Exceptions. Upon written application from the owner or operator of an industrial or commercial noise source, the review authority, as part of a permit approval, may conditionally authorize exceptions to local noise emission standards, based upon analysis supported by Development Services, in the following situations:
1. Infrequent noise;
 2. Noise levels at or anywhere beyond the property lines of the property of origin when exceeded by an exempt noise in the same location; and
 3. f, after applying best available control technology, a use existing prior to the effective date of this Zoning Ordinance is unable to conform to the standards established by this section.

Butte County General Plan Health and Safety Element

California law requires that general plans include a noise element and safety element. Butte County's General Plan 2030 incorporates the noise element requirement in its Health and Safety Element (Butte County 2012). A main goal of the Health and Safety Element is to maintain an acceptable noise environment throughout the county. The Health and Safety Element also requires that construction activities located within 1,000 feet of residences be limited to daytime hours between 7:00 a.m. and 6:00 p.m. on weekdays and non-holidays.

City of Biggs

City of Biggs Municipal Code

The City of Biggs Municipal Code restricts construction activity to between the hours of 6:00 a.m. and 7p.m. across a residential zoned or a commercial zoned real property boundary, except for emergency work being performed by a public agency or a public utility.

City of Biggs General Plan Noise Element

The City of Biggs General Plan Noise Element establishes maximum allowable noise exposure levels for noise-sensitive land uses (Table 11-1) and noise level performance standards for non-transportation noise sources (Table 11-2). Examples of non-transportation noise sources are construction equipment, industrial operations, outdoor recreation facilities, heating, ventilation, and air conditioning (HVAC) units; and loading docks.

Table 11-1. City of Biggs General Plan Noise Element Maximum Allowable Noise Exposure

Land Use	Outdoor Areas ^a L _{dn} /CNEL, dB	Interior Spaces	
		L _{dn} /CNEL, dB	L _{eq} , dB ^b
Residential	65 ^c	45	–
Transient lodging	–	45	–
Hospitals, nursing homes	65 ^c	45	–
Theaters, auditoriums, music halls	–	–	35
Churches, meeting halls	65 ^c	–	40
Office buildings	–	–	45
Schools, libraries, museums	65 ^c	–	45
Playgrounds, neighborhood parks	70	–	–

Source: City of Biggs 2014:N-12, N-13.

L_{dn} = day-night level.

L_{eq} = equivalent sound level.

CNEL = community noise equivalent level.

dB = decibel.

^a Noise standards are to be applied at outdoor activity areas with the greatest exposure to the noise source. When it is not practical to mitigate exterior noise levels at the patios of balconies of multi-family dwellings, a common area or on-site park may be designated as the outdoor activity area. For noise-sensitive land uses that do not include outdoor activity areas, only the interior noise standard shall apply.

^b As determined for a typical worst-case hour during periods of use.

^c Where it is not possible to reduce noise in outdoor activity areas to 65 dB L_{dn} /CNEL or less using all feasible noise reduction measures, an exterior noise level of up to 70 dB L_{dn}/CNEL may be allowed provided that interior noise levels are in compliance with maximum allowable levels listed this table.

Table 11-2. City of Biggs General Plan Noise Element Noise Level Performance Standards Non-Transportation Sources

Noise Level Descriptor (dBA)	Daytime 7 a.m. to 10 p.m.	Nighttime 10 p.m. to 7 a.m.
Average-Hourly (L _{eq})	55	50
Intermittent Noise Level (L ₂ or L _{max})	75	65

Source: City of Biggs 2014:N-13.

Notes: 1. Noise level standards do not apply to mixed-use residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings) provided interior noise levels remain below 45 dB L_{dn}/CNEL.
 2. In areas where the existing ambient noise level exceeds the established daytime or nighttime standard, the existing level shall become the respective noise standard and an increase of 3 dBA or more shall be significant. Noise levels shall be reduced 5 dBA if the existing ambient hourly Leq is at least 10 dBA lower than the standards. 3. Transportation noise sources are defined as traffic on public roadways, railroad line operations, and aircraft in flight.

L_{dn} = day-night level.

L₂ = noise level exceeded 2% of the time.

L_{max} = maximum noise level.

dB = decibel.

dBA = A-weighted decibel.

CNEL = community noise equivalent level.

City of Gridley

City of Gridley Municipal Code

The City of Gridley Municipal Code Section 9.40.160 contains the following construction restrictions related to noise:

9.40.160 Construction or demolition—Generally.

It is unlawful and in violation of this chapter for any person to operate or cause the operation of any tools or equipment used in construction, drilling, repair, alteration, or demolition work between the hours of seven P. M. and six A. M. on weekdays or at any time on Sundays or holidays. In such a manner that creates noise clearly audible across a residential zoned or a commercial zoned real property boundary, except for emergency work being performed by a public agency or a public utility

City of Gridley General Noise Element

The City of Gridley Noise Element sets forth land use compatibility standards for interior noise (Table 11-3) and performance standards for non-transportation noise (Table 11-4).

Table 11-3. Land Use Compatibility Standards for Interior Noise

Land Use	Maximum Allowable Interior Noise dBA CNEL
Residential and mixed use with residential component	45
Commercial—hotel, motel, transient lodging	45
School classrooms, libraries, churches	45
Hospitals, convalescent homes	45

Source: City of Gridley 2010.

Notes: The noise standards described in this table do not apply to bathrooms, toilets, closets, or corridors.

The acceptable interior noise level for other uses (offices, theaters, commercial, industrial) depends upon the specific nature of the indoor activity.

dBA = A-weighted decibel.

CNEL = community noise equivalent level.

Table 11-4. Noise Level Performance Standards for New Projects Affected by or Including Non-Transportation Noise Sources

Noise Level Descriptor	Daytime (dB) (7 a.m.–10 p.m.)	Nighttime (dB) (10 p.m.–7 a.m.)
Hourly average level (L_{eq})	60	45
Maximum equivalent levels (L_{max})	75	65

Source: City of Gridley 2010.

Notes: Each of the noise levels specified shall be lowered by 5 decibels for simple tone noises, noises consisting primarily of speech, or music, or for recurring impulsive noises. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings). The noise standard is to be applied at the property lines of the generating land use.

dB = decibel.

L_{eq} = equivalent sound level.

L_{max} = maximum sounds level.

The City of Gridley Noise Element also states that for purposes of noise analysis conducted pursuant to CEQA, the following thresholds of significance should be used.

- Where existing exterior noise levels are between 60 and 65 dBA¹ at outdoor activity areas of noise-sensitive uses, an increase of 3 dBA or greater is considered significant and requires mitigation to reduce noise to acceptable levels.
- Where existing exterior noise levels are greater than 65 dBA, at outdoor activity areas of noise-sensitive uses, an increase of 1.5 dBA or greater is considered significant and requires mitigation to reduce noise to acceptable levels.
- Where it is not possible to reduce noise in outdoor activity areas to 60 dBA or less using practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dBA may be allowed, provided that available exterior noise reduction measures have been implemented.

City of Chico

City of Chico Municipal Code

The City of Chico Noise Ordinance is the primary enforcement tool for the operation of locally regulated noise sources, such as construction activity or outdoor recreation facilities, and is set forth in Chapter 9.38 of the City's Municipal Code.

9.38.030 Residential property noise limits:

- A. No person shall produce, suffer or allow to be produced by human voice, machine, animal, or device, or any combination of same, on residential property, a noise level at any point outside of the property plane that exceeds, at any point outside of the property plane, seventy (70) dBA between the hours of seven a.m. and nine p.m. or sixty (60) dBA between the hours of nine p.m. and seven a.m.
- B. No person shall produce, suffer or allow to be produced by human voice, machine, animal, or devices or any combination of same, on multifamily residential property, a noise level more than sixty (60) dBA three feet from any wall, floor, or ceiling inside any dwelling unit on the same property, when the windows and doors of the dwelling unit are closed, except within the dwelling unit in which the noise source or sources may be located.

9.38.040 Commercial and industrial property noise limits: No person shall produce, suffer or allow to be produced by human voice, machine, animal, or device, or any combination of same, on commercial or industrial property, a noise level at any point outside of the property plane that exceeds seventy (70) dBA.

9.38.010 Declaration of policy: Except as otherwise provided in this chapter, no person shall produce, suffer or allow to be produced on public property, by human voice, machine, animal, or device, or any combination of same, a noise level that exceeds sixty (60) dBA at a distance of 25 feet or more from the source.

