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CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

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Noise

Scope of Analysis and Indicators of Effects

This section describes typical characteristics of noise, including ambient sound, in the environment, the regulatory criteria developed to control unwanted noise, and the noise related effects of the proposed project and alternatives. The area of analysis includes the noise sensitive uses located throughout the proposed power line corridor and residences near the proposed substation locations. The timeframe considered for assessment of noise impacts includes the temporary effects during project construction and long-term effects related to the operation and maintenance of the grid interconnection or the Kirkwood generator system. Indicators of effects are the anticipated increases in noise levels with respect to noise standards identified in local plans and ordinances

Affected Environment

Environmental Setting

Characteristics of Noise

The level of noise in a community changes over the course of a day and time and is typically controlled by the activities occurring within an area and nearby. The acceptability of the level of sound is based on the compatibility of activities in an area, and unwanted or excessive sound is perceived as intrusive noise. For example, noise is often considered more annoying during relatively quiet nighttime hours when people are trying to relax or sleep. Ambient or baseline sound level is the background sound level and is a composite of sound from existing sources both near and far. Because ambient or baseline sound is not considered adverse, it is not classified as noise.

The intensity of sound is customarily measured in decibels (dB). Decibel levels are weighted to take into account the fact that human hearing is less sensitive to sounds of very low or very high pitch than it is to mid-range frequencies of a few hundred to a few thousand cycles per second. These are referred to as “A weighted” decibel, or dB(A). The dB(A) level represents the apparent intensity or loudness of the sound rather than its true physical intensity.

Weighted averages of noise data are used to describe various noise characteristics. The equivalent sound level (Leq) is an average noise level over a specified period of time. Noise standards in local county ordinances and planning documents are specified with various criteria:

- Lmax is a single event criteria used to evaluate acceptable maximum noise levels.
- Leq(15) is a short-term measurement averaging noise over a 15-minute period.
- Leq(hourly) is an average noise over a 60-minute period.

- Ldn is a day-night equivalent level that assigns a 10 dB penalty to noises occurring during nighttime hours (7 p.m. to 7 a.m.).
- CNEL (Community Noise Equivalent Level) is weighted to penalize evening and nighttime noise, thereby representing community noise levels for a full 24-hour period.

Typical levels of outdoor and indoor environmental noise in various settings (Amador County, 1988) are illustrated in Table 3-32.

Table 3-32. Common Noise Levels

Common Outdoor Noise Levels	Noise Level dB(A)	Common Indoor Noise Levels
	— 110 —	Rock band
Jet flyover at 1000 ft.	—	
	—	
	— 100 —	Inside subway train (New York)
Gas lawn mower at 3 ft.	—	
	—	
	— 90 —	Food blender at 3 ft.
Diesel truck at 50 ft.	—	
	—	
	—	
Noisy urban daytime	— 80 —	Garbage disposal at 3 ft. Shouting at 3 ft.
	—	
	—	
	— 70 —	Vacuum cleaner at 10 ft.
Gas lawn mower at 100 ft.	—	
	—	
	—	
Commercial area	— 60 —	Normal speech at 3 ft. Large business office
	—	
	—	
Quiet urban daytime	— 50 —	Dishwasher next room
	—	
	—	
	— 40 —	Small theater, large conference room (background)
Quiet urban nighttime	—	
	—	
	—	
Quiet suburban nighttime	— 30 —	Library Bedroom at night
	—	
	—	
Quiet rural nighttime	— 20 —	Concert hall (background)
	—	
	—	
	— 10 —	Broadcast & recording studio
	—	
	—	
	—	Threshold of hearing
	— 0 —	

Source: "Guide on Evaluation and Attenuation of Traffic Noise", American Association of State Highway and Transportation Officials.

Note: A ten (10) decibel increase in sound level on dB(A) scale doubles the apparent loudness or annoyance of the sound.

Existing Noise Levels and Sources

Typical outdoor ambient sound levels vary based on the types of sound and the distances to the sources. Existing sound levels and sources of noise in the area of analysis are outlined below:

- Typical noise levels in Amador County are low. Daily noise levels measured in CNEL or Ldn ranged from 44.4 to 55.3 based on four sites with the lowest noise. Daytime noise, hourly Leq, was measured in the mid 40's to mid 50's dB(A) and nighttime noise, hourly Leq, was measured in the mid 30's to low 40's dB(A) (EDAW, 2007).
- Traffic noise is generated along arterial roads, such as Highway 88 and to some extent along minor collector routes, such as Bear River Road and Kirkwood Meadows Drive. Noise levels are related to average daily traffic volumes, speed, and percentage of large truck traffic. Existing traffic noise was modeled along Highway 88 both east (at Kirkwood Meadows Drive) and west (at Dew Drop Road) of the area of analysis in 2007 by EDAW (Amador County, 2007). Results were very similar for these two locations with a noise level of 65 dB(A) Ldn/CNEL at 82 to 83 feet from the Highway 88 centerline and 55 dB(A) Ldn/CNEL at 388 to 379 feet from the Highway 88 centerline.
- Human activity in residential, commercial, and industrial areas is a source of noise in the environment, and noise levels typically increase with the density in population. Within the area of analysis, there are few developed areas, and the resident population is low. Community areas include the Bear River recreation residences, residences around Silver Lake, and residential areas at Kirkwood. Limited commercial activities also occur at near Bear River Resort, around Silver Lake, and at Kirkwood. Typical existing ambient noise conditions are 40 to 50 Ldn for rural residential areas and 20 to 30 Leq for quiet nighttime rural areas.
- Public and private campgrounds (outdoor activity, recreational vehicles with portable generators, boats, off-highway vehicles, etc.) are sources of noise during the summer season. Over snow off-highway vehicles (snowmobiles, etc.) on ENF snow trails are sources of noise during the winter season.
- Utilities (water, sewer, power, etc.) can be sources of noise, typically related to operations (pumps, engines, transformers, high voltage electric lines, etc.) as well as maintenance of those operations. Within the area of analysis, existing sources of utility noise include PG&E's Salt Springs Reservoir facility, the existing 21 KV overhead power line and transformers, and diesel power generation systems used for residential and commercial areas between Bear River Reservoir and Kirkwood.
- Within Kirkwood, snowmaking activities have been identified as a noise source specifically associated with ski resorts (60 to 65 dB(A) Leq at 100 feet from the equipment). Noise levels can be as high as 74.5 dB(A) Leq within 150 feet of the snowmaking compressors. Noise generated by snowmaking can exceed Alpine and Amador county standards both outdoors and within some residential areas (USDA FS, 2006).

Local criteria for maximum acceptable noise levels in outdoor activity areas are summarized in Table 3-33.