City of Chico General Plan Noise Element

The City of Chico General Plan Noise Element establishes maximum allowable noise exposure levels for noise-sensitive land uses (Table 11-5), and noise level performance standards for non-transportation noise sources (Table 11-6).

¹ dBA is an "A" weighted decibel, which relates the measurement of sound to the sensitivity of the human ear.

Table 11-5. City of Chico General Plan Noise Element Maximum Allowable Noise Levels from Transportation Noise Sources

Land Use	Outdoor Activity Areas ^a L _{dn} /CNEL, dB	Interior Spaces	
		L _{dn} /CNEL, dB	L _{eq} , dB ^b
Residential	65 ^c	45	–
Transient lodging	–	45	–
Hospitals, nursing homes	65 ^c	45	–
Theaters, auditoriums, music halls	–	–	35
Churches, meeting halls	65 ^c	–	40
Office buildings, commercial	–	–	45
Schools, libraries, museums	65 ^c	–	45
Playgrounds, parks	70	–	–

Source: City of Chico 2011.

L_{dn} = day-night level.

CNEL = community noise equivalent level.

dB = decibel.

^a Noise standards are to be applied at outdoor activity areas with the greatest exposure to the noise source. When it is not practical to mitigate exterior noise levels at the patios or balconies of multi-family dwellings, a common area or onsite park may be designated as the outdoor activity area. For noise-sensitive land uses that do not include outdoor activity areas, only the interior noise standard shall apply.

^b As determined for a typical worst-case hour during periods of use.

^c Where it is not possible to reduce noise in outdoor activity areas to 65 dB L_{dn}/CNEL or less using all feasible noise reduction measures, an exterior noise level of up to 70 dB L_{dn}/CNEL may be allowed provided that interior noise levels are in compliance with this table.

Table 11-6. City of Chico General Plan Noise Element Maximum Allowable Exterior Noise Levels from Non-Transportation Sources

Noise Level Descriptor	Daytime 7 a.m. to 10 p.m.	Nighttime 10 p.m. to 7 a.m.
Hourly L _{eq} , dB	55	45
Maximum dB	75	65

Source: City of Chico 2011.

Notes: Noise levels are for planning purposes and may vary from the standards of the City's Noise Ordinance, which are for enforcement purposes.

Noise levels shall be lowered by 5 dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises. Noise level standards do not apply to mixed-use residential units established in conjunction with industrial or commercial uses provided interior noise levels remain below 45 dB L_{dn}/CNEL.

In areas where the existing ambient noise level exceeds the established daytime or nighttime standard, the existing level shall become the respective noise standard and an increase of 3 dBA or more shall be significant. Noise levels shall be reduced 5 dBA if the existing ambient hourly L_{eq} is at least 10 dBA lower than the standards.

Noise standards are to be applied at outdoor activity areas with the greatest exposure to the noise source. When it is not practical to mitigate exterior noise levels at patio or balconies of multi-family dwellings, a common area or onsite park may be designated as the outdoor activity area.

L_{eq} = equivalent sound level.

dB = decibel.

City of Oroville

City of Oroville Municipal Code

Chapter 13A of the Oroville Municipal Code limits construction activity to between the hours of 9:00 p.m. and 7:00 a.m. on weekdays and between 10:00 a.m. and 6:00 p.m. on weekends and holidays. In addition, no individual piece of equipment shall produce a noise level exceeding 83 dBA at a distance of 25 feet from the source.

Oroville General Plan Health and Safety Element

The City of Oroville General Plan Noise Element establishes maximum allowable noise exposure levels for noise-sensitive land uses (Table 11-7), and noise level performance standards for non-transportation noise sources (Table 11-8).

Table 11-7. City of Oroville General Plan Noise Element Maximum Allowable Noise Exposure to Transportation Noise Sources

Land Use	Exterior Noise Level Standard for Outdoor Activity Areas ^a	Interior Noise Level Standard	
	L_{dn} /CNEL, dB	L_{dn} /CNEL, dB	L_{eq} , dB ^b
Residential	60 ^c	45	-
Transient lodging	60 ^c	45	-
Hospitals, nursing homes	60 ^c	45	-
Theaters, auditoriums, music halls	-	-	35
Churches, meeting halls	60 ^c	-	40
Office buildings	-	-	45
Schools, libraries, museums	-	-	45
Playgrounds, neighborhood parks	70	-	-

Source: City of Oroville 2009.

L_{dn} = day-night level.

CNEL = community noise equivalent level.

dB = decibel.

^a Where the location of outdoor activity areas is unknown, the exterior noise-level standard shall be applied to the property line of the receiving land use.

^b As determined for a typical worst-case hour during periods of use.

^c Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn} /CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn} /CNEL may be allowed, provided that available exterior noise-level reduction measures have been implemented and interior noise levels are in compliance with this table.

Table 11-8. City of Oroville General Plan Noise Element Maximum Allowable Noise Exposure to Non-Transportation Sources

Land Use	Noise Level Descriptor	Exterior Noise Level Standard (Applicable at Property Line)		Interior Noise Level Standard	
		Daytime (7:00 a.m.– 10:00 p.m.)	Nighttime (10:00 p.m.– 7:00 a.m.)	Daytime (7:00 a.m.– 10:00 p.m.)	Nighttime (10:00 p.m.– 7:00 a.m.)
Residential	L _{eq}	50	45	40	35
	L _{max}	70	65	60	55
Transient lodging, hospitals, nursing homes	L _{eq}	–	–	40	35
	L _{max}	–	–	60	35
Theaters, auditoriums, music halls	L _{eq}	–	–	35	35
Churches, meeting halls	L _{eq}	–	–	40	40
Office buildings	L _{eq}	–	–	45	–
Schools, libraries	L _{eq}	–	–	45	–
Playgrounds, parks	L _{eq}	65	–	–	–

Source: City of Oroville 2009.

Notes: Each of the noise levels specified above shall be lowered by 5dB for simple tone noises, which are noises consisting primarily of speech, music or recurring impulsive noises. These noise-level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwelling).

L_{eq} = equivalent sound level.

L_{max} = maximum sound level.

11.1.2 Environmental Setting

This section describes noise, vibration, and noise-sensitive land uses and discusses the existing noise environment in the Plan Area.

Noise Fundamentals

Noise is commonly defined as unwanted 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, evaluation of noise is necessary when considering the environmental impacts of a proposed project.

Sound is mechanical energy (vibration) transmitted by pressure waves over a medium such as air or water. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level is the most common descriptor used to characterize the loudness of an ambient (existing) sound level. Although the dB scale, a logarithmic scale, is used to quantify sound intensity, it does not accurately describe how sound intensity is perceived by human hearing. The human ear is not equally sensitive to all frequencies in the entire spectrum, so noise

measurements are weighted more heavily for frequencies to which humans are sensitive in a process called A-weighting, written as dBA and referred to as A-weighted decibels. Table 11-9 provides definitions of sound measurements and other terminology used in this section, and Table 11-10 summarizes typical A-weighted sound levels for different noise sources.

Table 11-9. Definition of Sound Measurements

Sound Measurements	Definition
Decibel (dB)	A unitless measure of sound on a logarithmic scale that indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micro-pascals.
A-Weighted Decibel (dBA)	An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
Maximum Sound Level (L_{max})	The maximum sound level measured during the measurement period.
Minimum Sound Level (L_{min})	The minimum sound level measured during the measurement period.
Equivalent Sound Level (L_{eq})	The equivalent steady state sound level that in a stated period of time would contain the same acoustical energy.
Percentile-Exceeded Sound Level (L_{xx})	The sound level exceeded "x" percent of a specific time period. L_{10} is the sound level exceeded 10% of the time.
Day-Night Level (L_{dn})	The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.
Community Noise Equivalent Level (CNEL)	The energy average of the A-weighted sound levels occurring during a 24-hour period with 5 dB added to the A-weighted sound levels occurring during the period from 7:00 p.m. to 10:00 p.m. and 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.
Peak Particle Velocity (Peak Velocity, or PPV)	A measurement of ground vibration defined as the maximum speed (measured in inches per second) at which a particle in the ground is moving relative to its inactive state. PPV is usually expressed in inches/sec.
Frequency: Hertz (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure.

In general, human sound perception is such that a change in sound level of 1 dB typically cannot be perceived by the human ear, a change of 3 dB is just noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving the sound level.