Table 3-33. Local Noise Criteria for Outdoor Activity Areas

County	Land Use	Noise Criteria
Amador ¹	Residential, low density	60 Ldn or CNEL (dB(A))
	Residential, multi-family	65 Ldn or CNEL (dB(A))
	Transient lodging (motels/hotels)	65 Ldn or CNEL (dB(A))
	Schools, libraries, churches, hospitals, nursing homes	70 Ldn or CNEL (dB(A))
	Playground, neighborhood parks	70 Ldn or CNEL (dB(A))
	Industrial, manufacturing, and agriculture	75 Ldn or CNEL (dB(A))
El Dorado ²	Transient lodging	60 Ldn or CNEL (dB(A))
	Churches, meeting halls, schools, hospitals	60 Ldn or CNEL (dB(A))
	Playgrounds, neighborhood parks	70 Ldn or CNEL (dB(A))
	Residential	60 Ldn or CNEL (dB(A))
Alpine ³	Residential neighborhood	65 dB(A) Leq(15)
	Residential estates	60 dB(A) Leq(15)
	Institutional (INS) and planned development	70 dB(A) Leq(15)
	Commercial recreational	75 dB(A) Leq(15)
Kirkwood ⁴	Single-family / duplex residential	60 Ldn or CNEL (dB(A))
	Multi-family residential	65 Ldn or CNEL (dB(A))
	Commercial	70 Ldn or CNEL (dB(A))
	Playgrounds; neighborhood parks	70 Ldn or CNEL (dB(A))
	Schools, libraries, churches	70 Ldn or CNEL (dB(A))

¹ Amador County General Plan (1988) "normally acceptable" noise levels for select land use types.

² El Dorado County General Plan (2004) maximum noise exposure based on transportation noise sources and selected land uses.

³ Alpine County Code Section 18.68.090.

⁴ Kirkwood Specific Plan EIR/EIS (2002).

Noise Sensitive Receptors

The perception of sound as unwanted noise is related to the sensitivity of those receiving the sound. State agencies or local governments through land use classifications identify noise-sensitive areas or specific land uses. Examples of noise-sensitive areas include residences, hospitals and healthcare facilities, schools, park/playgrounds, and libraries.

Most of the power line alignment crosses sparsely developed public lands managed by the ENF. It also crosses a few isolated parcels with existing residences on private lands that have the land use classifications "Natural Resources" in El Dorado County and "General Forest" or "Open Recreation" in Amador County (Figure 23). There is residential development on private lands at Kirkwood, which is a "Planned Development". There are also existing recreation residences on leased National Forest land at three locations: the Bear River Tract, near Silver lake, and near Kirkwood with land use

classifications “Open Forest” in Amador County. There are no hospitals, healthcare facilities, park/playgrounds, or libraries along the project corridor or in the Kirkwood community. Except at Kirkwood, the only county designated sensitive land use classification is the “Residential Suburban” classification on private land near Corral Flat.

Though not specifically designated as a sensitive land use or sensitive receptor by Amador, El Dorado, or Alpine Counties in their General Plan documents, there are developed campgrounds and picnic areas along the power line corridor that are open seasonally. Excessive noise could interfere with public enjoyment of activities at these outdoor areas.

Typical construction noise has the potential to be 45 to 65 dB(A) at about 500 feet, and 65 dB(A) a level generally recognized to be perceived as an annoyance in residential areas. Table 3-34 summarizes the existing campgrounds, picnic areas, and residences within 500 feet of the power line corridor that are identified as noise sensitive receptors for construction of the project.

Table 3-34. Campgrounds, Picnic Areas and Residences Within 500 feet of the Temporary Construction Corridor

Segment	Area	Land Ownership	County	Alternatives 2 ¹	Alternative 3 ¹
Residences					
6	Corral Flat Residence	Private	El Dorado	x	x
9 & Alt 3:9	Tragedy Springs Area Residence	Private	Amador	x	x
20	Devil's Gate Tract	ENF	Amador	x	x
Alt 3:21	Fremont Road Residences	Private	Kirkwood (Amador)	NA	x
Alt 3:21	Kirkwood Mdw. Drive Residences	Private	Kirkwood (Amador/Alpine)	NA	x
22	E. Meadows Drive Residences	Private	Kirkwood (Alpine)	x	NA
Campgrounds and Picnic Areas					
1	Salt Spring Picnic Area	ENF	Amador	x	x
2	Pardoes Point Picnic Area	ENF	Amador	x	x
3	South Shore Picnic Area	ENF	Amador	x	x
9 & Alt 3:9	Tragedy Springs Picnic Area	ENF	El Dorado	x	x
13 & Alt 3:13	Sandy Cove Picnic Area	ENF	Amador	x	x
15	Silver Lake Campground	ENF	Amador	x	x
15	West Silver Lake Campground	Private	El Dorado	x	x

¹ Alternative 4 relocates the KM Green substation from Road 08N17 to near Cole Creek Campground, but could be used with either alignment 2 or 3 and does not affect the Areas identified within 500 feet of the construction corridor.

Sources of operational noise that would occur after construction of the project would include the KM Blue and KM Green substations and new overhead power lines. Table 3-35 summarizes the sources of operational noise and the existing picnic areas, campgrounds and residences in the vicinity of these permanent facilities.

Table 3-35. Sources of Operational Noise and Campgrounds, Picnic Areas and Residences Near Permanent Facilities

Segment	Area	Land Ownership	County	Alternatives 2 and 3 ¹	Alternative 4 ²
Residences					
1 & 2	Bear River Tract	ENF	Amador	KM Green and Overhead Line	Overhead Line
Alt 3:21 and 22	E. Meadows Drive Residences	Private	Kirkwood (Alpine)	KM Blue	KM Blue
Campgrounds and Picnic Areas					
1	Salt Spring Picnic Area	ENF	Amador	Overhead Line	Overhead Line
1	Cole Creek Campground	ENF	Amador	Overhead Line	KM Green and Overhead Line
2	Pardoes Point Picnic Area	ENF	Amador	Overhead Line	Overhead Line
3	South Shore Picnic Area	ENF	Amador	Overhead Line	Overhead Line

¹ KM Green substation located on Road 08N17

² KM Green substation located on near Cole Creek Campground.

Vibration Characteristics

Excessive vibration created by human activity can also interfere with sensitive land uses and must be considered in accordance with the CEQA guidelines. Vibration sources that could be created by the project would be compaction and blasting activities related to power line construction. Activities within 50 to 100 feet could adversely effect sensitive receptors. The only sensitive receptors within 50 to 100 feet of the construction corridor are the residential areas at Kirkwood and the eastern most campsites of the West Silver Lake Campground that parallel Highway 88. The following summary from the Amador County General Plan Update Working Paper for Noise, 2007, is provided to characterize the phenomena of vibration.

“Vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure borne noise. Sources of ground borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, ground borne vibrations may be described by amplitude and frequency.

Vibration amplitudes are usually expressed in peak particle velocity (PPV) or root mean square (RMS), as in RMS vibration velocity. The PPV and RMS velocity are normally described in inches per second. PPV is defined as the maximum instantaneous positive or negative peak of a vibration

signal. PPV is often used in monitoring of blasting vibration because it is related to the stresses that are experienced by buildings (Federal Transit Administration [FTA] 2006, Caltrans 2006).