Different types of measurements are used to characterize the time-varying nature of sound. These measurements include the equivalent sound level (L_{eq}), the minimum and maximum sound levels (L_{min} and L_{max}), percentile-exceeded sound levels (such as L_{10} , L_{20}), the day-night sound level (L_{dn}), and the community noise equivalent level (CNEL). L_{dn} and CNEL values differ by less than 1 dB. As a matter of practice, L_{dn} and CNEL values are considered to be equivalent and are treated as such in this assessment.

For a point source, such as a stationary compressor or construction equipment, sound attenuates based on geometry at rate of 6 dB per doubling of distance. For a line source such as free-flowing traffic on a freeway, sound attenuates at a rate of 3 dB per doubling of distance (California

Department of Transportation 2009). Atmospheric conditions including wind, temperature gradients, and humidity can change how sound propagates over distance and can affect the level of sound received at a given location. The degree to which the ground surface absorbs acoustical energy also affects sound propagation. Sound that travels over an acoustically absorptive surface, such as grass attenuates at a greater rate than sound that travels over a hard surface such as pavement. The increased attenuation is typically in the range of 1 to 2 dB per doubling of distance. Barriers, such as buildings and topography that block the line of sight between a source and receiver, also increase the attenuation of sound over distance.

Table 11-10. Typical A-Weighted Sound Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	—110—	Rock band
Jet flyover at 1,000 feet	—100—	
Gas lawnmower at 3 feet	—90—	
Diesel truck at 50 feet at 50 mph	—80—	Food blender at 3 feet Garbage disposal at 3 feet
Noisy urban area, daytime	—70—	Vacuum cleaner at 10 feet Normal speech at 3 feet
Gas lawnmower, 100 feet Commercial area	—60—	
Heavy traffic at 300 feet	—50—	Large business office Dishwasher in next room
Quiet urban daytime	—40—	Theater, large conference room (background)
Quiet urban nighttime	—30—	Library
Quiet suburban nighttime	—20—	Bedroom at night, concert hall (background)
Quiet rural nighttime	—10—	Broadcast/recording studio
	—0—	

Source: California Department of Transportation 2009.

Vibration

Operation of heavy construction equipment, particularly pile driving and other impulsive devices, such as pavement breakers, creates seismic waves that radiate along the surface of the earth and downward into the earth. These surface waves can be felt as ground vibration. Vibration from operation of this equipment can result in effects ranging from annoyance of people to damage of structures. Varying geology and distance will result in different vibration levels containing different

frequencies and displacements. In all cases, vibration amplitudes will decrease with increasing distance.

As seismic waves travel outward from a vibration source, they excite the particles of rock and soil through which they pass and cause them to oscillate. The actual distance that these particles move is usually only a few ten-thousandths to a few thousandths of an inch. The rate or velocity (in inches per second [in/sec]) at which these particles move is the commonly accepted descriptor of the vibration amplitude, referred to as the peak particle velocity (PPV). Table 11-11 summarizes typical vibration levels generated by construction equipment (Federal Transit Administration 2006).

Table 11-11. Vibration Source Levels for Construction Equipment

Equipment	PPV at 25 feet
Pile driver (impact)	0.644 to 1.518
Pile drive (sonic)	0.170 to 0.734
Vibratory roller	0.210
Hoe ram	0.089
Large bulldozer	0.089
Caisson drilling	0.089
Loaded trucks	0.076
Jackhammer	0.035
Small bulldozer	0.003

Source: Federal Transit Administration 2006.

Vibration amplitude attenuates over distance and is a complex function of how energy is imparted into the ground and the soil conditions through which the vibration is traveling. The following equation can be used to estimate the vibration level at a given distance for typical soil conditions. PPV_{ref} is the reference PPV at 25 feet (from Table 11-11):

$$PPV = PPV_{ref} \left(\frac{25}{distance} \right)^{1.5}$$

Table 11-12 summarizes guidelines vibration annoyance potential criteria suggested by the California Department of Transportation (Caltrans) (California Department of Transportation 2004).

Table 11-12. Guideline Vibration Annoyance Potential Criteria

Human Response	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

Source: California Department of Transportation 2004.

Notes: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

PPV = peak particle velocity.

in/sec = inches per second.

Table 11-13 summarizes guideline vibration damage potential criteria suggested by Caltrans (California Department of Transportation 2004).

Table 11-13. Guideline Vibration Damage Potential Criteria

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Source: California Department of Transportation 2004.

Notes: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

PPV = peak particle velocity.

in/sec = inches per second.

Noise-Sensitive Land Uses

Noise-sensitive land uses are generally defined as locations where people reside or where the presence of unwanted sound could adversely affect the primary intended use of the land. Places where people live, sleep, recreate, worship, and study are generally considered to be sensitive to noise because intrusive noise can be disruptive to these activities.

Noise-sensitive uses in the Plan Area are located primarily in the main areas of development, which include the cities of Biggs, Gridley, Chico, and Oroville. Rural residences and recreational uses are scattered throughout the unincorporated portion of the Plan Area.

Existing Noise Environment

There are several primary sources of noise in the Plan Area. Mobile noise sources are those related to transportation and include roadway traffic, railroads, and airports. By far the most prevalent noise source is roadway traffic, which is a constant source of noise compared to the intermittent sounds generated by railroads and airports. Stationary sources of noise in the area include aggregate mines, natural gas extraction facilities, recycling facilities, solid waste transfer stations, agricultural activities, general service commercial and light industrial uses, recreational uses, and parks and school playing fields.

The existing noise environment in the Plan Area can be characterized generally by the area's level of development. The level of development and ambient noise levels tend to be closely correlated. Areas that are not urbanized are relatively quiet, while areas more urbanized are noisier as a result of roadway traffic, industry, and other human activities. Table 11-14 summarizes typical ambient noise levels based on level of development.

Table 11-14. Population Density and Associated Ambient Noise Levels

	L_{dn}
Rural	40-50
Small town or quiet suburban residential	50
Normal suburban residential	55
Urban residential	60
Noisy urban residential	65
Very noisy urban residential	70
Downtown, major metropolis	75-80
Area adjoining freeway or near major airport	80-90

Source: Hoover and Keith 2000.
 L_{dn} = day-night level.

11.2 Environmental Consequences

This section incorporates by reference the impact determinations presented for noise effects in the Local Agencies' general plan EIRs (as described in more detail in Chapter 3, Section 3.3, *Resource Chapter Organization and NEPA/CEQA Requirements*).² The significance findings and mitigation measures of each of the general plan EIRs are compiled in Appendix C. The Lead Agencies have reviewed these analyses and found them to be appropriate for the purposes of this EIS/EIR.

11.2.1 Methods for Impact Analysis

The BRCP would not provide individual project approvals or entitlements for any private or public development or infrastructure projects. Accordingly, this EIS/EIR does not provide CEQA or NEPA

² These previous CEQA documents are available collectively for public review at the BCAG offices (2580 Sierra Sunrise Terrace, Suite 100 Chico, CA 95928-8441). Individual general plans and EIRs are also available at each of the respective land use agencies.

coverage for individual covered activities and does not function as a *programmatic* or *umbrella* CEQA or NEPA document for regional development and infrastructure projects. The BRCP EIS/EIR evaluates only the adverse and beneficial environmental effects associated with the decisions of the Local Agencies, water and irrigation districts, and Caltrans to approve, permit, and implement the BRCP. Accordingly, the methods for analyzing direct impacts on noise are tailored to evaluate the decisions of the Local Agencies, water and irrigation districts, and Caltrans to approve, permit, and implement the BRCP. This EIS/EIR also incorporates the impact determinations of the Local Agencies' general plan EIRs to analyze indirect impacts on noise.

In adopting the EIRs for the local general plans, each Local Agency determined that the programmatic impacts resulting from increased transportation noise (traffic, train, or aircraft) causing a permanent increase in ambient noise would be significant and unavoidable even with the implementation of general plan policies and the adoption of identified mitigation measures within their jurisdictions (i.e., inside the UPAs). The City of Chico determined there would also be a significant and unavoidable impact resulting from stationary sources. Other noise-related impacts related to implementation of the Local Agency general plans were found to be less than significant. It is assumed that all covered activities approved by the Local Agencies would be consistent with the policies of the respective general plans and would be subject to any mitigation measures identified such that impacts would be adequately mitigated to the extent identified in the general plan EIRs

The methodology for evaluating impacts on noise also incorporates standard best management practices (BMPs) required by Caltrans during construction of transportation projects. These BMPs are summarized in Appendix D. The analysis assumes that Caltrans would implement these BMPs, when appropriate, during transportation projects within the Plan Area.

Water and irrigation district activities have not been analyzed in previous CEQA documents. These activities include: rerouting of existing canals, replacement of water delivery structures, replacement of large weirs, mowing and trimming vegetation along service roads, and removing aquatic vegetation from canals. Potential impacts on noise could occur primarily during construction or maintenance of these activities. Noise and vibration-generating activities specifically associated with implementation of activities outside of the UPAs (e.g., water and irrigation districts' activities) would include the following.

- Construction of canals.
- Weirs.
- Water delivery structures.
- Moving and trimming vegetation along service roads.
- Maintenance activities to remove aquatic vegetation from canals.

Potential noise impacts could occur during construction or maintenance activities.

Impacts of Conservation Strategy Implementation

Noise and vibration-generating activities specifically associated with implementing the conservation strategy include the following.

- Operation of construction or other equipment associated with habitat management and enhancement, habitat restoration, general maintenance, avoidance and minimization measures, and species population enhancement.

- Use of construction equipment for habitat enhancement, vegetation removal, ground surface grading and recontouring, installation of irrigation systems, construction of facilities and roads, and in-water activities.
- Truck traffic on public roads associated with hauling excavated material and fill/cover material to and from restoration or other construction sites within the BRCP conservation lands.
- Maintenance activities that would require the use of trucks or off-road vehicles.

The assessment of potential construction noise levels was based on methodology developed by FHWA (2006). Noise levels produced by commonly used construction equipment are summarized below in Table 11-15. Individual types of construction equipment are expected to generate maximum noise levels ranging from 74 to 85 dBA at a distance of 50 feet. The construction noise level at a given receiver depends on the type of construction activity, the noise level generated by that activity, and the distance and shielding between the activity and noise-sensitive receivers.

Utilization factors for construction noise are used in the analysis to develop L_{eq} noise exposure values. The L_{eq} value accounts for the energy average of noise over a specified interval (usually 1 hour), so a utilization factor represents the amount of time a type of equipment is used during the interval.

Table 11-15. Commonly Used Construction Equipment Noise Emission Levels

Equipment Listed for Southport Project	Acoustical use Factor (%)	L_{max} at 50 Feet (dBA)	L_{eq} at 50 Feet (dBA)
Compactor (ground)	20	83	76
Dozer	40	82	78
Dump Truck	40	76	72
Excavator	40	81	77
Flat Bed Truck	40	74	70
Front End Loader	40	79	75
Grader	40	85	81
Paver	50	77	74
Pickup Truck	40	75	71
Scraper	40	84	80
Crane	16	81	73

Source: Federal Highway Administration 2006.

L_{eq} = equivalent sound level.

L_{max} = maximum sounds level.

dBA = A-weighted decibel.

11.2.2 Significance Criteria

In accordance with Appendix G of the State CEQA Guidelines, the action alternatives would be considered to have a significant effect if they would result in any of the conditions listed below.

- Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies.

- Expose persons to or generate excessive groundborne vibration or groundborne noise levels.
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- Be located within an airport land use plan area, or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels.
- Be located in the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels.

11.2.3 Impacts and Mitigation Measures

Alternative 1—No Action (No Plan Implementation)

As discussed in Chapter 2, Section 2.3.1, *Alternative 1—No Action (No Plan Implementation)*, under Alternative 1, project proponents would apply for permits on a project-by-project basis, without a coordinated and comprehensive effort to minimize and mitigate biological impacts through the BRCP. Under Alternative 1, urban development and public infrastructure projects would continue to occur pursuant to the approved general plans of the Local Agencies and BCAG's regional plan(s). These include residential, commercial, and industrial development as well as construction, maintenance, and use of urban infrastructure, parks, recreational facilities, public services, and similar types of urban land uses. Other activities that would occur under Alternative 1 are construction and maintenance of public infrastructure projects outside of urban areas, including public infrastructure projects in and over streams (e.g. bridge replacements). No regional conservation strategy or conservation measures would be implemented; therefore, impacts related to noise that are associated with the conservation strategy and conservation measures would not occur.

Impact NOI-1: Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies (NEPA: less than significant; CEQA: less than significant)

The Local Agencies determined that activities that would occur under the general plans would result in less-than-significant impacts to exposing persons to or generating noise levels in excess of local standards or noise ordinances. Under Alternative 1, noise from traffic, trains, and aircraft would exceed 60 L_{dn} throughout the Plan Area in the future. However, the Local Agencies determined that the various general plan goals, objectives, and actions would restrict noise from transportation sources and would reduce the impacts to a less-than-significant level. In addition, infrastructure projects undertaken by Caltrans would be required to comply with noise restrictions summarized in Appendix D. Construction and recurring maintenance projects undertaken by water and irrigation districts are expected to be located away from sensitive receptors to noise because they would be primarily performed in agricultural or open space areas. Therefore, there is a low potential for rural residences to be located adjacent to these activities and to be exposed to excessive noise. Therefore, these activities are not anticipated to expose persons or generate noise levels in excess of established standards.

NEPA Determination: Alternative 1 could expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance; however, because the various Local Agencies' general plans or Caltrans' best management practices would restrict noise generating activities, the impact would be less than significant. No mitigation is required.

CEQA Determination: Alternative 1 could expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance; however, because the various Local Agencies' general plans or Caltrans' best management practices would restrict noise generating activities, the impact would be less than significant. No mitigation is required.

Impact NOI-2: Expose persons to or generate excessive groundborne vibration or groundborne noise levels (NEPA: less than significant; CEQA: less than significant)

The Local Agencies determined that activities that would occur under implementation of the general plans would result in less-than-significant impacts related to exposing persons to or generating excessive groundborne vibration or groundborne noise levels. Under Alternative 1, groundborne vibration could result from high-impact construction activities throughout the Plan Area. In addition, the development of noise-sensitive land uses near sources of existing groundborne vibration would occur. However, the Local Agencies determined the various general plan goals, objectives, and actions address the exposure of noise-sensitive land uses to groundborne vibration and would reduce impacts to below the level of significance. In addition, infrastructure projects undertaken by Caltrans would be required to comply with groundborne vibration guidelines summarized in Appendix D. Construction and recurring maintenance projects undertaken by water and irrigation districts would be required to comply with the local restrictions of the County or jurisdiction where the work would be performed. Therefore, these activities are not anticipated to expose persons or generate groundborne vibration levels in excess of established standards.

NEPA Determination: Alternative 1 could expose persons to or generate groundborne vibration levels in excess of standards established in a local general plan or noise ordinance depending on where the groundborne vibration is in relation to existing sensitive receptors; however, because the various Local Agencies' general plans or Caltrans' best management practices would restrict noise generating activities, the impact would be less than significant. No mitigation is required.

CEQA Determination: Alternative 1 could expose persons to or generate groundborne vibration levels in excess of standards established in a local general plan or noise ordinance depending on where the groundborne vibration is in relation to existing sensitive receptors; however, because the various Local Agencies' general plans or Caltrans' best management practices would restrict noise generating activities the impact would be less than significant. No mitigation is required.

Impact NOI-3: Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project (NEPA: significant and unavoidable; CEQA: significant and unavoidable)

The Local Agencies determined that implementation of the general plans would result in a significant and unavoidable impact regarding a substantial permanent increase in noise related to transportation noise, and this increase could affect noise-sensitive land uses. Implementation of the various general plans would allow increased development that would result in more traffic on roadways throughout the Plan Area. Implementation of the goals, policies, and actions in the general plans include noise-reducing measures that would help lessen this impact. The feasibility of implementing these measures would be determined on a project-by-project basis; however, the

Local Agencies determined it may not be possible to fully mitigate traffic, train, and aircraft noise in all areas. Caltrans infrastructure projects would contribute to the permanent increase in ambient noise levels caused by transportation noise. Water and irrigation district infrastructure projects are not expected to substantially increase traffic noise as they would be performed on an intermittent and relatively infrequent basis compared to other traffic generating activities. Furthermore, maintenance activities to remove aquatic vegetation from channels would occur and are not expected to generate substantial noise due to their frequency (annually at a portion of the canals, and less frequently at other portions) and duration (typically less than a day).