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. It takes some time for the human body to respond to vibration signals. In a sense, the human body responds to average vibration amplitude. The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a 1-second period. As with airborne sound, the RMS velocity is often expressed in decibel notation as vibration decibels (VdB), which serves to compress the range of numbers required to describe vibration (FTA 2006). This is based on a reference value of 1 micro (μ) inch per second (in/sec).

The background vibration-velocity level in residential areas is usually approximately 50 VdB. Ground borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels (FTA 2006).

Typical outdoor sources of perceptible ground borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Construction activities can generate ground borne vibrations, which can pose a risk to nearby structures. Constant or transient vibrations can weaken structures, crack facades, and disturb occupants (FTA 2006).

Construction vibrations can be transient, random, or continuous. Blasting, impact pile driving, and wrecking balls generate transient construction vibrations. Continuous vibrations result from vibratory pile drivers, large pumps, horizontal directional drilling, and compressors. Random vibration can result from jackhammers, pavement breakers, and heavy construction equipment.

As sound (noise) propagates from the source to the receptor, the attenuation, or manner of noise reduction in relation to distance, is dependent on surface characteristics, atmospheric conditions.”

Regulatory Setting

Federal Regulations

Environmental Protection Agency

The Federal Environmental Protection Agency (EPA) published guidance in 1974 regarding acceptable maximum environmental noise levels, “Information on Levels of Environmental Noise Requisite to Protect Health and Welfare with an Adequate Margin of Safety.” The agency identified yearly noise levels to protect public health and welfare with a margin of safety, which are summarized in Table 3-36. Since that time, the EPA has allowed state and local level governments to take the lead in regulating environmental noise.

Table 3-36. Yearly Ldn Values That Protect Public Health and Welfare

Effect	Noise Levels (decibels)	Area
Hearing	Leq (24 hour) [70	All areas
Outdoor activity interference and annoyance	Ldn [55	Outdoors in residential areas and farms and other outdoor areas where people spend varying amounts of time and other places in which quiet is a basis for use
	Leq (24 hour) [55	Outdoor areas where people spend limited amounts of time such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	Ldn [45	Indoor residential areas
	Leq (24 hour) [45	Other indoor areas with human activities such as schools, etc.

Source: Protective Noise Levels, EPA,550/9-79-100, office of Noise Abatement & Control, November 1978

USDA Forest Service

The 1989 Eldorado National Forest Land and Resource Management Plan as amended by the 2004 Sierra Nevada Forest Plan Amendment Record of Decision does not identify standards and guidelines for noise sources or ambient environmental noise. However, sensitive areas include developed campgrounds and picnic areas open seasonally for the public. Campgrounds typically have rules established by the ENF or concessionaries designating quiet hours from 10 p.m. to 6 a.m.

State Regulations

The State of California requires a noise element to be included in the general plans developed by local governments. Guidelines that identify noise levels compatible with various land uses have been developed to assist local governments with preparing the noise element (State of California General Plan Guidelines, 2003) and regulating environmental noise at the local level.

California Public Utilities Commission

The California Public Utility Commission (CPUC) has jurisdiction over noise produced by privately owned public utilities, preempting local noise regulations. Typically, the CPUC requires utilities to

consult with local agencies, make every feasible effort to meet local noise standards, and implement a variety of Best Management Practices for noise control. Although the KMPUD power line would be a publicly owned utility that would not be regulated by the CPUC, KMPUD would be coordinating construction and operation of the overhead line (Segments 1 and 2) and the KM Green substation with PG&E. PG&E is currently regulated by the CPUC and implements noise reduction measures in accordance with CPUC requirements. KMPUD would also be subject to local noise regulations.

Local Regulations

Regulations governing noise levels are typically implemented through local ordinances, as well as General Plan goals and policies. Amador, Alpine, and El Dorado Counties each have regulations regarding both transportation and non-transportation sources of noise based on land use. The specific goals, policies, and ordinances vary slightly within each jurisdiction.

Amador County

The Amador County Code does not include ordinances specifically related to noise. However, the Noise Element of the Amador County General Plan (1988) provides policies and implementation measures to control noise. Amador County does not identify noise criteria specifically for construction activity or restricted hours of operation.

Policy: It is the policy of the County to prevent the encroachment of noise sources into areas designated for existing or future noise sensitive lands.

Implementation: a) Any required noise monitoring shall be taken and any required noise mitigation conditions shall be adopted at the property line between the noise source and noise sensitive land uses. Noise level standards shall not be exceeded unless found to be acceptable pursuant to Section 15903 of the State CEQA Guidelines (California Administrative Code Statement of Overriding Considerations).

Policy: It is the policy of the County that the following noise sensitive lands uses shall not be exposed to an exterior noise level at the property lines which exceeds an Ldn of 65 dB(A) and will have an interior noise level not to exceed an Ldn of 45 dB(A):

- Residential Classifications in the Land Use Element
- Residential Projects, including Rezones, Use Permits, and Residential Division of Land
- Schools and Churches
- Hospitals, Care Facilities, Libraries and Auditoriums

Implementation: Uses which are proposed near noise sensitive land uses or classifications which would potentially generate noise levels at any or all of their property lines higher than 65 dB(A) shall be required to mitigate their noise generation by distance buffers, equipment or activity noise

attenuation, barriers to noise, operational restrictions, frequency modifications, and single event noise level restrictions.

Implementation: The following standards shall apply to any noise generating facilities at their property lines unless otherwise mitigated or found acceptable.

- The noise level contributed by the proposed noise generating project to adjoining properties identified by the County as being noise sensitive shall not raise the existing ambient noise level at the property line beyond the following levels:

<u>Existing Ambient Noise Level</u>	<u>Allowable Increase</u>
Ldn 55 dB(A)	Ldn 3 dB(A)
Ldn 60 dB(A)	Ldn 2 dB(A)
Ldn 65 dB(A)	Ldn 1 dB(A)

The 24-hour Ldn noise level standards measured at the property line of a noise generator shall also not be exceeded on a per hour basis beyond the following levels:

Cumulative period of 30 minute per hour	0
Cumulative period of 15 minute per hour	+5
Cumulative period of 5 minute per hour	+10
Cumulative period of 1 minute per hour	+15
Level not to be exceeded for any time per hour	+20

Except for impulse of intermittent noise level maximum to be measured at a noise generators property line:

<u>Impulse Duration</u>	<u>25 or less μ Seconds</u>	<u>One Second</u>	<u>One Second</u>	<u>One Second</u>
Number of Impulses per Day:	1	1	10	100
Maximum Noise Level dB(A):	167	145	135	125

Blasting noise levels (peak pressures) shall not exceed the standards recommended in U.S. Bureau of Mines publication RI8485. Vibration from blasting shall not exceed the standards recommended in U.S. Bureau of Mines Publication RI8508.