The City of Chico determined that noise from stationary sources would also result in a significant and unavoidable impact. Under Alternative 1, implementation of the general plan could result in the future development of land uses that generate substantial noise levels in close proximity to noise-sensitive land uses. In addition, new noise-sensitive land uses could be located in areas of existing stationary noise sources. The City's general plan goals, policies, and objectives restrict new development of noise-sensitive land uses, require an acoustical analysis when proposed projects are likely to expose noise-sensitive land uses to noise levels that exceed City standards, and limit noise through the use of insulation, berms, building design and orientation, staggered operation hours, and other techniques. However, the City of Chico determined some stationary noise impacts cannot be reduced to levels below significance.

NEPA Determination: Alternative 1 would result in a substantial permanent increase in ambient noise levels as a result of transportation noise and stationary sources (in the case of the City of Chico). Various Local Agencies' general plans or Caltrans' best management practices would restrict noise generating activities; however, they would not reduce the permanent increase in ambient noise levels to below significance. Therefore, impacts would be significant and unavoidable.

CEQA Determination: Alternative 1 would result in a substantial permanent increase in ambient noise levels as a result of transportation noise and stationary sources (in the case of the City of Chico). Various Local Agencies' general plans or Caltrans' best management practices would restrict noise generating activities; however, they would not reduce the permanent increase in ambient noise levels to below significance. Therefore, impacts would be significant and unavoidable.

Impact NOI-4: Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project (NEPA: significant and unavoidable; CEQA: significant and unavoidable)

The County and the Cities of Chico, Gridley, and Oroville determined that implementation of the general plans would result in a less-than-significant impact regarding a substantial temporary or periodic increase in ambient noise levels. Under Alternative 1, construction and demolition activities would occur. The various general plans contain goals, policies, and actions that limit construction hours and noise generating activity so that temporary construction noise would not exceed local standards. Similar to these Local Agency determinations, construction noise generated by Caltrans and water and irrigation districts for various public infrastructure activities would be temporary and would be restricted to certain work windows during daytime hours so that temporary construction noise would not exceed standards. The City of Biggs determined that implementation of the general plan would result in a substantial temporary or periodic increase in ambient noise levels in their planning area as a result of the construction and agricultural uses. While implementation of their general plan policies or best management practices could reduce this

impact, it would not reduce it to less-than-significant levels, and some noise-sensitive land uses would still be exposed to temporary or periodic increases in ambient noise.

NEPA Determination: Alternative 1 could result in a substantial temporary or periodic increase in ambient noise levels as a result of construction activities, but various Local Agencies' general plans or Caltrans' best management practices would restrict noise generating activities to certain hours and incorporate certain noise reducing devices on construction equipment. However, implementation of the City of Biggs general plan policies or best management practices would not reduce this effect to a less-than-significant level within the jurisdiction. Therefore, impacts would be significant and unavoidable.

CEQA Determination: Alternative 1 could result in a substantial temporary or periodic increase in ambient noise levels as a result of construction activities, but various Local Agencies' general plans or Caltrans' best management practices would restrict noise generating activities to certain hours and incorporate certain noise reducing devices on construction equipment. However, implementation of the City of Biggs general plan policies or best management practices would not reduce this effect to a less-than-significant level within the jurisdiction. Therefore, impacts would be significant and unavoidable.

Impact NOI-5: Be located within an airport land use plan area, or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels (NEPA: less than significant; CEQA: less than significant)

The County and the Cities of Chico, Gridley, Biggs, and Oroville determined that the implementation of the general plans would not result in a significant impact due to location within an airport land use plan area, or within 2 miles of a public or private airport. Under Alternative 1, sensitive land uses could be exposed to aircraft noise in excess of applicable noise standards for land use compatibility. The County and Cities have incorporated goals, policies, and objectives in their general plans to limit exposure to aircraft noise. These measures would ensure that future development near airports would meet applicable noise standards. Caltrans and water and irrigation districts' projects are not anticipated to permanently increase the number of workers within the vicinity of airports because these types of projects are infrastructure projects such as roads, pipelines, and canals. While construction workers may work within close proximity to an airport, they would do so intermittently and for a temporary period of time. Furthermore, construction workers would primarily experience noise from the actual construction work.

NEPA Determination: Alternative 1 could expose sensitive land uses to aircraft noise; however, because the various Local Agencies' general plans require limits on exposure to aircraft noise, and because Caltrans and water and irrigation district work would be temporary public infrastructure projects, the impact would be less than significant. No mitigation is required.

CEQA Determination: Alternative 1 could expose sensitive land uses to aircraft noise; however, because the various Local Agencies' general plans require limits on exposure to aircraft noise, and because Caltrans and water and irrigation district work would be temporary public infrastructure projects, the impact would be less than significant. No mitigation is required.

Impact NOI-6: Be located in the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels (NEPA: less than significant; CEQA: less than significant)

The County and the Cities of Biggs, Chico, Gridley, and Oroville determined that the implementation of the general plans would not result in a significant impact due to location in the vicinity of a private airstrip and exposing people to excessive noise levels. The County and Cities have incorporated goals, policies, and objectives in their general plans to limit exposure to aircraft noise. These measures would ensure that future development near airports would meet applicable noise standards. Impacts associated with Caltrans, waste and wastewater management agencies, and water and irrigation districts' activities would be similar to those described for NOI-5.

NEPA Determination: The impact determination would be the same as NOI-5; impacts would be less than significant. No mitigation is required.

CEQA Determination: The impact determination would be the same as NOI-5; impacts would be less than significant. No mitigation is required.

Alternative 2—Proposed Action

Under Alternative 2, covered activities would include the existing, planned, and proposed land uses over which the Permit Applicants have land use authority; state and local transportation projects; maintenance of water delivery systems (e.g., WCWD canals and similar delivery systems); habitat restoration, enhancement, and management actions (conservation measures); and adaptive management and monitoring activities. Most covered activities would require individual permits and approvals pursuant to the Local Agencies' general plans and land use regulations, or the requirements of the implementing agency (such as Caltrans and irrigation districts) and would undergo subsequent project-level CEQA review and relevant NEPA review for construction and operations-related impacts; some covered activities, however, may be exempted from environmental review requirements due to project characteristics including small projects or infill projects.

Potential noise impacts could occur during construction or maintenance of covered activities associated with planned development. Those activities that involve construction and the use of heavy construction equipment or those that involve earthmoving activities could generate noise. Covered activities that would involve construction (including earthmoving activities) are all development activities consistent with the Local Agencies' general plans, state and local transportation projects, and water district canal installation, and are described in Impacts NOI-1 through NOI-6 under Alternative 1.

Potential noise impacts could occur during construction or maintenance of covered activities associated with the conservation strategy and conservation measures. Potential noise impacts could occur from the use of construction equipment for habitat enhancement, vegetation removal, ground surface grading and recontouring, installation of irrigation systems, construction of facilities and roads, and in-water activities (CM4–CM11, CM14, and Activities to Improve Urban Stormwater Water Quality). Noise impacts could also result from maintenance activities that would require the use of trucks or off-road vehicles.

Impact NOI-1: Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies (NEPA: less than significant with mitigation; CEQA: less than significant with mitigation)

Impacts of Planned Development

Impacts related to covered activities within the jurisdictions of the Local Agencies and undertaken by Caltrans and water and irrigation districts would be the same under Alternative 2 as those described for Alternative 1, Impact NOI-1. In addition, implementation of BRCP AMM 27, *Avoid and Minimize Noise and Other Disturbances from Bridge Construction Activities*, included in Alternative 2, would further reduce noise impacts during construction.

Impacts of Conservation Strategy Implementation

Implementing the conservation strategy, including the conservation measures, would require the use of construction equipment throughout the Plan Area. The location of construction is currently unknown. Some construction activity could occur near noise-sensitive land uses such as rural residences. Table 11-16 shows the calculated worst-case L_{max} and L_{eq} sound levels (dBA) of four pieces of equipment (grader, truck, and two scrapers) operating simultaneously to implement conservation measures. Construction noise typically attenuates at a rate of 6 dB per doubling of distance.

Table 11-16. Worst-Case Scenario Noise Levels of Construction Equipment (Grader, Truck, Two Scrapers) Operating Simultaneously

Distance Between Source and Receiver (feet)	Geometric Attenuation (dB)	Ground Effect Attenuation (dB)	Calculated L_{max} Sound Level (dBA)	Calculated L_{eq} Sound Level (dBA)
50	0	0	94	94
100	-6	-2	86	86
200	-12	-4	78	78
300	-16	-5	74	74
400	-18	-6	70	70
500	-20	-6	68	68
600	-22	-7	66	66
700	-23	-7	64	64
800	-24	-7	63	63
900	-25	-8	61	61
1,000	-26	-8	60	60
1,200	-28	-9	58	58
1,400	-29	-9	56	56
1,600	-30	-9	55	55
1,800	-31	-10	53	53
2,000	-32	-10	52	52
2,500	-34	-10	50	50
3,000	-36	-11	48	48

dB = decibel.

dBA = A-weighted decibel.

L_{eq} = equivalent sound level.

L_{max} = maximum sound level.

As shown in Table 11-16, construction activities could result in noise levels exceeding 60 dBA at distances as great as 1,000 feet. This indicates that construction noise, although temporary and infrequent based on the type of activity (e.g., grading or scraping to restore riparian areas), could exceed local standards within this distance.

NEPA Determination: Implementation of the Local Agencies' general plan policies, Caltrans' best management practices, or AMM 27 would restrict noise generating activities and, therefore, Alternative 2 would not expose persons or generate noise levels in excess of standards. However, construction activities associated with the conservation strategy could result in short-term exceedances in local noise standards; this impact would be less than significant with implementation of Mitigation Measure NOI-1.

CEQA Determination: Implementation of the Local Agencies' general plan policies, Caltrans' best management practices or AMM27 would restrict noise generating activities and, therefore, Alternative 2 would not expose persons or generate noise levels in excess of standards. However, construction activities associated with the conservation strategy could result in short-term exceedances in local noise standards; this impact would be less than significant with implementation of Mitigation Measure NOI-1.

Mitigation Measure NOI-1: Implement measures to reduce noise during construction and address noise complaints

Employ Noise-Reducing Construction Practices during Construction

During construction, BRCP proponents or authorized contractors will employ best practices to reduce construction noise near noise-sensitive land uses. Implementation of this measure will ensure that construction noise levels, as applicable, do not exceed 60 dBA (1-hour L_{eq}) during daytime hours (7:00a.m. to 10:00p.m.) and 50 dBA (single-event maximum) during nighttime hours (10:00p.m. to 7:00a.m.).

Measures used to limit construction noise include the following.

- Limiting above-ground noise-generating construction operations to the hours between 7a.m. and 6p.m, Monday through Friday, and between 8a.m. and 5p.m. on Saturdays.
- Locating stationary equipment (e.g., generators, compressors, rock crushers, cement mixers, idling trucks) as far as possible from noise-sensitive land uses.
- Prohibiting gasoline or diesel engines from having unmuffled exhaust.
- Requiring that all construction equipment powered by gasoline or diesel engines have sound-control devices that are at least as effective as those originally provided by the manufacturer and that all equipment be operated and maintained to minimize noise generation.
- Preventing excessive noise by shutting down idle vehicles or equipment.
- Using noise-reducing enclosures around noise-generating equipment.
- Selecting haul routes that affect the fewest number of people.
- Constructing barriers between noise sources and noise-sensitive land uses or take advantage of existing barrier features (e.g., terrain, structures) to block sound transmission to noise-sensitive land uses. The barriers shall be designed to obstruct the line of sight

between the noise-sensitive land use and onsite construction equipment. When installed properly, acoustic barriers can reduce construction noise levels by approximately 8 to 10 dBA (U.S. Environmental Protection Agency 1971).

Prior to Construction, Initiate a Complaint/Response Tracking Program

Prior to construction, BRCP proponents or authorized contractors will make a construction schedule available to residents living in the vicinity of the construction areas before construction begins and designate a noise disturbance coordinator. The coordinator will be responsible for responding to complaints regarding construction noise by determining the cause of the complaint, and ensuring that reasonable measures are implemented to correct the problem when feasible. A contact telephone number for the noise disturbance coordinator will be conspicuously posted on construction site fences and will be included in the notification of the construction schedule.

Impact NOI-2: Expose persons to or generate excessive groundborne vibration or groundborne noise levels (NEPA: less than significant; CEQA: less than significant)

Impacts of Planned Development

Impacts related to covered activities within the jurisdictions of the Local Agencies and undertaken by Caltrans and water and irrigation districts would be the same under Alternative 2 as those described for Alternative 1, Impact NOI-2. In addition, implementation of BRCP AMM 27, *Avoid and Minimize Noise and Other Disturbances from Bridge Construction Activities*, included in Alternative 2, would further reduce impacts related to groundborne vibration or groundborne noise levels.

Impacts of Conservation Strategy Implementation

Implementing the conservation strategy, including the conservation measures, would require the use of construction equipment. Heavy construction equipment would be used throughout the Plan Area. It is anticipated that construction equipment would not typically operate within 50 feet of residences and structures where vibration may be perceptible. Any vibration would be intermittent and temporary.

NEPA Determination: Implementation of the Local Agencies' general plan policies, Caltrans' best management practices, or AMM 27 would restrict noise generating activities and, therefore, Alternative 2 would not expose persons to excessive groundborne vibrations. In addition, heavy equipment associated with the conservation strategy would not operate within 50 feet of residences and, therefore, groundborne vibration would not be perceptible. The impact would be less than significant. No mitigation is required.

CEQA Determination: Implementation of the Local Agencies' general plan policies, Caltrans' best management practices, or AMM 27 would restrict noise generating activities and, therefore, Alternative 2 would not expose persons to excessive groundborne vibrations. In addition, heavy equipment associated with the conservation strategy would not operate within 50 feet of residences and, therefore, groundborne vibration would not be perceptible. The impact would be less than significant. No mitigation is required.

Impact NOI-3: Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project (NEPA: significant and unavoidable; CEQA: significant and unavoidable)

Impacts of Planned Development

Impacts related to covered activities within the jurisdictions of the Local Agencies and undertaken by Caltrans and water and irrigation districts would be the same under Alternative 2 as those described for Alternative 1, Impact NOI-3. Implementation of BRCP AMM 27, *Avoid and Minimize Noise and Other Disturbances from Bridge Construction Activities*, would not fully reduce these impacts to less-than-significant levels.

Impacts of Conservation Strategy Implementation

Operation of the conservation strategy is not anticipated to result in a substantial permanent increase in noise. Activities that would occur within the Plan Area on a permanent and ongoing basis include travel through the preserve by all-terrain vehicle, truck, or off-road vehicle. Minor increases in traffic associated with habitat restoration and construction in different locations throughout the Plan Area would occur. Monitoring activities are expected to generate a low number of daily trips and would not create a significant amount of noise.

NEPA Determination: Like Alternative 1, Alternative 2 would result in a substantial permanent increase in ambient noise levels as a result of transportation noise generated in all Local Agency jurisdictions and by stationary sources in the City of Chico as a result of general plan implementation. Operation of the conservation strategy is not anticipated to result in a substantial permanent increase in noise and no mitigation measures are necessary for noise generated by operation of the conservation strategy. Various Local Agencies' general plans or Caltrans' best management practices would restrict noise-generating activities; however, for impacts related to implementation of the general plans, they would not reduce the permanent increase in ambient noise levels to below significance. The impacts would be significant and unavoidable.

CEQA Determination: Like Alternative 1, Alternative 2 would result in a substantial permanent increase in ambient noise levels as a result of transportation noise and stationary sources (in the case of the City of Chico) generated by general plan implementation. Operation of the conservation strategy is not anticipated to result in a substantial permanent increase in noise. Various Local Agencies' general plans or Caltrans' best management practices would restrict noise-generating activities; however, they would not reduce the permanent increase in ambient noise levels to below significance. Therefore, impacts would be significant and unavoidable.

Impact NOI-4: Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project (NEPA: significant and unavoidable; CEQA: significant and unavoidable)

Impacts of Planned Development

Impacts would be the same under Alternative 2 as those described for Alternative 1, Impact NOI-4 for impact analysis related to covered activities within the jurisdictions of the Local Agencies and undertaken by Caltrans and water and irrigation districts. Implementation of BRCP AMM 27, *Avoid and Minimize Noise and Other Disturbances from Bridge Construction Activities*, would not fully reduce these impacts to less-than-significant levels.

Impacts of Conservation Strategy Implementation

As stated above under Alternative 2, Impact NOI-1, implementing the conservation strategy would entail construction activities throughout the Plan Area. Construction noise, although temporary, could result in substantial temporary increases in ambient noise levels. As shown above in Table 11-16, construction noise levels could result in noise levels exceeding 60 dBA at distances as great as 1,000 feet. This would result in a substantial temporary or periodic increase in ambient noise levels.