El Dorado County

The Public Health, Safety, and Noise Element of the El Dorado County General Plan (2004) includes goals, objectives, and policies related to noise. Those specific to the project alternatives are related to construction noise. No operational sources of noise would be located in El Dorado County.

- Goal 6.5: Acceptable Noise Levels: Ensure that County residents are not subject to noise beyond acceptable levels.
- Objective 6.5.1: Protect existing noise sensitive developments (e.g. hospitals, schools, churches, and residential) from new noise uses that would generate noise levels incompatible with those uses and, conversely, discourage noise sensitive uses from locating near sources of high noise levels.
- Policy 6.5.1.11. The standards outlined in Table 3-37 below (from Table 6-5 of the General Plan) shall apply to those activities associated with actual construction of a project as long as such construction occurs between the hours of 7 a.m. and 7 p.m., Monday through Friday, and 8 a.m. and 5 p.m. on weekends, and on federally recognized holidays. Exceptions are allowed if it can be shown that construction beyond these times is necessary to alleviate traffic congestion and safety hazards. Table 3-37 indicates the standards applicable in the area of analysis, which is designated as “Rural Regions” in the El Dorado County General Plan (Land Use Element, 2009 Policy 2.1.3.1) with land use classification “Natural Resources”.

Table 3-37. Maximum Allowable Noise Exposure for Non-Transportation Noise Sources in Rural Regions – Construction Noise

Land Use Designation	Time Period	Noise Level dB	
		Leq	Lmax
Rural Land, Natural Resources, Open Space, and Agricultural Lands (RR, NR, OS, AL)	7 a.m. – 7 p.m.	65	75
	7 p.m. – 7 a.m.	60	70

El Dorado County also has the following ordinances that pertain to noise potentially associated with the project and alternatives.

- 9.16.010 Noise From or Onto Highways.
- 9.16.020 Exemptions from Section 9.16.010.
- 9.16.030 Operating Unmuffled Engine.
- 9.16.040 Loud and Raucous Noises--Definitions.
- 9.16.050 Loud and Raucous Noises--Prohibited.

Alpine County

The Safety Element of the Alpine County General Plan (Revised February 2009) includes noise related goals and policies that would be applicable to the project and alternatives described below.

- General Plan Goal No. 24: Reduce or minimize the number of nuisances created by noise affecting citizens of Alpine County.
- Policy No. 24a: No development shall be allowed that would subject persons living in existing or planned residential areas to unhealthful noise levels.

- Policy No. 24b: New development of noise-sensitive uses shall not be allowed where the noise level due to non-transportation noise sources will exceed the noise level standards shown in the chart below (Table 3-38), as measured immediately within the property line of the new development, unless effective noise mitigation measures have been incorporated into the development design to achieve the standards specified.

Noise created by new proposed non-transportation noise sources shall be mitigated so as not to exceed the noise level standards as measured immediately at the property line of lands designated for noise sensitive uses. Noise sensitive uses include hospitals, clinics, schools, libraries, or residences. This policy shall not apply to noise sources associated with agricultural operations on lands zoned for agricultural uses, residential units established in conjunction with industrial or commercial uses, or snow-making in ski resort areas.

Table 3-38. Noise Level Performance Standards For Noise Sensitive Uses Affected By Non-Transportation Projects

Noise Level	Daytime	Nighttime
Descriptor	(7 a.m. to 10 p.m.)	(10 p.m. to 7 a.m.)
Hourly Leq,	50	45
Maximum level, dB	70	65

- Policy No. 24c: The Planning Commission may allow noise level standards to be exceeded for temporary activities.

Noise ordinances are also included in the Alpine County Code. Section 18.68.090 has the following applicable requirements.

- B. Standards. No activity shall produce sounds measured in excess of the following Leq(15) standards (Table 3-39) beyond parcel boundaries within any area zoned as listed in the following table. These standards do not apply to parcel lines located within the interior of a building.

Table 3-39. Noise Level Restrictions by Zoning Designation

Zone	Maximum Leq(15)
Residential Neighborhood (RN ¹)	65 dB(A)
Residential Estates (RE*)	60 dB(A)
Institutional (INS)	70 dB(A)
Planned Development (PD)	70 dB(A)
Commercial Recreational (CR)	75 dB(A)
Commercial (C)	75 dB(A)

¹ Includes all subcategories of these zoning districts, such as RN-20, RE-4, etc.

F. Exemptions. Sound or noise from the following sources and activities are exempt from the requirements of this section:

1. Construction. Noise from construction activities between the hours of 8 a.m. and 6 p.m. Monday through Friday; and between 9 a.m. and 3 p.m. on Saturday and Sunday. Construction noise that does not exceed the maximum sound levels allowed in this section is not subject to these time restrictions.

Kirkwood Specific Plan

The 2003 Kirkwood Specific Plan includes the following design ordinance (Appendix 4) specific to construction noise:

- Construction activities shall be limited to the hours between 7:00 a.m. and 7:00 p.m., unless extended hours of operation are granted from Tri-TAC and the county of jurisdiction. The owner/owner's agent shall take necessary precautions and notify adjacent property owners, businesses, local traffic, pedestrians, etc. prior to any blasting activities.

Significance Criteria

NEPA Impact Criteria

The NEPA analysis determines whether direct or indirect effects related to outdoor noise levels in noise sensitive areas would result from the project and provides a comparison of effects by alternative. As defined by the Council on Environmental Quality, significance of an effect is determined by the context and intensity of the resulting change relative to the existing environment (40 CFR 1508.27). As applicable, effects are discussed in terms of spatial extent, duration, and intensity.

For the purposes of the analysis, indirect and direct effects are described in terms of consistency with ENF rules and guidelines, as well as applicable state and county plans and ordinances.

CEQA Impact Significance Criteria

Criteria for determining the significance of impacts related to noise are based on the environmental checklist found in Appendix G of the 2010 CEQA Statute and Guidelines (Association of Environmental Professionals, 2010). Noise related effects would be considered significant if the project would result in:

1. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
2. Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels.

3. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
4. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.
6. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.

Effects Analysis

Alternative 1 (No Action / No Project)

Direct and Indirect Effects

Under the CEQA No Project Alternative, the 5-megawatt MU powerhouse would provide the primary source of power. The Final Environmental Impact Report (2002) for the Kirkwood Specific Plan and CEQA Categorical Exemption regarding reconstruction of the Kirkwood powerhouse did not identify any significant impact from equipment noise created by the generator system. Therefore, the No Project Alternative would result in no temporary or permanent direct or indirect effects on noise sources or ambient environmental noise levels.

Under the NEPA No Action Alternative, which includes the operation, maintenance, and management of the new 5-megawatt powerhouse up to its full capacity together with an expansion of the in-valley generation system to 10-megawatt to serve the build-out of the community and resort, noise levels would be dependant on the final expansion configuration. The system would be required to comply with applicable county noise ordinances and the Kirkwood Specific Plan (2003), and be consistent with the Specific Plan Environmental Report (2002).