NEPA Determination: Like Alternative 1, Alternative 2 would result in a substantial temporary increase in ambient noise levels as a result of construction noise generated by general plan implementation in the City of Biggs. The City's general plan policies or mitigation measures would not reduce the permanent increase in ambient noise levels to below significance. Construction impacts associated with the conservation strategy would be reduced with implementation of Mitigation Measure NOI-1. However, impacts would remain significant and unavoidable.

CEQA Determination: Like Alternative 1, Alternative 2 would result in a substantial temporary increase in ambient noise levels as a result of construction noise generated by general plan implementation in the City of Biggs. The City's general plan policies or mitigation measures would not reduce the permanent increase in ambient noise levels to below significance. Construction impacts associated with the conservation strategy would be reduced with implementation of Mitigation Measure NOI-1. However, impacts would remain significant and unavoidable.

Mitigation Measure NOI-1: Implement measures to reduce noise during construction and address noise complaints

Impact NOI-5: Be located within an airport land use plan area, or, where such a plan has not been adopted, within two miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels (NEPA: less than significant; CEQA: less than significant)

Impacts of Planned Development

Impacts related to covered activities within the jurisdictions of the Local Agencies and undertaken by Caltrans and water and irrigation districts would be the same under Alternative 2 as those described for Alternative 1, Impact NOI-5.

Impacts of Conservation Strategy Implementation

Implementing the conservation strategy, including the conservation measures, would require the use of construction equipment throughout the Plan Area. It is not known where the activities would take place. Construction workers may be located within 2 miles of a public airport. However, construction activities would be temporary and intermittent and is not expected to expose workers to excessive noise.

NEPA Determination: The impact determination would be the same as Alternative 1; impacts would be less than significant. No mitigation is required.

CEQA Determination: The impact determination would be the same as Alternative 1; impacts would be less than significant. No mitigation is required.

Impact NOI-6: Be located in the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels (NEPA: less than significant; CEQA: less than significant)

Impacts of Planned Development

Impacts related to covered activities within the jurisdictions of the Local Agencies and undertaken by Caltrans and water and irrigation districts would be the same under Alternative 2 as those described for Alternative 1, Impact NOI-6.

Impacts of Conservation Strategy Implementation

Implementing the conservation strategy under Alternative 2 would be the same as described for NOI-5 above.

NEPA Determination: The impact determination would be the same as NOI-5 under Alternative 2; impacts would be less than significant. No mitigation required.

CEQA Determination: The impact determination would be the same as NOI-5 under Alternative 2; impacts would be less than significant. No mitigation required.

Alternative 3—Reduced Development/Reduced Fill

Alternative 3 is similar to Alternative 2 except that it uses the various general plan EIR reduced development alternatives as described in Chapter 2, *Proposed Action and Alternatives*, to create a single reduced development footprint. Covered activities under this alternative would be similar to those described in the BRCP but would be limited to the reduced development footprint for a reduced permit term of 30 years. The reduced footprint and reduced land conservation would likely result in fewer built structures and, therefore, less ground disturbance.

It is anticipated that under Alternative 3, fewer acres of natural communities would be conserved because reduced development would provide reduced funding for the conservation strategy. However, it is anticipated that the conservation measures would be the same because the reduction of fill would be achieved through the reduced development footprint of the Local Agencies' general plans rather than through modification of the conservation measures. Consequently, the impacts related to implementation of the conservation strategy and conservation measures would be the same as under Alternative 2.

Impact NOI-1: Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies (NEPA: less than significant with mitigation; CEQA: less than significant with mitigation)

There would be fewer impacts expected under Alternative 3 when compared to Alternative 2 because under this alternative, it is anticipated there may be less development or fewer structures. However, impacts associated with the conservation strategy would be the same and could result in short-term exceedances in local noise standards.

NEPA Determination: The impact determination would be the same as Alternative 2; with Mitigation Measure NOI-1 incorporated, the impact would be less than significant.

CEQA Determination: The impact determination would be the same as Alternative 2; with Mitigation Measure NOI-1 incorporated, the impact would be less than significant.

Mitigation Measure NOI-1: Implement measures to reduce noise during construction and address noise complaints**Impact NOI-2: Expose persons to or generate excessive groundborne vibration or groundborne noise levels (NEPA: less than significant; CEQA: less than significant)**

There would be fewer impacts expected under Alternative 3 when compared to Alternative 2 with respect to covered activities within the jurisdictions of the Local Agencies and undertaken by Caltrans and water and irrigation districts because under this alternative, it is anticipated there would be less development. Impacts associated with the conservation strategy would be the same as described under Alternative 2.

NEPA Determination: The impact determination would be the same as Alternative 2. The impact would be less than significant. No mitigation is required.

CEQA Determination: The impact determination would be the same as Alternative 2. The impact would be less than significant. No mitigation is required.

Impact NOI-3: Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project (NEPA: significant and unavoidable; CEQA: significant and unavoidable)

There would be fewer impacts expected under Alternative 3 compared to Alternative 2 with respect to covered activities within the jurisdictions of the Local Agencies and undertaken by Caltrans and water and irrigation districts because under this alternative, it is anticipated there may be less development. However, substantial permanent increase in ambient noise levels as a result of transportation noise and stationary sources (in the case of the City of Chico) generated by general plan implementation would still occur. Various Local Agencies' general plans or Caltrans' best management practices would restrict noise-generating activities; however, they would not reduce the permanent increase in ambient noise levels to below significance. Operation of the conservation strategy is not anticipated to result in a substantial permanent increase in noise, as described in Alternative 2.

NEPA Determination: The impact determination would be the same as Alternative 2. The impact would be significant and unavoidable.

CEQA Determination: The impact determination would be the same as Alternative 2. The impact would be significant and unavoidable.

Impact NOI-4: Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project (NEPA: significant and unavoidable; CEQA: significant and unavoidable)

This impact would be slightly less under Alternative 3 as compared to Alternative 2 with respect to covered activities within the jurisdictions of the Local Agencies and undertaken by Caltrans and water and irrigation districts because under this alternative, it is anticipated there would be less development. However, there would still be a substantial temporary increase in ambient noise levels as a result of construction noise generated by general plan implementation in the City of Biggs. In addition, temporary and periodic noise from construction activities associated with the conservation strategy could occur near noise-sensitive land uses.

NEPA Determination: The impact determination would be the same as Alternative 2. Mitigation Measure NOI-1 would reduce temporary noise impacts from construction activities related to the conservation strategy to less-than-significant levels; however, impacts associated with implementation of the Biggs general plan would remain significant and unavoidable.

CEQA Determination: The impact determination would be the same as Alternative 2. Mitigation Measure NOI-1 would reduce temporary noise impacts from construction activities related to the conservation strategy to less than significant levels; however, impacts associated with implementation of the Biggs general plan would remain significant and unavoidable.

Mitigation Measure NOI-1: Implement measures to reduce noise during construction and address noise complaints

Impact NOI-5: Be located within an airport land use plan area, or, where such a plan has not been adopted, within two miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels (NEPA: less than significant; CEQA: less than significant)

This impact would be the same under Alternative 3 as under Alternative 2 with respect to covered activities within the jurisdictions of the Local Agencies and undertaken by Caltrans and water and irrigation districts and under the conservation strategy.

NEPA Determination: The impact determination would be the same as under Alternative 2. The impact would be less than significant. No mitigation is required.

CEQA Determination: The impact determination would be the same as under Alternative 2. The impact would be less than significant. No mitigation is required.

Impact NOI-6: Be located in the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels (NEPA: less than significant; CEQA: less than significant)

This impact would be the same under Alternative 3 as under Alternative 2 with respect to covered activities within the jurisdictions of the Local Agencies and undertaken by Caltrans and water and irrigation districts and under the conservation strategy.

NEPA Determination: The impact under Alternative 3 would be the same as under Alternative 2. The impact would be less than significant. No mitigation is required.

CEQA Determination: The impact under Alternative 3 would be the same as under Alternative 2. The impact would be less than significant. No mitigation is required.

Alternative 4—Greater Conservation

Alternative 4 would be similar to Alternative 2 except that under Alternative 4, the conservation strategy would include the conservation of an additional 9,850 acres of grassland and 35,310 acres of riceland. Alternative 4 would include the same conservation measures as Alternative 2, and all other acreage protection targets for natural communities/land types would be the same as described for Alternative 2. The impacts of the covered activities within local jurisdictions of the Local Agencies would be the same under Alternative 4 as under the Alternative 2, as would the water district and irrigation districts' covered activities and the Caltrans activities.