Cumulative Effects

Noise is frequently a cumulative impact related to growth and development, particularly with respect to increased traffic levels. The No Action / No Project Alternative would result in no changes in development or land uses at Kirkwood, which has an approved Specific Plan (2003). Ongoing mitigation measures to attenuate noise at Kirkwood include limiting hours of operation between the hours of 7 a.m. and 7 p.m. for construction and special event loudspeakers, as well as implementing a Snowmaking Noise Management Program.

Effects Common to Alternatives 2 (Proposed Action / Proposed Project), 3 (Expanded Hwy 88), and 4 (KM Green Substation Location at Cole Creek Road)

The following activities and their effects are common to both Alternative 2 and Alternative 3. Where the alternative alignment segments overlap and result in the same impacts, their impacts are discussed jointly within this section. Alternative 4, which differs only from Alternatives 2 and 3 in location of the KM Green substation at Cole Creek Road, could be used with either power line alignment proposed under Alternatives 2 and 3, and therefore, is also included in this analysis.

Direct and Indirect Effects

Alternatives 2, 3, and 4 would affect noise levels in the area of analysis on a temporary basis during construction of the power line and on a long-term basis for operation of the substations and overhead power line. Vibration would also be created by construction activities during installation of the power line.

Construction

Alternatives 2, 3, and 4 would temporarily increase noise associated with installation of the underground power line, overhead power line, and substations, during the construction period. Construction would use a variety of heavy equipment and construction methods as described in Chapter 2 over a two to three-year period. Construction activities are summarized below:

- Substation construction would involve grading equipment, trucks to haul equipment and materials, backhoes for foundation excavation, cranes to set equipment, and portable generators for site work.
- The overhead power line rebuild would involve the use of backhoes, drilling, and possible blasting for pole foundations, cable pulling equipment, trucks to haul equipment and materials, and periodic use of helicopters to set poles in inaccessible areas of Segments 1 and 2. Helicopter operations are anticipated to be continuous for a period of about two weeks and occasional for a period of two to three months.
- Underground power line construction methods would involve the use of trenching equipment, trucks, compaction equipment, horizontal drills for crossing under Highway 88, and paving equipment. Blasting is anticipated for installation of underground vaults and in some trench areas. Due to the linear nature of the underground power line, construction activity near any specific receptor are expected to last one to two weeks.

Typical noise generated by construction equipment that would be used during power line construction activities is shown in Table 3-40.

Table 3-40. Average Maximum Noise Levels at 50 feet from Common Construction Equipment

Equipment Description	Impact Device?	Actual Measured Average L _{max} ² at 50 feet
Auger Drill Rig	No	84
Backhoe	No	78
Blasting (rock slope production) ¹	Yes	126
Blasting (mitigated rock fracturing) ¹	Yes	98
Boring Jack Power Unit	No	83
Chain Saw	No	84
Clam Shovel (dropping)	Yes	87
Compactor (ground)	No	83
Compressor (air)	No	78
Concrete Mixer Truck	No	79
Concrete Pump Truck	No	81
Concrete Saw	No	90
Crane	No	81
Dozer	No	82
Drill Rig Truck	No	79
Drum Mixer	No	80
Dump Truck	No	76
Excavator	No	81
Flat Bed Truck	No	74
Front End Loader	No	79
Generator	No	81
Generator (<25KVA, VMS signs)	No	73
Gradall	No	83
Grader ¹	No	89
Grapple (on backhoe)	No	87
Horizontal Boring Hydr. Jack	No	82
Impact Pile Driver ¹	Yes	110
Jackhammer	Yes	89
Man Lift	No	75
Mounted Impact Hammer (hoe ram)	Yes	90
Pavement Scarifier	No	90
Paver	No	77
Pickup Truck	No	75
Pneumatic Tools	No	85
Pumps	No	81
Refrigerator Unit	No	73
Rivet Buster/chipping gun	Yes	79
Rock Drill	No	81
Roller	No	80
Sand Blasting (Single Nozzle)	No	96
Scraper	No	84
Shears (on backhoe)	No	96
Slurry Plant	No	78
Slurry Trenching Machine	No	80
Tractor ¹	No	84
Vacuum Excavator (Vac-truck)	No	85
Vacuum Street Sweeper	No	82
Ventilation Fan	No	79
Vibrating Hopper	No	87
Vibratory Concrete Mixer	No	80
Vibratory Pile Driver	Yes	101
Warning Horn	No	83
Water Jet deleading	No	92
Welder / Torch	No	74

¹ WSDOT Measured data in FHWA's Roadway Construction Noise Mode Database (2005).

² L_{max} is the maximum value of a noise level that occurs during a single event.

Noise from multiple sources at the same location results in louder levels than a single source. Decibels are measured on a logarithmic scale, so noise levels cannot be added by standard addition. A typical range of combined noise generated by construction equipment would be 75 to 90 dB(A) Leq at 50 feet from the construction. Sound attenuates with distance from the source and calculated noise levels at various distances from the construction activity are shown in Table 3-41. Noise levels were calculated using a 7.5 dB(A) reduction per doubling distance based on a point source and predominantly soft (open forest) terrain (WDOT, 2010).

Table 3-41. Typical Range of Noise Levels for Construction Activities

Distance (Feet)	Typical Range of Noise Levels Lmax dB(A)
50	75 – 90
500	45 – 65
1000	42.5 – 57.5
2000	38.1 – 49.9
5000	25 – 40

Topography, vegetation, and atmospheric factors affect sound levels and noise perception. A break in the line of sight between noise sources and receivers can result in a 5 dB reduction. Dense vegetation can reduce noise levels by as much as 5 dB for every 100 feet (USDOT, 2010). Noise travels farther during periods of high humidity and in cold temperatures. Wind can reduce noise levels. These influences are difficult to quantify and are not taken into account in evaluation of noise over short distances. As a result, predicted noise levels for construction (Table 3-41) are likely to be higher than actual noise levels.

Calculations suggest construction noise closer than 500 feet to a sensitive receptor has the potential to exceed noise standards as follows:

- Amador County – Alignments for Alternatives 2 and 3 are closer than 500 feet to one residence on private land at Tragedy Springs. There is potential for construction noise to periodically exceed 65 dB(A).
- El Dorado County – Alignments for Alternatives 2 and 3 are the same and are within 500-feet of the residence at Corral Flat and the West Silver Lake Campground, both on private land with land use classification “Natural Resources”, and there is potential to exceed the 65 dB(A) hourly Leq standard (Table 3-37).
- Kirkwood – Construction activity is allowed between 7 a.m. and 7 p.m., and the project complies with the standard.

The El Dorado and Alpine County criteria of 65 dB(A) Leq was used to assess the significance of impacts to noise levels on ENF lands. Facilities located on public land where the ENF is the land manager and that are closer than 500 feet to the power line alignments are shown in Table 3-34.

Vibrations associated with construction equipment and activities include: pile driving, trenching or pavement breaking, jackhammers, and other types of impact equipment, as well as blasting and rock drilling. Rock drilling and blasting are proposed for construction of Alternatives 2, 3, and 4, primarily associated with installation of the underground power line in rocky terrain. Vibrations from tamping activities are expected to generate vibration levels of 0.03 inches per second peak particle velocity at 50 feet (PG&E, 2010). Since vibration levels exceeding 0.01 inch per second for a continuous period begin to annoy people (Caltrans, 2002), sensitive receivers within 50 to 100 feet of the project could be adversely affected. Sensitive receptors within 50 to 100 feet of the construction corridor include residences at Kirkwood (Segments Alt 3:21 and 22) and the eastern most campsites of the West Silver Lake Campground (Segment 15). These areas may experience vibrations from construction activity, such as tamping, that would create a temporary adverse effect.

Design criteria incorporated in the project to minimize the adverse effects of construction activities in noise and vibration sensitive areas and to comply with local regulations include: restricting hours of operation, providing advance notification to residents and the general public, and operating equipment in ways to reduce noise. Implementation of the following design criteria for noise and vibration (Chapter 2) would avoid and minimize adverse effects of the project from construction activities:

- Construction equipment would be in good working order and maintained per manufacturer's recommendations.
- Construction equipment would be adequately muffled.
- Idling of construction equipment and vehicles would be minimized during construction.
- Licensed blasters (by the US Bureau of Mines; California Department of Industrial Relations Mining and Tunneling, or similar) would be used to supervise and visually direct blasting actions.
- Within 500 feet of residences or campgrounds, straw bales, baffles, or similar temporary sound barriers would be used where the construction noise is greater than the maximum allowable noise level for the land use designation sound receptors.

Increased noise levels caused by construction are temporary and often times acceptable to receptors, provided operations are limited to daytime hours and prior notification is provided. Noise is perceived to be more of a nuisance during early morning, late evening, and weekends or holidays. The following design criteria (Chapter 2) would also be used to avoid or minimize adverse effects from construction noise or vibrations on sensitive receptors.

- Noise generating construction activities within 500 feet of any developed campground, picnic area, and residence would be limited to daytime hours from 7 a.m. to 7 p.m. on weekdays and 8 a.m. to 5 p.m. on weekends and California state designated holidays.
- Construction within the Caltrans right-of-way limits, adjacent to sensitive receptors in Segments Alt 3:9, 20, Alt 3:13, 15, and 18 (as shown in Table 3-34), would not occur during weekends or designated holidays and would be limited to daylight hours.
- Construction within the county road right-of-way limits, adjacent to sensitive receptors in Segments Alt 3:9 and 3 (as shown in Table 3-34), would not occur during designated holidays and holiday weekends and would be limited to daylight hours.
- Helicopter operations would be restricted to daytime hours from 7 a.m. to 7 p.m.
- Dates and times for blasting activities would be communicated to residences and businesses in the project vicinity through letters, phone calls, door hangers, signs posted at trailheads and campgrounds.
- Information about construction schedules and locations would be posted at campground and picnic areas and on informational websites (i.e. Kirkwood, Caltrans, county and Forest Service) providing the public with advance notification. Notification procedures would be coordinated with the Eldorado National Forest, Amador County, and Alpine County. KMPUD would coordinate with private property owners.

Operations

Operational noise associated with the power line would be created or increased by implementation of Alternatives 2, 3, or 4. Sources of sound associated with equipment would include the new transformers being installed at the proposed KM Green and KM Blue substations and the overhead power line (existing overhead line rebuilt at a higher voltage). Equipment in the aboveground sectionalizing cabinets and belowground vaults installed along the underground section of the power line would not generate noise (personal communication with Power Engineers, December 2010). Minimal operational noise would be generated by maintenance personnel accessing this equipment with a utility truck for annual inspections or for monthly inspections at the substations.

Typically, the main source of sound from a substation is the large bulk power transformers, particularly those involved with DC to AC inverters. The transformers at KM Green and KM Blue substations would be relatively small, and there is no DC to AC conversion at the substations. In transformers of the size and type proposed (10 to 12 MVA at KM Green and KM Blue substations), there are two sources of noise: (1) the cooling fans that come on during times of heavy load, and (2) the interaction between the magnetic fields inside the transformer and iron containing metals in the transformer tank and radiators that produce a continuous humming sound at a frequency mainly 60 Hertz and 120 Hertz. The magnitude of both sources of sound is directly related to the load on the

transformer. The magnetic fields in the transformer are proportional to load, so during lightly loaded conditions the sound produced greatly decreases. The cooling fans would come on during the peak electrical load created by ski operations and the sound produced would increase. Heavy load conditions that produce the most sound at the substations would occur during daytime hours in the ski season (personal communication, Power Engineers, 2010). As discussed in Chapter 1, existing and projected seasonal energy use is about 60 percent less during summer months than during the ski season, and under these lighter loads the cooling fans would not operate and sound would be reduced. In order to minimize noise from substation operations, the transformers at both substations would be constructed with low noise transformers and cooling equipment, installed in accordance with standards for environmental compatibility (IEEE 1127-1998 and NEMA Tr-1). Sound levels have been calculated for the equipment in both the KM Green and KM Blue substations for two conditions: typical loads with no cooling fans, and peak ski season loads with cooling fans. These calculations are presented below.

KM Green Substation

At 50-feet from the equipment, sound levels for a properly installed 10 to 12 MVA transformer (KM Green substation) would be 40 to 55 dB(A) under typical operating conditions and 55 to 75 dB(A) under peak load ski season conditions when cooling fans are operating (personal communication, Power Engineers, 2011). With distance sound produced by the transformer is estimated to attenuate to typical ambient conditions (hourly average 40 to 45 dB(A) Leq daytime, 20 to 30 dB(A) Leq nighttime) within the following distances:

- 80 to 200 feet during the daytime, except during the ski season;
- 900 to 1200 feet during the daytime periodically during the ski season; and
- 300 to 1300 feet during the nighttime year round.

At both KM Green substation locations, at Forest Service Road 08N17 and near Cole Creek Road the closest property boundary would be greater than 1500 feet. Ambient conditions based on a day/night weighted average (Ldn) of 40 dB(A) (Amador County, 2007) would increase at 1500 feet by 0.3 dB(A) under typical conditions and 1.5 dB(A) under peak ski season loads. Sound produced by the KM Green substation at the nearest property boundary would be less than the 3 dB(A) Ldn increase and the 65 dB(A) Ldn standard specified in the Amador County General Plan Noise Element. Therefore, adverse effects of the KM Green substation operations on noise levels would be less than significant.