Impact NOI-1: Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies (NEPA: less than significant with mitigation; CEQA: less than significant with mitigation)

This impact would be the same under Alternative 4 as under Alternative 2 as increased conservation of additional grasslands and ricelands would not generate noise levels in excess of established standards beyond those already identified under Alternative 2.

NEPA Determination: The impact determination under Alternative 4 would be the same as under Alternative 2. With Mitigation Measure NOI-1 incorporated to reduce construction noise generated as a result of the conservation strategy, the impact would be less than significant.

CEQA Determination: The impact determination under Alternative 4 would be the same as under Alternative 2. With Mitigation Measure NOI-1 incorporated to reduce construction noise generated as a result of the conservation strategy, the impact would be less than significant.

Mitigation Measure NOI-1: Implement measures to reduce noise during construction and address noise complaints

Impact NOI-2: Expose persons to or generate excessive groundborne vibration or groundborne noise levels (NEPA: less than significant; CEQA: less than significant)

This impact would be the same under Alternative 4 as under Alternative 2 as increased conservation of additional grasslands and ricelands would not generate groundborne vibrations beyond those already identified under Alternative 2.

NEPA Determination: The impact determination under Alternative 4 would be the same as under Alternative 2. The impact would be less than significant. No mitigation is required.

CEQA Determination: The impact determination under Alternative 4 would be the same as under Alternative 2. The impact would be less than significant. No mitigation is required.

Impact NOI-3: Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project (NEPA: significant and unavoidable; CEQA: significant and unavoidable)

This impact would be the same under Alternative 4 as under Alternative 2 as increased conservation of additional grasslands and ricelands would not result in a substantial permanent increase in ambient noise levels beyond those already identified under Alternative 2.

NEPA Determination: The impact determination under Alternative 4 would be the same as under Alternative 2. The impact would be significant and unavoidable.

CEQA Determination: The impact determination under Alternative 4 would be the same as under Alternative 2. The impact would be significant and unavoidable.

Impact NOI-4: Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project (NEPA: significant and unavoidable; CEQA: significant and unavoidable)

This impact would be the same under Alternative 4 as under Alternative 2 as increased conservation of additional grasslands and ricelands would not result in a substantial temporary or periodic increase in ambient noise levels beyond those already identified under Alternative 2.

NEPA Determination: The impact determination would be the same as Alternative 2. Mitigation Measure NOI-1 would reduce temporary noise impacts from construction activities related to the conservation strategy to less-than-significant levels; however, impacts associated with implementation of the Biggs general plan would remain significant and unavoidable.

CEQA Determination: The impact determination would be the same as Alternative 2. Mitigation Measure NOI-1 would reduce temporary noise impacts from construction activities related to the conservation strategy to less-than-significant levels; however, impacts associated with implementation of the Biggs general plan would remain significant and unavoidable.

Mitigation Measure NOI-1: Implement measures to reduce noise during construction and address noise complaints

Impact NOI-5: Be located within an airport land use plan area, or, where such a plan has not been adopted, within two miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels (NEPA: less than significant; CEQA: less than significant)

This impact would be the same under Alternative 4 as under Alternative 2 as increased conservation of additional grasslands and ricelands would not expose residents or workers to noise levels associated with airports beyond those already identified under Alternative 2.

NEPA Determination: The impact under Alternative 4 would be the same as under Alternative 2. The impact would be less than significant. No mitigation is required.

CEQA Determination: The impact under Alternative 4 would be the same as under Alternative 2. The impact would be less than significant. No mitigation is required.

Impact NOI-6: Be located in the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels (NEPA: less than significant; CEQA: less than significant)

This impact would be the same under Alternative 4 as under Alternative 2 as increased conservation of additional grasslands and ricelands would not expose residents or workers to noise levels associated with airports beyond those already identified under Alternative 2.

NEPA Determination: The impact under Alternative 4 would be the same as under Alternative 2. The impact would be less than significant. No mitigation is required.

CEQA Determination: The impact under Alternative 4 would be the same as under Alternative 2. The impact would be less than significant. No mitigation is required.

11.2.4 Cumulative Analysis

Methods and Approach

The cumulative analysis for noise is a qualitative evaluation using the past, present, and reasonably foreseeable future projects listed in Chapter 3, Section 3.3.2, under *Cumulative Impacts*. This cumulative effects analysis for noise considers the effects of implementing the action alternatives in combination with other past, present, and reasonably foreseeable projects or programs. The analysis focuses on projects in the Plan Area, in particular those that could create a cumulatively significant increase in noise relative to noise-sensitive land uses. This analysis considered urban development projects, including roadway projects, and water supply development projects; the general plan EIR impact determinations for cumulative impacts, where applicable; and the impact determinations identified above for the various alternatives. This analysis determines whether the covered activities not analyzed in previous environmental documents would result in cumulatively considerable incremental contribution that, when combined with the past, present, and reasonably foreseeable future projects, would result in a cumulatively significant impact.

Cumulative Impacts

Past, present, and reasonably foreseeable future projects are identified in Chapter 3, *Approach to the Analysis*. Overall, these projects have resulted in or are anticipated to result in cumulative impacts as a result of transportation noise from urban development, including roadway projects, and the construction of infrastructure facilities.

The County and the Cities of Chico, Gridley, and Oroville determined that there would be cumulatively considerable and significant and unavoidable impacts as a result of transportation noise. Implementation of the general plans would noticeably increase transportation noise (traffic, train, and aircraft) throughout the Plan Area. Various general plan goals, policies, and actions are in place to reduce noise impacts due to transportation; however, it is still anticipated that there would be a substantial permanent increase in ambient noise levels. Since transportation noise is an unavoidable outcome of residential and commercial growth as foreseen in the implementation of the various general plans, this cumulative impact is significant and unavoidable for all alternatives.

11.3 References

- Butte County. 2012. *Butte County General Plan 2030*. Adopted October 26, 2010. Amended November 6, 2012. Oroville, CA. Available: <http://www.buttegeneralplan.net/products/2012-11-06_GPA_ZO_Adopted/ButteCountyGP2030_Amended.pdf>. Accessed: February 25, 2013.
- California Department of Transportation. 2004. *Transportation- and Construction-Induced Vibration Guidance Manual*. (J&S 02-039.) June. Prepared for the Noise, Vibration, and Hazardous Waste Management Office, Sacramento, CA. Prepared by Jones & Stokes, Sacramento, CA.
- . 2009. *Technical Noise Supplement to the Traffic Noise Analysis Protocol*. November. Prepared by Jones & Stokes Associates, Inc., Sacramento, CA. Available: <http://www.dot.ca.gov/hq/env/noise/pub/tens_complete2009RedlineScreenProcess.pdf>. Accessed: July 22, 2013.

- City of Biggs. 2014. *City of Biggs General Plan*. March. Available: <<http://www.biggsgeneralplan.com/documents/BiggsGeneralPlanUpdate.pdf>>. Accessed: March 2014.
- City of Chico. 2011. *Chico 2030 General Plan*. Chico, CA. April. Chico, CA. Available: <http://www.chico.ca.us/document_library/general_plan/documents/CompleteGeneralPlan.pdf>. Accessed: February 25, 2013.
- City of Gridley. 2010. *2030 General Plan*. February 15. Gridley, CA. Available: <<http://www.gridley.ca.us/city-departments/planning-department/documents>>. Accessed: January 2011.
- City of Oroville. 2009. *Oroville 2030 General Plan*. Submitted June 2. Oroville, CA. Prepared by Design, Community & Environment, Berkeley, CA, in association with Fehr & Peers Associates and Jones & Stokes Associates, Inc. Available: <<http://www.cityoforoville.org/index.aspx?page=451#1>>. Accessed: June 2011.
- Federal Highway Administration. 2006. *Construction Noise Handbook Section 9: Construction Equipment Noise Levels and Ranges*. Available: <http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook09.cfm>. Accessed: July 22, 2013.
- Federal Transit Administration. 2006. *Transit Noise and Vibration Impact Assessment*. May. U.S. Department of Transportation. Available: <http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf>. Accessed: December 7, 2012.
- Hoover and Keith. 2000. *Noise Control for Buildings and Manufacturing Plants*. Houston, TX.
- U.S. Environmental Protection Agency. 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*. Washington, DC.