KM Blue Substation

At 50-feet from the equipment, sound levels for properly installed 10 to 12 MVA transformer (KM Blue substation) would be 40 to 55 dB(A) under typical operating conditions and 55 to 75 dB(A) under peak load ski season conditions when cooling fans are operating (personal communication,

Power Engineers, 2011). In addition, to minimize noise at the KM Blue substation, where residences are relatively close, a low noise installation would be used, resulting in a 5 to 10 dB(A) reduction in sound in the vicinity of the substation. Calculations of the KM Blue transformer noise without a “low noise” reduction estimated that the hourly Leq at 400 to 450 feet would be 26 to 31 under typical operating conditions and 51 to 53 dB(A) under peak load conditions (ski season peak loads). During the winter season, noise could exceed the 50 dB(A) daytime Leq standard in the Alpine County General Plan for sensitive land uses. This noise level would be reduced by the low noise type installation (screen/barrier resilient mounting, isolation, flexible couplings, etc.) as needed to comply with the standard. Therefore adverse effect of the KM Blue substation operations on noise levels would be less than significant.

Overhead Power Lines

Studies indicate there is no perceptible sound produced under properly installed 115 kV lines during dry weather conditions and 18 to 26 dB(A) under wet weather conditions (California Energy Commission, 2010). Sound produced by the 35 kV line and the existing 21kV lines would be less than the 155 kV estimates. The noise created by overhead transmission lines would not elevate noise levels above ambient conditions typical of rural areas in Amador County (40 to 55 dB(A)) or increase noise at any residential property boundary to 65 dB(A) Ldn, even during wet weather. Due to all of these factors, impacts from noise associated with the 115 kV overhead line (Segment 1) and the 35 kV overhead line (Segment 2) would be less than significant.

Cumulative Effects

Noise is frequently a cumulative impact related to growth and development, particularly with respect to increased traffic levels. Alternatives 2 and 3 would result in no changes in development or land uses at Kirkwood, which has an approved Specific Plan (2003). On going mitigation measures to attenuate noise at Kirkwood would not be affected, including limiting hours of operation between 7 a.m. and 7 p.m. for construction and special event loudspeakers, as well as implementing the Snowmaking Noise Management Program. The cumulative effect of Alternatives 2, 3, or 4 throughout the area of analysis would be less than significant.

Alternative 2 (Proposed Action / Proposed Project) and Alternative 3 (Expanded Hwy 88) Power Line Route Comparison

Direct and Indirect Effects

Alternatives 2 and 3 would have similar direct and indirect noise effects during construction and operation. Both Alternatives 2 and 3 would expose residences in Kirkwood to construction noise (Table 3-34) along the respective proposed alignments. Construction of Alternative 2 would have a local, temporary effect on the residences located along East Meadow Drive (Segment 22), while

Alternative 3 would have a local, temporary effect on the residences located along Fremont Road and Kirkwood Meadows Parkway (Segment Alt 3:21).

KM Green Substation Location Comparison

Direct and Indirect Effects

Under Alternatives 2 and 3, the substation would be located on FS Road 08N17 with the nearest sensitive stationary sound receptor at a residence located approximately 1,500 feet away (Figure 2.1). The substation would be located on a “dead end” road according to ENF Travel Management Plan (ENF, 2008), minimizing exposure to the general public.

Under Alternative 4, the substation would be located on Cole Creek Road with the nearest sensitive stationary sound receptor being the Cole Creek Campground, located approximately 1,900 feet away (Figure 2.1). The substation site is adjacent to Cole Creek Road, which is frequented by snowmobiles in the winter and in the summer by recreationists.

Calculations to determine the effect of the KM Green substation transformer noise on the nearest stationary receptor estimate the day/night weighted average (Ldn) at 1,500 feet would increase from 40 dB(A) existing ambient conditions to 41.5 or less dB(A) under peak load operating conditions (ski season peak loads) and 40.3 under typical operating conditions. Noise exposure would be considerably lower than the 65 dB(A) Ldn standard and the 3 dB(A) Ldn increase specified in the Amador County General Plan. Impacts to sensitive stationary sound receptors (Bear River recreation residences and the Cole Creek Campground) from either the substation location (at FS road 08N17 or Cole Creek Road) would be less than significant.

Recreational winter activities near the substation include snowmobiling, which provides transportation to the Bear River recreation residences and utilizes the groomed snow trail loop between Bear River Reservoir and Cole Creek Campground. The ENF estimates 50 to 100 snowmobiles in the area on a weekend (personal communication, ENF, 2010). Substation noise would be considerably less than the noise generated by the snowmobiles, and would therefore not have an affect on snowmobilers at either KM Green substation location.

NEPA Impact Summary

As designed, the noise levels of construction, operation, and maintenance for the proposed project and alternatives would be consistent with the ENF rules and guidelines, as well as applicable state and county plans and ordinances.

The construction activity for the power line and substations under Alternatives 2, 3, and 4 would cause temporary local increases in noise levels that have the potential to exceed 65 dB(A) within 500 feet of

the activity. Specific residences and campgrounds on private land and National Forest Land have been identified in Table 3-34 where construction noise may have an adverse effect. Adverse effects would be avoided and minimized by employing design criteria that restrict hours of operation, provide advance notification to residents and the general public, and require that equipment by operations reduce noise. Design features are incorporated in power line plans and specifications and implemented through the ENF Special Use Permit and the Amador County Encroachment Permits. KMPUD would coordinate with the ENF and counties regarding notification of residents and the general public of construction activities and schedules. As designed, adverse effects related to temporary construction noise produced by Alternatives 2, 3, and 4 would be less than significant.

The operation of the power line and substations would produce sound, primarily related to transformers located at the KM Green and KM Blue substations and the additional lines along the existing 21 kV overhead power corridor (Segments 1 and 2 of the project). The substations would locally increase ambient noise levels primarily during the winter ski season during the heaviest electrical load, however calculated increase in ambient noise levels at the nearest sensitive receptors would comply with local standards. At the Bear River recreation residences the increase ambient noise would be less than 1.5 dB(A) Ldn complying with Amador County noise standards. At Kirkwood, the noise level at the nearest property boundary would be less than 50 dB(A) Leq (hourly), complying with Alpine County noise standards. Design features to reduce sound produced at the substations and minimize adverse effects of noise include low noise transformer, as well as low noise transformer installation at the KM Blue substation. As designed, adverse effects related to construction noise produced by Alternatives 2, 3, and 4 would be less than significant.

CEQA Impact Significance Determinations

The proposed project would result in a significant impact if it would result in:

1. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

As described in detail in the Effects Analysis above, during construction, Alternatives 2, 3, and 4 would temporarily expose sensitive noise receptors such as residences, local campgrounds and picnic areas (Table 3-34) located within 500 feet to the project area to noise levels greater than 45 to 65 dB(A), generally recognized to be a source of annoyance.

Applicable standards have the potential to be exceeded at the following locations:

- The residence on private land at Tragedy Springs (Amador County) may experience construction noise for an anticipated one to two week period that could exceed 65 dB(A) Ldn, established for residential land use in the Amador County General Plan, because the underground line would be installed in either Tragedy Springs Road (Alternative 2) or Highway 88 (Alternative 3), both less than 500 feet from the residence.

- The residence at Corral Creek and the West Silver Lake Campground (El Dorado County) along Highway 88 may experience construction noise for an anticipated one to two week period that could exceed 65 dB(A) Leq, established for construction noise for natural resource land use classifications in the El Dorado County General Plan. The underground line is less than 500 feet from these locations.

To avoid and minimize adverse effects to sensitive noise receptors from construction related noise the project incorporates several design criteria, which include restricting the hours of construction (7 a.m. to 7 p.m. during weekdays; 8 a.m. to 5 p.m. on weekends) and use of sound abatement measures such as straw bales, baffles, or similar sound barriers. Additionally, equipment would be kept in good working order and idling would be minimized. Where blasting activities would be within 500 feet of a sound sensitive area, blasting sound abatement measures would be employed to reduce noise levels, such as covering the charge with heavy mats or reducing the blast energy. Due to the temporary nature of the impact and with incorporation of the project design criteria, impacts from exposure to construction noise would be *less than significant*.

Long-term operation of the KM Green and KM Blue substations also poses permanent sources of noise. Calculations to determine the effect of the KM Green substation transformer noise on the nearest stationary receptor estimate the day/night weighted average (Ldn) at 1,500 feet would increase from 40 dB(A) existing ambient conditions to 41.5 or less dB(A) under peak load operating conditions, an increase of 1.5 dB(A) during the ski season. Noise would be considerably lower than the 65 dB(A) Ldn standard and the 3 dB(A) Ldn increase specified in the Amador County General Plan. Impacts to the nearest sensitive receptors, Bear River Recreation Residences for the KM Green substation location near Road 08N17 or the Cole Creek Campground for the KM Green substation at Cole Creek Road would be *less than significant*.

Calculations of the KM Blue transformer noise estimate that the hourly Leq at 400 to 450 feet would be 51 to 53 dB(A) under peak load conditions (ski season peak loads), which would exceed the 50 dB(A) daytime Leq standard in the Alpine County General Plan for sensitive land uses. These noise levels would be reduced by 5 to 10 dB(A) with a low noise installation and would comply with the County standard. Therefore, operations of the KM Blue substation would not substantially increase ambient noise in the Kirkwood area, and the impact would be *less than significant*.

Long-term operation of the buried line, sectionalizing cabinets, or vaults would not result in increased noise levels. Noise under the 35 kV and 115 kV would not elevate noise levels above ambient conditions typical of rural areas in Amador County (40 to 55 dB(A)) Ldn or increase noise at the property boundary or any residence to 65 dB(A) Ldn, therefore the impacts on noise would be *less than significant*.

2. Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels.

Alternatives 2, 3, and 4 would generate vibrations related to construction along the project corridor, typically related to compaction or blasting activities. Sensitive receivers within 50 to 100 feet of the project could be adversely affected. As described under the Effects Analysis, the design criteria were developed to prevent excessive vibration and include restricting hours of operation and operating equipment in ways to reduce noise. Dates and times for blasting activities would be communicated to residences and businesses in the project vicinity through letters, phone calls, door hangers, signs posted at trailheads and campgrounds. Information about construction schedules and locations would be posted at campground and picnic areas and on informational websites (i.e. Kirkwood, Caltrans, county and Forest Service) providing the public with advance notification. Notification procedures would be coordinated with the Eldorado National Forest, Amador County, and Alpine County. KMPUD would coordinate with private property owners. Because the duration of the vibration generating activities would be temporary and minimized through incorporation of project design criteria, the impact from construction activities related to vibrations would be *less than significant*.

3. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

Operations of both the KM Green and KM Blue substations would result in a permanent increase in ambient noise levels in the project vicinity. As discussed above in the Effects Analysis, both substations would be constructed with low noise transformers and cooling equipment. Sound levels with the immediate area of the substation would increase, but would attenuate with distance. An increase of 1.5 or less dB(A) Ldn at 1,500 feet would occur under peak load operating conditions, which occur during the daytime during the ski season. Under typical operating conditions the increase at 1500 feet would be 0.3 dB(A). Noise exposure would be considerably lower than the 65 dB(A) Ldn standard and the 3 dB(A) Ldn increase specified in the Amador County General Plan.

Calculations of the KM Blue transformer noise estimated that the hourly Leq at 400 to 450 feet would be 51 to 53 dB(A) under peak load conditions(ski season peak loads) which would exceed the 50 dB(A) daytime Leq standard in the Alpine County General Plan for sensitive land uses. These noise levels would be reduced by 5 to 5 dB(A) with a low noise installation and would comply with the County standard.

Therefore, operations of the KM Green and KM Blue substations would not substantially increase ambient noise in the Kirkwood area, and the impact would be *less than significant*.

4. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

As described in detail in the Effects Analysis above, during construction, Alternatives 2, 3, and 4 would temporarily expose sensitive noise receptors such as residences, local campgrounds and picnic

areas (Table 3-34) located within 500 feet to the project area to noise levels that would be greater than 45 to 65 dB(A) Leq, generally recognized to be a source of annoyance. To avoid and minimize adverse effects to sensitive noise receptors from construction related noise the project incorporates several design criteria, which include restricting the hours of construction in the vicinity of sensitive receptors and use of sound abatement measures such as straw bales, baffles, or similar sound barriers. Additionally, equipment would be kept in good working order and idling would be minimized. Where blasting activities would be within 500 feet of a sound sensitive area, blasting sound abatement measures, such covering the charge with heavy mats or reducing the blast energy, would be employed to reduce noise levels. Dates and times for blasting activities would be communicated to residences and businesses in the project vicinity through letters, phone calls, door hangers, signs posted at trailheads and campgrounds. Information about construction schedules and locations would be posted at campground and picnic areas and on informational websites (i.e. Kirkwood, Caltrans, county and Forest Service) providing the public with advance notification. Notification procedures would be coordinated with the Eldorado National Forest, Amador County, and Alpine County. KMPUD would coordinate with private property owners.

Operation of the KM Green and KM Blue substations would not result in noise levels that exceed County standards. The 115 kV overhead lines would create a periodic increase in noise during wet conditions (rain, sleet, fog, etc.), but the estimated increase is less than the typical ambient noise conditions.

The impact related to temporary or periodic noise from operation of the project would not be substantial and impacts would be *less than significant*.

5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Alternatives 2, 3, and 4 are not located within an airport land use plan or within two miles of a public airport. Alternatives 2, 3, and 4 would have *no impact* on related noise levels.

6. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

Alternatives 2, 3, and 4 are not located within the vicinity of a private airstrip. Alternatives 2, 3, and 4 would have *no impact* on related noise levels.